**APPENDICES A, G, AND I HAVE BEEN OMITTED THEY HAVE BEEN SUBMITTED UNDER CONFIDENTIAL COVER**

# Appendix 4.4-A

## Biological Technical Report

# Biological Technical Report

## TL695/6971 Reconductor Project
## Aboard Marine Corps Base Camp Pendleton
## San Diego and Orange Counties, California

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## ACRONYMS AND ABBREVIATIONS

| | |
|---|---|
| BGEPA | Bald and Golden Eagle Protection Act |
| BMPs | Best Management Practices |
| BTR | Biological Technical Report |
| CCA | California Coastal Act of 1972 |
| CCC | California Coastal Commission |
| CDFW | California Department of Fish and Wildlife |
| CESA | California Endangered Species Act |
| CNPS | California Native Plant Society |
| CNDDB | California Natural Diversity Database |
| CPUC | California Public Utilities Commission |
| RWQCB | California Regional Water Quality Control Boards |
| CWA | Clean Water Act |
| CZMA | Coastal Zone Management Act of 1972 |
| CFR | Code of Federal Regulations |
| ESA | Endangered Species Act |
| INRMP | Integrated Natural Resources Management Plan |
| MCB | Marine Corps Base Camp Pendleton |
| MBTA | Migratory Bird Treaty Act |
| NOAA | National Oceanic and Atmospheric Administration |
| NMFS | National Marine Fisheries Service |
| NCCP | Natural Communities Conservation Plan |
| OCRM | Office of Ocean and Resource Management |
| PEA | Proponent's Environmental Assessment |
| PSA | Proposed Survey Area |
| PTC | Permit to Construct |
| SDG&E | San Diego Gas & Electric Company |
| SWRCB | State Water Resources Control Board |
| SWPPP | Storm Water Pollution Prevention Plan |
| ACOE | U.S Army Corps of Engineers |
| U.S.C. | United States Code |
| DoD | United States Department of Defense |
| USFWS | United States Department of the Interior Fish and Wildlife Service |
| EPA | United States Environmental Protection Agency |

## 1.0 INTRODUCTION

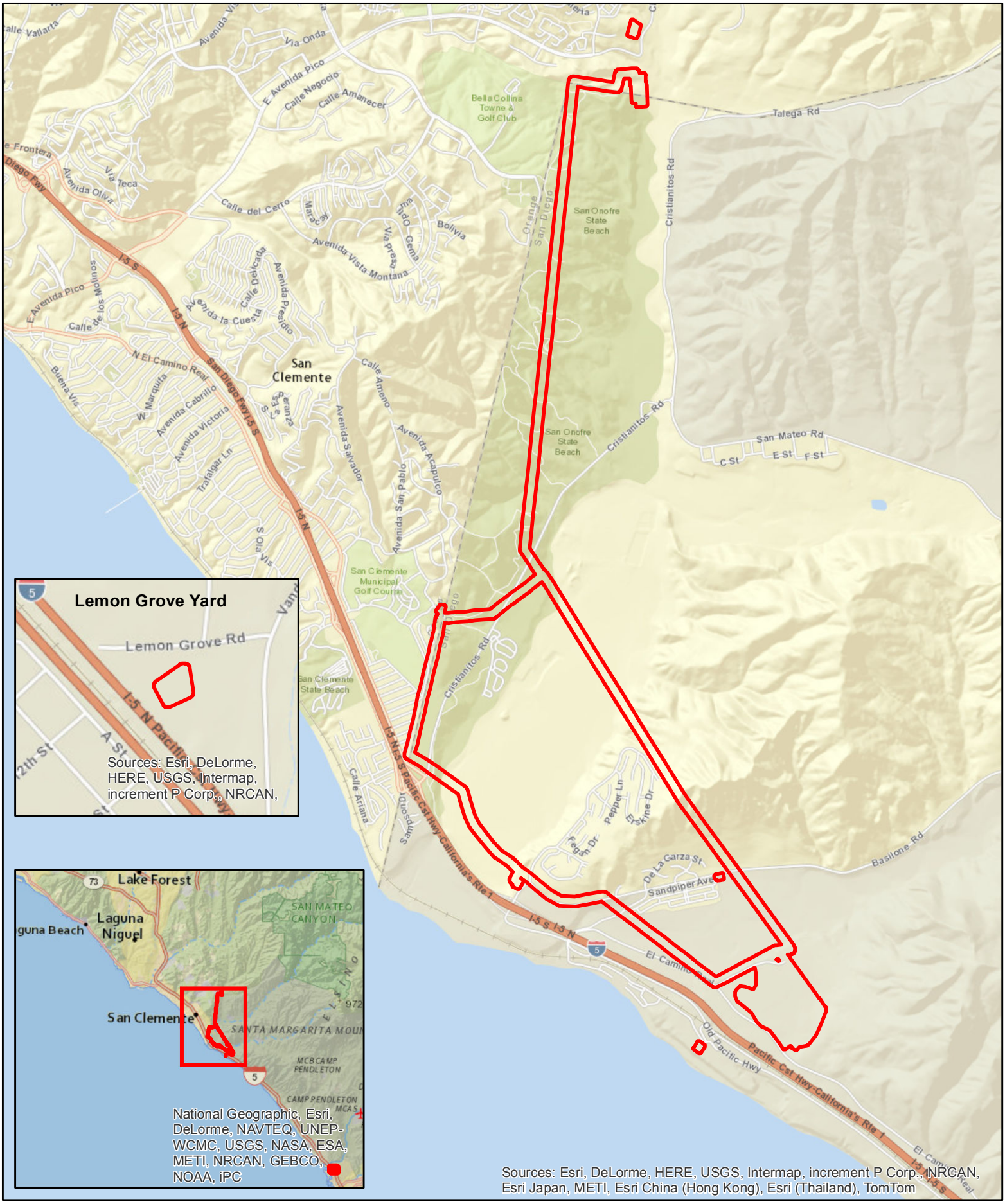
San Diego Gas & Electric Company (SDG&E) is a regulated public utility that provides electric service to over three million customers within its 4,100 square mile service territory, which covers portions of southern Orange County, San Diego County, and western Imperial County in California. In an effort to provide service reliability for its customers within Marine Corps Base (MCB) Camp Pendleton and southern Orange County, SDG&E is proposing to construct the TL695/6971 Reconductor Project (Project), which involves the reconductoring of an approximately 10 mile-long 69 kilovolt (kV) power line in northern San Diego County, near its northwest border with Orange County (Figure 1). The power line is located primarily on federal military lands aboard the northwestern portion of MCB Camp Pendleton. The proposed Project includes the removal of existing wood poles; the installation of new dull galvanized steel poles; reconductoring; and other improvements. The Project alignment runs generally north to south, from SDG&E's Talega Substation to its Basilone Substation, with one section of the Project heading southeast from the San Mateo Junction, and the other heading southeast from the Basilone Substation to the SDG&E Japanese Mesa Substation, in the San Onofre Nuclear Generation Station (SONGS) Mesa area.

SDG&E has retained Pangea Biological (Pangea) to conduct biological resource surveys (including special-status plant and wildlife surveys) and a jurisdictional waters/wetland study within the proposed Project. Analysis of biological and water/wetland resources included a 300-foot-wide (150 feet on either side of the project alignment) survey corridor along the proposed Project alignment, as well additional work areas outside of the project corridor.

The purpose of this Biological Technical Report (BTR) is to document the findings of both reconnaissance-level and focused biological and jurisdictional water and wetland surveys conducted for the proposed Project, and to analyze the potential and actual impacts that could occur as a result of construction of the proposed Project. This report will be included as an attachment to SDG&E's Proponent's Environmental Assessment (PEA), and filed as part of its application for a Permit to Construct (PTC) that will be submitted to the California Public Utilities Commission (CPUC). Pangea has prepared this report on behalf of SDG&E.

## 2.0 PROJECT DESCRIPTION

The proposed reconductoring, pole structure removal, and pole structure installation will occur within existing utility corridors and power line alignments. Reconductoring will also take place at existing substations. The new dull galvanized steel pole structures will consist of both direct bury and foundation pole structures. New pole structures will be placed in new holes and/or set in existing holes. The Proposed Project will also involve removing existing conductor; topping existing pole structures above distribution and communication lines; stringing new conductor onto existing structures; installing new cable pole structures; and placing conductor in a new underground alignment. Construction activities will be facilitated through the use of various temporary facilities, including stringing sites, guard structures, work/staging/turnaround areas, helicopter Incidental Landing Areas (ILAs), and staging yards.




0 0.25 0.5 0.75 1 Mile

Created by Pangea Biological, September 2015
Coordinate System: NAD 1983 StatePlane California VI FIPS 0406 Feet
Projection: Lambert Conformal Conic
Datum: North American 1983

25240 TL 695/6971 Reconductor Project
Figure 1: Tie Line 695/6971 Project Location Overview

Survey_corridor

Pangea Biological

Access for construction activities will be provided by existing dirt access roads, overland travel routes, and footpaths. One new dirt access road segment, approximately 50 feet in length, will be required to access a proposed pole structure. Helicopters will also be used for construction, and will land as needed at ILAs and/or staging yards. Refer to Chapter 3, Project Description, of the TL 695/6971 Reconductor Project Proponent's Environmental Assessment for a detailed description of construction activities, including the dimensions of temporary workspaces that may affect special status plant or wildlife species and/or their habitat.

## Project Components

### Overhead Construction

The existing wooden poles will be replaced with new dull galvanized steel-wood (SW) poles, which consist of directly-embedded, tubular light-duty and heavy-duty steel poles, and engineered steel poles with pier foundations. Construction-related activities associated with the proposed Project include installing or replacing direct bury wood and steel pole structures, installing pier foundation pole structures, installing pier foundation cable poles, removing existing poles from service, conducting overhead pole top work at poles or pole structures, installation of new conductor along a section of existing lattice structures, installation of new underground line, installation and temporary use of temporary guard structures, accessing stringing sites and staging yards, as well as replacing existing overhead conductor. Once the new pole structures have been installed, the new conductor will be installed, either replacing the existing conductor or adding new conductor to the pole or structure. Wherever possible, activities will occur within existing paved or unpaved access roads or other previously disturbed areas.

### Pole Installation and Replacement

***Direct Bury Steel Poles***

In general, temporary impact areas were evaluated based on anticipated geometric work spaces around each proposed work location. Construction work spaces are dynamic in nature and may require minor modifications during the construction phase of the Proposed Project in order to facilitate worker safety and to avoid impacts to natural resources, including sensitive habitats. Therefore, the proposed temporary impact areas are estimated based on the "best information available at the time of this report." To account for shifts in construction approaches, potential temporary impact areas were evaluated based on a 20-foot radius surrounding each direct bury steel pole. It is anticipated that installation of direct bury steel poles will occur within an approximately 10-foot work area radius around the pole within the larger 20-foot potential temporary impact area. Thus, the resulting evaluated total impact area includes 1,240 square feet of temporary impacts and approximately 16 square feet of permanent impacts as a result of the pole. Installation and/or replacement of H-frame poles and 3-pole angle structures will require additional temporary and permanent workspace per pole. However, because many of the new poles will be located in the immediate vicinity of existing poles, the actual proposed work areas for pole replacements will often be much smaller, as existing disturbed areas, temporary work areas, and access roads will be used during installation and/or replacement of poles as much as possible. These work spaces provide a safe working area for equipment, vehicles and materials during pole installation and maintenance.

***Pier Foundation Steel Poles***

Concrete pier foundation poles will utilize a 6- to 8-foot-diameter hole dug approximately 30 to 40 feet by a large truck-mounted auger. A rebar cage is lowered into the hole, and an anchor bolt cage is inserted within the rebar cage. The hole is then filled with concrete, with the exposed final foundation remaining approximately two feet above ground level. The new engineered steel pole is then bolted to the foundation. New steel single-pole concrete pier foundation structures will require an approximately 75-foot by 75-foot (5,625 square feet) temporary workspace at each pole. The installation of new H-frame foundation poles will require additional temporary and permanent workspace per pole.

***Pier Foundation Steel Cable Poles***

Concrete pier foundation cable poles are similar to regular pier foundation poles; however, the base of the foundation includes underground connections for transition of overhead to underground conductor. New steel cable pole pier foundations require a larger temporary workspace to construct (approximately 150 feet by 150 feet, or 22,500 square feet) at each pole.

***Pole Removal***

In addition to the installation of new poles and replacement of existing pole structures, some existing poles are to be removed for the proposed project. Pole removals will typically be completed from existing access roads or disturbed areas or with the use of a helicopter. Temporary workspace for pole removals will typically require an approximately 10-foot radius work area around each pole (314 square feet of temporary work area). However, if work is conducted from an existing disturbed area or access road, then the temporary impacts are expected to be lower.

***Lattice Tower Work***

Installation of new conductor along a section of existing lattice towers will require a temporary workspace of approximately 314 square feet, or a 10-foot radius around the tower leg closest to the existing access road nearest the structure. Work is intended to be conducted primarily from construction vehicles parking within the existing access road and/or from helicopter, which will result in lower impacts in this area. However, if climbing the tower is necessary, SDG&E has included foot traffic impacts and equipment staging around one of the tower legs in order to access the tower on foot, if necessary.

***Pole Top Work***

Some of the existing poles within the proposed Project will not be completely replaced; however, materials and equipment on the pole (such as guy wires, insulators, conductor, etc.) will be modified, replaced, or removed. For those locations that only require work on the pole (or pole top), crews will require access to the site, but will either use construction vehicles (such as a bucket or line truck) to access the pole, or will climb the pole to perform construction activities. Vehicle access to these sites will be from existing access roads and/or existing disturbed areas, and temporary impacts may result from crews walking around the base of the poles and/or structures and the laydown of materials (insulators, stringing rollers, etc.), hand tools, and other equipment at the base of the pole/structure. Temporary workspace required for pole top work will include an approximately 10-foot radius work area around each pole (314 square feet of temporary work area); however, the impacts to these areas may be lower depending on the positioning of construction vehicles, equipment and materials required to conduct the work.

***Stringing and Pulling Sites***

The setup and use of proposed stringing sites will be necessary during construction of the proposed Project. In general, stringing sites will range in size from approximately 40 feet by 80 feet (3,200 square feet), 80 feet by 80 feet (6,400 square feet), 15 to 30 feet by 100 to 150 feet (1,500 to 3,000 square feet), to some sites in disturbed and paved areas up to 10,000 square feet in size. Stringing sites will generally be located directly in line or slightly offset from the existing conductor. It is not anticipated that grading of the stringing sites will be necessary; however, stringing sites located within vegetated areas may be mowed or vegetation trimmed prior to use to minimize the potential for fire, or damage to native vegetation during construction.

***Guard Structures***

Temporary guard structure sites will be set up and used during the reconductoring of the power line. Guard structures will be used where the overhead line will cross existing roads or sensitive resources that require additional protection from potential contact with conductor that is being installed or removed. These structures may consist of a single wood pole with a cross-beam attached to side extensions, a two-pole wood structure with a cross-beam, or a boom truck. The temporary work area impacts for a guard structure include an approximately 6-foot by 6-foot workspace per pole installed (approximately 72 square feet) for the temporary installation of the guard pole in anticipation of wire pulling.

### Underground Construction

To accommodate the installation of the underground duct banks located along the underground portion of the TL695/6971 Double Circuit Steel Pole Line section, temporary workspaces centered on the duct bank alignments would be established. These areas would be cleared and graded, as needed, to provide a safe working space for the operation of construction equipment. The duct banks would require an approximately 30-foot-wide workspace (approximately 15 feet on each side of the line), for the length of the proposed underground segment.

Two underground pull sites would be established to provide a safe working space for the installation of the underground portion of the TL695/6971 Double Circuit Steel Pole Line section. These pull sites will be located on either end of the underground segment and would be located directly in line or offset with the conductor, adjacent to the cable poles that transition from underground to overhead line.

### Substation Modifications

Modifications to the Talega, Basilone, and Japanese Mesa substations will be required to accommodate the new conductor being installed as part of the proposed Project. These modifications will be completed within the existing footprint of each substation and will not require any additional temporary workspace outside of the existing substation boundaries.

### Staging Yards

The proposed Project includes six temporary construction staging areas: Basilone Road, Lemon Grove, San Mateo, SDG&E SONGS Lot 4, SONGS Mesa, and Talega Staging Yard. Staging yards may be used for refueling areas for vehicles and construction equipment by a mobile fueling truck, pole framing and assembly, open storage of material and equipment, construction trailers, portable restrooms, parking, lighting and may include generator use for temporary power in construction trailers. Construction

workers typically meet at the staging area each morning and park their vehicles at the yard. In-ground fencing will be installed at the staging yards in cases where it is not already installed. Gravel, class II base, or other BMP may be used to line the ground at staging yards to avoid the creation of unsafe mud conditions and unnecessary sediment transport off site. SDG&E has attempted to identify a reasonable number of staging yards commensurate with the size, location, and scope of the proposed Project.

The Basilone Road Staging Yard is approximately 1 acre (43,560 square feet) in size and is located south of Basilone Road and approximately 230 feet southeast of the intersection of Basilone Road and Meadowlark Drive.

The Lemon Grove Staging Yard is approximately 1.5 acres (65,340 square feet) and is located south of Lemon Grove Road, and approximately 950 feet southwest of the intersection of Vandergrift Boulevard and Lemon Grove Road.

The San Mateo Staging Yard is approximately 0.75 acre (32,670 square feet) in size and is located east of Calle Bahia, and approximately 0.5 mile east of the intersection of El Camino Real and East Avenida Magdalena.

The SDG&E SONGS Lot 4 Staging Yard is a paved parking lot located south of Old Pacific Highway and approximately 1.3 miles southeast of the intersection of Interstate 5 and Basilone Road. It is approximately 1 acre (43,560 square feet) in size and consists of paved ground.

The SDG&E SONGS Mesa Staging Yard is approximately 80 acres in size (3,484,800 square feet) and is located north of El Camino Real and approximately 0.7 mile southeast of the intersection of Basilone Road and Morgan Street.

The Talega Staging Yard is approximately 1.5 acres (65,340 square feet) and is located northeast of Corte Cristianitos and approximately 0.2 mile northeast of the intersection of Avenida Pico and Camino La Pedriza.

### Helicopter Usage During Construction

Helicopters will be used during construction for activities including (but not necessarily limited to) stringing of overhead conductor, installation or removal of structures and/or materials, and transportation of equipment associated with the proposed Project. SDG&E anticipates that light- or medium-duty helicopters may be used. Helicopters will be used during daylight hours, and flight paths will generally be limited to the existing alignment except for ingress and egress from helicopter landing areas (including local airports, staging yards, and ILAs). Any helicopter use will comply with all relevant usage permits including the U. S. Department of Defense (DoD), and Federal Aviation Administration (FAA). SDG&E and/or the construction contractor will coordinate with local air traffic control, and comply with applicable FAA regulations regarding helicopter use to prevent conflict with air traffic in the vicinity.

ILAs are used for short-term helicopter operations, such as framing of poles and structures, and transport of poles, conductor or other equipment to specific locations within the proposed Project. Helicopters will typically be staged out of local airports (such as McClellan-Palomar, Oceanside, Montgomery, and Gillespie), and can use construction staging areas as ILAs. Helicopter staging activities, such as maintenance and repair, will be conducted at the local airport(s). Helicopter refueling may be

required at proposed Project ILAs. Proposed ILA locations will typically be adjacent to existing access roads to facilitate transport of equipment and materials to and from an ILA during construction. ILAs will typically be located in previously disturbed or developed areas, however, surveys for potential biological and wetland/water resources will be conducted in and in the vicinity of proposed ILA sites during the spring of 2016 to determine any resources that could be impacted as a result of set up and use of any ILA.

### Project Access

SDG&E currently maintains a network of existing paved and unpaved access roads on MCB Camp Pendleton that are used to maintain and operate the existing power lines within their easements. In coordination with MBC Camp Pendleton, this network of roads will be used to access all temporary work areas required during construction. Most work areas are accessible by vehicle in paved/developed areas, or unpaved SDG&E-maintained access roads; however, SDG&E has identified new permanent access roads, turnout areas, overland travel routes, and footpaths that will be required for use during construction. These areas will allow construction personnel and/or vehicles and equipment to be able to access each of the project work areas that are not directly accessible by existing access roads. Any recently added project components outside the project study area for this report will be surveyed in the spring of 2016 to determine any biological and water/wetland resources that may be affected as a result of construction.

## 3.0 REGULATORY SETTING

The following federal, state and local regulations and policies pertaining to biological resources for the proposed Project are described below.

### 3.1 Federal Regulations

#### Federal Endangered Species Act

The federal Endangered Species Act (ESA) was enacted to protect plant and wildlife species from extinction by eliminating or reducing the threats to these species and by aiding in the recovery and/or maintenance of existing species populations. Species that are designated (listed) as endangered or threatened, as well as species that are candidates for listing, are protected from unauthorized "take" under the ESA. The ESA prohibits take of endangered wildlife, where "take" is defined as to "harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, collect, or attempt to engage in such conduct" (16 United States Code [U.S.C.] §§ 1532(19), 1538). For plants, this statute governs removing, possessing, maliciously damaging, or destroying any listed plant on federal land and removing, cutting, digging-up, damaging, or destroying any listed plant on non-federal land in knowing violation of state law (16 U.S.C. § 1538(c)). The ESA also designates critical habitat for federally listed species and protects these species from interference with vital breeding and behavioral activities and from critical habitat degradation.

The ESA is administered by the United States Department of the Interior Fish and Wildlife Service (USFWS) and the National Oceanic and Atmospheric Administration's (NOAA) National Marine Fisheries Service (NMFS). Under Section 7 of the ESA, federal agencies are required to consult with the USFWS if their actions, including permit approvals or funding, could adversely affect a listed species or its critical habitat. Through consultation and the issuance of a Biological Opinion, the USFWS may issue an incidental take statement, allowing take of the species that is incidental to another authorized activity, provided that the action would not jeopardize the continued existence of the species. Section 10 of the

ESA provides for issuance of incidental take permits to private parties with the development of a Habitat Conservation Plan (HCP) or Natural Communities Conservation Plan (NCCP), such as SDG&E's existing NCCP for work conducted in its service territory.

A person, defined as an "individual, corporation, partnership, trust, association, or any other private entity; or any officer, employee, agent, department, or instrumentality of the Federal Government, of any State, municipality, or political subdivision of a State, or of any foreign government; any State, municipality, or political subdivision of a State; or any other entity subject to the jurisdiction of the United States", is prohibited from taking a listed species until an appropriate permit pursuant to Section 7, 9, and/or 10 of the ESA has been obtained from the USFWS and/or NMFS.

### Clean Water Act

The U.S. Environmental Protection Agency (EPA) administers the Clean Water Act (CWA), which regulates potential impacts to wetlands, Waters of the U.S., and Waters of the State resulting from discharge of dredged materials by implementing pollution control measures to maintain water quality in these waterways. The purpose of the CWA is to "restore and maintain the chemical, physical, and biological integrity of the nation's waters." Some sections of the CWA, including Sections 404 and 401, are administered by agencies other than the EPA.

The U.S. Army Corps of Engineers (ACOE) administers Section 404 of the CWA, which is the regulation of the discharge of dredged or fill material into navigable waters, including wetlands and other Waters of the U.S. The definition of Waters of the U.S. includes rivers, streams, estuaries, territorial seas, ponds, lakes, and wetlands. Wetlands are defined as those areas "that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions" (33 CFR § 328.3(b)). The ACOE is responsible for issuing general and individual permits and for making determinations on whether an area is considered jurisdictional. Substantial impacts to Waters of the U.S. may require an Individual Permit. Projects that only minimally affect Waters of the U.S., may meet the conditions of one of the existing Nationwide Permits, provided such permits' other respective conditions are satisfied.

A Water Quality Certification or waiver pursuant to Section 401 of the CWA is required for Section 404 permit actions. The SWRCB, in conjunction with the nine California Regional Water Quality Control Boards (RWQCB), administers Section 401 of the CWA, which is a requirement of a State Water Quality Certification or waiver for any activity requiring a Section 404 permit. The State Water Quality Certification ensures the activity will not violate any established State water quality standards. The SWRCB and/or RWQCB are responsible for issuing permits pursuant to the Section 401 Water Quality Certification Program. For the proposed Project, this certification or waiver would need to be issued by the San Diego Regional Water Quality Control Board (RWQCB).

### Coastal Zone Management Act

The Coastal Zone Management Act of 1972 (CZMA) is administered by the Office of Ocean and Resource Management (OCRM) of NOAA. It was established as a national policy to preserve, protect, develop, and where possible, enhance or restore the coastal zone in the U.S. The federal consistency provision, Section 307 of the CZMA, allows states to join the Coastal Zone Management Program (CZMP), which takes a comprehensive approach to coastal resource management by balancing the often competing

and occasionally conflicting demands of coastal resource use, economic development, and conservation, and allows states to issue applicable permits. California implements a federally approved CZMP, which is administered by the California Coastal Commission (CCC, see below).

### Migratory Bird Treaty Act

The Migratory Bird Treaty Act (MBTA, 50 Code of Federal Regulations [CFR] Parts 13 and 21) implements international treaties between the U.S. and other countries for the protection of migratory bird species that spend all or a portion of their lives in the United States. It protects species and any of their parts, eggs, and nests from activities such as hunting, pursuing, capturing, killing, selling, and shipping unless expressly authorized in the regulations or by permit. As authorized by the MBTA, the USFWS issues permits to qualified applicants for activities such as falconry, raptor propagation, scientific collection, rehabilitation, education, migratory game bird propagation, salvage, take of depredating birds, taxidermy, and waterfowl sale and disposal.

### Bald and Golden Eagle Protection Act

The Bald and Golden Eagle Protection Act (BGEPA) prohibits the "take" of either the bald eagle (*Haliaeetus leucocephalus*) or the golden eagle (*Aquila chrysaetos*), including their parts, nests, or eggs. The definition of take in the BGEPA is to "pursue, shoot, shoot at, poison, wound, kill, capture, trap, collect, molest, or disturb" any bald or golden eagle. The USFWS administers the BGEPA, and limited take authorizations are allowed for qualifying activities. Persons who "take, possess, sell, purchase, barter, offer to sell, transport, export or import, at any time in any manner, any bald eagle (or any golden eagle), alive or dead, or any part, nest, or egg thereof" with prior approval by the USFWS will be subject to criminal penalties.

## 3.2 State Regulations

### California Endangered Species Act

The California Endangered Species Act (CESA) generally parallels the main provisions of the ESA. Section 2080 of the Fish and Game Code prohibits the taking, possession, purchase, sale, and import or export of endangered, threatened, or candidate species, unless otherwise authorized by permit or in the regulations. Take is defined in Section 86 of the Fish and Game Code as to "hunt, pursue, catch, capture, or kill, or attempt to hunt, pursue, catch, capture, or kill." CESA allows for take incidental to otherwise lawful projects. State lead agencies are required to consult with the CDFW to ensure that any action they undertake is not likely to jeopardize the continued existence of any endangered or threatened species or result in destruction or adverse modification of essential habitat.

### Fish and Game Code

The State of California began to designate species as "fully protected" prior to the creation of the CESA and the ESA. Lists of fully protected species were initially developed to provide protection to those animals that were rare or faced possible extinction, including fish, amphibians, reptiles, birds, and mammals. Many fully protected species have since been listed as threatened or endangered under the CESA and/or the ESA. Fully protected species may not be taken or possessed at any time (Fish and Game Code § 4700).

Section 2081 of the California Fish and Game Code gives the California Department of Fish and Wildlife (CDFW) the authority to issue an incidental take permit for projects that have the potential for take on a special-status species, including state-listed species, as long as the impacts are minimized and fully mitigated and will not jeopardize the continued existence of a state-listed species. The measures required to minimize and fully mitigate impacts must be roughly proportional to the extent of the proposed impact to the species and must be capable of successful implementation while maintaining the applicant's objectives to the greatest extent feasible.

Sections 1601 through 1606 of the Fish and Game Code require that a Notification of Lake or Streambed Alteration Agreement Application be submitted to the CDFW for "any activity that may substantially divert or obstruct the natural flow or substantially change the bed, channel, or bank of any river, stream, or lake." The CDFW reviews the proposed actions and, if necessary, submits (to the applicant) a proposal that includes measures to protect affected fish and wildlife resources. The final proposal that is mutually agreed upon by the CDFW and applicant is a Lake or Streambed Alteration Agreement. The State of California has incorporated the protection of birds and nests in Sections 3503, 3503.5, 3513, and 3800 of the Fish and Game Code.

### Native Plant Protection Act

The Native Plant Protection Act (NPPA) of 1977 (Fish and Game Code §§ 1900–1913) was created with the intent to "preserve, protect, and enhance rare and endangered plants in this State." The NPPA is administered by the CDFW. The CDFW Commission has the authority to designate native plants as "endangered" or "rare" and to protect them from take.

### Porter-Cologne Water Quality Act

The intent of the Porter-Cologne Act is to protect water quality and the beneficial uses of water, and applies to both surface and ground water. Under this law, the SWRCB develops statewide water quality plans, and the RWQCBs develop basin plans, which identify beneficial uses, water quality objectives, and implementation plans. The RWQCBs have the primary responsibility to implement the provisions of both statewide and basin plans. Waters regulated under Porter-Cologne, referred to as "Waters of the state," include isolated waters that are no longer regulated by the ACOE. Any person discharging, or proposing to discharge, waste to Waters of the state must file a Report of Waste Discharge and receive either waste discharge requirements (WDRs) or a waiver to WDRs before beginning the discharge.

### California Coastal Act

The California Coastal Act of 1972 (CCA) was enacted to provide the standards for balancing development and conservation of resources within the coastal zone, which includes approximately 1.5 million acres along the Pacific Coast of the U.S. The CCA is administered by the CCC to regulate the short and long-term conservation and use of coastal resources through responsible development.

The CCC protects Environmentally Sensitive Habitat Areas (ESHAs) per Section 30240 of the CCA, which states that "environmentally sensitive habitat areas shall be protected against any significant disruption of habitat values, and only uses dependent on such resources shall be allowed within such areas." An ESHA is defined as "any area in which plant or animal life or their habitats are either rare or especially valuable because of their special nature or role in an ecosystem and which could be easily disturbed or degraded by human activities and developments."

ESHA designations are often based on the presence of rare habitats, or on areas that support populations of rare, sensitive, or especially valuable species or habitats. The CDFW identifies rare habitats in their List of California Terrestrial Natural Communities Recognized by the CNDDB (CDFW 2015a). Rare species are defined as those that are listed under the CESA or ESA, those that are on Lists 1, 2, 3, or 4 of the California Native Plant Society (CNPS), and those for which there is other compelling evidence of rarity such as published academic studies.

California currently has a federally approved CZMP, which is administered through state and local governments. Throughout southern California, there are two state coastal management agencies, the California Coastal Conservancy, and the CCC. The California Coastal Conservancy is responsible for purchasing, protecting, restoring, and enhancing coastal resources, and the CCC manages development within the coastal zone. The CCA encourages local municipalities to establish Local Coastal Programs (LCPs) to make decisions on behalf of the CCC, and to protect public access and coastal resources on a local level. After certification of an LCP, authority to issue a Coastal Development Permit is delegated to the local government, but the CCC maintains permit jurisdiction over specific lands (such as tidelands, submerged islands, and lands of public trust), and can appeal permits approved by local governments in certain geographical locations. Development within the coastal zone may not commence until the CCC or the local government with a certified LCP has issued a Coastal Development Permit.

## 3.3 Local and Other Regulations

### MCB Camp Pendleton Integrated Natural Resources Management Plan

The MCB Camp Pendleton Integrated Natural Resources Management Plan (INRMP) is a planning document that guides the management and conservation of natural resources on lands falling within MCB Camp Pendleton control, including federally listed threatened or endangered species and their habitats. INRMPs are intended principally to guide the effective management of an installation's natural resources to ensure that its lands remain available and in good condition to support the installation's military mission, and with "no net loss" in the capability of military installation land to support the military mission of the installation. The MCB Camp Pendleton INRMP was developed as an "umbrella" document that encompasses all elements of natural resources management applicable to MCB Camp Pendleton, including compliance with the Terms and Conditions of relevant USFWS Biological Opinions and ongoing stewardship activities. SDG&E's currently works under numerous leases/right-of-way agreements for electric and gas utility lines/service on MCB Camp Pendleton, and in these areas are subject to the requirements of the INRMP. MCB Camp Pendleton's Assistant Chief of Staff, Environmental Security provides the lead and overall coordination of environmental compliance and natural resources management at MCB Camp Pendleton.

### SDG&E Subregional Natural Communities Conservation Plan

Under Section 10(a) of the ESA, SDG&E developed a comprehensive sub-regional multiple species and habitat Natural Communities Conservation Plan (NCCP) to effectively preserve and enhance covered sensitive species and their habitats within SDG&E's service territory, during the operation, maintenance, and expansion of its electric and natural gas distribution and transmission systems. For operations and maintenance activities as well as the completion of some capital projects, SDG&E's NCCP constitutes a permit issued pursuant to Fish and Game Code Section 20817 with an implementation agreement with the CDFW for the management and conservation of multiple species and their associated habitats as established according to the California ESA (CESA) and the state's NCCP Act. The purpose of the

Subregional NCCP is to establish and implement a long-term agreement between SDG&E, USFWS, and CDFW for the preservation and conservation of sensitive species and their habitats, while allowing SDG&E to develop, install, maintain, operate, and repair facilities necessary to provide energy services to customers living in SDG&E's service area. Fifty-two plant species and 58 wildlife species, some of which are federally and/or state listed, are covered under the NCCP. Under the NCCP, incidental take of a covered species would be authorized during otherwise lawful activities. The NCCP also provides steps to minimize and mitigate any potential impacts to covered species and their habitats.

While the proposed Project falls within the area in which SDG&E's utility operations are governed by SDG&E's NCCP, SDG&E will not use the take authority granted by the USFWS and the CDFW in the NCCP for impacts to covered species. Potential take of state and federally listed species will be handled through consultation with the USFWS and CDFW in accordance with applicable sections of the federal ESA and the CESA. The proposed Project will incorporate the Operational Protocols incorporated in the NCCP to avoid and minimize impacts to sensitive species and habitats in their project design features and Ordinary Construction/Operating Restrictions.

The NCCP identifies 61 Operational Protocols designed to avoid and minimize potential impacts to sensitive species and their habitats, and to provide appropriate mitigation where such impacts are unavoidable in order to ensure survivability and conservation of protected species and their habitat. These 61 protocols include provisions for personnel training, pre-activity studies, maintenance, and repair and construction of facilities, including access roads, and emergency repairs. SDG&E's NCCP does not exempt projects subject to permits from the California Public Utilities Commission, the CCC, or several other federal and state agencies. Therefore, many SDG&E projects, including the proposed Project, would also be subject to National Environmental Policy Act (NEPA) and California Environmental Quality Act review. The NCCP is intended to form the basis for evaluating impacts to sensitive species and their habitats in subsequent environmental reviews. SDG&E's NCCP has also defined habitat enhancement measures. In addition, SDG&E would implement Project specific measures to further minimize potential impacts, to ensure the protection and conservation of listed and covered species and their habitats.

## 4.0 METHODS

### 4.1 Project Study Area

The Project Study Area (PSA) primarily includes an approximately 300-foot survey corridor (approximately 150 feet on either side of the centerline of the proposed route) along the entire 10 mile length of the proposed Project. Also included in the impacts analysis for this report are the proposed Basilone, Lemon Grove, San Mateo, SDG&E Lot 4, SONGS Mesa, and Talega (1) staging yards.

A study "corridor" was established for biological resource surveys in order to accommodate minor changes in project design (such as changes to work areas and/or additions/deletions or changes to the locations of pole/structures), while minimizing the need to conduct additional surveys. The methods used to conduct the studies within the PSA are detailed below.

Subsequent changes to the Proposed Project have resulted in new project components (Talega staging yard (2), stringing sites, turnaround areas, etc.) outside of the PSA that have been added after initial surveys had been conducted. These additional components will be surveyed in spring 2016, to

determine the biological and jurisdictional resources within these areas. The results of these surveys will be submitted as a supplement to this BTR.

## 4.2 Literature and Existing Data Review

### Literature Search

A number of recent studies (from reconnaissance-level constraints analysis studies to site- and species-specific focused surveys) have been conducted within and in the immediate vicinity of the PSA. As part of the initial data review for the proposed Project, a literature review of reference materials was conducted, including existing management plans, aerial photography of the region, the CDFW Natural Diversity Database (CNDDB), a search of the CNPS Inventory of Rare and Endangered Vascular Plants of California, the USFWS website and Federal Register regarding federally listed species, U. S Geological Survey topographic maps, National Wetland Inventory maps, review of the reports of previous biological resource surveys conducted within and in the vicinity of the project, and manuals, guides, and other environmental documentation and resources for California plants and wildlife.

Pertinent planning documents relevant to the proposed Project were also referenced, including MCB Camp Pendleton's INRMP and SDG&E's Subregional NCCP. Environmental documents for work previously conducted in the vicinity of the proposed Project on MCB Camp Pendleton were also reviewed.

### Special Status Species Lists

In order to develop a potential list of special status plant and wildlife species that occur or could potentially occur within the proposed Project, a search of the CNDDB RareFind 5 program, maintained by the CDFW, was conducted for special status species that lie within one mile of the proposed Project area. Other resources that were queried included the USFWS website, CNPS Inventory of Rare and Endangered Vascular Plants of California, the SDG&E Subregional NCCP, existing MCB Camp Pendleton environmental documentation and electronic data, and San Diego County Bird Atlas. Records for known special status plants and wildlife within one mile of the proposed Project were compiled and reviewed. Species were considered special status if they met the following criteria:

- Species are included on CNPS List 1B.1, 1B.2, 1B.3, 2.1, 2.2, 2.3, 3, or 4;
- Species are federally listed as endangered, threatened, or are a candidate for listing status;
- Species are state-listed as endangered, threatened, a California Species of Special Concern, or fully protected; or
- Species are considered sensitive by MCB Camp Pendleton.

Approximately 66 special status plants and wildlife species have been identified as occurring or potentially occurring within or in the immediate vicinity of the proposed Project. These species are described in Section 5.0. When formal Section 7 consultation is established with the USFWS, the proposed Project will receive a final list of species (listed or candidate species) that are of concern from the USFWS.

Determination of the potential for listed, or other sensitive plant and/or wildlife species to occur within the PSA was assessed based on a few criteria:

- Low Potential for Occurrence – There are no recent historical records for this species within or in the immediate vicinity of the PSA, and any habitat or specific environmental conditions needed to support the species do not exist or are of poor quality

- Moderate Potential for Occurrence – 1) Historical records exist for the species within or adjacent to the PSA, however, either no suitable habitat exists, or only poor quality habitat occurs within or in the immediate vicinity of the PSA, or 2) No previous historical records for this species have been recorded within or in the immediate vicinity of the PSA. However, suitable habitat exists for the species within or in the immediate vicinity of the PSA.

- High Potential for Occurrence – Historical records exist for the species within or adjacent to the PSA and suitable habitat for the species exists for the species within or in the immediate vicinity of the PSA.

- Present – The species has been observed within or in the immediate vicinity of the PSA.

- Not Detected During Survey – Protocol-level surveys were conducted for the species and suitable habitat exists, however, the species was not detected during the surveys or during other incidental surveys conducted for the proposed Project.

### Critical Habitat

A search of the USFWS Critical Habitat Portal was conducted to identify whether the proposed Project area is located within any USFWS-designated critical habitat areas. In addition, recovery plans for listed species and Geographic Information System data from the USFWS website were also reviewed. The MCB Camp Pendleton INRMP was also reviewed and cross referenced with the USFWS Critical Habitat Portal to determine which lands (covered by the INRMP) have been precluded from Critical Habitat designation.

## 4.3 Resource Agency Correspondence

SDG&E conducted informal initial discussions with the USFWS during the spring and summer of 2015 regarding biological resources with potential to occur in the vicinity of the proposed Project. Initial discussions with the USFWS included a dialogue regarding potential species of concern that could occur in the vicinity of the PSA, and the need and types of protocol-level surveys that would be required for the proposed Project. Pangea and the USFWS permitted biologists working with the Pangea team have also coordinated with the USFWS regarding surveys for special status plant and wildlife species within the PSA by submitting notifications to conduct protocol-level surveys, as a condition of their USFWS permit to survey these species.

To comply with the requirements of NEPA for the proposed Project, it is assumed that MCB Camp Pendleton will be the lead Federal Agency for the proposed Project, and authorized representatives from MCB Camp Pendleton will conduct formal Section 7 Consultation with the USFWS (with support from SDG&E and its consultants) during the course of the environmental documentation and approval process.

## 4.4 Surveys

During the numerous field surveys conducted within the PSA, biologists noted any general and special-status plant and wildlife species occurring within the PSA. Species were detected by direct observation, but also through signs, such as parts of plants that had grown in previous seasons or earlier in the growing season, and scat, tracks, burrows, and vocalizations of wildlife species. Methods used for focused, protocol-level special status plant and wildlife species surveys conducted are described below, and in the survey reports included as part of the appendices.

### Initial Constraints Analysis

An initial survey and analysis of biological and jurisdictional resource constraints was conducted in April 2013 to identify the presence of, or potential to occur, of special-status biological and jurisdictional water resources along SDG&E's TL695 (LSA Associates, Inc., 2013). Reconnaissance-level surveys were conducted to determine the potential or presence of vernal pools and/or sensitive branchiopods, federally listed plant species, least Bell's vireo (*Vireo bellii pusillus*), southwestern willow flycatcher (*Empidonax traillii extimus*), Pacific pocket mouse (*Perognathus longimembris pacificus*), coastal cactus wren (*Campylorhynchus brunneicapillus sandiegensis*), and potential jurisdictional resources that could be affected from the construction of the proposed Project (Appendix A).

### Biological Resource Surveys/Vegetation Mapping

At the request of SDG&E, a general biological resource survey was conducted in July and August 2014 to determine the vegetation communities located within the PSA, and determine the potential federal, state, and/or NCCP Sensitive (covered) species that occur or have potential to occur (AECOM 2014a). At the time of this survey, SDG&E was still considering using the take authority granted by the USFWS and the CDFW in the NCCP for impacts to covered species. Surveys were conducted to map vegetation communities, and to determine potential habitat areas for the sensitive species listed as potentially occurring in the PSA. Additional information on locations of basins within the PSA that could potentially support sensitive branchiopod species was also provided. Vegetation community classifications used in this report follow Holland's Preliminary Descriptions of the Terrestrial Natural Communities of California (Holland, 1986), as modified by Oberbauer (Oberbauer et. al., 2008, Appendix B).

As part of special status plant surveys conducted in the spring of 2015 (Cardno 2015a), vegetation types were reviewed and updated to reflect the most current conditions within the PSA. The vegetation communities identified in the current PSA alignment have been digitized and used as the preliminary vegetation community base for this BTR (Appendix C).

### Rare Plant Surveys

Rare Plant Surveys within the PSA were conducted during the spring of 2015. Reconnaissance level field surveys were conducted throughout the project area for all potential rare plants. Focused surveys for thread-leaved brodiaea (*Brodiaea filifolia*, BRFI) were conducted according to the "Brodiaea filifolia Inventory Protocol," prepared by the MCB Camp Pendleton Environmental Security Department, Land Management Section (MCB Camp Pendleton 2015a). Potential BRFI habitat GIS data was provided by SDG&E (SDG&E 2015). During the course of surveys, Cardno biologists identified areas that were categorized as potential BRFI habitat in the GIS (SDG&E 2015), but that did not contain suitable BRFI habitat; therefore, such areas were not surveyed (Cardno 2015a, Appendix C). All suitable BRFI habitats

within the project area were surveyed at least every two weeks for three complete surveys. Surveys were conducted from March 31 through May 21, 2015.

## Special Status Wildlife Surveys

***Branchiopod Survey***

Wet season fairy shrimp surveys within the PSA were conducted during the spring of 2015 (Cardno 2015b, Appendix D). Before initiating the wet season surveys, a 15-day notice of intent (notification) letter was sent to the USFWS Carlsbad Field Office requesting permission to conduct surveys for the presence of listed fairy shrimp.

Wet season fairy shrimp surveys were conducted in accordance with the Interim Survey Guidelines to Permittees for Recovery Permits under Section 10(a)(1)(A) of the Endangered Species Act for the Listed Branchiopods (USFWS 1996). After wet season fairy shrimp surveys began, the USFWS published updated survey guidelines for wet and dry season surveys for these species (USFWS 2015b). As a result, the wet season fairy shrimp surveys continued to be conducted under the original (1996) guidelines, with the dry season surveys to be completed under the updated guidelines from 2015.

Surveys were conducted by USFWS-permitted fairy shrimp and vernal pool biologists. Before beginning focused surveys, site reconnaissance surveys were conducted to determine suitable habitat. All potential basins were documented and mapped in the field using a global positioning system unit with a sub-meter level accuracy receiver. Documentation and GIS locations of potential habitat was provided by SDG&E prior to initiating fairy shrimp surveys.

Initial location data provided by SDG&E included seven basins in the PSA. During the course of wet season sampling, any unexpected and undocumented ponded features encountered within the survey area were also inspected for potential vernal pool characteristics or diagnostic species. If warranted, these basins were surveyed for fairy shrimp presence.

Wet season sampling commenced following a substantial rainfall event at the end of February 2015, and subsequent permission to proceed from the USFWS. Sampling events occurred between the dates of March 6 and May 20, 2015. During that time, basins identified as having potentially suitable fairy shrimp habitat were mapped, photographed, and then surveyed for the duration of the wet season. During the wet season, each basin was surveyed up to 10 times, approximately once every two weeks and/or after rain events. Only sexually mature individuals were collected. If a federally-listed fairy shrimp was recovered from any of the basins during the wet season sampling, the fairy shrimp survey for that basin would have been considered complete under the protocol guidelines.

Dry season protocol fairy shrimp surveys were completed in September 2015. Fairy shrimp soil collection was conducted in accordance with the *Interim Survey Guidelines to Permittees for Recovery Permits under Section 10(a)(1)(A) of the Endangered Species Act for the Listed Vernal Pool Branchiopods* (USFWS 1996) with incorporation of the most recent guidance (USFWS 2015) wherever possible. Soil collection was conducted by USFWS permitted fairy shrimp and vernal
pool biologists (Cardno 2015b, Appendix D).

***Arroyo Toad***
Protocol surveys for the arroyo toad (*Anaxyrus californicus*) within the PSA were conducted during the spring of 2015. The surveys followed the protocol established by the USFWS (USFWS 1999). Both daytime and nighttime surveys were conducted between March 24 and June 14, 2015 to determine an accurate assessment of the presence or absence of the species in the PSA. Six surveys were conducted during the breeding season, per the USFWS protocols. At least one survey was conducted each month in April, May, and June with at least seven days between surveys (Bloom 2015a, Appendix E).

***Burrowing Owl***
Protocol surveys for the western burrowing owl (*Athene cunicularia hypugaea*; BUOW) were conducted in the fall and winter of 2014-2015. A focused assessment of suitable BUOW habitat within the PSA was conducted in November 2014, to determine areas within the PSA that could be utilized by BUOW and where nonbreeding BUOW burrow surveys should be conducted (AECOM 2015, Appendix F).

Potential BUOW habitat was mapped within three main areas of the PSA. Four nonbreeding BUOW season (September 1 through January 31) surveys were conducted per the guidelines set forth by the Staff Report on Burrowing Owl Mitigation (CDFW 2012). This report reflects the most recent regulatory agency/industry standard protocols for BUOW surveys. Nonbreeding BUOW surveys generally occurred over a one- or two-day period per survey. The first nonbreeding BUOW survey was conducted on December 18 and 19, 2014; the second survey on December 29, 2014; the third survey on January 8 and 9, 2015; and the fourth survey on January 22 and 23, 2015. Surveys were conducted approximately 10 days to two weeks apart.

***Coastal Cactus Wren (Breeding Surveys)***
A total of four breeding surveys for the coastal cactus wren within the PSA were conducted between April 8 and June 13, 2015, to determine locations of potential breeding habitat for the species and to detect breeding coastal cactus wren pairs within the PSA. The first two surveys were dedicated to surveying the entire PSA for suitable habitat and to conducting the initial breeding surveys in areas of potential habitat. The last two surveys focused on detecting nests and birds in habitat within the PSA (Bloom 2015b, Appendix G).

***Coastal California Gnatcatcher***
Protocol-level presence/absence surveys were conducted for the coastal California gnatcatcher (*Polioptila californica californica,* CAGN) within the PSA in 2014. The surveys were part of an initial review of the proposed Project, and were conducted to determine where suitable habitat exists for CAGN within the PSA, as well as locations where CAGN were observed (AECOM 2014b, Appendix H). Before conducting the surveys, a habitat assessment and vegetation mapping of the PSA was conducted (AECOM 2014a) to outline potentially suitable CAGN habitat and to delineate the vegetation community boundaries. Potentially suitable CAGN habitat was then digitized onto maps to establish the areas to conduct protocol-level surveys. CAGN surveys were completed during the 2014 breeding season per USFWS guidelines (USFWS 1997). Since the CAGN surveys were conducted within SDG&E's service territory, protocol surveys were conducted per SDG&E's NCCP. The protocol required three surveys to be conducted during the breeding season (February 15 through August 30). Surveys were conducted within suitable CAGN habitat between August 11 and August 27, 2015.

***Least Bell's Vireo***

Protocol surveys for the least Bell's vireo within the PSA were conducted during the spring of 2015. A total of eight presence/absence least Bell's vireo surveys were conducted between April 10 and June 21, 2015, in accordance with Service protocol (USFWS 2001). All potential least Bell's vireo habitat and riparian areas within the PSA were surveyed eight times during the breeding season (April 10 to July 31), with a minimum of ten days between survey visits (Bloom 2015a, Appendix E). Some least Bell's vireo surveys were conducted in the same survey areas, simultaneously with southwestern willow flycatcher surveys (see below).

***Southwestern Willow Flycatcher***

Protocol surveys for the southwestern willow flycatcher within the PSA were conducted during the spring and summer of 2015. A total of five surveys were conducted between May 21 and July 2, 2015, according to the revised protocol for project-related surveys for Southwestern Willow Flycatcher (Sogge et al. 2010). All potentially suitable habitat for the southwestern willow flycatcher was surveyed once during Period 1 (May 15 to May 31), two times during Period 2 (June 1 to June 24), and twice during Period 3 (June 25 to July 17). Surveys were conducted at least five days apart and during morning hours (Bloom 2015a, Appendix E). Some southwestern willow flycatcher surveys were conducted in the same survey areas, simultaneously with least Bell's vireo surveys.

***Western Yellow-billed Cuckoo***

Surveys for the yellow-billed cuckoo (*Coccyzus americanus*) were not conducted, as Federal 10(a)(1)(A) Recovery Permits for this species had been issued to only a few individuals prior to the finalization of the survey protocol for this species. A final draft survey protocol for the yellow-billed cuckoo was published on April 22, 2015 (Halterman et al. 2015). During surveys for other riparian bird species, such as the least Bell's vireo and the southwestern willow flycatcher, Bloom Biological biologists also evaluated potential habitat for, and the potential for the occurrence of the yellow-billed cuckoo within the PSA. Although protocol-level surveys could not be conducted, any incidental sightings of the yellow-billed cuckoo would be reported.

***Pacific Pocket Mouse***

Protocol surveys for the Pacific Pocket Mouse (PPM) in suitable habitat areas in the vicinity of the PSA were conducted by permitted biologist Scott Tremor during the summer of 2013. Trapping efforts were conducted in the northern section of the PSA near Talega Substation, and north of Basilone Road, near the Basilone Substation from July 21 through July 31, 2013. The surveys were conducted in accordance with established survey requirements/protocols defined in Mr. Tremor's Federal 10(a)(1)(A) Recovery Permit (TE-787716-7) (Tremor 2013a, 2013b, Appendix I).

### Jurisdictional Resources

***Jurisdictional Delineation***

A wetland delineation of wetland and non-wetland waters within the PSA was conducted between June 1 and June 5, and on October 2, 2015. Methodology followed the ACOE Regional Supplement Wetland Delineation Manual: Arid West Region (Version 2.0) guidelines, and consisted of preliminary data gathering and research, field assessment surveys, digital mapping, and documentation of final boundary determinations (Pangea and Borcher 2015, Appendix J).

Prior to conducting the field delineation assessment, the following information sources were reviewed to evaluate potential ACOE, CDFW, RWQCB, and CCC jurisdiction:

- SDG&E's aerial photographs;
- United States Geologic Survey (USGS) 7.5-degree minute topographic quadrangle maps;
- United States Department of Agriculture Natural Resources Conservation Service (NRCS) soil survey maps;
- United States Fish and Wildlife Service (USFWS) National Wetland Inventory GIS data; and,
- USGS National Hydrological Dataset GIS data for modeling of streams to evaluate possible stream features.

Field assessment surveys were conducted to confirm the potential jurisdictional areas identified in the in-office reconnaissance process and to delineate those areas of interest within the survey area for the potential presence of water resources. To assist with the field analysis, a customized data dictionary was uploaded onto the Global Positioning System (GPS) unit to allow field surveyors to select specific feature data.

In the field, boundaries and dimensions of jurisdictional wetland and water features were recorded utilizing a sub-meter GPS unit, on field maps, and field notes. Features within the survey area were investigated for the presence of drainages, including culverts, water bodies, riparian vegetation, potential wetlands, and connectivity to jurisdictional waters.

## 5.0 RESULTS AND DISCUSSION

### 5.1 Project Setting

The PSA ranges in elevation from approximately 25 feet to 545 feet above mean sea level (MSL), with lower elevations along the flat grassy plains southeast of San Mateo Creek and northwest of Basilone Road, and the highest portion occurring through the hilly terrain where the new line is proposed along the lattice towers north of Basilone Road. The terrain along the PSA is highly variable, and ranges from relatively flat topography, to rolling hills, to more steep and hilly terrain with ridges intermixed with drainages and canyons. The PSA crosses primarily undeveloped areas, as well as some developed areas and disturbed habitat, with a substantial network of existing dirt and paved roads providing access to most of the structures to be modified as a result of the proposed Project. Additional project components such as access, helicopter landing areas, and work on additional poles, have been identified that are outside the PSA, and surveys will be required to determine the biological resources associated with these additional components, and their potential to affect sensitive biological resources. These areas will be scheduled for survey and further analysis, and the additional information will be presented as an update to this BTR.

The TL695 corridor occurs in Orange and San Diego Counties, which are known for their biological diversity. In addition to the vegetation communities that occur within the survey area, suitable habitat for several special status plant and wildlife species was also identified. This section identifies the vegetation communities identified within the PSA, as well as the plant and wildlife species that occur or potentially occur within the PSA.

## 5.2 Vegetation Communities

Vegetation communities are assemblages of plant species that commonly coexist in the wild. The classification of vegetation communities is based on the life form of the dominant species within that community and the associated flora. Vegetation was mapped in accordance with Holland (Holland 1986), as modified by Oberbauer (Oberbauer et.al. 2008). Initial vegetation community mapping and habitat suitability mapping data were collected via geo-referenced polygons with a tablet unit, using GIS technology, and have been updated as the dimensions of the PSA have changed. The vegetation communities observed within the PSA are illustrated in Appendix C.

The PSA and other associated project components generally support 10 vegetation communities:

- Nonnative Grassland
- Diegan Coastal Sage Scrub
- Mulefat Scrub
- Non-vegetated Channel
- Southern Sycamore-Alder Riparian Woodland
- Southern Willow Scrub
- Eucalyptus Woodland
- Coast Live Oak Woodland
- Disturbed Habitat
- Urban/Developed

One potential plant community (vernal pool) was identified as potentially occurring at two locations within the PSA during the initial reconnaissance-level constraints analysis conducted in 2014 (AECOM 2014a). These areas were reviewed during focused botanical surveys and again during fairy shrimp surveys conducted in 2015, and it was determined that although two potential vernal pool indicator species were observed in and in the vicinity of these locations, neither of the sites would be considered as typical vernal pool habitat. This was primarily due to the disturbed nature of the sites, the site-specific topography, and the lack of other vernal pool indicator species at the sites and in the immediate vicinity.

A description of the plant communities occurring within the PSA are described below (Cardno 2015a) (AECOM 2014a). The plant communities observed within the PSA and the relative acreages of each plant community are provided in Table 5.1. Diegan coastal sage scrub is the dominant vegetation community within the PSA, with disturbed habitat and urban/developed areas comprising the second largest cover type within the PSA.

### Plant Communities Within the PSA

***Nonnative Annual Grassland (Holland Code 42200)***

Nonnative annual grassland is characterized by a dense to sparse cover of annual grasses and forbs of Mediterranean origin, often with native and nonnative annual forbs (Holland 1986). This plant community generally occurs on fine-textured loam or clay soils that are moist or even waterlogged during the winter rainy season, and very dry during the summer and fall. Regionally, typical grasses include ripgut brome (*Bromus diandrus*), red brome (*Bromus madritensis* ssp. *rubens*), soft chess

**Table 5.1 Vegetation Communities Located Within the PSA**

| Vegetation Community | Approximate Area in Acres |
|---|---|
| ***Grassland*** | |
| Nonnative Grassland | 9.16 |
| *Subtotal* | *9.16* |
| ***Scrubland*** | |
| Diegan Coastal Sage Scrub | 228.92 |
| *Subtotal* | *228.92* |
| ***Riparian/Wetland*** | |
| Mulefat Scrub | 7.23 |
| Non-vegetated Channel | 1.45 |
| Southern Sycamore-Alder Riparian Woodland | 12.13 |
| Southern Willow Scrub | 8.87 |
| *Subtotal* | *29.68* |
| ***Upland Woodland*** | |
| Eucalyptus Woodland | 0.37 |
| Coast Live Oak Woodland | 0.19 |
| *Subtotal* | *0.56* |
| ***Disturbed/Developed/Unknown*** | |
| Disturbed Habitat | 77.32 |
| Urban/Developed | 151.25 |
| *Subtotal* | *228.57* |
| ***TOTAL*** | ***496.89*** |

(*Bromus hordeaceus*), wild oats (*Avena* spp.), and rat-tail fescue (*Vulpia myuros*). Nonnative disturbance-related annuals such as filaree (*Erodium* sp.), and horseweed (*Erigeron canadensis*) are common to this community. This vegetation community is found alongside firebreaks along ridge tops, interspersed between Diegan coastal sage scrub, and around areas that have been historically disturbed. Nonnative annual grassland occurs throughout the project study area, primarily to the northeast, a few areas in the north, and in the southeast of the PSA.

***Diegan Coastal Sage Scrub: Coastal Form (Holland Code 32510)***
Diegan coastal sage scrub is a vegetation community dominated by relatively low-lying shrubs. It is typically less than 6 feet in height, soft-leaved, and drought-deciduous. Dominant species in these communities drop their leaves as the summer dry season progresses to reduce stress from lack of water. The coastal form of Diegan coastal sage scrub is similar to other forms of Diegan coastal sage scrub but is found at lower elevations, below 1,000 feet. California sagebrush is more dominant in coastal Diegan coastal sage scrub than in other Diegan coastal sage scrub varieties. The dominant species in this community is California sagebrush (*Artemisia californica*), but associated dominants can include California buckwheat (*Eriogonum fasciculatum* var. *fasciculatum*), laurel sumac (*Malosma laurina*), lemonadeberry (*Rhus integrifolia*), broom Baccharis (*Baccharis sarothroides*), and black sage (*Salvia mellifera*). Diegan coastal sage scrub is found throughout the project study area and is the dominant vegetation type.

***Mulefat Scrub (Holland Code 63310)***
Mulefat scrub is a riparian shrub community that is strongly dominated by mulefat (*Baccharis salicifolia*), often in association with several willow species. Mulefat scrub occurs along intermittent streams with a fairly coarse substrate and moderately deep water table. Understory vegetation is usually composed of nonnative, weedy species, or is lacking altogether. This community is maintained by frequent flooding. In the absence of periodic flooding, and over time, this community may develop into cottonwood- or sycamore-dominated riparian communities.

Within the survey area, mulefat scrub occupies floodplain areas of San Mateo and San Onofre Creeks. This community is strongly dominated by mulefat, with western ragweed (*Ambrosia psilostachya*) and willow dock (*Rumex salicifolia*) occupying the understory.

***Non-Vegetated Channel (Holland Code 64200)***
Non-vegetated channels are natural flood channels that are sparsely vegetated. The lack of significant vegetative cover in such areas can be attributed to either natural processes, such as flooding, or to human activities, such as vegetation clearing or stream channelization. Non-vegetated channels occur within San Mateo Creek, where annual scouring by rock and sand tend to prevent vegetation from growing in the channel.

***Southern Sycamore-Alder Riparian Woodland (Holland Code 62400)***
Sycamore alder riparian woodland is a tall, winter-deciduous, streamside woodland dominated by western sycamore (*Platanus racemosa*) and white alder (*Alnus rhombifolia*). These woodlands are commonly found along rocky stream beds that are subject to periodic high-intensity flooding. Vegetation associated with sycamore alder riparian woodland includes blue elderberry (*Sambucus mexicana*), Douglas mugwort (*Artemisia douglasiana*), scale-broom (*Lepidospartum squamatum*), poison

oak (*Toxicodendron diversilobum*), and willows (*Salix* sp.) This vegetation type is scattered in a few sections throughout the PSA but is primarily located along the more stabilized banks of the San Mateo and San Onofre Creeks.

***Southern Willow Scrub (Holland Code 63320)***
Southern willow scrub is a dense, closed-canopy scrub that occurs throughout California in association with riverine features. It is lacking in the taller trees that are characteristic of riparian forests. Dominant plant species include willows, mulefat, and coyote brush (*Baccharis pilularis*). There is typically not a substantial herbaceous understory within this vegetation community due to the dense shrub cover.

This community is dominated by mulefat and arroyo willow (*Salix lasiolepis*), with California sagebrush and western ragweed occasionally co-dominating in the dryer portions of the drainages. Within the PSA, southern willow scrub is associated with some small drainage features and within San Mateo and San Onofre Creeks. There is also a small portion of southern willow scrub in the far northeastern part of the project study area in Orange County.

***Eucalyptus Woodland (Holland Code 79100)***
This community is dominated by several species of eucalyptus (*Eucalyptus* spp.). These introduced species produce large amounts of leaf and bark litter, the chemical composition of which may inhibit the establishment and growth of other species, especially natives, in the understory. Often these species have been planted for aesthetic and horticultural purposes or as a windbreak, but many species of eucalyptus have become naturalized and have been quite successful in invading riparian areas. There is a small portion of eucalyptus woodland surrounded by Diegan coastal sage scrub in upland areas adjacent to San Onofre Creek.

***Coast Live Oak Woodland (Holland Code 71160)***
This community is well represented on MCB Camp Pendleton and can co-occur with Diegan coastal sage scrub, valley needlegrass grassland, and other types of oak woodland. Coast live oak woodland is an open to dense tree community with coast live oak (*Quercus agrifolia*) as the dominant tree species. The shrub understory of this community is well developed in undisturbed sites and may include blue elderberry, laurel sumac (*Malosma laurina*), poison oak, and toyon (*Heteromeles arbutifoloia*) (Holland 1986). An herbaceous stratum is usually present, including miner's lettuce (*Claytonia perfoliata* var. *perfoliata*), chickweed (*Stellaria media*), and nonnative grasses. Coast live oak woodland is located in the far northeastern part of the PSA, in Orange County.

***Disturbed Habitat (Holland Code 11300)***
Disturbed habitat includes vegetation and soils characterized by physical disturbance. Nonnative species are commonly introduced by humans in these sites. A physical disturbance may include clearing for fuel management, repeated grading, graded fire breaks, powerline access roads and areas around power poles, construction staging areas, or any repeated use areas. Examples of repeated use areas are trails, access roads, and dirt parking lots. Characteristic species of these communities include tocalote (*Centaurea melitensis*), Italian thistle (*Carduus pycnocephalus*), artichoke thistle (*Cynara cardunculus*), sow-thistle (*Sonchus* sp.), tumbleweed (*Salsola tragus*), telegraph weed (*Heterotheca grandiflora*), horehound (*Marrubium vulgare*), mustard (*Sisymbrium* spp.), radish (*Raphanus sativus*), Hottentot fig (*Carpobrotus edulis*), garland chrysanthemum (*Glebionis coronaria*), and fennel (*Foeniculum vulgare*). Annual grasses are not often included in this vegetation community and are considered more typical of nonnative annual grassland. Disturbed habitat occurs throughout the project study area primarily in the

form of dirt roads and trails and areas that were historically agriculture, as well as those areas regularly mowed and/or used as training areas.

***Urban/Developed Land (Holland Code 12000)***

Urban/developed areas within the PSA include buildings, paved areas, and ornamental landscaping. Areas of ornamental/landscape plantings occur throughout the PSA. These areas include lawns, parks, road medians, and roadsides. Common species in these areas include African daisy (*Arctotis* sp.), eucalyptus, Peruvian pepper tree (*Schinus molle*), myoporum (*Myoporum laetum*), and African fountain grass (*Pennisetum setaceum*). Other developed areas include graveled or paved parking lots similar to the area within the SONGS mesa. Urban/developed areas are not necessarily considered a vegetation community, and typically support no or very few biological resources.

### Plant Communities - Other Project Components

***Substations***

There is no native habitat occurring within each existing substation (Talega, Basilone, and Japanese Mesa Substations). The areas within the substations are typically devoid of vegetation, with a heavy layer of gravel base, and are all considered Urban/Developed.

***Staging Yards***

Field and desktop evaluations of the habitats within proposed Staging Yards were conducted to determine potential vegetation communities occurring within each yard. These habitats will be confirmed in the field as the project components are finalized for the proposed Project.

The Basilone Road Staging Yard is an existing construction yard consisting primarily of bare ground and/or a gravel base, with no vegetation within the yard. The Basilone Road Staging Yard is located within a previously fenced yard and consists primarily of bare ground. The staging yard is surrounded to the north by Basilone Road and then coastal sage scrub habitat, to the south by coastal sage scrub habitat and a previously fenced yard, to the east by an access road and coastal sage scrub habitat, and to the west by development and landscape/ornamental vegetation.

The Lemon Grove Staging Yard is also a fenced existing construction yard consisting of a gravel base with no native vegetation within the yard. It is located within a previously fenced gravel yard. The staging yard is surrounded to the north by an access road and then disturbed habitat, to the south and west by disturbed habitat, and to the east by disturbed habitat and then railroad tracks.

The San Mateo Staging Yard consists of a fenced, inactive target practice/shooting range consisting primarily of bare ground. The yard is surrounded by landscape/ornamental vegetation to the north and west, the San Mateo Substation to the south, and native coastal sage scrub habitat to the east.

The SDG&E SONGS Lot 4 Staging Yard is located in pavement, wholly within a paved parking lot.

The SDG&E SONGS Mesa Staging Yard is located within fenced paved parking lots and gravel lots. It is surrounded to the north, south, east, and west by coastal sage scrub habitat.

The Talega Staging Yard is located within disturbed habitat and has been used previously on other construction projects for this same purpose. It is surrounded to the north by oak woodland habitat, to

the south by disturbed habitat, to the east by disturbed habitat (additional area previously used as a construction yard), and to the west by landscape/ornamental vegetation and then development.

## 5.3 Plant Species

Approximately 275 plant species have been observed within the PSA during surveys conducted in the area. A compendium list of plant species observed during studies in support of the proposed Project is included in Appendix K.

### Special Status Plant Species

A total of six special status plant species were observed during surveys conducted in support of the proposed Project, and another 20 species were not observed during surveys but have potential to occur in the PSA. Figure 2 illustrates the locations of special status plant and wildlife species observed within the proposed Project area. Species observed included thread-leaved brodiaea (*Brodiaea filifolia*), California boxthorn (*Lycium californicum*), Coulter's matilija poppy (*Romneya coulteri*), paniculate tarweed (*Deinandra paniculata*), San Diego County viguiera (*Viguiera laciniata*), and western dichondra (*Dichondra occidentalis*).

***Thread-leaved Brodiaea (Brodiaea filifolia, Federal Threatened, California Endangered, CNPS 1B.1)***

Protocol-level surveys were conducted for thread-leaved brodiaea within the PSA in 2015 in support of the proposed Project. Four populations of thread-leaved brodiaea (BRFI) were observed during protocol surveys for this species. The location of each population is illustrated in Appendix C. Thread-leaved brodiaea is a perennial bulbiferous herb with a blooming period of April through May (occasionally extending from March through June) that typically occurs in clay soils around vernal pools and in openings in vernally moist grassland habitats.

***California Boxthorn (Lycium californicum, CNPS 4.2)***

California boxthorn is a perennial shrub with a blooming period of December through August that typically occurs in coastal bluff scrub and coastal scrub habitats. California boxthorn is a CNPS 4.2 (limited distribution). One fairly large population was observed (approximately 100 individuals) on the south side of Cristianitos Road in an area of sparse Diegan coastal sage scrub with sandy soil that had multiple, deep erosional channels running through the area.

***Coulter's Matilija Poppy (Romneya coulteri, CNPS 4.2)***

Coulter's matilija poppy is a perennial rhizomatous herb with a blooming period of March through July that typically occurs in coastal scrub and chaparral habitats. Coulter's matilija poppy is a CNPS 4.2 (limited distribution) perennial herb that is endemic to California. One population of approximately 150 individuals was observed on the south side of Basilone Road, just north of San Onofre Creek in sparse Diegan coastal sage scrub. This population is vouchered in the Consortium of California Herbaria (Consortium of California Herbaria 2015), and is documented as potentially being one of the only natural populations of this species in San Diego County.


0 0.25 0.5 0.75 1 Mile

# 25240 TL 695/6971 Reconductor Project
## Figure 2: Special Status Species Observations

| | | | |
|---|---|---|---|
| Thread-leaved brodiaea | Paniculate tarweed | Fairy Shrimp Basins | Least Bell's Vireo |
| California boxthorn | San Diego County Viguiera | Arroyo Toad | Survey Area |
| Coulter's matilija poppy | Western dichondra | Cactus Wren | |

Created by Pangea Biological, November 2015
Coordinate System: NAD 1983 StatePlane California VI FIPS 0406 Feet
Projection: Lambert Conformal Conic
Datum: North American 1983

Pangea Biological

***Paniculate Tarweed (Deinandra paniculata, CNPS 4.2)***
Paniculate tarweed is an annual herb with a blooming period of April through November that is typically found in vernally mesic soils or sandy soils in coastal scrub, vernal pools, and valley and foothill grassland habitats in southern California. Paniculate tarweed is a CRPR 4.2 (limited distribution). This species was observed in several locations in populations ranging from single individuals to hundreds of individuals. It was typically observed in nonnative grassland habitats and was often in disturbed areas, particularly along the side of dirt roads.

***San Diego County Viguiera (Viguiera laciniata, CNPS 4.2)***
San Diego County viguiera is a perennial shrub with a blooming period of February through August that is typically found in coastal scrub and chaparral habitats in coastal southern California. San Diego County viguiera is a CRPR 4.2 (limited distribution). A large population of hundreds of individuals was observed on the slopes surrounding the Talega Substation. It appears that this population was planted in this location, as there is irrigation equipment throughout the area.

***Western Dichondra (Dichondra occidentalis, CNPS 4.2)***
Western dichondra is a perennial rhizomatous herb with a blooming period of January through July that typically occurs in coastal scrub, chaparral, cismontane woodland, and valley and foothill grassland habitats in coastal southern California. Western dichondra is a CRPR 4.2 (limited distribution). A single population of approximately 250 individuals was observed in sparse Diegan coastal sage scrub and nonnative grassland.

Other special status plant species identified as having potential to occur within the PSA are listed in Table 5.2, and are discussed further below.

***Blochman's Dudleya (Dudleya blochmaniae ssp. blochmaniae, CNPS 1B.1)***
Blochman's dudleya is a perennial herb with a blooming period of April through June that typically occurs in rocky, clay, or serpentine soils in coastal bluff scrub, coastal scrub, chaparral, valley, and foothill grassland habitats. There is a moderate potential for this species to occur within the PSA.

***Chaparral Ragwort (Senecio aphanactis, CNPS 2B.2)***
Chaparral ragwort is an annual herb with a blooming period of January through April that occurs in coastal scrub, chaparral, and woodland habitats. There is a moderate potential for this species to occur within the PSA.

***Coastal Dune Milk-vetch (Astragalus tener var. titi, Federal Endangered, California Endangered, CNPS 1B.1)***
Coastal dune milk-vetch, is an annual herb with a blooming period of March through May that typically occurs in vernally mesic soils in sandy depressions, vernal pools near the coast, on coastal bluffs, coastal dunes, and in coastal prairie habitats. There is a moderate potential for this species to occur within the PSA.

***Coulter's Goldfields (Lasthenia glabrata ssp. coulteri, CNPS 1B.1)***
Coulter's goldfields is an annual herb with a blooming period of February through June that can occur in vernal pools, coastal salt, and playa habitats. Due to a lack of suitable habitat in the vicinity of the proposed Project, there is a low potential for this species to occur within the PSA.

**Table 5.2 Special Status Plant Species Potentially Occurring Within the PSA**

| Species | Habitat Requirements | Status | Potential to Occur within the PSA |
|---|---|---|---|
| Blochman's dudleya (*Dudleya blochmaniae* ssp. *blochmaniae*) | Rocky, clay, or serpentine soils in coastal bluff scrub, coastal scrub, chaparral, and valley and foothill grassland habitats | CNPS 1B.1 | Moderate potential – Suitable habitat within PSA |
| California boxthorn (*Lycium californicum*) | Coastal bluff scrub and coastal scrub habitats | CNPS 4.2 | Present |
| chaparral ragwort (*Senecio aphanactis*) | Coastal scrub, chaparral, and woodland habitats | CNPS 2B.2 | Moderate potential – Suitable habitat within PSA |
| coastal dune milk-vetch (*Astragalus tener* var. *titi*) | Vernally mesic soils in sandy depressions, vernal pools near the coast, on coastal bluffs, coastal dunes, and in coastal prairie habitats | FE, SE, CNPS 1B.1 | Moderate potential – Suitable habitat within PSA |
| Coulter's goldfields (*Lasthenia glabrata* ssp. *coulteri*) | Coastal marsh and swamp, playas, and vernal pool habitats | CNPS 1B.1 | Low potential – No suitable habitat within PSA |
| Coulter's matilija poppy (*Romneya coulteri*) | Coastal sage scrub and chaparral habitats | CNPS 4.2 | Present |
| Coulter's saltbush (*Atriplex coulteri*) | Alkali or clay soils in coastal bluff scrub, coastal dunes, coastal scrub, and valley and foothill grassland habitats | CNPS 1B.2 | Moderate potential – Suitable habitat with clay soils within PSA |
| estuary seablite (*Suadea esteroa*) | Coastal salt habitats | CNPS 1B.2 | Low potential – No Suitable habitat within PSA |
| intermediate mariposa-lily (*Calochortus weedii* var. *intermedius*) | Rocky or calcareous soils in coastal scrub, chaparral, and valley and foothill grassland habitats | CNPS 1B.2 | Moderate potential – Suitable habitat with rocky soils within PSA |
| little mouse tail (*Myosurus minimus* ssp. *apus*) | Vernal pools and alkaline marshes | CNPS 3.1 | Moderate potential – Suitable habitat within PSA |
| many-stemmed dudleya (*Dudleya multicaulis*) | Clay or heavy soils on sandstone outcrops or rocky hillsides in chaparral, coastal scrub, coastal plains, and valley and foothill grassland habitats | CNPS 1B.2 | Moderate potential – Suitable habitat with clay soils within PSA |

| Species | Habitat Requirements | Status | Potential to Occur within the PSA |
|---|---|---|---|
| Nuttall's acmispon (*Acmispon prostratus*) | Coastal dunes and coastal scrub with sandy soil habitats | CNPS 1B.1 | Moderate potential – Suitable habitat within PSA |
| Nuttall's scrub oak (*Quercus dumosa*) | Sandy or clay loam soils in coastal scrub, chaparral, and coniferous forest habitats | CNPS 1B.1 | Moderate potential – Suitable habitat within PSA |
| Palmer's grapplinghook (*Harpagonella palmeri*) | Dry, semi-barren sites and clay soils within coastal sage scrub, chaparral, and grassland habitats. | CNPS 4.2 | Moderate potential – Suitable habitat with clay soils within PSA |
| paniculate tarweed (*Deinandra paniculata*) | Vernally mesic soils or sandy soils in coastal scrub, vernal pool, and valley and foothill grassland habitats | CNPS 4.2 | Present |
| Pendleton button-celery (*Eryngium pendletonense*) | Vernal pools and marshes, or mesic areas within coastal sage scrub or valley and foothill grassland habitats | CNPS 1B.1 | Moderate potential – Suitable habitat within PSA |
| prostrate vernal pool navarretia (*Navarretia prostrata*) | Mesic soils in coastal scrub, meadows and seeps, vernal pools, and valley and foothill grassland habitats | CNPS 1B.1 | Moderate potential – Suitable habitat within PSA |
| San Diego button-celery (*Eryngium aristulatum* var. *parishii*) | Vernal pools and marshes, or mesic areas within coastal sage scrub or valley and foothill grassland habitats | FE, SE, CNPS 1B.1 | Moderate potential – Suitable habitat within PSA |
| San Diego County viguiera (*Viguiera laciniata*) | Coastal scrub and chaparral habitats | CNPS 4.2 | Present |
| south coast saltscale (*Atriplex pacifica*) | Coastal bluff scrub, coastal dunes, coastal scrub, playas | CNPS 1B.2 | Moderate potential – Suitable habitat within PSA |
| spreading navarretia (*Navarretia fossalis*) | Vernal pools and vernal swales | FT, CNPS 1B.1 | Moderate potential – Some suitable habitat within PSA |

| Species | Habitat Requirements | Status | Potential to Occur within the PSA |
|---|---|---|---|
| sticky dudleya (*Dudleya viscida*) | Rocky soils and on rock cliffs in coastal bluff scrub, chaparral, cismontane woodland, and coastal scrub habitats | CNPS 1B.2 | Moderate potential – Suitable habitat within PSA |
| thread-leaved brodiaea (*Brodiaea filifolia*) | Clay soils around vernal pools and in openings in vernally moist grassland habitats | FT, SE, CNPS 1B.1 | Present |
| variegated dudleya (*Dudleya variegata*) | Clay soils on dry hillsides, mesas, and vernal pools, and openings in chaparral, coastal scrub, and valley and foothill grassland habitats | CNPS 1B.2 | Moderate potential – Suitable habitat within PSA |
| western dichondra (*Dichondra occidentalis*) | Coastal scrub, chaparral, cismontane woodland, and valley and foothill grassland habitats | CNPS 4.2 | Present |
| white-rabbit tobacco (*Pseudognaphalium leucocephalum*) | Sandy or gravelly soils in coastal scrub, chaparral, woodland, and riparian woodland habitats | CNPS 2B.2 | Moderate potential – Suitable habitat within PSA |

*Notes: FE=Federal Endangered; FT=Federal Threatened; SE=State Endangered; CRPR = California Rare Plant Rank*

*Rank:*
*1A: Plants presumed extinct in California*
*1B: Plants rare, threatened, or endangered in California and elsewhere*
*2: Plant rare, threatened, or endangered in California, but more common elsewhere*
*3: Plants about which we need more information – A review list*
*4: Plants of limited distribution – A watch list*

*Threat Ranks:*
*0.1-Seriously threatened in California (high degree/immediacy of threat)*
*0.2-Fairly threatened in California (moderate degree/immediacy of threat)*
*0.3-Not very threatened in California (low degree/immediacy of threats or no current threats known)*

***Coulter's Saltbush (Atriplex coulteri, CNPS 1B.2)***
Coulter's saltbush is a perennial herb with a blooming period of March through October that typically occurs in clay or alkaline soils in coastal dunes, coastal scrub, and valley and foothill grassland habitats. There is a moderate potential for this species to occur within the PSA.

***Estuary Seablite (Suaeda esteroa, CNPS 1B.2)***
Estuary seablite is a perennial herb with a blooming period of May through January that occurs in coastal marsh and swamp habitats. Due to a lack of suitable habitat in the vicinity of the proposed Project, there is a low potential for this species to occur within the PSA.

***Intermediate Mariposa-lily (Calochortus weedii var. intermedius, CNPS 1B.2)***
Intermediate mariposa-lily is perennial bulbiferous herb with a blooming period of May through July that typically occurs in rocky or calcareous soils in sage scrub, chaparral, or valley and foothill grassland habitats. There is a moderate potential for this species to occur within the PSA.

***Little Mousetail (Myosurus minimus ssp. apus, CNPS 3.1)***
Little mousetail is an annual herb with a blooming period of March through June and is typically associated with vernal pools and alkaline marshes. There is a moderate potential for this species to occur within the PSA.

***Many-stemmed Dudleya (Dudleya multicaulis, CNPS 1B.2)***
Many-stemmed dudleya is a perennial herb with a blooming period of April through July that typically occurs in clay or heavy soils on sandstone outcrops or rocky hillsides, and slopes away from the river in chaparral, coastal scrub, coastal plains, and valley and foothill grassland habitats. There is a moderate potential for this species to occur within the PSA.

***Nuttall's Acmispon (Acmispon prostratus, CNPS 1B.1)***
Nuttall's acmispon is an annual herb with a blooming period of March through July that typically occurs in coastal dune and sandy soil coastal scrub habitats. There is a moderate potential for this species to occur within the PSA.

***Nuttall's Scrub Oak (Quercus dumosa, CNPS 1B.1)***
Nuttall's scrub oak is a perennial evergreen shrub with a blooming period of February through August that typically occurs in sandy or clay loam soils in coastal scrub, chaparral, and coniferous forest habitats. There is a moderate potential for this species to occur within the PSA.

***Palmer's Grapplinghook (Harpagonella palmeri, CNPS 4.2)***
Palmer's grapplinghook is an annual herb with a blooming period of March through April and is typically associated with dry, semi-barren sites and clay soils within coastal sage scrub, chaparral, and grassland habitats. There is a moderate potential for this species to occur within the PSA.

***Pendleton Button Celery (Eryngium pendletonense, CNPS 1B.1)***
Pendleton button celery is a perennial herb with a blooming period of April through June. It is typically associated with vernal pools, or mesic areas within coastal scrub and grassland. There is a moderate potential for this species to occur within the PSA.

***Prostrate Vernal Pool Navarretia (Navarretia prostrata, CNPS 1B.1)***
Prostrate vernal pool navarretia is an annual herb with a blooming period of April through July that typically occurs in vernal pools or in mesic soils around sage scrub, meadows, seeps, valley, and foothill grassland habitats. There is a moderate potential for this species to occur within the PSA.

***San Diego Button-celery (Eryngium aristulatum var. parishii, Federal Endangered, California Endangered, CNPS 1B.1)***
San Diego button-celery may behave as an annual or perennial and has a blooming period of April to June. It is typically associated with vernal pools and marshes, or mesic areas within coastal sage scrub or valley, and foothill grassland habitats. There is a moderate potential for this species to occur within the PSA.

***South Coast Saltscale (Atriplex pacifica, CNPS 1B.2)***
South coast saltscale is an annual herb with a blooming period of March through October that typically occurs in sage scrub, coastal dune, coastal bluff, and playa habitats. There is a moderate potential for this species to occur within the PSA.

***Spreading Navarretia (Navarretia fossalis, Federal Threatened, CNPS 1B.1)***
Spreading navarretia is an annual herb with a blooming period of April through June and is typically associated with vernal pools and vernal swales. There is a moderate potential for this species to occur within the PSA.

***Sticky Dudleya (Dudleya viscida, CNPS 1B.2)***
Sticky dudleya is a perennial herb with a blooming period of May through June that typically occurs in rocky soils and on rock cliffs in coastal bluff scrub, chaparral, cismontane woodland, and coastal scrub habitats. There is a moderate potential for this species to occur within the PSA.

***Variegated Dudleya (Dudleya variegata, CNPS 1B.2)***
Variegated dudleya is a perennial herb with a blooming period of April through June that typically occurs in clay soils on dry hillsides, mesas, and vernal pools, and openings in chaparral, coastal scrub, and valley and foothill grassland habitats. There is a moderate potential for this species to occur within the PSA.

***White Rabbit-tobacco (Pseudognaphalium leucocephalum, CNPS 2B.2)***
White rabbit-tobacco is a perennial herb with a blooming period of July through December that typically occurs in sandy or gravelly soils in sage scrub, chaparral, and woodland habitats. There is a moderate potential for this species to occur within the PSA.

## 5.5 Wildlife Species

Approximately 100 wildlife species have been observed within the PSA during surveys conducted in the area. A compendium list of wildlife species observed during studies in support of the proposed Project is included in Appendix K.

### Special Status Wildlife Species Observed

A total of six special status wildlife species were observed within the PSA during focused and/or protocol surveys conducted in support of the proposed Project, and another 34 species were not observed during surveys but have potential to occur in the PSA. Species observed include the arroyo toad, the coastal cactus wren, the coastal California gnatcatcher, the least Bell's vireo, loggerhead shrike (*Lanius ludovicianus*), and Dulzura pocket mouse (*Chaetodipus californicus femoralis*).

***Arroyo Toad (Federal Endangered, California Species of Special Concern)***

The arroyo toad is found in streams with silt-free sandy streambeds, shallow pools or quiet runs, and nearby sandbars or sandy terraces. They prefer riparian habitat with mulefat, willow, western sycamore, and cottonwood (*Populus* sp.), but can also be found in streams within woodland and forest habitats with minimal riparian vegetation. The arroyo toad is primarily nocturnal within their stream habitats, and they are most active after seasonal rains in late winter and early spring. Their breeding season is generally from March through July, but this may vary depending on rainfall. The arroyo toad will travel into upland habitat (up to 3,000 feet from a stream) during the non-breeding season.

Protocol-level surveys were conducted for arroyo toad within the PSA in 2015 in support of the proposed Project. The surveys were conducted in habitats with the potential to support arroyo toad. One arroyo toad was observed in San Mateo Creek and three arroyo toads were observed in San Onofre Creek (both locations within the PSA) during the protocol surveys (Bloom Biological 2015a). Construction activities are not anticipated within either San Mateo or San Onofre creeks. The location of each observation is illustrated in Appendix E.

***Coastal Cactus Wren (USFWS Bird of Conservation Concern, California Species of Special Concern)***

The coastal cactus wren is only found in the San Diego County and southern Orange County in California. It inhabits arid and semiarid areas with coastal sage scrub habitat dominated by thickets of cactus (i.e. cholla or prickly-pear). It is dependent on these cactus stands, where it remains year-round maintaining its large, hollow, football-shaped nests. The nesting season for the coastal cactus wren is typically from March to mid-July, but it can be observed maintaining and roosting at their nests year-round.

Nesting surveys were conducted for coastal cactus wren within the PSA in 2015 in support of the proposed Project. The surveys were conducted in habitats with the potential to support coastal cactus wrens and their nests. One coastal cactus wren family ground and two nests were observed within the southern section of the PSA (Bloom 2015b). The location of each observation is illustrated in Appendix G.

***Coastal California Gnatcatcher (Federal Threatened, California Species of Special Concern)***

The coastal California gnatcatcher is only found in southern California within the United States. It is a year-round resident within coastal sage scrub habitat and prefers areas dominated by California sagebrush and California buckwheat. They may also forage and nest in other scrub habitats, such as chaparral and riparian scrub, if it is closely associated with nearby coastal sage scrub habitat. The nesting season for coastal California gnatcatcher is typically from March through August.

Protocol-level surveys were conducted for coastal California gnatcatcher within the PSA in 2014 in support of the proposed Project. The surveys were conducted in habitats with the potential to support coastal California gnatcatchers. A total of 108 coastal California gnatcatcher observations were made throughout the PSA (AECOM 2014b), and most if not all of the coastal sage scrub habitat within the PSA

should be considered occupied habitat for the coastal California gnatcatcher. Additional coastal California gnatcatcher surveys are anticipated to be conducted closer to the beginning of construction of the proposed Project, in order to better determine the most current locations of gnatcatchers prior to construction.

***Least Bell's Vireo (Federal Endangered, California State Endangered)***
The least Bell's vireo migrates into southern California during its breeding season from around mid-March through late September, and is typically associated with dense riparian woodland habitat with a dense upper canopy, where it forages, and a dense understory, where it nests. It may also forage in upland habitats up to 200 feet from the riparian edge.

Protocol-level surveys were conducted for least Bell's vireo within the PSA, in spring and summer 2015, in support of the proposed Project. The surveys were conducted in riparian habitats with the potential to support least Bell's vireo. A total of 52 least Bell's vireo observations were recorded within the PSA during the survey (Bloom 2015a). The location of each observation is illustrated in Appendix E.

***Loggerhead Shrike (USFWS Bird of Conservation Concern, California Species of Special Concern)***
The loggerhead shrike is an uncommon year-round resident to San Diego County that be found in grassland, open sage scrub, chaparral, and desert scrub habitats (Unitt 2004). Their nesting season can extend as early as January through July. Suitable grassland and coastal sage scrub habitat occur within the PSA. The loggerhead shrike was observed in the southern portion of the PSA (south of San Mateo Creek) during burrowing owl surveys conducted in December 2014 and January 2015 (AECOM 2015).

***Dulzura Pocket Mouse (California Species of Special Concern)***
The Dulzura pocket mouse is a solitary mouse that spends its days in burrows and its nights foraging for seeds. It is typically found in mature coastal sage scrub and chaparral habitats, but can also occur in desert grassland habitats. Suitable coastal sage scrub habitat occurs throughout the PSA. In addition, Dulzura pocket mouse was observed north and south of San Mateo Creek during trapping surveys for Pacific pocket mouse in July 2013 (Tremor 2013a, 2013b).

For purposes of this report, special status wildlife species include those that are either; listed or proposed for listing as threatened or endangered by the USFWS or the CDFW, species designated as "Birds of Conservation Concern" by the USFWS, those species designated as "fully protected" by the CDFW, species considered "species of special concern" by the CDFW, and/or those considered "taxa to watch" by the CDFW. Other special status wildlife species observed or with potential to occur in the PSA are identified in Table 5.3, and are discussed in further detail below.

### Special Status Wildlife Species with Potential to Occur

***Riverside Fairy Shrimp (Streptocephalus woottoni, Federal Endangered)***
The Riverside fairy shrimp is a small aquatic crustacean found in moderate to deep (greater than 12 inches), longer-lived vernal pools and ephemeral freshwater wetland habitats, and is typically associated with vernal pool complexes. Vernal pool complexes are generally made up of between 5 to 50 pools, are hydrologically connected, and have similar species composition. It does not occur in riverine, marine, or other permanent water bodies. It occurs in San Diego, Orange, Riverside, and Ventura Counties, where they are found in both hardpan and claypan vernal pools.

**Table 5.3 Special Status Wildlife Species Potentially Occurring Within the PSA**

| Species | Habitat Requirements | Status | Potential to Occur within the PSA |
|---|---|---|---|
| ***Invertebrates*** | | | |
| Riverside fairy shrimp (*Streptocephallus woottoni*) | Vernal pools and ephemeral freshwater wetland habitats, and is typically associated with vernal pool complexes | FE | Moderate potential – Suitable habitat observed within the PSA, and other non-sensitive fairy shrimp species observed during focused surveys in 2015 |
| San Diego fairy shrimp (*Branchinecta sandiegonensis*) | Shallow vernal pools and ephemeral freshwater wetland habitats, and is typically associated with vernal pool complexes | FE | Moderate potential – Suitable habitat observed within the PSA, and other non-sensitive fairy shrimp species observed during focused surveys in 2015 |
| ***Fish*** | | | |
| southern steelhead (*Oncorhynchus mykiss*) | Ocean, estuaries, rivers, and watershed habitats | FE, SSC | Moderate potential within watersheds of San Mateo Creek and San Onofre Creek within the PSA |
| tidewater goby (*Eucyclogobius newberryi*) | Coastal lagoon and estuary habitats | FE, SSC | Low to moderate potential within watersheds of San Mateo Creek and San Onofre Creek within the PSA |
| ***Amphibians*** | | | |
| arroyo toad (*Anaxyrus californicus*) | Streams with silt-free streambeds, shallow pools or quiet runs, and nearby sandbars or sandy terraces – they prefer riparian habitat but can also be found in streams within woodland and forest habitats with minimal riparian vegetation | FE, SSC | Present – Observed during focus surveys and suitable habitat observed within the PSA |
| western spadefoot toad (*Spea hammondii*) | Mixed oak woodlands, grasslands, coastal sage scrub, chaparral, sandy washes, lowlands, river floodplains, alluvial fans, playas, alkali flats, foothills, and mountains | SSC | Moderate potential – Suitable habitat observed within the PSA |

| Species | Habitat Requirements | Status | Potential to Occur within the PSA |
|---|---|---|---|
| ***Reptiles*** | | | |
| coast patch-nosed snake (*Salvaroda hexalepis virgultea*) | Semi-arid brushy areas such as chaparral, coastal sagebrush, pinyon-juniper woodland, and desert scrub habitats | SSC | Moderate potential – Potential habitat observed within the PSA |
| Coronado island skink (*Plestiodon skiltonianus interparietalis*) | Pine forest, open woodland, grasslands, chaparral, and coastal sage scrub habitats and along creeks and rivers | SSC | Moderate potential – Suitable habitat exists within the PSA |
| northern red rattlesnake (*Crotalus ruber ruber*) | Coastal sage scrub, chaparral, desert slope scrub, thorn scrub, and woodland habitats below 5,000 feet | SSC | Moderate potential – Suitable habitat observed within the PSA |
| orange-throated whiptail (*Aspidoscelis hyperythrus*) | Semi-arid brushy areas typically with loose soil and rocks, including washes, stream sides, rocky hillsides, coastal chaparral, and coastal sage scrub habitats | SSC | Moderate potential – Suitable habitat observed within the PSA |
| San Diego horned lizard (*Phrynosoma coronatum blainvillei*) | Sage scrub, chaparral, grasslands, woodlands, and coniferous forest habitats | SSC | Moderate potential – Suitable habitat observed within the PSA |
| southwestern pond turtle (*Actinemys marmorata pallida*) | Ponds, lakes, rivers, streams, creeks, marshes, and irrigation ditches with emergent and floating vegetation | SSC | Low potential – Some suitable upland habitat for nesting and aestivation observed within the PSA |
| two-striped garter snake (*Thamnophis hammondii*) | Permanent or intermittent freshwater source, such as ponds, lakes, and temporary bodies of water – prefers riparian habitat with coastal sage scrub, and coniferous forest habitats | SSC | Moderate potential – Suitable habitat observed within the PSA |

| Species | Habitat Requirements | Status | Potential to Occur within the PSA |
|---|---|---|---|
| ***Birds*** | | | |
| bank swallow (*Riparia riparia*) | Low areas along rivers, streams, ocean coasts, or reservoirs with vertical cliffs or banks | ST | Moderate potential – Some suitable nesting habitat may occur in San Mateo Creek within the PSA |
| Belding's savannah sparrow (*Passerculus sandwichensis beldingi*) | Salt marsh habitat dominated by pickleweed (*Salicornia* sp.) | SE | Low potential – No suitable nesting or foraging habitat observed within the PSA |
| burrowing owl (*Athene cunicularia*) | Grasslands and open scrub habitats, but may also be found in vacant lots and other open disturbed areas | BCC, SSC | Moderate potential – Suitable open scrub and grassland habitat was observed within the PSA |
| California least tern (*Sternula antillarum browni*) | Breeds on sand dunes and on sandbars close to lagoons, bays, and estuaries – may also forage at inland lakes and reservoirs | FE, SE, FP | Low potential – No suitable nesting or foraging habitat observed within the PSA |
| coastal cactus wren (*Campylorhynchus brunneicapillus sandiegensis*) | Arid and semiarid areas with coastal sage scrub habitat dominated by thickets of cactus | BCC, SSC | Present – Observed during focused surveys in 2015, and suitable habitat observed within the PSA |
| coastal California gnatcatcher (*Polioptila californica californica*) | Coastal sage scrub habitat and prefers areas dominated by California sagebrush and California buckwheat – may also forage and nest in other scrub habitats, such as chaparral and riparian scrub | FT, SSC | Present – Observed during focused surveys in 2014 and suitable habitat (CSS) observed within the PSA |
| Cooper's hawk (*Accipiter cooperii*) | Riparian woodlands, oaks woodlands, and eucalyptus groves habitats | WL | Moderate – Suitable nesting and foraging habitat was observed within the PSA |
| ferruginous hawk (*Buteo regalis*) | Extensive grassland habitats and agricultural areas | WL | Low potential – Some open flat areas and potential grassland habitat observed within the PSA |
| grasshopper sparrow (*Ammondramus savannarum*) | Native and nonnative grasslands | SSC | Moderate potential – Suitable habitat observed within the PSA |

| Species | Habitat Requirements | Status | Potential to Occur within the PSA |
|---|---|---|---|
| least Bell's vireo (*Vireo bellii pusillus*) | Riparian woodland habitats with a relatively dense tree canopy | FE, SE | Present – Observed during focused surveys and suitable habitat observed within the PSA |
| light-footed Ridgeway's rail (*Rallus obsoletus levipes*) | Saltwater and brackish marsh habitats | FE, SE, FP | Low potential – No suitable nesting or foraging habitat observed within the PSA |
| loggerhead shrike (*Lanius ludovicianus*) | Grassland, open sage scrub, chaparral, and desert scrub habitats | BCC, SSC | Present- Observed during surveys and suitable habitat observed within the PSA |
| northern harrier (*Circus cyaneus*) | Grassland and marsh habitats | SSC | Moderate potential – Some suitable foraging habitat observed within the PSA |
| southern California rufous-crowned sparrow (*Aimophila ruficeps canescens*) | Coastal sage scrub, broken or burned chaparral, and arid, rocky hillsides in mature chaparral habitat | WL | Moderate potential – Suitable habitat observed within the PSA |
| southwestern willow flycatcher (*Empidonax traillii extimus*) | Riparian woodland/ forest habitats with some surface water | FE, SE | Moderate potential – Suitable habitat observed within the PSA |
| western snowy plover (*Charadrius alexandrinus nivosus*) | Beaches, dunes, dry mud or salt flats, and sandy shores of river, lakes and ponds | FT, BCC, SSC | Low potential – No suitable nesting or foraging habitat observed within the PSA |
| western yellow-billed cuckoo (*Coccyzus americanus*) | Riparian woodland habitats | FT, SE | Moderate potential – Suitable nesting and foraging habitat observed within the PSA |
| white-tailed kite (*Elanus leucurus*) | Grassland with adjacent riparian woodland, oak groves, or sycamore groves habitats | FP | Moderate potential – Suitable nesting and foraging habitat observed within the PSA. |
| yellow-breasted chat (*Icteria virens*) | Riparian woodland habitats | SSC | Moderate potential – Suitable habitat observed within the PSA |
| yellow warbler (*Dendroica petechia*) | Riparian woodland habitats | BCC, SSC | Moderate potential – Suitable habitat observed within the PSA |
| ***Mammals*** | | | |
| American badger (*Taxidea taxus*) | Drier and open stages of scrub, forest, and grassland habitats | SSC | Moderate potential – Suitable foraging and burrowing habitat observed within the PSA |

| Species | Habitat Requirements | Status | Potential to Occur within the PSA |
|---|---|---|---|
| Dulzura pocket mouse (*Chaetodipus californicus femoralis*) | Mature coastal sage scrub and chaparral habitats – it may also occur in desert grassland habitats | SSC | Present – Observed during focused trapping/surveys for Pacific Pocket Mouse. Suitable habitat observed within the PSA |
| Mexican long-tongued bat (*Choeronycteris mexicana*) | Desert shrubland, mountain canyons with deep riparian vegetation, woodlands, and tropical deciduous forest habitats | SSC | Low potential – Marginally suitable habitat observed within the PSA |
| northwestern San Diego pocket mouse (*Chaetodipus fallax fallax*) | Sandy soils with rocks or coarse gravel in coastal sage scrub, chaparral, grassland, and sage scrub/grassland transitional habitats | SSC | Moderate potential – Suitable habitat observed within the PSA |
| Pacific pocket mouse (*Perognathus longimembris pacificus*) | Open coastal sage scrub habitat with fine-grain, sandy substrates | FE, SSC | High potential – Suitable habitat observed within the PSA, and species detected in and in the vicinity of the PSA during previous surveys |
| San Diego black-tailed jackrabbit (*Lepus californicus bennetti*) | Grassland, desert shrub, open forest, scrub, and chaparral habitats in coastal southern California | SSC | Moderate potential – Suitable foraging habitat observed within the PSA |
| San Diego desert woodrat (*Neotoma lepida intermedia*) | Coastal sage scrub, chaparral, woodland, and desert habitats | SSC | Moderate potential – Suitable habitat observed within the PSA |
| western mastiff bat (*Eumops perotis californicus*) | Semi-arid to arid habitats and woodland, coastal scrub, grassland, palm oases, chaparral, desert scrub, and urban habitats – roost in cliffs, buildings, trees, and tunnels | SSC | Moderate potential – Suitable foraging habitat observed within the PSA |

*USFWS: FE=Federal Endangered, FT=Federal Threatened, BCC= USFWS Birds of Conservation Concern, CDFW: FP=Fully protected, SE=State Endangered, ST=State Threatened, SSC=California Species of Special Concern, WL=CDFW Watch List*

Protocol-level wet season surveys were conducted for Riverside fairy shrimp within the PSA in early 2015 in support of the proposed Project. Protocol-level dry season surveys were conducted in September 2015. The surveys were conducted in habitat with the potential to support Riverside fairy shrimp. No Riverside fairy shrimp have been detected during the surveys (Cardno 2015b, Appendix D).

***San Diego Fairy Shrimp (Branchinecta sandiegonensis, Federal Endangered)***
The San Diego fairy shrimp is a small aquatic crustacean found in more shallow vernal pools and ephemeral freshwater wetland habitats and is typically associated with vernal pool complexes. Vernal pool complexes are generally made up of between 5 to 50 pools, are hydrologically connected, and have similar species composition. It does not occur in riverine, marine, or other permanent water bodies. In the United States, the current range of the San Diego fairy shrimp is restricted to San Diego and Orange Counties.

Protocol-level wet season surveys were conducted for San Diego fairy shrimp within the PSA in early 2015 in support of the proposed Project. Protocol-level dry season surveys were conducted in September 2015. The surveys were conducted in habitat with the potential to support San Diego fairy shrimp. No San Diego fairy shrimp was detected during the surveys (Cardno 2015b, Appendix D).

***Southern Steelhead (Oncorhynchus mykiss, Federal Endangered, California Species of Special Concern)***
The southern steelhead is an anadromous fish and member of the salmon family that is native to southern California. The southern steelhead hatches in streams and rivers, and will spend part of their life cycle developing physiological changes that allow them to migrate back into saltwater to mature (NMFS 2011). The southern steel head will usually return to spawn in the same stream or river that they were hatched. San Mateo Creek and San Onofre Creek provide potentially suitable habitat when flowing; therefore, there is a moderate potential for southern steelhead to occur within the drainages that cross the PSA.

***Tidewater Goby (Eucyclogobius newberryi, Federal Endangered, California Species of Special Concern)***
The tidewater goby is endemic species to California coastal lagoons, estuaries, and marshes. It is a benthic species that prefers brackish waters, shallow lagoons, and lower streams reaches where the water is still but not stagnant. Tidewater gobies are generally found within the fresh-saltwater interface in the upper part of estuaries, but can often migrate as far as 0.5 mile upstream along tributaries from an estuary (USFWS 2005). San Mateo Creek and San Onofre Creek may provide some potential habitat when flowing; therefore, there is a moderate potential for tidewater goby to occur within the drainages that cross the PSA.

***Western Spadefoot Toad (Spea hammondii, California Species of Special Concern)***
The western spadefoot toad may be found in a wide range of habitats where favorable sandy or gravelly soils for burrowing are present. These habitats include mixed woodlands, grasslands, coastal sage scrub, chaparral, sandy washes, lowlands, river floodplains, alluvial fans, playas, alkali flats, foothills, and mountains. Western spadefoot toads are mainly terrestrial returning to water only to breed. After heavy rains, temporary shallow rain pools are used for breeding, with a breeding season typically from January through May; however, they can breed at any time of the year if conditions are favorable. Outside of the breeding season the western spadefoot toad is rarely seen, spending its time underground in burrows. Suitable oak woodland, grassland, coastal sage scrub, and riparian habitats occur throughout the PSA; therefore, there is moderate potential for western spadefoot toad to occur within the PSA.

***Coast Patch-nosed Snake (Salvadora hexalepis virgultea, California Species of Special Concern)***
The coast patch-nosed snake is found in brushy or shrubby vegetation areas, such as coastal sage scrub and chaparral habitats. It is active during the day, hunting small vertebrates, such as lizards and small mammals, on the ground and sometimes pursuing prey up into shrubs. It will burrow into loose, sandy soils, but is quick to flee when it feels threatened. Suitable coastal sage scrub habitat occurs throughout the PSA; therefore, there is moderate potential for coast patch-nosed snake to occur within the PSA.

***Coronado Island Skink (Plestiodon skiltonianus interparietalis, California Species of Special Concern)***
The Coronado island skink prefers openings and clearings where rocks, logs, and other debris are present in pine forest, open woodland, and grassland habitats, and along creeks and rivers, but may also be found in chaparral and coastal sage scrub habitats. It is active during the day, somewhat secretive and rarely seen, but may be found foraging in leaf litter. When not foraging it takes refuge under bark, leaf litter, rocks, and in burrows. Suitable woodland, grassland, riparian, and coastal sage scrub habitats occur throughout the PSA; therefore, there is a moderate potential for Coronado island skink to occur within the PSA.

***Northern Red Diamond Rattlesnake (Crotalus ruber ruber, California Species of Special Concern)***
The northern red diamond rattlesnake, one of San Diego County's larger rattlesnakes, is generally a quiet, secretive rattlesnake. It is typically found in coastal sage scrub, chaparral, desert slope scrub, thorn scrub, and woodland habitats below 5,000 feet. It can occasionally be found in grassland habitats as well, but prefers areas with rocks and brush. Suitable woodland and coastal sage scrub habitats occur throughout the PSA; therefore, there is moderate potential for northern red diamond rattlesnake to occur within the PSA.

***Orange-throated Whiptail (Aspidoscelis hyperythrus, California Species of Special Concern)***
The orange-throated whiptail is a highly mobile species that can be found in brushy semi-arid areas typically with loose soil and rocks, including washes, streamsides, rocky hillsides, coastal chaparral, and coastal sage scrub habitats. Suitable riparian and coastal sage scrub habitats occur throughout the PSA; therefore, there is moderate potential for orange-throated whiptail to occur within the PSA.

***San Diego Horned Lizard (Phrynosoma coronatum blainvillei, California Species of Special Concern)***
The San Diego horned lizard is found within a variety of natural habitats in San Diego County that include sage scrub, chaparral, grasslands, woodlands, and coniferous forest and prefers habitats that are undisturbed, with open areas and patches of loose soils. It primarily eats native harvester ants and can frequently be found near anthills. Suitable coastal sage scrub, grasslands, and woodland habitats occur throughout the PSA, and the San Diego horned lizard has been documented in other parts of MCB Camp Pendleton; therefore, there is moderate potential for San Diego horned lizard to occur within the PSA.

***Southwestern Pond Turtle (Actinemys marmorata pallida, California Species of Special Concern)***
The southwestern pond turtle is San Diego County's only native freshwater turtle. It typically occurs near a permanent water source, but will also travel on land near water bodies. The southwestern pond turtle prefers ponds or water bodies with emergent and floating vegetation, such as cattails and algae mats, that supply food and protection for the turtle. The San Mateo Creek and San Onofre Creek within the PSA do not appear to flow as a permanent water source; however, nearby habitats could provide potential habitat for nesting and aestivation within the PSA. Therefore, there is a low potential for southwestern pond turtle to occur within the PSA.

***Two-striped Garter Snake (Thamnophis hammondii, California Species of Special Concern)***
The two-striped garter snake is a mostly aquatic snake generally found in or near a permanent or intermittent freshwater source, such as streams, ponds, lakes, and temporary bodies of water. They prefer riparian habitat with rocky streambeds and sandy riverbeds within oak woodland, chaparral, coastal sage scrub, and coniferous forest habitats. Suitable riparian habitat was observed in Cristianitos Creek, San Mateo Creek, and San Onofre Creek; therefore, there is a moderate potential for two-striped garter snake to occur within the PSA.

***Bank Swallow (Riparia riparia, California State Threatened)***
The bank swallow is a rare migrant to southern California that can be found in agricultural lands, wetland, and river habitats. The nesting season for the bank swallow is from April to June, with nests built, often in colonies, in vertical sandy riverbanks and bluffs. Some potential nesting habitat occurs within the PSA where it is crossed by San Mateo Creek; therefore, there is moderate potential for this species to occur within the PSA.

***Belding's Savannah Sparrow (Passerculus sandwichensis beldingi, California State Endangered)***
The Belding's savannah sparrow is a year-round resident of coastal southern California salt marsh habitat dominated by pickleweed (*Salicornia* sp.). The nesting season for the Belding's savannah sparrow is generally from March through mid-July, with nests built in dense marsh vegetation on or near the ground. No suitable salt marsh habitat was observed within the PSA; therefore, there is a low potential for this species to occur within the PSA.

***Burrowing Owl (Athene cunicularia, USFWS Bird of Conservation Concern, California Species of Special Concern)***
The burrowing owl can be found in grassland and open scrub habitats where it utilizes mammal burrows, and occasionally man-made structures such as culverts, for roosting and nesting. The species occurs in San Diego County year-round, with the breeding season generally February through August, but is more common in winter.

Suitable habitat for burrowing owl does occur within the PSA. Protocol-level surveys were conducted for burrowing owl within the PSA during the 2014-2015 non-breeding season in support of the proposed Project. The surveys were conducted in habitats with the potential to support burrowing owls. No burrowing owls or their sign were observed within the PSA during the survey (AECOM 2015).

***California Least Tern (Sternula antillarum browni, Federal Endangered, California State Endangered, California Fully Protected)***
The California least tern is a year-round resident of coastal southern California, though most breeding occurs on off-shore islands. They are usually seen foraging and roosting along the coast and in coastal bays, harbors, and tidal lagoon, but can occasionally be found on more inland freshwater lakes and reservoirs. No suitable foraging or nesting habitat occurs within the PSA; therefore, there is a low potential for California least tern to occur within the PSA.

***Cooper's Hawk (Accipiter cooperii, CDFW Watch List)***
The Cooper's hawk is a year-round resident of riparian woodlands, oak woodlands, and more recently of eucalyptus groves in California. This hawk typically nests in tall trees such as oaks and eucalyptus, but may utilize other trees as well. The nesting season for Cooper's hawk occurs from as early as January

through June. This species was not documented within one mile of the project by the CNDDB, however, there is suitable nesting and foraging habitat within the PSA, and there is a moderate potential for this species to occur. Suitable coast live oak woodland and eucalyptus woodland habitats for nesting were observed within the PSA; therefore, there is potential for Cooper's hawk to occur within the PSA.

***Ferruginous Hawk (Buteo regalis, CDFW Watch List)***
The ferruginous hawk is an uncommon winter visitor to southern California from October through February and it is not known to breed in San Diego County according to the *San Diego County Bird Breeding Atlas* (Unitt 2004). While wintering in the area, it prefers to hunt in extensive tracts of grassland habitat and agricultural areas. Potential migratory foraging habitat such as the grassland habitat south of San Mateo Creek could provide areas for foraging; therefore, there is a low potential for ferruginous hawk to occur within the PSA.

***Grasshopper Sparrow (Ammodramus savannarum, California Species of Special Concern)***
The grasshopper sparrow generally migrates into San Diego County to breed, but it has been recorded in the county in the winter months. It is generally restricted to native grassland habitat dominated by bunchgrass of the genus *Nassella*, but has been documented in nonnative grassland habitat as well. The native grassland that it inhabits usually has some scattered native coastal sage shrubs. The nesting season for grasshopper sparrow is from April through June. Some potential nonnative grassland habitat occurs within the northern and southern portions of the PSA; therefore, there is moderate potential for grasshopper sparrow to occur within the PSA.

***Light-footed Ridway's Rail (Rallus obsoletus levipes, Federal Endangered, California State Endangered and Fully Protected)***
The light-footed Ridgway's rail is a year-round resident of salt-water and brackish marsh habitats along coastal California. California cord grass (*Spartina foliosa*) is their preferred nesting habitat and material though pickleweed and tumbleweed are sometimes used if California cord grass is limited. Light-footed Ridway's rails may sometimes nest in freshwater marshes, but with limited success. Their nesting season can extend from March through July. No suitable marsh habitat occurs within the PSA; therefore, there is low potential for light-footed Ridgway's rail to occur within the PSA.

***Northern Harrier (Circus cyaneus, California Species of Special Concern)***
The northern harrier is a year-round resident of southern California, but is more numerous as a winter visitor. Northern harriers forage in open grassland and marsh habitats and build nests on the ground in marshes or other dense vegetation. Their nesting season typically extends from April through June. Suitable foraging grassland habitat occurs within the PSA; therefore, there is a moderate potential for northern harrier to occur within the PSA.

***Southern California Rufous-crowned Sparrow (Aimophila ruficeps canescens, CDFW Watch List)***
The southern California rufous-crowned sparrow is a year-round resident of California that rarely ventures far from its preferred habitats of coastal sage scrub, broken or burned chaparral, and arid, rocky hillsides in mature chaparral. Its nesting season extends from March through July, with nests typically found on or near the ground at the bases of low shrubs. Suitable coastal sage scrub habitat occurs throughout the PSA; therefore, there is moderate potential for southern California rufous-crowned sparrow to occur within the PSA.

***Southwestern Willow Flycatcher (Empidonax traillii extimus, Federal Endangered, California State Endangered)***
The southwestern willow flycatcher is a migratory species that spends the breeding season in the southwestern United States. While in the United States, the southwestern willow flycatcher is a strict inhabitant of the dense vegetation associated with riparian woodland/forest habitats with some surface water. In San Diego County, southwestern willow flycatchers start arriving in May to breed in riparian woodland/forest habitats and starts migrating south by the end of August.

Protocol-level surveys were conducted for southwestern willow flycatcher during May through July 2015 in support of the proposed Project. The surveys were conducted in habitats with the potential to support southwestern willow flycatcher. No willow flycatcher or any subspecies, including the southwestern willow flycatcher, were detected within the PSA during the surveys (Bloom 2015a).

***Western Snowy Plover (Charadrius alexandrinus nivosus, Federal Threatened, USFWS Bird of Conservation Concern, California Species of Special Concern)***
The western snowy plover is a year-round resident along the California coast and inhabits beaches, dunes, dry mud or salt flats, and sandy shores of rivers, lakes, ponds. The nesting season for western snowy plover extends from March through September when it nests in shallow scrapes on the ground in sand or dried mud. No suitable beaches, dunes, dry mud or salt flats, sandy shores of rivers, lakes, or ponds occur within the PSA; therefore, there is low potential for western snowy plover to occur within the PSA.

***Western Yellow-billed Cuckoo (Coccyzus americanus Federal Threatened, California State Endangered)***
The western yellow-billed cuckoo is an uncommon summer resident in San Diego County that typically inhabits riparian habitats. Western yellow-billed cuckoos breed in riparian woodlands with cottonwoods and willows. The breeding season for western yellow-billed cuckoo in California is from late June to late July, but could being as early as May and may continue into late August. Potential habitat occurs within the PSA in San Mateo Creek and San Onofre Creek; however, no evidence of the Western yellow-billed cuckoo was observed during other protocol-level species surveys for special status riparian avian and amphibian species. Therefore, there is moderate potential for western yellow-billed cuckoo to occur within riparian habitats crossing the PSA.

***White-tailed Kite (Elanus leucurus, California Fully Protected)***
The white-tailed kite is a common year-round resident in San Diego County and typically inhabits riparian woodlands, oak woodlands, and grassland habitats. It typically nests in oaks, but may utilize other trees as well. The nesting season for white-tailed kite occurs as early as January through August. Suitable riparian woodland and grassland habitats occur within the PSA; therefore, there is a moderate potential for white-tailed kite to occur within the PSA.

***Yellow-breasted Chat (Icteria virens, California Species of Special Concern)***
The yellow-breasted chat is a summer visitor to southern California and typically inhabits riparian woodland habitats where it nests in thickets of dense vegetation. The breeding season for yellow-breasted chat occurs as early as April through as late as July. Suitable riparian habitat occurs within the PSA in San Mateo Creek and San Onofre Creek; therefore, there is moderate potential for yellow-breasted chat to occur within the PSA.

***Yellow Warbler (Dendroica petechia, USFWS Bird of Conservation Concern, California Species of Special Concern)***
The yellow warbler is a summer visitor to southern California and typically inhabits riparian woodland habitats where it nests in upright forks of twigs. The breeding season for yellow warbler occurs from mid-April through July. Suitable riparian habitat occurs within the PSA in San Mateo Creek and San Onofre Creek; therefore, there is moderate potential for yellow warbler to occur within the PSA.

***American Badger (Taxidea taxus, California Species of Special Concern)***
The American badger occurs throughout California and is most often found in drier and open stages of shrub, forest, and grassland habitats, where friable soils, suitable for digging burrows, are present. Suitable coastal sage scrub and grassland habitats occur within the PSA; therefore, there is moderate potential for American badger to occur within the PSA.

***Mexican Long-tongue Bat (Choeronycteris mexicana, California Species of Special Concern)***
The Mexican long-tongue bat is found in desert shrubland, mountain canyons with deep riparian vegetation, woodland, and tropical deciduous forest habitats. It feeds primarily on nectar and pollen, and it typically roosts in buildings, mines, caves, tunnels, or rock crevices. Marginally suitable riparian habitat for foraging occurs where San Mateo Creek and San Onofre Creek cross the PSA; therefore, there is a low potential for Mexican long-tongue bat to occur within the PSA.

***Northwestern San Diego Pocket Mouse (Chaetodipus fallax fallax, California Species of Special Concern)***
The Northwestern San Diego pocket mouse is found in a wide variety of habitats in southern California, including chaparral, coastal sage scrub, grassland, and sage scrub/grassland transitional habitats. This mouse has a strong affinity for habitats that have sandy soils where rocks and/or coarse gravel are present. Suitable coastal sage scrub and grassland habitats occur within the PSA; therefore, there is moderate potential for northwestern San Diego pocket mouse to occur within the PSA.

***Pacific Pocket Mouse (Perognathus longimembris pacificus, Federal Endangered, California Species of Special Concern)***
The Pacific pocket mouse is currently known from only four locations (three on MCB Camp Pendleton and one in Dana Point). These remaining populations occur within open coastal sage scrub habitat with fine-grain, sandy substrates. Historically this pocket mouse was known to inhabit coastal sage scrub, coastal strand, coastal dune, and river alluvium habitats within approximately 2.5 miles of the ocean. Historical records of Pacific pocket mouse observations have been documented in the vicinity of the proposed reconductor segment along existing lattice towers in the hills north of Basilone Road, as well as coastal sage scrub habitat south of the San Mateo Substation.

Protocol-level surveys were conducted for Pacific pocket mouse within the PSA in 2013, in areas of suitable habitat that had not previously been documented as occupied by Pacific pocket mouse. The surveys were conducted in habitats with the potential to support Pacific pocket mouse near San Mateo Creek and San Onofre Creek. No Pacific pocket mouse were captured or observed during the surveys (Tremor 2013a, 2013b); however, there is a high potential that this species occurs within the proposed Project area. No trapping was conducted in known occupied Pacific pocket mouse habitat, in order to minimize potential disturbance to the species. MCB Camp Pendleton and the U.S. Geological Survey have been conducting extensive surveys in Pacific pocket mouse habitat to determine population locations, densities, and other pertinent ecological information for this species at MCB Camp Pendleton.

SDG&E will use the latest data from these studies to determine specific Pacific pocket mouse locations within the PSA. In coordination with MCB Camp Pendleton and the USFWS, additional surveys will be conducted as necessary to determine the most recent areas occupied by Pacific pocket mouse within the PSA, in order to avoid or minimize potential impacts to this species as a result of construction.

***San Diego Black-tailed Jackrabbit (Lepus californicus bennettii, California Species of Special Concern)***
The San Diego black-tailed jackrabbit occurs in grassland and desert shrub habitats, as well as open/early stages of forest, scrub, and chaparral habitats in coastal southern California. It prefers more open scrub habitat without a dense understory and is rarely found in closed canopy habitats. Suitable grassland and coastal sage scrub habitats occur throughout the PSA; therefore, there is moderate potential for San Diego black-tailed jackrabbit to occur within the PSA.

***San Diego Desert Woodrat (Neotoma lepida intermedia, California Species of Special Concern)***
The San Diego desert woodrat may be found within a variety of habitats within southern California including coastal sage scrub, chaparral, woodland, and desert habitats, especially in rocky areas. They build rather large, and sometime elaborate nests from sticks, cacti, rocks, bits of plant material, and sometime with man-made trash or debris. These nests are called middens and are located above ground, often under rock outcrops, in a rock pile, under shrubs, or within the center of cactus or agave patches. No woodrat middens were observed during any of the wildlife surveys; however, suitable coastal sage scrub and coast live oak woodland habitat occurs within the PSA. Therefore, there is moderate potential for San Diego desert woodrat to occur within the PSA.

***Western Mastiff Bat (Eumops perotis californicus, California Species of Special Concern)***
The western mastiff bat is typically found in open semi-arid to arid habitats such as woodland, coastal scrub, grassland, palm oases, chaparral, desert scrub, and urban areas. It typically roosts in high buildings, trees, tunnels, and cliff crevices. Suitable coat live oak woodland, coastal sage scrub and grassland habitats for foraging occur within the PSA. In addition, potential buildings for roosting occur within and in the vicinity of the PSA; therefore, there is moderate potential for western mastiff bat to occur within the PSA.

## 5.7 Critical Habitat

Under the ESA, to the extent prudent and determinable, the USFWS is required to designate Critical Habitat for endangered and threatened species (16 U.S.C. § 1533 (a)(3)). Critical Habitat is defined as areas of land, water, and air space containing the physical and biological features essential for the survival and recovery of endangered and threatened species. Designated Critical Habitat includes sites for breeding and rearing, movement or migration, feeding, roosting, cover, and shelter.

Designated Critical Habitats require special management and protection of existing resources, including water quality and quantity, host animals and plants, food availability, pollinators, sunlight, and specific soil types. Critical habitat designation delineates all suitable habitat occupied or not, that is essential to the survival and recovery of the species.

Most of the Proposed Project is within MCB Camp Pendleton. According to USFWS policy, if adequate special management or protection is provided by a legally operative plan that addresses the maintenance and improvement of the primary constituent elements important to the species and manages for the long-term conservation of the species, habitat identified as essential to the protection

and recovery of a species may be omitted from federal critical habitat designation. "Benefit" to the species is determined by these three criteria 1) The plan provided a conservation benefit to the species; 2) the plan provided certainty that the management plan will be implemented; and 3) the plan provides certainty that the conservation effort will be effective. MCB Camp Pendleton's INRMP meets these three criteria for all federally listed species except the California brown pelican, which is currently proposed for federal delisting (MCB Camp Pendleton 2012).

The northernmost portion of the PSA which lies outside of the boundaries of MCB Camp Pendleton, falls within or crosses designated Critical Habitat for both the arroyo toad and coastal California gnatcatcher. Project components within critical habitat for these species include stringing sites, poles and conductor to be replaced, a helicopter ILA, and Talega Staging Yard 1.

In the USFWS 2003 Proposed Rule to Revise Designation of Critical Habitat for the Coastal California Gnatcatcher, the USWFS considered but did not propose as critical habitat, pursuant to sections 3(5)(A) and 4(b)(2) of the Act, reserve lands covered by three completed and approved regional/subregional HCPs (68 FR 20228). These lands include SDG&E right-of-way (ROW) within SDG&E's NCCP. Although these areas were not included in the proposed critical habitat, the USFWS sought public review and comment on these lands, provided maps to facilitate the public's ability to comment, and alerted the public that the lands could potentially be included in the final designation. Lands considered but not proposed for designation were also analyzed for potential economic impacts in the Draft Economic Analysis.

In 2007, USFWS issued the Revised Final Rule, reaffirming exclusion of lands within approved regional and subregional HCPs under section 4(b)(2) of the FESA. The USFWS determined that lands owned by SDG&E and covered under SDG&E's NCCP provided greater benefits to coastal California gnatcatcher than other areas designated as critical habitat. As such, the USFWS designation of critical habitat for the coastal California gnatcatcher specifically excludes SDG&E ROW within SDG&E's NCCP area.

## 5.8 Wildlife Movement Corridors

Wildlife corridors are defined as areas that connect suitable habitat in a region otherwise fragmented by rugged terrain, changes in vegetation, or human disturbance. Natural features, such as canyon drainages, ridgelines, or areas with dense vegetation cover can provide corridors for wildlife travel. Wildlife corridors are important to mobile species because they provide access to individuals to find shelter, mates, food, and water; allow the dispersal of individuals away from high population density areas; and by allowing immigration and emigration of individuals to other populations they allow for gene flow between populations. Wildlife corridors are considered sensitive by resource and conservation agencies. Terrestrial wildlife species may travel along natural drainages, such as San Mateo and San Onofre Creeks, which could provide protective cover from predators, as well as a consistent water and food source. Migrating avian species will use native habitat areas as stopovers on their journey through the area to wintering sites south of the project, and north to nesting areas to the north.

In its INRMP, MCB Camp Pendleton has noted that many of the open space areas within and adjacent to Camp Pendleton, and to the northeast within the Cleveland National Forest, are generally large enough to support varied and abundant resident plant and wildlife populations and provide for unrestricted movement between the Base and adjacent open space lands. Also the large habitat areas on Base generally allow unrestricted access to the north toward permanently designated open space areas of the

Cleveland National Forest, Casper's Wilderness Park, O'Neill Regional Park, Rancho Mission Viejo Land Conservancy, and Thomas F. Riley Wilderness Park.

While there are likely a number of preferred travel routes and landscape features that larger and more mobile wildlife species may use to move within and between permanent open space areas, wildlife "corridors" have not been formally studied and documented within the open space habitat areas on Camp Pendleton nor surrounding the Base, except for the Santa Ana – Palomar Mountain Linkage.

Wildlife movement on Base is facilitated by the fact that Camp Pendleton contains several watersheds and several small coastal drainages. Although water flows are intermittent across these drainages, they support abundant riparian woodland, scrub, and wetland vegetation communities within the floodplain areas, and coastal sage, chaparral or grassland vegetation on canyon slopes and along ridgelines. These areas provide food and cover for many wildlife species on the Base, in addition to facilitating wildlife movement base wide. Potential east-west wildlife movement on Camp Pendleton can occur along the Santa Margarita River and Las Flores, Aliso, and San Onofre canyons, portions of the San Mateo and San Luis Rey Rivers, and along several small coastal drainages. San Onofre Creek, San Mateo Creek, and the Santa Margarita River offer the best direct connection for wildlife, albeit highly restricted by the I-5 corridor, to the beaches and coastal bluffs of Camp Pendleton.

Potential north-south wildlife movement occurs on Camp Pendleton through the inland mountains situated along the eastern half of the Base, and those of the coastal belt located just east of the I-5 corridor. Other potential north-south wildlife movement on Camp Pendleton may include the areas along the beaches, coastal benches/bluffs, and foothills that are, for the most part, unconstrained by development and other artificial barriers (MCB Camp Pendleton 2007).

While local wildlife movements may be temporarily disrupted during construction of the proposed Project, the temporary and permanent impacts as a result of construction are not expected to significantly affect the movement of wildlife through MCB Camp Pendleton or along any existing or potential wildlife movement corridors within the base or specifically within the PSA. Although the proposed project is over 10 miles in length, work on each individual power pole and/or tower will be localized and of relatively short duration, and should not result in large-scale impacts across an extensive section of native habitat. In addition, work is to be conducted primarily within existing SDG&E utility corridors, with existing transmission and distribution lines. New and replacement pole and tower structure placement for the proposed Project will occur in the vicinity of existing structures within the ROW, and would result in minimal additional loss of protective cover, roosting or foraging habitat, or movement corridors by maintaining existing wide natural areas that allow for movement of species. The proposed Project will also avoid or span existing drainages that can serve as wildlife movement corridors; therefore, impacts to wildlife movement corridors as a result of construction of the proposed Project are anticipated to be less than significant.

## 5.9 Environmentally Sensitive Habitat Areas

As discussed in Section 3.0 Regulatory Setting (specifically the California Coastal Act), ESHAs are defined as "any area in which plant or animal life or their habitats are either rare or especially valuable because of their special nature or role in an ecosystem and which could be easily disturbed or degraded by human activities and developments". Proposed development within and adjacent to an ESHA must be located and designated to prevent significant impacts to the functions and values of the ESHA.

Native vegetation communities within the PSA can be considered ESHAs if they provide potential habitat for a number of sensitive plant and wildlife species. For example, upland habitats such as coastal sage scrub habitat could support the Coastal California gnatcatcher and Pacific pocket mouse, while grassland habitat can provide suitable nesting and/or roosting habitat for the western burrowing owl and other potential raptor species. Riparian habitats such as those found within San Mateo or San Onofre Creeks could potentially provide suitable nesting and/or roosting habitat for species such as the least Bell's vireo and arroyo toad. Areas such as compacted bare ground and areas of high disturbance would not typically be considered ESHAs. However, these are areas that could retain water during storm events, resulting in potential habitat for sensitive fairy shrimp species.

## 5.10 Jurisdictional Resources

The PSA contains wetland and non-wetland water features that may be subject to regulation by federal and state resource agencies. All wetlands and riparian areas identified within the PSA continue outside of the survey area and are either part of the San Mateo Creek or San Onofre Creek systems that flow directly into the Pacific Ocean. All waters, streambed, wetland and riparian features delineated were jurisdictional, and if impacted during construction will require permits/agreements from ACOE, RWQCB, and CDFW. In addition to ACOE, RWQCB, and CDFW, all features identified within the Coastal Zone are also jurisdictional to the CCC, and if impacted may require a coastal development permit.

Twenty-six features were identified jurisdictional to ACOE, RWQCB, and CDFW including five jurisdictional to the CCC during surveys conducted in June and October 2015. Some features supported areas determined to be ACOE, RWQCB, and CDFW wetland, but also supported non-wetland open channel, and CDFW jurisdictional adjacent riparian vegetation.

Two locations of potential vernal pool habitat were identified within the PSA during the initial reconnaissance-level constraints analysis conducted in 2014 (AECOM 2014a). These areas were reviewed during focused botanical surveys and again during fairy shrimp surveys conducted in 2015, and it was determined that in their present condition, neither site would be considered as potential vernal pool habitat, therefore, a jurisdictional determination at these two locations was not conducted.

Within the survey area, a total of approximately 141,572 square feet (3.250 acres) of ACOE Waters of the U.S., RWQCB Waters of State, and CDFW Streambed, 548,384 square feet (12.589 acres) of ACOE Wetland, RWQCB Wetland, and CDFW Wetland, 72,881 square feet (1.673 acres) of RWQCB Waters of State, and CDFW Streambed, 14,622 square feet (0.336 acre) of ACOE wetland and RWQCB Wetland Waters of the State, 258,372 square feet (5.931 acres) of CDFW Riparian, and 58,420 square feet (1.341 acres) of CCC Wetland were identified during the survey. A summary of the Jurisdictional Features observed, as well as the jurisdiction for each feature and approximate size within the PSA, are listed in Table 5.5 below.

The proposed Project has been designed to avoid impacts to jurisdictional resources whenever possible. Most of the features identified above are expected to be avoided during construction. A footpath is proposed for crews to access Poles 125 and 124, located within the riparian habitat north of the Basilone Substation. The vegetation along the footpath will be trimmed to facilitate access to the poles, and the vegetation around each pole will also be trimmed to facilitate access when the 69kV line is removed from this section of the project. No ground excavation or grubbing of vegetation is expected

for work conducted along the proposed footpath and at these two poles sites, therefore, no additional permits or authorizations from jurisdictional agencies are expected as a result of vegetation trimming in this area.

## 6.0 IMPACTS

Potential impacts associated with the proposed Project can be classified as temporary or permanent, and direct or indirect. Temporary impacts generally include impacts associated with construction activities, including the use of vehicles or helicopters to assemble and install new facilities and remove and/or replace old equipment, the use of temporary workspace, storage of construction materials and equipment, or vegetation removal in areas to conduct construction activities. These areas are intended to be restored once construction is complete. Permanent impacts generally include impacts associated with construction and installation of a new facility, such as new poles and underground vaults.

Direct impacts include the physical loss or removal of vegetation due to the installation of new facilities or work at staging/laydown areas. Indirect impacts during construction may include the interruption of normal nesting or foraging behaviors, loss of prey items, such as insects or food resources, or the suppression of growth due to excessive dust or noise. Impacts to special status species may occur either through temporary or permanent habitat loss, interruption of normal species routines, or through direct mortality.

Potential impacts to special status species associated with the proposed Project were assessed by analyzing species-specific requirements, including necessary vegetative habitat, elevational range, foraging needs, denning or breeding requirements, migratory trends, current ranges, and known occurrences or records.

### 6.1 Project Specific Impacts

The following describes the potential for impacts to sensitive resources during construction of the proposed Project. During the construction and operations and maintenance phases of the proposed Project, SDG&E would operate in compliance with all State and federal laws, regulations, permit conditions, and requirements.

The proposed Project has been designed to avoid sensitive habitat areas that may support special-status species and sensitive biological resources when possible, including not placing poles or other facilities in drainage areas or other sensitive habitats, using existing access roads to the greatest extent possible, and placing staging areas, laydown areas, and guard structures outside of sensitive habitats where feasible. Where avoidance of sensitive habitat areas supporting sensitive species is not possible, or where sensitive habitat areas exist adjacent to proposed Project work areas, SDG&E would implement additional mitigation measures to minimize project impacts in these areas.

**Table 5.5 Summary of Jurisdictional Wetlands and Riparian Areas in the PSA**

| Wetland | Jurisdiction | Total Area In Square Feet | Total Area In Acres |
|---|---|---|---|
| **Feature 1** | ACOE/RWQCB/CDFW Waters | 439 | 0.010 |
| | RWQCB/CDFW Streambed | 869 | 0.020 |
| **Feature 2** | ACOE/RWQCB/CDFW Waters | 834 | 0.019 |
| | RWQCB/CDFW Streambed | 840 | 0.019 |
| **Feature 3** | ACOE/RWQCB/CDFW Wetland | 6,001 | 0.138 |
| | CDFW Riparian | 6,705 | 0.154 |
| **Feature 4** | ACOE/RWQCB/CDFW Waters | 405 | 0.009 |
| | RWQCB/CDFW Streambed | 818 | 0.019 |
| **Feature 5** | ACOE/RWQCB/CDFW Wetland | 2,444 | 0.056 |
| **Feature 6** | ACOE/RWQCB/CDFW Waters | 1,071 | 0.025 |
| | RWQCB/CDFW Streambed | 1,075 | 0.025 |
| **Feature 7** | ACOE/RWQCB/CDFW Waters | 521 | 0.012 |
| | RWQCB/CDFW Streambed | 522 | 0.012 |
| **Feature 8** | ACOE/RWQCB/CDFW Waters | 5,120 | 0.118 |
| | RWQCB/CDFW Streambed | 10,274 | 0.236 |
| **Feature 9** | ACOE/RWQCB/CDFW Waters | 1,301 | 0.030 |
| | RWQCB/CDFW Streambed | 1,301 | 0.030 |
| **Feature 10** | ACOE/RWQCB/CDFW Waters | 1,233 | 0.028 |
| | CDFW Riparian | 31,349 | 0.720 |
| **Feature 11** | ACOE/RWQCB/CDFW Waters | 458 | 0.011 |
| | RWQCB/CDFW Streambed | 459 | 0.011 |
| **Feature 12** | ACOE/RWQCB/CDFW Waters | 600 | 0.014 |
| | RWQCB/CDFW Streambed | 1,207 | 0.028 |
| **Feature 13 (San Mateo East)** | ACOE/RWQCB/CDFW Waters | 66,508 | 1.527 |
| | ACOE/RWQCB/CDFW Wetland | 23,602 | 0.542 |
| | CDFW Riparian | 107,006 | 2.457 |
| **Feature 14** | ACOE/RWQCB/CDFW Waters | 1,259 | 0.029 |
| | RWQCB/CDFW Streambed | 1,261 | 0.029 |
| **Feature 15 (San Onofre East)** | ACOE/RWQCB/CDFW Waters | 44,226 | 1.015 |
| | RWQCB/CDFW Streambed | 44,194 | 1.015 |
| **Feature 16** | ACOE/RWQCB/CDFW Waters | 979 | 0.022 |
| | RWQCB/CDFW Streambed | 2,956 | 0.068 |
| **Feature 17** | ACOE/RWQCB/CDFW Wetland | 8,909 | 0.205 |
| | ACOE/RWQCB/CDFW Waters | 2,002 | 0.046 |
| | RWQCB/CDFW Streambed | 2,016 | 0.046 |
| **Feature 18** | ACOE/RWQCB/CDFW Wetland/CCC Wetland | 40,714 | 0.935 |

| Wetland | Jurisdiction | Total Area In Square Feet | Total Area In Acres |
|---|---|---|---|
| **Feature 19 (San Onofre West)** | ACOE/RWQCB/CDFW Wetland/CCC Wetland | 109,695 | 2.518 |
| | ACOE/RWQCB/CDFW Waters/CCC Wetland | 9,793 | 0.225 |
| | CDFW Riparian/CCC Wetland | 33,820 | 0.776 |
| **Feature 20** | ACOE/RWQCB/CDFW Waters/CCC Wetland | 991 | 0.023 |
| | RWQCB/CDFW Streambed/CCC Wetland | 1,419 | 0.033 |
| **Feature 21** | ACOE/RWQCB/CDFW Wetland/CCC Wetland | 196,489 | 4.511 |
| **Feature 22 (San Mateo West)** | ACOE/RWQCB/CDFW Wetland/CCC Wetland | 160,532 | 3.685 |
| | CDFW Riparian/CCC Wetland | 58,420 | 1.341 |
| **Feature 23** | ACOE/RWQCB/CDFW Waters | 1,829 | 0.042 |
| | RWQCB/CDFW Streambed | 3,062 | 0.070 |
| | CDFW Riparian | 21,072 | 0.484 |
| **Feature 24** | ACOE/RWQCB/CDFW Waters | 2,001 | 0.046 |
| | RWQCB/CDFW Streambed | 607 | 0.014 |
| **Feature 25** | ACOE/RWQCB Wetland | 6,307 | 0.145 |
| **Feature 26** | ACOE/RWQCB Wetland | 8,315 | 0.191 |
| | ***Total ACOE/RWQCB/CDFW Waters*** | ***141,572*** | ***3.250*** |
| | ***Total ACOE/RWQCB/CDFW Wetland*** | ***548,384*** | ***12.589*** |
| | ***Total RWQCB/CDFW Streambed*** | ***72,881*** | ***1.673*** |
| | ***Total ACOE/RWQCB Wetland*** | ***14,622*** | ***0.336*** |
| | ***Total CDFW Riparian*** | ***258,372*** | ***5.931*** |
| | ***Total CCC Wetland*** | ***58,420*** | ***1.341*** |

### Permanent Impacts

Permanent impacts include the placement of either a direct bury steel pole, pier foundation steel pole, pier foundation steel cable pole, or underground conductor vault. Permanent impacts would also include access road modifications; however, no modifications to existing access roads are anticipated by SDG&E for the proposed Project.

***Direct Bury Steel Poles***

Permanent impacts resulting from the installation of directly embedded steel poles were calculated with an assumption that each pole location would require up to an approximately 54-inch diameter hole for the replacement pole and that each pole would measure up to approximately 30 inches at ground level, which would result in approximately 16 square feet of permanent impact per pole, including the permanent impact from the concrete annulus backfill surrounding the pole.

***Pier Foundation Steel Poles***

The anticipated permanent impacts for the installation of concrete pier foundation poles were calculated with an assumption that each concrete pier foundation would be no larger than 7 feet in

diameter, for a permanent impact area of approximately 39 square feet for each of the new pier foundation cable poles.

***Pier Foundation Steel Cable Poles***

The anticipated permanent impacts for the installation of concrete pier foundation cable poles were calculated with an assumption that each concrete pier foundation would be no larger than 8 feet in diameter, for a permanent impact area of approximately 51 square feet for each of the new pier foundation cable poles.

***Underground Conduit Vaults***

Two underground conductor vaults are proposed for the underground portion of the project. The anticipated permanent impacts for the installation of the underground vaults are the dimensions of the vaults themselves (approximately 10 feet by 18 feet in size). Therefore, the estimated permanent impacts for the installation of the underground vaults is 1,800 square feet per vault or a total of 3,600 square feet.

### Temporary Impacts

***Direct Bury Steel Poles***

In general, temporary impact areas were evaluated based on anticipated geometric work spaces around each proposed work location. Construction work spaces are dynamic in nature and may require minor modifications during the construction phase of the proposed Project to facilitate worker safety and to avoid impacts to natural resources, including sensitive habitats. Therefore, the proposed temporary impact areas below are estimated based on the "best information available at the time of this report." To account for minor shifts in construction approaches, potential temporary impact areas were evaluated based on a 20-foot radius surrounding each directly embedded pole. Thus, the resulting evaluated total impact area will include a 1,256 square foot temporary impact area around each pole and a permanent impact area of 16 square feet, resulting in the approximate calculated 1,240 square feet of potential temporary impact area for each pole.

***Pier Foundation Steel Poles***

Crews will use a temporary work area of approximately 75 feet by 75 feet for a total impact area of approximately 5,625 square feet per location. A 39 square foot permanent impact area was subtracted from the 5,625 square feet of temporary work area, resulting in approximately 5,586 square feet of total temporary impacts for each new concrete pier foundation pole site. An enlarged work area is required for concrete pier foundation poles due to the wider base associated with the pole structure and associated equipment required to complete construction. However, these temporary impacts will be limited to only the space necessary to install the foundation and pole, and will generally be smaller than 75 feet by 75 feet.

***Pier Foundation Steel Cable Poles***

Crews will use a temporary work area of approximately 150 feet by 150 feet for a total impact area of approximately 22,500 square feet per location. A 51 square foot permanent impact area was subtracted from the 22,500 square feet of temporary work area, resulting in approximately 22,499 square feet of total temporary impacts for each new concrete pier foundation cable pole site. An enlarged work area is required for concrete pier foundation cable poles due to the wider base associated with the pole structure and associated equipment required to complete construction. However, these temporary

impacts will be limited to only the space necessary to install the foundation and pole; and will generally be smaller than 150 feet by 150 feet.

***Project Access***

SDG&E will utilize existing access roads to the extent possible during construction. SDG&E has identified a number of disturbed areas adjacent to existing access roads to utilize for turnouts for construction vehicles to be able to pass along the narrow access road system. Where existing access roads are damaged, repairs may be made by blading and smoothing the existing access road as applicable, avoiding drainage crossings and any other jurisdictional resources located within roads. Importing and compacting more stable materials on existing facilities in unstable areas may also be required. Generally, access roads would be smoothed level to allow construction equipment and vehicles to access each site safely. SDG&E would continue to utilize BMPs to minimize dust and erosion.

As part of the proposed project, permanent access roads, turnout areas, overland travel routes, and access footpaths have been identified for use during construction. These areas will allow construction personnel and/or vehicles and equipment to be able to access each of the project work areas that are not directly accessible by existing access roads.

***Stringing Sites, Staging Yards, Incidental Landing Areas***

The proposed Project will require the use of stringing sites to facilitate the stringing of new conductor. Vehicles, equipment, and personnel will remain within the SDG&E ROW, existing paved or unpaved access roads, and previously disturbed areas to the greatest extent possible. Temporary staging yards will be utilized during construction of the project. The Project may also require the use of ILAs in support of helicopter operations.

***Pole Removal, Lattice Tower Work, Pole Top Work***

During construction, some poles will be completely removed from service and not replaced. The temporary impact areas for the removal of each wood pole location is expected to be a maximum of 10-foot radius around the pole, or 314 square feet per site.

Approximately 11 existing steel lattice towers will be accessed during construction to add new conductor to the towers. Work is intended to be conducted primarily from construction vehicles parking on the existing access road and/or from helicopter; however, climbing off the tower may be necessary. The temporary impact areas for access to and equipment staging around one leg of the tower is expected to be a maximum of 10-foot radius around the base leg, or 314 square feet per site. As part of the proposed project, pole top work will be conducted at numerous existing pole locations. The temporary impact areas for pole top work is expected to be a maximum of 10-foot radius around each pole, or 314 square feet per site.

***Guard Structures***

Temporary guard structures will also be utilized during construction at various locations where the proposed Project crosses public roads or sensitive resources. The guard structures are necessary to provide for safety while the conductor is pulled through the line. Two wooden poles with a wooden cross-arm (an H-frame design) may be erected during wire pulling activities, at the junction where public roads or other sensitive resources intersect the existing Project, and will be removed upon completion of wire pulling, sagging, and clip in. Approximately 72 square feet will be temporarily impacted to install each of the guard structures.

***Underground Power Line***

The installation of new underground power line will require a 30–foot-wide workspace for the entire length of the line. Temporary impacts associated with trenching and installation of the proposed underground power line section are anticipated during construction.

## 6.2. Impacts to Vegetation Communities

Anticipated Project impacts were calculated based on vegetation mapping, site-specific conditions, and proposed impact areas described above for features included in the proposed Project design. Construction work spaces are dynamic in nature and may require minor modifications during the construction phase of the proposed Project to facilitate worker safety and avoid impacts to natural resources, including sensitive habitats. Therefore, the proposed permanent and temporary impact areas discussed below are estimated and may shift or be modified within the existing PSA.

Estimated permanent and temporary construction impacts to specific vegetation communities associated with the proposed Project were calculated using anticipated permanent and temporary impact work areas described above. The anticipated impact areas per vegetation community are shown in detail in Table 6.1 below.

The project has been designed to avoid sensitive habitat areas wherever possible, including placing poles outside of drainage areas, using existing access roads, and placing any new facilities, staging areas, or access roads outside sensitive habitats where feasible. In some locations, work areas have been modified to avoid known sensitive resources and are therefore irregularly shaped. These modified work spaces still follow the total maximum impact areas for the type of work at the site, but the overall impacts are expected to be less.

Sensitive habitats are considered naturally occurring plant assemblages or restored habitats that are reasonably expected to support natural diversity and carrying capacities of sensitive species in the region. Non-sensitive habitat types are those typically of a lower biological value and include bare ground, heavily disturbed areas, developed and urban areas (paved), and landscaping. These areas are not typically expected to have a major ecological value, contribute to the function of natural habitats and open space areas in the region, or support special status plant and wildlife species addressed in this report. A summary of estimated impacts to sensitive and non-sensitive habitat types is provided in Table 6.2.

**Table 6.1 Estimated Construction Impacts to Vegetation Community**

| Vegetation Community | Anticipated Area of Impact in Square Feet | Anticipated Area of Impact in Acres |
|---|---|---|
| ***Temporary Impacts*** | | |
| Nonnative Grassland | 61,791 | 1.42 |
| Diegan Coastal Sage Scrub | 178,674 | 4.10 |
| Southern Sycamore-Alder Riparian Woodland | 2,241 | 0.05 |
| Disturbed Habitat | 128,933 | 2.96 |
| Urban/Developed | 3,915,311 | 89.88 |
| ***Total Estimated Temporary Impacts*** | ***4,286,950*** | ***98.41*** |
| ***Permanent Impacts*** | | |
| Nonnative Grassland | 381 | 0.009 |
| Diegan Coastal Sage Scrub | 1,515 | 0.035 |
| Southern Sycamore Alder Riparian Woodland | 0 | 0 |
| Disturbed Habitat | 682 | 0.016 |
| Urban/Developed | 652 | 0.015 |
| ***Total Estimated Permanent Impacts*** | ***3,230*** | ***0.075*** |
| **Note: These calculations do not include some work areas outside of the PSA recently added to the proposed Project. These areas will be surveyed prior to construction, and the information will be updated for this report.* | | |

**Table 6.2 Estimated Impacts to Sensitive and Non-Sensitive Habitats**

| Type of Impact | Total Estimated Area of Impact in Square Feet | Total Estimated Area of Impact in Acres |
|---|---|---|
| ***Temporary Impacts*** | | |
| Total Estimated Temporary Impacts to Native Vegetation Communities (Diegan Coastal Sage Scrub, Nonnative Grassland, Southern Sycamore-Alder Riparian Woodland) | 242,706 | 5.57 |
| Total Estimated Temporary Impacts to Non-Sensitive Vegetation Communities (Disturbed, Developed, Bare Ground, and Landscape/Ornamental Areas) | 4,044,244 | 92.84 |
| ***Total Estimated Temporary Impacts*** | ***4,286,950*** | ***98.41*** |
| ***Permanent Impacts*** | | |
| Total Estimated Permanent Impacts to Native Vegetation Communities (Diegan Coastal Sage Scrub, Nonnative Grassland, Southern Sycamore-Alder Riparian Woodland) | 1,896 | 0.044 |
| Total Estimated Permanent Impacts to Non-Sensitive Vegetation Communities (Disturbed, Developed, Bare Ground, and Landscape/Ornamental Areas) | 1,334 | 0.031 |
| ***Total Estimated Permanent Impacts*** | ***3,230*** | ***0.075*** |
| **Note: These calculations do not include some work areas outside of the PSA recently added to the proposed Project. These areas will be surveyed prior to construction, and the information will be updated for this report.* | | |

## 6.3 Special Status Plant Species

Construction activities could potentially impact special status plant species, depending on the final location of proposed facilities. Approximately 26 special status plant species have been observed or have potential to occur within the PSA. Permanent impacts to sensitive plant species could include the removal of plants during construction, population fragmentation, and the introduction of nonnative species that may out-compete native plant species. Temporary impacts may include crushing or damaging plants, runoff, or sedimentation and erosion that could adversely impact plant populations by altering site conditions. Construction related dust could also reduce the rates of photosynthesis and hinder normal plant growth.

Impacts to thread-leaved brodiaea, California boxthorn, Coulter's matilija poppy, paniculate tarweed, San Diego County viguiera, and western dichondra can be minimized by avoiding these species to the extent possible. These areas can be avoided by flagging or fencing the area off during construction to minimize impacts to these species.

## 6.4 Special Status Wildlife Species

Construction activities could potentially impact special status wildlife species, depending on the final location of the proposed facilities. Approximately 40 special status wildlife species have been observed

or have potential to occur within the PSA. Permanent impacts to special status wildlife species could include the removal of suitable habitat with project facilities, or direct mortality to individuals, nests, burrows, and young as a result of construction. Temporary impacts may include temporary construction activities that alter normal behavior patterns, including migration and dispersal, courtship and mating, and foraging and roosting.

### Invertebrates

Construction activities could potentially impact two special status invertebrate species, if present. Protocol-level surveys have been conducted for the San Diego fairy shrimp and Riverside fairy shrimp, however these species have not been observed on the proposed Project. These species have a moderate potential to occur in suitable habitat within the PSA. Wet and dry season surveys have been completed for these species, and neither species were detected during the surveys. In addition, neither species has been identified previously within the PSA, although non-sensitive fairy shrimp species have been observed in the PSA. Potential habitat for fairy shrimp species occurs within vernal pools, ponded areas, and road ruts within and adjacent to proposed Project access roads. In addition to SDG&E access for this proposed Project, the access roads are also utilized and maintained by other utilities and by military personnel.

The proposed Project has been designed to avoid permanent impacts to special status fairy shrimp species wherever possible. Impacts to fairy shrimp species as a result of temporary work areas such as stringing sites and equipment staging yards will be avoided. Impacts to fairy shrimp as a result of normal access road use are not anticipated with standard avoidance and minimization measures in place.

### Fish

The southern steelhead and tidewater goby have a moderate potential to occur on the proposed Project, and construction activities could potentially impact these species, if present. Suitable habitat exists in San Mateo Creek and San Onofre Creek during periods of surface water flow. Although no focused surveys were conducted, these species were not observed during surveys conducted in the area, and the proposed Project has been designed to avoid riparian and jurisdictional areas. Therefore, the impacts to these two species, if present on the project, are expected to be minimal.

### Amphibians

Construction of the proposed Project has the potential to impact both the arroyo toad and western spadefoot. The arroyo toad was observed in San Mateo Creek and San Onofre Creek during protocol-level surveys in 2015, and the western spadefoot has a moderate potential to occur. The proposed Project has been designed to avoid impacts to potential breeding habitat such as the drainages within the PSA; however, construction activities have the potential to impact upland foraging and aestivation habitat, such as grasslands. Construction activities could include impacts such as pole hole excavation, pole installation and removal, wire installation activities, and temporary staging or storage of equipment and construction vehicles in suitable habitat.

### Reptiles

Construction activities could potentially impact seven special status reptile species. One of these species, the southwestern pond turtle, inhabits permanent freshwater sources that were not observed during surveys within the PSA. There is a low potential for this species to occur, and no impacts to this

species are anticipated. The coast horned lizard, coast patch-nosed snake, Coronado Island skink, northern red diamond rattlesnake, orange-throated whiptail, San Diego horned lizard, and two-striped garter snake have a moderate potential to occur. Impacts to these species may include individual mortality due to construction traffic or entrapment during construction activities, and loss of potential foraging and breeding habitat due to the installation of project components. Impacts such as disruption of foraging behavior from active temporary work areas for installation of new poles, staging yards and stringing sites may also occur.

### Birds

Construction activities could potentially result in impacts to foraging and/or nesting habitat for 20 special status avian species that have either been observed within the PSA or have the potential to occur. Proposed Project activities that could result in impacts to avian species include removal of vegetation to facilitate pole hole excavation, pole installation and removal, wire installation activities, and temporary staging or storage of equipment and construction vehicles in suitable habitat. Other potential impacts to special status avian species include noise from construction equipment and vehicles.

The coastal cactus wren was observed within the PSA during nesting surveys conducted in 2015, and there is a potential for impacts to this species as a result of construction of the proposed Project. Protective measures to minimize impacts to stands of cactus (the primary breeding and perching habitat for this species) should be implemented during construction to help minimize impacts to this species.

Numerous individuals of the coastal California gnatcatcher were observed during protocol surveys conducted in 2014 (as well as numerous incidental sightings during surveys conducted in 2015), and much of the coastal sage scrub habitat within the proposed Project can be considered occupied gnatcatcher habitat. Additional surveys are recommended closer to construction to determine the most current coastal California gnatcatcher distribution within the proposed Project, and protective measures for the coastal California gnatcatcher should be implemented during construction to help minimize impacts to this species.

Least Bell's vireo was observed in riparian habitats within the PSA during protocol-level surveys conducted in 2015, and there is a potential for impacts to this species as a result of the construction of the proposed Project. The proposed Project has been designed to avoid impacts to potential breeding habitat, such as the drainages within the PSA, which could lower the potential for impacts to least Bell's vireo during construction activities.

The loggerhead shrike was observed during surveys conducted for the western burrowing owl in December 2014 and January 2015, and there is a potential for impacts to this species as a result of the construction of the proposed Project.

Protocol surveys for southwestern willow flycatcher were conducted in suitable riparian habitat within the PSA during the spring of 2015. No southwestern willow flycatchers were detected during the protocol surveys. In addition, the proposed Project has been designed to avoid impacts to potential breeding habitat, such as the drainages found within the PSA, which also lowers the potential to impact this species (if present) during construction activities. Although there is a moderate potential for this

species to occur within the proposed Project due to the presence of suitable riparian habitat, if the species does not occur in the area, then the potential for impacts to this species is minimal.

Nonbreeding season protocol surveys for the western burrowing owl were conducted within suitable habitat areas within the proposed Project in December 2014 and January 2015. No burrowing owls or their sign were detected during the surveys. Although there is a moderate potential for this species to occur within the proposed Project due to the presence of suitable habitat (grassland and other open areas), if the species does not occur in the area, then the potential for impacts to this species is minimal.

Focused surveys for the Western yellow-billed cuckoo were not conducted for the proposed Project, however, protocol-level surveys were conducted for other special status avian species within potential riparian habitat areas within the proposed Project. No Western yellow-billed cuckoo were detected during any of the previous surveys conducted for the Project; however, suitable riparian habitat does occur onsite, and there is a moderate potential for this species to occur. The proposed Project has been designed to avoid impacts to potential breeding habitat, such as the drainages found within the PSA, which also lowers the potential impacts to this species during construction activities.

Suitable habitat exists for the bank swallow, Cooper's hawk, grasshopper sparrow, northern harrier, Southern California rufous-crowned sparrow, white-tailed kite, yellow-breasted chat, and yellow warbler; however, none of these species were observed during the current surveys. There is a moderate potential for these species to occur within the proposed Project. If present, there is also a potential for impacts to these species as a result of construction activities.

There is a low potential for impacts to Belding's savannah sparrow, California least tern, ferruginous hawk, light-footed Ridgeway's rail, and western snowy plover as a result of the proposed project, due to the lack of suitable habitat in or in the vicinity of the project. None of these species were observed during project surveys, and the potential for these species to be affected by implementation of the proposed Project is low.

### Mammals

Proposed construction activities may result in permanent and temporary impacts to eight special status mammal species that are either present or have a potential to occur within the proposed Project. Proposed construction activities, including removing and installing power poles and clearing vegetation during creation of work areas and stringing sites, may cause both permanent and temporary impacts to special status mammal species, if present. Permanent impacts from these activities may include a reduction of foraging, burrowing, and nesting (woodrat) habitat from the installation of new facilities or the replacement of existing facilities. Temporary impacts may result from trimming of native vegetation for temporary work areas, construction noise, and ground vibration, as mammals may be deterred from inhabiting or foraging in areas during construction activities.

The Dulzura pocket mouse was detected during trapping surveys conducted in 2013 within portions of the PSA. Construction of the proposed Project may result in impacts to individuals or habitat of the Dulzura pocket mouse, and protective measures for this species should be implemented during construction to help minimize impacts to this species.

Historically, the Pacific pocket mouse has been well documented as occurring in the vicinity of the proposed Project; however, no Pacific pocket mouse were detected during surveys conducted in suitable habitat within the PSA that had not previously been documented as occupied by Pacific pocket mouse (Tremor 2013a, 2013b). No trapping was conducted in known occupied Pacific pocket mouse habitat, in order to minimize potential disturbance to the species. MCB Camp Pendleton and the U.S. Geological Survey have been conducting extensive surveys in Pacific pocket mouse habitat to determine population locations, densities, and other pertinent ecological information for this species at MCB Camp Pendleton. SDG&E will use the latest data from these studies to determine specific Pacific pocket mouse locations within the PSA. In coordination with MCB Camp Pendleton and the USFWS, additional surveys will be conducted as necessary to determine the most recent areas occupied by Pacific pocket mouse within the PSA, in order to avoid or minimize potential impacts to this species as a result of construction. Additional protective measures for the Pacific pocket mouse should be implemented during construction to help minimize impacts to this species.

Suitable habitat exists for the American badger, northwestern San Diego pocket mouse, San Diego black-tailed jackrabbit, San Diego desert woodrat, and western mastiff bat, however, none of these species were observed during the current surveys. There is a moderate potential for these species to occur within the proposed Project. If present, there is also a potential for impacts to these species as a result of construction activities.

There is a low potential for impacts to Mexican long-tongued bat as a result of the proposed Project, due to the lack of suitable habitat in or in the vicinity of the project. This species was not observed during project surveys, and the potential for this species to be affected by implementation of the proposed Project is low.

### 6.5. Critical Habitat

Proposed pole replacement areas, stringing sites, and staging yards within the PSA outside of MCB Camp Pendleton are located within critical habitat for the coastal California gnatcatcher and the arroyo toad. Construction activities at pole replacement areas could result in both permanent and temporary impacts to critical habitat, and other construction activities at stringing sites and staging yards could result in temporary impacts to critical habitat for these species. The USFWS determined that lands owned by SDG&E and covered under SDG&E's NCCP provided greater benefits than other areas designated as critical habitat. Therefore, the USFWS designation of critical habitat specifically excludes SDG&E ROW within SDG&E's NCCP area.

### 6.6 Wildlife Movement Corridors

The proposed Project is not expected to result in significant permanent or temporary impacts to local or regional wildlife movement corridors, including migratory bird routes. The proposed Project is located along an existing SDG&E powerline alignment with conductor already present and other utility corridors in the vicinity. New structure placement for the proposed Project will occur in the immediate vicinity of existing structures within the ROW, and due to their relatively small footprint, would result in minimal loss of protective vegetative cover, roosting sites, foraging habitat, or potential movement corridors, as portions of the proposed Project are located within extensive areas of natural habitat that would allow for the continued movement of wildlife species through the area. Although local wildlife movement may be affected during construction activities, no permanent effects to wildlife movement patterns are expected, and species movements are expected to return at the completion of construction. Therefore,

impacts to any wildlife movement corridors in the vicinity of the proposed Project are expected to be less than significant.

### 6.7 Environmentally Sensitive Habitat Areas

Similar to potential wildlife movement corridors described above, work on each individual power pole and/or tower will be localized and of relatively short duration, and will be conducted primarily within existing SDG&E utility corridors, therefore, construction of the proposed Project should not result in large-scale impacts across an extensive section of any particular native habitat. The proposed Project will also avoid or span existing drainages to the extent possible. Therefore, construction of the proposed Project is not expected to result in significant impacts to the functions and values of the ESHA.

### 6.8 Jurisdictional Resources

The proposed Project has been designed to avoid impacts to jurisdictional resources whenever possible. The proposed footpath to access Poles 125 and 124, located within the riparian habitat north of the Basilone Substation will consist of trimming of vegetation to access the poles, and no permanent impacts for this activity are anticipated. Vegetation trimming activities within this area are therefore not expected to require additional permits or authorizations by resource agencies.

No other pole structures or stringing sites are anticipated to be located within existing jurisdictional waters or wetlands, and existing access roads will be used to the greatest extent possible. Staging areas, laydown areas, guard structures, and other project components will also be located outside jurisdictional resources. If a project component is located in the vicinity of an existing jurisdictional feature, proper erosion control measures will be taken and BMPs will be implemented during construction to ensure the protection of the resource. If unavoidable impacts to jurisdictional features are identified during the establishment of final workspace and/or changes to the proposed Project, SDG&E would obtain the required authorizations and/or permits from the applicable regulatory agency prior to construction. Through implementation of all conditions specified in permits obtained for the proposed Project, impacts to jurisdictional resources are expected to be less than significant.

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**Appendix A – Constraints Survey and Report LSA 2013**

**THIS APPENDIX HAS BEEN OMITTED – IT HAS BEEN SUBMITTED UNDER CONFIDENTIAL COVER**

**Appendix B – Biological Resource Survey Report AECOM 2014**

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November 4, 2014

Mr. Todd Easley
San Diego Gas & Electric
8315 Century Park Court - CP21E
San Diego, CA 92123

**Subject: Biological Resource Surveys for the Transmission Line 695 Wood to Steel Pole Replacement Project, San Diego and Orange Counties, California**

Dear Mr. Easley:

The purpose of this letter is to summarize for San Diego Gas & Electric (SDG&E) the biological resource surveys that AECOM conducted in August 2014 for the Transmission Line (TL) 695 Wood to Steel Pole Replacement Project, San Diego and Orange Counties (Figure 1). This letter includes the methods used to assess biological resources, including the list of potential sensitive species evaluated, the survey results for vegetation mapping and suitable habitat, and biological constraints and recommendations. Potential jurisdictional areas are not discussed within this document.

As part of the scope of work for TL 695 described in our letter dated June 20, 2014 and approved by SDG&E in late July 2014, protocol surveys for coastal California gnatcatcher were also performed. The results of these surveys will be reported under separate cover.

## Project Description

The TL 695 Wood to Steel Pole Replacement Project (Project) would involve the replacement of existing wooden structures with steel poles. Some wooden poles and associated anchors would be completely removed and not replaced due to the longer span between the steel poles. The Project would be covered by the SDG&E Natural Community Conservation Plan (NCCP) and would include a 150-foot survey buffer around the TL centerline for a total Project width of approximately 300 feet. There are also several stringing sites located throughout the Project that include a 150-foot buffer. The staging area is located in an urban/developed area and therefore no buffer was placed around the staging area. The Project is located along the northern boundary of Marine Corps Base Camp Pendleton (MCBCP) with the northern end in Orange County and the southern end near the San Onofre Nuclear Generating Station.

## Methods for Assessing Biological Resources

A search of the relevant regional databases for sensitive biological resources in the vicinity of the Project was conducted prior to conducting field surveys. This included a search of the California Department of Fish and Wildlife's (CDFW) California Natural Diversity Database (CNDDB) and a search of the California Native Plant Society's Electronic Inventory. Additionally, historical biological survey data from MCBCP (herein referred to as Basewide survey data) were reviewed to determine the presence and location of federally listed plant and wildlife species. Basewide survey data are a

compilation of historical data on points and polygons of federally listed plant and wildlife species within the boundaries of MCBCP. This database contains several decades of biological survey data and is the most comprehensive database of federally listed species on MCBCP. It includes locations and findings of vernal pool surveys; surveys for various construction and expansion projects; research survey data; incidental data; and data of known breeding territories, plant locations, and so forth. These data are provided confidentially to SDG&E for planning purposes; AECOM has not requested permission from MCBCP to utilize these data for SDG&E.

Additionally, AECOM has conducted multiple years of surveys (2008 until present) in the general vicinity and overlapping areas for various projects (Basewide Utilities Infrastructure Improvement Projects and Basewide Water Improvement Projects) on MCBCP. Vegetation mapping that had been conducted by AECOM for these various projects in addition to Basewide vegetation mapping was used to assist in creating a vegetation map. No permission is needed to utilize these data, as they belong to AECOM.

On July 30, 31, and August 4, 2014, a field assessment of the Project was conducted by AECOM biologists Andrew Fisher and Joey Betzler to map vegetation communities and provide a baseline of biological resources that occur or have the potential to occur in or around the Project. AECOM biologists used existing data (from previous AECOM projects and Basewide vegetation mapping) to assist in completing the vegetation mapping. For purposes of this report, the term “project study area” refers to the proposed TL corridor, stringing sites, staging areas, and a 150-foot survey buffer around the TL corridor and stringing sites.

Vegetation communities and land cover types are summarized in Table 1 and described below. Vegetation community classifications used in this report follow Holland’s *Preliminary Descriptions of the Terrestrial Natural Communities of California* (1986), as modified by Oberbauer (2008); a cross-walk to the SDG&E NCCP vegetation communities is provided for each community and in Table 1.

Potential suitable habitat for sensitive plant and wildlife species, focused on federally listed and state-listed species and NCCP species (including Narrow Endemic species), was identified within the project study area and mapped using geographic information system (GIS) technology.

**Vegetation Mapping and Suitable Habitat Survey Results**

Vegetation Communities

Vegetation types or plant communities are assemblages of plant species that commonly coexist. The classification of vegetation communities is based on the life form of the dominant species within that community and the associated flora. Vegetation was mapped in accordance with Holland (1986) as modified by Oberbauer (2008) and used a minimum mapping unit of 1.0 acre for upland vegetation communities and 0.5 acre for

riparian communities. During vegetation mapping, habitat suitability was identified for special-status species that may require focused surveys. Vegetation community mapping and habitat suitability mapping data were collected via geo-referenced polygons with a tablet unit, using GIS technology.

The project study area generally supports 12 vegetation communities: mulefat scrub, southern willow scrub, sycamore alder riparian woodland, vernal pool, coast live oak woodland, Diegan coastal sage scrub, eucalyptus woodland, nonnative annual grassland, valley needlegrass grassland, disturbed habitat, nonvegetated channel, and urban/developed. Table 1 summarizes the acreages for each vegetation community within the TL corridor, stringing sites, staging area, and 150-foot buffer. The vegetation communities are illustrated in Figures 2a through 2j. Descriptions and locations of the vegetation communities are summarized below.

Riparian and Wetlands (NCCP-Covered Habitats)

*Mulefat Scrub (Holland Code 63310); Riparian Scrub (NCCP)*

Mulefat scrub is a riparian shrub community that is strongly dominated by mulefat (*Baccharis salicifolia*), often in association with several willow species. Mulefat scrub occurs along intermittent streams with a fairly coarse substrate and moderately deep water table. Understory vegetation is usually composed of nonnative, weedy species or is lacking altogether. This community is maintained by frequent flooding. In the absence of periodic flooding, this community may develop into cottonwood- or sycamore-dominated riparian communities (Holland 1986).

Within the survey area, mulefat scrub occupies floodplain areas of San Mateo and San Onofre Creeks (Figures 2d, 2g, 2h, and 2i). This community was strongly dominated by mulefat, with western ragweed (*Ambrosia psilostachya*) and willow dock (*Rumex salicifolia*) occupying the understory.

*Southern Willow Scrub (Holland Code 63320); Riparian Scrub (NCCP)*

Southern willow scrub is a dense, closed-canopy scrub that occurs throughout California in association with riverine features. It is lacking in the taller trees that are characteristic of riparian forests. Dominant plant species include willows (*Salix* spp.), mulefat, and coyote brush (*Baccharis pilularis*). There is typically not a substantial herbaceous understory within this vegetation community due to the dense shrub cover (Oberbauer et al. 2008).

This community was dominated by mulefat and arroyo willow (*Salix lasiolepis*), with California sagebrush (*Artemisia californica*) and western ragweed occasionally co-dominating in the dryer portions of the drainages. Within the survey area, southern willow scrub is associated with some small drainage features and within San Mateo and San Onofre Creeks. There is also a small portion of southern willow scrub in the far northeastern part of the project study area in Orange County (Figures 2b, 2c, 2e, and 2i).

*Sycamore Alder Riparian Woodland (Holland Code 62400); Riparian Forest/Riparian Woodland (NCCP)*

Sycamore alder riparian woodland is a tall, winter-deciduous, streamside woodland dominated by western sycamore (*Platanus racemosa*) and white alder (*Alnus rhombifolia*). These woodlands are commonly found along rocky stream beds that are subject to periodic high-intensity flooding. Vegetation associated with sycamore alder riparian woodland includes blue elderberry (*Sambucus mexicana*), Douglas mugwort (*Artemisia douglasiana*), scale-broom (*Lepidospartum squamatum*), poison oak (*Toxicodendron diversilobum*), and willows (*Salix* sp.).

This vegetation type was scattered in a few sections throughout the project study area, but primarily was located along the more stabilized banks of San Mateo and San Onofre Creeks (Figures 2d, 2e, 2s, and 2g).

*Vernal Pool (Holland Code 44322); Hardpan Vernal Pool (NCCP) – occurring in disturbed habitat*

At least four depressions occur in the clay inclusions within the project study area; however, no native vernal pool indicator species (such as woolly marbles [*Psilocarphus brevissimus* var. *brevissimus*] and spikerush [*Eleocharis* spp.]) were observed at the time of surveys. Other common species include nonnative annual grasses and weedy species such as black mustard (*Brassica nigra*).

Within the survey area, the vernal pools are associated with disturbed habitat, surrounded by Diegan coastal sage scrub and nonnative annual grassland communities. Two vernal pools located in the northeastern part of the project study area appeared highly degraded and were choked with black mustard that had senesced (Figure 2c). The surrounding Diegan coastal sage scrub appeared to have begun to encroach and take over the vernal pool. At least one potential pool was located within a dirt road adjacent to San Onofre Creek (Figure 2g). This depression will hold water and may support vernal pool branchiopods, but is unlikely to support vernal pool plant indicator species due to its location within a disturbed dirt roadway. There is the potential for additional pools or basins to form in dirt roadways throughout the length of the project study area as winter rains fill compacted areas. Although these features are unlikely to support vernal pool plants due to their disturbed nature, they may support vernal pool branchiopods. The fourth potential vernal pool is located in the far southern end of the project study area (Figure 2h). This depression was created by an excavator and is almost a perfect rectangle with the depression of the excavator still evident. This depression is slowly beginning to look more natural and may support vernal pool branchiopods.

Uplands (NCCP-Covered Habitats)

*Coast Live Oak Woodland (Holland Code 71160); Coast Live Oak Forest (NCCP)*

This community is well represented on MCBCP and can co-occur with Diegan coastal sage scrub, valley needlegrass grassland, and other types of oak woodland. Coast live oak woodland is an open to dense tree community with coast live oak (*Quercus agrifolia*) as the dominant tree species. The shrub understory of this community is well developed in undisturbed sites and may include blue elderberry, laurel sumac (*Malosma laurina*), poison oak, and toyon (*Heteromeles arbutifoloia*) (Holland 1986). An herbaceous stratum is usually present, including miner's lettuce (*Claytonia perfoliata* var. *perfoliata*), chickweed (*Stellaria media*), and nonnative grasses.

Coast live oak woodland was located in the far northeastern part of the project study area in Orange County (Figure 2b).

*Diegan Coastal Sage Scrub: Coastal Form (Holland Code 32510); Coastal Sage Scrub (NCCP)*

Diegan coastal sage scrub is a vegetation community dominated by relatively low-lying shrubs. It is less than 6 feet in height, soft-leaved, and drought-deciduous. Dominant species in these communities drop their leaves as the summer dry season progresses to reduce stress from lack of water. Approximately eight rare plant and 11 rare animal species occur in Diegan coastal sage scrub at MCBCP (Zedler et al. 1997).

The coastal form of Diegan coastal sage scrub is similar to other forms of Diegan coastal sage scrub but is found at lower elevations, below 1,000 feet. California sagebrush is more dominant in coastal Diegan coastal sage scrub than in other Diegan coastal sage scrub varieties. The dominant species in this community is California sagebrush, but associated dominants can include California buckwheat (*Eriogonum fasciculatum* var. *fasciculatum*), laurel sumac, lemonadeberry (*Rhus integrifolia*), broom baccharis (*Baccharis* spp.), and black sage (*Salvia mellifera*).

Diegan coastal sage scrub is found throughout the project study area and is the dominant vegetation type (Figures 2b through 2i).

*Eucalyptus Woodland (Holland Code 79100 and NCCP)*

This community is dominated by several species of eucalyptus (*Eucalyptus* spp.). These introduced species produce large amounts of leaf and bark litter, the chemical composition of which may inhibit the establishment and growth of other species, especially natives, in the understory. Generally, these species were planted for aesthetic and horticultural purposes, but many species of eucalyptus have become naturalized and have been quite successful in invading riparian areas. There is a small portion of eucalyptus woodland surrounded by Diegan coastal sage scrub in upland areas adjacent to San Onofre Creek (Figure 2f).

*Nonnative Annual Grassland (Holland Code 42200); Grassland (NCCP)*

Nonnative annual grassland is characterized by a dense to sparse cover of annual grasses and forbs of Mediterranean origin, often with native and nonnative annual forbs (Holland 1986). This plant community generally occurs on fine-textured loam or clay soils that are moist or even waterlogged during the winter rainy season and very dry during the summer and fall. Regionally, typical grasses include ripgut brome (*Bromus diandrus*), red brome (*Bromus madritensis* ssp. *rubens*), soft chess (*Bromus hordeaceus*), wild oats (*Avena* spp.), and rat-tail fescue (*Vulpia myuros*). Nonnative disturbance-related annuals such as filaree (*Erodium* sp.), and horseweed (*Erigeron canadensis*) are common to this community.

This vegetation community is found alongside firebreaks along ridge tops, interspersed between Diegan coastal sage scrub, and around areas that have been historically disturbed. Nonnative annual grassland occurred throughout the project study area, but was located in the far northeast, a few areas in the north, and in the southeast (Figures 2b, 2c, 2d, 2h, and 2i).

*Valley Needlegrass Grassland (Holland Code 42110); Grassland (NCCP)*

MCBCP has extensive areas of intact perennial grasslands, which compose a significant portion of the native grasslands left in coastal Southern California. Valley needlegrass grassland is a community of annual and perennial herbs and grasses dominated by native perennial bunchgrasses such as purple needlegrass (*Stipa pulchra*) and nodding needlegrass (*Stipa cernua*).

Within the project study area, purple needlegrass is the exclusive determinant for classifying an area as valley needlegrass grassland. As defined in Appendix I of the MCBCP Integrated Natural Resources Management Plan, the threshold for discerning valley needlegrass grassland from nonnative annual grassland is one perennial native bunchgrass per square meter (USMC 2007).

This association generally occurs on fine-textured clay soils that are moist or wet in winter but very dry in summer. Shrubs are infrequent, probably due to the unstable clay soils. The degree of habitat quality in native grasslands such as valley needlegrass grassland varies greatly depending on the history of grazing, cultivation, and other disturbance factors. Nonnative annual grasses such as bromes (*Bromus* spp.), wild oats, wild barley (*Hordeum* spp.), and rat-tail fescue commonly make up a significant portion of the cover on disturbed sites. Native and introduced herbs occur between the needlegrass, often exceeding the bunchgrass in cover (Holland 1986). Perennial herb species found in this community type may include blue-eyed grass (*Sisyrinchium bellum*), and bulb species such as the federally listed thread-leaved *brodiaea* (*Brodiaea filifolia*) and other native lilies (*Brodiaea* spp., *Calochortus* spp., and *Fritillaria* sp.). Native annual species found in this community include wildflowers such as graceful tarweed (*Holocarpha virgata*), fascicled tarplant (*Deinandra fasciculata*), clarkias (*Clarkia* sp.), and fiddlenecks (*Amsinckia* spp.). Throughout the survey area, there are extensive

stands of common fennel (*Foeniculum vulgare*), a noxious weed species that has invaded this habitat. Other common nonnative annuals include filaree, sow-thistle (*Sonchus* spp.), and tocalote (*Centaurea melitensis*).

A small portion of valley needlegrass grassland exists in the southern part of the project study area (Figure 2h).

Other Cover Types

*Disturbed Habitat (Holland Code 11300 and NCCP)*

Disturbed habitat includes vegetation and soils characterized by physical disturbance. Nonnative species are commonly introduced by humans in these sites. A physical disturbance may include clearing for fuel management, repeated grading, graded fire breaks, powerline access roads and areas around power poles, construction staging areas, or any repeated use areas. Examples of repeated use areas are trails, access roads, and dirt parking lots. Characteristic species of these communities include tocalote, Italian thistle (*Carduus pycnocephalus*), artichoke thistle (*Cynara cardunculus*), sow-thistle, tumbleweed (*Salsola tragus*), telegraph weed (*Heterotheca grandiflora*), horehound (*Marrubium vulgare*), mustard (*Sisymbrium* spp.), radish (*Raphanus sativus*), hottentot fig (*Carpobrotus edulis*), garland chrysanthemum (*Glebionis coronaria*), and fennel. Annual grasses are not often included in this vegetation community and are considered more typical of nonnative annual grassland.

Disturbed habitat occurs throughout the project study area primarily in the form of dirt roads and trails and areas that were historically agriculture, but are now bare and regularly mowed and used as a training area (Figures 2b through 2i).

*Nonvegetated Channel (Holland Code 64200 and NCCP)*

Nonvegetated channels are natural flood channels that are sparsely vegetated. The lack of significant vegetative cover in such areas can be attributed to either natural processes, such as flooding, or to human activities, such as vegetation clearing or stream channelization. Nonvegetated channel occurs within San Mateo Creek where annual sourcing by rock and sand prevent vegetation from growing in the channel (Figure 2e).

*Urban/Developed Land (Holland Code 12000); Bare Ground, Pavement, and Landscape/Ornamental (NCCP)*

Urban/developed areas within the survey area include buildings, paved areas, and ornamental landscaping. Areas of ornamental/landscape plantings occur throughout the project study area. These areas include lawns, parks, freeway medians, and roadsides. Common species in these areas include African daisy (*Arctotis* sp.), eucalyptus, Peruvian pepper tree (*Schinus molle*), myoporum (*Myoporum laetum*), and African fountain grass (*Pennisetum setaceum*). These areas occur throughout the project

footprint primarily as paved roads and buildings. The staging area at the south end of the project study area is a fully enclosed gravel lot, which is considered developed. It is not considered a vegetation community and typically supports no or very few biological resources (Figure 2b through 2j).

The acreages of the vegetation communities and cover types within the TL 695 project study area are listed below in Table 1 and shown on Figures 2a through 2j.

**Table 1. Vegetation Communities and Cover Types within the TL 695 Project**

| Vegetation Communities | NCCP Vegetation Communities | Acres within Stringing Sites (Acres) | Acres within Buffer of TL Centerline and Stringing Sites (Acres) | Survey Area Total (Acres) |
|---|---|---|---|---|
| **Riparian and Wetlands** | | | | |
| Mulefat Scrub | Riparian Scrub | 0.9 | 19.0 | 19.9 |
| Sycamore Alder Riparian Woodland | Riparian Forest/ Riparian Woodland | 0.6 | 21.9 | 22.5 |
| Southern Willow Scrub | Riparian Scrub | 0.4 | 21.1 | 21.5 |
| Vernal Pool | Hardpan Vernal Pool | - | 0.2 | 0.2 |
| **Uplands** | | | | |
| Coast Live Oak Woodland | Coast Live Oak Forest | 0.4 | 7.2 | 7.6 |
| Diegan Coastal Sage Scrub | Coastal Sage Scrub | 11.8 | 393.4 | 405.2 |
| Eucalyptus Woodland | Eucalyptus Woodland | - | 0.4 | 0.4 |
| Nonnative Annual Grassland | Grassland | 0.9 | 23.8 | 24.7 |
| Valley Needlegrass Grassland | Grassland | - | 2.8 | 2.8 |
| **Other Cover Types** | | | | |
| Disturbed Habitat | Disturbed Habitat | 1.9 | 88.0 | 89.9 |
| Nonvegetated Channel | Nonvegetated Channel | - | 2.9 | 2.9 |
| Urban/Developed | Bare Ground, Pavement, and Landscape/Ornamental | 5.5 | 69.4 | 74.9 |
| Urban/Developed (Staging Yard) | Bare Ground | - | - | 1.5 |
| **Grand Total** | | **22.4** | **650.2[1]** | **674.1[1]** |

[1]Numbers may not sum completely due to rounding.

## Potential Sensitive Species

Table 2 lists the federal, state, and/or NCCP sensitive plant and wildlife species that have potential to occur within the project study area based on the habitat evaluations conducted in July and August 2014, the CNDDB records search, a review of historical Basewide survey data, and biological knowledge of the area. It describes each species NCCP status, Federal or State Listing status, and whether it was detected during coastal California gnatcatcher surveys, or is known to occur within the project study area based on Basewide survey data (includes Federally listed species only).

No U.S. Fish and Wildlife Service (USFWS) mapped critical habitat exists for any wildlife species within the project study area.

**Sensitive Plant Species**

Suitable habitat was observed for all five sensitive plant species with the potential to occur in the project study area. Potential to occur for these species ranged from high to low based on soil characteristics, level of disturbance observed in vegetation (nonnative species, trails from humans, etc.), size of patch of habitat, and connectivity to other similar vegetation and/or open space. In addition, thread-leaved brodiaea (*Brodiaea filifolia*), a federally threatened and NCCP covered species, is known to occur in the northeastern part of the project study area based on Basewide survey data.

**Table 2. Federal, State, and/or NCCP Sensitive Species Detected or with Potential to Occur within the TL 695 Project**

| Potential Sensitive Species | | NCCP Covered or Narrow Endemic[1] | Federal or State Listing[2] | Detected during Survey[3] | Known to Occur within the Project[4] |
|---|---|---|---|---|---|
| **Common Names** | **Scientific Names** | | | | |
| **Plants** | | | | | |
| Many-stemmed dudleya | *Dudleya multicaulis* | NC | - | no | no |
| Palmer's grapplinghook | *Harpagonella palmeri* | NC | - | no | no |
| Pendleton button celery | *Eryngium pendletonense* | NC | - | no | no |
| Thread-leaved brodiaea | *Brodiaea filifolia* | NC | FT | no | yes |
| Variegated dudleya | *Dudleya variegata* | NC | - | no | no |
| **Wildlife** | | | | | |
| American badger | *Taxidea taxus* | NC | CSC | no | no |
| Arroyo toad | *Anaxyrus californicus* | NC | FE | no | yes |
| Coastal cactus wren | *Campylorhynchus brunneicapillus sandiegensis* | NC, NE | CSC | yes | no |
| Coastal California gnatcatcher | *Polioptila californica californica* | NC | FT/CSC | yes | yes |
| Coast patch-nosed snake | *Salvadora hexalepis virgultea* | NC | CSC | no | no |
| Coastal rosy boa | *Lichanura trivigata roseofusca* | NC | - | no | no |
| Cooper's hawk | *Accipiter cooperii* | NC | - | yes | no |
| Coronado island skink | *Plestiodon skiltonianus interparietalis* | NC | CSC | no | no |
| Dulzura pocket mouse | *Chaetodipus californicus femoralis* | NC | CSC | no | no |
| Ferruginous hawk | *Buteo regalis* | NC | - | no | no |
| Grasshopper sparrow | *Ammodramus savannarum* | NC | CSC | no | no |
| Least Bell's vireo | *Vireo bellii pusillus* | NC | FE/CE | yes | yes |
| Mountain lion | *Puma concolor* | NC | - | no | no |

| Potential Sensitive Species | | NCCP Covered or Narrow Endemic[1] | Federal or State Listing[2] | Detected during Survey[3] | Known to Occur within the Project[4] |
|---|---|---|---|---|---|
| **Common Names** | **Scientific Names** | | | | |
| Northern harrier | *Circus cyaneus* | NC | CSC | no | no |
| Northern red-diamond rattlesnake | *Crotalus ruber ruber* | NC | CSC | no | no |
| Northwestern San Diego pocket mouse | *Chaetodipus fallax fallax* | NC | CSC | no | no |
| Orangethroat whiptail | *Aspidoscelis hyperythra beldingi* | NC | CSC | no | no |
| Pacific pocket mouse | *Perognathus longimembris pacificus* | NC, NE | FE | no | yes |
| Riverside fairy shrimp | *Streptocephalus woottoni* | NC | FE | no | no |
| San Diego black-tailed jackrabbit | *Lepus californicus bennetti* | NC | CSC | no | no |
| San Diego horned lizard | *Phrynosoma coronatum blainvillii* | NC | CSC | no | no |
| San Diego fairy shrimp | *Branchinecta sandiegonensis* | NC | FE | no | no |
| San Diego ring-necked snake | *Diadophis punctatus similis* | NC | - | no | no |
| Southern California rufous-crowned sparrow | *Aimophila ruficeps canescens* | NC | - | yes | no |
| Southern mule deer | *Odocoileus hemionus* | NC | - | yes | no |
| Southern western pond turtle | *Actinemys pallida* | NC | CSC | no | no |
| Southern steelhead | *Oncorhynchus mykiss irideus* | NC | FE | no | yes |
| Southwestern willow flycatcher | *Empidonax traillii extimus* | NC | FE | no | yes |
| Two-striped garter snake | *Thamnophis hammondii* | NC | CSC | no | no |
| Western bluebird | *Sialia mexicana* | NC | - | yes | no |
| Western burrowing owl | *Athene cunicularia hypugea* | NC, NE | CSC | no | no |
| Western spadefoot toad | *Spea hammondii* | NC | CSC | no | no |
| Western yellow-billed cuckoo (Distinct Population Segment) | *Coccyzus americanus* | - | FT | no | no |

[1] NC = NCCP Covered Species; NE = Narrow Endemic per NCCP

[2] FE = federal endangered; FT = federal threatened; FC = federal candidate; CE = state endangered; CT = state threatened; CSC = California Species of Special Concern.

[3] Species were detected during coastal California gnatcatcher surveys in August 2014.

[4] Species known to occur within the project study area based on Basewide survey data, which applies only to federally listed species.

Table 3 provides approximate acreage within both the stringing sites and the buffer areas that the five sensitive plant species may occur within the project study area. Rare plant surveys have not been conducted within the project study area and therefore the exact location or verification of the presence or absence of these five species has not been conducted. According to Basewide survey data there are known populations of thread-leaved brodiaea within and adjacent to the northeastern portion of the project study area. Within this area, 0.02 acre of a known population occurs within the project study area. The known locations and potential areas where thread-leaved brodiaea occur are shown in Figure 3.

**Table 3. Sensitive Plant Species Acreage within Components of the Project**

| Potential Sensitive Species | | Vegetation Communities Where They Occur | Acres within Stringing Sites (Acres) | Acres within Buffer of TL Centerline and Stringing Sites (Acres) | Survey Area Total (Acres)[1] |
|---|---|---|---|---|---|
| **Common Names** | **Scientific Names** | | | | |
| **Plants** | | | | | |
| Many-stemmed dudleya | *Dudleya multicaulis* | Diegan coastal sage scrub and grasslands | 12.8 | 420.1 | **432.8** |
| Palmer's grapplinghook | *Harpagonella palmeri* | Diegan coastal sage scrub and grasslands | 12.8 | 420.1 | **432.8** |
| Pendleton button celery | *Eryngium pendletonense* | Diegan coastal sage scrub and grasslands | 12.8 | 420.1 | **432.8** |
| Thread-leaved brodiaea | *Brodiaea filifolia* | Diegan coastal sage scrub and grasslands | 10.0 | 283.3 | **293.3** |
| Variegated dudleya | *Dudleya variegata* | Diegan coastal sage scrub and grasslands | 12.8 | 420.1 | **432.8** |

[1]Numbers may not sum completely due to rounding.

## Sensitive Wildlife Species

Suitable habitat was observed for all 33 sensitive wildlife species within the project study area. Table 4 provides the acreage of potentially suitable habitat identified for each of these species within the project study area. The potentially suitable habitat for each species was defined based on the vegetation type(s) where that species is known to occur. Some large-bodied species (and some birds) have wide-ranging territories that cover many different vegetation types, while some generally smaller-bodied species have more specific vegetation community types where they may occur. For some species, such as narrow endemic species, specific habitat mapping was conducted and is shown on Figure 4. For the Pacific pocket mouse, Basewide survey data was used to delineate the boundary of occupied habitat and additional potentially suitable habitat was delineated nearby. Potentially suitable habitat for each species is further broken down

between the stringing sites and buffer areas within the total area of the project study area.

It should be noted that some species, such as southwestern willow flycatcher (*Empidonax traillii extimus*) and western yellow-billed cuckoo (*Coccyzus americanus*) are known to migrate through various areas of MCBCP, but have very specific nesting/breeding territories. Southwestern willow flycatcher primarily breed along the Santa Margarita River (outside the project study area), and western yellow-billed cuckoos are only know to migrate through MCBCP, primarily within the Santa Margarita River.

**Table 4. Potentially Suitable Habitat for Sensitive Wildlife Species within the TL 695 Project**

| Common Name of Species Detected or Potentially Present within the Project Study Area | Vegetation Communities and Other Cover Types Where the Species May Occur[1] | Acres within Stringing Sites (Acres) | Acres within Buffer of TL Centerline and Stringing Sites (Acres) | Survey Area Total (Acres) |
|---|---|---|---|---|
| American badger | grasslands, disturbed areas | 1.7 | 66.9 | **68.6** |
| Arroyo toad (includes both breeding [San Mateo and San Onofre Creeks] and aestivation [in all upland habitats within 0.6 mile of known breeding location]) | San Mateo and San Onofre Creeks, and nearby woodlands and Diegan coastal Sage Scrub | 2.5 | 155.4 | **157.9** |
| Coastal cactus wren | cactus patches within Diegan coastal sage scrub | - | 33.9 | **33.9** |
| Coastal California gnatcatcher | Diegan coastal sage scrub | 11.8 | 393.4 | **405.2** |
| Coast patch-nosed snake | Diegan coastal sage scrub | 11.8 | 393.4 | **405.2** |
| Coastal rosy boa | Diegan coastal sage scrub | 11.8 | 393.4 | **405.2** |
| Cooper's hawk | all vegetation types | 22.4 | 650.2 | **672.6** |
| Coronado island skink | Diegan coastal sage scrub, coast live oak woodlands, southern willow scrub, mulefat scrub, sycamore alder riparian woodland | 14.0 | 462.6 | **476.6** |
| Dulzura pocket mouse | Diegan coastal sage scrub | 11.8 | 393.4 | **405.2** |
| Ferruginous hawk | grasslands, disturbed areas | 1.7 | 66.9 | **68.6** |
| Grasshopper sparrow | grasslands | 0.9 | 26.7 | **27.6** |
| Least Bell's vireo | southern willow scrub, mulefat scrub, sycamore alder riparian woodland | 2.2 | 64.2 | **66.4** |
| Mountain lion | All vegetation community types except urban/developed | 16.9 | 580.8 | **597.7** |

| Common Name of Species Detected or Potentially Present within the Project Study Area | Vegetation Communities and Other Cover Types Where the Species May Occur[1] | Acres within Stringing Sites (Acres) | Acres within Buffer of TL Centerline and Stringing Sites (Acres) | Survey Area Total (Acres) |
|---|---|---|---|---|
| Northern harrier | Diegan coastal sage scrub, grasslands, disturbed areas, southern Willow scrub, mulefat scrub, sycamore alder riparian woodland | 15.3 | 522.3 | **537.6** |
| Northern red-diamond rattlesnake | Diegan coastal sage scrub | 11.8 | 393.4 | **405.2** |
| Northwestern San Diego pocket mouse | Diegan coastal sage scrub | 11.8 | 393.4 | **405.2** |
| Orangethroat whiptail | Diegan coastal sage scrub, southern willow scrub, mulefat scrub, sycamore alder riparian woodland | 13.6 | 455.4 | **469.0** |
| Pacific pocket mouse (suitable habitat) | Diegan coastal sage scrub to east of San Onofre Housing Area on Mouse Mountain | 0.5 | 19.4 | **19.9** |
| Pacific pocket mouse (occupied habitat based on Basewide survey data) | Diegan coastal sage scrub to east of San Onofre Housing Area on Mouse Mountain | 0.5 | 48.8 | **49.3** |
| Riverside fairy shrimp | vernal pools | - | 0.2 | **0.2** |
| San Diego black-tailed jackrabbit | Diegan coastal sage scrub, grasslands, disturbed areas | 14.7 | 508.1 | **522.8** |
| San Diego horned lizard | Diegan coastal sage scrub | 11.8 | 393.4 | **405.2** |
| San Diego fairy shrimp | vernal pools | - | 0.2 | **0.2** |
| San Diego ring-necked snake | Diegan coastal sage scrub and coast live oak woodlands | 12.2 | 400.6 | **412.9** |
| Southern California rufous-crowned sparrow | Diegan coastal sage scrub | 11.8 | 393.4 | **405.2** |
| Southern mule deer | all vegetation community types except urban/developed | 16.9 | 580.8 | **597.7** |
| Southern western pond turtle | San Mateo and San Onofre Creeks | 0.3 | 5.4 | **5.7** |
| Southern steelhead | San Mateo and San Onofre Creeks | 0.3 | 5.4 | **5.7** |
| Southwestern willow flycatcher | sycamore alder riparian woodland and southern willow scrub | 0.6 | 22.0 | **22.6** |
| Two-striped garter snake | Diegan coastal sage scrub, southern willow scrub, mulefat scrub, sycamore alder riparian woodland | 13.6 | 455.4 | **469.0** |

| Common Name of Species Detected or Potentially Present within the Project Study Area | Vegetation Communities and Other Cover Types Where the Species May Occur[1] | Acres within Stringing Sites (Acres) | Acres within Buffer of TL Centerline and Stringing Sites (Acres) | Survey Area Total (Acres) |
|---|---|---|---|---|
| Western bluebird | southern willow scrub, sycamore alder riparian woodland, disturbed areas | 1.7 | 83.2 | **84.9** |
| Western burrowing owl[2] | grasslands, disturbed areas | 1.7 | 66.9 | **68.6** |
| Western spadefoot toad | vernal pools, Diegan coastal sage scrub, and grasslands | 12.7 | 420.2 | **432.9** |
| Western yellow-billed cuckoo (Distinct Population Segment)[3] | sycamore alder riparian woodland | 0.6 | 21.9 | **22.5** |

[1] Grasslands include both nonnative annual and valley needlegrass grassland. Species listed as occurring in disturbed areas excludes dirt roads.
[2] This species is only know to spend the winter on MCBCP, and has not been recorded nesting or breeding on MCBCP since the 1990's (London *pers comm*. 2014).
[3] This species has not been detected breeding on MCBCP, and has only been detected migrating through MCBCP.

Table 5 details the protocol surveys and survey windows for various federally listed and narrow endemic species where potentially suitable (and in some cases occupied) habitat occurs within the project study area. Surveys for certain species are conducted by MCBCP annually and therefore may not be required for the Project if MCBCP allows SDG&E to utilize their data for permitting purposes. Table 5 lists those species for which surveys are normally conducted by MCBCP. For some species, such as the Pacific pocket mouse, surveys may not be required in areas that are already known to be occupied.

**Table 5. Potential Protocol Surveys and Survey Windows**

| Sensitive Species | | Federal or State Listing[1] | NCCP Covered | Survey Window[2] | MCBCP Surveys Conducted and Basewide Data Available |
|---|---|---|---|---|---|
| Common Names | Scientific Names | | | | |
| Thread-leaved brodiaea | *Brodiaea filifolia* | FT | Yes | April through May (100% coverage of entire area on 3 separate surveys) | No |
| Arroyo toad | *Anaxyrus californicus* | FE | Yes | March 15 through July 1 (6 surveys)[3] | Yes |
| Coastal cactus wren | *Campylorhynchus brunneicapillus sandiegensis* | CSC, NE | Yes | No formal survey protocol; however, 3 surveys recommended during the breeding season, generally March 15 through June 30 | No |
| Coastal California | *Polioptila californica* | FT | Yes | February 15 through August 31 | No |

| Sensitive Species | | Federal or State Listing[1] | NCCP Covered | Survey Window[2] | MCBCP Surveys Conducted and Basewide Data Available |
|---|---|---|---|---|---|
| Common Names | Scientific Names | | | | |
| gnatcatcher | *californica* | | | (3 surveys) | |
| Least Bell's vireo | *Vireo bellii pusillus* | FE | Yes | April 10 and July 31 (8 surveys)[3] | Yes |
| Western yellow-billed cuckoo | *Coccyzus americanus* | FT | No | June through August (4 surveys) | No |
| Pacific pocket mouse | *Perognathus longimembris pacificus* | FE, NE | Yes | 5 consecutive trap nights or until captured during April through July | No |
| Southwestern willow flycatcher | *Empidonax traillii extimus* | FE | Yes | May 15 through July 17 (5 surveys)[3] | Yes |
| Western burrowing owl | *Athene cunicularia hypugea* | CSC, NE | Yes | Breeding Season: February – August (4 surveys)<br><br>Nonbreeding Season: September through January (4 surveys spaced evenly apart) | No |
| Vernal pool branchiopods | *Branchinecta sandiegonensis, Streptocephalus woottoni* | FE | Yes | Either 1 wet and 1 dry season survey or 2 wet season surveys within a 5-year period. | No |

[1] FE = Federal endangered; FT = Federal threatened; CSC = California Species of Special Concern; and NE = Narrow Endemic per NCCP

[2] This is a typical survey window; optimal survey times vary by species and by year.

[3] Usually Basewide survey data are used to determine the occupied habitat for these species, and project-specific surveys may not be required.

## Biological Constraints and Recommendations

The TL 695 corridor occurs in a portion of San Diego County known for its biological diversity. In addition to the vegetation communities that occur within the survey area, suitable habitat for several sensitive plant and wildlife species was also identified. This section identifies the constraints for these potential resources and provides recommendations for designing the Project to minimize and avoid impacts to them, including constraints associated with permitting the Project under SDG&E's existing NCCP, since this is the preferred method. If it is determined that the NCCP would not be used for permitting, then the constraints and recommendations in this section would need to be revisited.

## Vegetation Communities

Twelve vegetation communities and cover types were mapped within the project study area. Eight of these communities require mitigation under the NCCP, and one (vernal pools) must be completely avoided. Diegan coastal sage scrub is the dominant

vegetation community within the TL corridor, with smaller amounts of several other NCCP covered vegetation communities (Table 1). In general, impacts to NCCP-covered vegetation communities, as indicated in Table 1 and Figures 2a through 2j, should be minimized to the greatest extent possible, with temporary impacts favorable over permanent impacts. Table 6 provides specific constraints and recommendations for NCCP-covered vegetation communities, nonnative annual grassland, coastal sage scrub, and riparian habitats.

Vegetation community mapping for the project study area also provides a baseline for preparing the preliminary impact analysis. This analysis will provide SDG&E with an idea about the Project's potential mitigation needs, and allow the project team to determine a path forward for permitting (e.g., using SDG&E's existing NCCP permit or pursuing project permits outside the NCCP). If requested by SDG&E, a preliminary impact analysis could be prepared for your review; however, this analysis is not part of this scope of work, once the project design has progressed enough for an adequate analysis (e.g., identification of permanent and temporary impact areas).

**Sensitive Plant Species**

Suitable habitat for five sensitive plant species (many-stemmed dudleya, Palmer's grapplinghook, Pendleton button celery, thread-leaved brodiaea, and variegated dudleya) was identified within the project study area and potentially suitable habitat for the only federally listed species, thread-leaved brodiaea is shown in Figure 3. Focused botanical surveys and rare plant surveys are recommended and would need to be conducted during the appropriate blooming periods for each of these species to determine presence/absence. These surveys would need to occur at the appropriate time in spring.

It is recommended that potential impacts to sensitive plant species (Figure 3) be minimized to the greatest extent possible, with temporary impacts favorable over permanent impacts. Table 6 provides specific constraints and recommendations for sensitive plant species suitable habitat.

**Sensitive Wildlife Species**

Suitable habitat for 33 sensitive wildlife species was identified within the Project (Table 4, Figures 4 and 5). Coastal California gnatcatcher surveys were conducted following the current USFWS survey protocol for the coastal California gnatcatcher (dated February 28, 1997, and amended July 28, 1997). AECOM biologists Andrew Fisher, Bonnie Hendricks, James McMorran, and Brennan Mulrooney conducted the surveys under Endangered Species Permit TE-820658. Since SDG&E has an active NCCP, only three surveys were conducted (at least 1 week apart) within approximately 405.2 acres of potentially suitable habitat (i.e., coastal sage scrub) between August 11, 2014, and August 27, 2014 (Figure 5). Many pairs, individuals, juveniles, and birds of unknown age and sex were detected throughout the entire Project. The summary results of CAGN

surveys, including exact locations of CAGN and areas of use, will be summarized in a 45-day report to USFWS that will be provided to SDG&E under separate cover.

Table 6 details the biological resource constraints and recommendations for various NCCP covered vegetation communities, and for sensitive plant and wildlife species. Table 6 does not address potential constraints and recommendations for vernal pools and federally listed fairy shrimp species; those are discussed in detail in Table 7, below.

**Table 6. Biological Resources Constraints and Recommendations**

| Biological Resources within TL Corridor, Stringing Sites, and Staging Areas | Constraints | Recommendation for Design |
|---|---|---|
| **Vegetation Communities** | | |
| NCCP-covered vegetation communities[1] | Requires mitigation at 2:1 ratio for permanent impacts and 1:1 ratio for temporary impacts.[1] | Minimize permanent and temporary impacts. Choose temporary impacts over permanent impacts when possible. |
| Nonnative annual grassland | Requires mitigation as indicated above, but can be restored on-site. | Place work pads and access roads in this community instead of others. |
| Coastal sage scrub | Requires mitigation as indicated above; more difficult to restore on-site within the 2-year timeframe of NCCP Enhancement Program. | Move work pads and access roads into nonnative annual grassland when possible. |
| Riparian vegetation communities (mulefat scrub and southern willow scrub) | Requires formal wetland delineation and additional permits and mitigation from the U.S. Army Corps of Engineers, California Department of Fish and Wildlife, and Regional Water Quality Control Board, if impacted. | Avoid these vegetation communities, if possible. Place work pads and access roads at least 50 feet away from these features. |
| **Sensitive Plant Species** | | |
| Five sensitive plants with potential to occur (many-stemmed dudleya, Palmer's grapplinghook, Pendleton button celery, thread-leaved brodiaea, and variegated dudleya) | Per NCCP, impacts to sensitive plant species should be avoided and minimized. No other mitigation, other than that above for vegetation communities, required under NCCP. | Minimize impacts in potential habitat. Choose temporary impacts over permanent impacts when possible. Conduct rare plant surveys (or specific thread-leaved brodiaea surveys) in spring 2015, the presence/absence of sensitive plants in relation to project footprint can be determined. It is possible to conduct protocol thread-leaved brodiaea surveys concurrently with rare plant surveys, since the other rare plant species would be present at the same time. In addition, rare plant surveys would be recommended for areas outside the thread-leaved brodiaea survey area. |
| **Sensitive Wildlife Species** | | |
| Suitable habitat for various NCCP covered species. | Per the NCCP, impacts to sensitive wildlife species should be avoided and minimized. No other mitigation, other than that above for vegetation | Minimize impacts in areas that contain the potential for the most NCCP covered species. Choose temporary impacts over permanent |

| Biological Resources within TL Corridor, Stringing Sites, and Staging Areas | Constraints | Recommendation for Design |
|---|---|---|
| | communities, is required under the NCCP for all species. | impacts when possible. Once focused and general wildlife surveys are completed, the presence/absence of sensitive wildlife in relation to the project footprint can be determined. |
| Coastal cactus wren | Narrow endemic species are not covered under the NCCP; therefore, additional permitting and mitigation would be required from USFWS and CDFW. Per the NCCP, impacts must be avoided. Construction during breeding season could be limited if nests are within 500 feet of work areas. | Avoid coastal cactus wren habitat when possible. Choose temporary impacts over permanent impacts when possible. |
| Coastal California gnatcatcher | Per the NCCP, impacts should be avoided and minimized. Requires habitat mitigation as indicated above. Construction during breeding season could be limited if nests are within 500 feet of work areas. | Avoid coastal California gnatcatcher habitat when possible. Choose temporary impacts over permanent impacts when possible. |
| Western burrowing owl | Narrow endemic species are not covered under the NCCP; therefore, additional permitting and mitigation would be required from USFWS and CDFW if occupied burrows are identified and impacted. Mitigation includes passive relocation of owls off-site (e.g., one-way doors installed in active burrows), creation of new burrows at a 2:1 mitigation ratio for active burrows impacted, and preservation of habitat at a 1:1 ratio near impact area. | Suitable habitat identified within the TL buffer and stringing sites. Owl presence/absence will be confirmed through surveys conducted during the nonbreeding season (October 2014 through January 2015). Unoccupied burrows can become occupied if construction does not start right after surveys are complete; therefore, it is recommended that all potential owl burrows be avoided. A map of potential owl burrows across the survey area will be provided once surveys are complete. |
| Pacific pocket mouse | Narrow endemic species are not covered under the NCCP; therefore, additional permitting and mitigation would be required from USFWS and CDFW. | Occupied habitat is known within the TL buffer. Consultation with MCBCP and USFWS should be conducted to determine if trapping is necessary. |
| Raptors | Per the NCCP, impacts to raptors should be avoided and minimized. Requires habitat mitigation as indicated above. Construction during the breeding season could be limited if nests are within 500 feet of work areas. | Design of the TL towers should include the latest raptor protection equipment and conform to Reducing Avian Collisions with Powerlines (APLIC) 2012 guidelines. |

[1] For the purposes of this report, MCBCP is being treated as a "preserve," or habitat considered as moderate, high, or very high quality in the absence of preserve boundaries. Habitat quality is based on plant species composition and connectivity with the surrounding natural vegetation communities.

[2] If total temporary impacts are less than 500 square feet, no mitigation would be required per Table 7.2 of NCCP; If total temporary impacts are between 500 and 1,000 square feet, mitigation would likely be achieved by withdrawing credits from the mitigation bank; if total temporary impacts are greater than 1,000 square feet, mitigation would likely be achieved through restoration on-site (e.g., enhancement or passive restoration).

It is recommended that western burrowing owl surveys be conducted in the winter of 2014 as this species is only known to winter on MCBCP (last breeding record was in the 1990's [London *pers comm*. 2014]), and nesting season surveys would not be useful for the project. It is recommended that a 500-foot buffer be placed around all Project features within areas of potential western burrowing owl habitat per the protocol survey guidelines for burrowing owl. A 150-foot buffer was surveyed around Project features during the habitat assessment described in this letter report. It is recommended that a habitat assessment for burrowing owl within the 500-foot buffer be conducted prior to initiating surveys. The increase to a 500-foot buffer would necessitate an additional habitat assessment.

Pacific pocket mouse trapping has been conducted in several spots in July 2013 by Scott Tremor (Tremor 2013a and 2013b) for SDG&E. These trapping locations were mutually agreed upon by SDG&E and the USFWS (William Miller). No Pacific pocket mice were captured at any of the trapping locations. Complete details of the trapping effort are located within the 45-day summary reports (Tremor 2013a and 2013b). The locations where trapping occurred are shown on Figure 4. Based on the habitat assessment conducted by AECOM for TL695, additional trapping may be necessary once the final Project features (such as stringing sites, access roads, and work areas where poles would be removed and replaced) are known.

Table 7 discusses potential vernal pools (referred to as basins since they have not had floral or fairy shrimp surveys conducted to date) that are known to occur within the Project. Some of the basins are documented from historical MCBCP Basewide data and some were found during the habitat assessment. A total of 7 basins are known to occur within the Project. Table 7 describes the potential fairy shrimp occupancy and past protocol survey history for each of the basins, including AECOM's recommendations for fairy shrimp and vernal pool/botanical surveys. The locations of these basins are shown on Figures 6, 7, and 8.

AECOM
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619.233.0952 fax

## Table 7. Fairy Shrimp Occupancy for Basins and Recommendations

| Basin Number/MCBCP Spatial Identifier[1] | Historical Fairy Shrimp Occupancy (from Basewide Survey Data) | Protocol Fairy Shrimp Survey Conducted to Date (Yes/No) | Fairy Shrimp Survey Recommendations | Vernal Pool/Botanical Survey Recommendations |
|---|---|---|---|---|
| SP_69001 | No Shrimp | No | More than 100-foot downhill from Project feature, no survey recommended | More than 100-foot downhill from Project feature, no survey recommended |
| SP_69002 | No Shrimp | No | More than 100-foot downhill from Project feature, no survey recommended | More than 100-foot downhill from Project feature, no survey recommended |
| SO_83001 | Lindahl's fairy shrimp | Yes | Avoid, but no additional surveys necessary | Conduct vernal pool survey |
| SO_83002 | Lindahl's fairy shrimp | Yes | Avoid, but no additional surveys necessary | Conduct vernal pool survey |
| SO_84001 | Lindahl's fairy shrimp | Yes | Avoid, but no additional surveys necessary | Conduct vernal pool survey |
| Basin 1 | Unknown | No | Conduct protocol fairy shrimp surveys | Conduct vernal pool survey |
| Basin 2 | Unknown | No | Conduct protocol fairy shrimp surveys | Conduct vernal pool survey |

[1] Some historically mapped basins have spatial identifiers (IDs) provided by MCBCP, which are provided in this column where applicable. Those basins without spatial IDs are labeled as Basin 1 and 2.

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Basins SP_69001 and SP_69002 have not had protocol fairy shrimp surveys conducted. Based on historical data, a non-protocol survey was conducted but shrimp were not found. Therefore, their occupancy status is currently unknown. Since these basins are located more than 100 feet away from any project feature (such as a pole location or access road), complete avoidance during construction is possible (e.g., direct and indirect impacts). Best Management Practices should be in place to prevent run-off and sedimentation into these basins, especially since they are downhill from where construction activities would take place.

Basins SO_83001, SO_83002, and SO_84001 have had full protocol fairy shrimp surveys conducted for another overlapping project (Basewide Water Improvement Project) in 2010 and 2011. No federally listed fairy shrimp species were detected during dry or wet season surveys. The only species found was the common Lindahl's fairy shrimp (*Branchinecta lindahli*). These basins should have a vernal pool survey conducted to determine if there are vernal pool plants present that should be avoided.

Basin 1 was identified during the habitat assessment; therefore, no historical fairy shrimp surveys have been conducted. Basin 1 is located within a dirt access road that traverses San Onofre Creek, and this road could be utilized for construction during periods when the basin was dry. If it is necessary to drive along this access road for construction during the wet season, fairy shrimp surveys for Basin 1 would be recommended. In addition, vernal pool surveys would be recommended to determine if there were any sensitive plants present within the basin.

Basin 2 was also identified during the habitat; therefore, historical fairy shrimp data is not available for this basin. Basin 2 is located near a power pole that would be removed or replaced; therefore, fairy shrimp surveys would be recommended. In addition, vernal pool surveys would be recommended to determine if there were any sensitive plants present within the basin.

A geodatabase containing the data represented in the figures can be submitted separately via email, if needed. We look forward to continuing to work with you on this important project. Please contact us if you have any questions.

Sincerely,

Barbie Prine
Project Manager

Andrew Fisher
Wildlife Biologist

Attachments:
Figure 1: Vicinity Map
Figure 2a - 2j: Vegetation Communities
Figure 3: Thread-leaved Brodiaea Potentially Suitable and Occupied Habitat
Figure 4: Narrow Endemic Species Suitable Habitat

Figure 5: Coastal California Gnatcatcher Survey Areas
Figure 6: Fairy Shrimp Survey Area Detail Map 1 of 3
Figure 7: Fairy Shrimp Survey Area Detail Map 2 of 3
Figure 8: Fairy Shrimp Survey Area Detail Map 3 of 3

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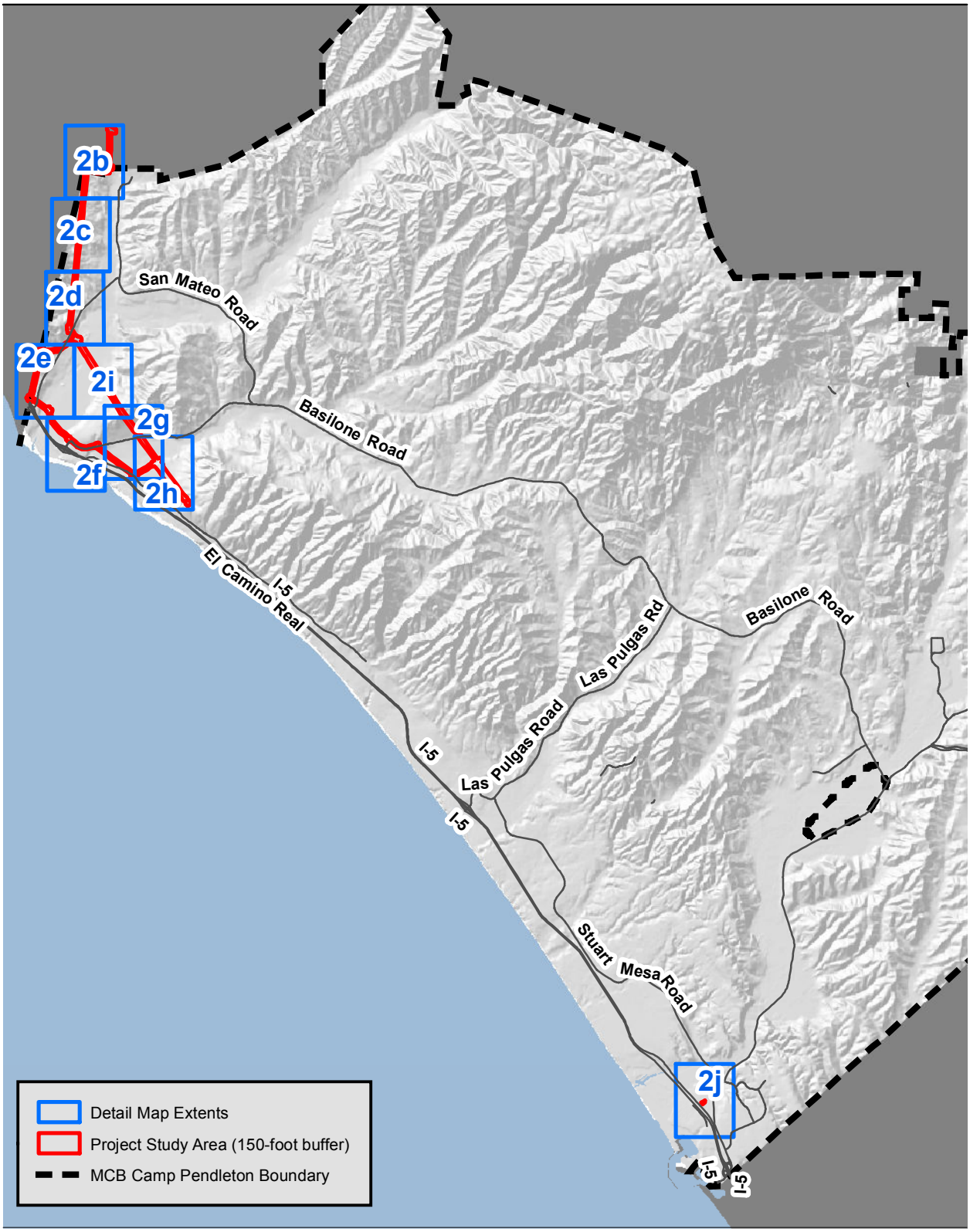


Source: SanGIS 2012; SDG&E 2014; MCBCP 2007

2.5 1.25 0 2.5 Miles

Scale: 1:158,400; 1 inch = 2.5 miles

**Figure 2a**
**Vegetation Communities - Overview Map**

TL 695 Wood to Steel Project Biological Constraints Evaluation and Survey

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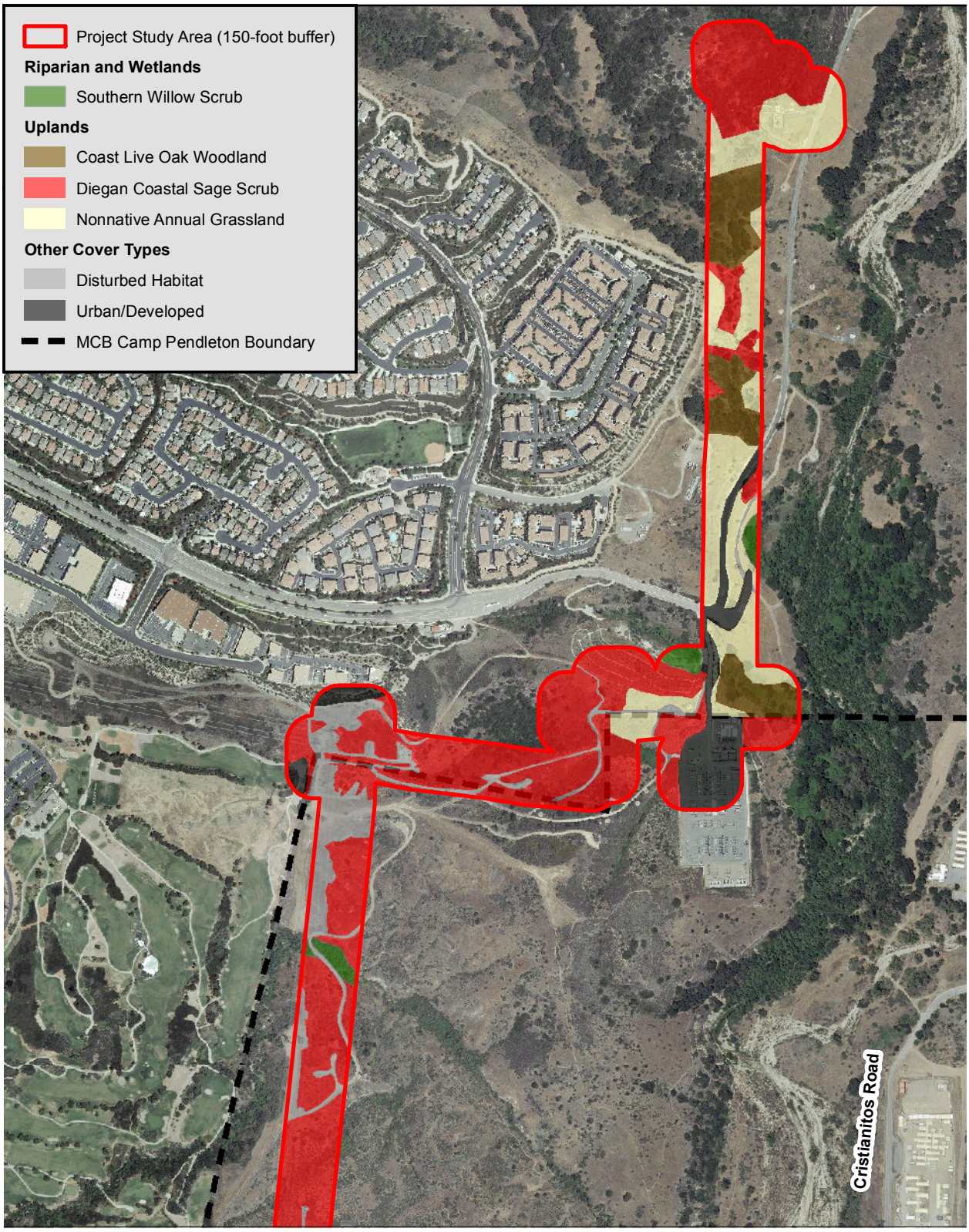


Source: SanGIS 2012; SDG&E 2014; MCBCP 2007

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Scale: 1:9,600; 1 inch = 800 feet

**Figure 2b**
**Vegetation Communities - Detail Map 1 of 9**

TL 695 Wood to Steel Project Biological Constraints Evaluation and Survey

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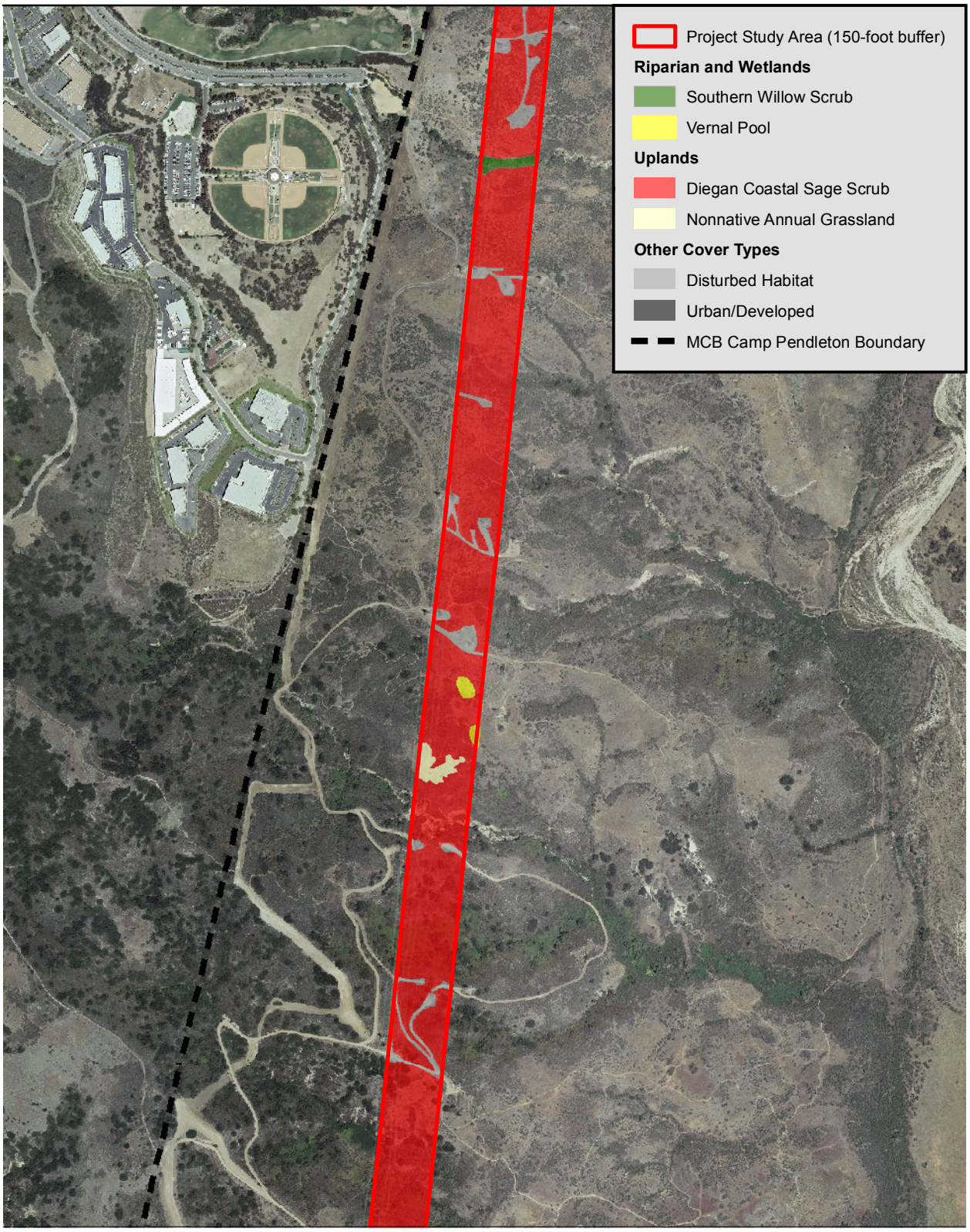


Source: SanGIS 2012; SDG&E 2014; MCBCP 2007

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Scale: 1:9,600; 1 inch = 800 feet

**Figure 2c**

**Vegetation Communities - Detail Map 2 of 9**

TL 695 Wood to Steel Project Biological Constraints Evaluation and Survey

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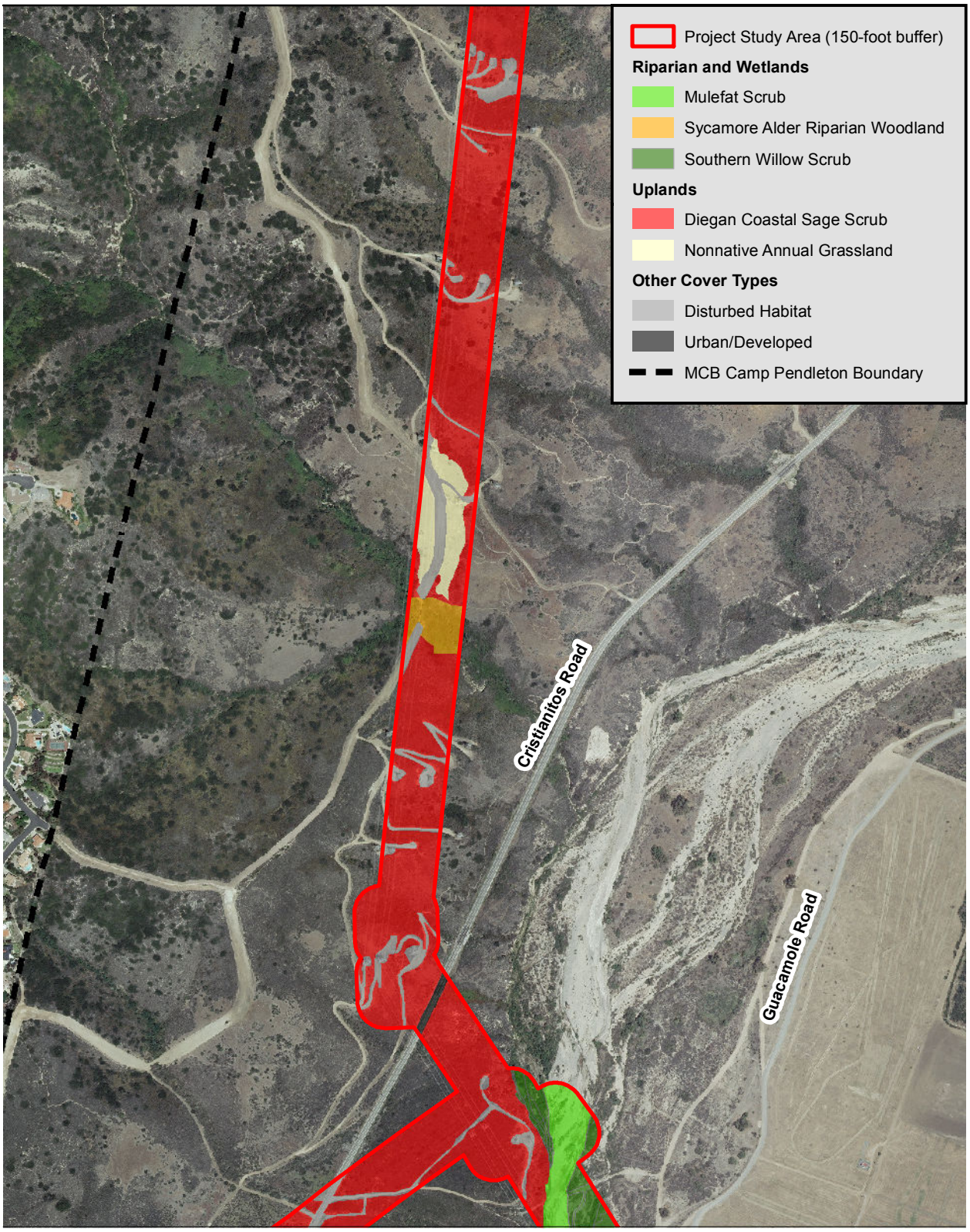



Source: SanGIS 2012; SDG&E 2014; MCBCP 2007

800 400 0 800 Feet

Scale: 1:9,600; 1 inch = 800 feet

**Figure 2d**

**Vegetation Communities - Detail Map 3 of 9**

TL 695 Wood to Steel Project Biological Constraints Evaluation and Survey

*Path: P:\2014\60329186_TM_Easley\900-CAD-GIS\920 GIS\922_Maps\Results_Ltr\VegSeries.mxd, 9/22/2014, janssenn*


Source: SanGIS 2012; SDG&E 2014; MCBCP 2007

800 400 0 800 Feet

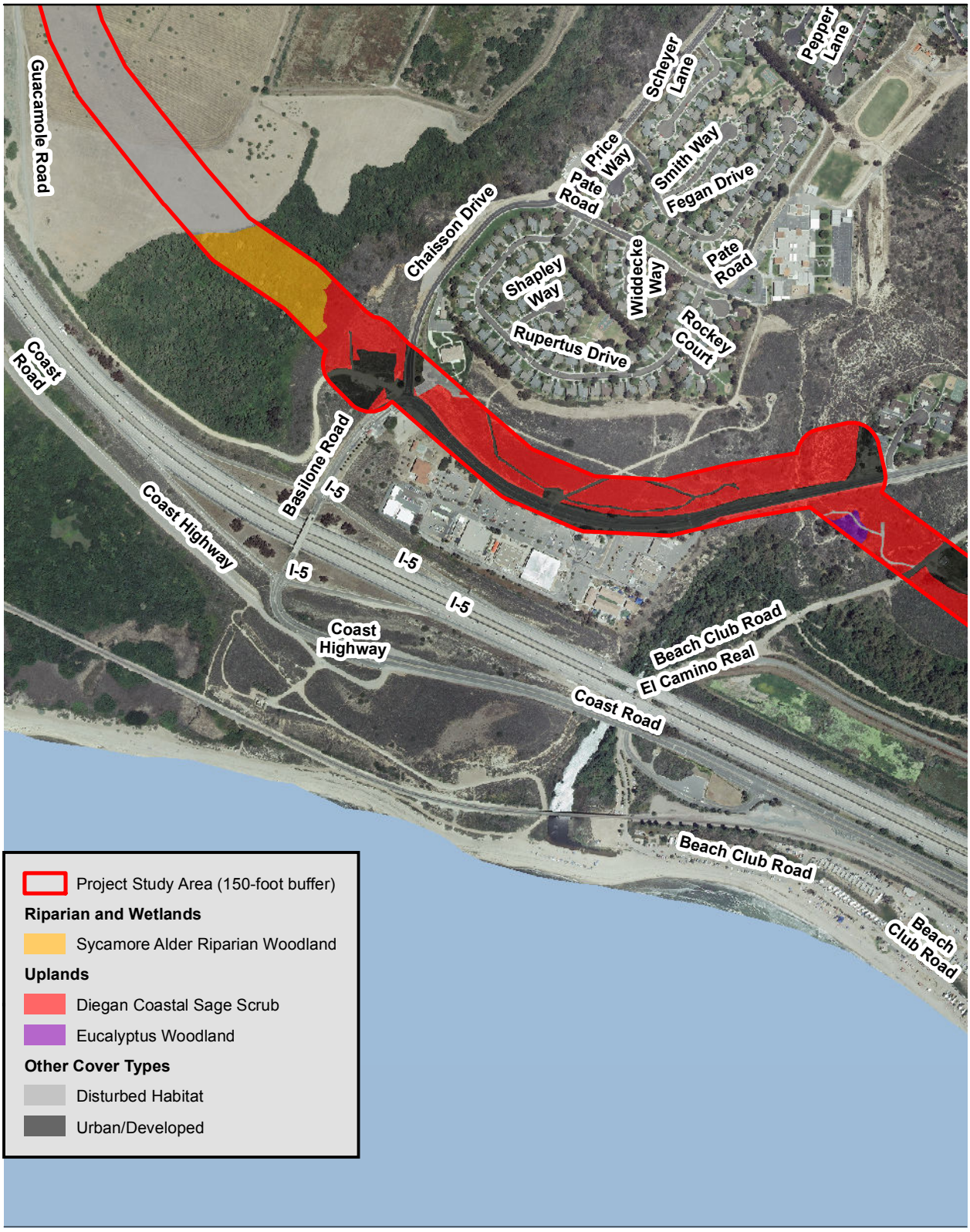
Scale: 1:9,600; 1 inch = 800 feet

**Figure 2e**

**Vegetation Communities - Detail Map 4 of 9**



*Path: P:\2014\60329186_TM_Easley\900-CAD-GIS\920 GIS\922_Maps\Results_Ltr\VegSeries.mxd, 9/22/2014, janssenn*




Source: SanGIS 2012; SDG&E 2014; MCBCP 2007

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Scale: 1:9,600; 1 inch = 800 feet

**Figure 2f**

**Vegetation Communities - Detail Map 5 of 9**

TL 695 Wood to Steel Project Biological Constraints Evaluation and Survey

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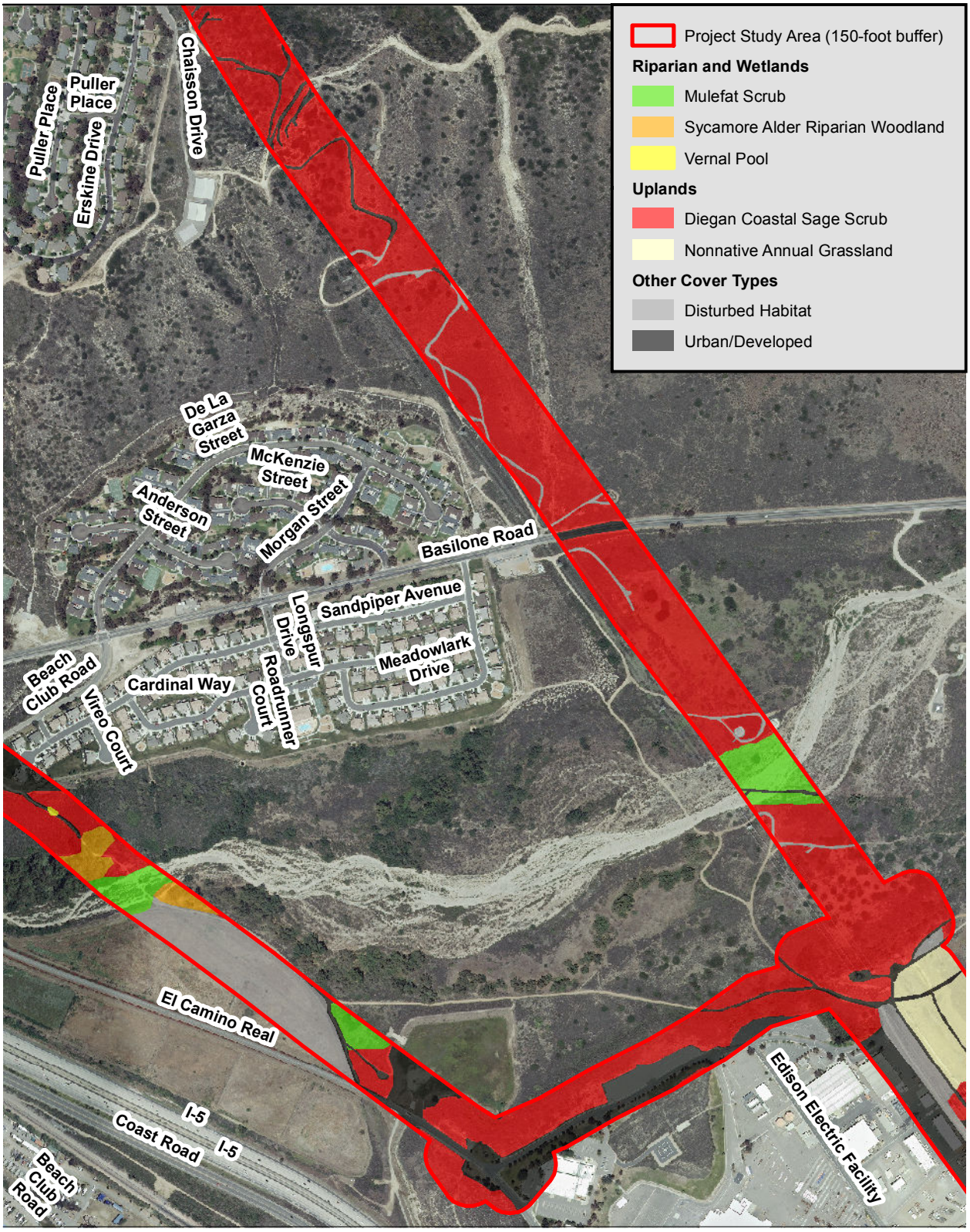


Source: SanGIS 2012; SDG&E 2014; MCBCP 2007

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Scale: 1:9,600; 1 inch = 800 feet

**Figure 2g**

**Vegetation Communities - Detail Map 6 of 9**

TL 695 Wood to Steel Project Biological Constraints Evaluation and Survey

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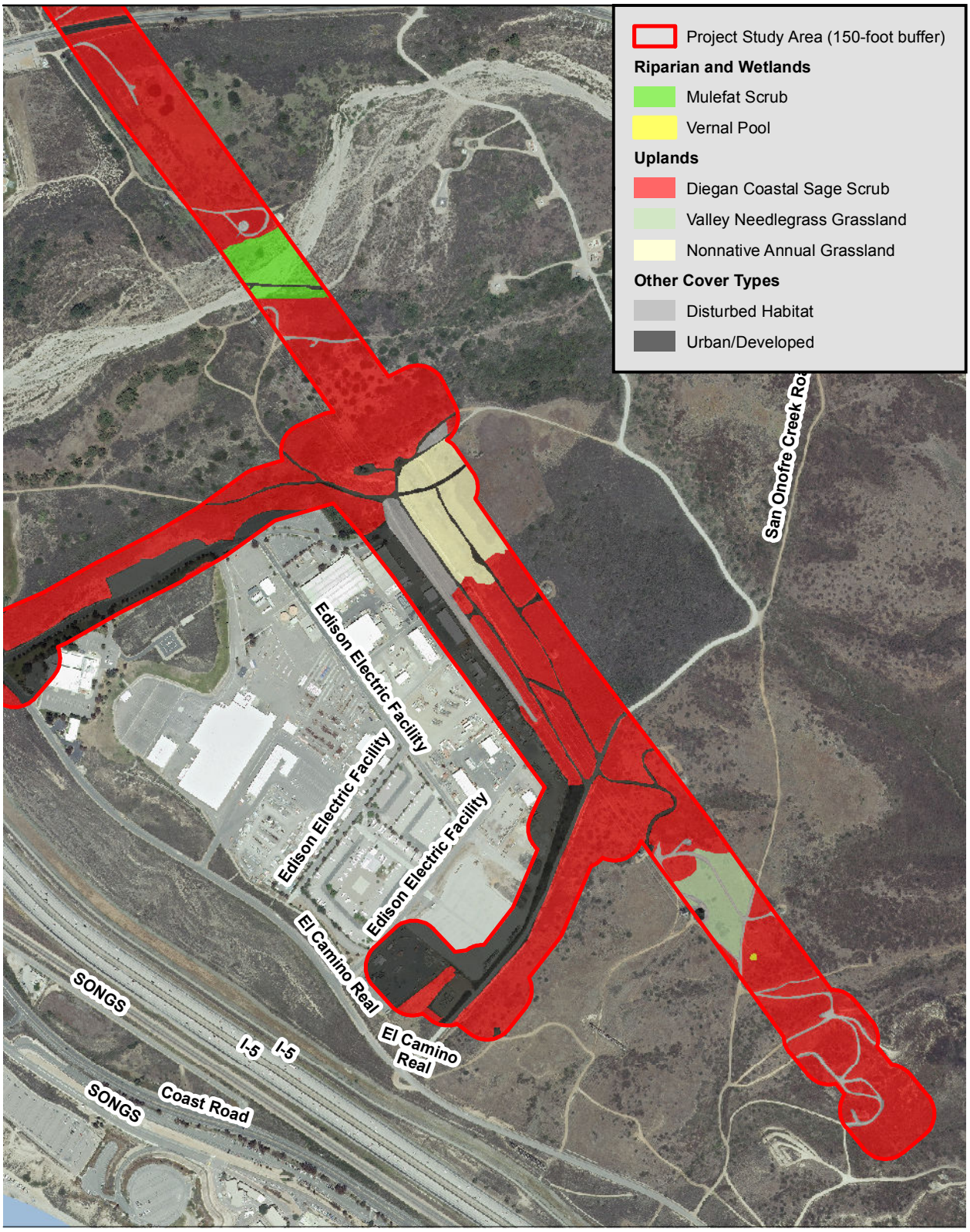


Source: SanGIS 2012; SDG&E 2014; MCBCP 2007

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Scale: 1:9,600; 1 inch = 800 feet

**Figure 2h**

**Vegetation Communities - Detail Map 7 of 9**

TL 695 Wood to Steel Project Biological Constraints Evaluation and Survey

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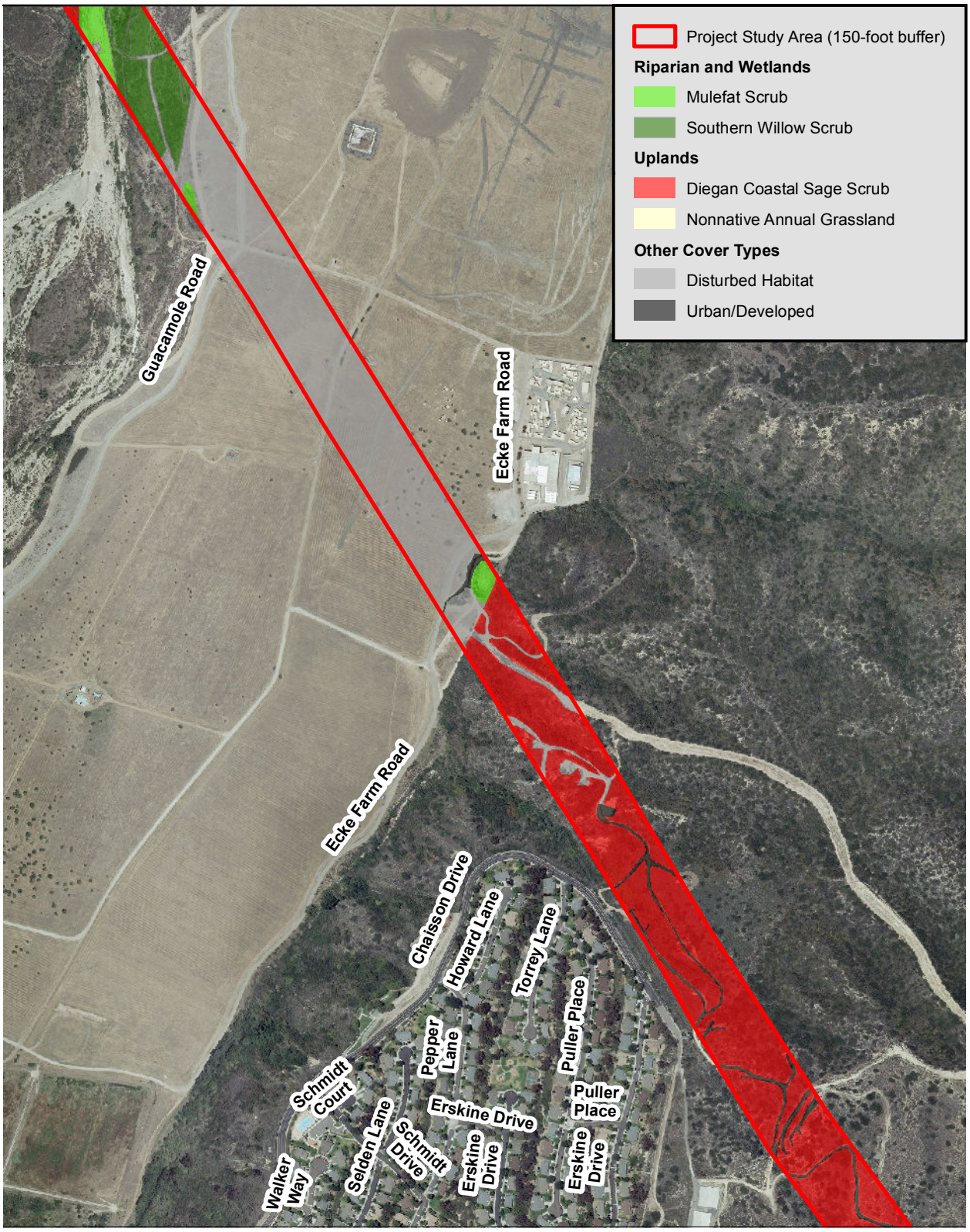


Source: SanGIS 2012; SDG&E 2014; MCBCP 2007

800 400 0 800 Feet

Scale: 1:9,600; 1 inch = 800 feet

**Figure 2i**

**Vegetation Communities - Detail Map 8 of 9**



*Path: P:\2014\60329186_TM_Easley\900-CAD-GIS\920 GIS\922_Maps\Results_Ltr\VegSeries.mxd, 9/22/2014, janssenn*


Source: SanGIS 2012; SDG&E 2014; MCBCP 2007

800 400 0 800 Feet

Scale: 1:9,600; 1 inch = 800 feet

**Figure 2j**

**Vegetation Communities - Detail Map 9 of 9**

TL 695 Wood to Steel Project Biological Constraints Evaluation and Survey

*Path: P:\2014\60329186_TM_Easley\900-CAD-GIS\920 GIS\922_Maps\Results_Ltr\VegSeries.mxd, 9/22/2014, janssenn*

**Appendix C – Rare Plant Survey Report Cardno 2015**

Final

# Rare Plant Survey Report for TL 695/6971 Reconductor Project

San Diego Gas & Electric Company

November 2015

Prepared for:
Pangea Biological

Prepared by:
Cardno

# Acronyms and Abbreviations

| | |
|---|---|
| BRFI | thread-leaved brodiaea (*Brodiaea filifolia*) |
| CNPS | California Native Plant Society |
| CLO | Coast Live Oak |
| CRPR | California Rare Plant Rank |
| DCSS | Diegan Coastal Sage Scrub |
| DEV | Urban/Developed |
| DIS | Disturbed Habitat |
| EW | Eucalyptus Woodland |
| GIS | geographic information system |
| GPS | global positioning system |
| ILA | Incidental Landing Area |
| kV | kilovolt |
| MCB | Marine Corps Base |
| MFS | Mulefat Scrub |
| NNG | Non-native Grassland |
| NVC | Non-vegetated Channel |
| PSA | Project Survey Area |
| SDG&E | San Diego Gas and Electric |
| SONGS | San Onofre Nuclear Generating Station |
| SSARW | Southern Sycamore-Alder Riparian Woodland |
| SWS | Southern Willow Scrub |
| TL | Tie Line |
| USFWS | United States Fish and Wildlife Service |
| VP | vernal pool |

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# 1.0 INTRODUCTION

This Rare Plant Survey Report describes the results of rare plant surveys conducted in support of a Proponent's Environmental Assessment being prepared for San Diego Gas & Electric Company's (SDG&E) Proposed Tie Line (TL) 695/6971 Reconductor[1] Project (i.e., the Proposed Project) in northern San Diego County (Figure 1).

Cardno biologists surveyed for all federally listed, state listed, and California Native Plant Society (CNPS) California Rare Plant Rank (CRPR) 1B through 4 plant species with the potential to occur in the project area.

Surveys were conducted in accordance with the Marine Corps Base (MCB) Camp Pendleton *Thread-Leaved Brodiaea (Brodiaea filifolia [BRFI]) Inventory Protocol* (MCB Camp Pendleton 2015a) (Appendix A). In addition to BRFI, other potentially occurring rare plant species including many-stemmed dudleya (*Dudleya multicaulis*), Palmer's grapplinghook (*Harpagonella palmeri*), Pendleton button celery (*Eryngium pendletonense*), and variegated dudleya (*Dudleya variegata*), along with other CRPR 1B through 4 plant species were searched for during BRFI surveys (March through May 2015).

This report will provide information necessary for the minimization/avoidance of potential impacts to rare plants, and will be used to support California Environmental Quality Act and National Environmental Policy Act review of the Proposed Project.

# 2.0 PROPOSED PROJECT AND SURVEY AREA

## 2.1 Project Location and Description

SDG&E proposes to reconductor a 69-kilovolt (kV) power line in northern San Diego County near the border of Orange County. The power line is located primarily on federal military lands in the western portion of MCB Camp Pendleton (Figure 1). The proposal also includes removing wood poles, installing steel poles, and reconductoring within existing utility corridors and other areas devoted to electric utilities. The 69-kV power line will be reconductored between SDG&E's Talega, Basilone, and Japanese Mesa Substations.

While the Proposed Project components are located primarily in the westerly portion of MCB Camp Pendleton, in San Diego County, California; a portion of the power line alignment extends into the eastern area of the city of San Clemente, in Orange County, California.

As depicted in Figure 1, the northern limit of the reconductor project is located outside MCB Camp Pendleton, to the north and west of the Talega Substation. From this point, the Proposed Project area runs west before turning south into MCB Camp Pendleton toward the San Mateo Junction (i.e., west of the Sierra Training Area) along the ridge tops of steep hills located to the north and west of Cristianitos Road. The hills in this area lie along the border of San Diego and Orange counties, and occur on lands that have been leased by the federal government to the California Department of Parks and Recreation. From San Mateo Junction, the Proposed Project runs in a southeasterly direction toward the northeastern corner of San Onofre Nuclear Generating Station (SONGS) Mesa. From this point, the Proposed Project extends to the northwest to the Basilone Substation, and to the southwest to the Japanese Mesa Substation. The Proposed Project includes approximately 27 miles of existing dirt roads that will be utilized to access various elements of the Proposed Project for construction activities.

[1] Reconductoring is a term used by utilities to describe the replacement of existing wires with new wires.

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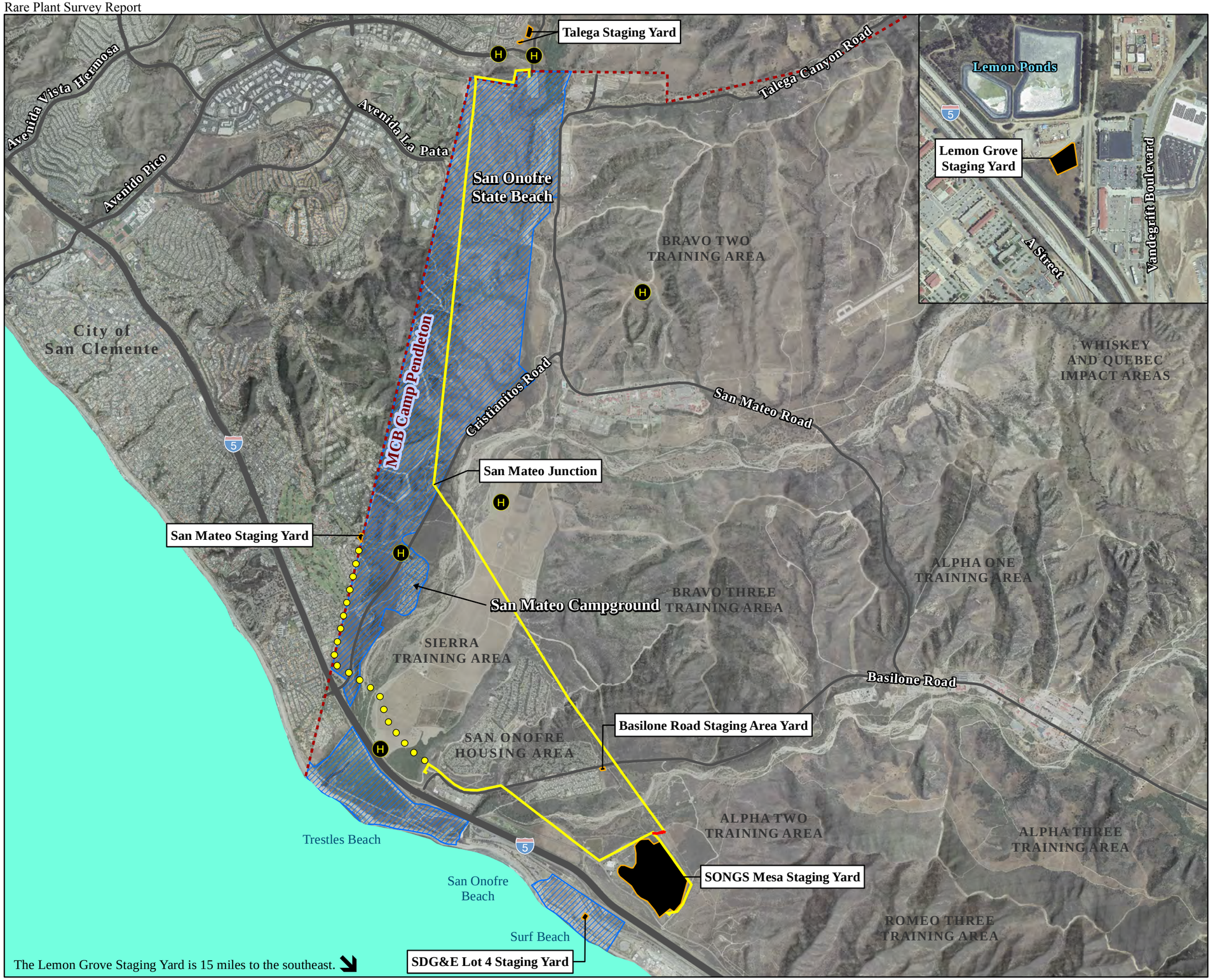


**Figure 1**
**TL695/6971 Proposed Project Area**

**LEGEND**

- MCB Camp Pendleton Boundary
- Proposed Project Overhead Route
- Proposed Project Underground Route
- Proposed Power Line Removal Segement
- Staging Yard
- Helicopter Incidental Landing Area
- State Parks Lease Area


Kilometers
0 2
0 1
Miles

Sources: City of San Clemente 2015, ESRI 2015

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## 2.2 Project Survey Area

The Project Survey Area (PSA) for rare plant surveys consists of a 300-foot buffer that originates from the tie line (150-foot buffer on each side of the tie-line) and a 50-foot buffer around all staging areas, substations, and stringing sites. In addition, a 20-foot buffer was used on both sides of dirt access roads, of which 11.8 miles occur within the main 300-foot survey buffer and 15.4 miles occur outside of the 300-foot survey buffer[2]. Table 1 details the PSA.

**Table 1. TL 695/6971 Rare Plant Project Survey Area**

| Project Component | Area |
|---|---|
| Power Line (including 300-foot survey buffer) | 393.70 acres |
| Substations (including 50-foot survey buffer) | |
| Basilone Substation | 1.14 acres |
| Japanese Mesa Substation | 0.28 acres |
| Talega Substation | 7.87 acres |
| Staging Yards (including 50-foot survey buffer) | |
| Basilone Staging Yard | 1.17 acres |
| Talega Staging Yard 1 of 2* | 3.72 acres |
| San Mateo Staging Yard | 1.31 acres |
| SONGS Mesa Staging Yard | 80.87 acres |
| SDG&E Lot 4 Staging Yard | 1.88 acres |
| Lemon Grove Staging Yard | 2.75 acres |
| Stringing Sites (including 50-foot buffer) | 2.23 acres |
| **TOTAL** | **496.90 acres** |

*Note:* *Talega Staging Yard 2 of 2 is a component that was added to the Proposed Project but is located outside of the PSA.

# 3.0 BACKGROUND

Rare plant surveys were conducted in accordance with the MCB Camp Pendleton BRFI protocol (MCB Camp Pendleton 2015a). Therefore, BRFI biological and occurrence information is emphasized in this document. BRFI is a federally threatened bulbiferous perennial that occurs at elevations between 30 feet and 2,500 feet (United States Fish and Wildlife Service [USFWS] 2009). In San Diego County, occurrences of BRFI are highly correlated with clay soils or clay lens inclusions in a loamy matrix, such as generally occur on mesas and hillsides with gentle to moderate slopes, or in association with vernal pools. These soils are generally vegetated with open native or non-native grassland, open coastal sage scrub, or open coastal sage scrub-chaparral communities (USFWS 2011).

The surface soil layers where MCB Camp Pendleton BRFI populations occur vary greatly and include loam, clay loam, sandy clay loam, sandy clay, and clay. BRFI populations on MCB Camp Pendleton occur in areas with shrink-swell soils where surface cracks are common (MCB Camp Pendleton 2012). The areas on MCB Camp Pendleton with the highest potential to have BRFI exhibit the following features:

- soil series mapped as a clay soil or with a clay subsoil;
- grassland and coastal sage scrub plant communities;
- less than 60 percent slopes;
- all slope aspects (north, south, east, and west); and

[2] Vegetation community data will be subsequently identified and incorporated into this report as it becomes available.

- less than 2,600 feet elevation (MCB Camp Pendleton 2012).

On MCB Camp Pendleton, BRFI typically blooms between April and June (MCB Camp Pendleton 2012). However, during the unusually dry spring of 2015, BRFI was first observed blooming on March 23, the earliest recorded blooming on MCB Camp Pendleton (MCB Camp Pendleton 2015b).

Threats to BRFI include loss of habitat from urbanization and agricultural conversion; alteration of hydrologic conditions and channelization; impacts from livestock grazing; unauthorized off-highway vehicle use; disking for fire suppression; and competition from non-native plants (USFWS 2009).

# 4.0 METHODS

## 4.1 Plant Community Data and Classification

Plant community geographic information systems (GIS) data for the project area was provided to Cardno by SDG&E (2015). Plant communities in portions of the project area were not mapped in the GIS (SDG&E 2015). Where plant communities were not mapped, Cardno conducted plant community mapping during the course of rare plant surveys and incorporated this supplemental data[3] into the GIS. Plant communities occurring in the project area are described below. Plant community definitions, classifications, and categories are based on Holland (1986) as updated by Oberbauer et al. (2008) for San Diego County. Respective areas of plant communities within the project area are provided in Section 5.0, Results.

**Plant Communities**

**Grassland**

- **Non-native Grassland** (NNG) is dominated by non-native annual grasses and weedy herbaceous forbs. Dominant exotic species include ripgut brome (*Bromus diandrus*), red brome (*Bromus madritensis* ssp. *rubens*), wild oats (*Avena* spp.), wild barleys (*Hordeum* spp.), Italian ryegrass (*Festuca perennis*), filarees (*Erodium* spp.), and soft chess brome (*Bromus hordeaceus*). Areas consisting of NNG typically have experienced past disturbance or are subject to regular disturbance.

**Scrub**

- **Diegan Coastal Sage Scrub** (DCSS) is the dominant scrub community in coastal southern California. It occurs on dry slopes with clay-rich soils and is typically dominated by California sagebrush (*Artemisia californica*) and other drought-tolerant, woody shrubs including California buckwheat (*Eriogonum fasciculatum*), laurel sumac (*Malosma laurina*), California sunflower (*Encelia californica*), and sages (*Salvia* spp.). This community typically intergrades with grassland communities at lower elevations and chaparral communities at higher elevations.

[3] Although Cardno has modified the GIS to include plant communities within 300-foot buffer around the power line alignment that were not included within the data provided by SDG&E, Cardno did not revise any of the plant community data originally provided by SDG&E.

**Riparian/Wetland**

- **Mulefat Scrub** (MFS) is a riparian scrub community, with greater than 50 percent ground cover, that typically occurs on coarse alluvial soils in intermittent streambeds and on floodplains. It is generally a species-poor community dominated by mulefat (*Baccharis salicifolia*) and often represents an early seral stage in the establishment of willow- or sycamore-dominated riparian forests. Patches of MFS are typically found along the outer edges of other riparian communities.
- **Non-vegetated Channel** (NVC) is sandy, gravelly, or rocky fringe of waterways or flood channels. Vegetation may exist but is usually less than 10 percent total cover.
- **Southern Sycamore-Alder Riparian Woodland** (SSARW) is a tall, open winter-deciduous streamside woodland dominated by California sycamore (*Platanus racemosa*) and/or white alder (*Alnus rhombifolia*). This community is typically found along very rocky streambeds subject to seasonally high-intensity flooding. Stands of this type seldom form closed canopy woodlands. Primary understory species include blackberry (*Rubus ursinus*), poison oak (*Toxicodendron diversilobum*), and native and non-native grasses.
- **Southern Willow Scrub** (SWS) is a dense, winter-deciduous riparian scrub community with greater than 60 percent ground cover found in loose, sandy, or gravelly alluvium deposited near stream channels. In the project area, it is typically dominated by arroyo willow (*Salix lasiolepis*) and may include other willow species (e.g., western sand bar willow [*Salix exigua*]) and mule-fat). Associated understory species include poison oak, western ragweed (*Ambrosia psilostachya*), and non-native species such as giant reed (*Arundo donax*) and poison hemlock (*Conium maculatum*).
- **Vernal Pool** (VP) includes seasonally flooded depressions that support a distinctive living community adapted to extreme variability in hydrologic conditions (seasonally very dry and very wet conditions).

**Upland Woodland**

- **Eucalyptus Woodland** (EW) is a type of non-native woodland dominated by large planted or naturalized gum trees (*Eucalyptus* spp.). Very little understory occurs in this community.
- **Coast Live Oak Woodland** (CLO) is a dense woodland community dominated by coast live oak with a closed, or nearly-closed, canopy. This community typically occurs on north facing slopes or shaded canyons and ravines. Common understory species include poison oak, blue elderberry (*Sambucus nigra* ssp. *caerulea*), laurel sumac, and toyon (*Heteromeles arbutifolia*).

**Disturbed/Developed**

- **Disturbed Habitat** (DIS) is where past or present physical disturbance is prevalent such that an area is no longer recognizable as a native or naturalized vegetation association. Typically, if vegetation is present, it is nearly exclusively composed of non-native plant species that take advantage of the disturbance. Examples of disturbed land include areas that have been disked or graded, and/or experienced repeated use that prevents natural revegetation; recently cleared firebreaks; construction staging areas; off-road vehicle trails; and old building sites.
- **Urban/Developed** (DEV) areas do not support native vegetation and are characterized by permanent or semi-permanent structures. Examples include buildings, parking lots, pavement, concrete, freeways, maintained dirt roads, and railways.

## 4.2 Field Investigations

Reconnaissance level field surveys were conducted throughout the project area for all potential rare plants. Surveys were conducted within suitable habitat throughout the PSA, including areas that were not included within the GIS data provided by SDG&E. Focused surveys for BRFI were conducted according to the *Brodiaea filifolia* Inventory Protocol prepared by the MCB Camp Pendleton Environmental Security Department, Land Management Section (MCB Camp Pendleton 2015a). Potential BRFI habitat GIS data was provided by SDG&E (2015). Areas of plant communities occurring within potential BRFI habitat are provided in Table 2. During the course of surveys, Cardno biologists identified areas that were categorized as potential BRFI habitat in the GIS (SDG&E 2015), but that did not contain suitable BRFI habitat; therefore, such areas were not surveyed. These excluded areas identified by Cardno biologists are described below and are shown on figures in Appendix B.

**Table 2. Area Identified as Potential BRFI Habitat**

| Plant Community | Area |
|---|---|
| DCSS | 163.6 acres |
| NNG | 7.5 acres |
| **TOTAL** | **171.1 acres** |

*Source:* SDG&E 2015.

All suitable BRFI habitats within the project area were surveyed at least every 2 weeks for three complete surveys. Survey teams were led by Cardno biologists (primary surveyors) and were supported by Cardno global positioning system (GPS)/biological technicians. Table 3 presents the complete list of BRFI survey team members.

**Table 3. Cardno Rare Plant Surveyors**

| Surveyor Name | Surveyor Duty |
|---|---|
| Clint Scheuerman (CS) | Biologist – Primary Surveyor |
| Richard Stolpe (RS) | Biologist – Primary Surveyor |
| Melissa Tu (MT) | Biologist – Primary Surveyor |
| Shannon Brown (SB) | GPS/Biological Technician |
| Caitlin Jafolla (CJ) | GPS/Biological Technician |

Surveys were initiated on March 31, 2015, following notification by MCB Camp Pendleton Environmental Security on March 23, 2015 that the BRFI flowering season had begun. The final survey took place on May 21, 2015. See Table 4 for complete survey details.

Note: Initially there were areas mapped as vernal pools but when the Cardno vernal pool biologist visited the sites, they were not in fact vernal pools.

**Table 4. TL695/6971 Rare Plant Survey Details**

| Survey | Date | Survey Team | Surveyors | Project Area Component |
|---|---|---|---|---|
| 1 | March 31 | 5-person team | CS, RS, MT, CJ, SB | Main Survey Area |
| 1 | April 1 | 2-person team | CS, SB | Access Roads |
| 1 | April 2 | 4-person team | CS, SB, CJ, RS | Main Survey Area |
| 1 | April 3 | 2-person team | CS, SB | Access Roads |
| 1 | April 6 | 4-person team | CS, SB, RS, CJ | Main Survey Area |
| 1 | April 7 | 4-person team | CS, SB, RS, CJ | Main Survey Area |
| 1 | April 9 | 2-person team | CS, SB | Access Roads |
| 2 | April 14 | 3-person team | CS, CJ, SB | Main Survey Area |
| 2 | April 15 | 2-person team | CS, SB | Access Roads |
| 2 | April 16 | 4-person team | CS, SB, RS, CJ | Main Survey Area |
| 2 | April 17 | 2-person team | CS, SB | Access Roads |
| 2 | April 20 | 4-person team | CS, SB, RS, CJ | Main Survey Area |
| 2 | April 21 | 3-person team | CS, SB, RS | Main Survey Area |
| 2 | April 23 | 2-person team | CS, SB | Access Roads |
| 3 | April 28 | 4-person team | CS, SB, RS, CJ | Main Survey Area |
| 3 | April 29 | 2-person team | CS, SB | Access Roads |
| 3 | April 30 | 4-person team | CS, SB, RS, CJ | Main Survey Area |
| 3 | May 1 | 2-person team | CS, SB | Access Roads |
| 3 | May 4 | 2-person team | CS, SB | Main Survey Area |
| 3 | May5 | 3-person team | CS, SB, RS | Main Survey Area |
| 3 | May 21 | 2-person team | CS, CJ | Main Survey Area and Access Roads |

All surveys were completed by teams of two to five surveyors walking parallel transects within suitable BRFI habitat in the project area. Surveyors were spaced 15 feet apart per the 100 percent survey methodology required by MCB Camp Pendleton (2015a). Transects were mapped using GPS units with sub-meter level accuracy receivers (one surveyor in each survey team carried the GPS unit at the end of the transect team). Each surveyor walked while in visual and verbal communication with the other surveyor(s) to confirm coverage of the area while collecting streaming GPS data for the transect lines. Transects were conducted in a parallel fashion where possible. However, because of the linear nature of the survey area through many areas of rough, mountainous terrain, transect routes were often conducted in a meandering fashion to provide full coverage of suitable habitat. The resulting transect lines were incorporated into GIS layers. Appendix B shows the BRFI transect lines for all three survey events. GPS transect data is to be provided separately on a compact disc. GPS data was stored in California State Plane, Zone VI coordinates, North America Datum of 1983, United States Survey Feet measure.

Transects were restricted to the survey area. However, populations of all rare plants observed within the project area were mapped to their full extent, including those portions that extended outside of the buffers. In addition, populations that were incidentally observed outside of the project area buffer during surveys were mapped. Consistent with MCB Camp Pendleton rare plant mapping procedures (MCB Camp Pendleton 2015a), populations of rare plants were mapped using a 23-foot minimum polygon rule. All rare plants of the same species occurring within 23 feet of each other were mapped as, and considered to be, one population. Any plant(s) that occurred more than 23 feet from another population was mapped as a separate population.

As discussed above, Cardno biologists determined that some areas categorized as containing suitable habitat for BRFI did not in fact contain suitable habitat, and therefore surveys were not conducted in these areas. These areas, described below, included dense stands of scrub communities (e.g., DCSS with no herb layers) (Photo 1), dense stands of NNG-broadleaf dominated (Photo 2), riparian stands, highly disturbed areas (e.g., roads, mowed areas), and steep areas having slopes of approximately 60 percent or greater.

**Dense stands of scrub communities**, primarily DCSS, often completely dominated by woody shrubs and subshrubs that contain little to no herbaceous understory and are more or less impassable on foot, were not surveyed (Photo 1). Many of these areas were dominated by sclerophyllous species such as lemonade berry (*Rhus integrifolia*) and laurel sumac. However, all areas where grasslands intergraded with such habitats (i.e., where understories were present) were surveyed. Also, all grassland patches within and amongst dense scrub communities were surveyed.

**Photo 1. Example Dense DCSS Stand that was not Surveyed**

**Dense stands of NNG-broadleaf dominated,** often found bordering and/or within grassland communities and that are entirely dominated by one or more herbaceous, broad-leaved exotic species, were not surveyed (Photo 2). The dominance of broadleaved exotics reflects previous disturbance, and within these habitat patches, the extreme density of exotic species and associated plant litter typically prevents the establishment of understory species. Areas that that were only partially dominated by non-native, broad-leaved species were fully surveyed.

**Photo 2. Example Dense NNG-Broadleaf Dominated Stand that was not Surveyed**

**Riparian stands** typically occurring in bottomlands and/or along aquatic systems and dominated by willows (*Salix* spp.), mule-fat, and other riparian trees and shrubs were not surveyed. Fringe riparian areas that bordered suitable habitat were surveyed up until vegetation became too dense for BRFI.

**Highly disturbed areas**, including roads, man-made structures, and habitats altered to the point that native vegetation no longer persists there, were not surveyed.

**Steep areas** having slopes of approximately 60 percent or greater were excluded for safety reasons and because BRFI is not known to occur on such slopes.

# 5.0 RESULTS

This section presents the 2015 TL 695/6971 rare plant survey results. Prior to surveys, a list of rare plants potentially occurring within the project area based on potential suitable habitat was provided to Cardno by SDG&E so that these species would also be included in the survey. As discussed above in Section 1.0, Introduction, those species included BRFI, many-stemmed dudleya (*Dudleya multicaulis*), Palmer's grapplinghook (*Harpagonella palmeri*), Pendleton button celery (*Eryngium pendletonense*), and variegated dudleya (*Dudleya variegata*), of which only BRFI was observed in the project area. All rare plant observations are described below. A complete list of all plant species encountered within the project area is provided in Appendix C.

## 5.1 BRFI Populations and Plant Community Mapping

Four populations of BRFI were observed during TL 695/6971 rare plant surveys. In accordance with MCB Camp Pendleton protocol, the project area was surveyed once every 2 weeks for a total of three complete survey events (MCB Camp Pendleton 2015a). Once BRFI populations were located and documented, they were revisited during subsequent survey events and numbers of individuals were counted. Table 5 presents the BRFI populations observed during 2015 surveys.

**Table 5. BRFI Populations Observed in 2015**

| BRFI Population | Location | Appendix B Figure # | # of Individuals (Phenology[1]) | | | Max. # |
|---|---|---|---|---|---|---|
| | | | Survey Event 1 | Survey Event 2 | Survey Event 3 | |
| 01 | 33.4424° N<br>-117.5789° W | B-12 | 54<br>(21 FB, 33 FL) | 257 (FL) | 61<br>(58 FR, 3 S) | 257 |
| 02 | 33.4245° N<br>-117.5765° W | B-22 | 123<br>(21 FB, 102 FL) | 281<br>(103 FL, 178 FR) | 54<br>(26 FR, 28 S) | 281 |
| 03 | 33.4210° N<br>-117.5810° W | B-25 | 116<br>(15 FB, 101 FL) | 60<br>(3 FL, 57 FR) | 19<br>(3 FR, 16 S) | 116 |
| 04 | 33.4430° N<br>-117.5809° W | B-12 | NO | 39<br>(3 FB, 36 FL) | 43<br>(33 FL, 10 FR) | 43 |

*Notes:* [1]Phenology (phase of plant's life cycle): FB = flower bud, FL = flowering, FR = fruiting, S = senescent; NO = not observed.

As described in Section 4.0, Methods, plant community GIS data for the project area was provided to Cardno by SDG&E (2015). Where there were gaps in plant community GIS data, Cardno mapped plant communities during the course of rare plant surveys. Areas of plant communities within the project area are provided in Table 6.

Locations of all BRFI populations observed during surveys are presented on figures in Appendix B. Habitat data for each BRFI population is presented in Tables 7-10, which are derived from and based on the standards of *Data Sheet for Rare Plant Points and Polygons* (MCB Camp Pendleton 2015a) (Appendix A).

## 5.2 Other Rare Plants Observed During Surveys

A number of CNPS CRPR List 4 (plants of limited distribution, a watch list) plant species were observed within the survey area; these species are described below. Datasheets were not completed for the List 4 species.

**California boxthorn (*Lycium californicum*)** is a CRPR 4.2 (limited distribution) shrub that occurs in coastal shrub communities throughout coastal southern California. One fairly large population was observed (roughly one hundred individuals) on the south side of Cristianitos Road in an area of sparse DCSS with sandy soil that had multiple, deep erosional channels running through it (Appendix B, Figure B-27).

**Coulter's matilija poppy (*Romneya coulteri*)** is a CRPR 4.2 (limited distribution) perennial herb that is endemic to California. One population of approximately 150 individuals was observed on the south side of Basilone Road, just north of San Onofre Creek in sparse DCSS. This population is vouchered in the Consortium of California Herbaria (2015) and is documented as potentially being one of the only natural populations of this species in San Diego County (Appendix B, Figure B-49).

**Paniculate tarweed (*Deinandra paniculata*)** is a CRPR 4.2 (limited distribution) annual herbaceous species that occurs in grassland communities in southern California. This species was observed in several locations in populations ranging from single individuals to hundreds of individuals. It was typically observed in NNG and was often in disturbed areas, particularly along the side of dirt roads (Appendix B, Figures B-3, B-4, B-11, B-12, B-17, B-67, and B-68).

**Table 6. Plant Communities in the TL 695/6971 Project Area**

| Plant Community | Area (Acres) | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | *Power Line* | *Substations* | | | *Staging Yards* | | | | | | *Stringing Sites* | ***TOTAL*** |
| | | *Basilone* | *Japanese Mesa* | *Talega* | *Basilone* | *Talega 1 of 2* | *San Mateo* | *SONGS Mesa* | *SDG&E Lot 4* | *Lemon Grove* | | |
| ***Grassland*** | | | | | | | | | | | | |
| Non-native Grassland | 6.30 | 0.00 | 0.00 | 0.17 | 0.00 | 2.63 | 0.00 | 0.00 | 0.00 | 0.0 | 0.06 | 9.16 |
| **Subtotal** | **6.30** | **0.00** | **0.00** | **0.17** | **0.00** | **2.63** | **0.00** | **0.00** | **0.00** | **0.0** | **0.06** | **9.16** |
| ***Scrub*** | | | | | | | | | | | | |
| Diegan Coastal Sage Scrub | 226.18 | 0.00 | 0.07 | 2.08 | 0.00 | 0.00 | 0.13 | 0.05 | 0.00 | 0.0 | 0.41 | 228.92 |
| **Subtotal** | **226.18** | **0.00** | **0.07** | **2.08** | **0.00** | **0.00** | **0.13** | **0.05** | **0.00** | **0.0** | **0.41** | **228.92** |
| ***Riparian/Wetland*** | | | | | | | | | | | | |
| Mulefat Scrub | 7.08 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.15 | 7.23 |
| Non-vegetated Channel | 1.45 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.00 | 1.45 |
| Southern Sycamore-Alder Riparian Woodland | 12.13 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | < 0.01 | 12.13 |
| Southern Willow Scrub | 8.87 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | < 0.01 | 0.00 | 0.00 | 0.0 | < 0.01 | 8.87 |
| **Subtotal** | **29.53** | **0.00** | **0.00** | **0.00** | **0.00** | **0.00** | **< 0.01** | **0.00** | **0.00** | **0.0** | **0.16** | **29.68** |
| ***Upland Woodland*** | | | | | | | | | | | | |
| Eucalyptus Woodland | 0.37 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.0 | 0.00 | 0.37 |
| Coast Live Oak Woodland | 0.01 | 0.00 | 0.00 | 0.03 | 0.00 | 0.15 | 0.00 | 0.00 | 0.00 | 0.0 | 0.00 | 0.19 |
| **Subtotal** | **0.38** | **0.00** | **0.00** | **0.03** | **0.00** | **0.15** | **0.00** | **0.00** | **0.00** | **0.0** | **0.00** | **0.56** |
| ***Disturbed/Developed*** | | | | | | | | | | | | |
| Disturbed Habitat | 75.87 | 0.00 | 0.00 | 0.00 | 0.00 | 0.93 | 0.05 | 0.00 | 0.00 | 0.0 | 0.47 | 77.32 |
| Urban/Developed | 55.46 | 1.14 | 0.21 | 5.59 | 1.17 | 0.00 | 1.13 | 80.81 | 1.88 | 2.75 | 1.13 | 151.25 |
| **Subtotal** | **131.33** | **1.14** | **0.21** | **5.59** | **1.17** | **0.93** | **1.18** | **80.81** | **1.88** | **2.75** | **1.60** | **228.67** |
| **TOTAL** | **393.70** | **1.14** | **0.28** | **7.86** | **1.17** | **3.72** | **1.31** | **80.87** | **1.88** | **2.75** | **2.23** | **496.90** |

*Sources:* Cardno 2015, SDG&E 2015.
*Notes:* Talega Staging Yard 2 of 2 is a component that was added to the Proposed Project but is located outside of the PSA.

**San Diego County viguiera (*Viguiera laciniata*)** is a CRPR 4.2 (limited distribution) shrub that occurs in chaparral and coastal sage scrub in coastal southern California. A large population of hundreds of individuals was observed on the slopes surrounding the Talega Substation. It appears that the species was planted in this location, as there is irrigation equipment throughout the area (Appendix B, Figure B-4).

**Western dichondra (*Dichondra occidentalis*)** is a CRPR 4.2 (limited distribution) perennial herb that occurs in chaparral, grasslands, woodlands, and coastal sage scrub in coastal southern California. A single population of approximately 250 individuals was observed in sparse DCSS and VNG (Appendix B, Figure B-34).

**Table 7. BRFI 01 Habitat Data**

| | | | |
|---|---|---|---|
| **Habitat Type** | Grasslands | **Plant Community** | Non-native Grassland |
| **Soil Texture** | Clay Loam | **Aspect** | SSE 1-4 percent |
| **Disturbance Type(s)** | Exotic Plants Predominant | **Disturbance Level** | Low |
| **Disturbance History** | Recent | | |
| **Notes** | None | | |

**Associated Plants**

| Species Name | Absolute percent Cover | Dominance Order | Dominant? | Native? |
|---|---|---|---|---|
| **Herb** | | | | |
| Bromus hordeaceus | 40 | 2 | Y | N |
| Stipa pulchra | 3 | 6 | N | Y |
| Brassica nigra | 5 | 5 | N | N |
| Avena fatua | 75 | 1 | Y | N |
| Bloomeria crocea | 10 | 4 | N | Y |
| Centaurea melitensis | 20 | 3 | N | N |
| Deinandra fasciculata | 10 | 4 | N | Y |
| Brodiaea filifolia | 3 | 6 | N | Y |
| | | | | |
| | | | | |
| **Total Herb Cover:** | 163 | | | |
| **50/20 Thresholds:** 50 percent of total cover = | 0.50 x 163 = ___**81.5**___ percent | | | |
| 20 percent of total cover = | 0.20 x **163** = ___**32.6**___ percent | | | |
| **Shrub** | | | | |
| Baccharis pilularis | 5 | 5 | Y | Y |
| | | | | |
| | | | | |
| **Total Shrub Cover:** | 5 | | | |
| **50/20 Thresholds:** 50 percent of total cover = | 0.50 x _____ = _____ percent | | | |
| | 0.20 x _____ = _____ percent | | | |
| **Tree** | | | | |
| | | | | |
| **Total Tree Cover:** | | | | |
| **50/20 Thresholds:** 50 percent of total cover = | 0.50 x _____ = _____ percent | | | |
| 20 percent of total cover = | 0.20 x _____ = _____ percent | | | |

**Photo 3. BRFI 01 Habitat**

**Table 8. BRFI 02 Habitat Data**

| | | | |
|---|---|---|---|
| **Habitat Type** | Grasslands | **Plant Community** | Non-native Grassland |
| **Soil Texture** | Clay Loam | **Aspect** | SE 3 percent |
| **Disturbance Type(s)** | Exotic Plants Predominant | **Disturbance Level** | Low |
| **Disturbance History** | Recent | | |
| **Notes** | None | | |

**Associated Plants**

| Species Name | Absolute percent Cover | Dominance Order | Dominant? | Native? |
|---|---|---|---|---|
| **Herb** | | | | |
| Avena fatua | 80 | 1 | Y | N |
| Brassica nigra | 15 | 3 | N | N |
| Bromus diandrus | 40 | 2 | Y | N |
| Brodiaea filifolia | 5 | 4 | N | Y |
| Foeniculum vulgare | 3 | 5 | N | N |
| Deinandra fasciculata | 1 | 6 | N | Y |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| **Total Herb Cover:** | 144 | | | |
| **50/20 Thresholds:** 50 percent of total cover = | 0.50 x 144 = ___72___ percent | | | |
| 20 percent of total cover = | 0.20 x **144** = ___28___ percent | | | |
| **Shrub** | | | | |
| | | | | |
| | | | | |
| | | | | |
| **Total Shrub Cover:** | | | | |
| **50/20 Thresholds:** 50 percent of total cover = | 0.50 x _____ = _____ percent | | | |
| | 0.20 x _____ = _____ percent | | | |
| **Tree** | | | | |
| | | | | |
| **Total Tree Cover:** | | | | |
| **50/20 Thresholds:** 50 percent of total cover = | 0.50 x _____ = _____ percent | | | |
| 20 percent of total cover = | 0.20 x _____ = _____ percent | | | |

**Photo 4. BRFI 02 Habitat**

**Photo 5. BRFI 02**

## Table 9. BRFI 03 Habitat Data

| | | | |
|---|---|---|---|
| **Habitat Type** | Grasslands | **Plant Community** | Non-native Grassland |
| **Soil Texture** | Clay Loam | **Aspect** | SSW 10 percent |
| **Disturbance Type(s)** | Exotic Plants Predominant, Road Affecting Population | **Disturbance Level** | Low |
| **Disturbance History** | Recent | | |
| **Notes** | Scraped foot trail is only a couple feet away, potentially affecting population. | | |

**Associated Plants**

| Species Name | Absolute percent Cover | Dominance Order | Dominant? | Native? |
|---|---|---|---|---|
| **Herb** | | | | |
| Avena fatua | 80 | 1 | Y | N |
| Brassica nigra | 5 | 3 | N | N |
| Bromus diandrus | 25 | 2 | Y | N |
| Brodiaea filifolia | 5 | 3 | N | Y |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| **Total Herb Cover:** | 115 | | | |
| **50/20 Thresholds:** 50 percent of total cover = | 0.50 x 115 = ___**57.5**___ percent | | | |
| 20 percent of total cover = | 0.20 x **115** = ___**23**___ percent | | | |
| **Shrub** | | | | |
| | | | | |
| | | | | |
| | | | | |
| **Total Shrub Cover:** | | | | |
| **50/20 Thresholds:** 50 percent of total cover = | 0.50 x _____ = _____ percent | | | |
| | 0.20 x _____ = _____ percent | | | |
| **Tree** | | | | |
| | | | | |
| **Total Tree Cover:** | | | | |
| **50/20 Thresholds:** 50 percent of total cover = | 0.50 x _____ = _____ percent | | | |
| 20 percent of total cover = | 0.20 x _____ = _____ percent | | | |

**Photo 6. BRFI 03 Habitat**

**Photo 7. BRFI 03**

**Table 10. BRFI 04 Habitat Data**

| | | | |
|---|---|---|---|
| **Habitat Type** | Grasslands | **Plant Community** | Non-native Grassland |
| **Soil Texture** | Clay Loam | **Aspect** | SSE 4 percent |
| **Disturbance Type(s)** | Exotic Plants Predominant | **Disturbance Level** | Low |
| **Disturbance History** | Recent | | |
| **Notes** | None | | |

**Associated Plants**

| Species Name | Absolute percent Cover | Dominance Order | Dominant? | Native? |
|---|---|---|---|---|
| **Herb** | | | | |
| Avena fatua | 65 | 1 | Y | N |
| Brassica nigra | 5 | 3 | N | N |
| Bromus diandrus | 35 | 2 | Y | N |
| Brodiaea filifolia | 3 | 4 | N | Y |
| Dichelostemma capitatum | 3 | 4 | N | Y |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| **Total Herb Cover:** | 111 | | | |
| **50/20 Thresholds:** 50 percent of total cover = | 0.50 x 163 = ___**55.5**___ percent | | | |
| 20 percent of total cover = | 0.20 x **163** = ___**22.2**___ percent | | | |
| **Shrub** | | | | |
| | | | | |
| | | | | |
| | | | | |
| **Total Shrub Cover:** | | | | |
| **50/20 Thresholds:** 50 percent of total cover = | 0.50 x _____ = _____ percent | | | |
| | 0.20 x _____ = _____ percent | | | |
| **Tree** | | | | |
| | | | | |
| **Total Tree Cover:** | | | | |
| **50/20 Thresholds:** 50 percent of total cover = | 0.50 x _____ = _____ percent | | | |
| 20 percent of total cover = | 0.20 x _____ = _____ percent | | | |

**Photo 8. BRFI 04 Habitat**

**Photo 9. BRFI 04**

# 6.0 DISCUSSION

Four populations of BRFI were observed and documented in and/or adjacent to the TL 695-6971 project area. Five other rare plant species (CRPR 4.2) were observed in the project area. All rare plant species documented and/or mapped in this report, and the habits in which they occur, should be avoided to the maximum extent possible during project planning, development, and construction.

# 7.0 REFERENCES

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USFWS. 2009. *Brodiaea filifolia* (thread-leaved brodiaea) 5-Year Review: Summary and Evaluation. Carlsbad Fish and Wildlife Office. Carlsbad, California. August 13.

USFWS. 2011. Endangered and Threatened Wildlife and Plants; Final Revised Critical Habitat for Brodiaea filifolia (Thread-Leaved Brodiaea), Final Rule. 76 *Federal Register* 26 (February 8, 2011): 6848-6925.

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# APPENDIX A

***MCB Camp Pendleton Brodiaea filifolia Inventory Protocol and Data Sheet for Rare Plant Points and Polygons***

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*Brodiaea filifolia* Inventory Protocol
Marine Corps Base Camp Pendleton
Environmental Security Department
Land Management Section
March 2015

## 1. TECHNICAL REQUIREMENTS

**A.** The surveyors shall have five years of experience with rare plant inventory and monitoring and a minimum of a Bachelor's degree in ecology, botany, biology or related field. The surveyors shall have at least one field season of experience surveying for the presence of *Brodiaea filifolia*. Staff shall possess the ability to distinguish *Brodiaea filifolia* from other similar species such as Kern brodiaea (*Brodiaea terrestris* ssp. *kernensis*), harvest brodiaea (*Brodiaea elegans* ssp. *elegans*), Orcutt's brodiaea (*Brodiaea orcuttii*), blue-eyed-grass (*Sisyrinchium bellum*), and blue dicks (*Dichelostemma capitatum*). All of these species are known to occur on the Base, except for harvest brodiaea. The resumes of all surveyors will be provided to the Land Management Section for approval prior to surveys.

**B.** The Contractor must have sufficient qualified staff to inventory all acreage within the short *Brodiaea filifolia* blooming period.

## 2. INVENTORY FOR PROJECT CLEARANCE

**A.** **Timing:** Land Management Section will visit two reference populations starting in mid-April to determine the appropriate inventory window. The southern population is in the Juliet Training Area and the central population is in the Oscar Two Training Area. *Brodiaea filifolia* blooms later than Kern brodiaea (*Brodiaea terrestris* ssp. *kernensis*); therefore, do not use it as a surrogate for determining the inventory window. An e-mail will be sent out to various contractors, U.S. Fish and Wildlife Service (USFWS), NAVFAC Southwest, and NAVFAC Atlantic when *Brodiaea filifolia* is observed. Any surveys completed for *Brodiaea filifolia* prior to this time will be invalid. This plant is a late spring to early summer blooming species with a short blooming window, typically mid-April through early-June. The three survey events will be conducted when *Brodiaea filifolia* is in bloom and overcast days will be avoided.

**B.** **Methods:** Inventory of *Brodiaea filifolia* for project clearance requires a 100% survey methodology in order to be accepted by the USFWS. The survey area will be surveyed once every two weeks for a minimum of three complete visits. The percent cloud cover and air temperature at the start and end of each survey date will be recorded and provided in the report as a table.

- **a. Transect Routes:** The inventory team members will walk parallel transects and each surveyor will be no more than 15 feet apart from each other. In portions of the inventory area where access is difficult, such as areas of relatively dense vegetation and/or steep slopes, care must be taken to ensure all accessible clearings are surveyed and the transect width can be expanded in these areas. For particularly large survey areas, the site can be divided into segments and those segments would be surveyed in the same order on subsequent survey events. The surveys during each survey event must be completed on consecutive dates, unless there is a conflict with Range Scheduling or there is inclement weather. All surveys must be performed when *Brodiaea filifolia* is in bloom. The survey routes from survey events 1, 2, and 3, along with the number of people that walked each transect, shall be documented with Geographical Positioning System (GPS) units that have sub-meter level of accuracy. This means that the GPS will collect streaming data as the botanists walk, rather than just collecting data at the beginning and end points of each transect. The transect routes from survey events 1, 2, and 3 shall be provided to the Land Management Section as a Geographical Information System (GIS) layer. It is expected

that the transect GIS dataset will appear as the parallel, naturally walked transect routes covering the entire survey area.

**b. Surveyed and Excluded Areas:** The GIS files and the report will clearly show the areas that were surveyed according to this protocol, and it will show the areas that were not surveyed and the reason for their exclusion (e.g., developed areas, dirt roads, riparian areas, etc.).

**c. Population Boundaries:** The population boundaries of all sensitive plants will be mapped using a GPS that has sub-meter level of accuracy. *Brodiaea filifolia* population boundaries will be mapped during each survey event. Sensitive plants will be mapped using the 7-meter mapping rule for each survey event. In other words, all plants located within 7 meters of each other would be considered one population, and plants located outside of the 7 meters would be a separate population. The GIS submittal to the Land Management Section will show the boundaries of the *Brodiaea filifolia* populations for each survey event and any other incidental sensitive plant populations.

**d. Population Estimate:** The number of *Brodiaea filifolia* individuals at each point and polygon location will be counted during each site visit and included in the GIS files as the pop_count. For large polygons that are difficult to count, the number of individuals within a polygon will be estimated by laying a one-meter-wide belt transect across the longest axis of the population polygon for each of the three visits. The highest number of individuals from the three visits will be used for the final population number for a particular point or polygon location and will be included in the GIS files as the plant_num (e.g, if 3 individuals were observed during survey event 1 in a particular *Brodiaea filifolia* population, 6 were observed in that population during survey event 2, and 4 were observed in that population during survey event 3, then the highest number observed for this particular population during the three survey events is 6). A table will be included in the results section of the report. The first column will include all *Brodiaea filifolia* populations within the survey area according to the 7-meter mapping rule, the next three columns will be the pop_count for survey events 1, 2, and 3, and the fifth column will show the highest number of individuals from the three visits (i.e., plant_num). In addition, the phenology of the *Brodiaea filifolia* plants will be estimated and provided in the GIS submittal. This includes the number of individuals in the vegetative stage, flower bud stage, flowering stage, fruiting and seed dispersal stage, and senescent stage (i.e., finished flowering and seed dispersal).

**e. Field Data Collection:** Field data for the sensitive plant populations shall include, but are not limited to, the following:

- **Date:** date the individuals were observed
- **Population Count:** total number of individuals
- **Phenology:** number of individuals in the vegetative stage, flowering bud stage, flowering stage, fruiting/seed dispersal stage, and senescent stage
- **Vegetation Community:** vegetation type following the most recent Vegetation Communities of San Diego County by Oberbauer

- **Dominant Plant Species:** The dominate plant species' scientific names listed in order of dominance using the nomenclature in The Jepson Manual, 2nd Edition. Dominant species shall be determined based on a 50/20 dominance rule per stratum, which is described in the United States Army Corps of Engineers Arid West Supplement (Page 22, Procedure for Selecting Dominant Species by the 50/20 Rule). An example table is provided below:

| Stratum | Species Name | Absolute Percent Cover | Dominant? |
|---|---|---|---|
| **Herb** | *Ambrosia psilostachya* | 3% | Yes |
| | *Distichlis spicata* | 3% | Yes |
| | *Bromus diandrus* | 2% | No |
| | *Polypogon monspeliensis* | 2% | No |
| | *Sisyrinchium bellum* | 1% | No |
| | **Total Herb Cover** | **11%** | |
| | **50/20 Thresholds:**<br>50% of total cover =<br>20% of total cover = | <br>0.50 x 11 = 5.5%<br>0.20 x 11 = 2.2% | |
| **Shrub** | *Artemisia californica* | 10% | Yes |
| | *Eriogonum fasciculatum* | 5% | Yes |
| | *Isocoma menziesii* | 2% | No |
| | **Total Shrub Cover** | **17%** | |
| | **50/20 Thresholds:**<br>50% of total cover =<br>20% of total cover = | <br>50% x 17 = 8.5%<br>20% x 17 = 3.4% | |
| | **Dominant species across all strata in order of dominance:** *Artemisia californica, Eriogonum fasciculatum, Ambrosia psilostachya, Distichlis spicata* | | |

- **Abundance Codes:** A numerical value between 1 and 3 assigned to each dominant plant species based on absolute percent cover:
  1 = 1 to 33% cover
  2 = 34 to 67% cover
  3 = 68 to 100% cover
- **Vegetation Community:** The vegetation type following the most recent Vegetation Communities of San Diego County by Oberbauer.
- **Soil Texture:** Soil texture testing shall be conducted in each BRFI population using a "Simplified Key to Soil Texture" (Brewer and McCann 1982). State in the report and GIS if the soil texture agrees with the mapped Natural Resources Conservation Service (NRCS) soil type.

**Simplified Key to Soil Texture (Brewer and McCann, 1982):**

Place about three teaspoons of soil from the upper soil horizon in the palm of your hand. Take out any particles >2mm in size, moisten soil to saturation, and use the following key to figure out the soil texture

A1 Soil does not remain in a ball when squeezed ..... **sand**
A2 Soil remains in a ball when squeezed ..... B

B1 Squeeze the ball between your thumb and forefinger, attempting to make a ribbon that you push up over your finger. Soil makes no ribbon ..... **loamy sand**
B2 Soil makes a ribbon; may be very short ..... C

C1 Ribbon extends less than 1" before breaking ..... D
C2 Ribbon extends 1" or more before breaking ..... E

D1 Add excess water to small amount of soil; soil feels at least slightly gritty ..... **loam or sandy loam**
D2 Soil feels smooth ..... **silt loam**

E1 Soil makes a ribbon that breaks when 1-2" long; cracks if bent into a ring ..... F
E2 Soil makes a ribbon more than 2" long; doesn't crack when bent into a ring ..... G

F1 Add excess water to small amount of soil; soil feels at least slightly gritty .. **sandy clay loam or clay loam**
F2 Soil feels smooth ..... **silty clay loam or silt**

G1 Add excess water to a small amount of soil; soil feels at least slightly gritty ..... **sandy clay or clay**
G2 Soil feels smooth ..... **silty clay**

- **Aspect:** Aspect will be identified using the cardinal points of a compass, along with descriptive information regarding the slope. Examples, Flat, N (steep, rocky cliffs), NW (very steep cliff-faces), S (almost vertical cliffs).
- **Disturbance Type:** New or historical disturbance impacting the species shall be recorded according to the following disturbance codes/types:

| Disturbance Code | Disturbance Type | Description |
|---|---|---|
| **0** | **No Disturbance** | No other disturbance types from this list can be assigned to a given population. |
| **1** | **Fill** | Population is observed to be growing in imported (or "fill") soils due to development or dumping. |
| **2** | **Tire Ruts** | Tire ruts are seen within or near a population and these ruts are determined to have the potential to impact the population either directly or via modifications to local hydrology. |
| **3** | **Scraped Mounds** | Population is observed to be growing in an area where the local topography of mima mounds have been scraped or altered in some way. |
| **4** | **Trash/Dumping** | A significant quantity of debris (anthropogenic source) is observed within or near the population. |

<table>
<tr><th>Disturbance Code</th><th>Disturbance Type</th><th>Description</th></tr>
<tr><td>5</td><td>Exotic Plants Predominant</td><td>Population is observed to be growing in an area with a >50% proportion of non-native dominant species. For example, if there is one native dominant species and one non-native dominant species in an area, and they add to 60% total cover, then the non-native dominant would have to have an absolute cover greater than 30% (or half of the total cover comprised by dominants as determined by the 50/20 rule) to qualify for this disturbance type. Use the following table:
<table>
<tr><th>1</th><th>2</th><th>3</th><th>4</th><th>5</th></tr>
<tr><td>Total Cover of Dominant Plants* from Assoc. Plants Table</td><td>Divide the value in Column 1 by 2</td><td>Cover of Dominant Native Plants*</td><td>Cover of Dominant Non-native Plants*</td><td>Exotic Plants Predominant? (value for Column 4 must be greater than the value for Column 2)</td></tr>
<tr><td></td><td></td><td></td><td></td><td></td></tr>
</table></td></tr>
<tr><td>6</td><td>Fire</td><td>Population tion is observed to be growing in an area affected by fire within a recent enough timeframe to still observe the fire’s effects.</td></tr>
<tr><td>7</td><td>Excavated Area</td><td>Population is observed to be growing in an excavated area, or if the population is determined to have been altered by nearby excavation.</td></tr>
<tr><td>8</td><td>Road Affecting Population</td><td>Population is observed to be growing in a road or trail, or if the population is determined to have been altered by nearby road or trail.</td></tr>
<tr><td>9</td><td>Scraped Area</td><td>Population is observed to be growing in a scraped area, or if the population is determined to have been altered by nearby scraping.</td></tr>
<tr><td>10</td><td>Mowing</td><td>Population is observed to be growing in an area that is mowed.</td></tr>
<tr><td>11</td><td>Thatch</td><td>This value is assigned if a population is observed to be growing in dense thatch.</td></tr>
<tr><td>12</td><td>Vehicle Activity</td><td>Population is observed to be growing in an area affected by off-road vehicles.</td></tr>
<tr><td>13</td><td>Firebreak</td><td>Population is observed to be growing in an area affected by firebreak grading, disking, mowing, or erosion.</td></tr>
<tr><td>14</td><td>Grazing</td><td>Population is observed to be growing in an area affected grazing by livestock (e.g., horses, cattle, sheep).</td></tr>
<tr><td>15</td><td>Small Mammal Soil Disturbance</td><td>Population is observed to be growing in an area affected by small mammals.</td></tr>
<tr><td>16</td><td>Erosion</td><td>Population is observed to be growing in an area affected by erosion.</td></tr>
<tr><td>17</td><td>Argentine Ants</td><td>Population growing in an area with argentine ants.</td></tr>
<tr><td></td><td></td><td>List any other disturbance types observed that do not fit any of the above categories.</td></tr>
</table>

- **Disturbance Level:**

| Disturbance Level | Number of Disturbances | Description |
|---|---|---|
| **Negligible** | 0–1 disturbances | The area does not have any disturbance affecting the BRFI population or negligible disturbances. If the area has 2 or more disturbances, a negligible disturbance level cannot be assigned. |

| Disturbance Level | Number of Disturbances | Description |
|---|---|---|
| **Low** | 1–3 disturbances | The disturbance(s) slightly affect the BRFI population. If the area has 4 or more disturbances, a low disturbance level cannot be assigned. |
| **Moderate** | 1–4 disturbances | The disturbance(s) is/are determined to have current or potential impacts to the BRFI population that may result in minor fragmentation, population reduction, and/or impedance of seed recruitment to surrounding areas. |
| **High** | 1 or more disturbances | The disturbance(s) is/are determined to cause severe impacts to the BRFI population resulting in fragmentation, population reduction, and/or impedance of seed recruitment to surrounding areas. |

- **Disturbance History:**

| Disturbance History | Description |
|---|---|
| **Recent** | A disturbance occurring within the current or previous growing season. |
| **Historical** | A disturbance occurring more than one growing season ago. |
| **NA** | Not applicable. |

- **Status:**

| Status | Description |
|---|---|
| **New** | If the observed individual is not within 7 meters of a known population from the Base GIS data set, then this observed individual would be categorize as "New". |
| **Historic** | If the observed individual is within 7 meters of a known population from the Base GIS data set, then this individual would be categorized as "Historic". |

- **Surveyors:** The names of the surveyor(s) shall be provided in the report and the GIS data set.
- **Photographs:** Photographs shall be provided of each special-status species observed within the survey area.

**C. <u>Range Control</u>:** The inventory crew must obtain a Range Facility Management Support System (RFMSS) reservation for the training area two weeks in advance and try every available day of that week to enter the training area if scheduling is difficult. One member of the survey team must be Range Safety Officer (RSO) certified. The RSO will checkout a radio from the Base and will keep in contact with Longrifle.

## 4. GPS AND GIS DATA DICTIONARIES

**A. <u>GPS and GIS</u>:** The Base GIS flora data dictionary is standardized for *Brodiaea filifolia.* It requires the collection of certain data in a certain format. This information could be entered into the GPS unit for easy upload into the GIS database. The following table shows the portions of the *Brodiaea filifolia* GIS flora data dictionary related to collection of field data for rare plant point and polygon locations.

| Attribute Name | Description | Example Values |
|---|---|---|
| **Rare Plant Populations (flora_special_species_area and flora_special_species_point):** | | |
| **species_id** | Primary Key. A unique, user defined identifier for each record or instance of an entity. [Format should include keyword given by CPEN (rp), four digit year of survey, abbreviated agency/contractor name (lowercase), and unique ID. Add enough leading zeros to the unique IDs so they all have the same number of digits.] (Text, 20) | rp_2010_aecom_01 |
| **feat_name** | Scientific name of species observed. (Text, 30) | Brodiaea filifolia |
| **pop_date** | The date on which the population count was made. Format for date is YYYYMMDD. (Long, 4) | 20100512 |
| **pop_count** | Number of individuals observed at this location on this pop_date. Collect this information for each survey event. (Long, 4) | 3 |
| **vegetative** | The number of individuals in the vegetative stage. (Double) | 0 |
| **flower_bud** | The number of individuals with flower buds. (Double) | 2 |
| **flowering** | The number of individuals flowering. (Double) | 1 |
| **fruiting** | The number of individuals fruiting and setting seed. (Double) | 0 |
| **senescent** | The number of individuals that have finished flowering, fruiting, and setting seed. (Double) | 0 |
| **hab_typ_d** | Applicable domain coded values include: CHAPARRAL, CLEARING, CLIFF, COASTAL, CULTIVATED FIELD, DUNE, ESTUARINE, FOREST, GRASSLANDS, LAKE, LOWLAND, MARSH, MEADOW, NEARSHORE, OAK_WOODLAND, OTHER, POND, RIPARIAN, RIPARIAN_SCRUB, RIPARIAN_WOODLAND, RIPARIAN_FOREST, RIVER, SAGE_SCRUB, SHOAL, SHORE_ZONE, STREAM, SWAMP, SYCAMORE_GRASSLAND, UNVEG_SAND, UPLAND, URBAN_LAND, VEG_SAND, VERNAL_POOL, WETLANDS. (Text, 16, Uppercase) | GRASSLANDS |
| **plant_comm** | The vegetation type. Follow most recent Vegetation Communities of San Diego County by Oberbauer. (Text, 75) | Non-native Grassland: Broadleaf-dominated |

<table>
<tr><th>Attribute Name</th><th>Description</th><th>Example Values</th></tr>
<tr><td>assoc_plants</td><td>Top four dominate plant species' scientific names separated with a comma. List in order of dominance using the 50/20 rule and add the abundance code in parenthesis after each species name. (Text, 150)<br>Abundance Codes:<br>1 = >0 to 33% cover<br>2 = >34 to 67% cover<br>3 = >68 to 100% cover</td><td>Brassica nigra (3), Hirschfeldia incana (2), Foeniculum vulgare (1), Avena barbata (1)</td></tr>
<tr><td>soil_texture</td><td>The soil texture using the Simplified Key to Soil Texture by Brewer and McCann (1982). State the texture with each word capitalized. (Text, 30)</td><td>Silty Clay</td></tr>
<tr><td>aspect</td><td>Fill in with N, S, E, W, NE, SE, NW, or SW followed in parenthesis with descriptive information. (Text, 40)<br>Examples:<br>N (Steep, rocky cliffs)<br>NW (Very steep cliff-faces)<br>S (Almost vertical cliffs)<br>Flat</td><td>Flat</td></tr>
<tr><td>disturb_type</td><td>The type of disturbance according to the disturbance type table in the methods section. It is acceptable to list other disturbances that are not included in the table. Separate multiples with a comma. (Text, 30)<br><br><table><tr><th>Disturbance Code</th><th>Disturbance Type</th></tr><tr><td>0</td><td>No Disturbance</td></tr><tr><td>1</td><td>Fill</td></tr><tr><td>2</td><td>Tire Ruts</td></tr><tr><td>3</td><td>Scraped Mounds</td></tr><tr><td>4</td><td>Trash/Dumping</td></tr><tr><td>5</td><td>Exotic Plants Predominant</td></tr><tr><td>6</td><td>Fire</td></tr><tr><td>7</td><td>Excavated Area</td></tr><tr><td>8</td><td>Road Affecting Population</td></tr><tr><td>9</td><td>Scraped Area</td></tr><tr><td>10</td><td>Mowing</td></tr><tr><td>11</td><td>Thatch</td></tr><tr><td>12</td><td>Vehicle Activity</td></tr><tr><td>13</td><td>Firebreak</td></tr><tr><td>14</td><td>Grazing</td></tr><tr><td>15</td><td>Small Mammal Soil Disturbance</td></tr><tr><td>16</td><td>Erosion</td></tr><tr><td>17</td><td>Argentine Ants</td></tr></table></td><td>5, 8</td></tr>
</table>

<table>
<tr><th>Attribute Name</th><th>Description</th><th>Example Values</th></tr>
<tr><td>disturb_level</td><td>The disturbance level. Acceptable values include: Negligible, Low, Moderate, High. (Text, 16)<br><br><table><tr><td>Negligible:</td><td>0–1 disturbances: The area does not have any disturbance affecting the BRFI population. If the area has 2 or more disturbances, a negligible disturbance level cannot be assigned.</td></tr><tr><td>Low:</td><td>1–3 disturbances: The disturbance(s) slightly affect the BRFI population. If the area has 4 or more disturbances, a low disturbance level cannot be assigned</td></tr><tr><td>Moderate:</td><td>1–4 disturbances: The disturbance(s) is/are determined to have current or potential impacts to the BRFI population that may result in minor fragmentation, population reduction, and/or impedance of seed recruitment to surrounding areas.</td></tr><tr><td>High:</td><td>1 or more disturbances: The disturbance(s) is/are determined to cause severe impacts to the BRFI population resulting in fragmentation, population reduction, and/or impedance of seed recruitment to surrounding areas.</td></tr></table></td><td>Low</td></tr>
<tr><td>disturb_hist</td><td>The disturbance history according to the table provided in the methods section. Acceptable values include: Recent, Historical. (Text, 16)<table><tr><td>Recent:</td><td>A disturbance occurring within the current or previous growing season.</td></tr><tr><td>Historical:</td><td>A disturbance occurring more than one growing season ago.</td></tr><tr><td>NA:</td><td>Not applicable.</td></tr></table></td><td>Historical</td></tr>
<tr><td>disturb_notes</td><td>Notes describing disturbances or threats observed within the population. (Text, 100)</td><td></td></tr>
<tr><td>surveynum</td><td>The survey event number. Examples, Survey 1, Survey 2, or Survey 3. (Text, 20)</td><td>Survey 1</td></tr>
<tr><td>surveyor</td><td>The company name and then followed with the name of the individual(s) who surveyed the feature. Use their lowercase initials and separate multiples with a comma. Write out names in the report. (Text, 50)</td><td>AECOM: km, bp</td></tr>
</table>

| Attribute Name | Description | Example Values |
|---|---|---|
| **Transect Routes (flora_study_line):** | | |
| **fl_sty_id** | A unique, user defined identifier for each record or instance of an entity. [Format should include key word given by CPEN (rp for rare plant), survey geometry (L for line), four digit year of survey, abbreviated agency/contractor name, and unique ID. Add enough leading zeros to the unique IDs so they all have the same number of digits.] (Text, 20) | rpL_2010_aecom_01 |
| **survey_date** | Date the feature was surveyed. Format for date is YYYYMMDD (i.e. September 15, 1994 = 19940915). (Long, 4, 10, 0) | 20100512 |
| **survey_event** | The survey event number for a particular area (e.g., Survey 1, Survey 2, Survey 3). (Text, 20) | Survey 1 |
| **trns_detail** | State the number of people that walked the transect and how far apart. (Text, 100) | 2 people 15 feet apart |
| **surveyor** | Name of the individual(s) who surveyed the feature. Use their initials, separate multiples with a comma and a space, and list in alphabetical order. Use lower case. Write out their names in the report. (Text, 50) | al, ap |

**B. GIS Geodatabase:** The GIS files must meet Base specifications and follow the most current GIS flora data dictionaries and metadata requirements. The GIS specifications, data dictionaries, flora geodatabase template, and metadata requirements are available upon request from Environmental Security Department (GIS Specialist, 760-763-1990).

**C. Differential Correction:** The Contractor shall contact the Environmental Security Department GIS Specialist (760-763-1990) to get current information regarding differential correction.

**D. HDOP:** Report Horizontal Dilution of Precision values for each survey in the GIS metadata.

## 5. SURVEY VALIDITY

**A. Survey Validity:** The *Brodiaea filifolia* survey report and GIS files need to be reviewed by the Land Management Section and accepted as valid prior to any site disturbance. Inventories will not be accepted as valid if they did not follow the Base protocol. The survey report and the GIS files will be provided to the Land Management Section (Gwen Kenney, Ecologist, 760-763-6330, gwen.kenney@usmc.mil) within 30 days after completing field surveys.

# DATA SHEET FOR RARE PLANT POINTS AND POLYGONS (Page 1 of 3)

| | | | |
|---|---|---|---|
| **Survey Name** | | **Datasheet No.** | |
| **Contractor** | | **Contract No.** | |
| **Survey Location** | | **Date** (YYYYMMDD) | |
| **Surveyors** | | **Survey Event No.** | |
| | | **GPS Pop ID** | |
| **GPS Waypoints** | | **GIS PopID7m** | |
| **Species Name** | | **VP Spatial ID** | |

| **Individuals** | # Individuals | Vegetative | Flower Bud | Flowering | Fruiting/Seed Dispersal | Senescent | Alt. ERPE Growth Habit |
|---|---|---|---|---|---|---|---|
| | | | | | | | |

| **Gender** | # Males | | # Females | |
|---|---|---|---|---|

**hab_typ_d:** (Pick Only One)

| | | | |
|---|---|---|---|
| ☐ Chaparral | ☐ Marsh | ☐ Riparian Woodland | ☐ Unvegetated Sand |
| ☐ Cliff | ☐ Oak Woodland | ☐ Sage Scrub | ☐ Vegetated Sand |
| ☐ Cultivated Field | ☐ Ponds | ☐ Stream | ☐ Vernal Pool |
| ☐ Dune | ☐ Riparian Forest | ☐ Sycamore Grassland | ☐ Wetlands |
| ☐ Grasslands | ☐ Riparian Scrub | | |

**Plant Community:** (Pick One or Fill in Oberbauer Veg Type)

☐ **Valley Needlegrass Grassland:** 20% or greater cover of native herbaceous species are present

☐ **Non-native Grassland: Broadleaf-dominated:** more than 50% of the total vegetative cover of non-native broadleaf species (e.g., mustard, fennel, tocalote, Italian thistle, bull thistle, milk thistle, etc.)

☐ **Non-native Grassland** ☐ **Other:** _____

☐ **Vernal Pool:** Pool Type _____

**Associated Plants:**

1. Fill in Plants, Absolute % Cover, Dominance Order
2. Sum the % cover values to get the total herb, shrub, and tree cover
3. Do the 50/20 Thresholds math
4. Fill in Dominant Column:
   a. Add up the top ranked dominant plants until you just exceed the 50% of total cover value
   b. Then pick any other plants with cover that is equal to or greater than the 20% of total cover value
5. Fill in the Native column (necessary for Disturbance Type - Exotic Plants Predominant)

**Abundance Codes:**
1: 1-33% cover
2: 34-67% cover
3: 68-100% cover

| **Species Name** | **Absolute % Cover** | **Dominance Order** | **Dominant?** | **Native?** |
|---|---|---|---|---|
| **Herb** | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| **Total Herb Cover:** | | | | |
| **50/20 Thresholds:** 50% of total cover = | 0.50 x _____ = _____% | | | |
| 20% of total cover = | 0.20 x _____ = _____% | | | |
| **Shrub** | | | | |
| | | | | |
| | | | | |
| | | | | |
| **Total Shrub Cover:** | | | | |
| **50/20 Thresholds:** 50% of total cover = | 0.50 x _____ = _____% | | | |
| 20% of total cover = | 0.20 x _____ = _____% | | | |
| **Tree** | | | | |
| | | | | |
| **Total Tree Cover:** | | | | |
| **50/20 Thresholds:** 50% of total cover = | 0.50 x _____ = _____% | | | |
| 20% of total cover = | 0.20 x _____ = _____% | | | |

**Dominant species across all strata in order of dominance with abundance codes in parenthesis (GIS Field Associated Plants):**

| | |
|---|---|
| **Soil Texture** | |
| **Aspect (Slope Description)** | |

| **Survey Name** | | **Datasheet No.** | |
|---|---|---|---|
| **Species Name** | | **Date** (YYYYMMDD) | |
| **GPS ID** | | **VP Spatial ID** | **GIS PopID7m** |

**Disturbance Type:** (All Applicable)

| | GIS Code | Disturbance Type | Description<br>Population is growing in this disturbance type or is affected by this disturbance type: |
|---|---|---|---|
| ☐ | 0 | No Disturbance | |
| ☐ | 1 | Fill | |
| ☐ | 2 | Tire Ruts | Tire ruts are seen within or near a population and these ruts are determined to have the potential to impact the population either directly or via modifications to local hydrology |
| ☐ | 3 | Scraped Mounds | Local topography of mima mounds have been scraped/altered |
| ☐ | 4 | Trash/Dumping | |
| ☐ | 5 | Exotic Plants Predominant<br><br>Are exotics impairing the ability for the rare plants to survive, expand, and set seed?<br>☐ Yes<br>☐ No | **Fill out table:**<br>**1** Total Cover of Dominant Plants* from Assoc. Plants Table \| **2** Divide the value in Column 1 by 2 \| **3** Cover of Dominant Native Plants* \| **4** Cover of Dominant Non-native Plants* \| **5** Exotic Plants Predominant? (value for Column 4 must be greater than the value for Column 2)<br>*Plants must have a "Yes" in the AssociatedPlants Dominants column. |
| ☐ | 6 | Fire | Population growing in an area affected by fire within a recent enough timeframe to still observe the fire's effects |
| ☐ | 7 | Excavated Area | Growing in excavated area or altered by nearby excavation |
| ☐ | 8 | Road Affecting Population | Growing in a road/ trail or altered by nearby road/trail |
| ☐ | 9 | Scraped Area | Growing in a scraped area or altered by nearby scraping. |
| ☐ | 10 | Mowing | Use Disturbance Type "13 Firebreak" if this in within a firebreak |
| ☐ | 11 | Dense Thatch | |
| ☐ | 12 | Vehicle Activity | |
| ☐ | 13 | Firebreak | Population affected by firebreak grading, disking, mowing, or erosion |
| ☐ | 14 | Grazing by livestock | |
| ☐ | 15 | Small Mammal Soil Disturbance | |
| ☐ | 16 | Erosion | Use Disturbance Type "13 Firebreak" if the erosion is due to a firebreak |
| ☐ | 17 | Argentine ants | Found on or next to the plant. |
| ☐ | | | |
| ☐ | | | |

**Disturbance Level:** (Pick Only One)

| | Disturbance Level | Number of Disturbances | Description |
|---|---|---|---|
| ☐ | **Negligible** | 0–1 | No to negligible disturbances |
| ☐ | **Low** | 1–3 | Disturbance slightly affects the population |
| ☐ | **Moderate** | 1–4 | Disturbance(s) is/are determined to have current or potential impacts to the population that may result in minor fragmentation, population reduction, and/or impedance of seed recruitment to surrounding areas. |
| ☐ | **High** | 1 or more | Disturbance(s) is/are determined to cause severe impacts to the population resulting in fragmentation, population reduction, and/or impedance of seed recruitment to surrounding areas. |

**Disturbance History:** (Only One)

☐ **Recent:** A disturbance occurring within the current or previous growing season.
☐ **Historical:** A disturbance occurring more than one growing season ago.
☐ **N/A:** No disturbances

**Notes:**

| | | | | | |
|---|---|---|---|---|---|
| **Survey Name** | | | | **Datasheet No.** | |
| **Species Name** | | | | **Date** (YYYYMMDD) | |
| **GPS ID** | | **VP Spatial ID** | | **GIS PopID7m** | |

| **Vegetative** | **Flower Bud** | **Flower** | **Fruit/Seed Dispersal** | **Senescent** |
|---|---|---|---|---|
| Place tally marks below | | | | |
| | | | | |
| **Total** | **Total** | **Total** | **Total** | **Total** |
| | | | | |

**Total Number of Individuals:**

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# APPENDIX B

*TL 695/6971 Rare Plant Survey Results*

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**Plant Communities in the TL 695/6971 Project Area**

| Acronym | Plant Community |
|---|---|
| CLOW | Coast Live Oak Woodland |
| DCSS | Diegan Coastal Sage Scrub |
| DEV | Urban/Developed |
| DIS | Disturbed Habitat |
| EW | Eucalyptus Woodland |
| MFS | Mulefat Scrub |
| NNG | Non-native Grassland |
| NVC | Non-vegetated Channel |
| SSARW | Southern Sycamore-Alder Riparian Woodland |
| SWS | Southern Willow Scrub |
| VP | Vernal Pool |

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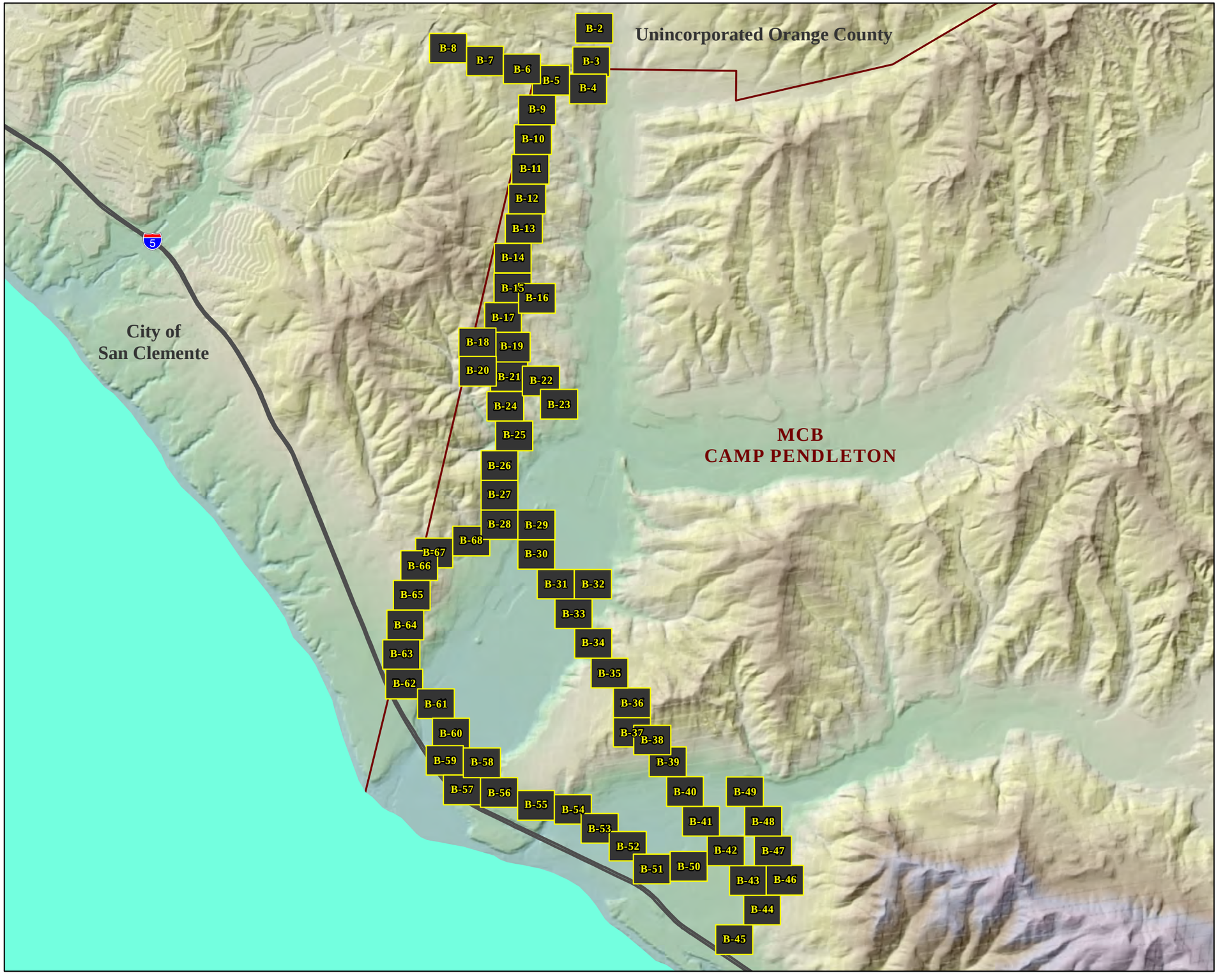
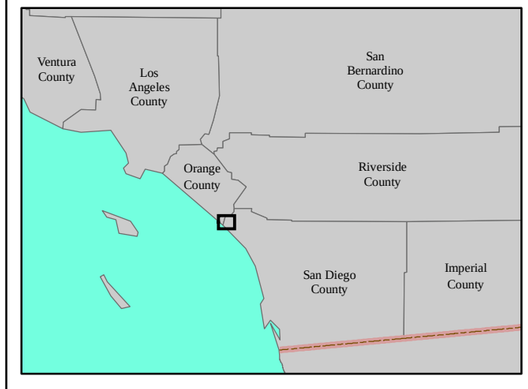



**Figure B-1**
**TL695/6971 Rare Plant Survey Results Overview**

**LEGEND**

- Appendix B Figure Extent
- MCB Camp Pendleton Boundary
- State Route or Interstate




Kilometers
0 2
0 1
Miles

# Figure B-2
# TL695/6971 Rare Plant Survey Results

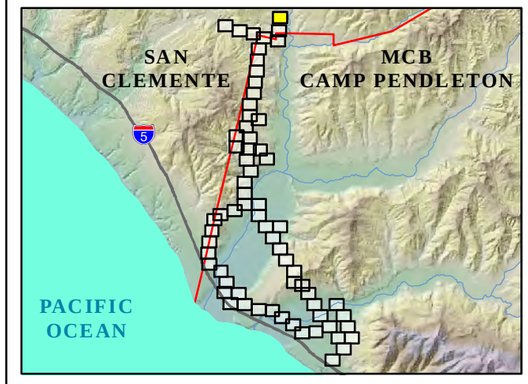

**LEGEND**

Project Features

- Project Survey Area
- Access Route
- Staging Yard
- Existing Wood Pole

Rare Plant Survey Results

- Survey 1 Transect
- Survey 2 Transect
- Survey 3 Transect
- Surveyed Suitable Habitat




Meters
0 50
0 200
Feet

N

Source: SDG&E 2015

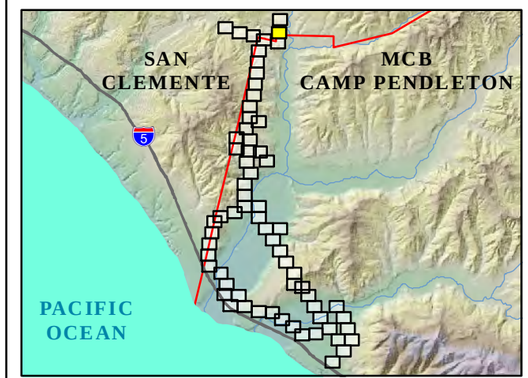
# Figure B-3
# TL695/6971 Rare Plant Survey Results


**LEGEND**

Project Features
- Project Survey Area
- Access Route
- Proposed Project Overhead Route
- Proposed Utility Pole
- Staging Yard
- Existing Wood Pole
- MCB Camp Pendleton Boundary

Rare Plant Survey Results
- Survey 1 Transect
- Survey 2 Transect
- Survey 3 Transect
- Surveyed Suitable Habitat
- Paniculate Tarweed

Unsuitable Potential BRFI Habitat
- Dense DCSS




Meters
0 50
0 200
Feet

Source: SDG&E 2015

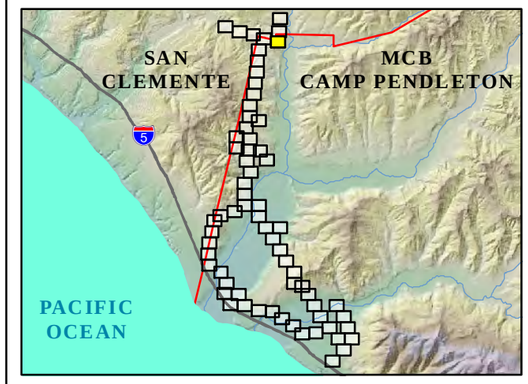

**Figure B-4**
**TL695/6971 Rare Plant Survey Results**

**LEGEND**

Project Features
- Project Survey Area
- Access Route
- Proposed Project Overhead Route
- Proposed Utility Pole
- Existing Wood Pole
- MCB Camp Pendleton Boundary

Rare Plant Survey Results
- Survey 1 Transect
- Survey 2 Transect
- Survey 3 Transect
- Surveyed Suitable Habitat
- Paniculate Tarweed
- San Diego County Viguiera

Unsuitable Potential BRFI Habitat
- Dense DCSS




Meters
0 50
0 200
Feet

Source: SDG&E 2015

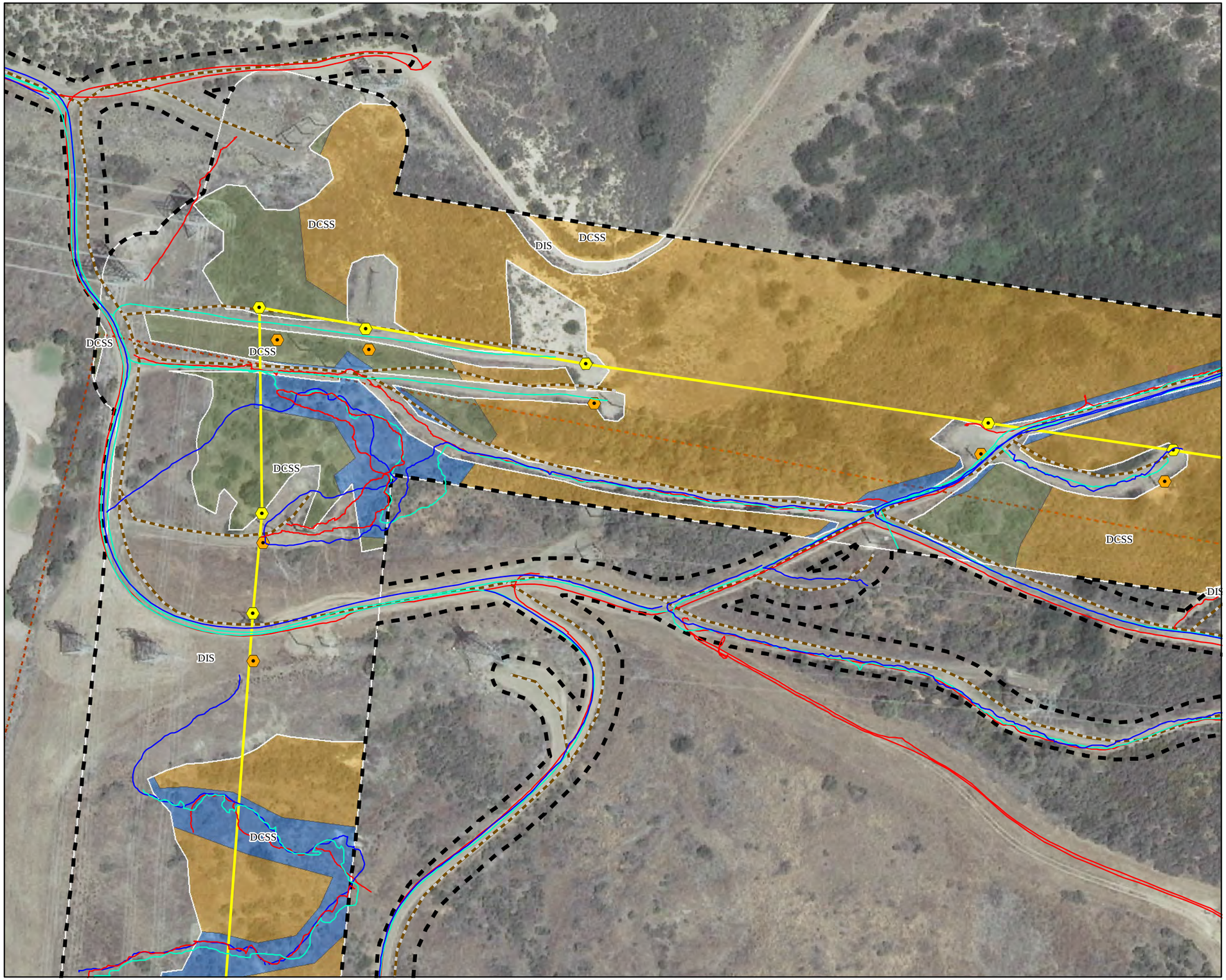
**Figure B-5**
**TL695/6971 Rare Plant Survey Results**

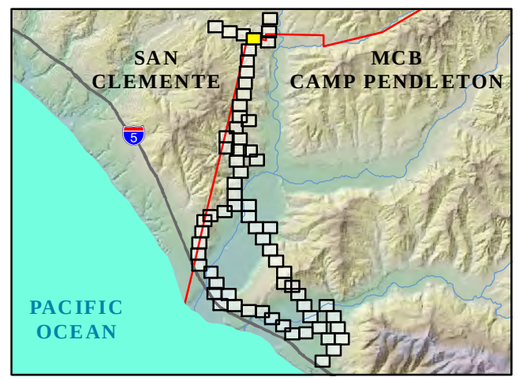
**LEGEND**

Project Features
- Project Survey Area
- Access Route
- Proposed Project Overhead Route
- Proposed Utility Pole
- Existing Wood Pole
- MCB Camp Pendleton Boundary

Rare Plant Survey Results
- Survey 1 Transect
- Survey 2 Transect
- Survey 3 Transect
- Surveyed Suitable Habitat

Unsuitable Potential BRFI Habitat
- Dense NNGB
- Dense DCSS




Meters
0 50
0 200
Feet

Source: SDG&E 2015

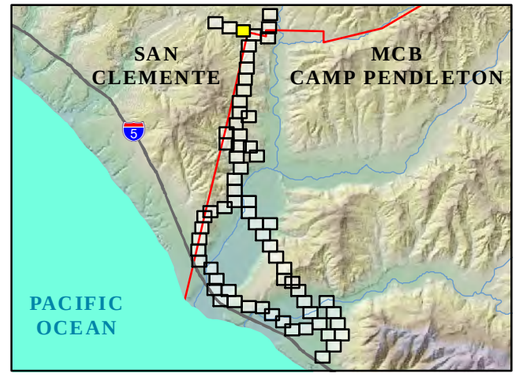

**Figure B-6**
**TL695/6971 Rare Plant Survey Results**

**LEGEND**

Project Features
- Project Survey Area
- Access Route
- Proposed Project Overhead Route
- Proposed Utility Pole
- Existing Wood Pole
- MCB Camp Pendleton Boundary

Rare Plant Survey Results
- Survey 1 Transect
- Survey 2 Transect
- Survey 3 Transect
- Surveyed Suitable Habitat

Unsuitable Potential BRFI Habitat
- Dense NNGB
- Dense DCSS




Meters
0 50
0 200
Feet

Source: SDG&E 2015

**Figure B-7**
**TL695/6971 Rare Plant Survey Results**

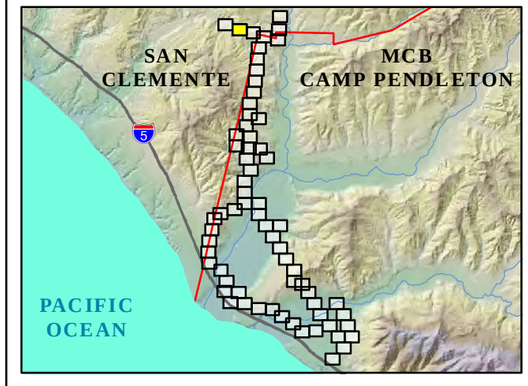
**LEGEND**

Project Features

- Project Survey Area
- Access Route

Rare Plant Survey Results

- Survey 1 Transect
- Survey 2 Transect
- Survey 3 Transect




Meters
0 50
0 200
Feet

Source: SDG&E 2015

**Figure B-8**
**TL695/6971 Rare Plant Survey Results**

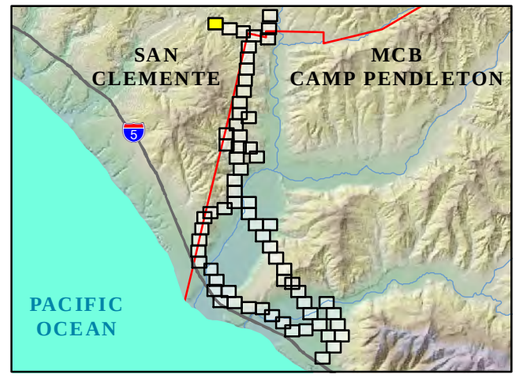
**LEGEND**

Project Features

- Project Survey Area
- Access Route

Rare Plant Survey Results

- Survey 1 Transect
- Survey 2 Transect
- Survey 3 Transect




Meters
0 50
0 200
Feet

N

Source: SDG&E 2015

# Figure B-9
# TL695/6971 Rare Plant Survey Results

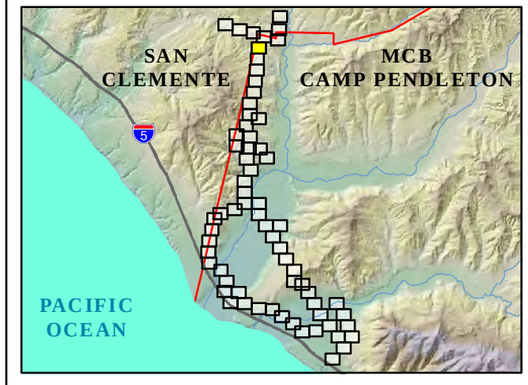
DCSS
DIS
DCSS
SWS
SWS
DCSS
DIS
DIS

**LEGEND**

Project Features
- Project Survey Area
- Access Route
- Proposed Project Overhead Route
- Proposed Utility Pole
- MCB Camp Pendleton Boundary

Rare Plant Survey Results
- Survey 1 Transect
- Survey 2 Transect
- Survey 3 Transect
- Surveyed Suitable Habitat

Unsuitable Potential BRFI Habitat
- Dense DCSS




Meters
0 50
0 200
Feet

Source: SDG&E 2015

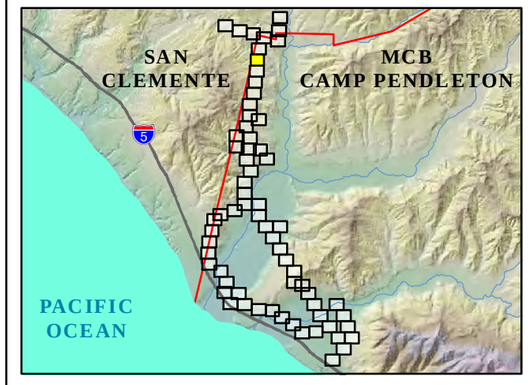

**Figure B-10**
**TL695/6971 Rare Plant Survey Results**

**LEGEND**

Project Features
- Project Survey Area
- Access Route
- Proposed Project Overhead Route
- Proposed Utility Pole
- Existing Wood Pole
- MCB Camp Pendleton Boundary

Rare Plant Survey Results
- Survey 1 Transect
- Survey 2 Transect
- Survey 3 Transect
- Surveyed Suitable Habitat

Unsuitable Potential BRFI Habitat
- Dense DCSS




Meters
0 50
0 200
Feet

Source: SDG&E 2015

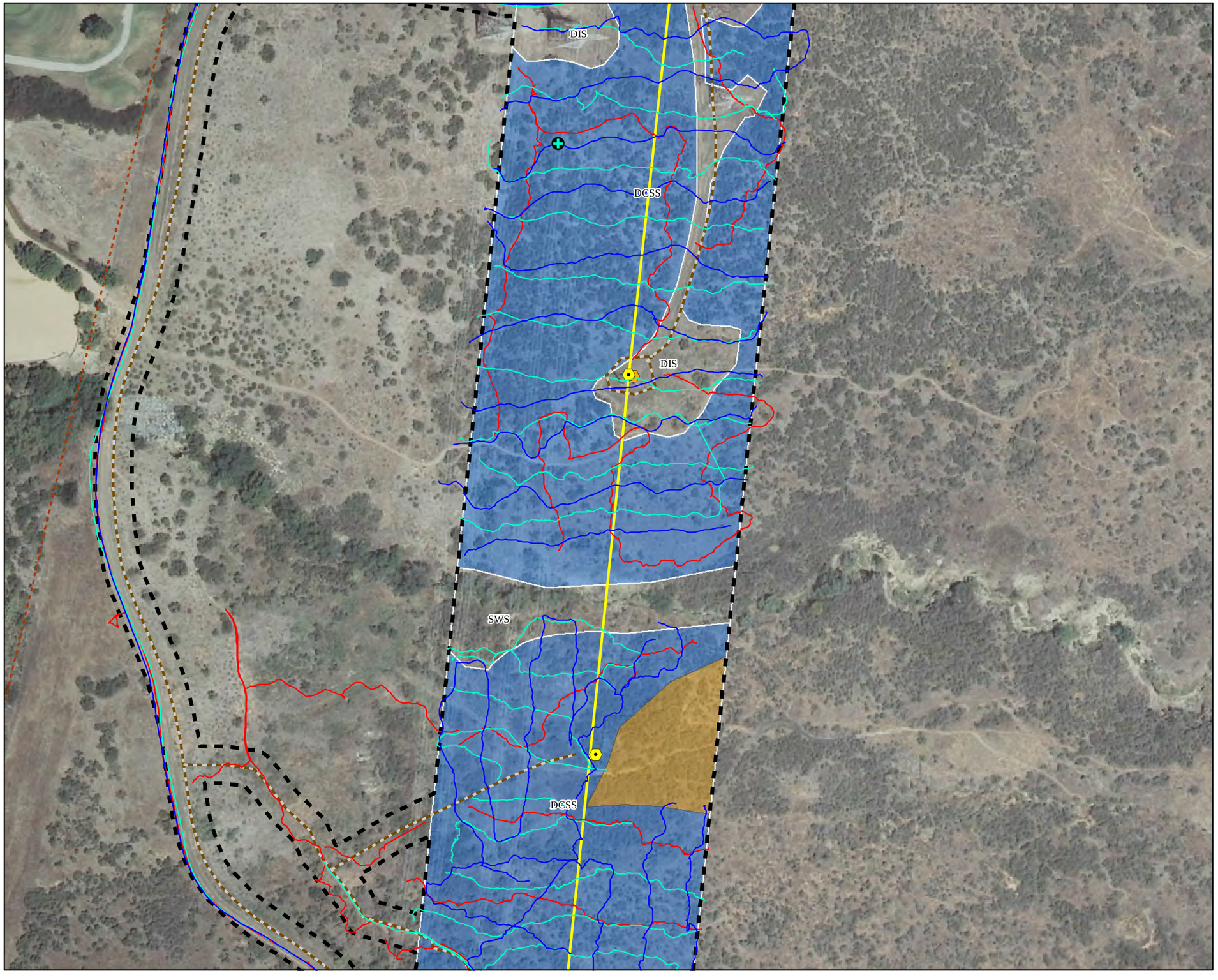


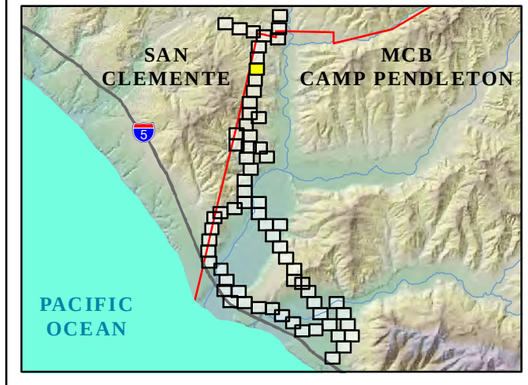

**Figure B-11**
**TL695/6971 Rare Plant Survey Results**

**LEGEND**

Project Features
- Project Survey Area
- Access Route
- Proposed Project Overhead Route
- Proposed Utility Pole
- Existing Wood Pole
- MCB Camp Pendleton Boundary

Rare Plant Survey Results
- Survey 1 Transect
- Survey 2 Transect
- Survey 3 Transect
- Surveyed Suitable Habitat
- Paniculate Tarweed

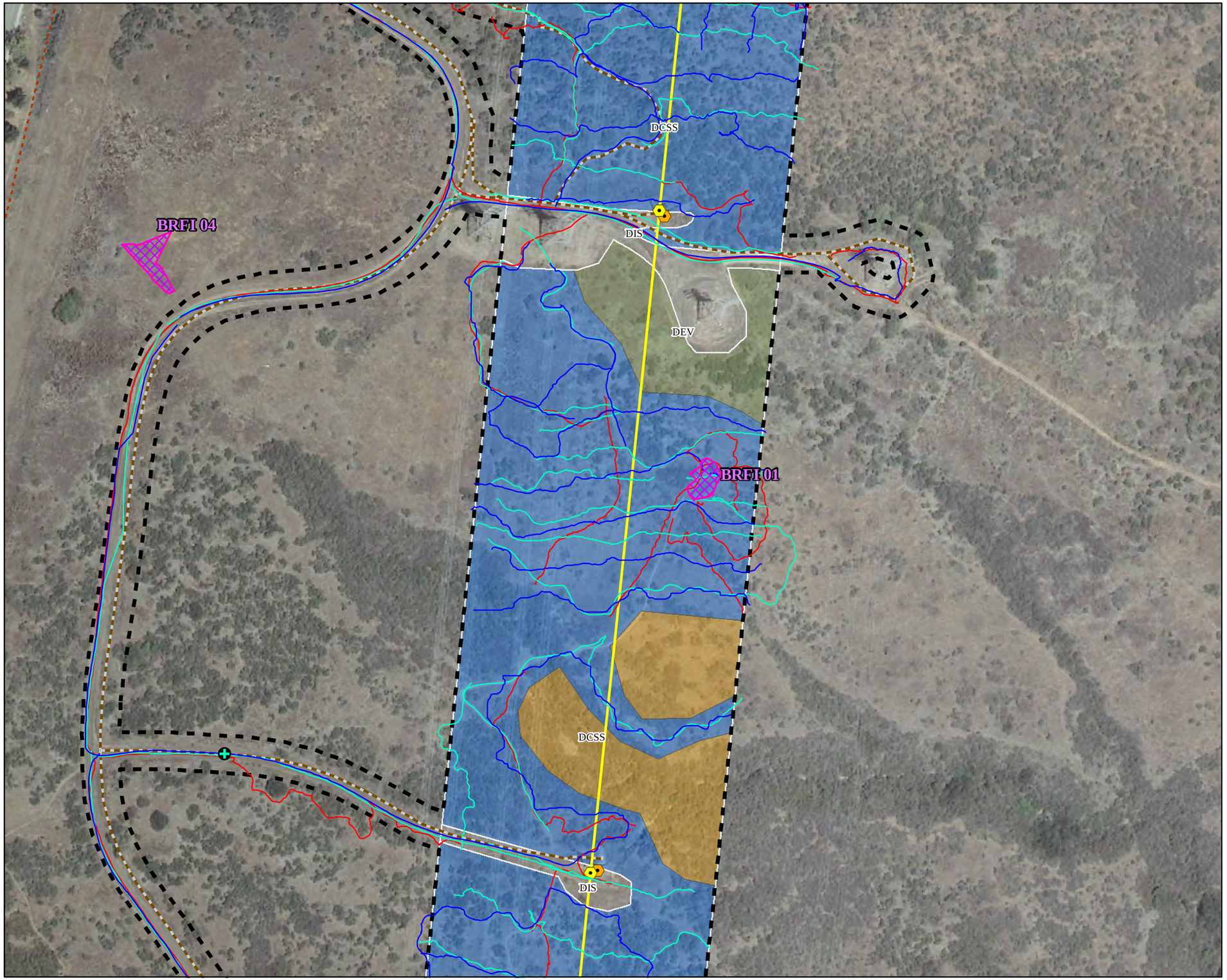
Unsuitable Potential BRFI Habitat
- Dense DCSS




Meters
0 50
0 200
Feet

Source: SDG&E 2015

**Figure B-12**
**TL695/6971 Rare Plant Survey Results**

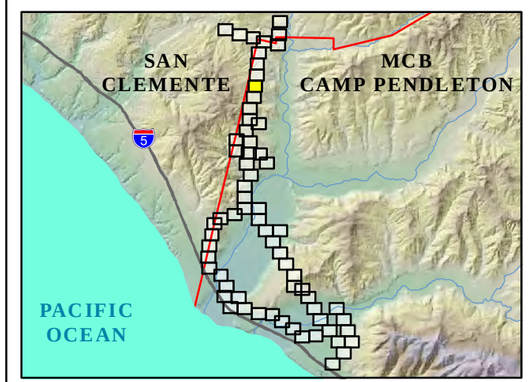



**LEGEND**

Project Features
- Project Survey Area
- Access Route
- Proposed Project Overhead Route
- Proposed Utility Pole
- Existing Wood Pole
- MCB Camp Pendleton Boundary

Rare Plant Survey Results
- Survey 1 Transect
- Survey 2 Transect
- Survey 3 Transect
- Surveyed Suitable Habitat
- BRFI Population
- Paniculate Tarweed

Unsuitable Potential BRFI Habitat
- Dense NNGB
- Dense DCSS




Meters
0 50
0 200
Feet

N

Source: SDG&E 2015

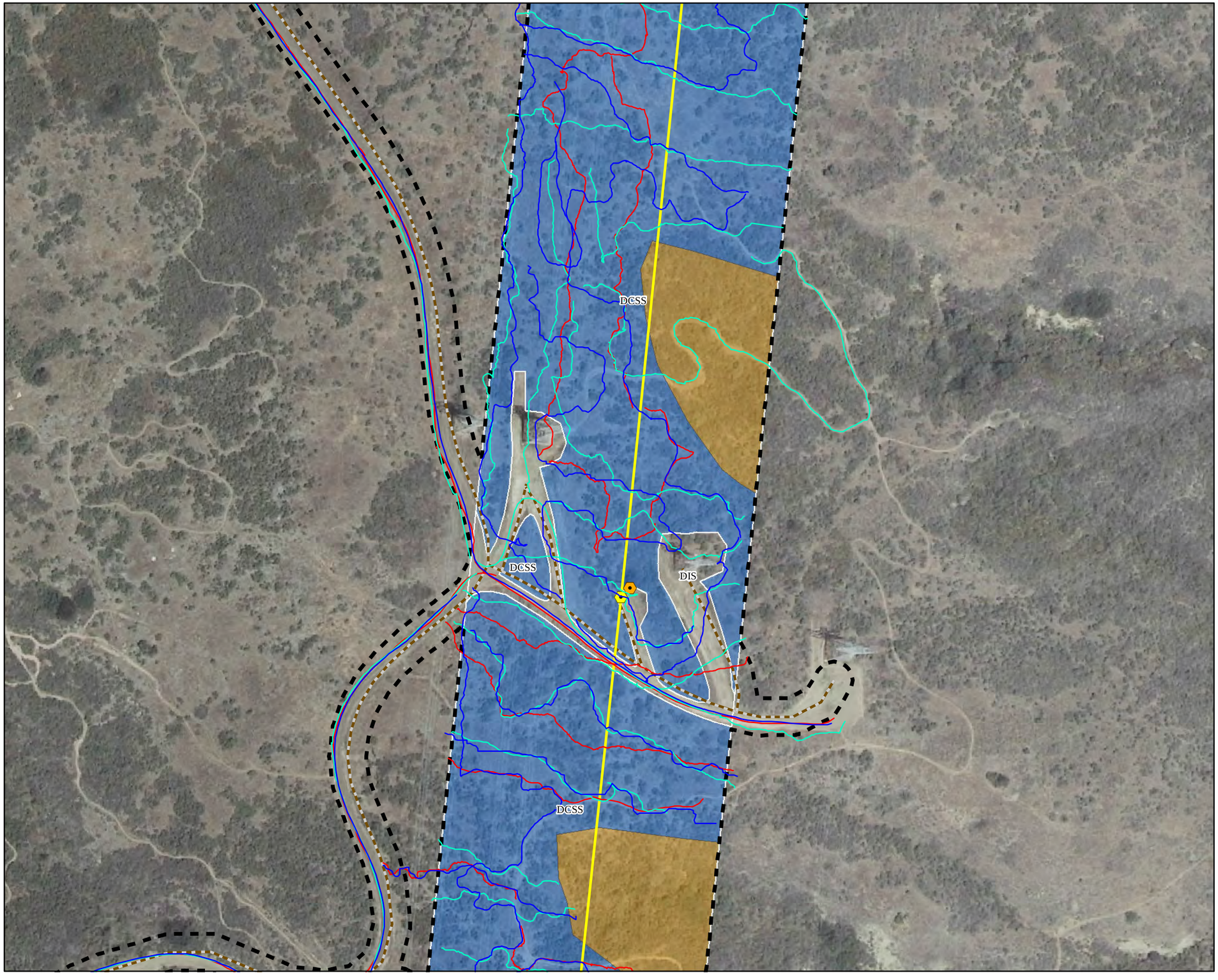


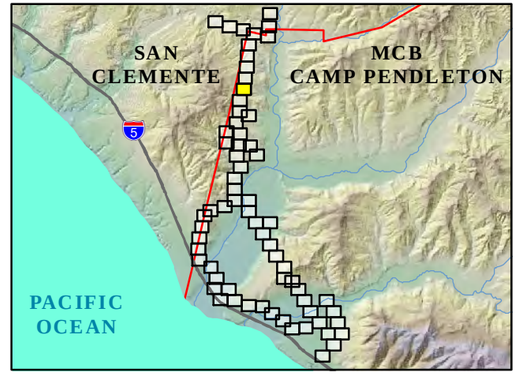

**Figure B-13**
**TL695/6971 Rare Plant Survey Results**

**LEGEND**

Project Features
- Project Survey Area
- Access Route
- Proposed Project Overhead Route
- Proposed Utility Pole
- Existing Wood Pole

Rare Plant Survey Results
- Survey 1 Transect
- Survey 2 Transect
- Survey 3 Transect
- Surveyed Suitable Habitat

Unsuitable Potential BRFI Habitat
- Dense DCSS




Meters
0 50
0 200
Feet

Source: SDG&E 2015

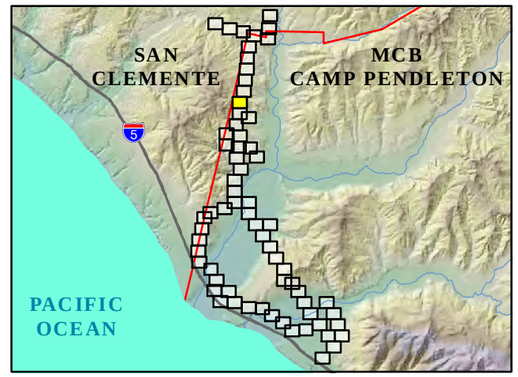

**Figure B-14**
**TL695/6971 Rare Plant Survey Results**

**LEGEND**

Project Features
- Project Survey Area
- Access Route
- Proposed Project Overhead Route
- Proposed Utility Pole
- Existing Wood Pole
- MCB Camp Pendleton Boundary
- Work/Staging/Turnaround Area

Rare Plant Survey Results
- Survey 1 Transect
- Survey 2 Transect
- Survey 3 Transect
- Surveyed Suitable Habitat

Unsuitable Potential BRFI Habitat
- Dense DCSS




Meters
0 50
0 200
Feet

Source: SDG&E 2015

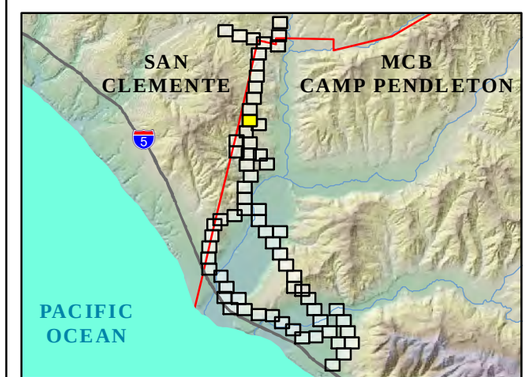

**Figure B-15**
**TL695/6971 Rare Plant Survey Results**

**LEGEND**

Project Features
- Project Survey Area
- Access Route
- Proposed Project Overhead Route
- Proposed Utility Pole
- Existing Wood Pole
- Work/Staging/Turnaround Area

Rare Plant Survey Results
- Survey 1 Transect
- Survey 2 Transect
- Survey 3 Transect

Unsuitable Potential BRFI Habitat
- Dense DCSS




Meters
0 50
0 200
Feet

Source: SDG&E 2015

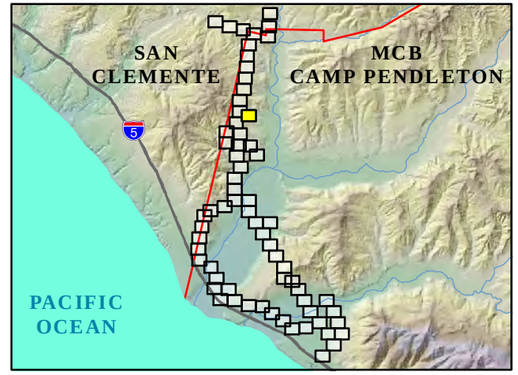

**Figure B-16**
**TL695/6971 Rare Plant Survey Results**

**LEGEND**

Project Features
- Project Survey Area
- Access Route
- Proposed Project Overhead Route
- Work/Staging/Turnaround Area

Rare Plant Survey Results
- Survey 1 Transect
- Survey 2 Transect
- Survey 3 Transect

Unsuitable Potential BRFI Habitat
- Dense DCSS




Meters
0 50
0 200
Feet

Source: SDG&E 2015

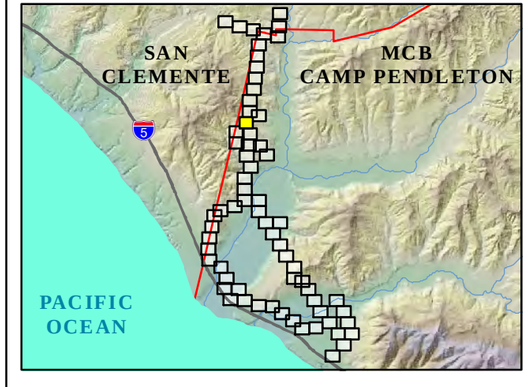

**Figure B-17**
**TL695/6971 Rare Plant Survey Results**

**LEGEND**

Project Features
- Project Survey Area
- Access Route
- Proposed Project Overhead Route
- Proposed Utility Pole
- Existing Wood Pole
- Work/Staging/Turnaround Area

Rare Plant Survey Results
- Survey 1 Transect
- Survey 2 Transect
- Survey 3 Transect
- Surveyed Suitable Habitat
- Paniculate Tarweed

Unsuitable Potential BRFI Habitat
- Dense DCSS




Meters
0 50
0 200
Feet

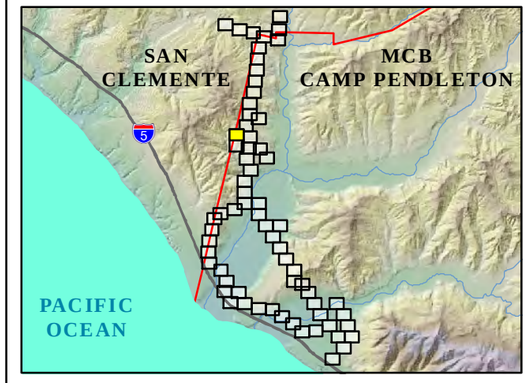
Source: SDG&E 2015

**Figure B-18**
**TL695/6971 Rare Plant Survey Results**

**LEGEND**

Project Features
- Project Survey Area
- Access Route
- MCB Camp Pendleton Boundary
- Work/Staging/Turnaround Area

Rare Plant Survey Results
- Survey 1 Transect
- Survey 2 Transect
- Survey 3 Transect




Meters
0 50
0 200
Feet

N

Source: SDG&E 2015

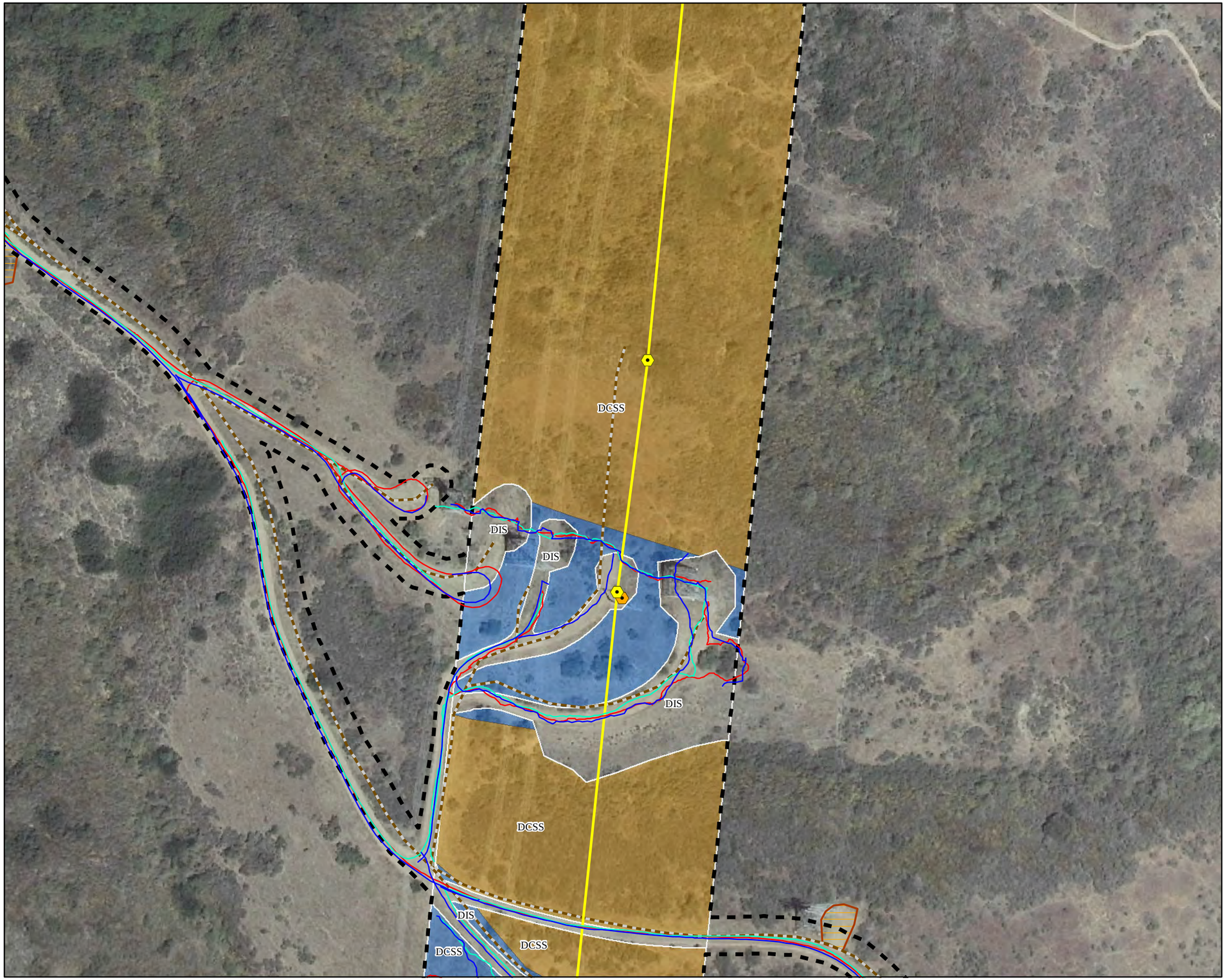


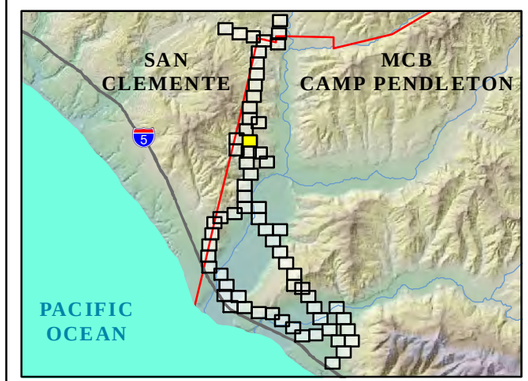

**Figure B-19**
**TL695/6971 Rare Plant Survey Results**

**LEGEND**

Project Features
- Project Survey Area
- Access Route
- Proposed Project Overhead Route
- Proposed Utility Pole
- Existing Wood Pole
- Work/Staging/Turnaround Area

Rare Plant Survey Results
- Survey 1 Transect
- Survey 2 Transect
- Survey 3 Transect
- Surveyed Suitable Habitat

Unsuitable Potential BRFI Habitat
- Dense DCSS




Meters
0 50
0 200
Feet

Source: SDG&E 2015

**Figure B-20**
**TL695/6971 Rare Plant Survey Results**

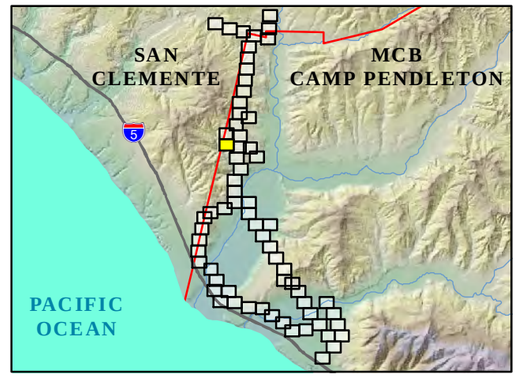
**LEGEND**

Project Features

- Project Survey Area
- Access Route
- MCB Camp Pendleton Boundary

Rare Plant Survey Results

- Survey 1 Transect
- Survey 2 Transect
- Survey 3 Transect




Meters

0 50

0 200

Feet

Source: SDG&E 2015

**Figure B-21**
**TL695/6971 Rare Plant Survey Results**

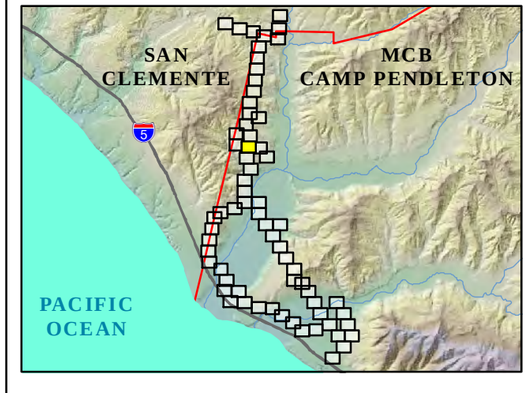
DIS
DCSS
DIS
DCSS
DIS
DIS
DCSS

**LEGEND**

Project Features
- Project Survey Area
- Access Route
- Proposed Project Overhead Route
- Proposed Utility Pole
- Existing Wood Pole
- Work/Staging/Turnaround Area

Rare Plant Survey Results
- Survey 1 Transect
- Survey 2 Transect
- Survey 3 Transect
- Surveyed Suitable Habitat

Unsuitable Potential BRFI Habitat
- Dense DCSS




Meters
0 50
0 200
Feet

Source: SDG&E 2015

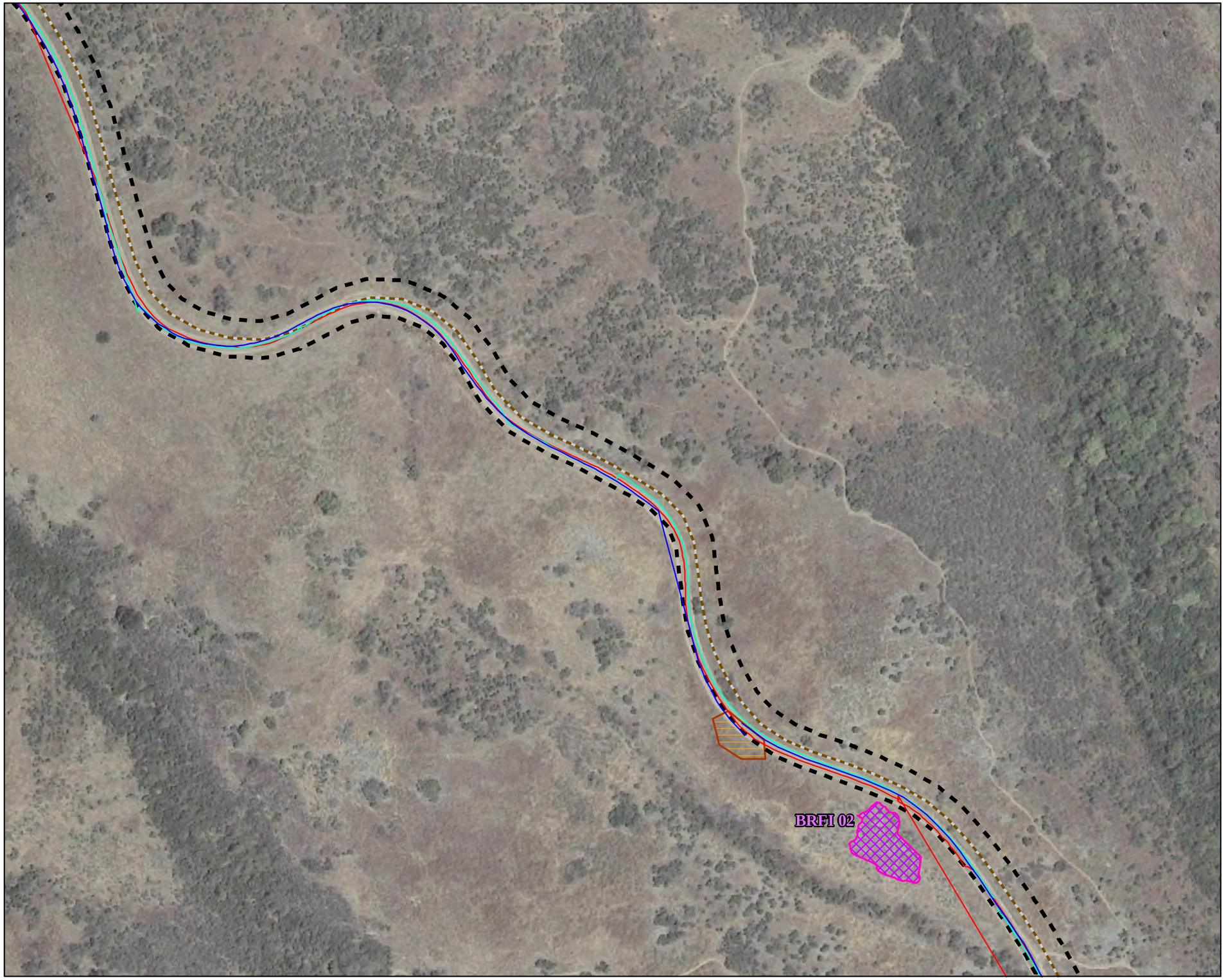
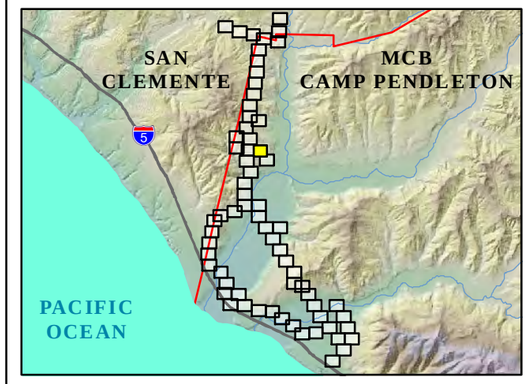



**Figure B-22**
**TL695/6971 Rare Plant Survey Results**

**LEGEND**

Project Features
- Project Survey Area
- Access Route
- Work/Staging/Turnaround Area

Rare Plant Survey Results
- Survey 1 Transect
- Survey 2 Transect
- Survey 3 Transect
- BRFI Population




Meters
0 50
0 200
Feet

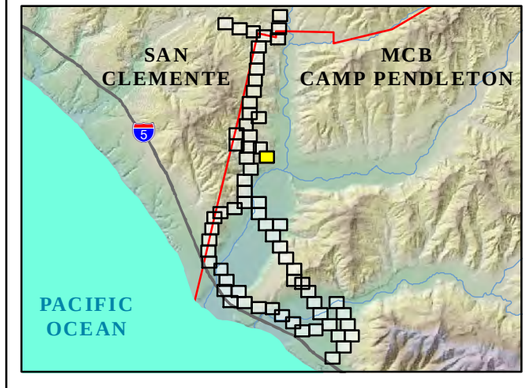
Source: SDG&E 2015


**Figure B-23**
**TL695/6971 Rare Plant Survey Results**

**LEGEND**

Project Features
- Project Survey Area
- Access Route
- Work/Staging/Turnaround Area

Rare Plant Survey Results
- Survey 1 Transect
- Survey 2 Transect
- Survey 3 Transect
- BRFI Population




Meters
0 50
0 200
Feet

Source: SDG&E 2015

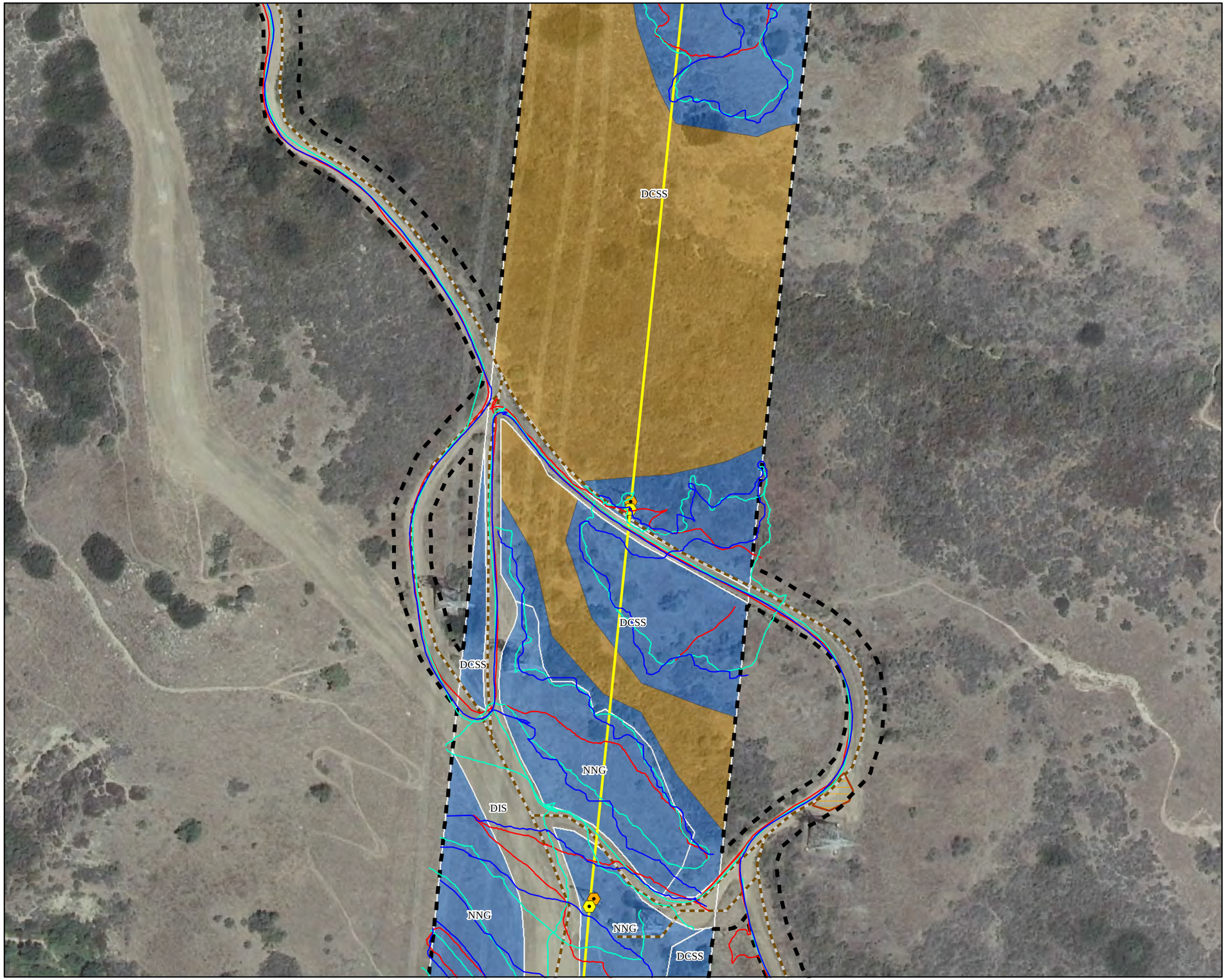


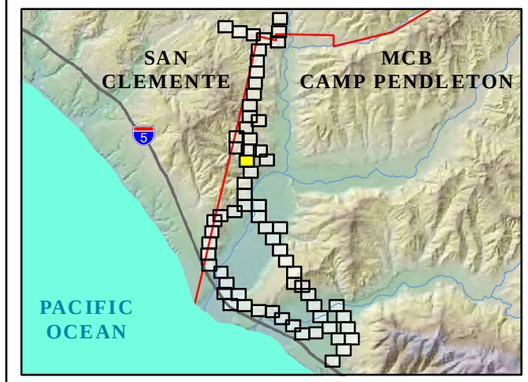

**Figure B-24**
**TL695/6971 Rare Plant Survey Results**

**LEGEND**

Project Features
- Project Survey Area
- Access Route
- Proposed Project Overhead Route
- Proposed Utility Pole
- Existing Wood Pole
- Work/Staging/Turnaround Area

Rare Plant Survey Results
- Survey 1 Transect
- Survey 2 Transect
- Survey 3 Transect
- Surveyed Suitable Habitat

Unsuitable Potential BRFI Habitat
- Dense DCSS




Meters
0 50
0 200
Feet

Source: SDG&E 2015

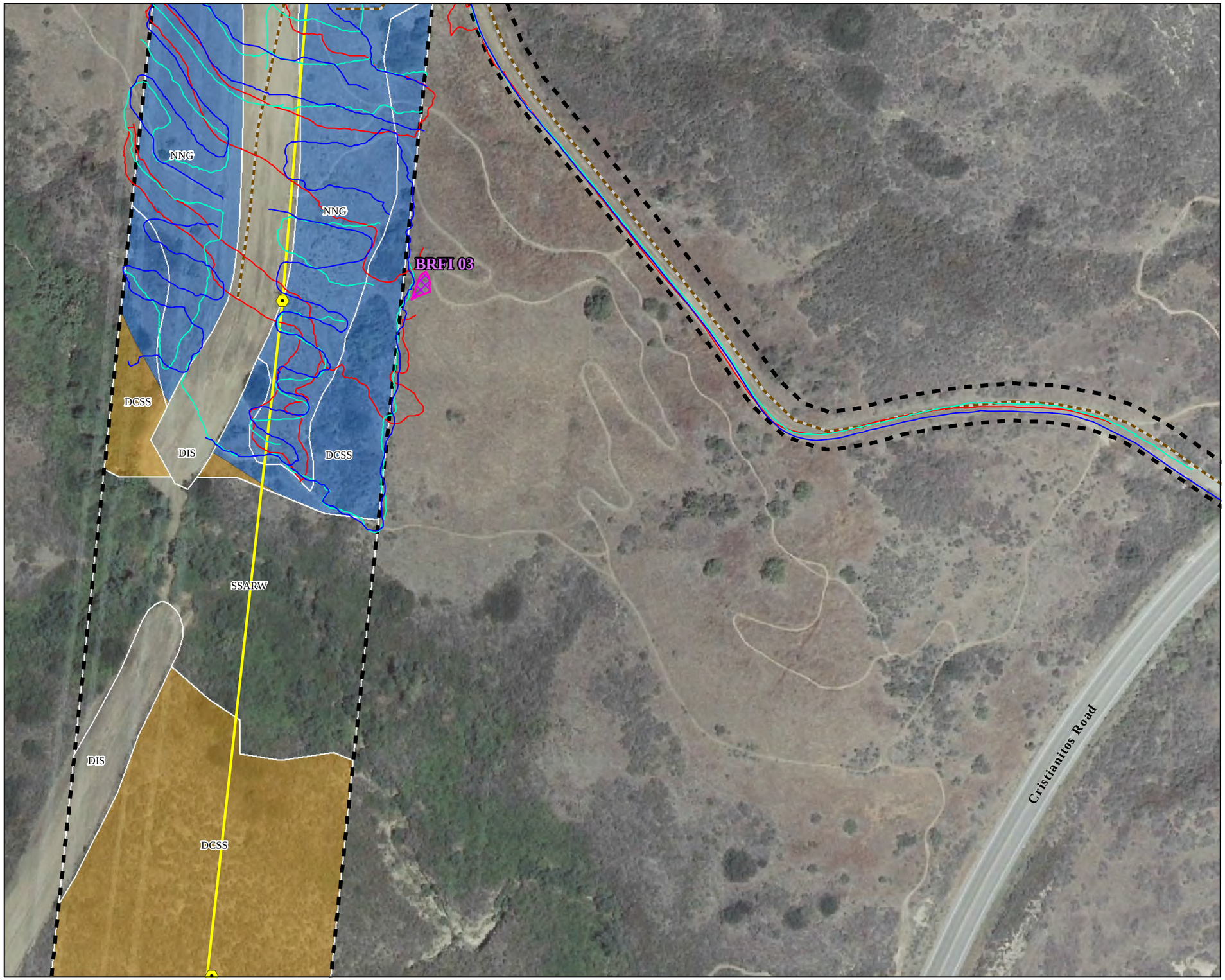


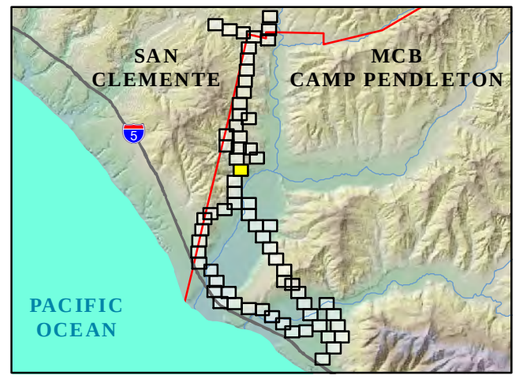

**Figure B-25**
**TL695/6971 Rare Plant Survey Results**

**LEGEND**

Project Features
- Project Survey Area
- Access Route
- Proposed Project Overhead Route
- Proposed Utility Pole

Rare Plant Survey Results
- Survey 1 Transect
- Survey 2 Transect
- Survey 3 Transect
- Surveyed Suitable Habitat
- BRFI Population

Unsuitable Potential BRFI Habitat
- Dense DCSS




Meters
0 50
0 200
Feet

Source: SDG&E 2015

# Figure B-26
# TL695/6971 Rare Plant Survey Results

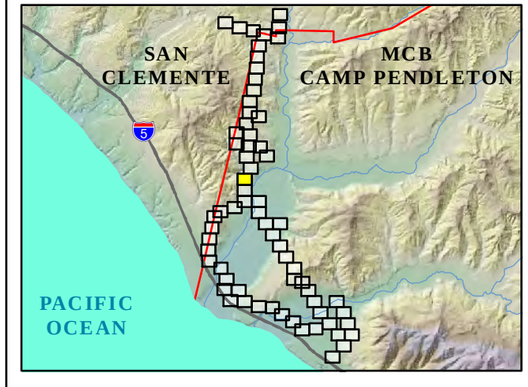
DCSS
DIS
DCSS
DIS
DIS
DCSS
DIS
DIS
DCSS
Cristianitos Road

**LEGEND**

Project Features
- Project Survey Area
- Access Route
- Proposed Project Overhead Route
- Proposed Utility Pole
- Existing Wood Pole
- Work/Staging/Turnaround Area

Rare Plant Survey Results
- Survey 1 Transect
- Survey 2 Transect
- Survey 3 Transect
- Surveyed Suitable Habitat

Unsuitable Potential BRFI Habitat
- Dense DCSS




Meters
0 50
0 200
Feet

Source: SDG&E 2015

# Figure B-27
# TL695/6971 Rare Plant Survey Results

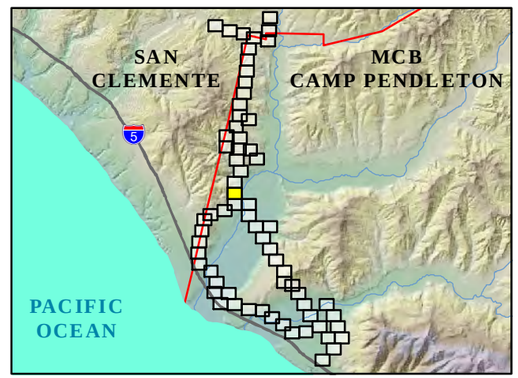
DCSS
DCSS
DIS
DIS
DCSS
DCSS
DEV
DCSS
Cristianitos Road

**LEGEND**

Project Features
- Project Survey Area
- Access Route
- Proposed Project Overhead Route
- Proposed Utility Pole
- Existing Wood Pole

Rare Plant Survey Results
- Survey 1 Transect
- Survey 2 Transect
- Survey 3 Transect
- Surveyed Suitable Habitat
- California Boxthorn

Unsuitable Potential BRFI Habitat
- Dense DCSS
- Riparian




Meters
0 50
0 200
Feet

Source: SDG&E 2015

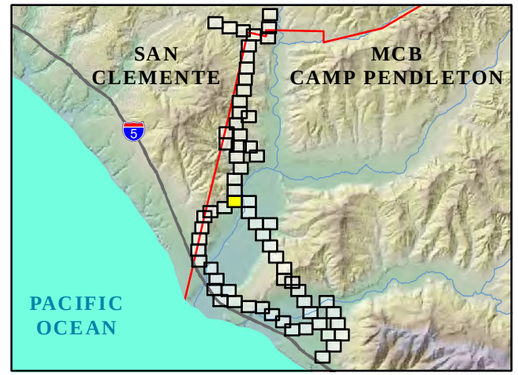
**Figure B-28**
**TL695/6971 Rare Plant Survey Results**

**LEGEND**

Project Features
- Project Survey Area
- Access Route
- Proposed Project Overhead Route
- Proposed Utility Pole
- Existing Wood Pole

Rare Plant Survey Results
- Survey 1 Transect
- Survey 2 Transect
- Survey 3 Transect
- Surveyed Suitable Habitat

Unsuitable Potential BRFI Habitat
- Dense NNGB
- Dense DCSS/NNGB/Recently Burned
- Dense DCSS




Meters
0 50
0 200
Feet

Source: SDG&E 2015

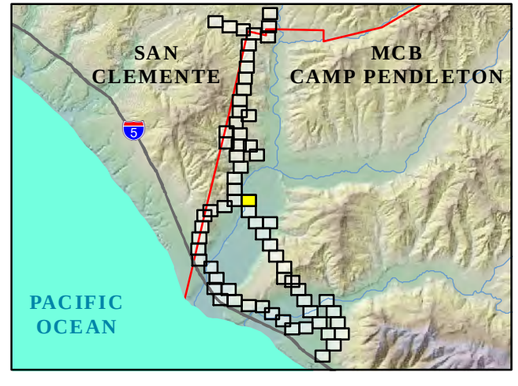

**Figure B-29**
**TL695/6971 Rare Plant Survey Results**

**LEGEND**

Project Features
- Project Survey Area
- Access Route
- Proposed Project Overhead Route
- Proposed Utility Pole
- Staging Yard

Rare Plant Survey Results
- Survey 1 Transect
- Survey 2 Transect
- Survey 3 Transect
- Surveyed Suitable Habitat

Unsuitable Potential BRFI Habitat
- Dense DCSS




Meters
0 50
0 200
Feet

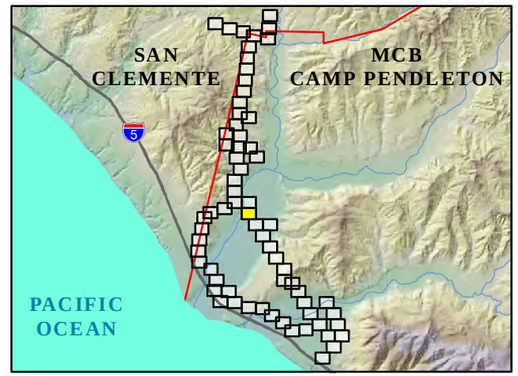
Source: SDG&E 2015


**Figure B-30**
**TL695/6971 Rare Plant Survey Results**

**LEGEND**

Project Features
- Project Survey Area
- Access Route
- Proposed Project Overhead Route
- Proposed Utility Pole

Rare Plant Survey Results
- Survey 1 Transect
- Survey 2 Transect
- Survey 3 Transect




Meters
0 50
0 200
Feet

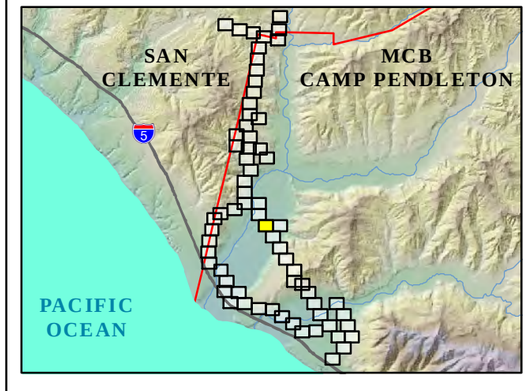
Source: SDG&E 2015


**Figure B-31**
**TL695/6971 Rare Plant Survey Results**

**LEGEND**

Project Features
- Project Survey Area
- Access Route
- Proposed Project Overhead Route
- Proposed Utility Pole

Rare Plant Survey Results
- Survey 1 Transect
- Survey 2 Transect
- Survey 3 Transect




Meters
0 50
0 200
Feet

Source: SDG&E 2015

**Figure B-32**
**TL695/6971 Rare Plant Survey Results**

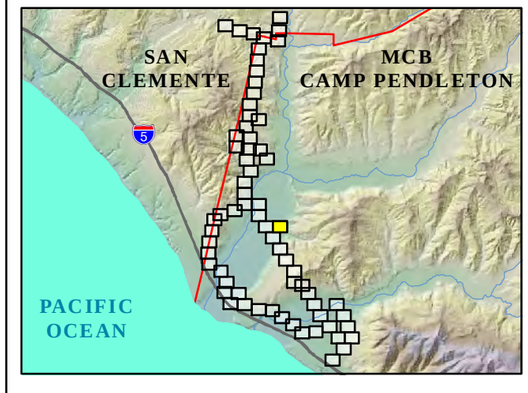
**LEGEND**

Project Features

- Project Survey Area
- Access Route

Rare Plant Survey Results

- Survey 1 Transect
- Survey 2 Transect
- Survey 3 Transect




Meters
0 50
0 200
Feet

Source: SDG&E 2015

**Figure B-33**
**TL695/6971 Rare Plant Survey Results**

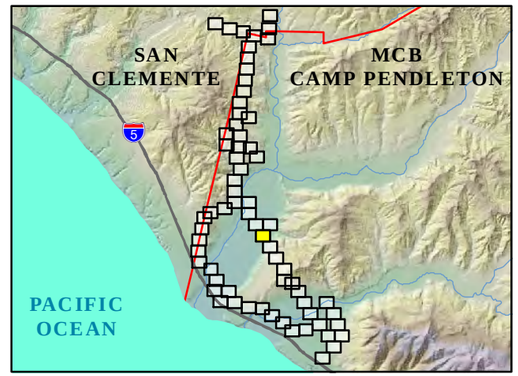
**LEGEND**

Project Features
- Project Survey Area
- Access Route
- Proposed Project Overhead Route
- Proposed Utility Pole

Rare Plant Survey Results
- Survey 1 Transect
- Survey 2 Transect
- Survey 3 Transect

Unsuitable Potential BRFI Habitat
- Dense DCSS

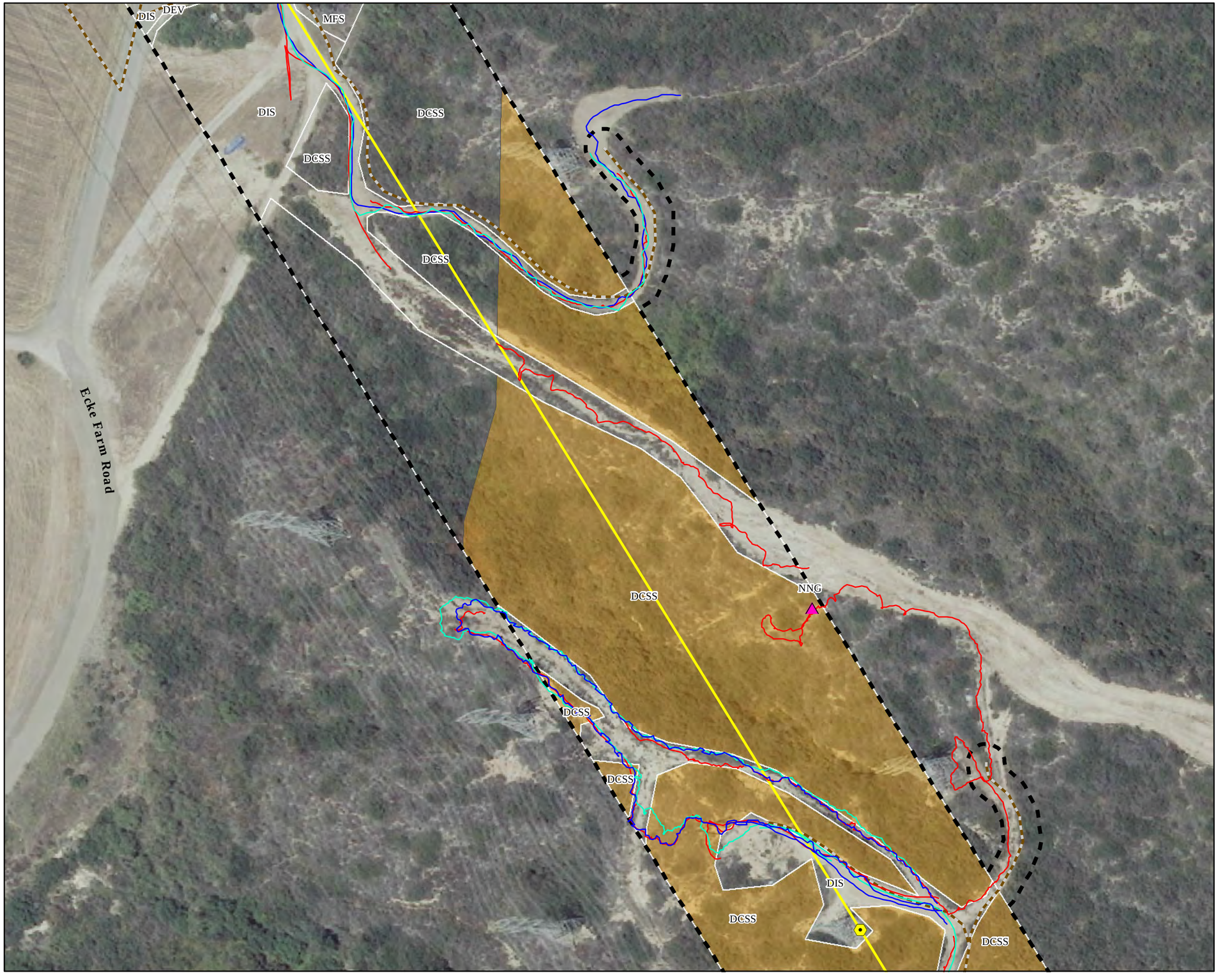
DIS
DEV
MFS
DIS
DCSS




Meters
0 50
0 200
Feet

Source: SDG&E 2015

# Figure B-34
# TL695/6971 Rare Plant Survey Results

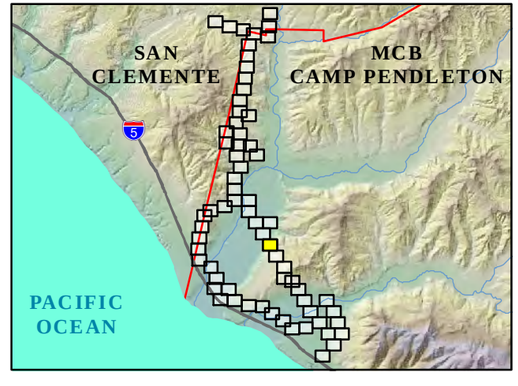



**LEGEND**

Project Features
- Project Survey Area
- Access Route
- Proposed Project Overhead Route
- Proposed Utility Pole

Rare Plant Survey Results
- Survey 1 Transect
- Survey 2 Transect
- Survey 3 Transect
- Western Dichondra

Unsuitable Potential BRFI Habitat
- Dense DCSS




Meters
0 50
0 200
Feet

Source: SDG&E 2015

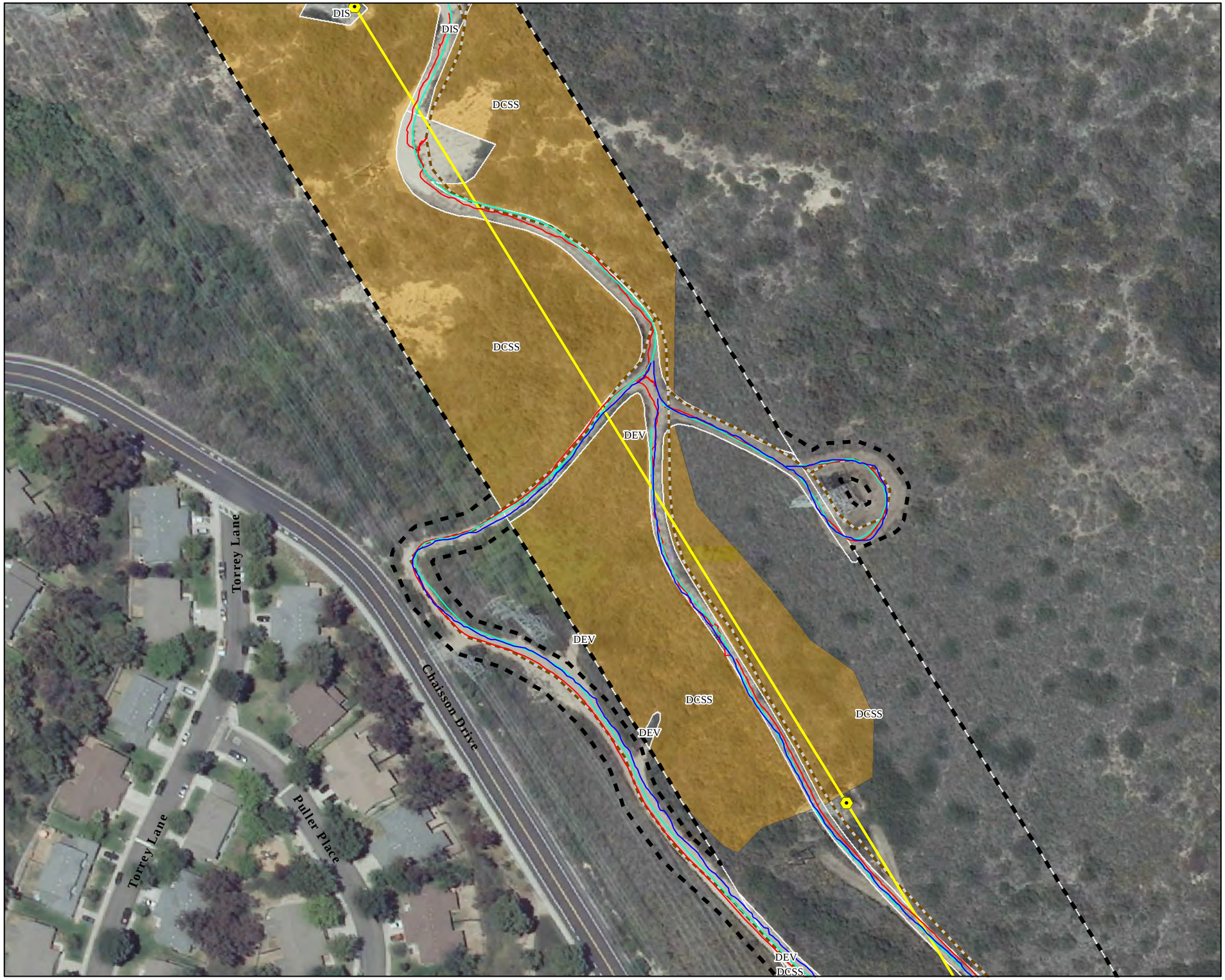


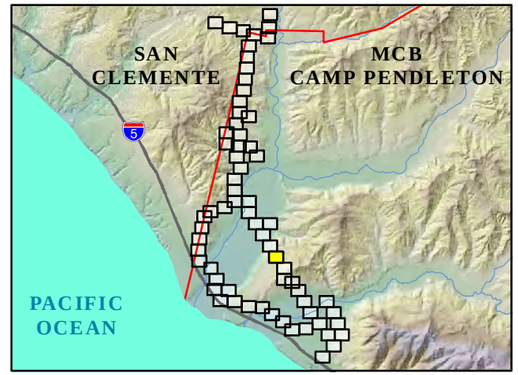

**Figure B-35**
**TL695/6971 Rare Plant Survey Results**

**LEGEND**

Project Features
- Project Survey Area
- Access Route
- Proposed Project Overhead Route
- Proposed Utility Pole

Rare Plant Survey Results
- Survey 1 Transect
- Survey 2 Transect
- Survey 3 Transect

Unsuitable Potential BRFI Habitat
- Dense DCSS




Meters
0 50
0 200
Feet

Source: SDG&E 2015

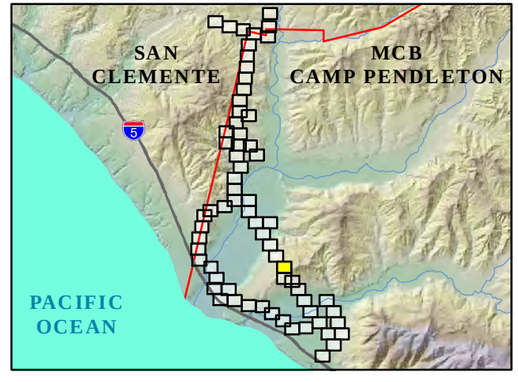
# Figure B-36
# TL695/6971 Rare Plant Survey Results


**LEGEND**

Project Features
- Project Survey Area
- Access Route
- Proposed Project Overhead Route
- Proposed Utility Pole

Rare Plant Survey Results
- Survey 1 Transect
- Survey 2 Transect
- Survey 3 Transect

Unsuitable Potential BRFI Habitat
- Dense DCSS




Meters
0 50
0 200
Feet

Source: SDG&E 2015

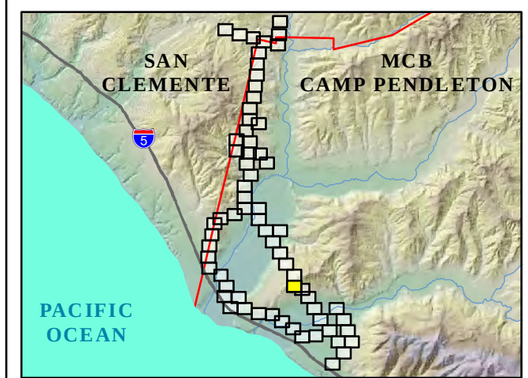

**Figure B-37**
**TL695/6971 Rare Plant Survey Results**

**LEGEND**

Project Features
- Project Survey Area
- Access Route
- Proposed Project Overhead Route
- Work/Staging/Turnaround Area

Rare Plant Survey Results
- Survey 1 Transect
- Survey 2 Transect
- Survey 3 Transect

Unsuitable Potential BRFI Habitat
- Dense DCSS




Meters
0 50
0 200
Feet

Source: SDG&E 2015

**Figure B-38**
**TL695/6971 Rare Plant Survey Results**

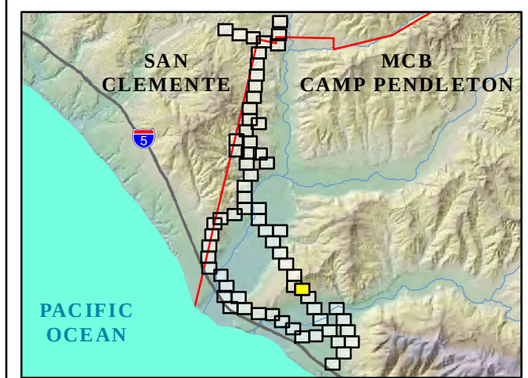
DEV
DCSS
DIS
DCSS
DEV
DIS
DCSS
DIS
DCSS
DIS
DCSS

**LEGEND**

Project Features
- Project Survey Area
- Access Route
- Proposed Project Overhead Route
- Proposed Utility Pole
- Work/Staging/Turnaround Area

Rare Plant Survey Results
- Survey 1 Transect
- Survey 2 Transect
- Survey 3 Transect

Unsuitable Potential BRFI Habitat
- Dense DCSS




Meters
0 50
0 200
Feet

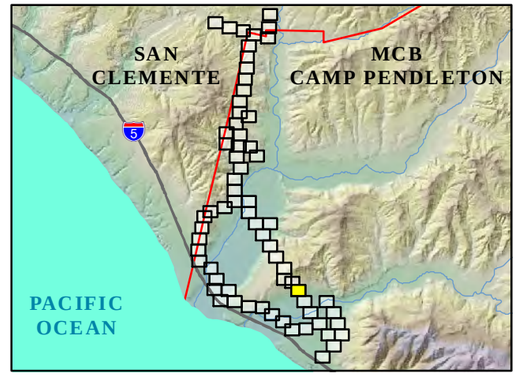
Source: SDG&E 2015

**Figure B-39**
**TL695/6971 Rare Plant Survey Results**


**LEGEND**

Project Features
- Project Survey Area
- Access Route
- Proposed Project Overhead Route
- Proposed Utility Pole

Rare Plant Survey Results
- Survey 1 Transect
- Survey 2 Transect
- Survey 3 Transect




Meters
0 50
0 200
Feet

Source: SDG&E 2015


**Figure B-40**
**TL695/6971 Rare Plant Survey Results**

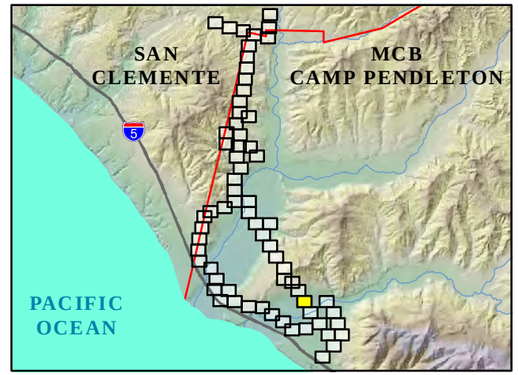
**LEGEND**

Project Features

- Project Survey Area
- Access Route
- Proposed Project Overhead Route
- Staging Yard

Rare Plant Survey Results

- Survey 1 Transect
- Survey 2 Transect
- Survey 3 Transect




Meters
0 50
0 200
Feet

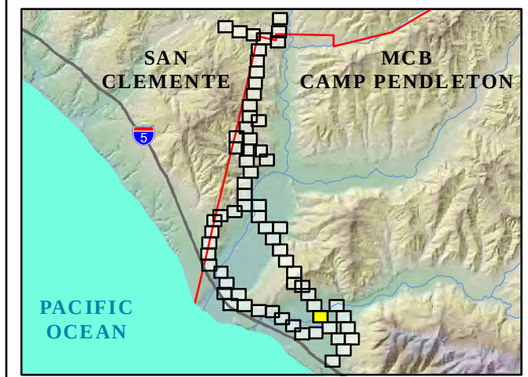
Source: SDG&E 2015


**Figure B-41**
**TL695/6971 Rare Plant Survey Results**

**LEGEND**

Project Features
- Project Survey Area
- Access Route
- Proposed Project Overhead Route
- Proposed Utility Pole

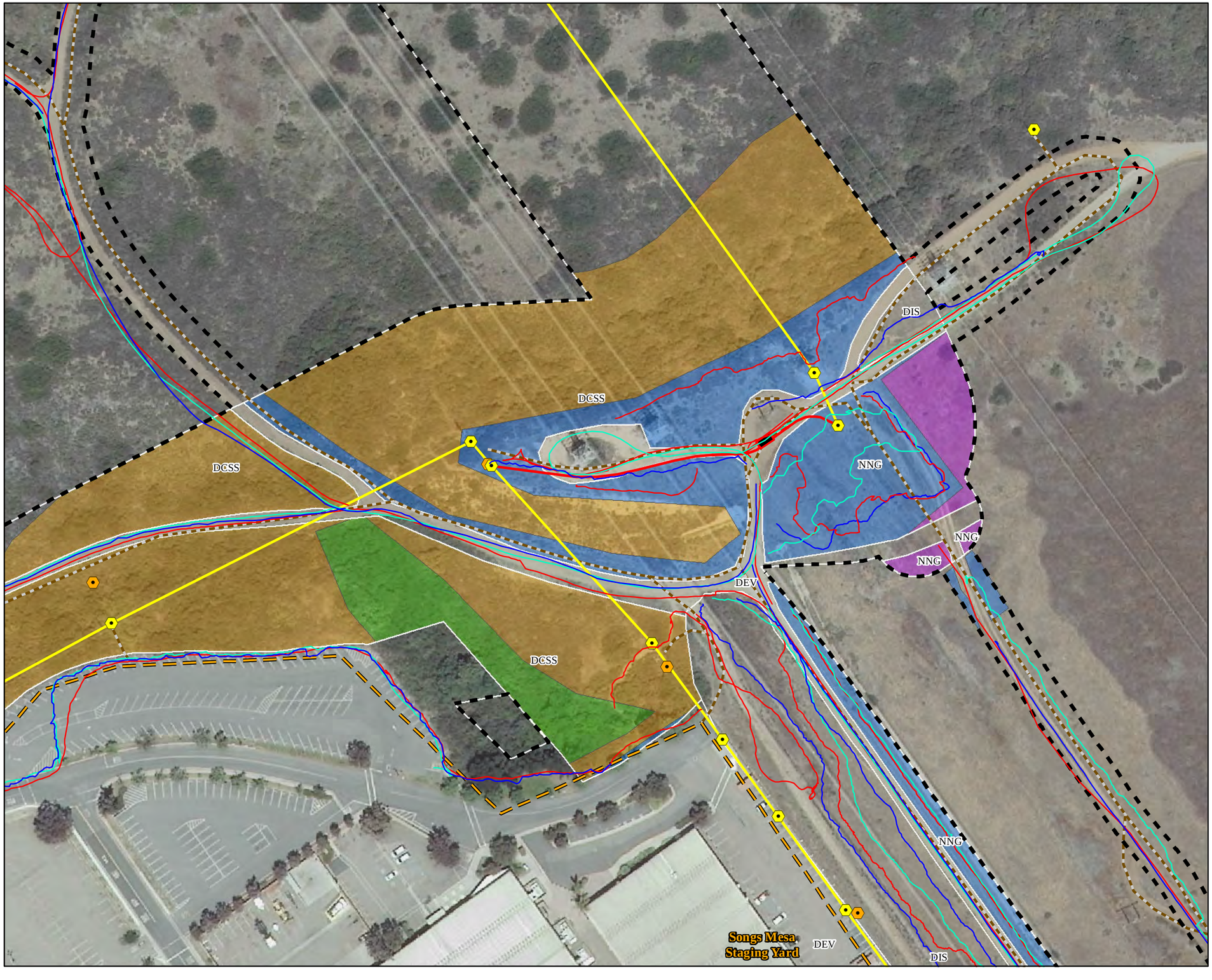
Rare Plant Survey Results
- Survey 1 Transect
- Survey 2 Transect
- Survey 3 Transect




Meters
0 50
0 200
Feet

Source: SDG&E 2015

# Figure B-42
# TL695/6971 Rare Plant Survey Results

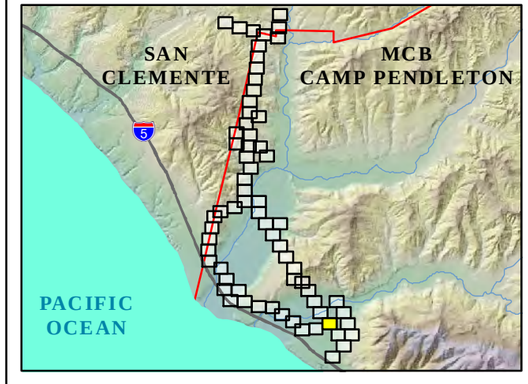



**LEGEND**

Project Features
- Project Survey Area
- Access Route
- Proposed Project Overhead Route
- Proposed Project Underground Route
- Proposed 69kV Vault
- Proposed Utility Pole
- Staging Yard
- Existing Wood Pole

Rare Plant Survey Results
- Survey 1 Transect
- Survey 2 Transect
- Survey 3 Transect
- Surveyed Suitable Habitat

Unsuitable Potential BRFI Habitat
- Dense DCSS
- Disturbed
- Riparian




Meters
0 50
0 200
Feet

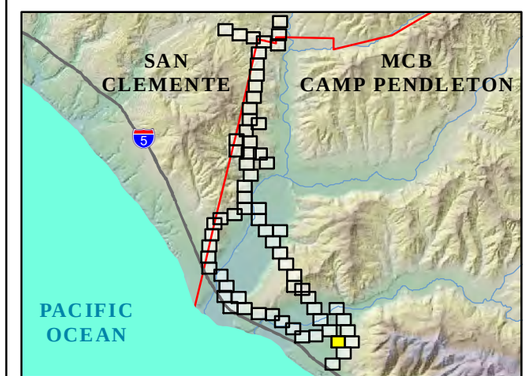
Source: SDG&E 2015


**Figure B-43**
**TL695/6971 Rare Plant Survey Results**

**LEGEND**

Project Features
- Project Survey Area
- Access Route
- Proposed Project Overhead Route
- Proposed Utility Pole
- Staging Yard
- Existing Wood Pole

Rare Plant Survey Results
- Survey 1 Transect
- Survey 2 Transect
- Survey 3 Transect
- Surveyed Suitable Habitat




Meters
0 50
0 200
Feet

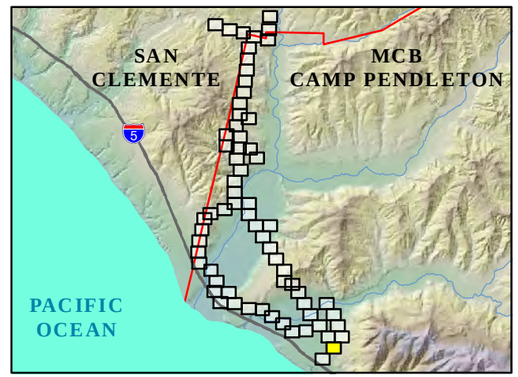
Source: SDG&E 2015


**Figure B-44**
**TL695/6971 Rare Plant Survey Results**

**LEGEND**

Project Features
- Project Survey Area
- Access Route
- Proposed Project Overhead Route
- Proposed Utility Pole
- Staging Yard
- Existing Wood Pole

Rare Plant Survey Results
- Survey 1 Transect
- Survey 2 Transect
- Survey 3 Transect




Meters
0 50
0 200
Feet

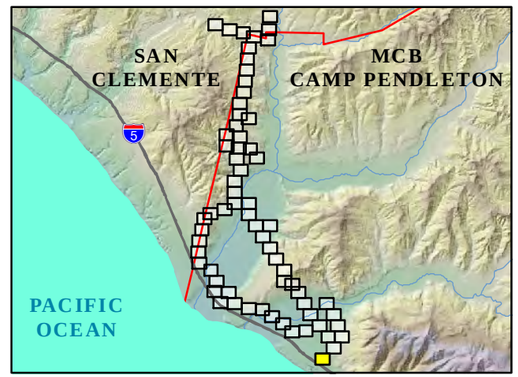
Source: SDG&E 2015


**Figure B-45**
**TL695/6971 Rare Plant Survey Results**

**LEGEND**

Project Features
- Project Survey Area
- Access Route
- Proposed Project Overhead Route
- Proposed Utility Pole
- Staging Yard
- Existing Wood Pole
- Work/Staging/Turnaround Area

Rare Plant Survey Results
- Survey 1 Transect
- Survey 2 Transect
- Survey 3 Transect
- Surveyed Suitable Habitat




Meters
0 50
0 200
Feet

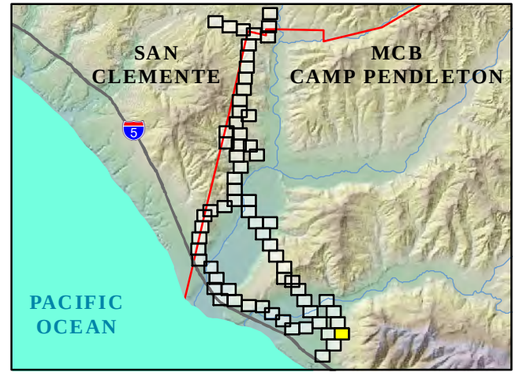
Source: SDG&E 2015


**Figure B-46**
**TL695/6971 Rare Plant Survey Results**

**LEGEND**

Project Features
- Project Survey Area
- Access Route

Rare Plant Survey Results
- Survey 1 Transect
- Survey 2 Transect
- Survey 3 Transect




Meters
0 50
0 200
Feet

Source: SDG&E 2015

**Figure B-47**
**TL695/6971 Rare Plant Survey Results**

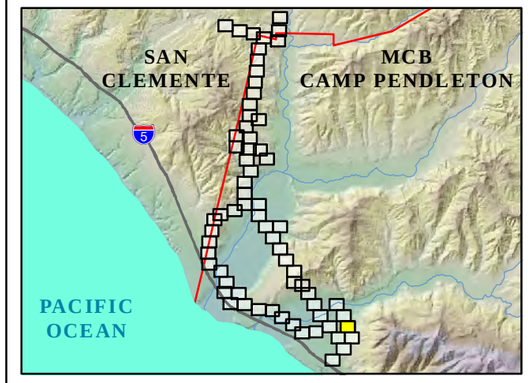
**LEGEND**

Project Features

- Project Survey Area
- Access Route

Rare Plant Survey Results

- Survey 1 Transect
- Survey 2 Transect
- Survey 3 Transect




Meters
0 50
0 200
Feet

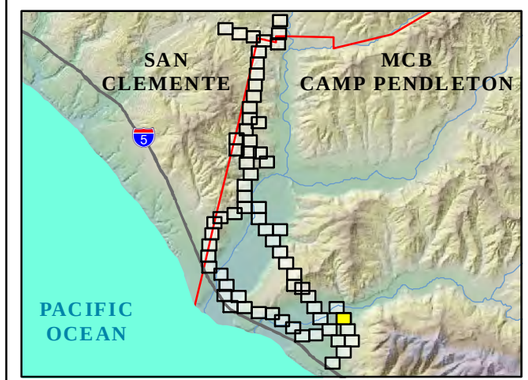
Source: SDG&E 2015

**Figure B-48**
**TL695/6971 Rare Plant Survey Results**

**LEGEND**

Project Features
- Project Survey Area
- Access Route

Rare Plant Survey Results
- Survey 1 Transect
- Survey 2 Transect
- Survey 3 Transect




Meters
0 50
0 200
Feet

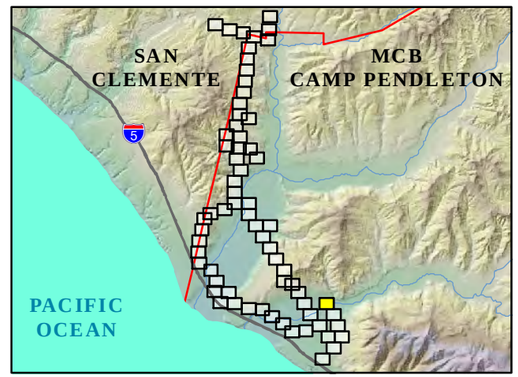
Source: SDG&E 2015


**Figure B-49**
**TL695/6971 Rare Plant Survey Results**

**LEGEND**

Project Features
- Project Survey Area
- Access Route

Rare Plant Survey Results
- Survey 1 Transect
- Survey 2 Transect
- Survey 3 Transect
- Coulter's Matilija Poppy




Meters
0 50
0 200
Feet

Source: SDG&E 2015

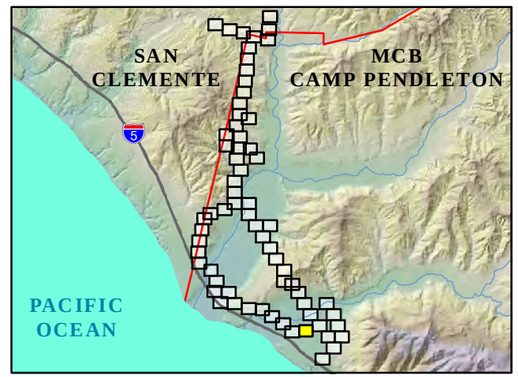

**Figure B-50**
**TL695/6971 Rare Plant Survey Results**

**LEGEND**

Project Features
- Project Survey Area
- Access Route
- Proposed Project Overhead Route
- Proposed Utility Pole
- Staging Yard
- Existing Wood Pole

Rare Plant Survey Results
- Survey 1 Transect
- Survey 2 Transect
- Survey 3 Transect
- Surveyed Suitable Habitat

Unsuitable Potential BRFI Habitat
- Dense DCSS




Meters
0 50
0 200
Feet

Source: SDG&E 2015

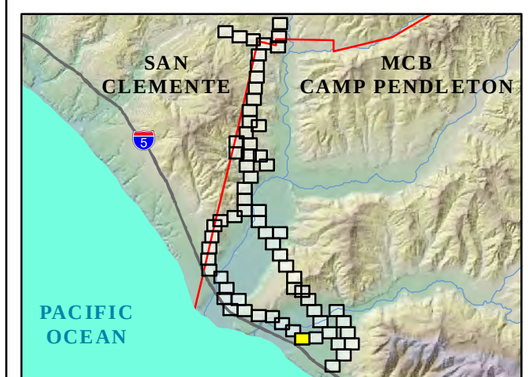
# Figure B-51
# TL695/6971 Rare Plant Survey Results


**LEGEND**

Project Features
- Project Survey Area
- Access Route
- Proposed Project Overhead Route
- Proposed Utility Pole
- Existing Wood Pole
- Work/Staging/Turnaround Area

Rare Plant Survey Results
- Survey 1 Transect
- Survey 2 Transect
- Survey 3 Transect
- Surveyed Suitable Habitat

Unsuitable Potential BRFI Habitat
- Dense DCSS




Meters
0 50
0 200
Feet

Source: SDG&E 2015

# Figure B-52
# TL695/6971 Rare Plant Survey Results

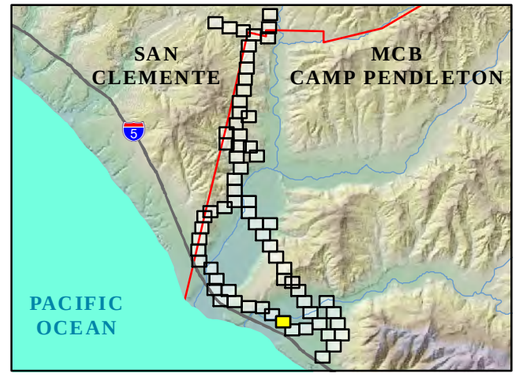

**LEGEND**

Project Features

- Project Survey Area
- Access Route
- Proposed Project Overhead Route
- Proposed Utility Pole
- Existing Wood Pole
- Work/Staging/Turnaround Area

Rare Plant Survey Results

- Survey 1 Transect
- Survey 2 Transect
- Survey 3 Transect




Meters
0 50
0 200
Feet

Source: SDG&E 2015

**Figure B-53**
**TL695/6971 Rare Plant Survey Results**

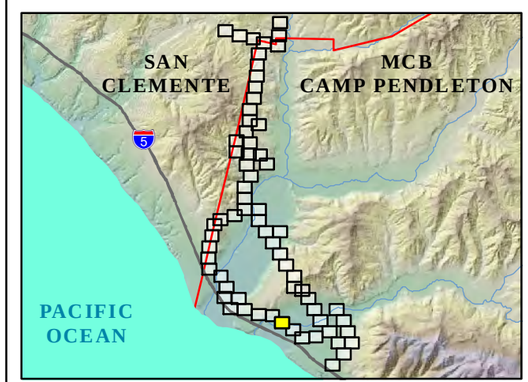

**LEGEND**

Project Features

- Project Survey Area
- Access Route
- Proposed Project Overhead Route
- Proposed Utility Pole
- Existing Wood Pole
- Work/Staging/Turnaround Area

Rare Plant Survey Results

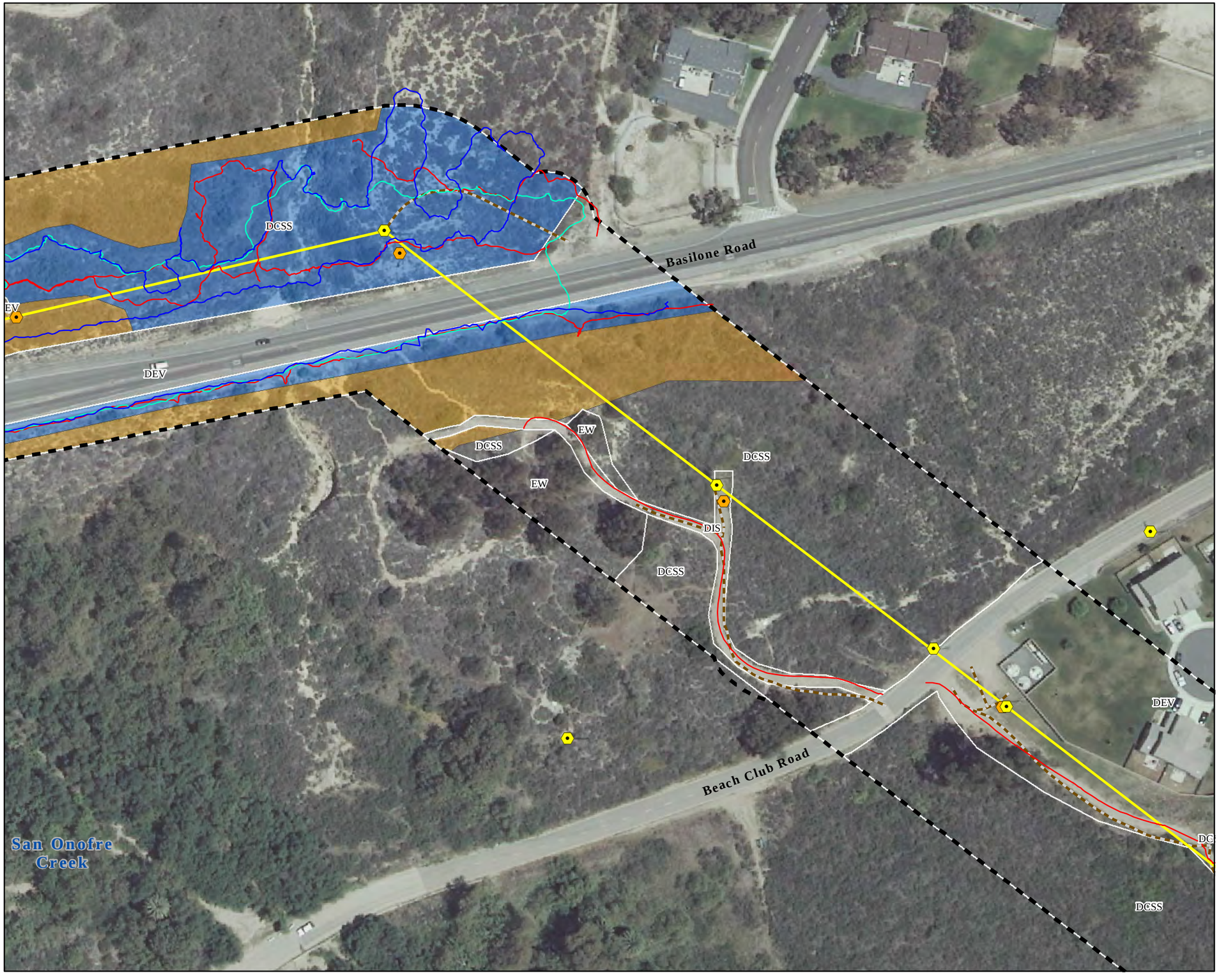
- Survey 1 Transect




Meters
0 50
0 200
Feet

Source: SDG&E 2015

# Figure B-54
# TL695/6971 Rare Plant Survey Results

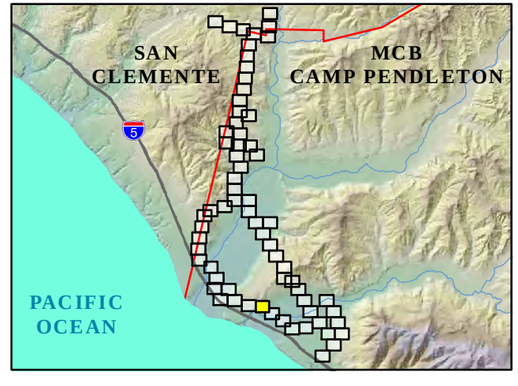



**LEGEND**

Project Features
- Project Survey Area
- Access Route
- Proposed Project Overhead Route
- Proposed Utility Pole
- Existing Wood Pole

Rare Plant Survey Results
- Survey 1 Transect
- Survey 2 Transect
- Survey 3 Transect
- Surveyed Suitable Habitat

Unsuitable Potential BRFI Habitat
- Dense DCSS




Meters
0 50
0 200
Feet

Source: SDG&E 2015

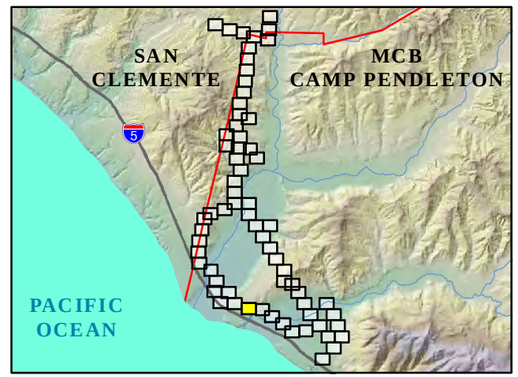

**Figure B-55**
**TL695/6971 Rare Plant Survey Results**

**LEGEND**

Project Features
- Project Survey Area
- Access Route
- Proposed Project Overhead Route
- Proposed Utility Pole
- Existing Wood Pole

Rare Plant Survey Results
- Survey 1 Transect
- Survey 2 Transect
- Survey 3 Transect
- Surveyed Suitable Habitat

Unsuitable Potential BRFI Habitat
- Dense DCSS




Meters
0 50
0 200
Feet

Source: SDG&E 2015

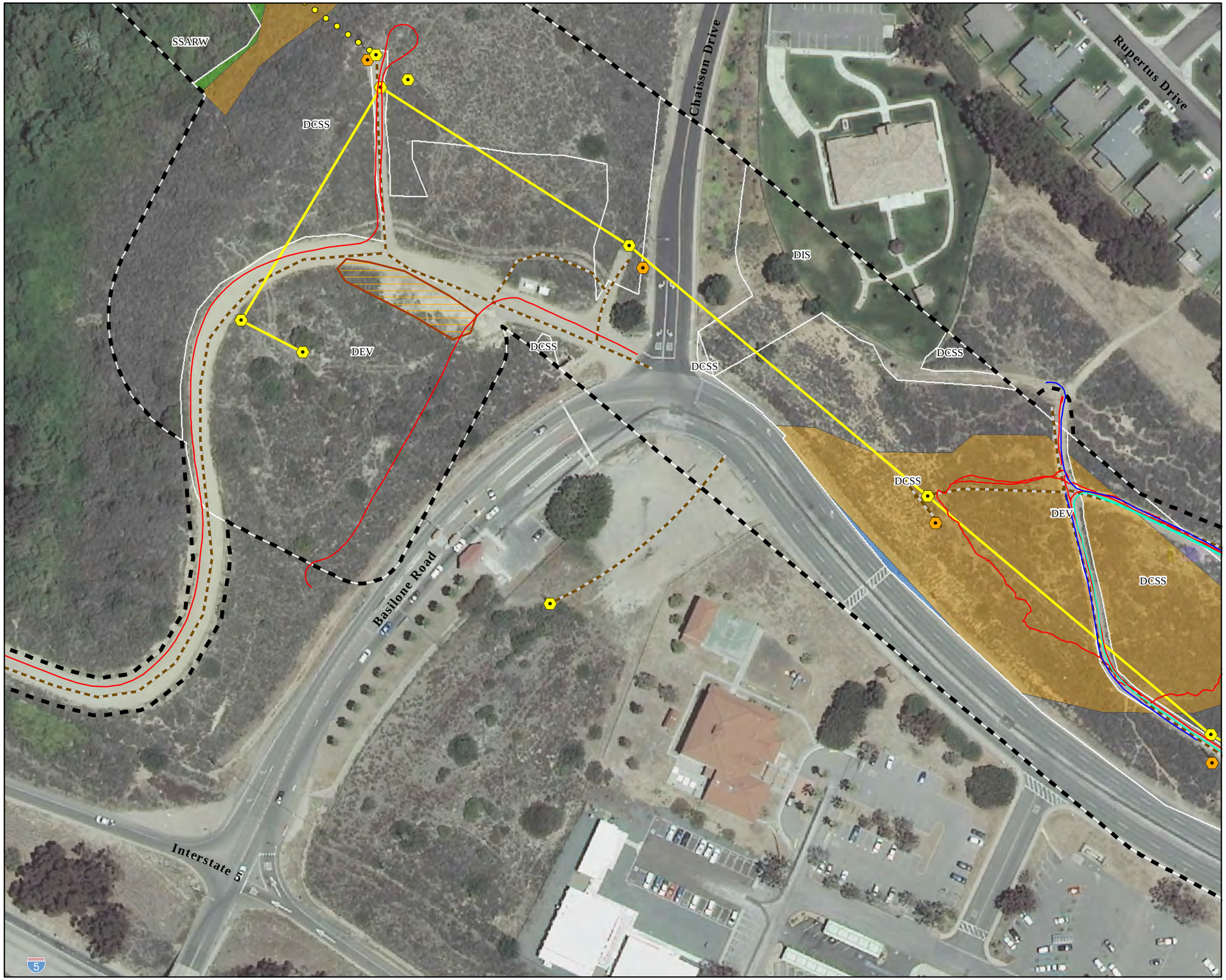


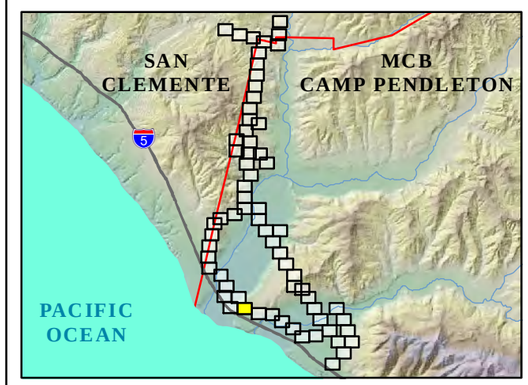

**Figure B-56**
**TL695/6971 Rare Plant Survey Results**

**LEGEND**

Project Features
- Project Survey Area
- Access Route
- Proposed Project Overhead Route
- Proposed Project Pole Topping Segment
- Proposed Utility Pole
- Existing Wood Pole
- Work/Staging/Turnaround Area

Rare Plant Survey Results
- Survey 1 Transect
- Survey 2 Transect
- Survey 3 Transect
- Surveyed Suitable Habitat

Unsuitable Potential BRFI Habitat
- Dense DCSS
- Riparian




Meters
0 50
0 200
Feet

Source: SDG&E 2015


**Figure B-57**
**TL695/6971 Rare Plant Survey Results**

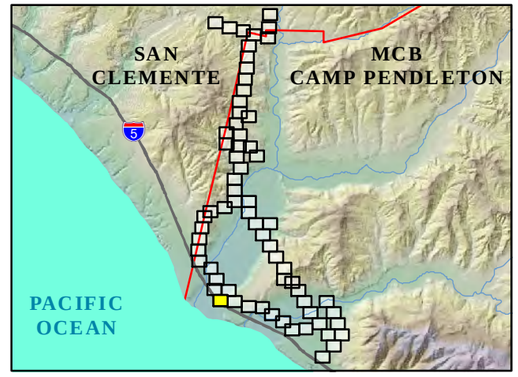
**LEGEND**

Project Features

- Project Survey Area
- Access Route

Rare Plant Survey Results

- Survey 1 Transect




Meters
0 50
0 200
Feet

Source: SDG&E 2015

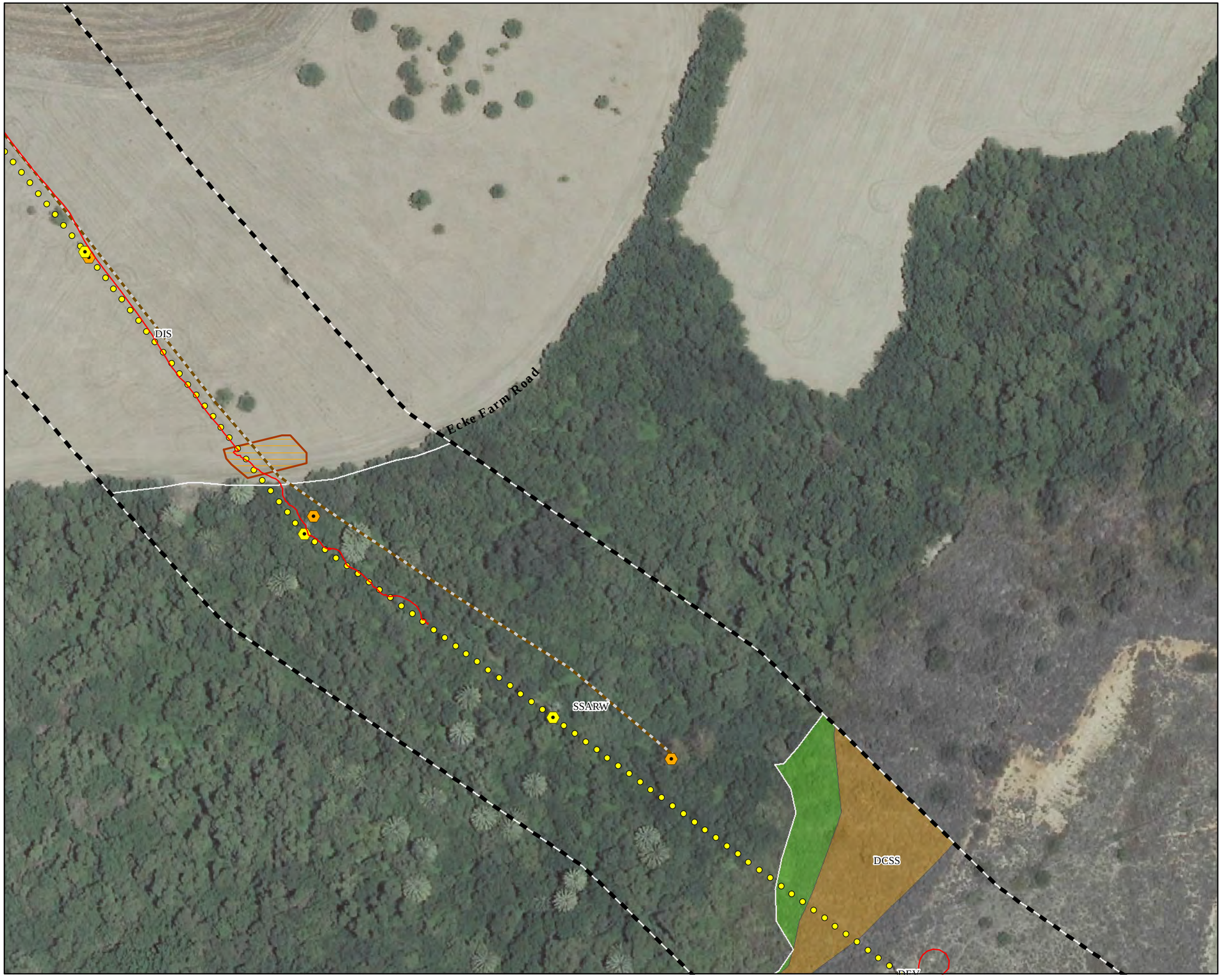


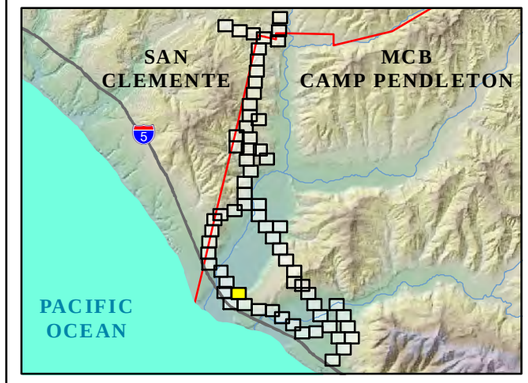

**Figure B-58**
**TL695/6971 Rare Plant Survey Results**

**LEGEND**

Project Features
- Project Survey Area
- Access Route
- Proposed Project Pole Topping Segment
- Proposed Utility Pole
- Existing Wood Pole
- Work/Staging/Turnaround Area

Rare Plant Survey Results
- Survey 1 Transect

Unsuitable Potential BRFI Habitat
- Dense DCSS
- Riparian




Meters
0 50
0 200
Feet

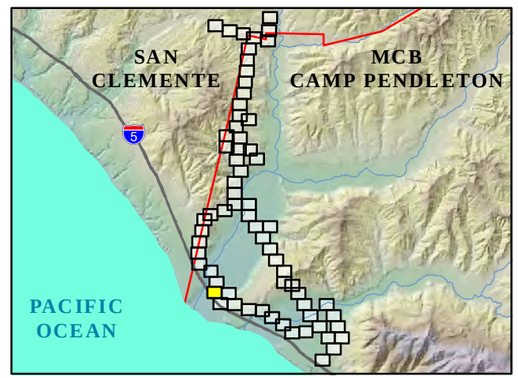
Source: SDG&E 2015


**Figure B-59**
**TL695/6971 Rare Plant Survey Results**

**LEGEND**

Project Features
- Project Survey Area
- Access Route
- Proposed Project Pole Topping Segment
- Proposed Utility Pole
- Staging Yard
- Existing Wood Pole

Rare Plant Survey Results
- Survey 1 Transect




Meters
0 50
0 200
Feet

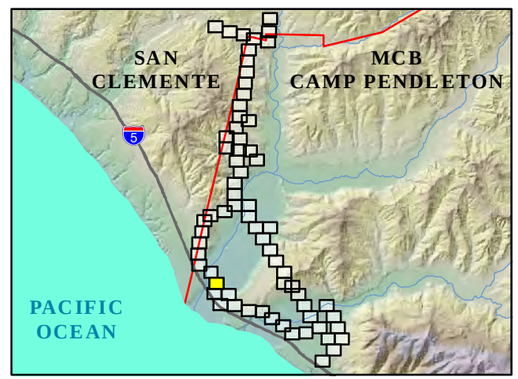
Source: SDG&E 2015


**Figure B-60**
**TL695/6971 Rare Plant Survey Results**

**LEGEND**

Project Features
- Project Survey Area
- Access Route
- Proposed Project Pole Topping Segment
- Proposed Utility Pole
- Existing Wood Pole

Rare Plant Survey Results
- Survey 1 Transect




Meters
0 50
0 200
Feet

Source: SDG&E 2015

# Figure B-61
# TL695/6971 Rare Plant Survey Results


**LEGEND**

Project Features

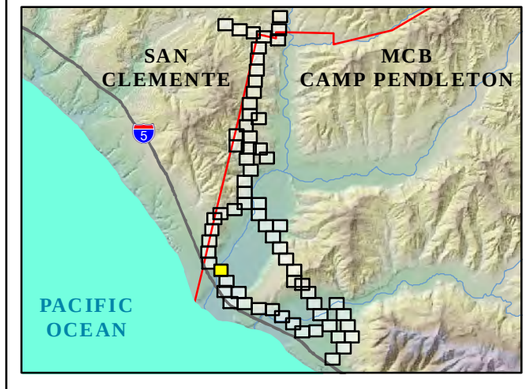
- Project Survey Area
- Access Route
- Proposed Project Pole Topping Segment
- Proposed Utility Pole
- Existing Wood Pole

Rare Plant Survey Results

- Survey 1 Transect

Unsuitable Potential BRFI Habitat

- Dense DCSS




Meters

0 50

0 200

Feet

Source: SDG&E 2015

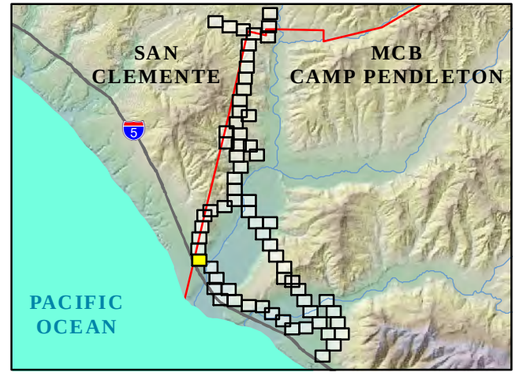
# Figure B-62
# TL695/6971 Rare Plant Survey Results


**LEGEND**

Project Features
- Project Survey Area
- Access Route
- Proposed Project Pole Topping Segment
- Proposed Utility Pole
- Existing Wood Pole
- MCB Camp Pendleton Boundary

Rare Plant Survey Results
- Survey 1 Transect
- Survey 2 Transect
- Survey 3 Transect

Unsuitable Potential BRFI Habitat
- Dense DCSS




Meters
0 50
0 200
Feet

Source: SDG&E 2015

# Figure B-63
# TL695/6971 Rare Plant Survey Results

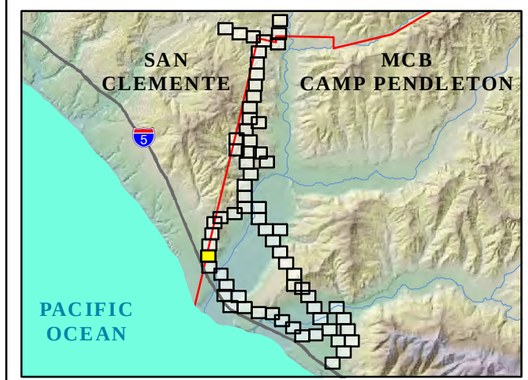

**LEGEND**

Project Features

- Project Survey Area
- Access Route
- Proposed Project Pole Topping Segment
- Proposed Utility Pole
- Existing Wood Pole
- MCB Camp Pendleton Boundary

Rare Plant Survey Results

- Survey 1 Transect
- Survey 2 Transect
- Survey 3 Transect
- Surveyed Suitable Habitat




Meters
0 50
0 200
Feet

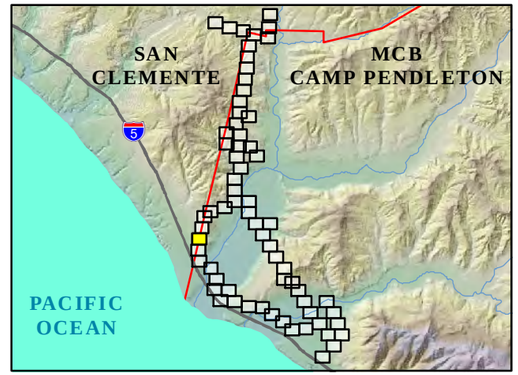
Source: SDG&E 2015


**Figure B-64**
**TL695/6971 Rare Plant Survey Results**

**LEGEND**

Project Features
- Project Survey Area
- Access Route
- Proposed Project Pole Topping Segment
- Proposed Utility Pole
- Existing Wood Pole
- MCB Camp Pendleton Boundary

Rare Plant Survey Results
- Survey 1 Transect
- Survey 2 Transect
- Survey 3 Transect
- Surveyed Suitable Habitat




Meters
0 50
0 200
Feet

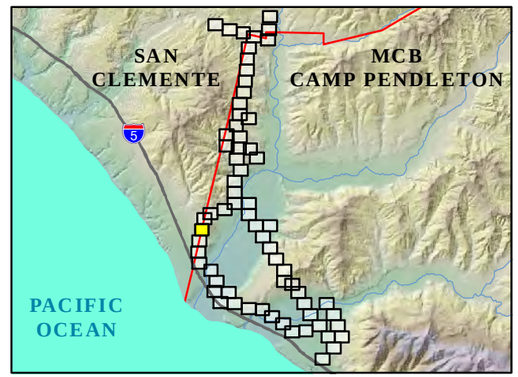
Source: SDG&E 2015


**Figure B-65**
**TL695/6971 Rare Plant Survey Results**

**LEGEND**

Project Features
- Project Survey Area
- Access Route
- Proposed Project Pole Topping Segment
- Proposed Utility Pole
- Existing Wood Pole
- MCB Camp Pendleton Boundary

Rare Plant Survey Results
- Survey 1 Transect
- Survey 2 Transect
- Survey 3 Transect
- Surveyed Suitable Habitat




Meters
0 50
0 200
Feet

Source: SDG&E 2015

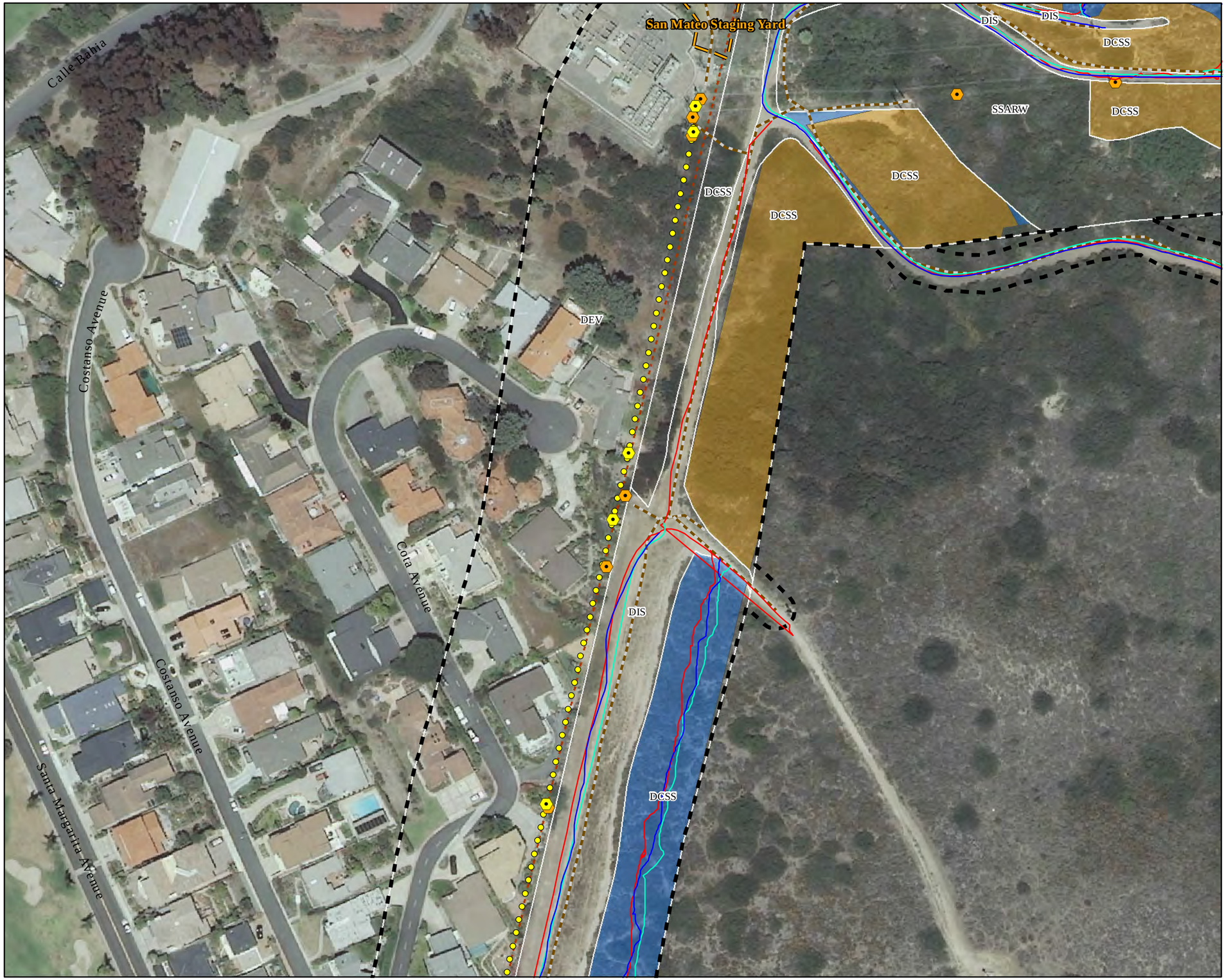


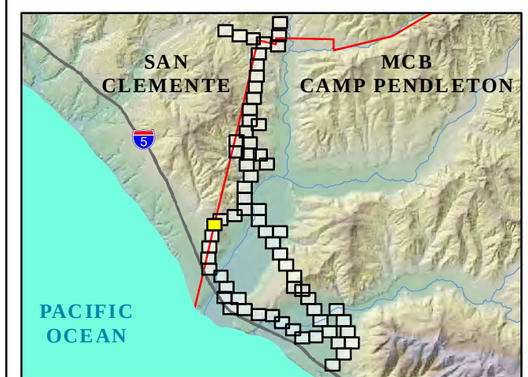

**Figure B-66**
**TL695/6971 Rare Plant Survey Results**

**LEGEND**

Project Features
- Project Survey Area
- Access Route
- Proposed Project Pole Topping Segment
- Proposed Utility Pole
- Staging Yard
- Existing Wood Pole
- MCB Camp Pendleton Boundary

Rare Plant Survey Results
- Survey 1 Transect
- Survey 2 Transect
- Survey 3 Transect
- Surveyed Suitable Habitat

Unsuitable Potential BRFI Habitat
- Dense DCSS




Meters
0 50
0 200
Feet

Source: SDG&E 2015

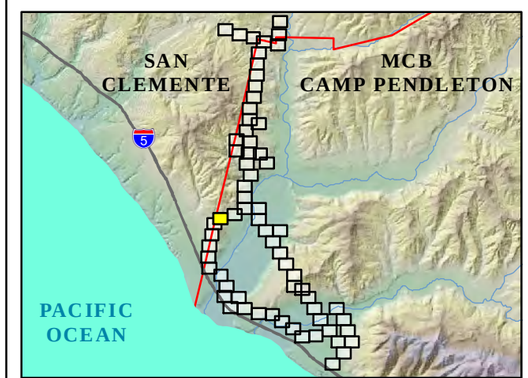

**Figure B-67**
**TL695/6971 Rare Plant Survey Results**

**LEGEND**

Project Features
- Project Survey Area
- Access Route
- Proposed Project Pole Topping Segment
- Proposed Utility Pole
- Staging Yard
- Existing Wood Pole
- MCB Camp Pendleton Boundary

Rare Plant Survey Results
- Survey 1 Transect
- Survey 2 Transect
- Survey 3 Transect
- Surveyed Suitable Habitat
- Paniculate Tarweed

Unsuitable Potential BRFI Habitat
- Dense DCSS




Meters
0 50
0 200
Feet

Source: SDG&E 2015

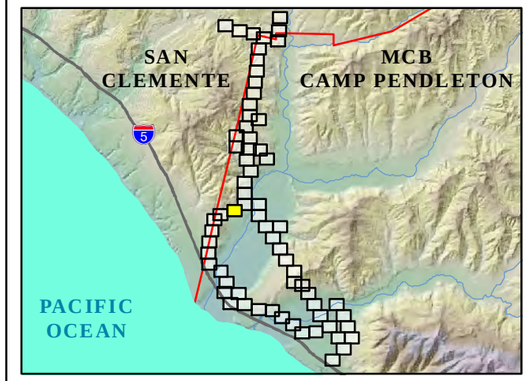
**Figure B-68**
**TL695/6971 Rare Plant Survey Results**

**LEGEND**

Project Features
- Project Survey Area
- Access Route
- Existing Wood Pole
- Work/Staging/Turnaround Area

Rare Plant Survey Results
- Survey 1 Transect
- Survey 2 Transect
- Survey 3 Transect
- Surveyed Suitable Habitat
- Paniculate Tarweed

Unsuitable Potential BRFI Habitat
- Dense NNGB
- Dense DCSS/NNGB/Recently Burned
- Dense DCSS




Meters
0 50
0 200
Feet

Source: SDG&E 2015

# APPENDIX C

## *Plant Species Observed During TL 695/6971 Rare Plant Surveys*

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# TL 695/6971 Plant List

| Family - Scientific Name | Common Name |
|---|---|
| **Ferns and Fern Allies** | |
| **Equisetaceae** | |
| *Equisetum laevigatum* | Smooth Horsetail |
| **Polypodiaceae** | |
| *Polypodium californicum* | Polypody Fern |
| **Pteridaceae** | |
| *Pentagramma triangularis* | Goldback Fern |
| **Selaginellaceae** | |
| *Seliginella bigelovii* | Bigelow's Spike Moss |
| **Dicots** | |
| **Adocaceae** | |
| *Sambucus nigra* ssp. *caerulea* | Blue Elderberry |
| **Aizoaceae** | |
| *Carpobrotus chilensis** | Sea Fig |
| *Carpobrotus edulis** | Hottentot Fig |
| *Mesembryanthemum crystallinum** | Common Ice Plant |
| *Tetragonia tetragonioides** | New Zealand Spinach |
| **Amaranthaceae** | |
| *Amaranthus albus** | Tumbleweed |
| **Anacardiaceae** | |
| *Malosma laurina* | Laurel Sumac |
| *Rhus integrifolia* | Lemonade Berry |
| *Schinus molle** | Peruvian Pepper |
| *Schinus terebinthifolius** | Brazilian Pepper |
| *Toxicodendron diversilobum* | Poison Oak |
| **Apiaceae** | |
| *Apium graveolens** | Celery |
| *Conium maculatum** | Poison Hemlock |
| *Daucus pusillus* | Rattlesnake Weed |
| *Foeniculum vulgare** | Fennel |
| *Sanicula crassicaulis* | Pacific Sanicle |
| **Apocynaceae** | |
| *Asclepias fascicularis* | Narrowleaf Milkweed |
| **Asteraceae** | |
| *Acourtia microcephala* | Sacapellote |
| *Ambrosia psilostachya* | Western Ragweed |
| *Artemisia californica* | California Sagebrush |
| *Artemisia douglasiana* | Mugwort |
| *Artemisia dracunculus* | Tarragon |
| *Baccharis pilularis* | Coyote Bush |
| *Baccharis salicifolia* | Mule Fat |
| *Bebbia juncea* | Sweet Bush |
| *Brickellia californica* | California Brickelbush |
| *Carduus pycnocephalus** | Italian Thistle |
| *Centaurea melitensis** | Tocalote |

# TL 695/6971 Plant List

| Family - Scientific Name | Common Name |
|---|---|
| *Chaenactis glabriuscula* var. *glabriuscula* | Yellow Pincushion |
| *Cirsium occidentale* | Cobweb Thistle |
| *Cirsium vulgare** | Bull Thistle |
| *Corethrogyne filaginifolia* var. *filaginifolia* | Common Sand Aster |
| *Cotula coronopifolia** | Brass Buttons |
| *Cynara cardunculus** | Artichoke Thistle |
| *Deinandra fasciculata* | Clustered Tarweed |
| *Deinandra paniculata* (CRPR 4.2) | Paniculate Tarplant |
| *Encelia californica* | California Encelia |
| *Encelia farinosa* | Brittlebush |
| *Erigeron bonariensis** | Flax-leaved Horseweed |
| *Erigeron foliosus* | Leafy Daisy |
| *Eriophyllum confertiflorum* | Golden Yarrow |
| *Euthamia occidentalis* | Grass-Leaf Goldenrod |
| *Glebionis coronaria** | Crown Daisy |
| *Grindelia camporum* | Gum Plant |
| *Hedypnois cretica** | Cretanweed |
| *Helminthotheca echioides** | Bristly Ox Tongue |
| *Heterotheca grandiflora* | Telegraph Weed |
| *Hypochaeris glabra** | Smooth Cat's Ear |
| *Isocoma menziesii* | Menzies' Goldenbush |
| *Jaumea carnosa* | Fleshy Jaumea |
| *Lactuca serriola** | Wild Lettuce |
| *Lasthenia californica* | California Goldfields |
| *Logfia filaginoides* | California Cottonrose |
| *Logfia gallica* | Dwarf Cottonrose |
| *Matricaria discoidea** | Pineapple Weed |
| *Osmadenia tenella* | False Rosinweed |
| *Pseudognaphalium biolettii* | Bicolor Cudweed |
| *Pseudognaphalium californicum* | California Everlasting |
| *Pseudognaphalium luteoalbum** | Jersey Cudweed |
| *Pseudognaphalium stramineum* | Cottonbatting Plant |
| *Psilocarphus tenellus* | Slender Woolly Marbles |
| *Rafinesquia californica* | California Chicory |
| *Senecio vulgaris** | Common Groundsel |
| *Silybum marianum** | Milk Thistle |
| *Sonchus asper** | Spiney-leaved Sow Thistle |
| *Sonchus oleraceus** | Common Sow Thistle |
| *Stephanomeria exigua* | Small Wirelettuce |
| *Stylocline gnaphaloides* | Everlasting Nest Straw |
| *Taraxacum officinale** | Dandelion |
| *Uropappus lindleyi* | Silver Puffs |
| *Venegasia carpesioides* | Canyon Sunflower |
| *Xanthium strumarium* | Rough Cockleburr |
| **Boraginaceae** | |

# TL 695/6971 Plant List

| Family - Scientific Name | Common Name |
|---|---|
| *Amsinckia mensiezii* var. *intermedia* | Menzie's Fiddleneck |
| *Cryptantha clevelandii* | Common Cryptantha |
| *Cryptantha intermedia* | Clearwater Cryptantha |
| *Emmenanthe penduliflora* | Whispering Bells |
| *Eucrypta chrysanthemifolia* | Spotted Eucrypta |
| *Heliotropium curassavicum* | Salt Heliotrope |
| *Phacelia cicutaria* var. *hispida* | Caterpillar Phacelia |
| *Phacelia minor* | California Bluebell |
| *Pholistoma auritum* var. *auritum* | Fiesta Flower |
| *Plagiobothrys collinus* | Cooper's Popcorn Flower |
| **Brassicaceae** | |
| *Brassica nigra** | Black Mustard |
| *Brassica rapa** | Field Mustard |
| *Brassica tournefortii* | Saharan Mustard |
| *Capsella bursa-pastoris** | Shepherd's Purse |
| *Cardamine californica* | Milk Maids |
| *Hirschfeldia incana** | Shortpod Mustard |
| *Lepidium nitidum* | Shining Pepperweed |
| *Nasturtium officinale* | White Watercress |
| *Raphanus sativus** | Wild Radish |
| *Sisymbrium altissimum** | Tumbling Mustard |
| **Cactaceae** | |
| *Cylindropuntia prolifera* | Coast Cholla |
| *Opuntia littoralis* | Coast Prickly Pear |
| *Opuntia oricola* | Chaparral Prickly Pear |
| *Opuntia ×occidentalis* | Western Prickly Pear |
| **Caryophyllaceae** | |
| *Cardionema ramosissima* | Sand Mat |
| *Cerastium glomeratum** | Mouse-eared Chickweed |
| *Polycarpon tetraphyllum* | Four Leaved Allseed |
| *Silene gallica** | Common Catchfly |
| *Spergularia rubra** | Red Sandspurry |
| *Stellaria media** | Common Chickweed |
| **Chenopodiaceae** | |
| *Atriplex lentiformis* | Big Saltbush |
| *Atriplex prostrata* | Fat-hen |
| *Atriplex semibaccata** | Australian Saltbush |
| *Chenopodium californicum* | California Goosefoot |
| *Salicornia pacifica* | Pickleweed |
| *Salsola tragus** | Russian Thistle |
| **Cistaceae** | |
| *Helianthemum scoparium* | Bisbee Peak Rushrose |
| **Cleomaceae** | |
| *Peritoma arborea var. arborea* | Bladderpod |
| **Convolvulaceae** | |

# TL 695/6971 Plant List

| Family - Scientific Name | Common Name |
|---|---|
| *Calystegia macrostegia* ssp. *arida* | Southern California Morning Glory |
| *Cressa truxillensis* | Spreading Alkali Weed |
| *Cuscuta californica* | California Dodder |
| *Dichondra occidentalis* (CRPR 4.2) | Western Pony's Foot |
| **Crassulaceae** | |
| *Crassula aquatica* | Aquatic Pygmy Weed |
| *Crassula connata* | Pygmy Weed |
| *Crassula ovata** | Jade Plant |
| *Dudleya edulis* | Fingertips |
| *Dudleya lanceolata* | Coastal Dudleya |
| *Dudleya pulverulenta* | Chalk Dudleya |
| **Cucurbitaceae** | |
| *Cucurbita foetidissima* | Calabazilla |
| *Marah macrocarpa* | Wild Cucumber |
| **Datiscaceae** | |
| *Datisca glomerata* | Durango Root |
| **Euphorbiaceae** | |
| *Chamaesyce polycarpa* | Small Seeded Spurge |
| *Chamaesyce serpens* | Creeping Spurge |
| *Croton californicus* | California Croton |
| *Croton setigerus* | Doveweed |
| *Euphorbia lathyris** | Gopher Plant |
| *Ricinus communis** | Castor Bean |
| **Fabaceae** | |
| *Acacia longifolia** | Golden Wattle |
| *Acmispon glaber* var. *glaber* | Deer Weed |
| *Acmispon heermannii* var. *heermannii* | Heermann's Lotus |
| *Acmispon micranthus* | Small Flowered Lotus |
| *Acmispon strigosus* | Hairy Lotus |
| *Amorpha fruticosa* | Desert Indigobush |
| *Lupinus bicolor* | Miniature Lupine |
| *Lupinus succulentus* | Arroyo Lupine |
| *Lupinus truncatus* | Blunt Leaved Lupine |
| *Medicago polymorpha** | Bur Clover |
| *Melilotus albus** | White Sweet Clover |
| *Melilotus indica** | Indian Sweet Clover |
| *Trifolium hirtum** | Rose Clover |
| *Vicia sativa* ssp. *nigra* | Garden Vetch |
| *Vicia villosa** | Winter Vetch |
| **Fagaceae** | |
| *Quercus agrifolia* | Coast Live Oak |
| **Frankeniaceae** | |
| *Frankenia salina* | Alkali Heath |
| **Gentianaceae** | |
| *Zeltnera venusta* | Charming Centaury |

# TL 695/6971 Plant List

| Family - Scientific Name | Common Name |
|---|---|
| **Geraniaceae** | |
| *Erodium botrys** | Long Beaked Filaree |
| *Erodium cicutarium** | Red Stemmed Filaree |
| *Erodium moschatum** | White Stemmed Filaree |
| *Geranium carolinianum* | Carolina Geranium |
| **Grossulariaceae** | |
| *Ribes speciosum* | Fuschia-flowered Gooseberry |
| **Lamiaceae** | |
| *Lamium amplexicaule** | Henbit Deadnettle |
| *Marrubium vulgare** | Horehound |
| *Salvia apiana* | White Sage |
| *Salvia columbariae* | Chia |
| *Salvia mellifera* | Black Sage |
| **Lythraceae** | |
| *Lythrum hyssopifolia** | Hyssop Loosestrife |
| **Malvaceae** | |
| *Malacothamnus fasciculatus* | Chaparral Mallow |
| *Malva parviflora** | Cheeseweed |
| *Malvella leprosa* | Alkali Mallow |
| *Sidalcea sparsifolia* | Checker Bloom |
| **Montiaceae** | |
| *Calandrinia ciliata* | Red Maids |
| *Claytonia perfoliata* | Miner's Lettuce |
| **Myrsinaceae** | |
| *Anagallis arvensis** | Scarlet Pimpernel |
| **Nyctaginaceae** | |
| *Mirabilis laevis* var. *crassifolia* | Wishbone Bush |
| **Onagraceae** | |
| *Camissoniopsis bistorta* | California Sun Cup |
| *Clarkia purpurea* | Purple Clarkia |
| *Epilobium ciliatum* | Fringed Willowherb |
| *Oenothera elata* | Great Marsh Evening-Primrose |
| **Orobanchaceae** | |
| *Castilleja affinis* ssp. *affinis* | Coast Indian Paintbrush |
| *Castilleja exserta* ssp. *exserta* | Purple Owl's Clover |
| **Oxalidaceae** | |
| *Oxalis pes-caprae** | Bermuda Buttercup |
| **Papavaraceae** | |
| *Eschscholzia californica* | California Poppy |
| *Romneya coulteri* (CRPR 4.2) | Coulter's matilija poppy |
| **Phrymaceae** | |
| *Mimulus aurantiacus* | Bush Monkey Flower |
| *Mimulus guttatus* | Common Monkey Flower |
| **Plantaginaceae** | |
| *Antirrhinum nuttallianum* ssp. *nuttallianum* | Nuttall's Snapdragon |

# TL 695/6971 Plant List

| Family - Scientific Name | Common Name |
|---|---|
| *Keckiella cordifolia* | Heart-leaved Penstemon |
| *Nuttallanthus texanus* | Blue Toadflax |
| *Plantago coronopus** | Cut-leaf Plantain |
| *Plantago elongata* | Coast Plantain |
| *Plantago erecta* | Dot-seed Plantain |
| *Plantago lanceolata** | English Plantain |
| *Plantago major** | Common Plantain |
| **Platanaceae** | |
| *Platanus racemosa* | California Sycamore |
| **Polemoniaceae** | |
| *Linanthus dianthiflorus* | Fringed Linanthus |
| *Gilia angelensis* | Chaparral Gilia |
| **Polygonaceae** | |
| *Chorizanthe staticoides* | Turkish Rugging |
| *Eriogonum elongatum* | Longstem Buckwheat |
| *Eriogonum fasciculatum* | California Buckwheat |
| *Eriogonum gracile* | Slender Woolly Buckwheat |
| *Lastarriaea coriacea* | Leather Spineflower |
| *Pterostegia drymarioides* | Fairy Mist |
| *Rumex crispus** | Curly Dock |
| **Primulaceae** | |
| *Dodecatheon clevelandii* ssp. *clevelandii* | Padre's Shooting Star |
| **Ranunculaceae** | |
| *Clematis ligusticifolia* | Western Virgin's Bower |
| *Delphinium parryi* ssp. *parryi* | Parry's Larkspur |
| *Ranunculus californicus* | California Buttercup |
| **Rosaceae** | |
| *Adenostoma fasciculatum* | Chamise |
| *Cercocarpus minutiflorus* | Smooth Mountain Mahogany |
| *Drymocallis glandulosa* | Sticky Cinquefoil |
| *Heteromeles arbutifolia* | Toyon |
| *Rosa californica* | California Rose |
| *Rubus ursinus* | California Blackberry |
| **Rubiaceae** | |
| *Galium angustifolium* ssp. *angustifolium* | Narrowleaf Bedstraw |
| *Galium aparine* | Common Bedstraw |
| *Galium porrigens* | Climbing Bedstraw |
| **Salicaceae** | |
| *Populus fremontii* | Fremont Cottonwood |
| *Salix exigua* | Sandbar Willow |
| *Salix gooddingii* | Black Willow |
| *Salix laevigata* | Red Willow |
| *Salix lasiolepis* | Arroyo Willow |
| **Saururaceae** | |
| *Anemopsis californica* | Yerba Mansa |

# TL 695/6971 Plant List

| Family - Scientific Name | Common Name |
|---|---|
| **Solanaceae** | |
| *Datura wrightii* | Sacred Datura |
| *Lycium californicum* (CRPR 4.2) | California Boxthorn |
| *Nicotiana glauca** | Tree Tobacco |
| *Solanum douglasii* | Douglas' Nightshade |
| *Solanum nigrum** | Black Nightshade |
| *Solanum parishii* | Parish's Purple Nightshade |
| *Solanum xanti* | Purple Nightshade |
| **Tamaricaceae** | |
| *Tamarix ramosissima** | Saltcedar |
| **Urticaceae** | |
| *Hesperocnide tenella* | Western Nettle |
| *Parietaria hespera* var. *hespera* | Pellitory |
| *Urtica dioica* | Stinging Nettle |
| **Verbenaceae** | |
| *Verbena lasiostachys* | Western Verbena |
| **Viscaceae** | |
| *Phoradendron macrophyllum* | Big Leaf Mistletoe |
| **Monocots** | |
| **Agavaceae** | |
| *Chlorogalum parviflorum* | Smallflower Soap Plant |
| *Hesperoyucca whipplei* | Chaparral Yucca |
| **Arecaceae** | |
| *Washingtonia robusta** | Mexican Fan Palm |
| *Phoenix canariensis** | Canary Island Date Palm |
| **Asphodelaceae** | |
| *Asphodelus fistulosus** | Onion Weed |
| **Cyperaceae** | |
| *Carex* spp. | Sedge |
| *Cyperus eragrostis* | Tall Flatsedge |
| *Cyperus involucratus** | Umbrella Sedge |
| *Eleocharis macrostachya* | Creeping Spike Rush |
| *Schoenoplectus acutus* | Hardstem Bulrush |
| *Schoenoplectus californicus* | California Bulrush |
| **Juncaceae** | |
| *Juncus balticus* | Baltic Rush |
| *Juncus mexicanus* | Mexican Rush |
| *Juncus rugulosus* | Wrinkled Rush |
| **Iridaceae** | |
| *Sisyrinchium bellum* | Blue Eyed Grass |
| **Liliaceae** | |
| *Calochortus splendens* | Splendid Mariposa Lily |
| **Melanthiaceae** | |
| *Toxicoscordion fremontii* | Fremont's Star Lily |
| **Poaceae** | |

# TL 695/6971 Plant List

| Family - Scientific Name | Common Name |
|---|---|
| *Arundo donax** | Giant Reed |
| *Avena barbata** | Slim Oat |
| *Avena fatua** | Common Oat |
| *Bothriochloa barbinodis* | Beard Grass |
| *Bromus diandrus** | Ripgut Brome |
| *Bromus hordeaceus** | Soft Chess Brome |
| *Bromus madritensis** | Red Brome |
| *Cortaderia selloana* | Pampas Grass |
| *Distichlis spicata* | Salt Grass |
| *Elymus condensatus* | Giant Ryegrass |
| *Festuca microstachys* | Small Fescue |
| *Festuca perennis** | Italian Ryegrass |
| *Hordeum murinum** | Foxtail Barley |
| *Lamarckia aurea** | Goldentop Grass |
| *Leptochloa fusca* ssp. *uninervia* | Mexican Sprangletop |
| *Melica imperfecta* | California Melic |
| *Phalaris minor** | Mediterranean Canarygrass |
| *Poa annua** | Annual Bluegrass |
| *Polypogon monspeliensis** | Rabbitsfoot Grass |
| *Schismus barbatus** | Mediterranean Grass |
| *Stipa lepida* | Foothill Needlegrass |
| *Stipa pulchra* | Purple Needlegrass |
| **Themidaceae** | |
| *Bloomeria crocea* | Goldenstar |
| *Brodiaea filifolia* (Federally Threatened) | Thread Leaved Brodiaea |
| *Dichelostemma capitatum* | Blue Dicks |
| *Muilla maritima* | Common Muilla |
| **Typhaceae** | |
| *Typha* spp. | Cattail |

*Non-Native Species

**Appendix D – Wet/Dry Season Fairy Shrimp Reports Cardno 2015**

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Final

# Wet Season Fairy Shrimp Technical Report for TL 695/6971 Reconductor Project

San Diego Gas & Electric Company

November 2015

Prepared for:
Pangea Biological

Prepared by:
Cardno

# Acronyms and Abbreviations

| | | | |
|---|---|---|---|
| kV | kilovolt | SDFS | San Diego fairy shrimp |
| | | SDG&E | San Diego Gas & Electric Company |
| MCB | Marine Corps Base | SONGS | San Onofre Nuclear Generating Station |
| PSA | Project Survey Area | TL | Tie Line |
| RFS | Riverside fairy shrimp | USFWS | United States Fish and Wildlife Service |

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# 1.0 INTRODUCTION

This Wet Season Fairy Shrimp Technical Report provides the results of United States Fish and Wildlife Service (USFWS) protocol surveys for federally listed fairy shrimp species conducted in support of a Proponent's Environmental Assessment being prepared for San Diego Gas & Electric Company's (SDG&E) Proposed Tie Line (TL) 695/6971 Reconductor[1] Project (i.e., the Proposed Project) in northern San Diego County (Figure 1). Under contract to SDG&E, and subcontracted through Pangea Biological (agreement number PBCARDNO-1001 Task Order 25240.01-001), Cardno conducted USFWS protocol surveys for federally listed fairy shrimp species in the SDG&E TL 695/6971 Reconductor project area.

In accordance with USFWS fairy shrimp presence/absence survey protocol (USFWS 1996), one full wet season (conducted from February to July 2015) presence/absence survey was conducted in the SDG&E TL 695/6971 Reconductor Project Survey Area (PSA) within all potential vernal basin habitats. Dry season tasks such as soil collection, and cyst hatching and identification, will be performed by appropriately certified permitees, and are expected to occur during the summer of 2015. A separate 90-day report will be submitted for dry season sampling activities. All wet season survey activities were completed prior to the USFWS issuance of the new protocol guidelines (USFWS 2015), and therefore conducted in accordance with the valid protocols of the time (USFWS 1996).

# 2.0 PROPOSED PROJECT AND PROJECT SURVEY AREA

## 2.1 Project Location and Description

SDG&E proposes to reconductor a 69-kilovolt (kV) power line in northern San Diego County near the border of Orange County. The power line is located primarily on federal military lands in the western portion of Marine Corps Base (MCB) Camp Pendleton (Figure 2). The proposal also includes removing wood poles, installing steel poles, and reconductoring within existing utility corridors and other areas devoted to electric utilities. The 69-kV power line will be reconductored between SDG&E's Talega, Basilone, and Japanese Mesa Substations.

While the Proposed Project components are located primarily in the westerly portion of MCB Camp Pendleton, in San Diego County, California; a portion of the power line alignment extends into the eastern area of the city of San Clemente, in Orange County, California.

As depicted in Figure 2, the northern limit of the reconductor project is located outside MCB Camp Pendleton, to the north and west of the Talega Substation. From this point, the project area runs west before turning south into MCB Camp Pendleton toward the San Mateo Junction (i.e., west of the Sierra Training Area) along the ridge tops of steep hills located to the north and west of Cristianitos Road. The hills in this area lie along the border of San Diego and Orange counties, and occur on lands that have been leased by the federal government to the California Department of Parks and Recreation. From San Mateo Junction, the Proposed Project runs in a southeasterly direction toward the northeastern corner of San Onofre Nuclear Generating Station (SONGS) Mesa. From this point, the Proposed Project extends to the northwest to the Basilone Substation, and to the southwest to the Japanese Mesa Substation. The Proposed Project includes approximately 27 miles of existing dirt roads that will be utilized to access various elements of the Proposed Project for construction activities.

[1] Reconductoring is a term used by utilities to describe the replacement of existing wires with new wires.

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**Figure 1**
**Regional Location of MCB Camp Pendleton and the Proposed Project Area**

**LEGEND**

- Project Area
- County Boundary
- MCB Camp Pendleton Boundary
- Cleveland National Forest Boundary
- State Route or Interstate


Kilometers
0 10
0 10
Miles

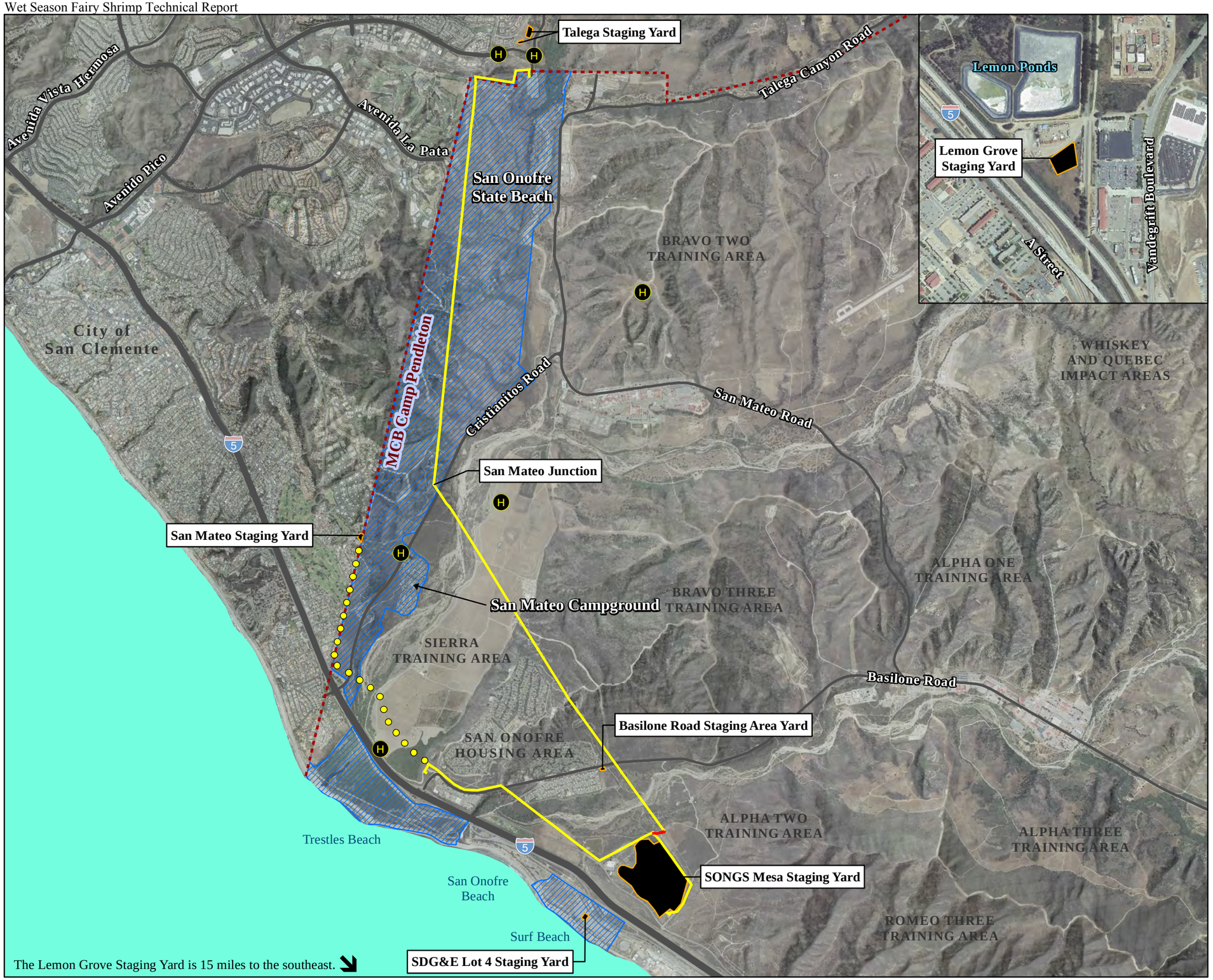


**Figure 2**
**TL695/6971 Proposed Project Area**

**LEGEND**

- MCB Camp Pendleton Boundary
- Proposed Project Overhead Route
- Proposed Project Underground Route
- Proposed Power Line Removal Segement
- Staging Yard
- Helicopter Incidental Landing Area
- State Parks Lease Area


Kilometers
0 2
0 1
Miles

Sources: City of San Clemente 2015, ESRI 2015

## 2.2 Project Survey Area

The PSA for fairy shrimp surveys consists of a 300-foot buffer that originates from the power line (150-foot buffer on each side of the power line) and a 50-foot buffer around all laydown areas, substations, and stringing sites. In addition, a 20-foot buffer was used on both sides of dirt access roads, of which 11.8 miles occur within the main 300-foot survey buffer and 15.4 miles occur outside of the 300-foot survey buffer. Table 1 details the PSA.

**Table 1. TL 695/6971 Fairy Shrimp Project Survey Area**

| Project Component | Area |
|---|---|
| Power Line (including 300-foot survey buffer) | 393.70 acres |
| Substations (including 50-foot survey buffer) | |
| Basilone Substation | 1.14 acres |
| Japanese Mesa Substation | 0.28 acres |
| Talega Substation | 7.86 acres |
| Staging Yards (including 50-foot survey buffer) | |
| Basilone Staging Yard | 1.17 acres |
| Talega Staging Yard 1 of 2* | 3.72 acres |
| San Mateo Staging Yard | 1.31 acres |
| SONGS Mesa Staging Yard | 80.87 acres |
| SDG&E Lot 4 Staging Yard | 1.88 acres |
| Lemon Grove Staging Yard | 1.43 acres |
| Stringing Sites (including 50-foot buffer) | 2.23 acres |
| **TOTAL** | **496.90 acres** |

*Note:* *Talega Staging Yard 2 of 2 is a component that was added to the Proposed Project but is located outside of the PSA.

# 3.0 BACKGROUND

Fairy shrimp are small, translucent crustaceans that are found in ephemeral (vernal) pools and occasionally in depressions (road ruts and ditches) that support suitable ponded habitat. When water begins to pond after the commencement of the rainy season, shrimp begin to hatch from encysted embryos (cysts). Two federally listed fairy shrimp species are known to occur in San Diego County, Riverside fairy shrimp (RFS) (*Streptocephalus woottoni*) and San Diego fairy shrimp (SDFS) (*Branchinecta sandiegonensis*), both of which are described below. Threats to both species include habitat loss and degradation due to urban and agricultural development, off-road vehicle use, vehicle trampling, and flood control measures (USFWS 2008a, 2008b). Both RFS and SDFS are known to co-occur with the more common, non-listed, versatile fairy shrimp (*Branchinecta lindahli*).

## 3.1 Riverside Fairy Shrimp

The RFS is a medium sized fairy shrimp, typically 0.5 to 1.0 inch that is generally restricted to vernal pools and other non-vegetated ephemeral pools greater than 12 inches in depth in Riverside, Orange, and San Diego counties in southern California, and northwestern Baja California, Mexico (USFWS 2008a). The northern range of RFS is defined by Skunk Hollow and the Santa Rosa Plateau in Riverside County and coastal sites in San Diego and Orange counties. The species is documented in one vernal pool complex on Marine Corps Air Station Miramar, throughout MCB Camp Pendleton, and eight vernal pool complexes on Otay Mesa (MCB Camp Pendleton 2012). The USFWS listed the RFS as federally endangered on August 3, 1993 (USFWS 1993).

The RFS has the most limited range of any endemic California (including Baja California) fairy shrimp and is currently only known to occupy approximately 45 vernal pool complexes (approximately 200 occupied basins) (USFWS 2008a). More than half of all extant complexes known to contain RFS are in San Diego County, including eight complexes (containing at least 81 basins) on MCB Camp Pendleton (MCB Camp Pendleton 2012, USFWS 2008a).

### 3.2 San Diego Fairy Shrimp

The SDFS is a small fairy shrimp (growing to 0.6 inch) that is generally found in smaller, shallower (2 to 12 inches deep) vernal pools and ephemeral basins than RFS and occasionally in depressions such as ditches and road ruts (MCB Camp Pendleton 2012, USFWS 2008b). The USFWS listed the SDFS as federally endangered on February 3, 1997 (USFWS 1997).

SDFS are only known to occur in approximately 137 vernal basin complexes in San Diego, Orange, and Santa Barbara counties, and northwestern Baja California, Mexico, with the majority of occupied habitat being in San Diego County (USFWS 2008b).

## 4.0 METHODS

Before initiating the wet season surveys, a 15-day notice of intent (notification) letter was sent to the USFWS Carlsbad Field Office requesting permission to conduct surveys for the presence of listed fairy shrimp. The wet season sampling notification letter was submitted on February 5, 2015 and approved on March 2, 2015 (Appendix A).

Fairy shrimp surveys were conducted in accordance with the Interim Survey Guidelines to Permittees for Recovery Permits under Section 10(a)(1)(A) of the Endangered Species Act for the Listed Vernal Pool Branchiopods (USFWS 1996)[2]. Surveys were conducted by USFWS permitted fairy shrimp and vernal pool biologists Richard Stolpe (Permit TE-25864A-0) and Clint Scheuerman (Permit TE-44855A-0).

Before beginning focused surveys, site reconnaissance surveys were conducted by Cardno, SDG&E, and Pangea Biological personnel to determine suitable vernal basin habitat. During site reconnaissance surveys, all potential vernal basins were documented and mapped in the field using a global positioning system unit with a sub-meter level accuracy receiver. The location of potential vernal basins was provided to Cardno prior to initiating fairy shrimp surveys. This information was used to prepare the 15-day wet season notice of intent that was sent to USFWS.

Per guidance from SDG&E and Pangea Biological, fairy shrimp surveys were restricted to seven previously identified basins in the survey area. However, during the course of wet season sampling, any unexpected and undocumented ponded features encountered within the PSA were also inspected for potential vernal pool characteristics or diagnostic species. If warranted, these basins were surveyed for fairy shrimp presence.

As a result of the timing of the project, wet season sampling commenced following a substantial rainfall event at the end of February 2015 and subsequent permission to proceed from the USFWS. Sampling events occurred between the dates of March 6 and July 29[3], 2015. During that time, basins identified as

[2] On May 31, 2015, new survey guidelines (the first in nearly 30 years) for conducting activities for federally listed large branchiopods were issued by USFWS (USFWS 2015). Therefore, wet season reporting for the Proposed Project follows the survey guidelines it was initiated under (USFWS 1996), which were valid at the time of the surveys.

[3] The later-than-normal end date for wet season surveys was driven by late season sufficient ponding events coupled with the finding of fairy shrimp in similar basins on coastal Camp Pendleton (for a different project) on July 28.

having potentially suitable vernal fairy shrimp habitat were mapped, photographed, and then surveyed for the duration of the wet season. Locations of all suitable vernal basins are provided on figures in Appendix B. During the wet season, each basin was surveyed approximately once every two weeks following sufficient ponding (rain) events until dry. A photographic record of surveyed basins is provided in Appendix C.

During each site visit, basin bottoms, edges, and vertical water columns were sampled using an aquarium net with mesh size no larger than 0.125 (1/8) inch (0.318 cm). Specimens collected from each basin numbered less than the maximum of 20 specimens and/or less than 10 percent of the estimated population per USFWS protocol. Only sexually mature individuals were collected. If a federally listed fairy shrimp was recovered from any of the basins during the wet season sampling, the fairy shrimp survey for that basin would have been considered complete under the protocol guidelines.

# 5.0 RESULTS

Results of vernal basin mapping and fairy shrimp surveys in the SDG&E TL 695/6971 Reconductor Project PSA are provided on figures in Appendix B and Table 2 below. Individual Vernal Pool Data Sheets are provided by date in Appendix D.

All surveyed basins were non-naturally occurring disturbed depressions, ruts, and/or swales. No federally listed fairy shrimp species were observed in the PSA; however, eight basins did contain the non-listed versatile fairy shrimp (*Branchinecta lindahli*). Two additional basins contained fairy shrimp that were not fully identified. The first of these basins, Basin 5-1, was observed in the field to contain fairy shrimp that were visually identifiable[4] to the *Branchinecta* genus. However, this observation was made during pre-survey reconnaissance. Additionally, this basin was initially thought to be outside of the project area. Therefore, Basin 5-1 was not sampled at that time and fairy shrimp were not observed in Basin 5-1 after that encounter. The second of these basins, Basin 33-3, contained fairy shrimp that were deceased and decaying in mud (casts), and, therefore, were unable to be sampled. Fairy shrimp were not encountered in this basin after that encounter; however, when this basin is full it appears to share hydrology with Basin 33-4, which contains the non-listed versatile fairy shrimp (*Branchinecta lindahli*). Both of the basins containing undetermined fairy shrimp likely contained *Branchinecta lindahli*, based upon the shallowness of the basins, relatively brief ponding durations, size and appearance characteristics of the shrimp, and in the case of Basin 33-3 connectivity to another basin containing *Branchinecta lindahli*. However, lab confirmation of samples would be needed to make a satisfactory determination of species.

As noted, Table 2 presents the results of the 2014-2015 wet season fairy shrimp surveys in the SDG&E TL 695/6971 Reconductor PSA.

[4] In-the-field identification made by USFWS permitted fairy shrimp biologists Richard Stolpe (TE-25864A-0).

**Table 2. TL 695/6971 Basins Containing Fairy Shrimp, 2014-2015 Wet Season**

| Basin ID | Approximate Lat./Long. | Dates Visited (Ponding = Bold) | Observed Species | Estimated Population | Wet Season Surveyed |
|---|---|---|---|---|---|
| Basin 5-1 | 33°26'39.17"N, 117°34'49.54"W | **2/3**; 3/20; 4/29; 5/12; 7/29 | *Branchinecta species* | 100s | No[1] |
| Basin 7-1 | 33°26'17.12"N, 117°34'52.64"W | 2/3; 3/20; 5/12 | None | - | Yes |
| Basin 21-1 | 33°23'3.94"N, 117°34'14.56"W | 2/3; **3/6, 9, 13, 20**, 26; 4/2; 5/20; **7/21, 29; 9/9** | *Branchinecta lindahli* | 100s | Yes |
| Basin 21-2 | 33°23'2.88"N, 117°34'12.98"W | 2/3; **3/6, 9, 13, 20**, 26; 4/2; 5/20; 7/21, 29 | *Branchinecta lindahli* | 1,000s | Yes |
| Basin 21-3 | 33°22'59.32"N, 117°34'7.84"W | 2/3; 3/6, 9, 13, 20, 26; 4/2; 5/20; 7/21, 29 | None | - | Yes |
| Basin 23-2 | 33°22'56.69"N, 117°33'20.04"W | 2/3; 3/6, 9, 13, 20, 26; 4/2; 5/20; 7/21 | None | - | Yes |
| Basin 23-4 | 33°22'55.79"N, 117°33'19.01"W | **2/3; 3/6, 9, 13, 20, 26; 4/2, 6**, 21; 5/20; 7/21 | None | - | Yes |
| Basin 23-8 | 33°22'59.05"N, 117°33'15.99"W | **5/20**; 7/21 | *Branchinecta lindahli* | 10s | Yes |
| Basin 24-1 | 33°22'30.01"N, 117°32'57.59"W | 2/3; **3/6, 9, 13**, 20; 4/2 | *Branchinecta lindahli* | 1s | Yes[2] |
| Basin 33-1 | 33°23'10.20"N, 117°33'35.19"W | 2/3; **3/6, 9, 13, 20, 26**; 4/2; 5/1, 20; 7/21 | *Branchinecta lindahli* | 10,000s | Yes |
| Basin 33-2 | 33°23'9.80"N, 117°33'39.02"W | 2/3; **3/6, 9, 13**, 20, 26; 4/2; 5/1, 20; 7/21 | *Branchinecta lindahli* | 100s | Yes |
| Basin 33-3 | 33°23'11.38"N, 117°33'38.02"W | 2/3; **3/6**, 9, 13, 20, 26; 4/2; 5/20; 7/21 | Undetermined[3] | 10s | Yes |
| Basin 33-4 | 33°23'12.03"N, 117°33'38.01"W | 2/3; **3/6, 9**, 13, 20, 26; 4/2; 5/1, 20; 7/21 | *Branchinecta lindahli* | 10s | Yes |
| Basin 33-10 | 33°23'1.02"N, 117°33'29.47"W | 2/3; **3/6, 9, 13**, 20, 26; 4/2; 5/1, **20**; 7/21 | *Branchinecta lindahli* | 1000's | Yes |
| Basin 33-11 | 33°23'2.83"N, 117°33'27.04"W | 2/3; **3/6**, 9, 13, 20, 26; 4/2; 5/20; 7/21 | None | - | Yes |

*Notes:* [1]Visual observation determined in the field by R. Stolpe during pre-survey reconnaissance. At the time of the observation, it was assumed that this basin would not be within the project area.
[2]Only one sampling event occurred in this basin, and it has been targeted for request for future surveys.
[3]Undetermined = fairy shrimp observed in dry/drying mud, but unable to sample.

# 6.0 DISCUSSION

No federally listed fairy shrimp species were identified in any of the surveyed basins in the SDG&E TL 695/6971 Reconductor PSA during wet season sampling. The non-listed versatile fairy shrimp was observed in eight basins; however, this species is not afforded any protection under the federal Endangered Species Act. Two basins contained undetermined fairy shrimp; one *Branchinecta* species (but likely *Branchinecta lindahli*), and the other unknown genus but also likely *Branchinecta lindahli.* A lab confirmation of species from the basins containing undetermined fairy shrimp would be needed to make a satisfactory determination of species.

This is an interim report; a separate 90-day report will be submitted for dry season sampling activities, and both reports will be combined in a Final Fairy Shrimp Report at the conclusion of the project.

# 7.0 REFERENCES

MCB Camp Pendleton. 2012. Integrated Natural Resource Management Plan Marine Corps Base and Marine Corps Air Station Camp Pendleton. Assistant Chief of Staff, Environmental Security. http://www.marines.mil/unit/basecamppendleton/Pages/BaseStaffandAgencies/Environmental/NaturalResourcesManagementPlan/Home.aspx.

USFWS. 1993. Endangered and Threatened Wildlife and Plants: Determination of Threatened Status for Three Vernal Pool Plants and the Riverside Fairy Shrimp. U.S. Fish and Wildlife Service. Federal Register 58: 41384-41392.

USFWS. 1996. Interim Survey Guidelines to Permittees for Recovery Permits under Section 10(a)(1)(A) of the Endangered Species Act for the Listed Vernal Pool Branchiopods. 19 August.

USFWS. 1997. Endangered and Threatened Wildlife and Plants: Determination of Endangered Status for the San Diego Fairy Shrimp. U.S. Fish and Wildlife Service. Federal Register 62: 4925-4939.

USFWS. 2008a. Riverside Fairy Shrimp (*Streptocephalus wootoni*) 5-Year Review: Summary and Evaluation. U.S. Fish and Wildlife Service Carlsbad Office. Carlsbad, California. September.

USFWS. 2008b. San Diego Fairy Shrimp (*Branchinecta sandiegonensis*) 5-Year Review: Summary and Evaluation. U.S. Fish and Wildlife Service Carlsbad Office. Carlsbad, California. September.

USFWS. 2015. Survey Guidelines for the Listed Large Branchiopods. Pacific Southwest Region. May 31.

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# APPENDIX A

*15-Day Notification for Wet Season Fairy Shrimp Surveys*

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**Clint Scheuerman**
**1941 Devaul Ranch Drive**
**San Luis Obispo, CA • 93405**
**Phone: (760) 809-4236**
**Email: clint.scheuerman@cardno-gs.com**

February 5, 2015

Ms. Stacey Love
Recovery Permits Coordinator
Carlsbad Fish and Wildlife Office
2177 Salk Avenue, Suite 250
Carlsbad, CA. 92008

**SUBJECT:** 15-day notification for 2015 wet season fairy shrimp surveys on Marine Corps Base Camp Pendleton in San Diego County, California in support of the San Diego Gas and Electric Company's TL 695/6971 Reconductor Project

Dear Ms. Love,

I am writing to request permission for myself and/or my coworker, Mr. Richard Stolpe (please see permit information below), to conduct wet season branchiopod sampling at 7 vernal pools/ponded basins on Marine Corps Base Camp Pendleton. All of the vernal pools/ponded basins are located within the USGS SAN CLEMENTE 7.5' Quadrangle (please see Enclosure 1). The surveys would be conducted as part of the environmental analysis for the San Diego Gas and Electric Company's TL 695/6971 Reconductor Project. The Proposed Project would replace conductor wire and poles within San Diego Gas and Electric's right-of-way along a 9-mile-long transmission corridor located in the western portion of Marine Corps Base Camp Pendleton. I realize that the surveys would be conducted after the first rains of the year, and so, I am requesting that we be able to begin the surveys as soon as possible. The vernal pool/ponded basin IDs and approximate coordinates are presented below and their locations are shown on the accompanying maps in Enclosure 1. Surveys will be conducted to collect baseline information in vernal pools that have not yet been surveyed for the presence of listed branchiopods. Based on preliminary analysis, these are the only features that need to be surveyed for listed vernal pool branchiopods are:

- Basin 1 (-117.570724, 33.384421)
- Basin 2 (-117.549498, 33.375085)
- SP_69001 (-117.579559, 33.436922)
- SP_69002 (-117.579302, 33.436169)
- SO_83001 (-117.555300, 33.382141)
- SO_83002 (-117.555526, 33.382433)
- SO_84001 (-117.557502, 33.384114)

Should, during the course of surveys, other features be located that require sampling, we will notify you at once before proceeding.

As a subcontractor to Pangea Biological for services provided to San Diego Gas and Electric Company for our employer Cardno, I, Clint Scheuerman, and/or Richard Stolpe will conduct the 2015 wet season branchiopod surveys. The branchiopod surveys will be conducted in accordance with the most recent guidelines published by the Service under Section 10(a)(1)(A) of the Endangered Species Act for wet season surveys.

Please refer to attached site maps of the areas we intend to survey. As always, please do not hesitate to contact me with any questions, or if I can provide anything further.

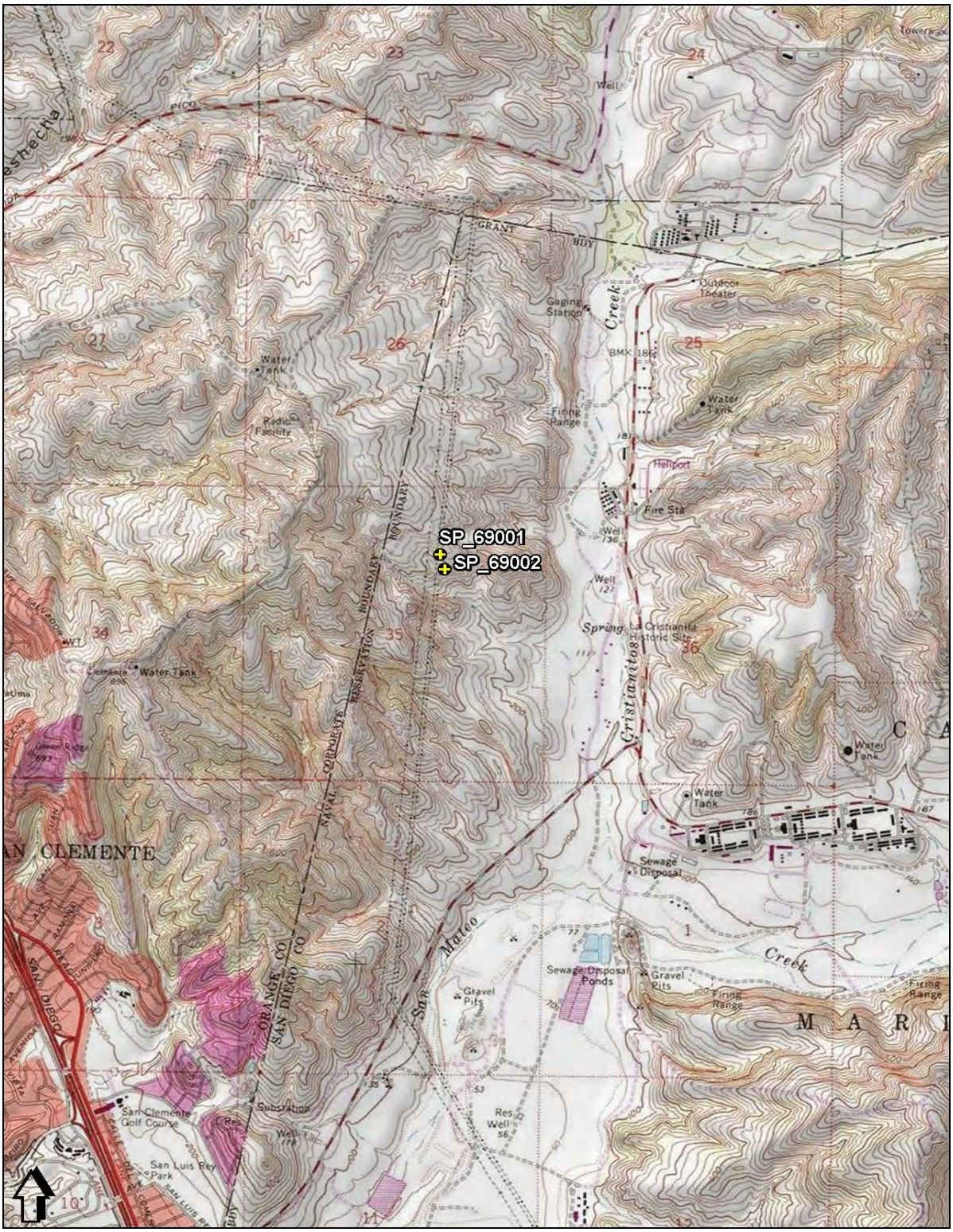
Very Respectfully,

Clint Scheuerman

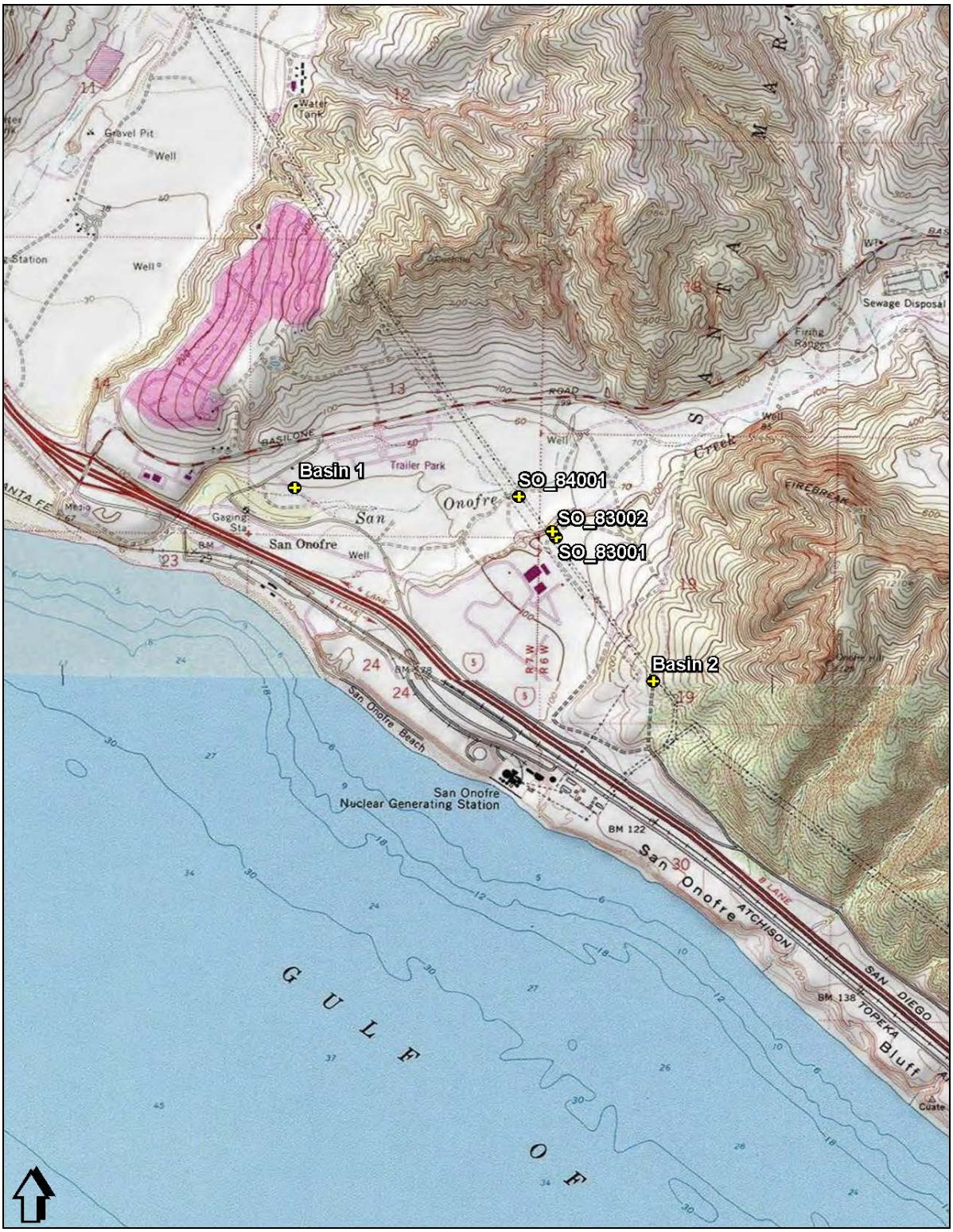
**Contact Information**
Clint Scheuerman, Cardno (Recovery Permit TE-44855A-1)
1941 Devaul Ranch Drive
San Luis Obispo, CA 93405
Phone: (760) 809-4236
Email: clint.scheuerman@cardno-gs.com

Richard Stolpe, Cardno (Recovery Permit TE-25864A-0)
514 Via De La Valle, Suite 308
Solana Beach, CA 92075
Phone: (858) 509-3157
Email: richard.stolpe@cardno-gs.com

**Enclosure 1.** Vernal Pool/Ponded Basin Locations for the TL 695 Project
in the USGS SAN CLEMENTE 7.5' Quadrangle



**Enclosure 1.** Vernal Pool/Ponded Basin Locations for the TL 695 Project
in the USGS SAN CLEMENTE 7.5' Quadrangle



**From:** Beck, Peter [mailto:peter_beck@fws.gov]
**Sent:** Monday, March 02, 2015 3:06 PM
**To:** Scheuerman, Clint
**Cc:** Stacey_Love@fws.gov; Barker, Scott; Stolpe, Richard; Jonathan Snyder
**Subject:** Re: TL 695/6971 ets 25240.01 – Wet Season Fairy Shrimp Notification

Clint,
Yes, if there is adequate ponding out there I think it makes sense to go ahead with the surveys now. Although I wouldn't normally directly approve such a request, considering our recent phone exchange, Stacey agreed I could go ahead and indicate our approval to save some time. Thanks for being patient and following up on this.
Sincerely,
Pete

**********

Peter P. Beck
Fish & Wildlife Biologist
U.S. Fish and Wildlife Service
2177 Salk Avenue, Suite 250
Carlsbad, CA 92008
Phone: (760) 431-9440 x213

On Mon, Mar 2, 2015 at 1:34 PM, Scheuerman, Clint <Clint.Scheuerman@cardno-gs.com> wrote:

Hi Stacey and Pete,

I received a voice message from Pete a couple weeks ago regarding our Notification of Intent to Conduct Wet Season Surveys at MCB Camp Pendleton. We ended up in a bit of phone-tag and never had a chance to talk, but we both agreed that at the time and with the dry weather patterns we were having, that it was too late in the season to conduct wet season surveys. However, with recent rains, it is likely that many of the vernal pools and other ponded basins in the area have ponded once again. Therefore, I am writing to check in with you and request your permission to begin wet season surveys as soon as possible. I appreciate your input and decision.

Respectfully,

Clint Scheuerman

SENIOR BIOLOGIST/WETLAND SCIENTIST
CARDNO, GOVERNMENT SERVICES DIVISION
Phone (+1) 805-755-6698 Mobile (+1) 760-809-4236
Address 1941 Devaul Ranch Drive, San Luis Obispo, CA 93405 USA

**From:** Scheuerman, Clint
**Sent:** Thursday, February 05, 2015 2:56 PM
**To:** Stacey_Love@fws.gov
**Cc:** 'teasely@semprautilities.com'; 'amy@pangeabiological.com'; 'ppotenza@pangeabiological.com'; 'msaplanning@pangeabiological.com'; Stolpe, Richard; Barker, Scott
**Subject:** TL 695/6971 ets 25240.01 – Wet Season Fairy Shrimp Notification

Dear Ms. Love,

Please find attached a request to conduct wet season surveys for listed vernal pool branchiopods in support of the San Diego Gas and Electric Company's TL 695/6971 Reconductor Project. All pertinent project and survey information is presented in the request. Please feel free to contact me should you have any questions or concerns.

Very Respectfully,


Clint Scheuerman

SENIOR BIOLOGIST/WETLAND SCIENTIST
CARDNO, GOVERNMENT SERVICES DIVISION

Cardno
Shaping the Future

Phone (+1) 805-755-6698 Mobile (+1) 760-809-4236
Address 1941 Devaul Ranch Drive, San Luis Obispo, CA 93405 USA
Email clint.scheuerman@cardno-gs.com Web www.cardno.com

# APPENDIX B

***TL 695/6971 2014-2015 Wet Season Fairy Shrimp Survey Results***

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Unincorporated Orange County

City of
San Clemente

MCB
CAMP PENDLETON

B-1

B-2

B-3

B-4

B-5

B-6

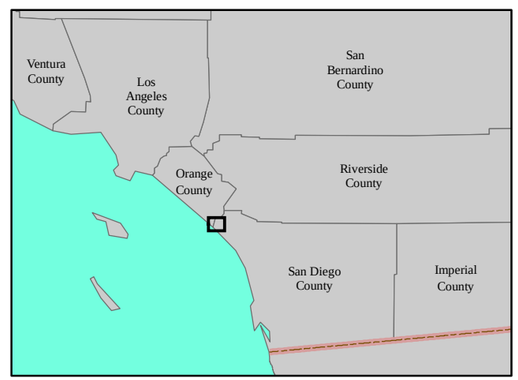
B-7

5

# Figure B-1
# TL695/6971 2014-2015 Wet Season
# Fairy Shrimp Survey Results Overview

**LEGEND**

- Appendix B Figure Extent
- Proposed Project Overhead Route
- Proposed Project Pole Topping Segment
- MCB Camp Pendleton Boundary
- State Route or Interstate




Kilometers
0 2
0 1
Miles

N


**Figure B-2**
**TL695/6971 2014-2015 Wet Season**
**Fairy Shrimp Survey Results**

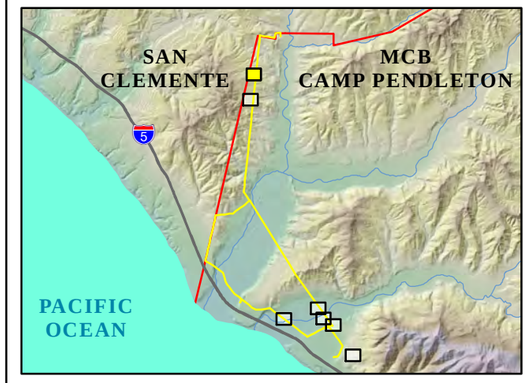
**LEGEND**

Project Features

- Access Route
- Proposed Project Overhead Route
- Survey Area
- Proposed Utility Pole
- Existing Wood Pole
- MCB Camp Pendleton Boundary

Wet Season Fairy Shrimp Survey Results

- Not Surveyed




Meters
0 50
0 200
Feet

N


**Figure B-3**
**TL695/6971 2014-2015 Wet Season**
**Fairy Shrimp Survey Results**

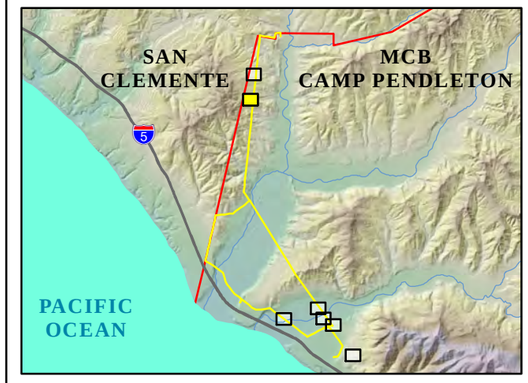
**LEGEND**

Project Features

- Access Route
- Proposed Project Overhead Route
- Survey Area
- Proposed Utility Pole
- Existing Wood Pole
- MCB Camp Pendleton Boundary
- Work/Staging/Turnaround Area

Wet Season Fairy Shrimp Survey Results

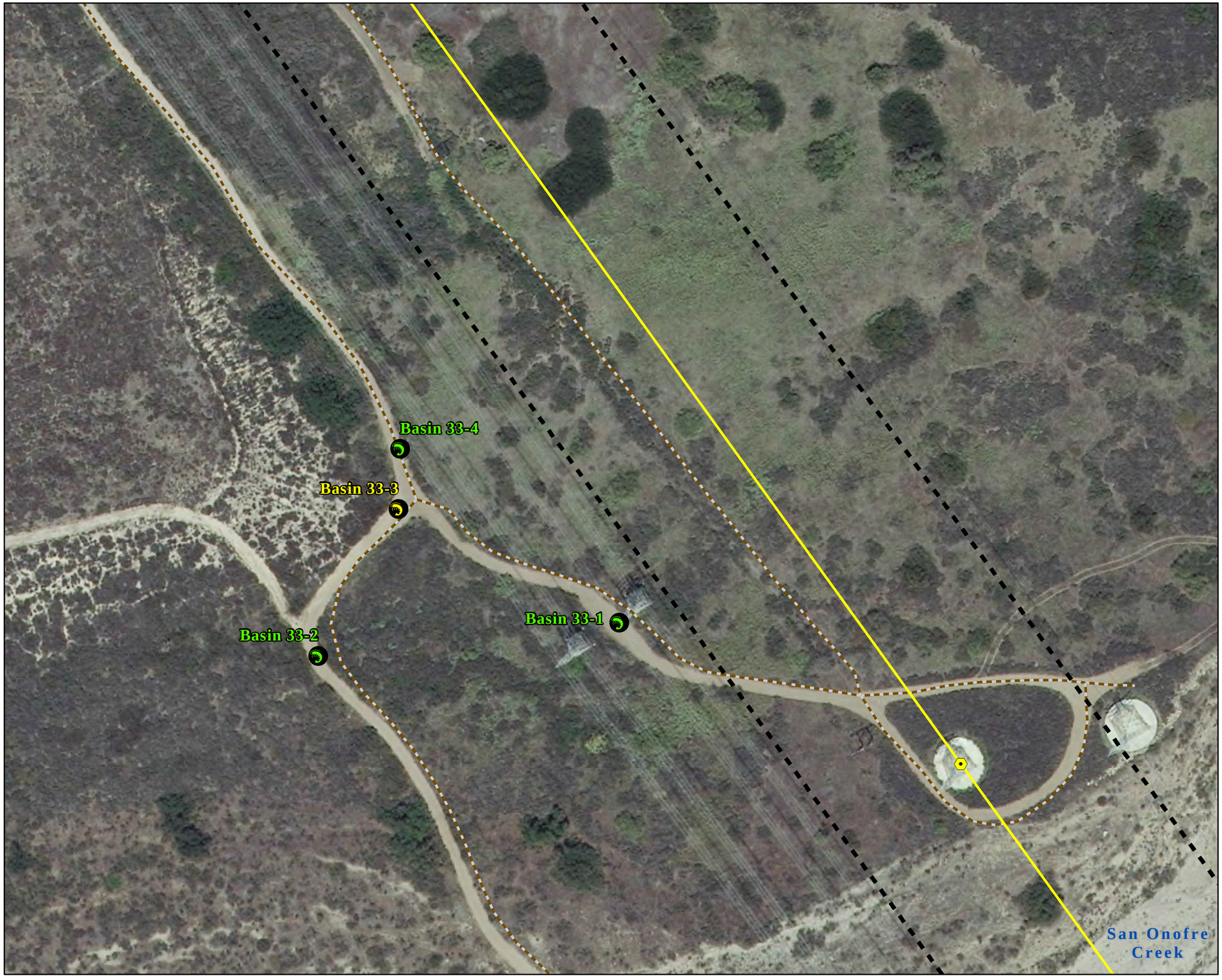
- No Fairy Shrimp Observed




Meters
0 50
0 200
Feet

N

# Figure B-4
# TL695/6971 2014-2015 Wet Season Fairy Shrimp Survey Results



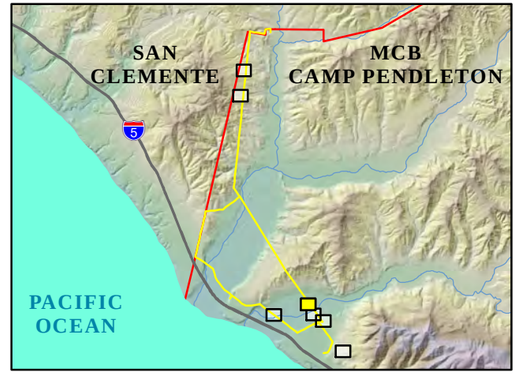

**LEGEND**

Project Features

- Access Route
- Proposed Project Overhead Route
- Survey Area
- Proposed Utility Pole

Wet Season Fairy Shrimp Survey Results

- Contains Fairy Shrimp (Undetermined)
- Contains Versatile Fairy Shrimp




Meters
0 50
0 200
Feet

N

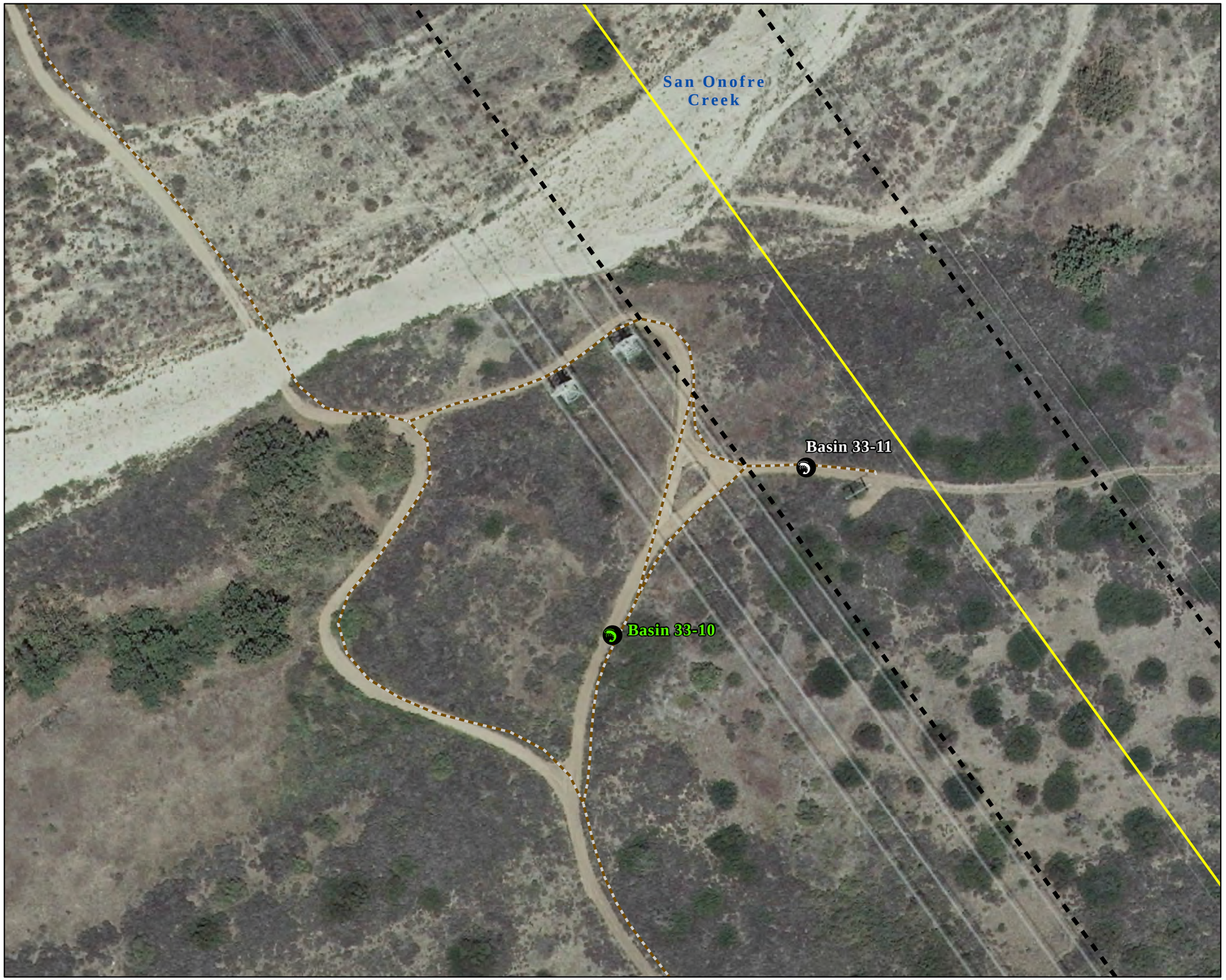



**Figure B-5**
**TL695/6971 2014-2015 Wet Season**
**Fairy Shrimp Survey Results**

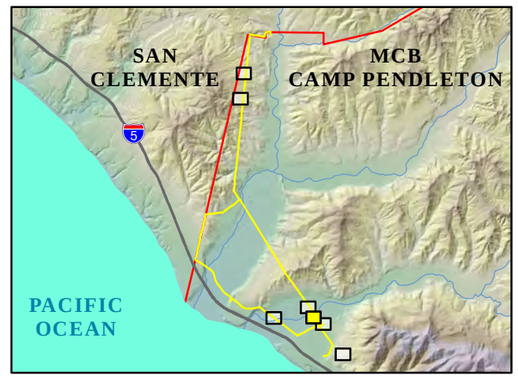
**LEGEND**

Project Features

- Access Route
- Proposed Project Overhead Route
- Survey Area

Wet Season Fairy Shrimp Survey Results

- No Fairy Shrimp Observed
- Contains Versatile Fairy Shrimp




Meters
0 50
0 200
Feet

N


**Figure B-6**
**TL695/6971 2014-2015 Wet Season**
**Fairy Shrimp Survey Results**

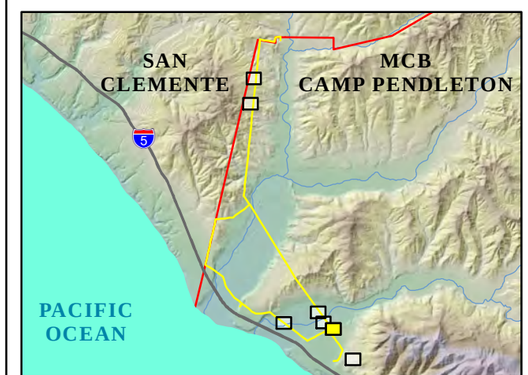
**LEGEND**

Project Features

- Access Route
- Proposed Project Overhead Route
- Proposed Project Underground Route
- Survey Area
- Proposed Utility Pole
- Existing Wood Pole
- Staging Yard
- Proposed 69kV Vault

Wet Season Fairy Shrimp Survey Results

- No Fairy Shrimp Observed
- Contains Versatile Fairy Shrimp




Meters
0 50
0 200
Feet

N


**Figure B-7**
**TL695/6971 2014-2015 Wet Season**
**Fairy Shrimp Survey Results**

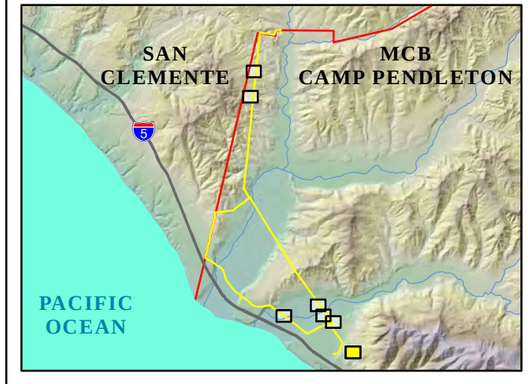
**LEGEND**

Project Features

Access Route

Wet Season Fairy Shrimp Survey Results

Contains Versatile Fairy Shrimp




Meters
0 50
0 200
Feet

N


**Figure B-8**
**TL695/6971 2014-2015 Wet Season Fairy Shrimp Survey Results**

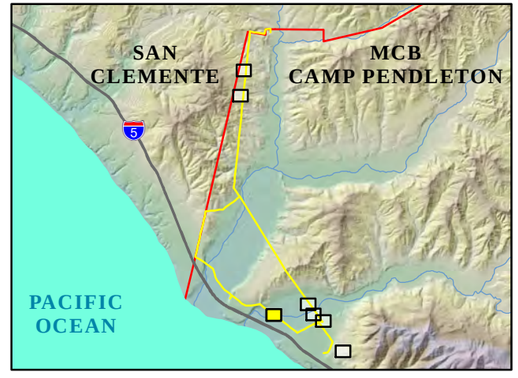
**LEGEND**

Project Features

- Access Route
- Proposed Project Overhead Route
- Survey Area
- Proposed Utility Pole
- Existing Wood Pole
- Work/Staging/Turnaround Area

Wet Season Fairy Shrimp Survey Results

- No Fairy Shrimp Observed
- Contains Versatile Fairy Shrimp




Meters
0 50
0 200
Feet

# APPENDIX C

*Photographic Record*

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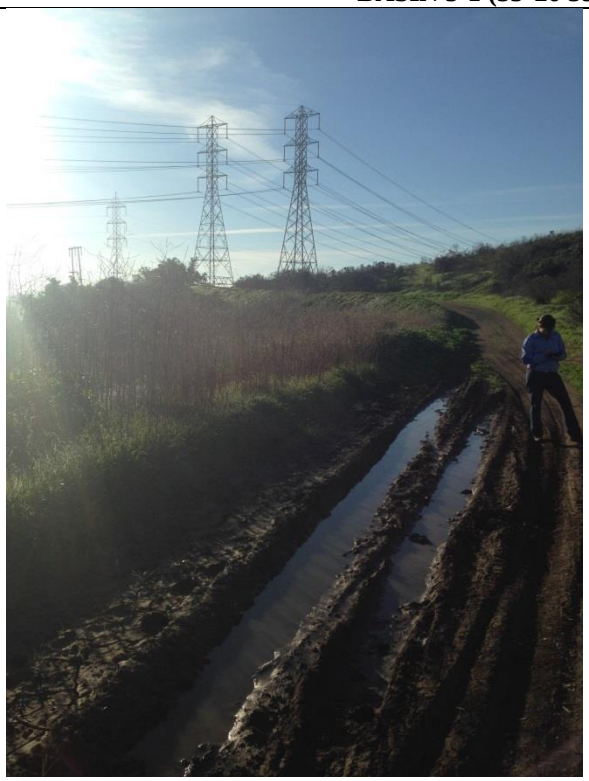
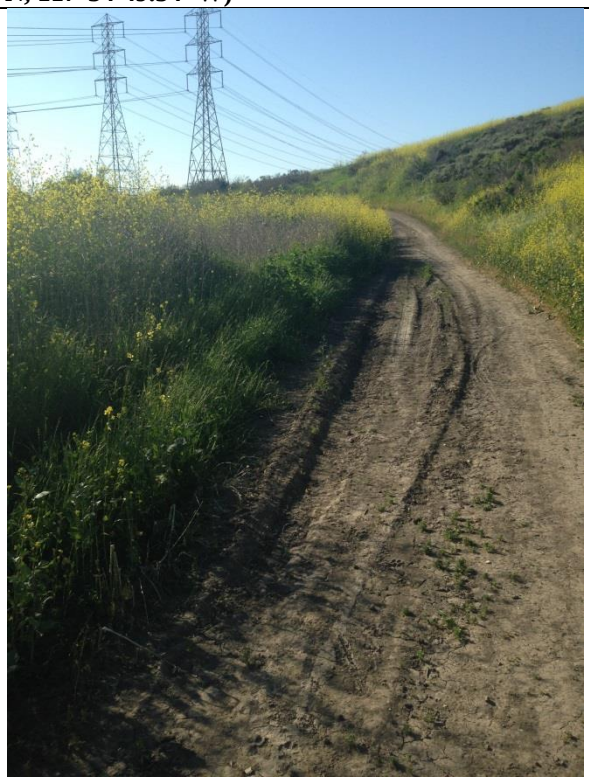
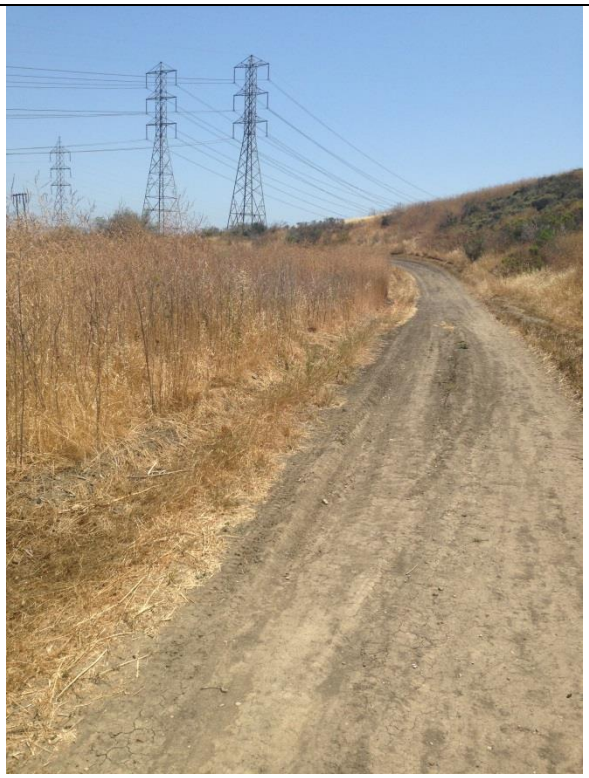
**BASIN 5-1 (33°26'39.17"N, 117°34'49.54"W)**



**View Southeast. Photo by RCS, 3 Feb 2015.**
***B. species.***



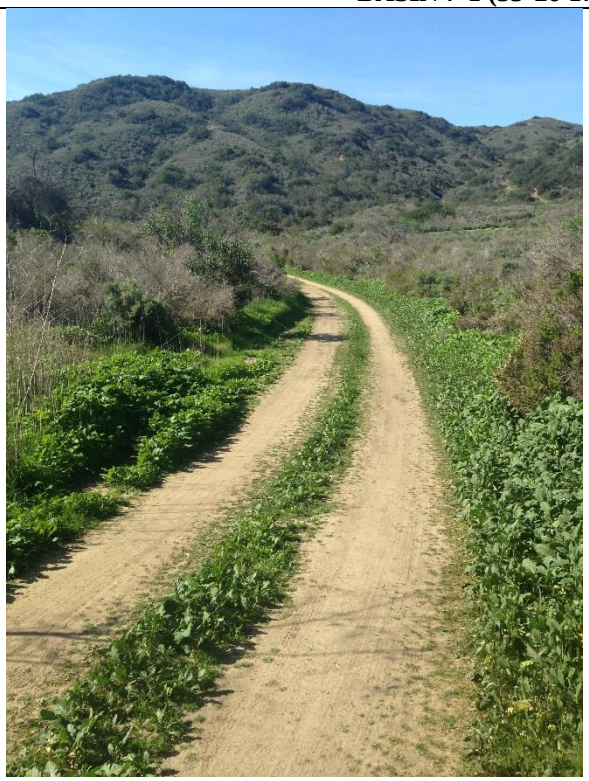
**View Southeast. Photo by RCS, 20 Mar 2015.**
***B. species.***



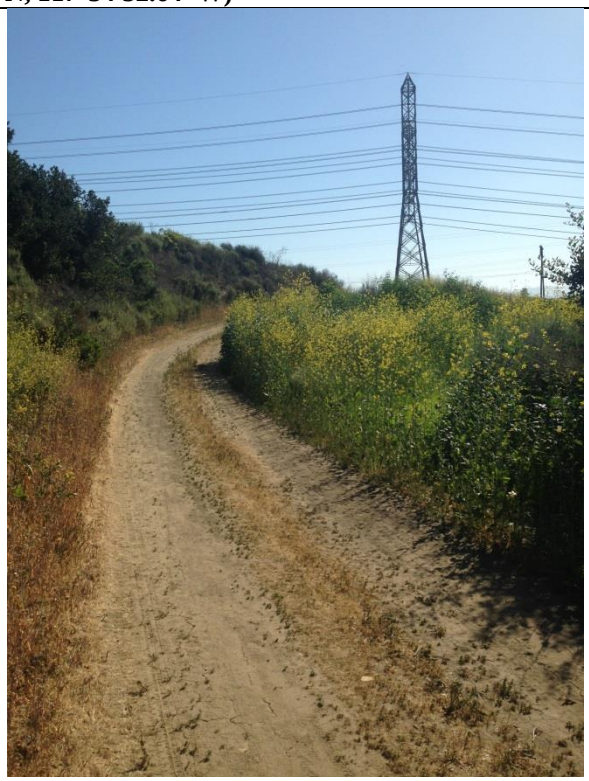
**View Southeast. Photo by RCS, 12 May 2015.**
***B. species.***

**View East. Photo by RCS, 29 July 2015.**
***B. species.***

**BASIN 7-1 (33°26'17.12"N, 117°34'52.64"W)**

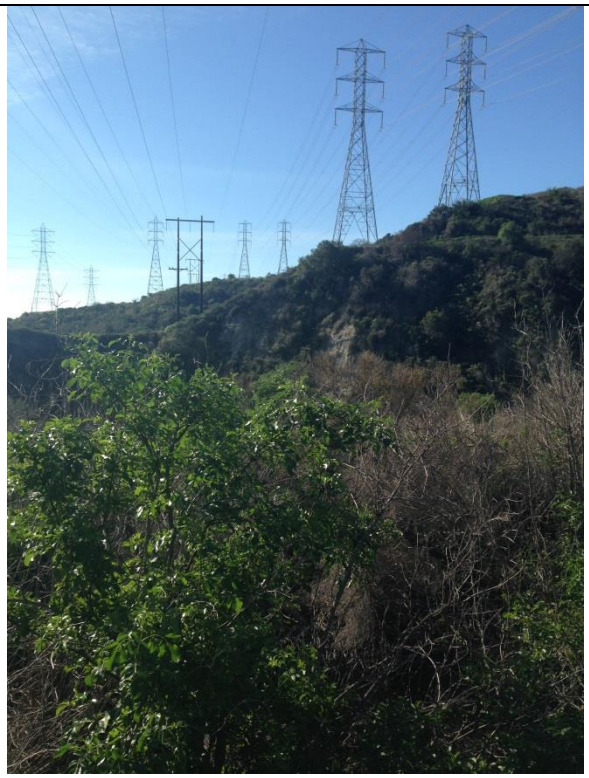


**View West. Photo by RCS, 3 Feb 2015.**
***No shrimp.***



**View East. Photo by RCS, 20 Mar 2015.**
***No shrimp.***

**View East. Photo by RCS, 9 Sep 2015.**
***No shrimp.***



**View South adjacent east/downslope from Basin 7-1.**
**Photo by RCS, 3 Feb 2015.**

**BASIN 21-1 (33°23'3.94"N, 117°34'14.56"W)**

**View Southeast. Photo by RCS, 3 Feb 2015.**
***B. lindahli.***

**View Southeast. Photo by RCS, 9 Mar 2015.**
***B. lindahli.***

**View Southeast of area north of Basin 21-1.**
**Photo by CMS, 7 Apr 2015.**

**View Southeast. Photo by RCS, 29 Jul 2015.**
***B. lindahli.***

**BASIN 21-2 (33°23'2.88"N, 117°34'12.98"W)**

**View Southeast. Photo by RCS, 9 Mar 2015.**
***B. lindahli.***

**View Southeast. Photo by RCS, 13 Mar 2015.**
***B. lindahli.***

**View Northwest. Photo by RCS, 20 Mar 2015.**
***B. lindahli.***

**View Southeast. Photo by RCS, 20 May 2015.**
***B. lindahli.***

**BASIN 21-3 (33°22'2.59"N, 117°34'7.84"W)**

**View Northwest. Photo by RCS, 3 Feb 2015.**
***No shrimp.***

**View Northwest. Photo by RCS, 6 Mar 2015.**
***No shrimp.***

**View Down/West. Photo by RCS, 20 Mar 2015.**
***No shrimp.***

**View Southeast. Photo by RCS, 20 May 2015.**
***No shrimp.***

**BASIN 23-2 (33°22'56.69"N, 117°33'20.04"W)**

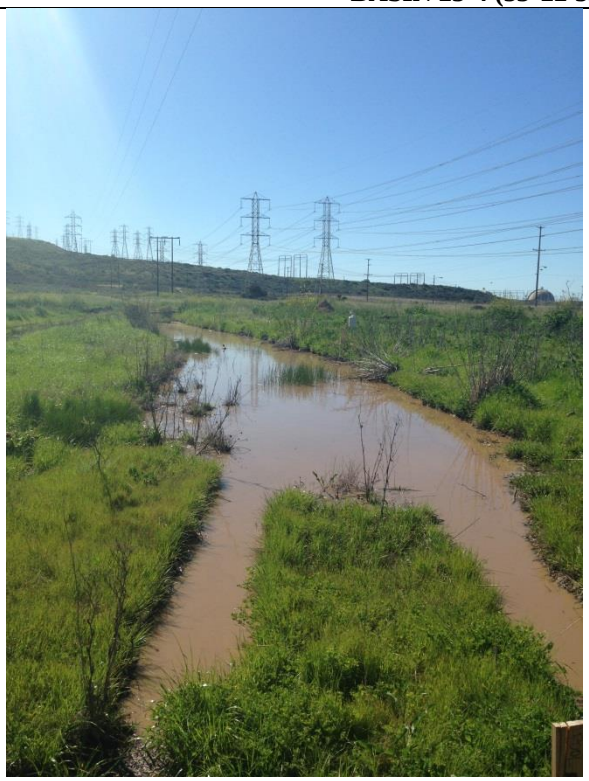
**View Northwest. Photo by RCS, 3 Feb 2015.**
***No shrimp.***

**View North. Photo by RCS, 6 Mar 2015.**
***No shrimp.***

**View Northwest. Photo by RCS, 20 May 2015.**
***No shrimp.***

**View Down/West. Photo by RCS, 21 Jul 2015.**
***No shrimp.***

**BASIN 23-4 (33°22'55.79"N, 117°33'19.01"W)**



**View Southeast. Photo by RCS, 13 Mar 2015.**
***No shrimp.***

**View Southeast. Photo by RCS, 26 Mar 2015.**
***No shrimp.***

**View Southeast. Photo by RCS, 6 Apr 2015.**
***No shrimp.***

**View Southeast. Photo by RCS, 20 May 2015.**
***No shrimp.***

**BASIN 23-8 (33°22'59.05"N, 117°33'15.99"W)**


**View East. Photo by RCS, 20 May 2015.**
***B. lindahli.***

**View East. Photo by RCS, 21 July 2015.**
***B. lindahli.***


**View Northeast of area southwest of Basin 23-8.**
**Photo by RCS, 20 May 2015.**

**Upland Vegetation Near Basin 23-8.**
**Photo by RCS, 20 Mar 2015**

**BASIN 24-1 (33°22'30.01"N, 117°32'57.59"W)**

**View Southeast. Photo by RCS, 2 Feb 2015.**
***B. lindahli.***

**View South. Photo by RCS, 6 Mar 2015.**
***B. lindahli.***

**View South. Photo by RCS, 9 Mar 2015.**
***B. lindahli.***

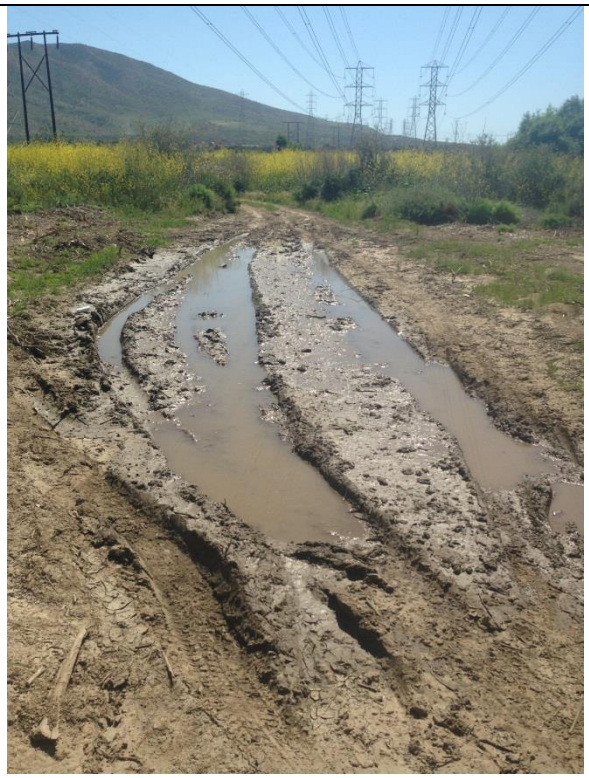
**View Northwest from Basin 33-3.**
**Photo by RCS, 2 Feb 2015.**

**BASIN 33-1 (33°23'10.20"N, 117°33'35.19"W)**

**View Southeast. Photos by RCS, 2 Feb 2015.**
***B. lindahli.***
**Desiccated tadpoles and possibly Triops (below).**

**View Southeast. Photo by RCS, 9 Mar 2015.**
***B. lindahli.***

**View Southeast. Photo by RCS, 13 Mar 2015.**
***B. lindahli.***



**View Southeast. Photo by RCS, 26 Mar 2015.**
***B. lindahli.***

**BASIN 33-2 (33°23'9.80"N, 117°33'39.02"W)**

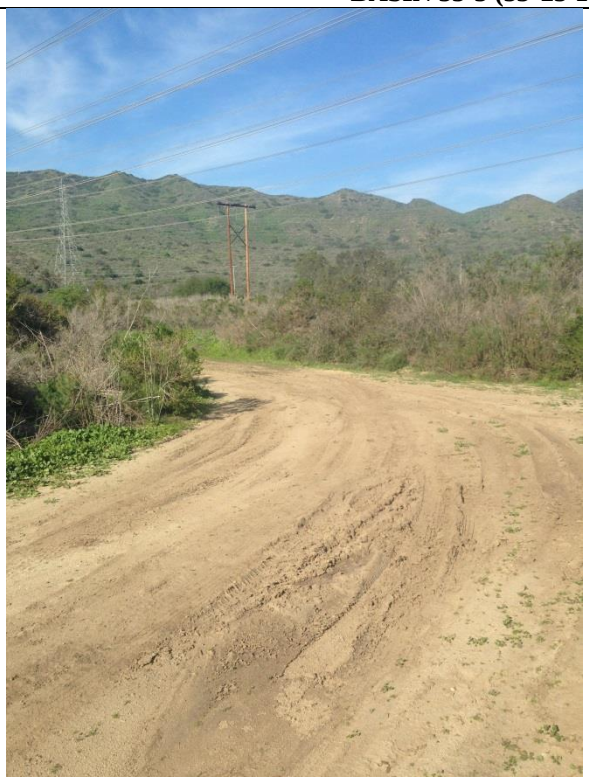
**View Southeast. Photo by RCS, 2 Feb 2015.**
***B. lindahli.***

**View South. Photo by RCS, 6 Mar 2015.**
***B. lindahli.***

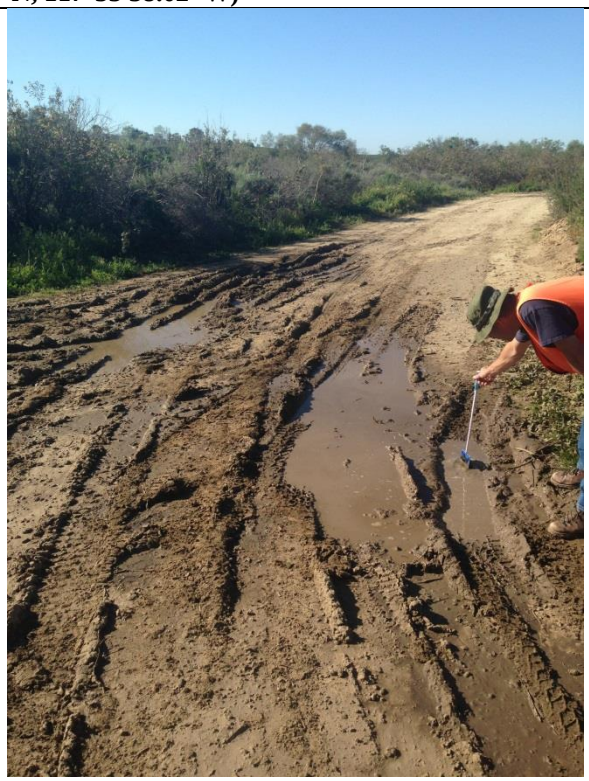
**View South. Photo by RCS, 9 Mar 2015.**
***B. lindahli.***

**View North. Photo by RCS, 20 May 2015.**
***B. lindahli.***

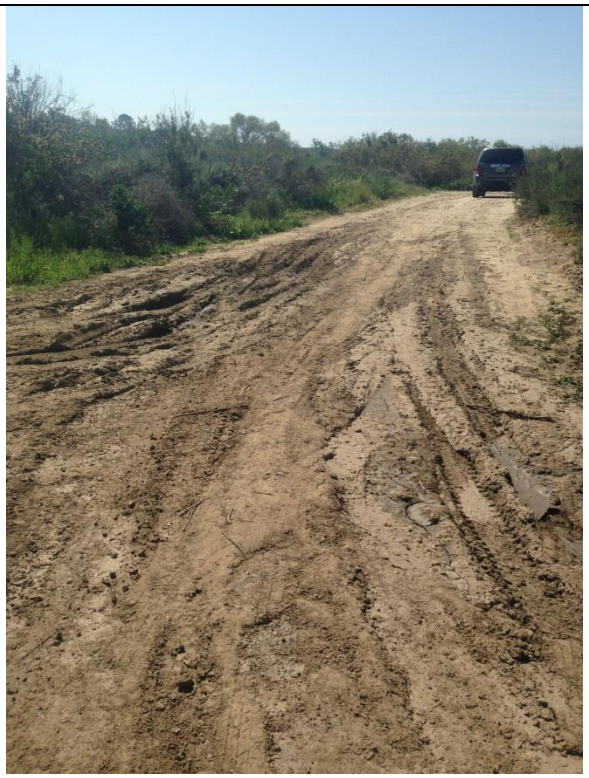
**BASIN 33-3 (33°23'11.38"N, 117°33'38.02"W)**



**View Northeast. Photo by RCS, 2 Feb 2015.**
***Undetermined fairy shrimp.***



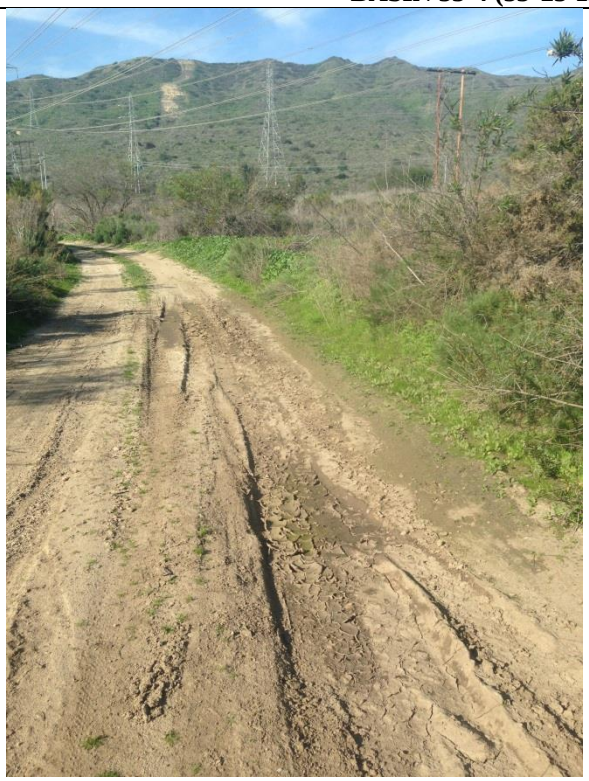
**View Southwest. Photo by RCS, 6 Mar 2015.**
***Undetermined fairy shrimp.***



**View Southwest. Photo by RCS, 9 Mar 2015.**
***Undetermined fairy shrimp.***

**View Down. Photo by RCS, 9 Mar 2015.**
***Undetermined fairy shrimp.***

**BASIN 33-4 (33°23'12.03"N, 117°33'38.01"W)**



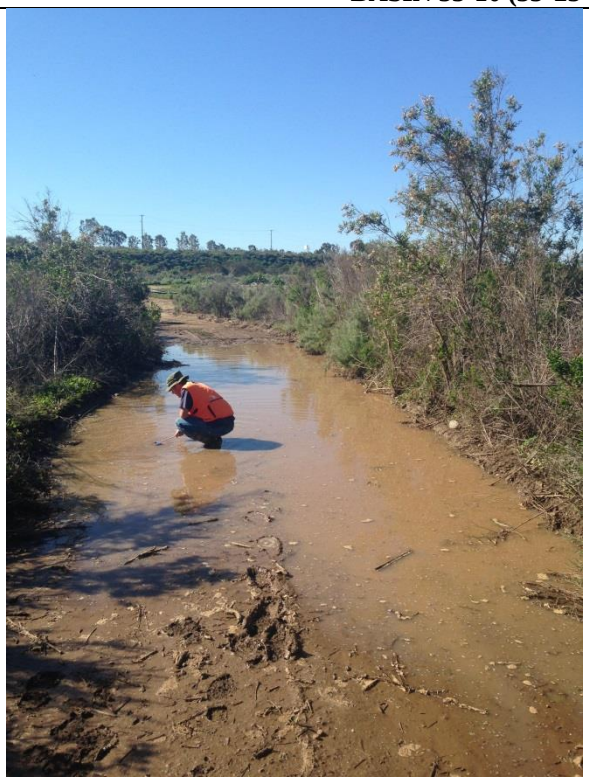
**View North. Photo by RCS, 2 Feb 2015.**
***B. lindahli.***

**View South. Photo by RCS, 6 Mar 2015.**
***B. lindahli.***

**View South. Photo by RCS, 9 Mar 2015.**
***B. lindahli.***

**View South. Photo by RCS, 13 Mar 2015.**
***B. lindahli.***

**BASIN 33-10 (33°23'1.02"N, 117°33'29.47"W)**



**View Southwest. Photo by RCS, 6 Mar 2015.**
***B. lindahli.***

**View Southwest. Photo by RCS, 9 Mar 2015.**
***B. lindahli.***

**View Southwest. Photo by RCS, 13 Mar 2015.**
***B. lindahli.***

**View Northeast. Photo by RCS, 20 May 2015.**
***B. lindahli.***

**BASIN 33-11 (33°23'2.83"N, 117°33'27.04"W)**

**View East. Photo by RCS, 6 Mar 2015.**
***No shrimp.***

**View East. Photo by RCS, 9 Mar 2015.**
***No shrimp.***

**View East. Photo by RCS, 20 May 2015.**
***No shrimp.***

**View East. Photo by RCS, 21 July 2015.**
***No shrimp.***

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# APPENDIX D

*Vernal Pool Data Sheets*

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2/3/15

5-1

**U.S. Fish and Wildlife Service Vernal Pool Data Sheet**
**Wet Season Survey**

Note: Please fill out the required information completely for each site visit.

This form is being submitted to serve as part of the 90-day report: ✓ no ___ yes

Required color slides and/or photographs for the project site are included: ___ no ✓ yes

Date: 2/3/15 Time: 0815 County: SD Quad: SC

Collector(s): R. Stolpe/M. Tu Permit #: TE8355495

Site/Project Name: TL695 Pool #: Basin 1 (5-1)

Township: N/A Range: N/A Section: N/A 33.26 lat 117.34 long.

Temperature: Water: — °C Air: 5.5 °C

Pool Depth:
at time of sampling: 10 cm
estimated maximum: — cm

Surface Area:
at time of sampling: ___ m x ___ m
estimated maximum: — m x — m

Habitat Condition: (circle where appropriate)

- undisturbed — disturbed: (tire tracks) garbage discing/plowing
- ungrazed — grazed: cattle horses sheep other___ light moderate heavy
- land use of habitat: dirt road

(Optional) Water Chemistry Data

Alkalinity (total):___ppm or mg/l Conductivity:___uMHO

Dissolved $NH_4$:___ppt or ppm Dissolved Oxygen:___ppm or mg/l

pH:___ Turbidity: (secchi disc depth)___cm or: clear to bottom ___

Salinity :___ppt or ppm Total Dissolved Solids (TDS):___ppm

Notes: Not sampled since not yet approved by USFWS. Will sample next time.

1

**U.S. Fish and Wildlife Service Vernal Pool Data Sheet**
**Wet Season Survey**

Note: Please fill out the required information completely for each site visit.

Species Observations: state none or estimate # of individuals present in terms of an order of magnitude (e.g., 10's, 100's, 1000's)

Anostracans:
(note reproductive status) 100s (mature)

Notostracans:
(note reproductive status) None

Species Observations (Optional) :

| | | | | | |
|---|---|---|---|---|---|
| Cladocerans: | yes | no | Insects: (adult or larvae) | | |
| Conchostracans: | yes | no | Anisoptera: | yes | no |
| Copepods: | yes | no | Zygoptera: | yes | no |
| Ostracods | yes | no | Hydrophilidae: | yes | no |
| Fish | yes | no | Dytiscidae: | yes | no |
| Frogs | yes | no | Corixidae: | yes | no |
| Salamanders | yes | no | Notonectidae: | yes | no |
| Waterfowl | yes | no | Belostomatidae: | yes | no |
| Other (specify) ___ | | | Other (specify) ___ | | |

Voucher Specimens

Specimens shall be preserved according to the standards of the institution in which they will be accessioned.

| Species | # Individuals | Accession/Catalog # | Pool # |
|---|---|---|---|

3/20/15

5-1

**U.S. Fish and Wildlife Service Vernal Pool Data Sheet**
**Wet Season Survey**

Note: Please fill out the required information completely for each site visit.

This form is being submitted to serve as part of the 90-day report: ___ no ✓ yes

Required color slides and/or photographs for the project site are included: ___ no ✓ yes

Date: 3/20/15 Time: 0915 County: SD Quad: S.C.

Collector(s): R. Stolpe/M. Tu Permit #: TE835495

Site/Project Name: TL 695 Pool #: Basin 1 (5-1)

Township: N/A Range: N/A Section: N/A 33.26 lat 117.34 long.

Temperature: Water: N/A °C Air: 15.8 °C

Pool Depth:
at time of sampling: 0 cm
estimated maximum: — cm

Surface Area:
at time of sampling: 0 m x 0 m
estimated maximum: — m x — m

Habitat Condition: (circle where appropriate)

- undisturbed disturbed: (tire tracks) garbage discing/plowing
- ungrazed grazed: cattle horses sheep other_____ light moderate heavy
- land use of habitat: dirt road

(Optional) Water Chemistry Data

Alkalinity (total):_____ ppm or mg/l Conductivity:_____ uMHO

Dissolved $NH_4$:_____ ppt or ppm Dissolved Oxygen:_____ ppm or mg/l

pH:_____ Turbidity: (secchi disc depth)_____ cm or: clear to bottom ____

Salinity:_____ ppt or ppm Total Dissolved Solids (TDS):_____ ppm

Notes: Dry



**U.S. Fish and Wildlife Service Vernal Pool Data Sheet**
**Wet Season Survey**

Note: Please fill out the required information completely for each site visit.

Species Observations: state none or estimate # of individuals present in terms of an order of magnitude (e.g., 10's, 100's, 1000's)

Anostracans:
(note reproductive status) None

Notostracans:
(note reproductive status) None

Species Observations (Optional):

| | | | | | |
|---|---|---|---|---|---|
| Cladocerans: | yes | no | Insects: (adult or larvae) | | |
| Conchostracans: | yes | no | Anisoptera: | yes | no |
| Copepods: | yes | no | Zygoptera: | yes | no |
| Ostracods | yes | no | Hydrophilidae: | yes | no |
| Fish | yes | no | Dytiscidae: | yes | no |
| Frogs | yes | no | Corixidae: | yes | no |
| Salamanders | yes | no | Notonectidae: | yes | no |
| Waterfowl | yes | no | Belostomatidae: | yes | no |
| Other (specify)_____ | | | Other (specify)_____ | | |

Voucher Specimens

Specimens shall be preserved according to the standards of the institution in which they will be accessioned.

| Species | # Individuals | Accession/Catalog # | Pool # |
|---|---|---|---|
| | N/A | | |

4/29/15

5-1

**U.S. Fish and Wildlife Service Vernal Pool Data Sheet**
**Wet Season Survey**

Note: Please fill out the required information completely for each site visit.

This form is being submitted to serve as part of the 90-day report: ___ no ✓ yes

Required color slides and/or photographs for the project site are included: ___ no ✓ yes

Date: 4 / 29 / 15 Time: 0951 County: SD Quad: S.C.

Collector(s): C. Scheuerman/S. Brown Permit #: TE-148554A0

Site/Project Name: TL 695 Pool #: 5-1

Township: N/A Range: N/A Section: N/A 33.26 lat. 117.34 long.

Temperature: Water: N/A °C Air: 25.5 °C

Pool Depth:
at time of sampling: Ø cm
estimated maximum: — cm

Surface Area:
at time of sampling: Ø m x Ø m
estimated maximum: — m x — m

Habitat Condition: (circle where appropriate)

- undisturbed — disturbed: (tire tracks) garbage discing/plowing
- ungrazed — grazed: cattle horses sheep other_____ light moderate heavy
- land use of habitat: dirt road

(Optional) Water Chemistry Data

Alkalinity (total): ___ ppm or mg/l Conductivity: ___ uMHO

Dissolved NH3: ___ ppt or ppm Dissolved Oxygen: ___ ppm or mg/l

pH: ___ Turbidity: (secchi disc depth) ___ cm or: clear to bottom ___

Salinity: ___ ppt or ppm Total Dissolved Solids (TDS): ___ ppm

Notes: Dry



**U.S. Fish and Wildlife Service Vernal Pool Data Sheet**
**Wet Season Survey**

Note: Please fill out the required information completely for each site visit.

Species Observations: state none or estimate # of individuals present in terms of an order of magnitude (e.g., 10's, 100's, 1000's)

Anostracans:
(note reproductive status) None

Notostracans:
(note reproductive status) None

Species Observations (Optional):

| | | | Insects: (adult or larvae) | | |
|---|---|---|---|---|---|
| Cladocerans: | yes | no | | | |
| Conchostracans: | yes | no | | | |
| Copepods: | yes | no | Anisoptera: | yes | no |
| Ostracods | yes | no | Zygoptera: | yes | no |
| Fish | yes | no | Hydrophilidae: | yes | no |
| Frogs | yes | no | Dytiscidae: | yes | no |
| Salamanders | yes | no | Corixidae: | yes | no |
| Waterfowl | yes | no | Notonectidae: | yes | no |
| Other (specify) | | | Belostomatidae: | yes | no |
| | | | Other (specify) | | |

Voucher Specimens

Specimens shall be preserved according to the standards of the institution in which they will be accessioned.

| Species | # Individuals | Accession/Catalog # | Pool # |
|---|---|---|---|
| | N/A | | |

5/12/15

5-1

**U.S. Fish and Wildlife Service Vernal Pool Data Sheet**
**Wet Season Survey**

Note: Please fill out the required information completely for each site visit.

This form is being submitted to serve as part of the 90-day report: ____ no ✓ yes

Required color slides and/or photographs for the project site are included: ____ no ✓ yes

Date: 5/12/15 Time: 1335 County: SD Quad: S.C.

Collector(s): R. Stolpe/C. Scharman/S. Bowen Permit #: TE8355495 TE47855AD

Site/Project Name: TL695 Pool #: 5-1

Township: N/A Range: N/A Section: N/A 33.26 lat. 117.34 long.

Temperature: Water: N/A °C Air: 20.2 °C

Pool Depth:
at time of sampling: Ø cm
estimated maximum: — cm

Surface Area:
at time of sampling: Ø m x Ø m
estimated maximum: — m x — m

Habitat Condition: (circle where appropriate)

- undisturbed disturbed: (tire tracks) garbage discing/plowing
- ungrazed grazed: cattle horses sheep other_____ light moderate heavy
- land use of habitat: dirt road

(Optional) Water Chemistry Data

Alkalinity (total):_____ppm or mg/l Conductivity:_____uMHO

Dissolved $NH_4$:_____ppt or ppm. Dissolved Oxygen:_____ppm or mg/l

pH:_____ Turbidity: (secchi disc depth)_____cm or: clear to bottom _____

Salinity :_____ppt or ppm Total Dissolved Solids (TDS):_____ppm

Notes: Dry



**U.S. Fish and Wildlife Service Vernal Pool Data Sheet**
**Wet Season Survey**

Note: Please fill out the required information completely for each site visit.

Species Observations: state none or estimate # of individuals present in terms of an order of magnitude (e.g., 10's, 100's, 1000's)

Anostracans:
(note reproductive status) None

Notostracans:
(note reproductive status) None

Species Observations (Optional) :

| | | | | | |
|---|---|---|---|---|---|
| Cladocerans: | yes | no | Insects: (adult or larvae) | | |
| Conchostracans: | yes | no | Anisoptera: | yes | no |
| Copepods: | yes | no | Zygoptera: | yes | no |
| Ostracods | yes | no | Hydrophilidae: | yes | no |
| Fish | yes | no | Dytiscidae: | yes | no |
| Frogs | yes | no | Corixidae: | yes | no |
| Salamanders | yes | no | Notonectidae: | yes | no |
| Waterfowl | yes | no | Belostomatidae: | yes | no |
| Other (specify) _____ | | | Other (specify) _____ | | |

Voucher Specimens

Specimens shall be preserved according to the standards of the institution in which they will be accessioned.

| Species | # Individuals | Accession/Catalog # | Pool # |
|---|---|---|---|
| | N/A | | |

7/29/15

5-1

**U.S. Fish and Wildlife Service Vernal Pool Data Sheet**
**Wet Season Survey**

Note: Please fill out the required information completely for each site visit.

This form is being submitted to serve as part of the 90-day report: ____ no ✓ yes

Required color slides and/or photographs for the project site are included: ____ no ✓ yes

Date: 7/29/15 Time: 1015 County: SD Quad: S.C.

Collector(s): R. Stolpe Permit #: TE835595

Site/Project Name: TL695 Pool #: 5-1

Township: N/A Range: N/A Section: N/A 33.26717.34 lat. long.

Temperature: Water: N/A °C Air: 23 °C

Pool Depth:
at time of sampling: Ø cm
estimated maximum: — cm

Surface Area:
at time of sampling: Ø m x Ø m
estimated maximum: — m x — m

Habitat Condition: (circle where appropriate)

- undisturbed disturbed: (tire tracks) garbage discing/plowing
- ungrazed grazed: cattle horses sheep other_____ light moderate heavy
- land use of habitat: dirt road

(Optional) Water Chemistry Data

Alkalinity (total):_____ppm or mg/l Conductivity:_____uMHO

Dissolved $NH_4$:_____ppt or ppm Dissolved Oxygen:_____ppm or mg/l

pH:_____ Turbidity: (secchi disc depth)_____cm or: clear to bottom ____

Salinity :_____ppt or ppm Total Dissolved Solids (TDS):_____ppm

Notes: Dry



**U.S. Fish and Wildlife Service Vernal Pool Data Sheet**
**Wet Season Survey**

Note: Please fill out the required information completely for each site visit.

Species Observations: state none or estimate # of individuals present in terms of an order of magnitude (e.g., 10's, 100's, 1000's)

Anostracans:
(note reproductive status) None

Notostracans:
(note reproductive status) None

Species Observations (Optional) :

| | | | | | |
|---|---|---|---|---|---|
| Cladocerans: | yes | no | Insects: (adult or larvae) | | |
| Conchostracans: | yes | no | Anisoptera: | yes | no |
| Copepods: | yes | no | Zygoptera: | yes | no |
| Ostracods | yes | no | Hydrophilidae: | yes | no |
| Fish | yes | no | Dytiscidae: | yes | no |
| Frogs | yes | no | Corixidae: | yes | no |
| Salamanders | yes | no | Notonectidae: | yes | no |
| Waterfowl | yes | no | Belostomatidae: | yes | no |
| Other (specify)_____ | | | Other (specify)_____ | | |

Voucher Specimens

Specimens shall be preserved according to the standards of the institution in which they will be accessioned.

| Species | # Individuals | Accession/Catalog # | Pool # |
|---|---|---|---|
| N/A | | | |

2/3/15

7-1

**U.S. Fish and Wildlife Service Vernal Pool Data Sheet**
**Wet Season Survey**

Note: Please fill out the required information completely for each site visit.

This form is being submitted to serve as part of the 90-day report: ✓ no ___ yes

Required color slides and/or photographs for the project site are included: ___ no ✓ yes

Date: 2/3/15 Time: 1043 County: SD Quad: S.C.

Collector(s): R. Stolpe / M. Tu Permit #: TE835549S

Site/Project Name: TL695 Pool #: SP59001 (7-1)

Township: N/A Range: N/A Section: N/A 33.26 lat -117.34 long.

Temperature: Water: N/A °C Air: 18 °C

Pool Depth:
at time of sampling: Ø cm
estimated maximum: — cm

Surface Area:
at time of sampling: Ø m x Ø m
estimated maximum: — m x — m

Habitat Condition: (circle where appropriate)

- undisturbed disturbed: (tire tracks) garbage discing/plowing
- ungrazed grazed: cattle horses sheep other_____ light moderate heavy
- land use of habitat: dirtroad

(Optional) Water Chemistry Data

Alkalinity (total):_____ppm or mg/l Conductivity:_____uMHO

Dissolved $NH_4$:_____ppt or ppm Dissolved Oxygen:_____ppm or mg/l

pH:_____ Turbidity: (secchi disc depth)_____cm or: clear to bottom _____

Salinity :_____ppt or ppm Total Dissolved Solids (TDS):_____ppm

Notes: Basin location unclear; has been graded over. Dry.



**U.S. Fish and Wildlife Service Vernal Pool Data Sheet**
**Wet Season Survey**

Note: Please fill out the required information completely for each site visit.

Species Observations: state none or estimate # of individuals present in terms of an order of magnitude (e.g., 10's, 100's, 1000's)

Anostracans:
(note reproductive status) None

Notostracans:
(note reproductive status) None

Species Observations (Optional) :

| | | | Insects: (adult or larvae) | | |
|---|---|---|---|---|---|
| Cladocerans: | yes | no | Anisoptera: | yes | no |
| Conchostracans: | yes | no | Zygoptera: | yes | no |
| Copepods: | yes | no | Hydrophilidae: | yes | no |
| Ostracods | yes | no | Dytiscidae: | yes | no |
| Fish | yes | no | Corixidae: | yes | no |
| Frogs | yes | no | Notonectidae: | yes | no |
| Salamanders | yes | no | Belostomatidae: | yes | no |
| Waterfowl | yes | no | Other (specify) | | |
| Other (specify) | | | | | |

Voucher Specimens

Specimens shall be preserved according to the standards of the institution in which they will be accessioned.

| Species | # Individuals | Accession/Catalog # | Pool # |
|---|---|---|---|
| | N/A | | |

3/20/15

7-1

**U.S. Fish and Wildlife Service Vernal Pool Data Sheet**
**Wet Season Survey**

Note: Please fill out the required information completely for each site visit.

This form is being submitted to serve as part of the 90-day report: ___ no ✓ yes

Required color slides and/or photographs for the project site are included: ___ no ✓ yes

Date: 3/20/15 Time: 1002 County: SD Quad: S.C.

Collector(s): B. Stolpe / M. Tu Permit #: TE835545

Site/Project Name: TL695 Pool #: SP59001 (7-1)

Township: N/A Range: N/A Section: N/A 32.29 lat. -117.39 long.

Temperature: Water: N/A °C Air: 18.3 °C

Pool Depth:
at time of sampling: 0 cm
estimated maximum: — cm

Surface Area:
at time of sampling: 0 m x 0 m
estimated maximum: — m x — m

Habitat Condition: (circle where appropriate)

- undisturbed — disturbed: (tire tracks) garbage discing/plowing
- ungrazed — grazed: cattle horses sheep other_____ light moderate heavy
- land use of habitat: dirt road

(Optional) Water Chemistry Data

Alkalinity (total):_____ppm or mg/l Conductivity:_____uMHO

Dissolved $NH_4$:_____ppt or ppm Dissolved Oxygen:_____ppm or mg/l

pH:_____ Turbidity: (secchi disc depth)_____cm or: clear to bottom ____

Salinity:_____ppt or ppm Total Dissolved Solids (TDS):_____ppm

Notes: Basin location unclear; road has been grazed over (recently?).

Dry

1

**U.S. Fish and Wildlife Service Vernal Pool Data Sheet**
**Wet Season Survey**

Note: Please fill out the required information completely for each site visit.

Species Observations: state none or estimate # of individuals present in terms of an order of magnitude (e.g., 10's, 100's, 1000's)

Anostracans:
(note reproductive status) None

Notostracans:
(note reproductive status) None

Species Observations (Optional):

| | | | Insects: (adult or larvae) | | |
|---|---|---|---|---|---|
| Cladocerans: | yes | no | Anisoptera: | yes | no |
| Conchostracans: | yes | no | Zygoptera: | yes | no |
| Copepods: | yes | no | Hydrophilidae: | yes | no |
| Ostracods | yes | no | Dytiscidae: | yes | no |
| Fish | yes | no | Corixidae: | yes | no |
| Frogs | yes | no | Notonectidae: | yes | no |
| Salamanders | yes | no | Belostomatidae: | yes | no |
| Waterfowl | yes | no | | | |
| Other (specify)_____ | | | Other (specify)_____ | | |

Voucher Specimens

Specimens shall be preserved according to the standards of the institution in which they will be accessioned.

| Species | # Individuals | Accession/Catalog # | Pool # |
|---|---|---|---|
| | N/A | | |

5/12/15

7-1

U.S. Fish and Wildlife Service Vernal Pool Data Sheet
Wet Season Survey

Note: Please fill out the required information completely for each site visit.

This form is being submitted to serve as part of the 90-day report ___ no ✓ yes

Required color slides and/or photographs for the project site are included: ✓ no ___ yes

Date: 5/12/15 Time: 1342 County: SD Quad: S.C.

Collector(s): R Stolpe/C Schwartman/S. Brown Permit #: TE835495 TE448550

Site/Project Name: TL695 Pool #: 7-1

Township: N/A Range: N/A Section: N/A 33.29 lat. -117.34 long.

Temperature: Water: N/A °C Air: 20 °C

Pool Depth:
at time of sampling: Ø cm
estimated maximum: — cm

Surface Area:
at time of sampling: Ø m x Ø m
estimated maximum: — m x — m

Habitat Condition: (circle where appropriate)

- undisturbed disturbed: (tire tracks) garbage discing/plowing
- ungrazed grazed: cattle horses sheep other_____ light moderate heavy
- land use of habitat: dirt road

(Optional) Water Chemistry Data

Alkalinity (total):_____ppm or mg/l Conductivity:_____uMHO

Dissolved $NH_4$:_____ppt or ppm Dissolved Oxygen:_____ppm or mg/l

pH:_____ Turbidity: (secchi disc depth)_____cm or: clear to bottom ____

Salinity:_____ppt or ppm Total Dissolved Solids (TDS):_____ppm

Notes: Basin location unclear. Road has been graded recently. Includes cut drainage and fiber rolls. Dry.

U.S. Fish and Wildlife Service Vernal Pool Data Sheet
Wet Season Survey

Note: Please fill out the required information completely for each site visit.

Species Observations: state none or estimate # of individuals present in terms of an order of magnitude (e.g., 10's, 100's, 1000's)

Anostracans:
(note reproductive status) None

Notostracans:
(note reproductive status) None

Species Observations (Optional):

| | | | | | |
|---|---|---|---|---|---|
| Cladocerans: | yes | no | Insects: (adult or larvae) | | |
| Conchostracans: | yes | no | Anisoptera: | yes | no |
| Copepods: | yes | no | Zygoptera: | yes | no |
| Ostracods | yes | no | Hydrophilidae: | yes | no |
| Fish | yes | no | Dytiscidae: | yes | no |
| Frogs | yes | no | Corixidae: | yes | no |
| Salamanders | yes | no | Notonectidae: | yes | no |
| Waterfowl | yes | no | Belostomatidae: | yes | no |
| Other (specify)_____ | | | Other (specify)_____ | | |

Voucher Specimens

Specimens shall be preserved according to the standards of the institution in which they will be accessioned.

| Species | # Individuals | Accession/Catalog # | Pool # |
|---|---|---|---|
| | N/A | | |

2/3/15

21-1

**U.S. Fish and Wildlife Service Vernal Pool Data Sheet**
**Wet Season Survey**

Note: Please fill out the required information completely for each site visit.

This form is being submitted to serve as part of the 90-day report: ___ no ___ yes

Required color slides and/or photographs for the project site are included: ___ no ___ yes

Date: 2/3/15 Time: 1200 County: SD Quad: S.C.

Collector(s): R. Stolpe / M. Tu Permit #: TE835549S

Site/Project Name: TL695 Pool #: 29½ (21-1)

Township: N/A Range: N/A Section: N/A 3338 lat. 117.57 long.

Temperature: Water: N/A °C Air: 21.6 °C

Pool Depth:
at time of sampling: Ø cm
estimated maximum: — cm

Surface Area:
at time of sampling: Ø m x Ø m
estimated maximum: — m x — m

Habitat Condition: (circle where appropriate)

- undisturbed — disturbed: (tire tracks) (garbage) discing/plowing
- ungrazed — grazed: cattle horses sheep other_____ light moderate heavy
- land use of habitat: dirt road / Alpha 2 T.A.

(Optional) Water Chemistry Data

Alkalinity (total):_____ppm or mg/l Conductivity:_____uMHO

Dissolved $NH_4$:_____ppt or ppm Dissolved Oxygen:_____ppm or mg/l

pH:_____ Turbidity: (secchi disc depth)_____cm or: clear to bottom ____

Salinity :_____ppt or ppm Total Dissolved Solids (TDS):_____ppm

Notes: Dry

1

**U.S. Fish and Wildlife Service Vernal Pool Data Sheet**
**Wet Season Survey**

Note: Please fill out the required information completely for each site visit.

Species Observations: state none or estimate # of individuals present in terms of an order of magnitude (e.g., 10's, 100's, 1000's)

Anostracans:
(note reproductive status) None

Notostracans:
(note reproductive status) None

Species Observations (Optional) :

| | | | Insects: (adult or larvae) | | |
|---|---|---|---|---|---|
| Cladocerans: | yes | no | Anisoptera: | yes | no |
| Conchostracans: | yes | no | Zygoptera: | yes | no |
| Copepods: | yes | no | Hydrophilidae: | yes | no |
| Ostracods | yes | no | Dytiscidae: | yes | no |
| Fish | yes | no | Corixidae: | yes | no |
| Frogs | yes | no | Notonectidae: | yes | no |
| Salamanders | yes | no | Belostomatidae: | yes | no |
| Waterfowl | yes | no | Other (specify) | | |
| Other (specify) | | | | | |

Voucher Specimens

Specimens shall be preserved according to the standards of the institution in which they will be accessioned.

| Species | # Individuals | Accession/Catalog # | Pool # |
|---|---|---|---|
| N/A | | | |

3/6/15

21-1

**U.S. Fish and Wildlife Service Vernal Pool Data Sheet**
**Wet Season Survey**

Note: Please fill out the required information completely for each site visit.

This form is being submitted to serve as part of the 90-day report: ____ no ✓ yes

Required color slides and/or photographs for the project site are included: ____ no ✓ yes

Date: 3/6/15 Time: 1130 County: SD Quad: S.C.

Collector(s): R. Stolpe/J. Asmus Permit #: TE-835549-5/none

Site/Project Name: TL 695 Pool #: 29-½(21-1)

Township: N/A Range: N/A Section: N/A 33.38 lat 117.57 long.

Temperature: Water: — °C Air: 27.5 °C

Pool Depth:
at time of sampling: 26 cm
estimated maximum: — cm

Surface Area:
at time of sampling: ____ m x ____ m
estimated maximum: — m x — m

Habitat Condition: (circle where appropriate)

- undisturbed disturbed: (tire tracks) (garbage) discing/plowing
- ungrazed grazed: cattle horses sheep other____
  light moderate heavy
- land use of habitat: dirt road/Alpha Two T.A.

(Optional) Water Chemistry Data

Alkalinity (total):____ppm or mg/l Conductivity:____uMHO

Dissolved $NH_4$:____ppt or ppm Dissolved Oxygen:____ppm or mg/l

pH:____ Turbidity: (secchi disc depth)____cm or: clear to bottom ____

Salinity:____ppt or ppm Total Dissolved Solids (TDS):____ppm

Notes:

FS collected 5M/ØF

B. lindahli

1

**U.S. Fish and Wildlife Service Vernal Pool Data Sheet**
**Wet Season Survey**

Note: Please fill out the required information completely for each site visit.

Species Observations: state none or estimate # of individuals present in terms of an order of magnitude (e.g., 10's, 100's, 1000's)

Anostracans:
(note reproductive status) 100s (mature)

Notostracans:
(note reproductive status) None

Species Observations (Optional):

| | | | Insects: (adult or larvae) | | |
|---|---|---|---|---|---|
| Cladocerans: | yes | no | Anisoptera: | yes | no |
| Conchostracans: | yes | no | Zygoptera: | yes | no |
| Copepods: | yes | no | Hydrophilidae: | yes | no |
| Ostracods | yes | no | Dytiscidae: | yes | no |
| Fish | yes | no | Corixidae: | yes | no |
| Frogs | yes | no | Notonectidae: | yes | no |
| Salamanders | yes | no | Belostomatidae: | yes | no |
| Waterfowl | yes | no | Other (specify)____ | | |
| Other (specify)____ | | | | | |

Voucher Specimens

Specimens shall be preserved according to the standards of the institution in which they will be accessioned.

| Species | # Individuals | Accession/Catalog # | Pool # |
|---|---|---|---|

3/9/15

21-1

**U.S. Fish and Wildlife Service Vernal Pool Data Sheet**
**Wet Season Survey**

Note: Please fill out the required information completely for each site visit.

This form is being submitted to serve as part of the 90-day report: ___ no ✓ yes

Required color slides and/or photographs for the project site are included: ___ no ✓ yes

Date: 3/9/15 Time: 1125 County: SD Quad: S.C.

Collector(s): R. Stolpe/M. Tu Permit #: TE835595

Site/Project Name: TL 695 Pool #: 29-½(21-1)

Township: N/A Range: N/A Section: N/A 33.38 lat. 117.57 long.

Temperature: Water: — °C Air: 17.8 °C

Pool Depth:
at time of sampling: 20 cm
estimated maximum: — cm

Surface Area:
at time of sampling: ___ m x ___ m
estimated maximum: — m x — m

Habitat Condition: (circle where appropriate)

- undisturbed - disturbed: (tire tracks) (garbage) discing/plowing

- ungrazed grazed: cattle horses sheep other___
light moderate heavy

- land use of habitat: dirt road / Alpha 2 T.A.

(Optional) Water Chemistry Data

Alkalinity (total): ___ ppm or mg/l Conductivity: ___ uMHO

Dissolved $NH_4$: ___ ppt or ppm Dissolved Oxygen: ___ ppm or mg/l

pH: ___ Turbidity: (secchi disc depth) ___ cm or: clear to bottom ___

Salinity: ___ ppt or ppm Total Dissolved Solids (TDS): ___ ppm

Notes: Very turbid water. Nearly 100% mortality FS
FS collected 3M/6F
B. lindahli

1

**U.S. Fish and Wildlife Service Vernal Pool Data Sheet**
**Wet Season Survey**

Note: Please fill out the required information completely for each site visit.

Species Observations: state none or estimate # of individuals present in terms of an order of magnitude (e.g., 10's, 100's, 1000's)

Anostracans:
(note reproductive status) 100s (mature)

Notostracans:
(note reproductive status) None

Species Observations (Optional):

| | | | Insects: (adult or larvae) | | |
|---|---|---|---|---|---|
| Cladocerans: | yes | no | | | |
| Conchostracans: | yes | no | Anisoptera: | yes | no |
| Copepods: | yes | no | Zygoptera: | yes | no |
| Ostracods | yes | no | Hydrophilidae: | yes | no |
| Fish | yes | no | Dytiscidae: | yes | no |
| Frogs | yes | no | Corixidae: | yes | no |
| Salamanders | yes | no | Notonectidae: | yes | no |
| Waterfowl | yes | no | Belostomatidae: | yes | no |
| Other (specify) ___ | | | Other (specify) ___ | | |

Voucher Specimens

Specimens shall be preserved according to the standards of the institution in which they will be accessioned.

| Species | # Individuals | Accession/Catalog # | Pool # |
|---|---|---|---|

3/13/15

21-1

**U.S. Fish and Wildlife Service Vernal Pool Data Sheet**
**Wet Season Survey**

Note: Please fill out the required information completely for each site visit.

This form is being submitted to serve as part of the 90-day report: ____ no ✓ yes

Required color slides and/or photographs for the project site are included: ____ no ✓ yes

Date: 3/13/15 Time: 0923 County: SD Quad: S.C.

Collector(s): R. Stolpe/M. Tu Permit #: TE8355495

Site/Project Name: TL695 Pool #: 29-½(21-1)

Township: N/A Range: N/A Section: N/A 33.38 lat. 117.57 long.

Temperature: Water: ~ °C Air: 21.1 °C

Pool Depth:
at time of sampling: 10 cm
estimated maximum: — cm

Surface Area:
at time of sampling: ____ m x ____ m
estimated maximum: — m x — m

Habitat Condition: (circle where appropriate)

- undisturbed disturbed: ~~tire tracks~~ (garbage) discing/plowing
- ungrazed grazed: cattle horses sheep other____ light moderate heavy
- land use of habitat: dirt road / Alpha 2 T.A.

(Optional) Water Chemistry Data

Alkalinity (total): ____ ppm or mg/l Conductivity: ____ uMHO

Dissolved $NH_4$: ____ ppt or ppm Dissolved Oxygen: ____ ppm or mg/l

pH: ____ Turbidity: (secchi disc depth) ____ cm or: clear to bottom ____

Salinity: ____ ppt or ppm Total Dissolved Solids (TDS): ____ ppm

Notes: Turbid water; algae.



**U.S. Fish and Wildlife Service Vernal Pool Data Sheet**
**Wet Season Survey**

Note: Please fill out the required information completely for each site visit.

Species Observations: state none or estimate # of individuals present in terms of an order of magnitude (e.g., 10's, 100's, 1000's)

Anostracans:
(note reproductive status) None

Notostracans:
(note reproductive status) None

Species Observations (Optional):

| | | | Insects: (adult or larvae) | | |
|---|---|---|---|---|---|
| Cladocerans: | (yes) | no | Anisoptera: | yes | no |
| Conchostracans: | yes | no | Zygoptera: | yes | no |
| Copepods: | yes | no | Hydrophilidae: | yes | no |
| Ostracods | yes | no | Dytiscidae: | yes | no |
| Fish | yes | no | Corixidae: | yes | no |
| Frogs | yes | no | Notonectidae: | yes | no |
| Salamanders | yes | no | Belostomatidae: | yes | no |
| Waterfowl | yes | no | Other (specify) | | |
| Other (specify) | | | | | |

Voucher Specimens

Specimens shall be preserved according to the standards of the institution in which they will be accessioned.

| Species | # Individuals | Accession/Catalog # | Pool # |
|---|---|---|---|

3/20/15

21-1

**U.S. Fish and Wildlife Service Vernal Pool Data Sheet**
**Wet Season Survey**

Note: Please fill out the required information completely for each site visit.

This form is being submitted to serve as part of the 90-day report: ____ no ✓ yes

Required color slides and/or photographs for the project site are included: ____ no ✓ yes

Date: 3/2015 Time: 1158 County: SD Quad: S.C.

Collector(s): R. Stolpe / M. Tu Permit #: TE835595

Site/Project Name: TL 695 Pool #: 29-½(21-1)

Township: N/A Range: N/A Section: N/A 33 38 lat. 717.57 long.

Temperature: Water: — °C Air: 21.1 °C

Pool Depth:
at time of sampling: 1 cm
estimated maximum: — cm

Surface Area:
at time of sampling: ____ m x ____ m
estimated maximum: — m x — m

Habitat Condition: (circle where appropriate)

- undisturbed — disturbed: (tire tracks) (garbage) — discing/plowing
- ungrazed — grazed: cattle horses sheep other____ light moderate heavy
- land use of habitat: dirt road / Alpha 2 T.A.

(Optional) Water Chemistry Data

Alkalinity (total):____ppm or mg/l Conductivity:____uMHO

Dissolved $NH_4$:____ppt or ppm Dissolved Oxygen:____ppm or mg/l

pH:____ Turbidity: (secchi disc depth)____cm or: clear to bottom ____

Salinity :____ppt or ppm Total Dissolved Solids (TDS):____ppm

Notes: Bees



**U.S. Fish and Wildlife Service Vernal Pool Data Sheet**
**Wet Season Survey**

Note: Please fill out the required information completely for each site visit.

Species Observations: state none or estimate # of individuals present in terms of an order of magnitude (e.g., 10's, 100's, 1000's)

Anostracans:
(note reproductive status) N

Notostracans:
(note reproductive status) N

Species Observations (Optional) :

| | | | Insects: (adult or larvae) | | |
|---|---|---|---|---|---|
| Cladocerans: | (yes) | no | Anisoptera: | yes | no |
| Conchostracans: | yes | no | Zygoptera: | yes | no |
| Copepods: | yes | no | Hydrophilidae: | yes | no |
| Ostracods | yes | no | Dytiscidae: | yes | no |
| Fish | yes | no | Corixidae: | yes | no |
| Frogs | yes | no | Notonectidae: | yes | no |
| Salamanders | yes | no | Belostomatidae: | yes | no |
| Waterfowl | yes | no | Other (specify) Apoidea | | |
| Other (specify) ____ | | | | | |

Voucher Specimens

Specimens shall be preserved according to the standards of the institution in which they will be accessioned.

| Species | # Individuals | Accession/Catalog # | Pool # |
|---|---|---|---|

3/26/15

21-1

**U.S. Fish and Wildlife Service Vernal Pool Data Sheet**
**Wet Season Survey**

Note: Please fill out the required information completely for each site visit.

This form is being submitted to serve as part of the 90-day report: ____ no ✓ yes

Required color slides and/or photographs for the project site are included: ✓ no ____ yes

Date: 3/26/15 Time: 1043 County: SD Quad: S.C.

Collector(s): R. Stolpe Permit #: TE835549S

Site/Project Name: TL695 Pool #: 29½ (21-1)

Township: N/A Range: N/A Section: N/A 3338 lat. -117:57 long.

Temperature: Water: N/A °C Air: 30.5 °C

Pool Depth:
at time of sampling: Ø cm
estimated maximum: — cm

Surface Area:
at time of sampling: Ø m x Ø m
estimated maximum: — m x — m

Habitat Condition: (circle where appropriate)

- undisturbed — disturbed: (tire tracks) (garbage) — discing/plowing
- ungrazed — grazed: cattle horses sheep other_____ light moderate heavy
- land use of habitat: dirt road / Alpha 2 T.A.

(Optional) Water Chemistry Data

Alkalinity (total):_____ppm or mg/l Conductivity:_____uMHO

Dissolved $NH_4$:_____ppt or ppm Dissolved Oxygen:_____ppm or mg/l

pH:_____ Turbidity: (secchi disc depth)_____cm or: clear to bottom ____

Salinity :_____ppt or ppm Total Dissolved Solids (TDS):_____ppm

Notes:



**U.S. Fish and Wildlife Service Vernal Pool Data Sheet**
**Wet Season Survey**

Note: Please fill out the required information completely for each site visit.

Species Observations: state none or estimate # of individuals present in terms of an order of magnitude (e.g., 10's, 100's, 1000's)

Anostracans:
(note reproductive status) None

Notostracans:
(note reproductive status) None

Species Observations (Optional) :

| | | | | | |
|---|---|---|---|---|---|
| Cladocerans: | yes | no | Insects: (adult or larvae) | | |
| Conchostracans: | yes | no | Anisoptera: | yes | no |
| Copepods: | yes | no | Zygoptera: | yes | no |
| Ostracods | yes | no | Hydrophilidae: | yes | no |
| Fish | yes | no | Dytiscidae: | yes | no |
| Frogs | yes | no | Corixidae: | yes | no |
| Salamanders | yes | no | Notonectidae: | yes | no |
| Waterfowl | yes | no | Belostomatidae: | yes | no |
| Other (specify)_____ | | | Other (specify)_____ | | |

Voucher Specimens

Specimens shall be preserved according to the standards of the institution in which they will be accessioned.

| Species | # Individuals | Accession/Catalog # | Pool # |
|---|---|---|---|
| | N/A | | |

4/2/15

21-1

**U.S. Fish and Wildlife Service Vernal Pool Data Sheet**
**Wet Season Survey**

Note: Please fill out the required information completely for each site visit.

This form is being submitted to serve as part of the 90-day report: ____ no ✓ yes

Required color slides and/or photographs for the project site are included: ✓ no ____ yes

Date: 4/2/15 Time: _____ County: SD Quad: S.C.

Collector(s): R. Stolpe Permit #: TE8355495

Site/Project Name: TL695 Pool #: 29-½(21-1)

Township: N/A Range: N/A Section: N/A 33.38 lat 717.57 long

Temperature: Water: N/A °C Air: _____ °C

Pool Depth:
at time of sampling: Ø cm
estimated maximum: — cm

Surface Area:
at time of sampling: Ø m x Ø m
estimated maximum: — m x — m

Habitat Condition: (circle where appropriate)

- undisturbed disturbed: (tire tracks) (garbage) discing/plowing
- ungrazed grazed: cattle horses sheep other_____
  light moderate heavy
- land use of habitat: dirt road / Alpha 2 T.A.

(Optional) Water Chemistry Data

Alkalinity (total): _____ ppm or mg/l Conductivity: _____ uMHO

Dissolved $NH_4$: _____ ppt or ppm Dissolved Oxygen: _____ ppm or mg/l

pH: _____ Turbidity: (secchi disc depth) _____ cm or: clear to bottom ____

Salinity: _____ ppt or ppm Total Dissolved Solids (TDS): _____ ppm

Notes: Dry



**U.S. Fish and Wildlife Service Vernal Pool Data Sheet**
**Wet Season Survey**

Note: Please fill out the required information completely for each site visit.

Species Observations: state none or estimate # of individuals present in terms of an order of magnitude (e.g., 10's, 100's, 1000's)

Anostracans:
(note reproductive status) None

Notostracans:
(note reproductive status) None

Species Observations (Optional):

| | | | Insects: (adult or larvae) | | |
|---|---|---|---|---|---|
| Cladocerans: | yes | no | Anisoptera: | yes | no |
| Conchostracans: | yes | no | Zygoptera: | yes | no |
| Copepods: | yes | no | Hydrophilidae: | yes | no |
| Ostracods | yes | no | Dytiscidae: | yes | no |
| Fish | yes | no | Corixidae: | yes | no |
| Frogs | yes | no | Notonectidae: | yes | no |
| Salamanders | yes | no | Belostomatidae: | yes | no |
| Waterfowl | yes | no | | | |
| Other (specify) _____ | | | Other (specify) _____ | | |

Voucher Specimens

Specimens shall be preserved according to the standards of the institution in which they will be accessioned.

| Species | # Individuals | Accession/Catalog # | Pool # |
|---|---|---|---|
| N/A | | | |

5/20/15

21-1

**U.S. Fish and Wildlife Service Vernal Pool Data Sheet**
**Wet Season Survey**

Note: Please fill out the required information completely for each site visit.

This form is being submitted to serve as part of the 90-day report: ____ no ✓ yes

Required color slides and/or photographs for the project site are included: ____ no ✓ yes

Date: 5/20/15 Time: 1220 County: _____ Quad: _____

Collector(s): R. Stolpe Permit #: TE835549S

Site/Project Name: TL695 Pool #: 21-1

Township: N/A Range: N/A Section: N/A 33.38 lat. 717.57 long.

Temperature: Water: N/A °C Air: 20 °C

Pool Depth:
at time of sampling: Ø cm
estimated maximum: _____cm

Surface Area:
at time of sampling: Ø m x Ø m
estimated maximum: _____m x _____m

Habitat Condition: (circle where appropriate)

- undisturbed disturbed: (tire tracks) (garbage) discing/plowing
- ungrazed grazed: cattle horses sheep other_____
  light moderate heavy
- land use of habitat:

(Optional) Water Chemistry Data

Alkalinity (total):_____ppm or mg/l Conductivity:_____uMHO

Dissolved $NH_4$:_____ppt or ppm Dissolved Oxygen:_____ppm or mg/l

pH:_____ Turbidity: (secchi disc depth)_____cm or: clear to bottom _____

Salinity :_____ppt or ppm Total Dissolved Solids (TDS):_____ppm

Notes: Dry

1

**U.S. Fish and Wildlife Service Vernal Pool Data Sheet**
**Wet Season Survey**

Note: Please fill out the required information completely for each site visit.

Species Observations: state none or estimate # of individuals present in terms of an order of magnitude (e.g., 10's, 100's, 1000's)

Anostracans:
(note reproductive status) None

Notostracans:
(note reproductive status) None

Species Observations (Optional) :

| | | | | | |
|---|---|---|---|---|---|
| Cladocerans: | yes | no | Insects: (adult or larvae) | | |
| Conchostracans: | yes | no | Anisoptera: | yes | no |
| Copepods: | yes | no | Zygoptera: | yes | no |
| Ostracods | yes | no | Hydrophilidae: | yes | no |
| Fish | yes | no | Dytiscidae: | yes | no |
| Frogs | yes | no | Corixidae: | yes | no |
| Salamanders | yes | no | Notonectidae: | yes | no |
| Waterfowl | yes | no | Belostomatidae: | yes | no |
| Other (specify) _____ | | | Other (specify) _____ | | |

Voucher Specimens

Specimens shall be preserved according to the standards of the institution in which they will be accessioned.

| Species | # Individuals | Accession/Catalog # | Pool # |
|---|---|---|---|

7/21/15

21-1

**U.S. Fish and Wildlife Service Vernal Pool Data Sheet**
**Wet Season Survey**

Note: Please fill out the required information completely for each site visit.

This form is being submitted to serve as part of the 90-day report: ___ no ✓ yes

Required color slides and/or photographs for the project site are included: ___ no ✓ yes

Date: 7/21/15 Time: 1440 County: SD Quad: S.C.

Collector(s): R. Stolpe/J. Asmus Permit #: TE8355495

Site/Project Name: TL695 Pool #: 21-1

Township: N/A Range: N/A Section: N/A 33.38 lat. 717.57 long.

Temperature: Water: 32.2 °C Air: 25.8 °C

Pool Depth:
at time of sampling: 22 cm
estimated maximum: — cm

Surface Area:
at time of sampling: 3 m x 9.4 m
estimated maximum: — m x — m

Habitat Condition: (circle where appropriate)

- undisturbed disturbed: (tire tracks) (garbage) discing/plowing
- ungrazed grazed: cattle horses sheep other_____
  light moderate heavy
- land use of habitat: dirt road / Alpha 2 T.A.

(Optional) Water Chemistry Data

Alkalinity (total):_____ppm or mg/l Conductivity:_____uMHO

Dissolved $NH_4$:_____ppt or ppm Dissolved Oxygen:_____ppm or mg/l

pH: 7.8 Turbidity: (secchi disc depth)_____cm or: clear to bottom ____

Salinity :_____ppt or ppm Total Dissolved Solids (TDS):_____ppm

Notes:



**U.S. Fish and Wildlife Service Vernal Pool Data Sheet**
**Wet Season Survey**

Note: Please fill out the required information completely for each site visit.

Species Observations: state none or estimate # of individuals present in terms of an order of magnitude (e.g., 10's, 100's, 1000's)

Anostracans:
(note reproductive status) None

Notostracans:
(note reproductive status) None

Species Observations (Optional) :

| | | | Insects: (adult or larvae) | | |
|---|---|---|---|---|---|
| Cladocerans: | (yes) | no | Anisoptera: | yes | no |
| Conchostracans: | yes | no | Zygoptera: | yes | no |
| Copepods: | yes | no | Hydrophilidae: | yes | no |
| Ostracods | (yes) | no | Dytiscidae: | yes | no |
| Fish | yes | no | Corixidae: | yes | no |
| Frogs | yes | no | Notonectidae: | yes | no |
| Salamanders | yes | no | Belostomatidae: | yes | no |
| Waterfowl | yes | no | Other (specify) Chironomidae | | |
| Other (specify)_____ | | | | | |

Voucher Specimens

Specimens shall be preserved according to the standards of the institution in which they will be accessioned.

| Species | # Individuals | Accession/Catalog # | Pool # |
|---|---|---|---|
| N/A | | | |

7/29/15

21-1

**U.S. Fish and Wildlife Service Vernal Pool Data Sheet**
**Wet Season Survey**

Note: Please fill out the required information completely for each site visit.

This form is being submitted to serve as part of the 90-day report: ____ no ✓ yes

Required color slides and/or photographs for the project site are included: ____ no ✓ yes

Date: 7/29/15 Time: 0925 County: SD Quad: S.C.

Collector(s): R. Stolpe _____ Permit #: TE835549-5

Site/Project Name: TL695 Pool #: 21-1

Township: N/A Range: N/A Section: N/A 3338 lat. 117.57 long.

Temperature: Water: 25 °C Air: 22.5 °C

Pool Depth:
at time of sampling: 20 cm
estimated maximum. ____ cm

Surface Area:
at time of sampling: ____ m x ____ m
estimated maximum: ____ m x ____ m

Habitat Condition: (circle where appropriate)

- undisturbed — disturbed: (tire tracks) (garbage) discing/plowing
- ungrazed — grazed: cattle horses sheep other_____ light moderate heavy
- land use of habitat: dirt road/Alpha 2 T.A.

(Optional) Water Chemistry Data

Alkalinity (total):____ ppm or mg/l. Conductivity:____ uMHO

Dissolved $NH_4$:____ppt or ppm Dissolved Oxygen:____ppm or mg/l

pH: 9.02 Turbidity: (secchi disc depth)____cm or: clear to bottom ____

Salinity :____ppt or ppm Total Dissolved Solids (TDS):____ppm

Notes: Broken pipe upslope has artificially inundated this basin



**U.S. Fish and Wildlife Service Vernal Pool Data Sheet**
**Wet Season Survey**

Note: Please fill out the required information completely for each site visit.

Species Observations: state none or estimate # of individuals present in terms of an order of magnitude (e.g., 10's, 100's, 1000's)

Anostracans:
(note reproductive status) None

Notostracans:
(note reproductive status) None

Species Observations (Optional) :

| | | | | | |
|---|---|---|---|---|---|
| Cladocerans: | (yes) | no | Insects: (adult or larvae) | | |
| Conchostracans: | yes | no | Anisoptera: | yes | no |
| Copepods: | yes | no | Zygoptera: | yes | no |
| Ostracods | (yes) | no | Hydrophilidae: | yes | no |
| Fish | yes | no | Dytiscidae: | yes | no |
| Frogs | yes | no | Corixidae: | yes | no |
| Salamanders | yes | no | Notonectidae: | yes | no |
| Waterfowl | yes | no | Belostomatidae: | yes | no |
| Other (specify) _____ | | | Other (specify) Coleoptera | | |

Voucher Specimens

Specimens shall be preserved according to the standards of the institution in which they will be accessioned.

| Species | # Individuals | Accession/Catalog # | Pool # |
|---|---|---|---|

9/9/15

21-1

**U.S. Fish and Wildlife Service Vernal Pool Data Sheet**
**Wet Season Survey**

Note: Please fill out the required information completely for each site visit.

This form is being submitted to serve as part of the 90-day report: ____ no ✓ yes

Required color slides and/or photographs for the project site are included: ____ no ✓ yes

Date: 9 / 9 / 15 Time: 1040 County: SD Quad: S.C.

Collector(s): R. Stolpe / S. Brown Permit #: TE835495

Site/Project Name: TL 695 Pool #: 21-1

Township: N/A Range: N/A Section: N/A 33.38 lat 117.57 long.

Temperature: Water: — °C Air: 35 °C

Pool Depth:
at time of sampling: 20 cm
estimated maximum: — cm

Surface Area:
at time of sampling: 3 m x 13.7 m
estimated maximum: — m x — m

Habitat Condition: (circle where appropriate)

- undisturbed — disturbed: (tire tracks) (garbage) discing/plowing
- ungrazed — grazed: cattle horses sheep other:_____ light moderate heavy
- land use of habitat: dirt road / Alpha 2 T.A.

(Optional) Water Chemistry Data

Alkalinity (total): ____ ppm or mg/l Conductivity: _____ uMHO

Dissolved $NH_4$: _____ ppt or ppm Dissolved Oxygen: _____ ppm or mg/l

pH: _____ Turbidity: (secchi disc depth) _____ cm or: clear to bottom ____

Salinity: _____ ppt or ppm Total Dissolved Solids (TDS): _____ ppm

Notes: Broken pipe upslope has artificially inundated this basin.



**U.S. Fish and Wildlife Service Vernal Pool Data Sheet**
**Wet Season Survey**

Note: Please fill out the required information completely for each site visit.

Species Observations: state none or estimate # of individuals present in terms of an order of magnitude (e.g., 10's, 100's, 1000's)

Anostracans:
(note reproductive status) None

Notostracans:
(note reproductive status) None

Species Observations (Optional):

| | | | Insects: (adult or larvae) | | |
|---|---|---|---|---|---|
| Cladocerans: | (yes) | no | Anisoptera: | yes | no |
| Conchostraeans: | yes | no | Zygoptera: | yes | no |
| Copepods: | yes | no | Hydrophilidae: | yes | no |
| Ostracods | (yes) | no | Dytiscidae: | yes | no |
| Fish | yes | no | Corixidae: | yes | no |
| Frogs | yes | no | Notonectidae: | yes | no |
| Salamanders | yes | no | Belostomatidae: | yes | no |
| Waterfowl | yes | no | Other (specify) | | |
| Other (specify) | | | | | |

Voucher Specimens

Specimens shall be preserved according to the standards of the institution in which they will be accessioned.

| Species | # Individuals | Accession/Catalog # | Pool # |
|---|---|---|---|

2/3/15

21-2

**U.S. Fish and Wildlife Service Vernal Pool Data Sheet**
**Wet Season Survey**

Note: Please fill out the required information completely for each site visit.

This form is being submitted to serve as part of the 90-day report: ✓ no ___ yes

Required color slides and/or photographs for the project site are included: ___ no ✓ yes

Date: 2/3/15 Time: 1202 County: SD Quad: S.C.

Collector(s): R. Stolpe/M. Tu Permit #: TE835495

Site/Project Name: TC695 Pool #: 29-36(1-2)

Township: N/A Range: N/A Section: N/A 3338.717.57 lat long

Temperature: Water: N/A °C Air: 21.6 °C

Pool Depth:
at time of sampling: Ø cm
estimated maximum: — cm

Surface Area:
at time of sampling: Ø m x Ø m
estimated maximum: — m x — m

Habitat Condition: (circle where appropriate)

- undisturbed disturbed: (tire tracks) (garbage) discing/plowing
- ungrazed grazed: cattle horses sheep other_____ light moderate heavy
- land use of habitat: dirt road / Alpha 2 T.A.

(Optional) Water Chemistry Data

Alkalinity (total):_____ppm or mg/l Conductivity:_____uMHO

Dissolved $NH_4$:_____ppt or ppm Dissolved Oxygen:_____ppm or mg/l

pH:_____ Turbidity: (secchi disc depth)_____cm or: clear to bottom ____

Salinity :_____ppt or ppm Total Dissolved Solids (TDS):_____ppm

Notes: Dry



**U.S. Fish and Wildlife Service Vernal Pool Data Sheet**
**Wet Season Survey**

Note: Please fill out the required information completely for each site visit.

Species Observations: state none or estimate # of individuals present in terms of an order of magnitude (e.g., 10's, 100's, 1000's)

Anostracans:
(note reproductive status) None

Notostracans:
(note reproductive status) None

Species Observations (Optional) :

| | | | Insects: (adult or larvae) | | |
|---|---|---|---|---|---|
| Cladocerans: | yes | no | Anisoptera: | yes | no |
| Conchostracans: | yes | no | Zygoptera: | yes | no |
| Copepods: | yes | no | Hydrophilidae: | yes | no |
| Ostracods | yes | no | Dytiscidae: | yes | no |
| Fish | yes | no | Corixidae: | yes | no |
| Frogs | yes | no | Notonectidae: | yes | no |
| Salamanders | yes | no | Belostomatidae: | yes | no |
| Waterfowl | yes | no | Other (specify) | | |
| Other (specify) | | | | | |

Voucher Specimens

Specimens shall be preserved according to the standards of the institution in which they will be accessioned.

| Species | # Individuals | Accession/Catalog # | Pool # |
|---|---|---|---|
| | N/A | | |

3/6/15

21-2

**U.S. Fish and Wildlife Service Vernal Pool Data Sheet**
**Wet Season Survey**

Note: Please fill out the required information completely for each site visit.

This form is being submitted to serve as part of the 90-day report: ____ no ✓ yes

Required color slides and/or photographs for the project site are included: ____ no ✓ yes

Date: 3/6/15 Time: 1140 County: SD Quad: S.C.

Collector(s): R. Stolpe / J. Asamus Permit #: TE-835549-5/none

Site/Project Name: TL695 Pool #: 29-3 (21-2)

Township: N/A Range: N/A Section: N/A 33.38 lat. 117.57 long.

Temperature: Water: — °C Air: 28 °C

Pool Depth:
at time of sampling: 11 cm
estimated maximum: — cm

Surface Area:
at time of sampling: ____ m x ____ m
estimated maximum: — m x — m

Habitat Condition: (circle where appropriate)

- undisturbed disturbed: (tire tracks) (garbage) discing/plowing
- ungrazed grazed: cattle horses sheep other____
  light moderate heavy
- land use of habitat: dirt road / Alpha Two T.A.

(Optional) Water Chemistry Data

Alkalinity (total):____ppm or mg/l Conductivity:____uMHO

Dissolved $NH_4$:____ppt or ppm Dissolved Oxygen:____ppm or mg/l

pH:____ Turbidity: (secchi dise depth)____cm or: clear to bottom ____

Salinity :____ppt or ppm Total Dissolved Solids (TDS):____ppm

Notes:

FS collected 6 M / 1 F

B. lindahli

1

**U.S. Fish and Wildlife Service Vernal Pool Data Sheet**
**Wet Season Survey**

Note: Please fill out the required information completely for each site visit.

Species Observations: state none or estimate # of individuals present in terms of an order of magnitude (e.g., 10's, 100's, 1000's)

Anostracans:
(note reproductive status) 1000s (sub-mature)

Notostracans:
(note reproductive status)

Species Observations (Optional) :

| | | | Insects: (adult or larvae) | | |
|---|---|---|---|---|---|
| Cladocerans: | yes | no | Anisoptera: | yes | no |
| Conchostracans: | yes | no | Zygoptera: | yes | no |
| Copepods: | yes | no | Hydrophilidae: | yes | no |
| Ostracods | yes | no | Dytiscidae: | yes | no |
| Fish | yes | no | Corixidae: | yes | no |
| Frogs | yes | no | Notonectidae: | yes | no |
| Salamanders | yes | no | Belostomatidae: | yes | no |
| Waterfowl | yes | no | Other (specify) ____ | | |
| Other (specify) ____ | | | | | |

Voucher Specimens

Specimens shall be preserved according to the standards of the institution in which they will be accessioned.

| Species | # Individuals | Accession/Catalog # | Pool # |
|---|---|---|---|

3/9/15

21-2

**U.S. Fish and Wildlife Service Vernal Pool Data Sheet**
**Wet Season Survey**

Note: Please fill out the required information completely for each site visit.

This form is being submitted to serve as part of the 90-day report: ___ no ✓ yes

Required color slides and/or photographs for the project site are included: ___ no ✓ yes

Date: 3/9/15 Time: 1138 County: SD Quad: S.C.

Collector(s): R. Stalpe / M. Tu Permit #: TE8355495

Site/Project Name: TL 695 Pool #: 29-3(21-2)

Township: N/A Range: N/A Section: N/A 33.38 lat. 117.57 long.

Temperature: Water: — °C Air: 17.8 °C

Pool Depth:
at time of sampling: 10 cm
estimated maximum: — cm

Surface Area:
at time of sampling: ___ m x ___ m
estimated maximum: — m x — m

Habitat Condition: (circle where appropriate)

- undisturbed disturbed: (tire tracks) (garbage) discing/plowing
- ungrazed grazed: cattle horses sheep other___ light moderate heavy
- land use of habitat: dirt road / Alpha 2 T.A.

(Optional) Water Chemistry Data

Alkalinity (total): ___ ppm or mg/l Conductivity: ___ uMHO

Dissolved $NH_4$: ___ ppt or ppm Dissolved Oxygen: ___ ppm or mg/l

pH: ___ Turbidity: (secchi disc depth) ___ cm or: clear to bottom ___

Salinity: ___ ppt or ppm Total Dissolved Solids (TDS): ___ ppm

Notes: Very turbid water
FS collected 11 M/D F
B. lindahli:

**U.S. Fish and Wildlife Service Vernal Pool Data Sheet**
**Wet Season Survey**

Note: Please fill out the required information completely for each site visit.

Species Observations: state none or estimate # of individuals present in terms of an order of magnitude (e.g., 10's, 100's, 1000's)

Anostracans:
(note reproductive status) 100s (mature)

Notostracans:
(note reproductive status) None

Species Observations (Optional):

| | | | Insects: (adult or larvae) | | |
|---|---|---|---|---|---|
| Cladocerans: | yes | no | Anisoptera: | yes | no |
| Conchostracans: | yes | no | Zygoptera: | yes | no |
| Copepods: | yes | no | Hydrophilidae: | yes | no |
| Ostracods | yes | no | Dytiscidae: | yes | no |
| Fish | yes | no | Corixidae: | yes | no |
| Frogs | yes | no | Notonectidae: | yes | no |
| Salamanders | yes | no | Belostomatidae: | yes | no |
| Waterfowl | yes | no | Other (specify) ___ | | |
| Other (specify) ___ | | | | | |

Voucher Specimens

Specimens shall be preserved according to the standards of the institution in which they will be accessioned.

| Species | # Individuals | Accession/Catalog # | Pool # |
|---|---|---|---|

3/13/15

21-2

**U.S. Fish and Wildlife Service Vernal Pool Data Sheet**
**Wet Season Survey**

Note: Please fill out the required information completely for each site visit.

This form is being submitted to serve as part of the 90-day report: ___ no ✓ yes

Required color slides and/or photographs for the project site are included: ___ no ✓ yes

Date: 3/13/15 Time: 0932 County: SD Quad: S.C

Collector(s): R. Stolpe / M. Tu Permit #: TE835495

Site/Project Name: TL695 Pool #: 29-3(21-2)

Township: N/A Range: N/A Section: N/A 3338 lat. 717.57 long.

Temperature: Water: — °C Air: 21.3 °C

Pool Depth:
at time of sampling: 8 cm
estimated maximum: — cm

Surface Area:
at time of sampling: ____ m x ____ m
estimated maximum: — m x — m

Habitat Condition: (circle where appropriate)

- undisturbed disturbed: (tire tracks) (garbage) discing/plowing
- ungrazed grazed: cattle horses sheep other____
  light moderate heavy
- land use of habitat: dirt road / Alpha 2 T.A.

(Optional) Water Chemistry Data

Alkalinity (total): ____ ppm or mg/l Conductivity: ____ uMHO

Dissolved $NH_4$: ____ ppt or ppm Dissolved Oxygen: ____ ppm or mg/l

pH: ____ Turbidity: (secchi disc depth) ____ cm or: clear to bottom ____

Salinity: ____ ppt or ppm Total Dissolved Solids (TDS): ____ ppm

Notes:

FS collected 5M/1F

B. lindahl:



**U.S. Fish and Wildlife Service Vernal Pool Data Sheet**
**Wet Season Survey**

Note: Please fill out the required information completely for each site visit.

Species Observations: state none or estimate # of individuals present in terms of an order of magnitude (e.g., 10's, 100's, 1000's)

Anostracans:
(note reproductive status) 10s (mature)

Notostracans:
(note reproductive status) None

Species Observations (Optional):

| | | | | | |
|---|---|---|---|---|---|
| Cladocerans: | yes | no | Insects: (adult or larvae) | | |
| Conchostracans: | yes | no | Anisoptera: | yes | no |
| Copepods: | yes | no | Zygoptera: | yes | no |
| Ostracods | yes | no | Hydrophilidae: | yes | no |
| Fish | yes | no | Dytiscidae: | yes | no |
| Frogs | yes | no | Corixidae: | yes | no |
| Salamanders | yes | no | Notonectidae: | yes | no |
| Waterfowl | yes | no | Belostomatidae: | yes | no |
| Other (specify) ____ | | | Other (specify) ____ | | |

Voucher Specimens

Specimens shall be preserved according to the standards of the institution in which they will be accessioned.

| Species | # Individuals | Accession/Catalog # | Pool # |
|---|---|---|---|

3/20/15

21-2

**U.S. Fish and Wildlife Service Vernal Pool Data Sheet**
**Wet Season Survey**

Note: Please fill out the required information completely for each site visit.

This form is being submitted to serve as part of the 90-day report: ____ no ✓ yes

Required color slides and/or photographs for the project site are included: ____ no ✓ yes

Date: 3/2915 Time: 1207 County: SD Quad: S.C.

Collector(s): R. Stolpe / M. Tu Permit #: TE835595

Site/Project Name: TL695 Pool #: 29-3(21-2)

Township: N/A Range: N/A Section: N/A 33.38 lat 117.57 long.

Temperature: Water: — °C Air: 21.1 °C

Pool Depth:
at time of sampling: 1 cm
estimated maximum: — cm

Surface Area:
at time of sampling: ____ m x ____ m
estimated maximum: — m x — m

Habitat Condition: (circle where appropriate)

- undisturbed disturbed: (tire tracks) (garbage) discing/plowing
- ungrazed grazed: cattle horses sheep other____ light moderate heavy
- land use of habitat: dirt road / Alpha 2 T.A.

(Optional) Water Chemistry Data

Alkalinity (total):____ ppm or mg/l Conductivity:____ uMHO

Dissolved $NH_4$:____ ppt or ppm Dissolved Oxygen:____ ppm or mg/l

pH:____ Turbidity: (secchi disc depth)____ cm or: clear to bottom ____

Salinity :____ ppt or ppm Total Dissolved Solids (TDS):____ ppm

Notes:



**U.S. Fish and Wildlife Service Vernal Pool Data Sheet**
**Wet Season Survey**

Note: Please fill out the required information completely for each site visit.

Species Observations: state none or estimate # of individuals present in terms of an order of magnitude (e.g., 10's, 100's, 1000's)

Anostracans:
(note reproductive status) N

Notostracans:
(note reproductive status) N

Species Observations (Optional) :

| | | | Insects: (adult or larvae) | | |
|---|---|---|---|---|---|
| Cladocerans: | (yes) | no | Anisoptera: | yes | no |
| Conchostracans: | yes | no | Zygoptera: | yes | no |
| Copepods: | yes | no | Hydrophilidae: | yes | no |
| Ostracods | yes | no | Dytiscidae: | yes | no |
| Fish | yes | no | Corixidae: | yes | no |
| Frogs | yes | no | Notonectidae: | yes | no |
| Salamanders | yes | no | Belostomatidae: | yes | no |
| Waterfowl | yes | no | Other (specify) ____ | | |
| Other (specify) ____ | | | | | |

Voucher Specimens

Specimens shall be preserved according to the standards of the institution in which they will be accessioned.

| Species | # Individuals | Accession/Catalog # | Pool # |
|---|---|---|---|

3/26/15

21-2

**U.S. Fish and Wildlife Service Vernal Pool Data Sheet**
**Wet Season Survey**

Note: Please fill out the required information completely for each site visit.

This form is being submitted to serve as part of the 90-day report: ____ no ✓ yes

Required color slides and/or photographs for the project site are included: ✓ no ____ yes

Date: 3/26/15 Time: _____ County: SD Quad: S.C.

Collector(s): R. Stolpe Permit #: TE835495

Site/Project Name: TC695 Pool #: 29-3(21-2)

Township: N/A Range: N/A Section: N/A 33.38 lat 117.57 long.

Temperature: Water: N/A °C Air: _____ °C

Pool Depth:
at time of sampling: Ø cm
estimated maximum: — cm

Surface Area:
at time of sampling: Ø m x Ø m
estimated maximum: — m x — m

Habitat Condition: (circle where appropriate)

- undisturbed disturbed: (tire tracks) (garbage) discing/plowing
- ungrazed grazed: cattle horses sheep other_____
  light moderate heavy
- land use of habitat: dirt road / Alpha 2 T.A.

(Optional) Water Chemistry Data

Alkalinity (total):_____ppm or mg/l Conductivity:_____uMHO

Dissolved $NH_4$:_____ppt or ppm Dissolved Oxygen:_____ppm or mg/l

pH:_____ Turbidity: (secchi disc depth)_____cm or: clear to bottom ____

Salinity :_____ppt or ppm Total Dissolved Solids (TDS):_____ppm

Notes:



**U.S. Fish and Wildlife Service Vernal Pool Data Sheet**
**Wet Season Survey**

Note: Please fill out the required information completely for each site visit.

Species Observations: state none or estimate # of individuals present in terms of an order of magnitude (e.g., 10's, 100's, 1000's)

Anostracans:
(note reproductive status) None

Notostracans:
(note reproductive status) None

Species Observations (Optional) :

| | | | Insects: (adult or larvae) | | |
|---|---|---|---|---|---|
| Cladocerans: | yes | no | Anisoptera: | yes | no |
| Conchostracans: | yes | no | Zygoptera: | yes | no |
| Copepods: | yes | no | Hydrophilidae: | yes | no |
| Ostracods | yes | no | Dytiscidae: | yes | no |
| Fish | yes | no | Corixidae: | yes | no |
| Frogs | yes | no | Notonectidae: | yes | no |
| Salamanders | yes | no | Belostomatidae: | yes | no |
| Waterfowl | yes | no | Other (specify) | | |
| Other (specify) | | | | | |

Voucher Specimens

Specimens shall be preserved according to the standards of the institution in which they will be accessioned.

| Species | # Individuals | Accession/Catalog # | Pool # |
|---|---|---|---|
| | N/A | | |

4/2/15

21-2

**U.S. Fish and Wildlife Service Vernal Pool Data Sheet**
**Wet Season Survey**

Note: Please fill out the required information completely for each site visit.

This form is being submitted to serve as part of the 90-day report: ___ no ✓ yes

Required color slides and/or photographs for the project site are included: ✓ no ___ yes

Date: 4/2/15 Time: _____ County: SD Quad: S.C.

Collector(s): R. Stolpe Permit #: TE835595

Site/Project Name: TL695 Pool #: 29-3(21-2)

Township: N/A Range: N/A Section: N/A 33.38 lat. -117.57 long.

Temperature: Water: N/A °C Air: _____ °C

Pool Depth:
at time of sampling: Ø cm
estimated maximum: — cm

Surface Area:
at time of sampling: Ø m x Ø m
estimated maximum: — m x — m

Habitat Condition: (circle where appropriate)

- undisturbed disturbed: (fire tracks) (garbage) discing/plowing
- ungrazed grazed: cattle horses sheep other_____
  light moderate heavy
- land use of habitat: dirt road/Alpha 2 T.A.

(Optional) Water Chemistry Data

Alkalinity (total):_____ppm or mg/l Conductivity:_____uMHO

Dissolved $NH_4$:_____ppt or ppm Dissolved Oxygen:_____ppm or mg/l

pH:_____ Turbidity: (secchi disc depth)_____cm or: clear to bottom ____

Salinity :_____ppt or ppm Total Dissolved Solids (TDS):_____ppm

Notes: Dry



**U.S. Fish and Wildlife Service Vernal Pool Data Sheet**
**Wet Season Survey**

Note: Please fill out the required information completely for each site visit.

Species Observations: state none or estimate # of individuals present in terms of an order of magnitude (e.g., 10's, 100's, 1000's)

Anostracans:
(note reproductive status) None

Notostracans:
(note reproductive status) None

Species Observations (Optional) :

| | | | Insects: (adult or larvae) | | |
|---|---|---|---|---|---|
| Cladocerans: | yes | no | Anisoptera: | yes | no |
| Conchostracans: | yes | no | Zygoptera: | yes | no |
| Copepods: | yes | no | Hydrophilidae: | yes | no |
| Ostracods | yes | no | Dytiscidae: | yes | no |
| Fish | yes | no | Corixidae: | yes | no |
| Frogs | yes | no | Notonectidae: | yes | no |
| Salamanders | yes | no | Belostomatidae: | yes | no |
| Waterfowl | yes | no | | | |
| Other (specify) _____ | | | Other (specify) _____ | | |

Voucher Specimens

Specimens shall be preserved according to the standards of the institution in which they will be accessioned.

| Species | # Individuals | Accession/Catalog # | Pool # |
|---|---|---|---|
| | N/A | | |

5/20/15

21-2

**U.S. Fish and Wildlife Service Vernal Pool Data Sheet**
**Wet Season Survey**

Note: Please fill out the required information completely for each site visit.

This form is being submitted to serve as part of the 90-day report: ____ no ✓ yes

Required color slides and/or photographs for the project site are included: ____ no ✓ yes

Date: 5/20/15 Time: 1225 County: _____ Quad: _____

Collector(s): R. Stolpe Permit #: TE835495

Site/Project Name: TL695 Pool #: 21-2

Township: _____ Range: _____ Section: _____ _____lat._____long.

Temperature: Water: N/A °C Air: 20 °C

Pool Depth:
at time of sampling: Ø cm
estimated maximum: _____cm

Surface Area:
at time of sampling: Ø m x Ø m
estimated maximum: _____m x _____m

Habitat Condition: (circle where appropriate)

- undisturbed disturbed: (tire tracks) (garbage) discing/plowing
- ungrazed grazed: cattle horses sheep other_____
  light moderate heavy
- land use of habitat: dirt road/Alpha 2 T.A.

(Optional) Water Chemistry Data

Alkalinity (total):_____ppm or mg/l Conductivity:_____uMHO

Dissolved $NH_4$:_____ppt or ppm Dissolved Oxygen:_____ppm or mg/l

pH:_____ Turbidity: (secchi disc depth)_____cm or: clear to bottom ____

Salinity :_____ppt or ppm Total Dissolved Solids (TDS):_____ppm

Notes: Dry

1

**U.S. Fish and Wildlife Service Vernal Pool Data Sheet**
**Wet Season Survey**

Note: Please fill out the required information completely for each site visit.

Species Observations: state none or estimate # of individuals present in terms of an order of magnitude (e.g., 10's, 100's, 1000's)

Anostracans:
(note reproductive status)

Notostracans:
(note reproductive status)

Species Observations (Optional) :

| | | | | | |
|---|---|---|---|---|---|
| Cladocerans: | yes | no | Insects: (adult or larvae) | | |
| Conchostracans: | yes | no | Anisoptera: | yes | no |
| Copepods: | yes | no | Zygoptera: | yes | no |
| Ostracods | yes | no | Hydrophilidae: | yes | no |
| Fish | yes | no | Dytiscidae: | yes | no |
| Frogs | yes | no | Corixidae: | yes | no |
| Salamanders | yes | no | Notonectidae: | yes | no |
| Waterfowl | yes | no | Belostomatidae: | yes | no |
| Other (specify)_____ | | | Other (specify)_____ | | |

Voucher Specimens

Specimens shall be preserved according to the standards of the institution in which they will be accessioned.

| Species | # Individuals | Accession/Catalog # | Pool # |
|---|---|---|---|

7/21/15

21-2

**U.S. Fish and Wildlife Service Vernal Pool Data Sheet**
**Wet Season Survey**

Note: Please fill out the required information completely for each site visit.

This form is being submitted to serve as part of the 90-day report: ____ no ✓ yes

Required color slides and/or photographs for the project site are included: ✓ no ____ yes

Date: 7/21/15 Time: 1450 County: SD Quad: S.C.

Collector(s): R. Stolpe / J. Asomas Permit #: TE835595

Site/Project Name: TL695 Pool #: 29-3(21-2)

Township: N/A Range: N/A Section: N/A 33.38 lat. -117.57 long.

Temperature: Water: N/A °C Air: 26 °C

Pool Depth:
at time of sampling: 0 cm
estimated maximum: — cm

Surface Area:
at time of sampling: 0 m x 0 m
estimated maximum: — m x — m

Habitat Condition: (circle where appropriate)

- undisturbed disturbed: (tire tracks) (garbage) discing/plowing
- ungrazed grazed: cattle horses sheep other_____ light moderate heavy
- land use of habitat: dirt road / Alpha 2 T.A.

(Optional) Water Chemistry Data

Alkalinity (total):_____ppm or mg/l Conductivity:_____uMHO

Dissolved $NH_4$:_____ppt or ppm Dissolved Oxygen:_____ppm or mg/l

pH:_____ Turbidity: (secchi disc depth)_____cm or: clear to bottom ____

Salinity :_____ppt or ppm Total Dissolved Solids (TDS):_____ppm

Notes: Dry

1

**U.S. Fish and Wildlife Service Vernal Pool Data Sheet**
**Wet Season Survey**

Note: Please fill out the required information completely for each site visit.

Species Observations: state none or estimate # of individuals present in terms of an order of magnitude (e.g., 10's, 100's, 1000's)

Anostracans:
(note reproductive status) None

Notostracans:
(note reproductive status) None

Species Observations (Optional) :

| | | | Insects: (adult or larvae) | | |
|---|---|---|---|---|---|
| Cladocerans: | yes | no | Anisoptera: | yes | no |
| Conchostracans: | yes | no | Zygoptera: | yes | no |
| Copepods: | yes | no | Hydrophilidae: | yes | no |
| Ostracods | yes | no | Dytiscidae: | yes | no |
| Fish | yes | no | Corixidae: | yes | no |
| Frogs | yes | no | Notonectidae: | yes | no |
| Salamanders | yes | no | Belostomatidae: | yes | no |
| Waterfowl | yes | no | | | |
| Other (specify) _____ | | | Other (specify) _____ | | |

Voucher Specimens

Specimens shall be preserved according to the standards of the institution in which they will be accessioned.

| Species | # Individuals | Accession/Catalog # | Pool # |
|---|---|---|---|
| | N/A | | |

7/29/15

21-2

**U.S. Fish and Wildlife Service Vernal Pool Data Sheet**
**Wet Season Survey**

Note: Please fill out the required information completely for each site visit.

This form is being submitted to serve as part of the 90-day report: ____ no ✓ yes

Required color slides and/or photographs for the project site are included: ____ no ✓ yes

Date: 7/29/15 Time: 0930 County: SD Quad: S.C.

Collector(s): T. Stolpe Permit #: TE835549S

Site/Project Name: TL695 Pool #: 21-2

Township: N/A Range: N/A Section: N/A 33.38 lat. 117.57 long.

Temperature: Water: N/A °C Air: 24.4 °C

Pool Depth:
at time of sampling: Ø cm
estimated maximum: — cm

Surface Area:
at time of sampling: Ø m x Ø m
estimated maximum: — m x — m

Habitat Condition: (circle where appropriate)

- undisturbed
- ungrazed

disturbed: (tire tracks) (garbage) discing/plowing

grazed: cattle horses sheep other_____
light moderate heavy

- land use of habitat: dirt road / Alpha 2 T.A.

(Optional) Water Chemistry Data

Alkalinity (total):_____ppm or mg/l Conductivity:_____uMHO

Dissolved $NH_4$:_____ppt or ppm Dissolved Oxygen:_____ppm or mg/l

pH:_____ Turbidity: (secchi disc depth)_____cm or: clear to bottom ____

Salinity :_____ppt or ppm Total Dissolved Solids (TDS):_____ppm

Notes: Dry



**U.S. Fish and Wildlife Service Vernal Pool Data Sheet**
**Wet Season Survey**

Note: Please fill out the required information completely for each site visit.

Species Observations: state none or estimate # of individuals present in terms of an order of magnitude (e.g., 10's, 100's, 1000's)

Anostracans:
(note reproductive status) None

Notostracans:
(note reproductive status) None

Species Observations (Optional) :

| | | | Insects: (adult or larvae) | | |
|---|---|---|---|---|---|
| Cladocerans: | yes | no | Anisoptera: | yes | no |
| Conchostracans: | yes | no | Zygoptera: | yes | no |
| Copepods: | yes | no | Hydrophilidae: | yes | no |
| Ostracods | yes | no | Dytiscidae: | yes | no |
| Fish | yes | no | Corixidae: | yes | no |
| Frogs | yes | no | Notonectidae: | yes | no |
| Salamanders | yes | no | Belostomatidae: | yes | no |
| Waterfowl | yes | no | Other (specify) | | |
| Other (specify) | | | | | |

Voucher Specimens

Specimens shall be preserved according to the standards of the institution in which they will be accessioned.

| Species | # Individuals | Accession/Catalog # | Pool # |
|---|---|---|---|
| N/A | | | |

2/3/15

21-3

**U.S. Fish and Wildlife Service Vernal Pool Data Sheet**
**Wet Season Survey**

Note: Please fill out the required information completely for each site visit.

This form is being submitted to serve as part of the 90-day report: ✓ no ___ yes

Required color slides and/or photographs for the project site are included: ___ no ✓ yes

Date: 2/3/15 Time: 1207 County: SD Quad: S.C.

Collector(s): R. Stolpe / M. Tu Permit #: TE-835549-5

Site/Project Name: TL695 Pool #: 29-4(21-3)

Township: N/A Range: N/A Section: N/A 33.38 lat. -117.57 long.

Temperature: Water: Ø °C Air: 21.7 °C

Pool Depth:
at time of sampling: Ø cm
estimated maximum: — cm

Surface Area:
at time of sampling: Ø m x Ø m
estimated maximum: — m x — m

Habitat Condition: (circle where appropriate)

- undisturbed disturbed: (tire tracks) (garbage) discing/plowing
- ungrazed grazed: cattle horses sheep other_____ light moderate heavy
- land use of habitat: dirt road/Alpha Two T.A.

(Optional) Water Chemistry Data

Alkalinity (total):_____ppm or mg/l Conductivity:_____uMHO

Dissolved $NH_4$:_____ppt or ppm Dissolved Oxygen:_____ppm or mg/l

pH:_____ Turbidity: (secchi disc depth)_____cm or: clear to bottom ____

Salinity :_____ppt or ppm Total Dissolved Solids (TDS):_____ppm

Notes:
Dry



**U.S. Fish and Wildlife Service Vernal Pool Data Sheet**
**Wet Season Survey**

Note: Please fill out the required information completely for each site visit.

Species Observations: state none or estimate # of individuals present in terms of an order of magnitude (e.g., 10's, 100's, 1000's)

Anostracans:
(note reproductive status) None

Notostracans:
(note reproductive status) None

Species Observations (Optional) :

| | | | Insects: (adult or larvae) | | |
|---|---|---|---|---|---|
| Cladocerans: | yes | no | Anisoptera: | yes | no |
| Conchostracans: | yes | no | Zygoptera: | yes | no |
| Copepods: | yes | no | Hydrophilidae: | yes | no |
| Ostracods | yes | no | Dytiscidae: | yes | no |
| Fish | yes | no | Corixidae: | yes | no |
| Frogs | yes | no | Notonectidae: | yes | no |
| Salamanders | yes | no | Belostomatidae: | yes | no |
| Waterfowl | yes | no | | | |
| Other (specify) _____ | | | Other (specify) _____ | | |

Voucher Specimens

Specimens shall be preserved according to the standards of the institution in which they will be accessioned.

| Species | # Individuals | Accession/Catalog # | Pool # |
|---|---|---|---|

3/16/15

21-3

**U.S. Fish and Wildlife Service Vernal Pool Data Sheet**
**Wet Season Survey**

Note: Please fill out the required information completely for each site visit.

This form is being submitted to serve as part of the 90-day report: ___ no ✓ yes

Required color slides and/or photographs for the project site are included: ___ no ✓ yes

Date: 3/16/15 Time: 1200 County: SD Quad: S.C.

Collector(s): R. Stolpe/J. Asoms Permit #: TE-835549-5/none

Site/Project Name: TL695 Pool #: 29-4(21-3)

Township: N/A Range: N/A Section: N/A 33.38 lat. -117.57 long.

Temperature: Water: Ø °C Air: 28.2 °C

Pool Depth:
at time of sampling: Ø cm
estimated maximum: — cm

Surface Area:
at time of sampling: Ø m x Ø m
estimated maximum: — m x — m

Habitat Condition: (circle where appropriate)

- undisturbed disturbed: (tire tracks) (garbage) discing/plowing
- ungrazed grazed: cattle horses sheep other_____
  light moderate heavy
- land use of habitat: dirt road/Alpha Two T.A.

(Optional) Water Chemistry Data

Alkalinity (total):_____ppm or mg/l Conductivity:_____uMHO

Dissolved $NH_4$:_____ppt or ppm Dissolved Oxygen:_____ppm or mg/l

pH:_____ Turbidity: (secchi disc depth)_____cm or: clear to bottom_____

Salinity:_____ppt or ppm Total Dissolved Solids (TDS):_____ppm

Notes:



**U.S. Fish and Wildlife Service Vernal Pool Data Sheet**
**Wet Season Survey**

Note: Please fill out the required information completely for each site visit.

Species Observations: state none or estimate # of individuals present in terms of an order of magnitude (e.g., 10's, 100's, 1000's)

Anostracans:
(note reproductive status) None

Notostracans:
(note reproductive status) None

Species Observations (Optional) :

| | | | Insects: (adult or larvae) | | |
|---|---|---|---|---|---|
| Cladocerans: | yes | no | Anisoptera: | yes | no |
| Conchostracans: | yes | no | Zygoptera: | yes | no |
| Copepods: | yes | no | Hydrophilidae: | yes | no |
| Ostracods | yes | no | Dytiscidae: | yes | no |
| Fish | yes | no | Corixidae: | yes | no |
| Frogs | yes | no | Notonectidae: | yes | no |
| Salamanders | yes | no | Belostomatidae: | yes | no |
| Waterfowl | yes | no | Other (specify) | | |
| Other (specify) | | | | | |

Voucher Specimens

Specimens shall be preserved according to the standards of the institution in which they will be accessioned.

| Species | # Individuals | Accession/Catalog # | Pool # |
|---|---|---|---|

3/9/15

21-3

**U.S. Fish and Wildlife Service Vernal Pool Data Sheet**
**Wet Season Survey**

Note: Please fill out the required information completely for each site visit.

This form is being submitted to serve as part of the 90-day report: ____ no ✓ yes

Required color slides and/or photographs for the project site are included: ____ no ✓ yes

Date: 3/9/15 Time: 1153 County: SD Quad: S.C.

Collector(s): R. Stolpe/M. Tu Permit #: TE8355495

Site/Project Name: TL 1095 Pool #: 294(21-3)

Township: N/A Range: N/A Section: N/A 33.38 lat. 117.57 long.

Temperature: Water: N/A °C Air: 18.8 °C

Pool Depth:
at time of sampling: Ø cm
estimated maximum: — cm

Surface Area:
at time of sampling: Ø m x Ø m
estimated maximum: — m x — m

Habitat Condition: (circle where appropriate)

- undisturbed disturbed: (tire tracks) (garbage) discing/plowing
- ungrazed grazed: cattle horses sheep other_____
  light moderate heavy
- land use of habitat:

(Optional) Water Chemistry Data

Alkalinity (total):_____ppm or mg/l Conductivity:_____uMHO

Dissolved $NH_4$:_____ppt or ppm Dissolved Oxygen:_____ppm or mg/l

pH:_____ Turbidity: (secchi disc depth)_____cm or: clear to bottom _____

Salinity :_____ppt or ppm Total Dissolved Solids (TDS):_____ppm

Notes:



**U.S. Fish and Wildlife Service Vernal Pool Data Sheet**
**Wet Season Survey**

Note: Please fill out the required information completely for each site visit.

Species Observations: state none or estimate # of individuals present in terms of an order of magnitude (e.g., 10's, 100's, 1000's)

Anostracans:
(note reproductive status) None

Notostracans:
(note reproductive status) None

Species Observations (Optional) :

| | | | | | |
|---|---|---|---|---|---|
| Cladocerans: | yes | no | Insects: (adult or larvae) | | |
| Conchostracans: | yes | no | Anisoptera: | yes | no |
| Copepods: | yes | no | Zygoptera: | yes | no |
| Ostracods | yes | no | Hydrophilidae: | yes | no |
| Fish | yes | no | Dytiscidae: | yes | no |
| Frogs | yes | no | Corixidae: | yes | no |
| Salamanders | yes | no | Notonectidae: | yes | no |
| Waterfowl | yes | no | Belostomatidae: | yes | no |
| Other (specify) _____ | | | Other (specify) _____ | | |

Voucher Specimens

Specimens shall be preserved according to the standards of the institution in which they will be accessioned.

| Species | # Individuals | Accession/Catalog # | Pool # |
|---|---|---|---|

3/13/15

21-3

**U.S. Fish and Wildlife Service Vernal Pool Data Sheet**
**Wet Season Survey**

Note: Please fill out the required information completely for each site visit.

This form is being submitted to serve as part of the 90-day report: ____ no ✓ yes

Required color slides and/or photographs for the project site are included: ✓ no ____ yes

Date: 3/13/15 Time: 0938 County: SD Quad: S.C

Collector(s): R. Stolpe / M. Tu Permit #: TE835495

Site/Project Name: TL 695 Pool #: 29-4(21-3)

Township: N/A Range: N/A Section: N/A 33.38 lat. 117.57 long.

Temperature: Water: N/A °C Air: 22.2 °C

Pool Depth:
at time of sampling: Ø cm
estimated maximum: — cm

Surface Area:
at time of sampling: Ø m x Ø m
estimated maximum: — m x — m

Habitat Condition: (circle where appropriate)

- undisturbed disturbed: (tire tracks) (garbage) discing/plowing
- ungrazed grazed: cattle horses sheep other_____ light moderate heavy
- land use of habitat: dirt road / Alpha 2 T.A.

(Optional) Water Chemistry Data

Alkalinity (total):_____ppm or mg/l Conductivity:_____uMHO

Dissolved $NH_4$:_____ppt or ppm Dissolved Oxygen:_____ppm or mg/l

pH:_____ Turbidity: (secchi disc depth)_____cm or: clear to bottom ____

Salinity :_____ppt or ppm Total Dissolved Solids (TDS):_____ppm

Notes: Dry



**U.S. Fish and Wildlife Service Vernal Pool Data Sheet**
**Wet Season Survey**

Note: Please fill out the required information completely for each site visit.

Species Observations: state none or estimate # of individuals present in terms of an order of magnitude (e.g., 10's, 100's, 1000's)

Anostracans:
(note reproductive status) None

Notostracans:
(note reproductive status) None

Species Observations (Optional) :

| | | | Insects: (adult or larvae) | | |
|---|---|---|---|---|---|
| Cladocerans: | yes | no | Anisoptera: | yes | no |
| Conchostracans: | yes | no | Zygoptera: | yes | no |
| Copepods: | yes | no | Hydrophilidae: | yes | no |
| Ostracods | yes | no | Dytiscidae: | yes | no |
| Fish | yes | no | Corixidae: | yes | no |
| Frogs | yes | no | Notonectidae: | yes | no |
| Salamanders | yes | no | Belostomatidae: | yes | no |
| Waterfowl | yes | no | Other (specify)_____ | | |
| Other (specify)_____ | | | | | |

Voucher Specimens

Specimens shall be preserved according to the standards of the institution in which they will be accessioned.

| Species | # Individuals | Accession/Catalog # | Pool # |
|---|---|---|---|
| | N/A | | |

3/20/15

21-3

**U.S. Fish and Wildlife Service Vernal Pool Data Sheet**
**Wet Season Survey**

Note: Please fill out the required information completely for each site visit.

This form is being submitted to serve as part of the 90-day report: ___ no ✓ yes

Required color slides and/or photographs for the project site are included: ✓ no ___ yes

Date: 3/20/15 Time: 1215 County: SD Quad: S.C.

Collector(s): R. Stolpe / M. Tu Permit #: TE8355495

Site/Project Name: TL695 Pool #: 29-4(21-3)

Township: N/A Range: N/A Section: N/A 33.38 lat -117.57 long.

Temperature: Water: N/A °C Air: 21 °C

Pool Depth:
at time of sampling: Ø cm
estimated maximum: — cm

Surface Area:
at time of sampling: Ø m x Ø m
estimated maximum: — m x — m

Habitat Condition: (circle where appropriate)

- undisturbed disturbed: (tire tracks) (garbage) discing/plowing
- ungrazed grazed: cattle horses sheep other_____
  light moderate heavy
- land use of habitat: dirt road / Alpha 2 T.A.

(Optional) Water Chemistry Data

Alkalinity (total):_____ppm or mg/l Conductivity:_____uMHO

Dissolved $NH_4$:_____ppt or ppm Dissolved Oxygen:_____ppm or mg/l

pH:_____ Turbidity: (secchi disc depth)_____cm or clear to bottom ____

Salinity:_____ppt or ppm Total Dissolved Solids (TDS):_____ppm

Notes:



**U.S. Fish and Wildlife Service Vernal Pool Data Sheet**
**Wet Season Survey**

Note: Please fill out the required information completely for each site visit.

Species Observations: state none or estimate # of individuals present in terms of an order of magnitude (e.g., 10's, 100's, 1000's)

Anostracans:
(note reproductive status) None

Notostracans:
(note reproductive status) None

Species Observations (Optional):

| | | | | | |
|---|---|---|---|---|---|
| Cladocerans: | yes | no | Insects: (adult or larvae) | | |
| Conchostracans: | yes | no | Anisoptera: | yes | no |
| Copepods: | yes | no | Zygoptera: | yes | no |
| Ostracods | yes | no | Hydrophilidae: | yes | no |
| Fish | yes | no | Dytiscidae: | yes | no |
| Frogs | yes | no | Corixidae: | yes | no |
| Salamanders | yes | no | Notonectidae: | yes | no |
| Waterfowl | yes | no | Belostomatidae: | yes | no |
| Other (specify) _____ | | | Other (specify) _____ | | |

Voucher Specimens

Specimens shall be preserved according to the standards of the institution in which they will be accessioned.

| Species | # Individuals | Accession/Catalog # | Pool # |
|---|---|---|---|
| N/A | | | |

3/26/15

21-3

**U.S. Fish and Wildlife Service Vernal Pool Data Sheet**
**Wet Season Survey**

Note: Please fill out the required information completely for each site visit.

This form is being submitted to serve as part of the 90-day report: ____ no ✓ yes

Required color slides and/or photographs for the project site are included: ✓ no ____ yes

Date: 3/26/15 Time: _____ County: SD Quad: S.C.

Collector(s): R. Stolpe Permit #: TE8355495

Site/Project Name: TL 695 Pool #: 29-4(21-3)

Township: N/A Range: N/A Section: N/A 3338 lat 11757 long.

Temperature: Water: N/A °C Air: _____ °C

Pool Depth:
at time of sampling: Ø cm
estimated maximum: — cm

Surface Area:
at time of sampling: Ø m x Ø m
estimated maximum: — m x — m

Habitat Condition: (circle where appropriate)

- undisturbed disturbed: (tire tracks) (garbage) discing/plowing
- ungrazed grazed: cattle horses sheep other_____
  light moderate heavy
- land use of habitat: dirt road / Alpha 2 T.A.

(Optional) Water Chemistry Data

Alkalinity (total):_____ppm or mg/l Conductivity:_____uMHO

Dissolved $NH_4$:_____ppt or ppm Dissolved Oxygen:_____ppm or mg/l

pH:_____ Turbidity: (secchi disc depth)_____cm or: clear to bottom _____

Salinity :_____ppt or ppm Total Dissolved Solids (TDS):_____ppm

Notes:



**U.S. Fish and Wildlife Service Vernal Pool Data Sheet**
**Wet Season Survey**

Note: Please fill out the required information completely for each site visit.

Species Observations: state none or estimate # of individuals present in terms of an order of magnitude (e.g., 10's, 100's, 1000's)

Anostracans:
(note reproductive status) None

Notostracans:
(note reproductive status) None

Species Observations (Optional) :

| | | | | | |
|---|---|---|---|---|---|
| Cladocerans: | yes | no | Insects: (adult or larvae) | | |
| Conchostracans: | yes | no | Anisoptera: | yes | no |
| Copepods: | yes | no | Zygoptera: | yes | no |
| Ostracods | yes | no | Hydrophilidae: | yes | no |
| Fish | yes | no | Dytiscidae: | yes | no |
| Frogs | yes | no | Corixidae: | yes | no |
| Salamanders | yes | no | Notonectidae: | yes | no |
| Waterfowl | yes | no | Belostomatidae: | yes | no |
| Other (specify) _____ | | | Other (specify) _____ | | |

Voucher Specimens

Specimens shall be preserved according to the standards of the institution in which they will be accessioned.

| Species | # Individuals | Accession/Catalog # | Pool # |
|---|---|---|---|
| | N/A | | |

4/2/15

21-3

**U.S. Fish and Wildlife Service Vernal Pool Data Sheet**
**Wet Season Survey**

Note: Please fill out the required information completely for each site visit.

This form is being submitted to serve as part of the 90-day report: ____ no ✓ yes

Required color slides and/or photographs for the project site are included: ✓ no ____ yes

Date: 4/2/15 Time: _____ County: SD Quad: S.C.

Collector(s): R. Stolpe Permit #: TE835549S

Site/Project Name: TL695 Pool #: 29-4(21-3)

Township: N/A Range: N/A Section: N/A 3338 lat. 117.57 long.

Temperature: Water: N/A °C Air: _____ °C

Pool Depth:
at time of sampling: Ø cm
estimated maximum: — cm

Surface Area:
at time of sampling: Ø m x Ø m
estimated maximum: — m x — m

Habitat Condition: (circle where appropriate)

- undisturbed — disturbed: (tire tracks) (garbage) discing/plowing
- ungrazed — grazed: cattle horses sheep other_____ light moderate heavy
- land use of habitat: dirt road/Alpha 2 T.A.

(Optional) Water Chemistry Data

Alkalinity (total):_____ppm or mg/l Conductivity:_____uMHO

Dissolved $NH_4$:_____ppt or ppm Dissolved Oxygen:_____ppm or mg/l

pH:_____ Turbidity: (secchi disc depth)_____cm or: clear to bottom ____

Salinity :_____ppt or ppm Total Dissolved Solids (TDS):_____ppm

Notes: Dry

1

**U.S. Fish and Wildlife Service Vernal Pool Data Sheet**
**Wet Season Survey**

Note: Please fill out the required information completely for each site visit.

Species Observations: state none or estimate # of individuals present in terms of an order of magnitude (e.g., 10's, 100's, 1000's)

Anostracans:
(note reproductive status) None

Notostracans:
(note reproductive status) None

Species Observations (Optional) :

| | | | Insects: (adult or larvae) | | |
|---|---|---|---|---|---|
| Cladocerans: | yes | no | Anisoptera: | yes | no |
| Conchostracans: | yes | no | Zygoptera: | yes | no |
| Copepods: | yes | no | Hydrophilidae: | yes | no |
| Ostracods | yes | no | Dytiscidae: | yes | no |
| Fish | yes | no | Corixidae: | yes | no |
| Frogs | yes | no | Notonectidae: | yes | no |
| Salamanders | yes | no | Belostomatidae: | yes | no |
| Waterfowl | yes | no | Other (specify) | | |
| Other (specify) | | | | | |

Voucher Specimens

Specimens shall be preserved according to the standards of the institution in which they will be accessioned.

| Species | # Individuals | Accession/Catalog # | Pool # |
|---|---|---|---|
| | N/A | | |

5/20/15

21-3

**U.S. Fish and Wildlife Service Vernal Pool Data Sheet**
**Wet Season Survey**

Note: Please fill out the required information completely for each site visit.

This form is being submitted to serve as part of the 90-day report: ____ no ✓ yes

Required color slides and/or photographs for the project site are included: ____ no ✓ yes

Date: 5/20/15 Time: 1228 County: _____ Quad: _____

Collector(s): R. Stolpe Permit #: TE8355495

Site/Project Name: TL695 Pool #: 21-3

Township: _____ Range: _____ Section: _____ _____lat._____long.

Temperature: Water: N/A °C Air: 20 °C

Pool Depth:
at time of sampling: 0 cm
estimated maximum: _____cm

Surface Area:
at time of sampling: 0 m x 0 m
estimated maximum: _____m x _____m

Habitat Condition: (circle where appropriate)

- undisturbed disturbed: tire tracks garbage discing/plowing
- ungrazed grazed: cattle horses sheep other_____
  light moderate heavy
- land use of habitat:

(Optional) Water Chemistry Data

Alkalinity (total):_____ppm or mg/l Conductivity:_____uMHO

Dissolved $NH_4$:_____ppt or ppm Dissolved Oxygen:_____ppm or mg/l

pH:_____ Turbidity: (secchi disc depth)_____cm or: clear to bottom ____

Salinity :_____ppt or ppm Total Dissolved Solids (TDS):_____ppm

Notes: Dry



**U.S. Fish and Wildlife Service Vernal Pool Data Sheet**
**Wet Season Survey**

Note: Please fill out the required information completely for each site visit.

Species Observations: state none or estimate # of individuals present in terms of an order of magnitude (e.g., 10's, 100's, 1000's)

Anostracans:
(note reproductive status)

Notostracans:
(note reproductive status)

Species Observations (Optional) :

| | | | | | |
|---|---|---|---|---|---|
| Cladocerans: | yes | no | Insects: (adult or larvae) | | |
| Conchostraeans: | yes | no | Anisoptera: | yes | no |
| Copepods: | yes | no | Zygoptera: | yes | no |
| Ostracods | yes | no | Hydrophilidae: | yes | no |
| Fish | yes | no | Dytiscidae: | yes | no |
| Frogs | yes | no | Corixidae: | yes | no |
| Salamanders | yes | no | Notonectidae: | yes | no |
| Waterfowl | yes | no | Belostomatidae: | yes | no |
| Other (specify) _____ | | | Other (specify) _____ | | |

Voucher Specimens

Specimens shall be preserved according to the standards of the institution in which they will be accessioned.

| Species | # Individuals | Accession/Catalog # | Pool # |
|---|---|---|---|

7/21/15

21-3

**U.S. Fish and Wildlife Service Vernal Pool Data Sheet**
**Wet Season Survey**

Note: Please fill out the required information completely for each site visit.

This form is being submitted to serve as part of the 90-day report: ___ no ✓ yes

Required color slides and/or photographs for the project site are included: ___ no ✓ yes

Date: 7/21/15 Time: 1455 County: SD Quad: S.C.

Collector(s): R. Stolpe/J. Asmus Permit #: TE835495

Site/Project Name: TL 1095 Pool #: 21-3

Township: N/A Range: N/A Section: N/A 33.38 lat -117.57 long.

Temperature: Water: N/A °C Air: 26.1 °C

Pool Depth:
at time of sampling: Ø cm
estimated maximum: — cm

Surface Area:
at time of sampling: Ø m x Ø m
estimated maximum: — m x — m

Habitat Condition: (circle where appropriate)

- undisturbed — disturbed: (tire tracks) (garbage) discing/plowing
- ungrazed — grazed: cattle horses sheep other_____ light moderate heavy
- land use of habitat:

(Optional) Water Chemistry Data

Alkalinity (total):_____ppm or mg/l Conductivity:_____uMHO

Dissolved $NH_4$:_____ppt or ppm Dissolved Oxygen:_____ppm or mg/l

pH:_____ Turbidity: (secchi disc depth)_____cm or: clear to bottom ____

Salinity :_____ppt or ppm Total Dissolved Solids (TDS):_____ppm

Notes: Dry



**U.S. Fish and Wildlife Service Vernal Pool Data Sheet**
**Wet Season Survey**

Note: Please fill out the required information completely for each site visit.

Species Observations: state none or estimate # of individuals present in terms of an order of magnitude (e.g., 10's, 100's, 1000's)

Anostracans:
(note reproductive status) None

Notostracans:
(note reproductive status) None

Species Observations (Optional) :

| | | | | | |
|---|---|---|---|---|---|
| Cladocerans: | yes | no | Insects: (adult or larvae) | | |
| Conchostracans: | yes | no | Anisoptera: | yes | no |
| Copepods: | yes | no | Zygoptera: | yes | no |
| Ostracods | yes | no | Hydrophilidae: | yes | no |
| Fish | yes | no | Dytiscidae: | yes | no |
| Frogs | yes | no | Corixidae: | yes | no |
| Salamanders | yes | no | Notonectidae: | yes | no |
| Waterfowl | yes | no | Belostomatidae: | yes | no |
| Other (specify) _____ | | | Other (specify) _____ | | |

Voucher Specimens

Specimens shall be preserved according to the standards of the institution in which they will be accessioned.

| Species | # Individuals | Accession/Catalog # | Pool # |
|---|---|---|---|

7/29/15

21-3

**U.S. Fish and Wildlife Service Vernal Pool Data Sheet**
**Wet Season Survey**

Note: Please fill out the required information completely for each site visit.

This form is being submitted to serve as part of the 90-day report: ___ no _✓_ yes

Required color slides and/or photographs for the project site are included: ✓ no ___ yes

Date: 7/29/15 Time: 0935 County: SD Quad: S.C.

Collector(s): R. Stolpe Permit #: TE8355495

Site/Project Name: TL 695 Pool #: 21-3

Township: N/A Range: N/A Section: N/A 3338 lat. 11757 long.

Temperature: Water: N/A °C Air: 24.5 °C

Pool Depth:
at time of sampling: Ø cm
estimated maximum: — cm

Surface Area:
at time of sampling: Ø m x Ø m
estimated maximum: — m x — m

Habitat Condition: (circle where appropriate)

- undisturbed
- disturbed: ~~tire tracks~~ ~~garbage~~ discing/plowing
- ungrazed
- grazed: cattle horses sheep other_____ light moderate heavy
- land use of habitat: dirt road / Alpha 2 T.A.

(Optional) Water Chemistry Data

Alkalinity (total):_____ppm or mg/l Conductivity:_____uMHO

Dissolved $NH_4$:_____ppt or ppm Dissolved Oxygen:_____ppm or mg/l

pH:_____ Turbidity: (secchi disc depth)_____cm or: clear to bottom ____

Salinity :_____ppt or ppm Total Dissolved Solids (TDS):_____ppm

Notes: Dry



**U.S. Fish and Wildlife Service Vernal Pool Data Sheet**
**Wet Season Survey**

Note: Please fill out the required information completely for each site visit.

Species Observations: state none or estimate # of individuals present in terms of an order of magnitude (e.g., 10's, 100's, 1000's)

Anostracans:
(note reproductive status) None

Notostracans:
(note reproductive status) None

Species Observations (Optional) :

| | | | Insects: (adult or larvae) | | |
|---|---|---|---|---|---|
| Cladocerans: | yes | no | | | |
| Conchostracans: | yes | no | Anisoptera: | yes | no |
| Copepods: | yes | no | Zygoptera: | yes | no |
| Ostracods | yes | no | Hydrophilidae: | yes | no |
| Fish | yes | no | Dytiscidae: | yes | no |
| Frogs | yes | no | Corixidae: | yes | no |
| Salamanders | yes | no | Notonectidae: | yes | no |
| Waterfowl | yes | no | Belostomatidae: | yes | no |
| Other (specify)_____ | | | Other (specify)_____ | | |

Voucher Specimens

Specimens shall be preserved according to the standards of the institution in which they will be accessioned.

| Species | # Individuals | Accession/Catalog # | Pool # |
|---|---|---|---|
| | N/A | | |

2/3/15

23-2

**U.S. Fish and Wildlife Service Vernal Pool Data Sheet**
**Wet Season Survey**

Note: Please fill out the required information completely for each site visit.

This form is being submitted to serve as part of the 90-day report: ✓ no ___ yes

Required color slides and/or photographs for the project site are included: ___ no ✓ yes

Date: 2/3/15 Time: 1234 County: SD Quad: S.C.

Collector(s): R. Stolpe / M. Tu Permit #: TE8355495

Site/Project Name: TL 695 Pool #: 34-1(23-2)

Township: N/A Range: N/A Section: N/A 33.38 lat. 117.55 long.

Temperature: Water: N/A °C Air: 21.7 °C

Pool Depth:
at time of sampling: Ø cm
estimated maximum: — cm

Surface Area:
at time of sampling: Ø m x Ø m
estimated maximum: — m x — m

Habitat Condition: (circle where appropriate)

- undisturbed (disturbed:) tire tracks garbage discing/plowing

- ungrazed grazed: cattle horses sheep other_____
light moderate heavy

- land use of habitat: Steel towers / Alpha 2 T.A.

(Optional) Water Chemistry Data

Alkalinity (total):_____ppm or mg/l Conductivity:_____uMHO

Dissolved $NH_4$:_____ppt or ppm Dissolved Oxygen:_____ppm or mg/l

pH:_____ Turbidity: (secchi disc depth)_____cm or: clear to bottom ____

Salinity :_____ppt or ppm Total Dissolved Solids (TDS):_____ppm

Notes: Dry

1

**U.S. Fish and Wildlife Service Vernal Pool Data Sheet**
**Wet Season Survey**

Note: Please fill out the required information completely for each site visit.

Species Observations: state none or estimate # of individuals present in terms of an order of magnitude (e.g., 10's, 100's, 1000's)

Anostracans:
(note reproductive status) None

Notostracans:
(note reproductive status) None

Species Observations (Optional) :

| | | | | | |
|---|---|---|---|---|---|
| Cladocerans: | yes | no | Insects: (adult or larvae) | | |
| Conchostracans: | yes | no | Anisoptera: | yes | no |
| Copepods: | yes | no | Zygoptera: | yes | no |
| Ostracods | yes | no | Hydrophilidae: | yes | no |
| Fish | yes | no | Dytiscidae: | yes | no |
| Frogs | yes | no | Corixidae: | yes | no |
| Salamanders | yes | no | Notonectidae: | yes | no |
| Waterfowl | yes | no | Belostomatidae: | yes | no |
| Other (specify)_____ | | | Other (specify)_____ | | |

Voucher Specimens

Specimens shall be preserved according to the standards of the institution in which they will be accessioned.

| Species | # Individuals | Accession/Catalog # | Pool # |
|---|---|---|---|
| | N/A | | |

3/6/15

23-2

**U.S. Fish and Wildlife Service Vernal Pool Data Sheet**
**Wet Season Survey**

Note: Please fill out the required information completely for each site visit.

This form is being submitted to serve as part of the 90-day report: ___ no ✓ yes

Required color slides and/or photographs for the project site are included: ___ no ✓ yes

Date: 3/6/15 Time: 1001 County: SD Quad: S.C.

Collector(s): R. Stolpe / J. Asmus Permit #: TE-835549-5/none

Site/Project Name: TH 695 Pool #: 34-1 (23-2)

Township: N/A Range: N/A Section: N/A 33.38 lat. 117.55 long.

Temperature: Water: — °C Air: 25 °C

Pool Depth:
at time of sampling: Ø cm
estimated maximum: — cm

Surface Area:
at time of sampling: Ø m x Ø m
estimated maximum: — m x — m

Habitat Condition: (circle where appropriate)

- undisturbed (disturbed:) tire tracks garbage discing/plowing
- ungrazed grazed: cattle horses sheep other_____ light moderate heavy
- land use of habitat: Steel tower / Alpha Two T.A.

(Optional) Water Chemistry Data

Alkalinity (total):_____ppm or mg/l Conductivity:_____uMHO

Dissolved $NH_4$:_____ppt or ppm Dissolved Oxygen:_____ppm or mg/l

pH:_____ Turbidity: (secchi disc depth)_____cm or: clear to bottom ____

Salinity :_____ppt or ppm Total Dissolved Solids (TDS):_____ppm

Notes:



**U.S. Fish and Wildlife Service Vernal Pool Data Sheet**
**Wet Season Survey**

Note: Please fill out the required information completely for each site visit.

Species Observations: state none or estimate # of individuals present in terms of an order of magnitude (e.g., 10's, 100's, 1000's)

Anostracans:
(note reproductive status) None

Notostracans:
(note reproductive status) None

Species Observations (Optional) :

| | | | Insects: (adult or larvae) | | |
|---|---|---|---|---|---|
| Cladocerans: | yes | no | Anisoptera: | yes | no |
| Conchostracans: | yes | no | Zygoptera: | yes | no |
| Copepods: | yes | no | Hydrophilidae: | yes | no |
| Ostracods | yes | no | Dytiscidae: | yes | no |
| Fish | yes | no | Corixidae: | yes | no |
| Frogs | yes | no | Notonectidae: | yes | no |
| Salamanders | yes | no | Belostomatidae: | yes | no |
| Waterfowl | yes | no | | | |
| Other (specify) | | | Other (specify) | | |

Voucher Specimens

Specimens shall be preserved according to the standards of the institution in which they will be accessioned.

| Species | # Individuals | Accession/Catalog # | Pool # |
|---|---|---|---|

3/9/15

23-2

**U.S. Fish and Wildlife Service Vernal Pool Data Sheet**
**Wet Season Survey**

Note: Please fill out the required information completely for each site visit.

This form is being submitted to serve as part of the 90-day report: ____ no ✓ yes

Required color slides and/or photographs for the project site are included: ____ no ✓ yes

Date: 3/9/15 Time: 13:41 County: SD Quad: S.C.

Collector(s): R. Stolpe / M. Tu Permit #: TE8355495

Site/Project Name: TL 695 Pool #: 34-1 (23-2)

Township: N/A Range: N/A Section: N/A 33.38 lat. 117.55 long.

Temperature: Water: N/A °C Air: 19.2 °C

Pool Depth:
at time of sampling: Ø cm
estimated maximum: — cm

Surface Area:
at time of sampling: Ø m x Ø m
estimated maximum: — m x — m

Habitat Condition: (circle where appropriate)

- undisturbed (disturbed:) tire tracks garbage discing/plowing
- ungrazed grazed: cattle horses sheep other_____
  light moderate heavy
- land use of habitat: Steel towers / Alpha 2 T.A.

(Optional) Water Chemistry Data

Alkalinity (total):_____ppm or mg/l Conductivity:_____uMHO

Dissolved $NH_4$:_____ppt or ppm Dissolved Oxygen:_____ppm or mg/l

pH:_____ Turbidity: (secchi disc depth)_____cm or: clear to bottom _____

Salinity :_____ppt or ppm Total Dissolved Solids (TDS):_____ppm

Notes:



**U.S. Fish and Wildlife Service Vernal Pool Data Sheet**
**Wet Season Survey**

Note: Please fill out the required information completely for each site visit.

Species Observations: state none or estimate # of individuals present in terms of an order of magnitude (e.g., 10's, 100's, 1000's)

Anostracans:
(note reproductive status) None

Notostracans:
(note reproductive status) None

Species Observations (Optional) :

| | | | | | |
|---|---|---|---|---|---|
| Cladocerans: | yes | no | Insects: (adult or larvae) | | |
| Conchostracans: | yes | no | Anisoptera: | yes | no |
| Copepods: | yes | no | Zygoptera: | yes | no |
| Ostracods | yes | no | Hydrophilidae: | yes | no |
| Fish | yes | no | Dytiscidae: | yes | no |
| Frogs | yes | no | Corixidae: | yes | no |
| Salamanders | yes | no | Notonectidae: | yes | no |
| Waterfowl | yes | no | Belostomatidae: | yes | no |
| Other (specify)_____ | | | Other (specify)_____ | | |

Voucher Specimens

Specimens shall be preserved according to the standards of the institution in which they will be accessioned.

| Species | # Individuals | Accession/Catalog # | Pool # |
|---|---|---|---|
| | N/A | | |

3/13/15

23-2

**U.S. Fish and Wildlife Service Vernal Pool Data Sheet**
**Wet Season Survey**

Note: Please fill out the required information completely for each site visit.

This form is being submitted to serve as part of the 90-day report: ___ no ✓ yes

Required color slides and/or photographs for the project site are included: ✓ no ___ yes

Date: 3/13/15 Time: 1046 County: SD Quad: S.C.

Collector(s): R. Stolpe / M. Tw Permit #: TE8355495

Site/Project Name: TL 695 Pool #: 34-1(23-2)

Township: N/A Range: N/A Section: N/A 33.38 lat. -117.55 long.

Temperature: Water: N/A °C Air: 28.4 °C

Pool Depth:
at time of sampling: Ø cm
estimated maximum: — cm

Surface Area:
at time of sampling: Ø m x Ø m
estimated maximum: — m x — m

Habitat Condition: (circle where appropriate)

- undisturbed (disturbed) tire tracks garbage discing/plowing
- ungrazed grazed: cattle horses sheep other_____
  light moderate heavy
- land use of habitat: Steel tower / Alpha 2 T.A.

(Optional) Water Chemistry Data

Alkalinity (total):_____ppm or mg/l Conductivity:_____uMHO

Dissolved $NH_4$:_____ppt or ppm Dissolved Oxygen:_____ppm or mg/l

pH:_____ Turbidity: (secchi disc depth)_____cm or: clear to bottom _____

Salinity :_____ppt or ppm Total Dissolved Solids (TDS):_____ppm

Notes:



**U.S. Fish and Wildlife Service Vernal Pool Data Sheet**
**Wet Season Survey**

Note: Please fill out the required information completely for each site visit.

Species Observations: state none or estimate # of individuals present in terms of an order of magnitude (e.g., 10's, 100's, 1000's)

Anostracans:
(note reproductive status) None

Notostracans:
(note reproductive status) None

Species Observations (Optional) :

| | | | | | |
|---|---|---|---|---|---|
| Cladocerans: | yes | no | Insects: (adult or larvae) | | |
| Conchostracans: | yes | no | Anisoptera: | yes | no |
| Copepods: | yes | no | Zygoptera: | yes | no |
| Ostracods | yes | no | Hydrophilidae: | yes | no |
| Fish | yes | no | Dytiscidae: | yes | no |
| Frogs | yes | no | Corixidae: | yes | no |
| Salamanders | yes | no | Notonectidae: | yes | no |
| Waterfowl | yes | no | Belostomatidae: | yes | no |
| Other (specify) | | | Other (specify) | | |

Voucher Specimens

Specimens shall be preserved according to the standards of the institution in which they will be accessioned.

| Species | # Individuals | Accession/Catalog # | Pool # |
|---|---|---|---|

3/20/15

23-2

**U.S. Fish and Wildlife Service Vernal Pool Data Sheet**
**Wet Season Survey**

Note: Please fill out the required information completely for each site visit.

This form is being submitted to serve as part of the 90-day report: ____ no ✓ yes

Required color slides and/or photographs for the project site are included: ✓ no ____ yes

Date: 3/20/15 Time: 1340 County: SD Quad: S-C

Collector(s): R. Stolpe/M. Tu Permit #: TE8355495

Site/Project Name: TL 695 Pool #: 34-1(23-2)

Township: N/A Range: N/A Section: N/A 33.38 lat. 117.55 long.

Temperature: Water: N/A °C Air: 23.1 °C

Pool Depth:
at time of sampling: Ø cm
estimated maximum: — cm

Surface Area:
at time of sampling: Ø m x Ø m
estimated maximum: — m x — m

Habitat Condition: (circle where appropriate)

- undisturbed disturbed: tire tracks garbage discing/plowing
- ungrazed grazed: cattle horses sheep other_____
light moderate heavy
- land use of habitat: Steel tower / Alpha 2 T.A.

(Optional) Water Chemistry Data

Alkalinity (total):_____ppm or mg/l Conductivity:_____uMHO

Dissolved $NH_4$:_____ppt or ppm Dissolved Oxygen:_____ppm or mg/l

pH:_____ Turbidity: (secchi disc depth)_____cm or: clear to bottom ____

Salinity :_____ppt or ppm Total Dissolved Solids (TDS):_____ppm

Notes:



**U.S. Fish and Wildlife Service Vernal Pool Data Sheet**
**Wet Season Survey**

Note: Please fill out the required information completely for each site visit.

Species Observations: state none or estimate # of individuals present in terms of an order of magnitude (e.g., 10's, 100's, 1000's)

Anostracans:
(note reproductive status) None

Notostracans:
(note reproductive status) None

Species Observations (Optional) :

| | | | Insects: (adult or larvae) | | |
|---|---|---|---|---|---|
| Cladocerans: | yes | no | | | |
| Conchostracans: | yes | no | | | |
| Copepods: | yes | no | Anisoptera: | yes | no |
| Ostracods | yes | no | Zygoptera: | yes | no |
| Fish | yes | no | Hydrophilidae: | yes | no |
| Frogs | yes | no | Dytiscidae: | yes | no |
| Salamanders | yes | no | Corixidae: | yes | no |
| Waterfowl | yes | no | Notonectidae: | yes | no |
| Other (specify) _____ | | | Belostomatidae: | yes | no |
| | | | Other (specify) _____ | | |

Voucher Specimens

Specimens shall be preserved according to the standards of the institution in which they will be accessioned.

| Species | # Individuals | Accession/Catalog # | Pool # |
|---|---|---|---|
| N/A | | | |

3/26/15

23-2

**U.S. Fish and Wildlife Service Vernal Pool Data Sheet**
**Wet Season Survey**

Note: Please fill out the required information completely for each site visit.

This form is being submitted to serve as part of the 90-day report: ___ no ✓ yes

Required color slides and/or photographs for the project site are included: ✓ no ___ yes

Date: 3/26/15 Time: _____ County: SD Quad: S.C.

Collector(s): R. Stolpe Permit #: TE835595

Site/Project Name: TL695 Pool #: 34-1(23-2)

Township: N/A Range: N/A Section: N/A 33.38 lat. 117.55 long.

Temperature: Water: N/A °C Air: _____ °C

Pool Depth:
at time of sampling: Ø cm
estimated maximum: — cm

Surface Area:
at time of sampling: Ø m x Ø m
estimated maximum: — m x — m

Habitat Condition: (circle where appropriate)

- undisturbed (disturbed:) tire tracks garbage discing/plowing
- ungrazed grazed: cattle horses sheep other_____ light moderate heavy
- land use of habitat: Steel tower / Alpha 2 T.A.

(Optional) Water Chemistry Data

Alkalinity (total):_____ppm or mg/l Conductivity:_____uMHO

Dissolved $NH_4$:_____ppt or ppm Dissolved Oxygen:_____ppm or mg/l

pH:_____ Turbidity: (secchi disc depth)_____cm or: clear to bottom ____

Salinity :_____ppt or ppm Total Dissolved Solids (TDS):_____ppm

Notes: Dry



**U.S. Fish and Wildlife Service Vernal Pool Data Sheet**
**Wet Season Survey**

Note: Please fill out the required information completely for each site visit.

Species Observations: state none or estimate # of individuals present in terms of an order of magnitude (e.g., 10's, 100's, 1000's)

Anostracans:
(note reproductive status) None

Notostracans:
(note reproductive status) None

Species Observations (Optional) :

| | | | | | |
|---|---|---|---|---|---|
| Cladocerans: | yes | no | Insects: (adult or larvae) | | |
| Conchostracans: | yes | no | Anisoptera: | yes | no |
| Copepods: | yes | no | Zygoptera: | yes | no |
| Ostracods | yes | no | Hydrophilidae: | yes | no |
| Fish | yes | no | Dytiscidae: | yes | no |
| Frogs | yes | no | Corixidae: | yes | no |
| Salamanders | yes | no | Notonectidae: | yes | no |
| Waterfowl | yes | no | Belostomatidae: | yes | no |
| Other (specify) _____ | | | Other (specify) _____ | | |

Voucher Specimens

Specimens shall be preserved according to the standards of the institution in which they will be accessioned.

| Species | # Individuals | Accession/Catalog # | Pool # |
|---|---|---|---|
| | N/A | | |

4/2/15

23-2

**U.S. Fish and Wildlife Service Vernal Pool Data Sheet**
**Wet Season Survey**

Note: Please fill out the required information completely for each site visit.

This form is being submitted to serve as part of the 90-day report: ____ no ✓ yes

Required color slides and/or photographs for the project site are included: ✓ no ____ yes

Date: 4/2/15 Time: _____ County: SD Quad: S.C.

Collector(s): R. Stolpe Permit #: TE835495

Site/Project Name: TL 695 Pool #: 34-1 (23-2)

Township: N/A Range: N/A Section: N/A 3338 lat. -117.55 long.

Temperature: Water: N/A °C Air: _____ °C

Pool Depth:
at time of sampling: Ø cm
estimated maximum: — cm

Surface Area:
at time of sampling: Ø m x Ø m
estimated maximum: — m x — m

Habitat Condition: (circle where appropriate)

- undisturbed (disturbed:) tire tracks garbage discing/plowing
- ungrazed grazed: cattle horses sheep other_____ light moderate heavy
- land use of habitat: Steel towers / Alpha 2 T.A.

(Optional) Water Chemistry Data

Alkalinity (total): _____ ppm or mg/l Conductivity: _____ uMHO

Dissolved $NH_4$: _____ ppt or ppm Dissolved Oxygen: _____ ppm or mg/l

pH: _____ Turbidity: (secchi disc depth) _____ cm or: clear to bottom _____

Salinity: _____ ppt or ppm Total Dissolved Solids (TDS): _____ ppm

Notes: Dry



**U.S. Fish and Wildlife Service Vernal Pool Data Sheet**
**Wet Season Survey**

Note: Please fill out the required information completely for each site visit.

Species Observations: state none or estimate # of individuals present in terms of an order of magnitude (e.g., 10's, 100's, 1000's)

Anostracans:
(note reproductive status) None

Notostracans:
(note reproductive status) None

Species Observations (Optional):

| | | | | | |
|---|---|---|---|---|---|
| Cladocerans: | yes | no | Insects: (adult or larvae) | | |
| Conchostracans: | yes | no | Anisoptera: | yes | no |
| Copepods: | yes | no | Zygoptera: | yes | no |
| Ostracods | yes | no | Hydrophilidae: | yes | no |
| Fish | yes | no | Dytiscidae: | yes | no |
| Frogs | yes | no | Corixidae: | yes | no |
| Salamanders | yes | no | Notonectidae: | yes | no |
| Waterfowl | yes | no | Belostomatidae: | yes | no |
| Other (specify) _____ | | | Other (specify) _____ | | |

Voucher Specimens

Specimens shall be preserved according to the standards of the institution in which they will be accessioned.

| Species | # Individuals | Accession/Catalog # | Pool # |
|---|---|---|---|
| | N/A | | |

5/20/15

23-2

**U.S. Fish and Wildlife Service Vernal Pool Data Sheet**
**Wet Season Survey**

Note: Please fill out the required information completely for each site visit.

This form is being submitted to serve as part of the 90-day report: ____ no ✓ yes

Required color slides and/or photographs for the project site are included: ____ no ✓ yes

Date: 5/20/15 Time: 1311 County: _____ Quad: _____

Collector(s): R. Stolpe Permit #: TE8355495

Site/Project Name: TL695 Pool #: _____

Township: _____ Range: _____ Section: _____ _____lat. _____long.

Temperature: Water: N/A °C Air: 20 °C

Pool Depth:
at time of sampling: Ø cm
estimated maximum: _____cm

Surface Area:
at time of sampling: Ø m x Ø m
estimated maximum: _____m x _____m

Habitat Condition: (circle where appropriate)

- undisturbed disturbed: tire tracks garbage discing/plowing

- ungrazed grazed: cattle horses sheep other_____
light moderate heavy

- land use of habitat:

(Optional) Water Chemistry Data

Alkalinity (total):_____ppm or mg/l Conductivity:_____uMHO

Dissolved $NH_4$:_____ppt or ppm Dissolved Oxygen:_____ppm or mg/l

pH:_____ Turbidity: (secchi disc depth)_____cm or; clear to bottom _____

Salinity :_____ppt or ppm Total Dissolved Solids (TDS):_____ppm

Notes: Dry



**U.S. Fish and Wildlife Service Vernal Pool Data Sheet**
**Wet Season Survey**

Note: Please fill out the required information completely for each site visit.

Species Observations: state none or estimate # of individuals present in terms of an order of magnitude (e.g., 10's, 100's, 1000's)

Anostracans:
(note reproductive status)

Notostracans:
(note reproductive status)

Species Observations (Optional) :

| | | | Insects: (adult or larvae) | | |
|---|---|---|---|---|---|
| Cladocerans: | yes | no | Anisoptera: | yes | no |
| Conchostracans: | yes | no | Zygoptera: | yes | no |
| Copepods: | yes | no | Hydrophilidae: | yes | no |
| Ostracods | yes | no | Dytiscidae: | yes | no |
| Fish | yes | no | Corixidae: | yes | no |
| Frogs | yes | no | Notonectidae: | yes | no |
| Salamanders | yes | no | Belostomatidae: | yes | no |
| Waterfowl | yes | no | Other (specify) _____ | | |
| Other (specify) _____ | | | | | |

Voucher Specimens

Specimens shall be preserved according to the standards of the institution in which they will be accessioned.

| Species | # Individuals | Accession/Catalog # | Pool # |
|---|---|---|---|

7/21/15

23-2

**U.S. Fish and Wildlife Service Vernal Pool Data Sheet**
**Wet Season Survey**

Note: Please fill out the required information completely for each site visit.

This form is being submitted to serve as part of the 90-day report: ___ no ✓ yes

Required color slides and/or photographs for the project site are included: ___ no ✓ yes

Date: 7/21/15 Time: 1424 County: SD Quad: S.C.

Collector(s): R. Stolpe / J. Asmus Permit #: TE-835549-5/none

Site/Project Name: TL 695 Pool #: 23-2

Township: N/A Range: N/A Section: N/A 3338 lat. 117.55 long.

Temperature: Water: — °C Air: 25.5 °C

Pool Depth:
at time of sampling: Ø cm
estimated maximum: — cm

Surface Area:
at time of sampling: Ø m x Ø m
estimated maximum: — m x — m

Habitat Condition: (circle where appropriate)

- undisturbed (disturbed:) tire tracks garbage discing/plowing
- ungrazed grazed: cattle horses sheep other_____ light moderate heavy
- land use of habitat: Steel tower / Alpha Two T.A.

(Optional) Water Chemistry Data

Alkalinity (total):_____ppm or mg/l Conductivity:_____uMHO

Dissolved $NH_4$:_____ppt or ppm Dissolved Oxygen:_____ppm or mg/l

pH:_____ Turbidity: (secchi disc depth)_____cm or: clear to bottom ____

Salinity :_____ppt or ppm Total Dissolved Solids (TDS):_____ppm

Notes: Dry

1

**U.S. Fish and Wildlife Service Vernal Pool Data Sheet**
**Wet Season Survey**

Note: Please fill out the required information completely for each site visit.

Species Observations: state none or estimate # of individuals present in terms of an order of magnitude (e.g., 10's, 100's, 1000's)

Anostracans:
(note reproductive status) None

Notostracans:
(note reproductive status) None

Species Observations (Optional) :

| | | | Insects: (adult or larvae) | | |
|---|---|---|---|---|---|
| Cladocerans: | yes | no | Anisoptera: | yes | no |
| Conchostracans: | yes | no | Zygoptera: | yes | no |
| Copepods: | yes | no | Hydrophilidae: | yes | no |
| Ostracods | yes | no | Dytiscidae: | yes | no |
| Fish | yes | no | Corixidae: | yes | no |
| Frogs | yes | no | Notonectidae: | yes | no |
| Salamanders | yes | no | Belostomatidae: | yes | no |
| Waterfowl | yes | no | Other (specify) _____ | | |
| Other (specify) _____ | | | | | |

Voucher Specimens

Specimens shall be preserved according to the standards of the institution in which they will be accessioned.

| Species | # Individuals | Accession/Catalog # | Pool # |
|---|---|---|---|

2/3/15

23-4

**U.S. Fish and Wildlife Service Vernal Pool Data Sheet**
**Wet Season Survey**

Note: Please fill out the required information completely for each site visit.

This form is being submitted to serve as part of the 90-day report: ✓ no ___ yes

Required color slides and/or photographs for the project site are included: ___ no ✓ yes

Date: 2/3/15 Time: 1236 County: SD Quad: S.C.

Collector(s): R. Stolpe / M. Tu Permit #: TE8355495

Site/Project Name: TL695 Pool #: 34-2(23-4)

Township: N/A Range: N/A Section: N/A 33.38 lat. 117.55 long.

Temperature: Water: — °C Air: 21.7 °C

Pool Depth:
at time of sampling: 35 cm
estimated maximum: — cm

Surface Area:
at time of sampling: ___ m x ___ m
estimated maximum: — m x — m

Habitat Condition: (circle where appropriate)

- undisturbed disturbed: (tire tracks) garbage discing/plowing
- ungrazed grazed: cattle horses sheep other_____
light moderate heavy
- land use of habitat: Alpha 2 T.A.

(Optional) Water Chemistry Data

Alkalinity (total):_____ppm or mg/l Conductivity:_____uMHO

Dissolved $NH_4$:_____ppt or ppm Dissolved Oxygen:_____ppm or mg/l

pH:_____ Turbidity: (secchi disc depth)_____cm or: clear to bottom_____

Salinity :_____ppt or ppm Total Dissolved Solids (TDS):_____ppm

Notes:



**U.S. Fish and Wildlife Service Vernal Pool Data Sheet**
**Wet Season Survey**

Note: Please fill out the required information completely for each site visit.

Species Observations: state none or estimate # of individuals present in terms of an order of magnitude (e.g., 10's, 100's, 1000's)

Anostracans:
(note reproductive status) None

Notostracans:
(note reproductive status) None

Species Observations (Optional) :

| | | | Insects: (adult or larvae) | | |
|---|---|---|---|---|---|
| Cladocerans: | (yes) | no | Anisoptera: | yes | no |
| Conchostracans: | yes | no | Zygoptera: | yes | no |
| Copepods: | yes | no | Hydrophilidae: | yes | no |
| Ostracods | (yes) | no | Dytiscidae: | yes | no |
| Fish | yes | no | Corixidae: | yes | no |
| Frogs | (yes) | no | Notonectidae: | yes | no |
| Salamanders | yes | no | Belostomatidae: | yes | no |
| Waterfowl | yes | no | Other (specify) | | |
| Other (specify) | Toad | | | | |

Voucher Specimens

Specimens shall be preserved according to the standards of the institution in which they will be accessioned.

| Species | # Individuals | Accession/Catalog # | Pool # |
|---|---|---|---|

3/16/15

23-4

**U.S. Fish and Wildlife Service Vernal Pool Data Sheet**
**Wet Season Survey**

Note: Please fill out the required information completely for each site visit.

This form is being submitted to serve as part of the 90-day report: ____ no ✓ yes

Required color slides and/or photographs for the project site are included: ____ no ✓ yes

Date: 3/6/15 Time: 1006 County: SD Quad: S.C.

Collector(s): R. Stolpe / J. Asmus Permit #: TE-835549-5/none

Site/Project Name: TL695 Pool #: 34-2(23-4)

Township: N/A Range: N/A Section: N/A 33.38 lat. 117.55 long.

Temperature: Water: — °C Air: 25 °C

Pool Depth:
at time of sampling: Unk cm
estimated maximum: — cm

Surface Area:
at time of sampling: _____ m x _____ m
estimated maximum: — m x — m

Habitat Condition: (circle where appropriate)

- undisturbed — disturbed: (tire tracks) garbage discing/plowing
- ungrazed — grazed: cattle horses sheep other_____ light moderate heavy
- land use of habitat: Alpha Two training area

(Optional) Water Chemistry Data

Alkalinity (total):_____ppm or mg/l Conductivity:_____uMHO

Dissolved $NH_4$:_____ppt or ppm Dissolved Oxygen:_____ppm or mg/l

pH:_____ Turbidity: (secchi disc depth)_____cm or: clear to bottom ____

Salinity:_____ppt or ppm Total Dissolved Solids (TDS):_____ppm

Notes:

1

**U.S. Fish and Wildlife Service Vernal Pool Data Sheet**
**Wet Season Survey**

Note: Please fill out the required information completely for each site visit.

Species Observations: state none or estimate # of individuals present in terms of an order of magnitude (e.g., 10's, 100's, 1000's)

Anostracans:
(note reproductive status) None

Notostraeans:
(note reproductive status) None

Species Observations (Optional):

| | | | Insects: (adult or larvae) | | |
|---|---|---|---|---|---|
| Cladocerans: | (yes) | no | Anisoptera: | yes | no |
| Conchostracans: | yes | no | Zygoptera: | yes | no |
| Copepods: | yes | no | Hydrophilidae: | yes | no |
| Ostracods | (yes) | no | Dytiscidae: | yes | no |
| Fish | yes | no | Corixidae: | yes | no |
| Frogs | (yes) | no | Notonectidae: | yes | no |
| Salamanders | yes | no | Belostomatidae: | yes | no |
| Waterfowl | yes | no | Other (specify) | | |
| Other (specify) | Toad | | | | |

Voucher Specimens

Specimens shall be preserved according to the standards of the institution in which they will be accessioned.

| Species | # Individuals | Accession/Catalog # | Pool # |
|---|---|---|---|
| N/A | | | |

3/9/15

23-4

**U.S. Fish and Wildlife Service Vernal Pool Data Sheet**
**Wet Season Survey**

Note: Please fill out the required information completely for each site visit.

This form is being submitted to serve as part of the 90-day report: ___ no ✓ yes

Required color slides and/or photographs for the project site are included: ___ no ✓ yes

Date: 3/9/15 Time: 1342 County: SD Quad: S.C.

Collector(s): R. Stolpe / M. Tn Permit #: TE835495

Site/Project Name: TL 695 Pool #: 34-2(234)

Township: N/A Range: N/A Section: N/A 33.38 at. 117.55 long.

Temperature: Water: — °C Air: 19.2 °C

Pool Depth:
at time of sampling: 50 cm
estimated maximum: — cm

Surface Area:
at time of sampling: ___ m x ___ m
estimated maximum: — m x — m

Habitat Condition: (circle where appropriate)

- undisturbed disturbed: (tire tracks) garbage discing/plowing
- ungrazed grazed: cattle horses sheep other___ light moderate heavy
- land use of habitat: Alpha 2 T.A.

(Optional) Water Chemistry Data

Alkalinity (total):___ppm or mg/l. Conductivity:___uMHO

Dissolved $NH_4$:___ppt or ppm Dissolved Oxygen:___ppm or mg/l

pH:___ Turbidity: (secchi disc depth)___cm or: clear to bottom ___

Salinity :___ppt or ppm Total Dissolved Solids (TDS):___ppm

Notes:



**U.S. Fish and Wildlife Service Vernal Pool Data Sheet**
**Wet Season Survey**

Note: Please fill out the required information completely for each site visit.

Species Observations: state none or estimate # of individuals present in terms of an order of magnitude (e.g., 10's, 100's, 1000's)

Anostracans:
(note reproductive status) None

Notostracans:
(note reproductive status) None

Species Observations (Optional) :

| | | | | | |
|---|---|---|---|---|---|
| Cladocerans: | (yes) | no | Insects: (adult or larvae) | | |
| Conchostracans: | yes | no | Anisoptera: | yes | no |
| Copepods: | yes | no | Zygoptera: | yes | no |
| Ostracods | yes | no | Hydrophilidae: | yes | no |
| Fish | yes | no | Dytiscidae: | yes | no |
| Frogs | (yes) | no | Corixidae: | yes | no |
| Salamanders | yes | no | Notonectidae: | yes | no |
| Waterfowl | yes | no | Belostomatidae: | yes | no |
| Other (specify) | Toad | | Other (specify) | | |

Voucher Specimens

Specimens shall be preserved according to the standards of the institution in which they will be accessioned.

| Species | # Individuals | Accession/Catalog # | Pool # |
|---|---|---|---|

3/13/15

23-4

**U.S. Fish and Wildlife Service Vernal Pool Data Sheet**
**Wet Season Survey**

Note: Please fill out the required information completely for each site visit.

This form is being submitted to serve as part of the 90-day report: ____ no ✓ yes

Required color slides and/or photographs for the project site are included: ____ no ✓ yes

Date: 3/13/15 Time: 1040 County: SD Quad: S.C.

Collector(s): R. Stolpe / M. Tu Permit #: TE8355495

Site/Project Name: TL695 Pool #: 34-2 (23-4)

Township: N/A Range: N/A Section: N/A 33.38 lat. 117.55 long.

Temperature: Water: — °C Air: 28.3 °C

Pool Depth:
at time of sampling: 45 cm
estimated maximum: — cm

Surface Area:
at time of sampling: ____ m x ____ m
estimated maximum: — m x — m

Habitat Condition: (circle where appropriate)

- undisturbed disturbed: (tire tracks) garbage discing/plowing
- ungrazed grazed: cattle horses sheep other____ light moderate heavy
- land use of habitat: Alpha Two T.A.

(Optional) Water Chemistry Data

Alkalinity (total):____ppm or mg/l Conductivity:____uMHO

Dissolved $NH_4$:____ppt or ppm Dissolved Oxygen:____ppm or mg/l

pH:____ Turbidity: (secchi disc depth)____cm or: clear to bottom ____

Salinity:____ppt or ppm Total Dissolved Solids (TDS):____ppm

Notes:



**U.S. Fish and Wildlife Service Vernal Pool Data Sheet**
**Wet Season Survey**

Note: Please fill out the required information completely for each site visit.

Species Observations: state none or estimate # of individuals present in terms of an order of magnitude (e.g., 10's, 100's, 1000's)

Anostracans:
(note reproductive status) None

Notostracans:
(note reproductive status) None

Species Observations (Optional):

| | | | | | |
|---|---|---|---|---|---|
| Cladocerans: | (yes) | no | Insects: (adult or larvae) | | |
| Conchostracans: | yes | no | Anisoptera: | yes | no |
| Copepods: | yes | no | Zygoptera: | yes | no |
| Ostracods | yes | no | Hydrophilidae: | yes | no |
| Fish | yes | no | Dytiscidae: | yes | no |
| Frogs | yes | no | Corixidae: | yes | no |
| Salamanders | yes | no | Notonectidae: | yes | no |
| Waterfowl | yes | no | Belostomatidae: | yes | no |
| Other (specify)____ | | | Other (specify)____ | | |

Voucher Specimens

Specimens shall be preserved according to the standards of the institution in which they will be accessioned.

| Species | # Individuals | Accession/Catalog # | Pool # |
|---|---|---|---|

3/20/15

23-4

**U.S. Fish and Wildlife Service Vernal Pool Data Sheet**
**Wet Season Survey**

Note: Please fill out the required information completely for each site visit.

This form is being submitted to serve as part of the 90-day report: ___ no ✓ yes

Required color slides and/or photographs for the project site are included: ✓ no ___ yes

Date: 3/20/15 Time: 1345 County: SD Quad: S.C.

Collector(s): R. Stolpe / M. Tu Permit #: TE835595

Site/Project Name: TL 695 Pool #: 34-2(23-4)

Township: N/A Range: N/A Section: N/A 3338 at. 717.55 long.

Temperature: Water: — °C Air: 23.2 °C

Pool Depth:
at time of sampling: 40 cm
estimated maximum: — cm

Surface Area:
at time of sampling: ___ m x ___ m
estimated maximum: — m x — m

Habitat Condition: (circle where appropriate)

- undisturbed - disturbed: (tire tracks) garbage discing/plowing

- ungrazed grazed: cattle horses sheep other___
light moderate heavy

- land use of habitat: Alpha Two T.A.

(Optional) Water Chemistry Data

Alkalinity (total):___ppm or mg/l Conductivity:___uMHO

Dissolved $NH_4$:___ppt or ppm Dissolved Oxygen:___ppm or mg/l

pH:___ Turbidity: (secchi disc depth)___cm or: clear to bottom ___

Salinity :___ppt or ppm Total Dissolved Solids (TDS):___ppm

Notes:



**U.S. Fish and Wildlife Service Vernal Pool Data Sheet**
**Wet Season Survey**

Note: Please fill out the required information completely for each site visit.

Species Observations: state none or estimate # of individuals present in terms of an order of magnitude (e.g., 10's, 100's, 1000's)

Anostracans:
(note reproductive status) None

Notostracans:
(note reproductive status) None

Species Observations (Optional) :

| | | | | | |
|---|---|---|---|---|---|
| Cladocerans: | yes | no | Insects: (adult or larvae) | | |
| Conchostracans: | yes | no | Anisoptera: | yes | no |
| Copepods: | yes | no | Zygoptera: | yes | no |
| Ostracods | yes | no | Hydrophilidae: | yes | no |
| Fish | yes | no | Dytiscidae: | yes | no |
| Frogs | yes | no | Corixidae: | yes | no |
| Salamanders | yes | no | Notonectidae: | yes | no |
| Waterfowl | yes | no | Belostomatidae: | yes | no |
| Other (specify) ___ | | | Other (specify) ___ | | |

Voucher Specimens

Specimens shall be preserved according to the standards of the institution in which they will be accessioned.

| Species | # Individuals | Accession/Catalog # | Pool # |
|---|---|---|---|

3/26/15

234

**U.S. Fish and Wildlife Service Vernal Pool Data Sheet**
**Wet Season Survey**

Note: Please fill out the required information completely for each site visit.

This form is being submitted to serve as part of the 90-day report: ___ no ✓ yes

Required color slides and/or photographs for the project site are included: ___ no ✓ yes

Date: 3/26/15 Time: 1205 County: SD Quad: S.C.

Collector(s): R. Stolpe Permit #: TE835595

Site/Project Name: TL695 Pool #: 342(23-4)

Township: N/A Range: N/A Section: N/A 33.38 lat. 117.55 long.

Temperature: Water: — °C Air: 31.6 °C

Pool Depth:
at time of sampling: 30 cm
estimated maximum: — cm

Surface Area:
at time of sampling: ___ m x ___ m
estimated maximum: — m x — m

Habitat Condition: (circle where appropriate)

- undisturbed disturbed: (tire tracks) garbage discing/plowing
- ungrazed grazed: cattle horses sheep other___
light moderate heavy
- land use of habitat: Alpha 2 T.A.

(Optional) Water Chemistry Data

Alkalinity (total):___ppm or mg/l Conductivity:___uMHO

Dissolved $NH_4$:___ppt or ppm Dissolved Oxygen:___ppm or mg/l

pH:___ Turbidity: (secchi disc depth)___cm or: clear to bottom ___

Salinity :___ppt or ppm Total Dissolved Solids (TDS):___ppm

Notes:

1

**U.S. Fish and Wildlife Service Vernal Pool Data Sheet**
**Wet Season Survey**

Note: Please fill out the required information completely for each site visit.

Species Observations: state none or estimate # of individuals present in terms of an order of magnitude (e.g., 10's, 100's, 1000's)

Anostracans:
(note reproductive status) None

Notostracans:
(note reproductive status) None

Species Observations (Optional) :

| | | | Insects: (adult or larvae) | | |
|---|---|---|---|---|---|
| Cladocerans: | (yes) | no | Anisoptera: | yes | no |
| Conchostracans: | yes | no | Zygoptera: | yes | no |
| Copepods: | yes | no | Hydrophilidae: | yes | no |
| Ostracods | yes | no | Dytiscidae: | yes | no |
| Fish | yes | no | Corixidae: | yes | no |
| Frogs | (yes) | no | Notonectidae: | yes | no |
| Salamanders | yes | no | Belostomatidae: | yes | no |
| Waterfowl | yes | no | Other (specify) | | |
| Other (specify) | Toad | | | | |

Voucher Specimens

Specimens shall be preserved according to the standards of the institution in which they will be accessioned.

| Species | # Individuals | Accession/Catalog # | Pool # |
|---|---|---|---|

4/2/15

23-4

**U.S. Fish and Wildlife Service Vernal Pool Data Sheet**
**Wet Season Survey**

Note: Please fill out the required information completely for each site visit.

This form is being submitted to serve as part of the 90-day report: ___ no ✓ yes

Required color slides and/or photographs for the project site are included: ___ no ✓ yes

Date: 4/2/15 Time: 1409 County: SD Quad: S.C.

Collector(s): R. Stolpe Permit #: TE8355495

Site/Project Name: TL695 Pool #: 34-2(23-4)

Township: N/A Range: N/A Section: N/A 33.38 lat. 717.55 long.

Temperature: Water: — °C Air: 21.1 °C

Pool Depth:
at time of sampling: 22 cm
estimated maximum: — cm

Surface Area:
at time of sampling: ____ m x ____ m
estimated maximum: — m x — m

Habitat Condition: (circle where appropriate)

- undisturbed disturbed: (tire tracks) garbage discing/plowing
- ungrazed grazed: cattle horses sheep other____ light moderate heavy
- land use of habitat: Alpha 2 T.A.

(Optional) Water Chemistry Data

Alkalinity (total): ____ ppm or mg/l Conductivity: ____ uMHO

Dissolved $NH_4$: ____ ppt or ppm Dissolved Oxygen: ____ ppm or mg/l

pH: ____ Turbidity: (secchi disc depth) ____ cm or: clear to bottom ____

Salinity: ____ ppt or ppm Total Dissolved Solids (TDS): ____ ppm

Notes:



**U.S. Fish and Wildlife Service Vernal Pool Data Sheet**
**Wet Season Survey**

Note: Please fill out the required information completely for each site visit.

Species Observations: state none or estimate # of individuals present in terms of an order of magnitude (e.g., 10's, 100's, 1000's)

Anostracans:
(note reproductive status) None

Notostracans:
(note reproductive status) None

Species Observations (Optional):

| | | | Insects: (adult or larvae) | | |
|---|---|---|---|---|---|
| Cladocerans: | yes | no | Anisoptera: | yes | no |
| Conchostracans: | yes | no | Zygoptera: | yes | no |
| Copepods: | yes | no | Hydrophilidae: | yes | no |
| Ostracods | yes | no | Dytiscidae: | yes | no |
| Fish | yes | no | Corixidae: | yes | no |
| Frogs | (yes) | no | Notonectidae: | yes | no |
| Salamanders | yes | no | Belostomatidae: | yes | no |
| Waterfowl | yes | no | Other (specify) | | |
| Other (specify) Toads | | | | | |

Voucher Specimens

Specimens shall be preserved according to the standards of the institution in which they will be accessioned.

| Species | # Individuals | Accession/Catalog # | Pool # |
|---|---|---|---|

4/6/15

23-4

**U.S. Fish and Wildlife Service Vernal Pool Data Sheet**
**Wet Season Survey**

Note: Please fill out the required information completely for each site visit.

This form is being submitted to serve as part of the 90-day report: ___ no ✓ yes

Required color slides and/or photographs for the project site are included: ___ no ✓ yes

Date: 4/6/15 Time: 1347 County: SD Quad: S.C.

Collector(s): R. Stolpe Permit #: TE835595

Site/Project Name: TL695 Pool #: 31-2(23-4)

Township: N/A Range: N/A Section: N/A 3338 lat. 717.55 long.

Temperature: Water: — °C Air: 18.2 °C

Pool Depth:
at time of sampling: 15 cm
estimated maximum: — cm

Surface Area:
at time of sampling: ___ m x ___ m
estimated maximum: — m x — m

Habitat Condition: (circle where appropriate)

- undisturbed disturbed: (tire tracks) garbage discing/plowing
- ungrazed grazed: cattle horses sheep other ___
  light moderate heavy
- land use of habitat: Alpha Two T.A.

(Optional) Water Chemistry Data

Alkalinity (total): ___ ppm or mg/l Conductivity: ___ uMHO

Dissolved $NH_4$: ___ ppt or ppm Dissolved Oxygen: ___ ppm or mg/l

pH: ___ Turbidity: (secchi disc depth) ___ cm or: clear to bottom ___

Salinity: ___ ppt or ppm Total Dissolved Solids (TDS): ___ ppm

Notes:



**U.S. Fish and Wildlife Service Vernal Pool Data Sheet**
**Wet Season Survey**

Note: Please fill out the required information completely for each site visit.

Species Observations: state none or estimate # of individuals present in terms of an order of magnitude (e.g., 10's, 100's, 1000's)

Anostracans:
(note reproductive status) None

Notostracans:
(note reproductive status) None

Species Observations (Optional):

| | | | Insects: (adult or larvae) | | |
|---|---|---|---|---|---|
| Cladocerans: | (yes) | no | Anisoptera: | yes | no |
| Conchostracans: | yes | no | Zygoptera: | yes | no |
| Copepods: | yes | no | Hydrophilidae: | yes | no |
| Ostracods | yes | no | Dytiscidae: | yes | no |
| Fish | yes | no | Corixidae: | yes | no |
| Frogs | yes | no | Notonectidae: | yes | no |
| Salamanders | yes | no | Belostomatidae: | yes | no |
| Waterfowl | yes | no | Other (specify) ___ | | |
| Other (specify) ___ | | | | | |

Voucher Specimens

Specimens shall be preserved according to the standards of the institution in which they will be accessioned.

| Species | # Individuals | Accession/Catalog # | Pool # |
|---|---|---|---|

4/21/15

23-4

**U.S. Fish and Wildlife Service Vernal Pool Data Sheet**
**Wet Season Survey**

Note: Please fill out the required information completely for each site visit.

This form is being submitted to serve as part of the 90-day report: ____ no ✓ yes

Required color slides and/or photographs for the project site are included: ____ no ✓ yes

Date: 4/21/15 Time: 1055 County: SD Quad: S.C.

Collector(s): R. Stolpe Permit #: TE835495

Site/Project Name: TL 695 Pool #: 34-2(23-4)

Township: N/A Range: N/A Section: N/A 33.38 lat. 117.55 long.

Temperature: Water: N/A °C Air: 17.2 °C

Pool Depth:
at time of sampling: Ø cm
estimated maximum: — cm

Surface Area:
at time of sampling: Ø m x Ø m
estimated maximum: — m x — m

Habitat Condition: (circle where appropriate)

- undisturbed disturbed: (tire tracks) garbage discing/plowing
- ungrazed grazed: cattle horses sheep other_____
  light moderate heavy
- land use of habitat: Alpha 2 T.A.

(Optional) Water Chemistry Data

Alkalinity (total):_____ppm or mg/l Conductivity:_____uMHO

Dissolved NH4:_____ppt or ppm Dissolved Oxygen:_____ppm or mg/l

pH:_____ Turbidity: (secchi disc depth)_____cm or: clear to bottom _____

Salinity:_____ppt or ppm Total Dissolved Solids (TDS):_____ppm

Notes: Dry

1

**U.S. Fish and Wildlife Service Vernal Pool Data Sheet**
**Wet Season Survey**

Note: Please fill out the required information completely for each site visit.

Species Observations: state none or estimate # of individuals present in terms of an order of magnitude (e.g., 10's, 100's, 1000's)

Anostracans:
(note reproductive status) None

Notostracans:
(note reproductive status) None

Species Observations (Optional):

| | | | | | |
|---|---|---|---|---|---|
| Cladocerans: | (yes) ✓dried | no | Insects: (adult or larvae) | | |
| Conchostracans: | yes | no | Anisoptera: | yes | no |
| Copepods: | yes | no | Zygoptera: | yes | no |
| Ostracods | yes | no | Hydrophilidae: | yes | no |
| Fish | yes | no | Dytiscidae: | yes | no |
| Frogs | (yes) | no | Corixidae: | yes | no |
| Salamanders | yes | no | Notonectidae: | yes | no |
| Waterfowl | yes | no | Belostomatidae: | yes | no |
| Other (specify) _____ | | | Other (specify) _____ | | |

Voucher Specimens

Specimens shall be preserved according to the standards of the institution in which they will be accessioned.

| Species | # Individuals | Accession/Catalog # | Pool # |
|---|---|---|---|

5/20/15

23-4

**U.S. Fish and Wildlife Service Vernal Pool Data Sheet**
**Wet Season Survey**

Note: Please fill out the required information completely for each site visit.

This form is being submitted to serve as part of the 90-day report: ____ no ____ yes

Required color slides and/or photographs for the project site are included: ____ no ____ yes

Date: 5/20/15 Time: 1313 County: _____ Quad: _____

Collector(s): R. Stolpe Permit #: TE8355495

Site/Project Name: TL695 Pool #: 23-4

Township: _____ Range: _____ Section: _____ _____lat._____long.

Temperature: Water: N/A °C Air: 20 °C

Pool Depth:
at time of sampling: Ø cm
estimated maximum: _____cm

Surface Area:
at time of sampling: Ø m x Ø m
estimated maximum: _____m x _____m

Habitat Condition: (circle where appropriate)

- undisturbed disturbed: tire tracks garbage discing/plowing
- ungrazed grazed: cattle horses sheep other_____
  light moderate heavy
- land use of habitat:

(Optional) Water Chemistry Data

Alkalinity (total):_____ppm or mg/l Conductivity:_____uMHO

Dissolved $NH_4$:_____ppt or ppm Dissolved Oxygen:_____ppm or mg/l

pH:_____ Turbidity: (secchi disc depth)_____cm or: clear to bottom _____

Salinity :_____ppt or ppm Total Dissolved Solids (TDS):_____ppm

Notes: Dry



**U.S. Fish and Wildlife Service Vernal Pool Data Sheet**
**Wet Season Survey**

Note: Please fill out the required information completely for each site visit.

Species Observations: state none or estimate # of individuals present in terms of an order of magnitude (e.g., 10's, 100's, 1000's)

Anostracans:
(note reproductive status)

Notostracans:
(note reproductive status)

Species Observations (Optional) :

| | | | Insects: (adult or larvae) | | |
|---|---|---|---|---|---|
| Cladocerans: | yes | no | Anisoptera: | yes | no |
| Conchostracans: | yes | no | Zygoptera: | yes | no |
| Copepods: | yes | no | Hydrophilidae: | yes | no |
| Ostracods | yes | no | Dytiscidae: | yes | no |
| Fish | yes | no | Corixidae: | yes | no |
| Frogs | yes | no | Notonectidae: | yes | no |
| Salamanders | yes | no | Belostomatidae: | yes | no |
| Waterfowl | yes | no | | | |
| Other (specify)_____ | | | Other (specify)_____ | | |

Voucher Specimens

Specimens shall be preserved according to the standards of the institution in which they will be accessioned.

| Species | # Individuals | Accession/Catalog # | Pool # |
|---|---|---|---|

7/21/15

23-4

**U.S. Fish and Wildlife Service Vernal Pool Data Sheet**
**Wet Season Survey**

Note: Please fill out the required information completely for each site visit.

This form is being submitted to serve as part of the 90-day report: ___ no ✓ yes

Required color slides and/or photographs for the project site are included: ___ no ✓ yes

Date: 7/21/15 Time: 1422 County: SD Quad: S.C.

Collector(s): R. Stolpe / J. Asmus Permit #: TE-835549-5/none

Site/Project Name: TL695 Pool #: 23-4

Township: N/A Range: N/A Section: N/A 33.38 lat. -117.55 long.

Temperature: Water: — °C Air: 25ish °C

Pool Depth:
at time of sampling: Ø cm
estimated maximum: — cm

Surface Area:
at time of sampling: Ø m x Ø m
estimated maximum: — m x — m

Habitat Condition: (circle where appropriate)

- undisturbed disturbed: (tire tracks) garbage discing/plowing
- ungrazed grazed: cattle horses sheep other_____
  light moderate heavy
- land use of habitat: Alpha Two training area

(Optional) Water Chemistry Data

Alkalinity (total):_____ppm or mg/l Conductivity:_____uMHO

Dissolved $NH_4$:_____ppt or ppm Dissolved Oxygen:_____ppm or mg/l

pH:_____ Turbidity: (secchi disc depth)_____cm or: clear to bottom ____

Salinity:_____ppt or ppm Total Dissolved Solids (TDS):_____ppm

Notes: Dry



**U.S. Fish and Wildlife Service Vernal Pool Data Sheet**
**Wet Season Survey**

Note: Please fill out the required information completely for each site visit.

Species Observations: state none or estimate # of individuals present in terms of an order of magnitude (e.g., 10's, 100's, 1000's)

Anostracans:
(note reproductive status) None

Notostracans:
(note reproductive status) None

Species Observations (Optional):

| | | | Insects: (adult or larvae) | | |
|---|---|---|---|---|---|
| Cladocerans: | yes | no | | | |
| Conchostracans: | yes | no | Anisoptera: | yes | no |
| Copepods: | yes | no | Zygoptera: | yes | no |
| Ostracods | yes | no | Hydrophilidae: | yes | no |
| Fish | yes | no | Dytiscidae: | yes | no |
| Frogs | yes | no | Corixidae: | yes | no |
| Salamanders | yes | no | Notonectidae: | yes | no |
| Waterfowl | yes | no | Belostomatidae: | yes | no |
| Other (specify)_____ | | | Other (specify)_____ | | |

Voucher Specimens

Specimens shall be preserved according to the standards of the institution in which they will be accessioned.

| Species | # Individuals | Accession/Catalog # | Pool # |
|---|---|---|---|
| | | N/A | |

2/3/15

24-1

**U.S. Fish and Wildlife Service Vernal Pool Data Sheet**
**Wet Season Survey**

Note: Please fill out the required information completely for each site visit.

This form is being submitted to serve as part of the 90-day report: ✓ no ___ yes

Required color slides and/or photographs for the project site are included: ___ no ✓ yes

Date: 2/3/15 Time: 1355 County: SD Quad: S.C.

Collector(s): R. Stolpe / M. Tu Permit #: TE8355495

Site/Project Name: TL 695 Pool #: 45-1(24-1)

Township: N/A Range: N/A Section: N/A 3337.717-55 lat. long.

Temperature: Water: — °C Air: 21.1 °C

Pool Depth:
at time of sampling: 15 cm
estimated maximum: — cm

Surface Area:
at time of sampling: 0 m x 0 m
estimated maximum: — m x — m

Habitat Condition: (circle where appropriate)

- undisturbed (disturbed:) tire tracks garbage discing/plowing
- ungrazed grazed: cattle horses sheep other_____
  light moderate heavy
- land use of habitat: Alpha 2 T.A.

(Optional) Water Chemistry Data

Alkalinity (total):_____ppm or mg/l Conductivity:_____uMHO

Dissolved $NH_4$:_____ppt or ppm Dissolved Oxygen:_____ppm or mg/l

pH:_____ Turbidity: (secchi disc depth)_____cm or: clear to bottom ____

Salinity :_____ppt or ppm Total Dissolved Solids (TDS):_____ppm

Notes:



**U.S. Fish and Wildlife Service Vernal Pool Data Sheet**
**Wet Season Survey**

Note: Please fill out the required information completely for each site visit.

Species Observations: state none or estimate # of individuals present in terms of an order of magnitude (e.g., 10's, 100's, 1000's)

Anostracans:
(note reproductive status) None

Notostracans:
(note reproductive status) None

Species Observations (Optional):

| | | | | | |
|---|---|---|---|---|---|
| Cladocerans: | (yes) | no | Insects: (adult or larvae) | | |
| Conchostracans: | yes | no | Anisoptera: | yes | no |
| Copepods: | yes | no | Zygoptera: | yes | no |
| Ostracods | (yes) | no | Hydrophilidae: | yes | no |
| Fish | yes | no | Dytiscidae: | yes | no |
| Frogs | yes | no | Corixidae: | yes | no |
| Salamanders | yes | no | Notonectidae: | yes | no |
| Waterfowl | yes | no | Belostomatidae: | yes | no |
| Other (specify)_____ | | | Other (specify)_____ | | |

Voucher Specimens

Specimens shall be preserved according to the standards of the institution in which they will be accessioned.

| Species | # Individuals | Accession/Catalog # | Pool # |
|---|---|---|---|

3/6/15

24-1

**U.S. Fish and Wildlife Service Vernal Pool Data Sheet**
**Wet Season Survey**

Note: Please fill out the required information completely for each site visit.

This form is being submitted to serve as part of the 90-day report: ____ no ✓ yes

Required color slides and/or photographs for the project site are included: ____ no ✓ yes

Date: 3/6/15 Time: 1050 County: SD Quad: S.C.

Collector(s): R. Stolpe/J. Asmus Permit #: TE-825549-5/none

Site/Project Name: TL695 Pool #: 45-1(24-1)

Township: N/A Range: N/A Section: N/A 33.37 lat. 117.55 long.

Temperature: Water: — °C Air: 26.6 °C

Pool Depth:
at time of sampling: 11 cm
estimated maximum: — cm

Surface Area:
at time of sampling: ____ m x ____ m
estimated maximum: — m x — m

Habitat Condition: (circle where appropriate)

- undisturbed (disturbed:) tire tracks garbage discing/plowing
- ungrazed grazed: cattle horses sheep other____
  light moderate heavy
- land use of habitat: Alpha Two T.A.

(Optional) Water Chemistry Data

Alkalinity (total):____ppm or mg/l Conductivity:____uMHO

Dissolved $NH_4$:____ppt or ppm Dissolved Oxygen:____ppm or mg/l

pH:____ Turbidity: (secchi disc depth)____cm or: clear to bottom ____

Salinity:____ppt or ppm Total Dissolved Solids (TDS):____ppm

Notes:



**U.S. Fish and Wildlife Service Vernal Pool Data Sheet**
**Wet Season Survey**

Note: Please fill out the required information completely for each site visit.

Species Observations: state none or estimate # of individuals present in terms of an order of magnitude (e.g., 10's, 100's, 1000's)

Anostracans:
(note reproductive status) None

Notostracans:
(note reproductive status) None

Species Observations (Optional):

| | | | | | |
|---|---|---|---|---|---|
| Cladocerans: | yes | no | Insects: (adult or larvae) | | |
| Conchostracans: | yes | no | Anisoptera: | yes | no |
| Copepods: | yes | no | Zygoptera: | yes | no |
| Ostracods | (yes) | no | Hydrophilidae: | yes | no |
| Fish | yes | no | Dytiscidae: | yes | no |
| Frogs | yes | no | Corixidae: | yes | no |
| Salamanders | yes | no | Notonectidae: | yes | no |
| Waterfowl | yes | no | Belostomatidae: | yes | no |
| Other (specify)____ | | | Other (specify)____ | | |

Voucher Specimens

Specimens shall be preserved according to the standards of the institution in which they will be accessioned.

| Species | # Individuals | Accession/Catalog # | Pool # |
|---|---|---|---|
| | N/A | | |

3/9/15

24-1

**U.S. Fish and Wildlife Service Vernal Pool Data Sheet**
**Wet Season Survey**

Note: Please fill out the required information completely for each site visit.

This form is being submitted to serve as part of the 90-day report: ____ no ✓ yes

Required color slides and/or photographs for the project site are included: ____ no ✓ yes

Date: 3/9/15 Time: 1407 County: SD Quad: S.C.

Collector(s): R. Stolpe / M. Tu Permit #: TE8355495

Site/Project Name: TL 695 Pool #: 45-1(24-1)

Township: N/A Range: N/A Section: N/A 3337 lat 717.55 long.

Temperature: Water: — °C Air: 19.3 °C

Pool Depth:
at time of sampling: 8 cm
estimated maximum: — cm

Surface Area:
at time of sampling: ____ m x ____ m
estimated maximum: — m x — m

Habitat Condition: (circle where appropriate)

- undisturbed (disturbed:) tire tracks garbage discing/plowing
- ungrazed grazed: cattle horses sheep other____
  light moderate heavy
- land use of habitat: Alpha 2 T.A.

(Optional) Water Chemistry Data

Alkalinity (total):____ppm or mg/l Conductivity:____uMHO

Dissolved $NH_4$:____ppt or ppm Dissolved Oxygen:____ppm or mg/l

pH:____ Turbidity: (secchi disc depth)____cm or: clear to bottom ____

Salinity :____ppt or ppm Total Dissolved Solids (TDS):____ppm

Notes:



**U.S. Fish and Wildlife Service Vernal Pool Data Sheet**
**Wet Season Survey**

Note: Please fill out the required information completely for each site visit.

Species Observations: state none or estimate # of individuals present in terms of an order of magnitude (e.g., 10's, 100's, 1000's)

Anostracans:
(note reproductive status) None

Notostracans:
(note reproductive status) None

Species Observations (Optional) :

| | | | | | |
|---|---|---|---|---|---|
| Cladocerans: | yes | no | Insects: (adult or larvae) | | |
| Conchostracans: | yes | no | Anisoptera: | yes | no |
| Copepods: | yes | no | Zygoptera: | yes | no |
| Ostracods | yes | no | Hydrophilidae: | yes | no |
| Fish | yes | no | Dytiscidae: | yes | no |
| Frogs | yes | no | Corixidae: | yes | no |
| Salamanders | yes | no | Notonectidae: | yes | no |
| Waterfowl | yes | no | Belostomatidae: | yes | no |
| Other (specify)____ | | | Other (specify)____ | | |

Voucher Specimens

Specimens shall be preserved according to the standards of the institution in which they will be accessioned.

| Species | # Individuals | Accession/Catalog # | Pool # |
|---|---|---|---|

3/13/15

24-1

**U.S. Fish and Wildlife Service Vernal Pool Data Sheet**
**Wet Season Survey**

Note: Please fill out the required information completely for each site visit.

This form is being submitted to serve as part of the 90-day report: ____ no ✓ yes

Required color slides and/or photographs for the project site are included: ____ no ✓ yes

Date: 3/13/15 Time: 1128 County: SD Quad: S.C.

Collector(s): R. Stolpe/M. Tu Permit #: TE8355495

Site/Project Name: TL695 Pool #: 45-1(24-1)

Township: N/A Range: N/A *Section: N/A 33.37 lat. 117.55 long.

Temperature: Water: 30 °C Air: 30.5 °C

Pool Depth:
at time of sampling: 1 cm
estimated maximum: — cm

Surface Area:
at time of sampling: 0.3 m x 0.3 m
estimated maximum: — m x — m

Habitat Condition: (circle where appropriate)

- undisturbed (disturbed:) tire tracks garbage discing/plowing
- ungrazed grazed: cattle horses sheep other_____
  light moderate heavy
- land use of habitat: Alpha Two T.A.

(Optional) Water Chemistry Data

Alkalinity (total):_____ppm or mg/l Conductivity:_____uMHO

Dissolved $NH_4$:_____ppt or ppm Dissolved Oxygen:_____ppm or mg/l

pH:_____ Turbidity: (secchi disc depth)_____cm or: clear to bottom ____

Salinity:_____ppt or ppm Total Dissolved Solids (TDS):_____ppm

Notes: F.S. collected 1 M/1 F
B. lindahli

1

**U.S. Fish and Wildlife Service Vernal Pool Data Sheet**
**Wet Season Survey**

Note: Please fill out the required information completely for each site visit.

Species Observations: state none or estimate # of individuals present in terms of an order of magnitude (e.g., 10's, 100's, 1000's)

Anostracans:
(note reproductive status) 1s

Notostracans:
(note reproductive status) None

Species Observations (Optional):

| | | | Insects: (adult or larvae) | | |
|---|---|---|---|---|---|
| Cladocerans: | yes | no | Anisoptera: | yes | no |
| Conchostracans: | yes | no | Zygoptera: | yes | no |
| Copepods: | yes | no | Hydrophilidae: | yes | no |
| Ostracods | yes | no | Dytiscidae: | yes | no |
| Fish | yes | no | Corixidae: | yes | no |
| Frogs | yes | no | Notonectidae: | yes | no |
| Salamanders | yes | no | Belostomatidae: | yes | no |
| Waterfowl | yes | no | Other (specify) | | |
| Other (specify) | | | | | |

Voucher Specimens

Specimens shall be preserved according to the standards of the institution in which they will be accessioned.

| Species | # Individuals | Accession/Catalog # | Pool # |
|---|---|---|---|

3/20/15

24-1

**U.S. Fish and Wildlife Service Vernal Pool Data Sheet**
**Wet Season Survey**

Note: Please fill out the required information completely for each site visit.

This form is being submitted to serve as part of the 90-day report: ___ no ✓ yes

Required color slides and/or photographs for the project site are included: ✓ no ___ yes

Date: 3/20/15 Time: 1415 County: SD Quad: S.C.

Collector(s): R. Stolpe/M. Tu Permit #: TE835549S

Site/Project Name: TL695 Pool #: 45-1(24-1)

Township: N/A Range: N/A Section: N/A 33.37 lat. 117.55 long.

Temperature: Water: N/A °C Air: 23.3 °C

Pool Depth:
at time of sampling: Ø cm
estimated maximum: — cm

Surface Area:
at time of sampling: Ø m x Ø m
estimated maximum: — m x — m

Habitat Condition: (circle where appropriate)

- undisturbed (disturbed:) tire tracks garbage discing/plowing
- ungrazed grazed: cattle horses sheep other_____ light moderate heavy
- land use of habitat: Alpha Two T.A.

(Optional) Water Chemistry Data

Alkalinity (total):_____ppm or mg/l Conductivity:_____uMHO

Dissolved $NH_4$:_____ppt or ppm Dissolved Oxygen:_____ppm or mg/l

pH:_____ Turbidity: (secchi disc depth)_____cm or: clear to bottom ____

Salinity :_____ppt or ppm Total Dissolved Solids (TDS):_____ppm

Notes:



**U.S. Fish and Wildlife Service Vernal Pool Data Sheet**
**Wet Season Survey**

Note: Please fill out the required information completely for each site visit.

Species Observations: state none or estimate # of individuals present in terms of an order of magnitude (e.g., 10's, 100's, 1000's)

Anostracans:
(note reproductive status) None

Notostracans:
(note reproductive status) None

Species Observations (Optional):

| | | | Insects: (adult or larvae) | | |
|---|---|---|---|---|---|
| Cladocerans: | yes | no | Anisoptera: | yes | no |
| Conchostracans: | yes | no | Zygoptera: | yes | no |
| Copepods: | yes | no | Hydrophilidae: | yes | no |
| Ostracods | yes | no | Dytiscidae: | yes | no |
| Fish | yes | no | Corixidae: | yes | no |
| Frogs | yes | no | Notonectidae: | yes | no |
| Salamanders | yes | no | Belostomatidae: | yes | no |
| Waterfowl | yes | no | Other (specify) | | |
| Other (specify) | | | | | |

Voucher Specimens

Specimens shall be preserved according to the standards of the institution in which they will be accessioned.

| Species | # Individuals | Accession/Catalog # | Pool # |
|---|---|---|---|
| N/A | | | |

3/26/15

24-1

**U.S. Fish and Wildlife Service Vernal Pool Data Sheet**
**Wet Season Survey**

Note: Please fill out the required information completely for each site visit.

This form is being submitted to serve as part of the 90-day report: ____ no ✓ yes

Required color slides and/or photographs for the project site are included: ✓ no ____ yes

Date: 3/26/15 Time: _____ County: SD Quad: S.C.

Collector(s): R. Stolpe Permit #: TE8355495

Site/Project Name: TL 695 Pool #: 45-1 (24-1)

Township: N/A Range: N/A Section: N/A 33.37 lat. 117.55 long.

Temperature: Water: N/A °C Air: _____ °C

Pool Depth:
at time of sampling: Ø cm
estimated maximum: — cm

Surface Area:
at time of sampling: Ø m x Ø m
estimated maximum: — m x — m

Habitat Condition: (circle where appropriate)

- undisturbed (disturbed) tire tracks garbage discing/plowing
- ungrazed grazed: cattle horses sheep other_____
  light moderate heavy
- land use of habitat: Alpha 2 T.A.

(Optional) Water Chemistry Data

Alkalinity (total):_____ ppm or mg/l Conductivity:_____uMHO

Dissolved $NH_4$:_____ppt or ppm Dissolved Oxygen:_____ppm or mg/l

pH:_____ Turbidity: (secchi disc depth)_____cm or: clear to bottom ____

Salinity :_____ppt or ppm Total Dissolved Solids (TDS):_____ppm

Notes: Dry

1

**U.S. Fish and Wildlife Service Vernal Pool Data Sheet**
**Wet Season Survey**

Note: Please fill out the required information completely for each site visit.

Species Observations: state none or estimate # of individuals present in terms of an order of magnitude (e.g., 10's, 100's, 1000's)

Anostracans:
(note reproductive status) None

Notostracans:
(note reproductive status) None

Species Observations (Optional) :

| | | | | | |
|---|---|---|---|---|---|
| Cladocerans: | yes | no | Insects: (adult or larvae) | | |
| Conchostracans: | yes | no | Anisoptera: | yes | no |
| Copepods: | yes | no | Zygoptera: | yes | no |
| Ostracods | yes | no | Hydrophilidae: | yes | no |
| Fish | yes | no | Dytiscidae: | yes | no |
| Frogs | yes | no | Corixidae: | yes | no |
| Salamanders | yes | no | Notonectidae: | yes | no |
| Waterfowl | yes | no | Belostomatidae: | yes | no |
| Other (specify)_____ | | | Other (specify)_____ | | |

Voucher Specimens

Specimens shall be preserved according to the standards of the institution in which they will be accessioned.

| Species | # Individuals | Accession/Catalog # | Pool # |
|---|---|---|---|

4/2/15

24-1

**U.S. Fish and Wildlife Service Vernal Pool Data Sheet**
**Wet Season Survey**

Note: Please fill out the required information completely for each site visit.

This form is being submitted to serve as part of the 90-day report: ____ no __✓__ yes

Required color slides and/or photographs for the project site are included: __✓__ no ____ yes

Date: 4/2/15 Time: _____ County: SD Quad: S.C.

Collector(s): R. Stolpe Permit #: TE835549S

Site/Project Name: TL695 Pool #: 45-1(24-1)

Township: N/A Range: N/A Section: N/A 33.37 lat -117.55 long.

Temperature: Water: N/A °C Air: _____ °C

Pool Depth:
at time of sampling: 0 cm
estimated maximum: — cm

Surface Area:
at time of sampling: 0 m x 0 m
estimated maximum: — m x — m

Habitat Condition: (circle where appropriate)

- undisturbed (disturbed) tire tracks garbage discing/plowing
- ungrazed grazed: cattle horses sheep other_____
  light moderate heavy
- land use of habitat: Alpha 2 T.A.

(Optional) Water Chemistry Data

Alkalinity (total):_____ppm or mg/l Conductivity:_____uMHO

Dissolved $NH_4$:_____ppt or ppm Dissolved Oxygen:_____ppm or mg/l

pH:_____ Turbidity: (secchi disc depth)_____cm or: clear to bottom ____

Salinity:_____ppt or ppm Total Dissolved Solids (TDS):_____ppm

Notes: Dry



**U.S. Fish and Wildlife Service Vernal Pool Data Sheet**
**Wet Season Survey**

Note: Please fill out the required information completely for each site visit.

Species Observations: state none or estimate # of individuals present in terms of an order of magnitude (e.g., 10's, 100's, 1000's)

Anostracans:
(note reproductive status) None

Notostracans:
(note reproductive status) None

Species Observations (Optional):

| | | | | | |
|---|---|---|---|---|---|
| Cladocerans: | yes | no | Insects: (adult or larvae) | | |
| Conchostracans: | yes | no | Anisoptera: | yes | no |
| Copepods: | yes | no | Zygoptera: | yes | no |
| Ostracods | yes | no | Hydrophilidae: | yes | no |
| Fish | yes | no | Dytiscidae: | yes | no |
| Frogs | yes | no | Corixidae: | yes | no |
| Salamanders | yes | no | Notonectidae: | yes | no |
| Waterfowl | yes | no | Belostomatidae: | yes | no |
| Other (specify)_____ | | | Other (specify)_____ | | |

Voucher Specimens

Specimens shall be preserved according to the standards of the institution in which they will be accessioned.

| Species | # Individuals | Accession/Catalog # | Pool # |
|---|---|---|---|

2/3/15

33-1

**U.S. Fish and Wildlife Service Vernal Pool Data Sheet**
**Wet Season Survey**

Note: Please fill out the required information completely for each site visit.

This form is being submitted to serve as part of the 90-day report: ✓ no ___ yes

Required color slides and/or photographs for the project site are included: ___ no ✓ yes

Date: 2/3/15 Time: 1430 County: SD Quad: S.C.

Collector(s): R. Stolpe / M. Tu Permit #: TE8355495

Site/Project Name: TL695 Pool #: 43-3(33-1)

Township: N/A Range: N/A Section: N/A 33.38 lat. 117.56 long.

Temperature: Water: N/A °C Air: 21.1 °C

Pool Depth:
at time of sampling: 0 cm
estimated maximum: — cm

Surface Area:
at time of sampling: 0 m x 0 m
estimated maximum: — m x — m

Habitat Condition: (circle where appropriate)

- undisturbed disturbed: (tire tracks) (garbage) discing/plowing
- ungrazed grazed: cattle horses sheep other_____
  light moderate heavy
- land use of habitat: dirt road / Alpha 2 T.A.

(Optional) Water Chemistry Data

Alkalinity (total):_____ppm or mg/l Conductivity:_____uMHO

Dissolved $NH_4$:_____ppt or ppm Dissolved Oxygen:_____ppm or mg/l

pH:_____ Turbidity: (secchi disc depth)_____cm or: clear to bottom _____

Salinity:_____ppt or ppm Total Dissolved Solids (TDS):_____ppm

Notes: Dried biomass of tadpoles and possibly Triops.

1

**U.S. Fish and Wildlife Service Vernal Pool Data Sheet**
**Wet Season Survey**

Note: Please fill out the required information completely for each site visit.

Species Observations: state none or estimate # of individuals present in terms of an order of magnitude (e.g., 10's, 100's, 1000's)

Anostracans:
(note reproductive status) None

Notostracans:
(note reproductive status) None

Species Observations (Optional) :

| | | | Insects: (adult or larvae) | | |
|---|---|---|---|---|---|
| Cladocerans: | yes | no | Anisoptera: | yes | no |
| Conchostracans: | yes | no | Zygoptera: | yes | no |
| Copepods: | yes | no | Hydrophilidae: | yes | no |
| Ostracods | (yes) | no | Dytiscidae: | yes | no |
| Fish | yes | no | Corixidae: | yes | no |
| Frogs | (yes) | no | Notonectidae: | yes | no |
| Salamanders | yes | no | Belostomatidae: | yes | no |
| Waterfowl | yes | no | Other (specify) | | |
| Other (specify) Triops? | | | | | |

Voucher Specimens

Specimens shall be preserved according to the standards of the institution in which they will be accessioned.

| Species | # Individuals | Accession/Catalog # | Pool # |
|---|---|---|---|

3/6/15

33-1

**U.S. Fish and Wildlife Service Vernal Pool Data Sheet**
**Wet Season Survey**

Note: Please fill out the required information completely for each site visit.

This form is being submitted to serve as part of the 90-day report: ___ no ✓ yes

Required color slides and/or photographs for the project site are included: ___ no ✓ yes

Date: 3/6/15 Time: 0903 County: SD Quad: S.C.

Collector(s): R. Stolpe/J. Asmus Permit #: TE-835549-5/none

Site/Project Name: TL695 Pool #: 43-3(33-1)

Township: N/A Range: N/A Section: N/A 33.38 lat. 117.56 long.

Temperature: Water: — °C Air: 22-27 °C

Pool Depth:
at time of sampling: 16 cm
estimated maximum: — cm

Surface Area:
at time of sampling: ____ m x ____ m
estimated maximum: — m x — m

Habitat Condition: (circle where appropriate)

- undisturbed - disturbed: (tire tracks) (garbage) discing/plowing
- ungrazed - grazed: cattle horses sheep other____ light moderate heavy
- land use of habitat: dirt road/Alpha Two training area

(Optional) Water Chemistry Data

Alkalinity (total):____ppm or mg/l Conductivity:____uMHO

Dissolved $NH_4$:____ppt or ppm Dissolved Oxygen:____ppm or mg/l

pH:____ Turbidity: (secchi disc depth)____cm or: clear to bottom ____

Salinity :____ppt or ppm Total Dissolved Solids (TDS):____ppm

Notes:

1

**U.S. Fish and Wildlife Service Vernal Pool Data Sheet**
**Wet Season Survey**

Note: Please fill out the required information completely for each site visit.

Species Observations: state none or estimate # of individuals present in terms of an order of magnitude (e.g., 10's, 100's, 1000's)

Anostracans:
(note reproductive status) None

Notostracans:
(note reproductive status) None

Species Observations (Optional) :

| | | | | | |
|---|---|---|---|---|---|
| Cladocerans: | yes | no | Insects: (adult or larvae) | | |
| Conchostracans: | yes | no | Anisoptera: | yes | no |
| Copepods: | yes | no | Zygoptera: | yes | no |
| Ostracods | yes | no | Hydrophilidae: | yes | no |
| Fish | yes | no | Dytiscidae: | yes | no |
| Frogs | yes | no | Corixidae: | yes | no |
| Salamanders | yes | no | Notonectidae: | yes | no |
| Waterfowl | yes | no | Belostomatidae: | yes | no |
| Other (specify) ____ | | | Other (specify) ____ | | |

Voucher Specimens

Specimens shall be preserved according to the standards of the institution in which they will be accessioned.

| Species | # Individuals | Accession/Catalog # | Pool # |
|---|---|---|---|
| N/A | | | |

3/9/15

33-1

**U.S. Fish and Wildlife Service Vernal Pool Data Sheet**
**Wet Season Survey**

Note: Please fill out the required information completely for each site visit.

This form is being submitted to serve as part of the 90-day report: ____ no ✓ yes

Required color slides and/or photographs for the project site are included: ____ no ✓ yes

Date: 3/9/15 Time: 1253 County: SD Quad: S.C.

Collector(s): R. Stolpe / M. Tu Permit #: TE835495

Site/Project Name: TL695 Pool #: 43-3(33-1)

Township: N/A Range: N/A Section: N/A 33.38 lat. 117.56 long.

Temperature: Water: — °C Air: 18.8 °C

Pool Depth:
at time of sampling: 21 cm
estimated maximum: — cm

Surface Area:
at time of sampling: ____ m x ____ m
estimated maximum: — m x — m

Habitat Condition: (circle where appropriate)

- undisturbed disturbed: (tire tracks) (garbage) discing/plowing
- ungrazed grazed: cattle horses sheep other____
  light moderate heavy
- land use of habitat: dirt road / Alpha 2 T.A.

(Optional) Water Chemistry Data

Alkalinity (total): ____ ppm or mg/l Conductivity: ____ uMHO

Dissolved $NH_4$: ____ ppt or ppm Dissolved Oxygen: ____ ppm or mg/l

pH: ____ Turbidity: (secchi disc depth) ____ cm or clear to bottom ____

Salinity: ____ ppt or ppm Total Dissolved Solids (TDS): ____ ppm

Notes:
FS collected 2M/4F
B. lindahli

1

**U.S. Fish and Wildlife Service Vernal Pool Data Sheet**
**Wet Season Survey**

Note: Please fill out the required information completely for each site visit.

Species Observations: state none or estimate # of individuals present in terms of an order of magnitude (e.g., 10's, 100's, 1000's)

Anostracans:
(note reproductive status) 10,000s (submature)

Notostracans:
(note reproductive status) None

Species Observations (Optional):

| | | | Insects: (adult or larvae) | | |
|---|---|---|---|---|---|
| Cladocerans: | yes | no | Anisoptera: | yes | no |
| Conchostracans: | yes | no | Zygoptera: | yes | no |
| Copepods: | yes | no | Hydrophilidae: | yes | no |
| Ostracods | yes | no | Dytiscidae: | yes | no |
| Fish | yes | no | Corixidae: | yes | no |
| Frogs | yes | no | Notonectidae: | yes | no |
| Salamanders | yes | no | Belostomatidae: | yes | no |
| Waterfowl | yes | no | Other (specify) ____ | | |
| Other (specify) ____ | | | | | |

Voucher Specimens

Specimens shall be preserved according to the standards of the institution in which they will be accessioned.

| Species | # Individuals | Accession/Catalog # | Pool # |
|---|---|---|---|

3/13/15

33-1

**U.S. Fish and Wildlife Service Vernal Pool Data Sheet**
**Wet Season Survey**

Note: Please fill out the required information completely for each site visit.

This form is being submitted to serve as part of the 90-day report: ___ no ✓ yes

Required color slides and/or photographs for the project site are included: ___ no ✓ yes

Date: 3/13/15 Time: 0958 County: SD Quad: S.C.

Collector(s): R. Stolpe / M. Tu Permit #: TE835595

Site/Project Name: TL695 Pool #: 43-3(33-1)

Township: N/A Range: N/A Section: N/A 3338.117.56 lat. long.

Temperature: Water: — °C Air: 26.1 °C

Pool Depth:
at time of sampling: 17 cm
estimated maximum: — cm

Surface Area:
at time of sampling: ___ m x ___ m
estimated maximum: — m x — m

Habitat Condition: (circle where appropriate)

- undisturbed disturbed: (tire tracks) (garbage) discing/plowing
- ungrazed grazed: cattle horses sheep other___ light moderate heavy
- land use of habitat: dirt road / Alpha 2 T.A.

(Optional) Water Chemistry Data

Alkalinity (total): ___ ppm or mg/l Conductivity: ___ uMHO

Dissolved $NH_4$: ___ ppt or ppm Dissolved Oxygen: ___ ppm or mg/l

pH: ___ Turbidity: (secchi disc depth) ___ cm or: clear to bottom ___

Salinity: ___ ppt or ppm Total Dissolved Solids (TDS): ___ ppm

Notes:

FS collected 4M/3F

B. lindahli

1

**U.S. Fish and Wildlife Service Vernal Pool Data Sheet**
**Wet Season Survey**

Note: Please fill out the required information completely for each site visit.

Species Observations: state none or estimate # of individuals present in terms of an order of magnitude (e.g., 10's, 100's, 1000's)

Anostracans:
(note reproductive status) 1000s (mature)

Notostracans:
(note reproductive status) None

Species Observations (Optional):

| | | | Insects: (adult or larvae) | | |
|---|---|---|---|---|---|
| Cladocerans: | yes | no | Anisoptera: | yes | no |
| Conchostracans: | yes | no | Zygoptera: | yes | no |
| Copepods: | yes | no | Hydrophilidae: | yes | no |
| Ostracods | yes | no | Dytiscidae: | yes | no |
| Fish | yes | no | Corixidae: | yes | no |
| Frogs | yes | no | Notonectidae: | yes | no |
| Salamanders | yes | no | Belostomatidae: | yes | no |
| Waterfowl | yes | no | Other (specify) | | |
| Other (specify) | | | | | |

Voucher Specimens

Specimens shall be preserved according to the standards of the institution in which they will be accessioned.

| Species | # Individuals | Accession/Catalog # | Pool # |
|---|---|---|---|

3/20/15

33-1

**U.S. Fish and Wildlife Service Vernal Pool Data Sheet**
**Wet Season Survey**

Note: Please fill out the required information completely for each site visit.

This form is being submitted to serve as part of the 90-day report: ____ no ✓ yes

Required color slides and/or photographs for the project site are included: ____ no ✓ yes

Date: 3/20/15 Time: 1300 County: SD Quad: S.C.

Collector(s): R. Stolpe / M. Tu Permit #: TE8355495

Site/Project Name: TL695 Pool #: 43-3 (33-1)

Township: N/A Range: N/A Section: N/A 3338 lat. 717.56 long.

Temperature: Water: — °C Air: 22.7 °C

Pool Depth:
at time of sampling: 8 cm
estimated maximum: — cm

Surface Area:
at time of sampling: ____ m x ____ m
estimated maximum: — m x — m

Habitat Condition: (circle where appropriate)

- undisturbed disturbed: (tire tracks) (garbage) discing/plowing
- ungrazed grazed: cattle horses sheep other____
  light moderate heavy
- land use of habitat: dirt road / Alpha 2 T.A.

(Optional) Water Chemistry Data

Alkalinity (total): ____ ppm or mg/l Conductivity: ____ uMHO

Dissolved $NH_4$: ____ ppt or ppm Dissolved Oxygen: ____ ppm or mg/l

pH: ____ Turbidity: (secchi disc depth) ____ cm or: clear to bottom ____

Salinity: ____ ppt or ppm Total Dissolved Solids (TDS): ____ ppm

Notes:

FS collected 7M/1F
B. lindahli;

1

**U.S. Fish and Wildlife Service Vernal Pool Data Sheet**
**Wet Season Survey**

Note: Please fill out the required information completely for each site visit.

Species Observations: state none or estimate # of individuals present in terms of an order of magnitude (e.g., 10's, 100's, 1000's)

Anostracans:
(note reproductive status) 100s (mature)

Notostracans:
(note reproductive status) None

Species Observations (Optional):

| | | | | | |
|---|---|---|---|---|---|
| Cladocerans: | yes | no | Insects: (adult or larvae) | | |
| Conchostracans: | yes | no | Anisoptera: | yes | no |
| Copepods: | yes | no | Zygoptera: | yes | no |
| Ostracods | yes | no | Hydrophilidae: | yes | no |
| Fish | yes | no | Dytiscidae: | yes | no |
| Frogs | yes | no | Corixidae: | yes | no |
| Salamanders | yes | no | Notonectidae: | yes | no |
| Waterfowl | yes | no | Belostomatidae: | yes | no |
| Other (specify) ____ | | | Other (specify) ____ | | |

Voucher Specimens

Specimens shall be preserved according to the standards of the institution in which they will be accessioned.

| Species | # Individuals | Accession/Catalog # | Pool # |
|---|---|---|---|

3/26/15

33-1

**U.S. Fish and Wildlife Service Vernal Pool Data Sheet**
**Wet Season Survey**

Note: Please fill out the required information completely for each site visit.

This form is being submitted to serve as part of the 90-day report: ____ no ✓ yes

Required color slides and/or photographs for the project site are included: ____ no ✓ yes

Date: 3/26/15 Time: 1145 County: SD Quad: S.C.

Collector(s): R. Stolpe Permit #: TE835546

Site/Project Name: TL695 Pool #: ~~43-3~~(33-1)

Township: N/A Range: N/A Section: N/A 33.38 lat. 117.56 long.

Temperature: Water: — °C Air: 31.7 °C

Pool Depth:
at time of sampling: 6 cm
estimated maximum: — cm

Surface Area:
at time of sampling: ____ m x ____ m
estimated maximum: — m x — m

Habitat Condition: (circle where appropriate)

- undisturbed disturbed: (tire tracks) (garbage) discing/plowing
- ungrazed grazed: cattle horses sheep other____ light moderate heavy
- land use of habitat: dirt road / Alpha 2 T.A.

(Optional) Water Chemistry Data

Alkalinity (total): ____ ppm or mg/l Conductivity: ____ uMHO

Dissolved $NH_4$: ____ ppt or ppm Dissolved Oxygen: ____ ppm or mg/l

pH: ____ Turbidity: (secchi disc depth) ____ cm or: clear to bottom ____

Salinity: ____ ppt or ppm Total Dissolved Solids (TDS): ____ ppm

Notes: FS collected 1M/3F
B. lindahli



**U.S. Fish and Wildlife Service Vernal Pool Data Sheet**
**Wet Season Survey**

Note: Please fill out the required information completely for each site visit.

Species Observations: state none or estimate # of individuals present in terms of an order of magnitude (e.g., 10's, 100's, 1000's)

Anostracans:
(note reproductive status) 10s (mature)

Notostracans:
(note reproductive status) None

Species Observations (Optional):

| | | | Insects: (adult or larvae) | | |
|---|---|---|---|---|---|
| Cladocerans: | yes | no | | | |
| Conchostracans: | yes | no | Anisoptera: | yes | no |
| Copepods: | yes | no | Zygoptera: | yes | no |
| Ostracods | yes | no | Hydrophilidae: | yes | no |
| Fish | yes | no | Dytiscidae: | yes | no |
| Frogs | yes | no | Corixidae: | yes | no |
| Salamanders | yes | no | Notonectidae: | yes | no |
| Waterfowl | yes | no | Belostomatidae: | yes | no |
| Other (specify) ____ | | | Other (specify) ____ | | |

Voucher Specimens

Specimens shall be preserved according to the standards of the institution in which they will be accessioned.

| Species | # Individuals | Accession/Catalog # | Pool # |
|---|---|---|---|

4/2/15

33-1

**U.S. Fish and Wildlife Service Vernal Pool Data Sheet**
**Wet Season Survey**

Note: Please fill out the required information completely for each site visit.

This form is being submitted to serve as part of the 90-day report: ___ no ✓ yes

Required color slides and/or photographs for the project site are included: ___ no ✓ yes

Date: 4/2/15 Time: 1401 County: SD Quad: S.C.

Collector(s): R. Stolpe Permit #: TE835549S

Site/Project Name: TL695 Pool #: 43-3(33-1)

Township: N/A Range: N/A Section: N/A 32.38 lat. 117.56 long.

Temperature: Water: N/A °C Air: 21.1 °C

Pool Depth:
at time of sampling: 0 cm
estimated maximum: — cm

Surface Area:
at time of sampling: 0 m x 0 m
estimated maximum: — m x — m

Habitat Condition: (circle where appropriate)

- undisturbed disturbed: (tire tracks) (garbage) discing/plowing
- ungrazed grazed: cattle horses sheep other_____ light moderate heavy
- land use of habitat: dirt road / Alpha 2 T.A.

(Optional) Water Chemistry Data

Alkalinity (total):_____ppm or mg/l Conductivity:_____uMHO

Dissolved $NH_4$:_____ppt or ppm Dissolved Oxygen:_____ppm or mg/l

pH:_____ Turbidity: (secchi dise depth)_____cm or: clear to bottom ____

Salinity :_____ppt or ppm Total Dissolved Solids (TDS):_____ppm

Notes: Dry

1

**U.S. Fish and Wildlife Service Vernal Pool Data Sheet**
**Wet Season Survey**

Note: Please fill out the required information completely for each site visit.

Species Observations: state none or estimate # of individuals present in terms of an order of magnitude (e.g., 10's, 100's, 1000's)

Anostracans:
(note reproductive status) None

Notostracans:
(note reproductive status) None

Species Observations (Optional) :

| | | | Insects: (adult or larvae) | | |
|---|---|---|---|---|---|
| Cladocerans: | yes | no | Anisoptera: | yes | no |
| Conchostracans: | yes | no | Zygoptera: | yes | no |
| Copepods: | yes | no | Hydrophilidae: | yes | no |
| Ostracods | yes | no | Dytiscidae: | yes | no |
| Fish | yes | no | Corixidae: | yes | no |
| Frogs | yes | no | Notonectidae: | yes | no |
| Salamanders | yes | no | Belostomatidae: | yes | no |
| Waterfowl | yes | no | Other (specify)_____ | | |
| Other (specify)_____ | | | | | |

Voucher Specimens

Specimens shall be preserved according to the standards of the institution in which they will be accessioned.

| Species | # Individuals | Accession/Catalog # | Pool # |
|---|---|---|---|
| | N/A | | |

5/1/15

33-1

**U.S. Fish and Wildlife Service Vernal Pool Data Sheet**
**Wet Season Survey**

Note: Please fill out the required information completely for each site visit.

This form is being submitted to serve as part of the 90-day report: ____ no ✓ yes

Required color slides and/or photographs for the project site are included: ____ no ✓ yes

Date: 5/1/15 Time: 0830 County: SD Quad: S.C.

Collector(s): R. Stolpe / C. Schevermann Permit #: TE-839549-5
TE94855AD

Site/Project Name: TL695 Pool #: 33-1

Township: N/A Range: N/A Section: N/A 33.38 lat. 117.96 long.

Temperature: Water: N/A °C Air: 22.2 °C

Pool Depth:
at time of sampling: 0 cm
estimated maximum: — cm

Surface Area:
at time of sampling: 0 m x 0 m
estimated maximum: — m x — m

Habitat Condition: (circle where appropriate)

- undisturbed · disturbed: (tire tracks) (garbage) discing/plowing
- ungrazed · grazed: cattle horses sheep other_____ light moderate heavy
- land use of habitat: dirt road / Alpha Two training area

(Optional) Water Chemistry Data

Alkalinity (total):_____ppm or mg/l Conductivity:_____uMHO

Dissolved $NH_4$:_____ppt or ppm Dissolved Oxygen:_____ppm or mg/l

pH:_____ Turbidity: (secchi disc depth)_____cm or: clear to bottom ____

Salinity :_____ppt or ppm Total Dissolved Solids (TDS):_____ppm

Notes: Dry



**U.S. Fish and Wildlife Service Vernal Pool Data Sheet**
**Wet Season Survey**

Note: Please fill out the required information completely for each site visit.

Species Observations: state none or estimate # of individuals present in terms of an order of magnitude (e.g., 10's, 100's, 1000's)

Anostracans:
(note reproductive status) None

Notostracans:
(note reproductive status) None

Species Observations (Optional) :

| | | | | | |
|---|---|---|---|---|---|
| Cladocerans: | yes | no | Insects: (adult or larvae) | | |
| Conchostracans: | yes | no | Anisoptera: | yes | no |
| Copepods: | yes | no | Zygoptera: | yes | no |
| Ostracods | yes | no | Hydrophilidae: | yes | no |
| Fish | yes | no | Dytiscidae: | yes | no |
| Frogs | yes | no | Corixidae: | yes | no |
| Salamanders | yes | no | Notonectidae: | yes | no |
| Waterfowl | yes | no | Belostomatidae: | yes | no |
| Other (specify)_____ | | | Other (specify)_____ | | |

Voucher Specimens

Specimens shall be preserved according to the standards of the institution in which they will be accessioned.

| Species | # Individuals | Accession/Catalog # | Pool # |
|---|---|---|---|
| N/A | | | |

5/20/15

33-1

**U.S. Fish and Wildlife Service Vernal Pool Data Sheet**
**Wet Season Survey**

Note: Please fill out the required information completely for each site visit.

This form is being submitted to serve as part of the 90-day report: ____ no ✓ yes

Required color slides and/or photographs for the project site are included: ____ no ✓ yes

Date: 5/20/15 Time: 1439 County: _____ Quad: _____

Collector(s): R. Stolpe Permit #: TE835495

Site/Project Name: TL695 Pool #: 33-1

Township: _____ Range: _____ Section: _____ _____lat._____long.

Temperature: Water: N/A °C Air: 20 °C

Pool Depth:
at time of sampling: Ø cm
estimated maximum: _____cm

Surface Area:
at time of sampling: Ø m x Ø m
estimated maximum: _____m x _____m

Habitat Condition: (circle where appropriate)

- undisturbed disturbed: tire tracks garbage discing/plowing

- ungrazed grazed: cattle horses sheep other_____
light moderate heavy

- land use of habitat:

(Optional) Water Chemistry Data

Alkalinity (total):_____ppm or mg/l Conductivity:_____uMHO

Dissolved $NH_4$:_____ppt or ppm Dissolved Oxygen:_____ppm or mg/l

pH:_____ Turbidity: (secchi disc depth)_____cm or: clear to bottom _____

Salinity :_____ppt or ppm Total Dissolved Solids (TDS):_____ppm

Notes: Dry

1

**U.S. Fish and Wildlife Service Vernal Pool Data Sheet**
**Wet Season Survey**

Note: Please fill out the required information completely for each site visit.

Species Observations: state none or estimate # of individuals present in terms of an order of magnitude (e.g., 10's, 100's, 1000's)

Anostracans:
(note reproductive status)

Notostracans:
(note reproductive status)

Species Observations (Optional) :

| | | | | | |
|---|---|---|---|---|---|
| Cladocerans: | yes | no | Insects: (adult or larvae) | | |
| Conchostracans: | yes | no | Anisoptera: | yes | no |
| Copepods: | yes | no | Zygoptera: | yes | no |
| Ostracods | yes | no | Hydrophilidae: | yes | no |
| Fish | yes | no | Dytiscidae: | yes | no |
| Frogs | yes | no | Corixidae: | yes | no |
| Salamanders | yes | no | Notonectidae: | yes | no |
| Waterfowl | yes | no | Belostomatidae: | yes | no |
| Other (specify) _____ | | | Other (specify) _____ | | |

Voucher Specimens

Specimens shall be preserved according to the standards of the institution in which they will be accessioned.

| Species | # Individuals | Accession/Catalog # | Pool # |
|---|---|---|---|

7/21/15

33-1

**U.S. Fish and Wildlife Service Vernal Pool Data Sheet**
**Wet Season Survey**

Note: Please fill out the required information completely for each site visit.

This form is being submitted to serve as part of the 90-day report: ____ no ✓ yes

Required color slides and/or photographs for the project site are included: ____ no ✓ yes

Date: 7/21/15 Time: 1400 County: SD Quad: S.C.

Collector(s): R Staiger/J. Adams Permit #: TE-835849-5/none

Site/Project Name: TL695 Pool #: 33-1

Township: N/A Range: N/A Section: N/A 3336 lat 117.56 long.

Temperature: Water: N/A °C Air: 25 °C

Pool Depth:
at time of sampling: Ø cm
estimated maximum: — cm

Surface Area:
at time of sampling: Ø m x Ø m
estimated maximum: — m x — m

Habitat Condition: (circle where appropriate)

- undisturbed disturbed: (tire tracks) (garbage) discing/plowing
- ungrazed grazed: cattle horses sheep other_____
  light moderate heavy
- land use of habitat: AlphaTwo T.A./dirt road

(Optional) Water Chemistry Data

Alkalinity (total):_____ppm or mg/l Conductivity:_____uMHO

Dissolved $NH_4$:_____ppt or ppm Dissolved Oxygen:_____ppm or mg/l

pH:_____ Turbidity: (secchi disc depth)_____cm or: clear to bottom ____

Salinity :_____ppt or ppm Total Dissolved Solids (TDS):_____ppm

Notes: Dry



**U.S. Fish and Wildlife Service Vernal Pool Data Sheet**
**Wet Season Survey**

Note: Please fill out the required information completely for each site visit.

Species Observations: state none or estimate # of individuals present in terms of an order of magnitude (e.g., 10's, 100's, 1000's)

Anostracans:
(note reproductive status) None

Notostracans:
(note reproductive status) None

Species Observations (Optional) :

| | | | Insects: (adult or larvae) | | |
|---|---|---|---|---|---|
| Cladocerans: | yes | no | Anisoptera: | yes | no |
| Conchostracans: | yes | no | Zygoptera: | yes | no |
| Copepods: | yes | no | Hydrophilidae: | yes | no |
| Ostracods | yes | no | Dytiscidae: | yes | no |
| Fish | yes | no | Corixidae: | yes | no |
| Frogs | yes | no | Notonectidae: | yes | no |
| Salamanders | yes | no | Belostomatidae: | yes | no |
| Waterfowl | yes | no | Other (specify) _____ | | |
| Other (specify) _____ | | | | | |

Voucher Specimens

Specimens shall be preserved according to the standards of the institution in which they will be accessioned.

| Species | # Individuals | Accession/Catalog # | Pool # |
|---|---|---|---|
| | | N/A | |

2/3/15

33-2

**U.S. Fish and Wildlife Service Vernal Pool Data Sheet**
**Wet Season Survey**

Note: Please fill out the required information completely for each site visit.

This form is being submitted to serve as part of the 90-day report: ✓ no ___ yes

Required color slides and/or photographs for the project site are included: ✓ no ___ yes

Date: 2/3/15 Time: 1415 County: SD Quad: S.C.

Collector(s): R. Stolpe/M. Tu Permit #: TE8355495

Site/Project Name: TL695 Pool #: 43-4 (33-2)

Township: N/A Range: N/A Section: N/A 33.38 lat 117.56 long.

Temperature: Water: N/A °C Air: 21.1 °C

Pool Depth:
at time of sampling: Ø cm
estimated maximum: — cm

Surface Area:
at time of sampling: Ø m x Ø m
estimated maximum: — m x — m

Habitat Condition: (circle where appropriate)

- undisturbed disturbed: tire tracks garbage discing/plowing
- ungrazed grazed: cattle horses sheep other_____ light moderate heavy
- land use of habitat: dirt road/Alpha 2 T.A.

(Optional) Water Chemistry Data

Alkalinity (total):_____ppm or mg/l Conductivity:_____uMHO

Dissolved $NH_4$:_____ppt or ppm Dissolved Oxygen:_____ppm or mg/l

pH:_____ Turbidity: (secchi disc depth)_____cm or: clear to bottom ____

Salinity :_____ppt or ppm Total Dissolved Solids (TDS):_____ppm

Notes: Dried small biomass, badly decayed, but likely fairy shrimp, with ostracods.

1

**U.S. Fish and Wildlife Service Vernal Pool Data Sheet**
**Wet Season Survey**

Note: Please fill out the required information completely for each site visit.

Species Observations: state none or estimate # of individuals present in terms of an order of magnitude (e.g., 10's, 100's, 1000's)

Anostracans:
(note reproductive status) Possibly - dried/decayed

Notostracans:
(note reproductive status) None

Species Observations (Optional) :

| | | | Insects: (adult or larvae) | | |
|---|---|---|---|---|---|
| Cladocerans: | yes | no | Anisoptera: | yes | no |
| Conchostracans: | yes | no | Zygoptera: | yes | no |
| Copepods: | yes | no | Hydrophilidae: | yes | no |
| Ostracods | (yes) | no | Dytiscidae: | yes | no |
| Fish | yes | no | Corixidae: | yes | no |
| Frogs | yes | no | Notonectidae: | yes | no |
| Salamanders | yes | no | Belostomatidae: | yes | no |
| Waterfowl | yes | no | Other (specify) | | |
| Other (specify) | | | | | |

Voucher Specimens

Specimens shall be preserved according to the standards of the institution in which they will be accessioned.

| Species | # Individuals | Accession/Catalog # | Pool # |
|---|---|---|---|

3/6/15

33-2

**U.S. Fish and Wildlife Service Vernal Pool Data Sheet**
**Wet Season Survey**

Note: Please fill out the required information completely for each site visit.

This form is being submitted to serve as part of the 90-day report: ___ no ✓ yes

Required color slides and/or photographs for the project site are included: ___ no ✓ yes

Date: 3/6/15 Time: 0853 County: SD Quad: S.C.

Collector(s): R. Stolpe/J. Adams Permit #: TE-835549-5/none

Site/Project Name: TL 695 Pool #: 43-4 (33-2)

Township: N/A Range: N/A Section: N/A 3338 lat. 117.516 long.

Temperature: Water: — °C Air: ~~[illegible]~~ 20.5 °C

Pool Depth:
at time of sampling: 12 cm
estimated maximum: — cm

Surface Area:
at time of sampling: ____ m x ____ m
estimated maximum: — m x — m

Habitat Condition: (circle where appropriate)

- undisturbed — disturbed: (tire tracks) garbage discing/plowing
- ungrazed — grazed: cattle horses sheep other____ light moderate heavy
- land use of habitat: dirt road/Alpha Two training area

(Optional) Water Chemistry Data

Alkalinity (total): ____ ppm or mg/l Conductivity: ____ uMHO

Dissolved $NH_4$: ____ ppt or ppm Dissolved Oxygen: ____ ppm or mg/l

pH: ____ Turbidity: (secchi disc depth) ____ cm or: clear to bottom ____

Salinity: ____ ppt or ppm Total Dissolved Solids (TDS): ____ ppm

Notes:

FS collected 6M/1F

B. lindahli



**U.S. Fish and Wildlife Service Vernal Pool Data Sheet**
**Wet Season Survey**

Note: Please fill out the required information completely for each site visit.

Species Observations: state none or estimate # of individuals present in terms of an order of magnitude (e.g., 10's, 100's, 1000's)

Anostracans:
(note reproductive status) 100's (mature)

Notostracans:
(note reproductive status) None

Species Observations (Optional):

| | | | Insects: (adult or larvae) | | |
|---|---|---|---|---|---|
| Cladocerans: | yes | no | Anisoptera: | yes | no |
| Conchostracans: | yes | no | Zygoptera: | yes | no |
| Copepods: | yes | no | Hydrophilidae: | yes | no |
| Ostracods | yes | no | Dytiscidae: | yes | no |
| Fish | yes | no | Corixidae: | yes | no |
| Frogs | yes | no | Notonectidae: | yes | no |
| Salamanders | yes | no | Belostomatidae: | yes | no |
| Waterfowl | yes | no | Other (specify) | | |
| Other (specify) | | | | | |

Voucher Specimens

Specimens shall be preserved according to the standards of the institution in which they will be accessioned.

| Species | # Individuals | Accession/Catalog # | Pool # |
|---|---|---|---|

3/9/15

33-2

**U.S. Fish and Wildlife Service Vernal Pool Data Sheet**
**Wet Season Survey**

Note: Please fill out the required information completely for each site visit.

This form is being submitted to serve as part of the 90-day report: ___ no ✓ yes

Required color slides and/or photographs for the project site are included: ___ no ✓ yes

Date: 3/9/15 Time: 1241 County: SD Quad: S.C

Collector(s): R. Stolpe / M. Tu Permit #: TE835548

Site/Project Name: TL695 Pool #: 43-4 (33-2)

Township: N/A Range: N/A Section: N/A 33.38 lat. 117.56 long.

Temperature: Water: — °C Air: 18.8 °C

Pool Depth:
at time of sampling: 10 cm
estimated maximum: — cm

Surface Area:
at time of sampling: ____ m x ____ m
estimated maximum: — m x — m

Habitat Condition: (circle where appropriate)

- undisturbed disturbed: (tire tracks) garbage discing/plowing
- ungrazed grazed: cattle horses sheep other____
  light moderate heavy
- land use of habitat: dirt road / Alpha 2 T.A.

(Optional) Water Chemistry Data

Alkalinity (total): ____ ppm or mg/l Conductivity: ____ uMHO

Dissolved $NH_4$: ____ ppt or ppm Dissolved Oxygen: ____ ppm or mg/l

pH: ____ Turbidity: (secchi disc depth) ____ cm or: clear to bottom ____

Salinity: ____ ppt or ppm Total Dissolved Solids (TDS): ____ ppm

Notes: FS collected 4M/3F
B. lindahli



**U.S. Fish and Wildlife Service Vernal Pool Data Sheet**
**Wet Season Survey**

Note: Please fill out the required information completely for each site visit.

Species Observations: state none or estimate # of individuals present in terms of an order of magnitude (e.g., 10's, 100's, 1000's)

Anostracans:
(note reproductive status) 10s (mature)

Notostracans:
(note reproductive status) None

Species Observations (Optional):

| | | | Insects: (adult or larvae) | | |
|---|---|---|---|---|---|
| Cladocerans: | yes | no | Anisoptera: | yes | no |
| Conchostracans: | yes | no | Zygoptera: | yes | no |
| Copepods: | yes | no | Hydrophilidae: | yes | no |
| Ostracods | yes | no | Dytiscidae: | yes | no |
| Fish | yes | no | Corixidae: | yes | no |
| Frogs | yes | no | Notonectidae: | yes | no |
| Salamanders | yes | no | Belostomatidae: | yes | no |
| Waterfowl | yes | no | Other (specify) ____ | | |
| Other (specify) ____ | | | | | |

Voucher Specimens

Specimens shall be preserved according to the standards of the institution in which they will be accessioned.

| Species | # Individuals | Accession/Catalog # | Pool # |
|---|---|---|---|

3/13/15

33-2

**U.S. Fish and Wildlife Service Vernal Pool Data Sheet**
**Wet Season Survey**

Note: Please fill out the required information completely for each site visit.

This form is being submitted to serve as part of the 90-day report: ____ no ✓ yes

Required color slides and/or photographs for the project site are included: ____ no ✓ yes

Date: 3/13/15 Time: 1002 County: SD Quad: S.C.

Collector(s): R. Stolpe / M. Tu Permit #: TE8355495

Site/Project Name: TL695 Pool #: 43-4 (33-2)

Township: N/A Range: N/A Section: N/A 33.38° lat. 117.58° long.

Temperature: Water: — °C Air: 26.1 °C

Pool Depth:
at time of sampling: 1 cm
estimated maximum: — cm

Surface Area:
at time of sampling: ____ m x ____ m
estimated maximum: — m x — m

Habitat Condition: (circle where appropriate)

- undisturbed disturbed: (tire tracks) garbage discing/plowing
- ungrazed grazed: cattle horses sheep other____ light moderate heavy
- land use of habitat: dirt road / Alpha 2 T.A.

(Optional) Water Chemistry Data

Alkalinity (total):____ppm or mg/l Conductivity:____uMHO

Dissolved $NH_4$:____ppt or ppm Dissolved Oxygen:____ppm or mg/l

pH:____ Turbidity: (secchi disc depth)____cm or: clear to bottom ____

Salinity :____ppt or ppm Total Dissolved Solids (TDS):____ppm

Notes:

FS collected 7M/0F
B. lindahli



**U.S. Fish and Wildlife Service Vernal Pool Data Sheet**
**Wet Season Survey**

Note: Please fill out the required information completely for each site visit.

Species Observations: state none or estimate # of individuals present in terms of an order of magnitude (e.g., 10's, 100's, 1000's)

Anostracans:
(note reproductive status) 10s (mature)

Notostracans:
(note reproductive status) None

Species Observations (Optional) :

| | | | Insects: (adult or larvae) | | |
|---|---|---|---|---|---|
| Cladocerans: | yes | no | | | |
| Conchostracans: | yes | no | Anisoptera: | yes | no |
| Copepods: | yes | no | Zygoptera: | yes | no |
| Ostracods | yes | no | Hydrophilidae: | yes | no |
| Fish | yes | no | Dytiscidae: | yes | no |
| Frogs | yes | no | Corixidae: | yes | no |
| Salamanders | yes | no | Notonectidae: | yes | no |
| Waterfowl | yes | no | Belostomatidae: | yes | no |
| Other (specify)____ | | | Other (specify)____ | | |

Voucher Specimens

Specimens shall be preserved according to the standards of the institution in which they will be accessioned.

| Species | # Individuals | Accession/Catalog # | Pool # |
|---|---|---|---|

3/20/15

33-2

**U.S. Fish and Wildlife Service Vernal Pool Data Sheet**
**Wet Season Survey**

Note: Please fill out the required information completely for each site visit.

This form is being submitted to serve as part of the 90-day report: ____ no ✓ yes

Required color slides and/or photographs for the project site are included: ✓ no ____ yes

Date: 3/20/15 Time: 1250 County: SD Quad: S.C.

Collector(s): R. Stolpe/M. Tu Permit #: TE835549S

Site/Project Name: TL695 Pool #: 43-4 (33-2)

Township: N/A Range: N/A Section: N/A 33.38 lat 117.58 long.

Temperature: Water: N/A °C Air: 22.4 °C

Pool Depth:
at time of sampling: Ø cm
estimated maximum: — cm

Surface Area:
at time of sampling: Ø m x Ø m
estimated maximum: — m x — m

Habitat Condition: (circle where appropriate)

- undisturbed — disturbed: tire tracks garbage discing/plowing
- ungrazed — grazed: cattle horses sheep other_____ light moderate heavy
- land use of habitat: dirt road/Alpha 2 T.A.

(Optional) Water Chemistry Data

Alkalinity (total):_____ppm or mg/l Conductivity:_____uMHO

Dissolved $NH_4$:_____ppt or ppm Dissolved Oxygen:_____ppm or mg/l

pH:_____ Turbidity: (secchi disc depth)_____cm or: clear to bottom ____

Salinity :_____ppt or ppm Total Dissolved Solids (TDS):_____ppm

Notes:



**U.S. Fish and Wildlife Service Vernal Pool Data Sheet**
**Wet Season Survey**

Note: Please fill out the required information completely for each site visit.

Species Observations: state none or estimate # of individuals present in terms of an order of magnitude (e.g., 10's, 100's, 1000's)

Anostracans:
(note reproductive status) None

Notostracans:
(note reproductive status) None

Species Observations (Optional) :

| | | | | | |
|---|---|---|---|---|---|
| Cladocerans: | yes | no | Insects: (adult or larvae) | | |
| Conchostracans: | yes | no | Anisoptera: | yes | no |
| Copepods: | yes | no | Zygoptera: | yes | no |
| Ostracods | yes | no | Hydrophilidae: | yes | no |
| Fish | yes | no | Dytiscidae: | yes | no |
| Frogs | yes | no | Corixidae: | yes | no |
| Salamanders | yes | no | Notonectidae: | yes | no |
| Waterfowl | yes | no | Belostomatidae: | yes | no |
| Other (specify) _____ | | | Other (specify) _____ | | |

Voucher Specimens

Specimens shall be preserved according to the standards of the institution in which they will be accessioned.

| Species | # Individuals | Accession/Catalog # | Pool # |
|---|---|---|---|
| | N/A | | |

3/26/15

33-2

**U.S. Fish and Wildlife Service Vernal Pool Data Sheet**
**Wet Season Survey**

Note: Please fill out the required information completely for each site visit.

This form is being submitted to serve as part of the 90-day report: ___ no ✓ yes

Required color slides and/or photographs for the project site are included: ✓ no ___ yes

Date: 3/26/15 Time: _____ County: SD Quad: S.C.

Collector(s): R. Stolpe Permit #: TE835595

Site/Project Name: TL695 Pool #: 43-4(33-2)

Township: N/A Range: N/A Section: N/A 33.38 lat. 117.56 long.

Temperature: Water: N/A °C Air: _____ °C

Pool Depth:
at time of sampling: Ø cm
estimated maximum: — cm

Surface Area:
at time of sampling: Ø m x Ø m
estimated maximum: — m x — m

Habitat Condition: (circle where appropriate)

- undisturbed disturbed: (tire tracks) garbage discing/plowing
- ungrazed grazed: cattle horses sheep other_____ light moderate heavy
- land use of habitat: dirt road/Alpha 2 T.A.

(Optional) Water Chemistry Data

Alkalinity (total):_____ppm or mg/l Conductivity:_____uMHO

Dissolved $NH_4$:_____ppt or ppm Dissolved Oxygen:_____ppm or mg/l

pH:_____ Turbidity: (secchi disc depth)_____cm or: clear to bottom ____

Salinity :_____ppt or ppm Total Dissolved Solids (TDS):_____ppm

Notes:

1

**U.S. Fish and Wildlife Service Vernal Pool Data Sheet**
**Wet Season Survey**

Note: Please fill out the required information completely for each site visit.

Species Observations: state none or estimate # of individuals present in terms of an order of magnitude (e.g., 10's, 100's, 1000's)

Anostracans:
(note reproductive status) None

Notostracans:
(note reproductive status) None

Species Observations (Optional) :

| | | | Insects: (adult or larvae) | | |
|---|---|---|---|---|---|
| Cladocerans: | yes | no | Anisoptera: | yes | no |
| Conchostracans: | yes | no | Zygoptera: | yes | no |
| Copepods: | yes | no | Hydrophilidae: | yes | no |
| Ostracods | yes | no | Dytiscidae: | yes | no |
| Fish | yes | no | Corixidae: | yes | no |
| Frogs | yes | no | Notonectidae: | yes | no |
| Salamanders | yes | no | Belostomatidae: | yes | no |
| Waterfowl | yes | no | Other (specify) | | |
| Other (specify) | | | | | |

Voucher Specimens

Specimens shall be preserved according to the standards of the institution in which they will be accessioned.

| Species | # Individuals | Accession/Catalog # | Pool # |
|---|---|---|---|
| | N/A | | |

4/2/15

33-2

**U.S. Fish and Wildlife Service Vernal Pool Data Sheet**
**Wet Season Survey**

Note: Please fill out the required information completely for each site visit.

This form is being submitted to serve as part of the 90-day report: ___ no ✓ yes

Required color slides and/or photographs for the project site are included: ✓ no ___ yes

Date: 4/2/15 Time: 1400 County: SD Quad: S.C

Collector(s): R. Stolpe Permit #: TE835595

Site/Project Name: TL695 Pool #: 43-4(33-2)

Township: N/A Range: N/A Section: N/A 33.38 lat. 717.56 long.

Temperature: Water: N/A °C Air: 21.1 °C

Pool Depth:
at time of sampling: Ø cm
estimated maximum: — cm

Surface Area:
at time of sampling: Ø m x Ø m
estimated maximum: — m x — m

Habitat Condition: (circle where appropriate)

- undisturbed disturbed: (tire tracks) garbage discing/plowing
- ungrazed grazed: cattle horses sheep other_____
  light moderate heavy
- land use of habitat: dirt road/Alpha 2 T.A.

(Optional) Water Chemistry Data

Alkalinity (total):_____ppm or mg/l Conductivity:_____uMHO

Dissolved $NH_4$:_____ppt or ppm Dissolved Oxygen:_____ppm or mg/l

pH:_____ Turbidity: (secchi disc depth)_____cm or: clear to bottom ____

Salinity :_____ppt or ppm Total Dissolved Solids (TDS):_____ppm

Notes: Dry

1

**U.S. Fish and Wildlife Service Vernal Pool Data Sheet**
**Wet Season Survey**

Note: Please fill out the required information completely for each site visit.

Species Observations: state none or estimate # of individuals present in terms of an order of magnitude (e.g., 10's, 100's, 1000's)

Anostracans:
(note reproductive status) None

Notostracans:
(note reproductive status) None

Species Observations (Optional) :

| | | | Insects: (adult or larvae) | | |
|---|---|---|---|---|---|
| Cladocerans: | yes | no | Anisoptera: | yes | no |
| Conchostracans: | yes | no | Zygoptera: | yes | no |
| Copepods: | yes | no | Hydrophilidae: | yes | no |
| Ostracods | yes | no | Dytiscidae: | yes | no |
| Fish | yes | no | Corixidae: | yes | no |
| Frogs | yes | no | Notonectidae: | yes | no |
| Salamanders | yes | no | Belostomatidae: | yes | no |
| Waterfowl | yes | no | Other (specify) | | |
| Other (specify) | | | | | |

Voucher Specimens

Specimens shall be preserved according to the standards of the institution in which they will be accessioned.

| Species | # Individuals | Accession/Catalog # | Pool # |
|---|---|---|---|
| N/A | | | |

5/1/15

33-2

**U.S. Fish and Wildlife Service Vernal Pool Data Sheet**
**Wet Season Survey**

Note: Please fill out the required information completely for each site visit.

This form is being submitted to serve as part of the 90-day report: ____ no ✓ yes

Required color slides and/or photographs for the project site are included: ____ no ✓ yes

Date: 5/1/15 Time: 0835 County: SD Quad: S.C.

Collector(s): R. Stolpe / C. Scheuerman Permit #: TE8355495
TE485540

Site/Project Name: TL695 Pool #: 33-2

Township: N/A Range: N/A Section: N/A 33.38 lat 117.58 long.

Temperature: Water: — °C Air: 18.3 °C

Pool Depth:
at time of sampling: Ø cm
estimated maximum: — cm

Surface Area:
at time of sampling: Ø m x Ø m
estimated maximum: — m x — m

Habitat Condition: (circle where appropriate)

- undisturbed disturbed: (tire tracks) garbage discing/plowing
- ungrazed grazed: cattle horses sheep other_____ light moderate heavy
- land use of habitat: dirt road / Alpha 2 T.A.

(Optional) Water Chemistry Data

Alkalinity (total):_____ppm or mg/l Conductivity:_____uMHO

Dissolved $NH_4$:_____ppt or ppm Dissolved Oxygen:_____ppm or mg/l

pH:_____ Turbidity: (secchi disc depth)_____cm or: clear to bottom _____

Salinity :_____ppt or ppm Total Dissolved Solids (TDS):_____ppm

Notes: Dry



**U.S. Fish and Wildlife Service Vernal Pool Data Sheet**
**Wet Season Survey**

Note: Please fill out the required information completely for each site visit.

Species Observations: state none or estimate # of individuals present in terms of an order of magnitude (e.g., 10's, 100's, 1000's)

Anostracans:
(note reproductive status) None

Notostracans:
(note reproductive status) None

Species Observations (Optional) :

| | | | Insects: (adult or larvae) | | |
|---|---|---|---|---|---|
| Cladocerans: | yes | no | Anisoptera: | yes | no |
| Conchostracans: | yes | no | Zygoptera: | yes | no |
| Copepods: | yes | no | Hydrophilidae: | yes | no |
| Ostracods | yes | no | Dytiscidae: | yes | no |
| Fish | yes | no | Corixidae: | yes | no |
| Frogs | yes | no | Notonectidae: | yes | no |
| Salamanders | yes | no | Belostomatidae: | yes | no |
| Waterfowl | yes | no | Other (specify) | | |
| Other (specify) | | | | | |

Voucher Specimens

Specimens shall be preserved according to the standards of the institution in which they will be accessioned.

| Species | # Individuals | Accession/Catalog # | Pool # |
|---|---|---|---|
| N/A | | | |

5/20/15

33-2

**U.S. Fish and Wildlife Service Vernal Pool Data Sheet**
**Wet Season Survey**

Note: Please fill out the required information completely for each site visit.

This form is being submitted to serve as part of the 90-day report: ____ no ✓ yes

Required color slides and/or photographs for the project site are included: ____ no ✓ yes

Date: 5/20/15 Time: 1428 County: _____ Quad: _____

Collector(s) R. Stolpe Permit #: TE835595

Site/Project Name: TL695 Pool #: 33-2

Township: _____ Range: _____ Section: _____ _____lat._____long.

Temperature: Water: N/A °C Air: 20 °C

Pool Depth:
at time of sampling: Ø cm
estimated maximum: _____cm

Surface Area:
at time of sampling: Ø m x Ø m
estimated maximum: _____m x _____m

Habitat Condition: (circle where appropriate)

- undisturbed disturbed: (tire tracks) garbage discing/plowing
- ungrazed grazed: cattle horses sheep other_____ light moderate heavy
- land use of habitat: dirt road / Alpha 2 T.A.

(Optional) Water Chemistry Data

Alkalinity (total):_____ppm or mg/l Conductivity:_____uMHO

Dissolved $NH_4$:_____ppt or ppm Dissolved Oxygen:_____ppm or mg/l

pH:_____ Turbidity: (secchi disc depth)_____cm or: clear to bottom ____

Salinity :_____ppt or ppm Total Dissolved Solids (TDS):_____ppm

Notes: Dry

1

**U.S. Fish and Wildlife Service Vernal Pool Data Sheet**
**Wet Season Survey**

Note: Please fill out the required information completely for each site visit.

Species Observations: state none or estimate # of individuals present in terms of an order of magnitude (e.g., 10's, 100's, 1000's)

Anostracans:
(note reproductive status)

Notostracans:
(note reproductive status)

Species Observations (Optional) :

| | | | Insects: (adult or larvae) | | |
|---|---|---|---|---|---|
| Cladocerans: | yes | no | Anisoptera: | yes | no |
| Conchostracans: | yes | no | Zygoptera: | yes | no |
| Copepods: | yes | no | Hydrophilidae: | yes | no |
| Ostracods | yes | no | Dytiscidae: | yes | no |
| Fish | yes | no | Corixidae: | yes | no |
| Frogs | yes | no | Notonectidae: | yes | no |
| Salamanders | yes | no | Belostomatidae: | yes | no |
| Waterfowl | yes | no | Other (specify) _____ | | |
| Other (specify) _____ | | | | | |

Voucher Specimens

Specimens shall be preserved according to the standards of the institution in which they will be accessioned.

| Species | # Individuals | Accession/Catalog # | Pool # |
|---|---|---|---|

7/21/15

33-2

**U.S. Fish and Wildlife Service Vernal Pool Data Sheet**
**Wet Season Survey**

Note: Please fill out the required information completely for each site visit.

This form is being submitted to serve as part of the 90-day report: ___ no ✓ yes

Required color slides and/or photographs for the project site are included: ___ no ✓ yes

Date: 7/21/15 Time: 1402 County: SD Quad: S.C.

Collector(s): R. Stolpe / J. Adams Permit #: TE-835749-5/none

Site/Project Name: TL695 Pool #: 33-2

Township: N/A Range: N/A Section: N/A 33.38 lat 117.56 long.

Temperature: Water: N/A °C Air: 25 °C

Pool Depth:
at time of sampling: Ø cm
estimated maximum: — cm

Surface Area:
at time of sampling: Ø m x Ø m
estimated maximum: — m x — m

Habitat Condition: (circle where appropriate)

- undisturbed disturbed: (tire tracks) garbage discing/plowing
- ungrazed grazed: cattle horses sheep other_____ light moderate heavy
- land use of habitat: dirt road / Alpha Two training area

(Optional) Water Chemistry Data

Alkalinity (total):_____ppm or mg/l Conductivity:_____uMHO

Dissolved $NH_4$:_____ppt or ppm Dissolved Oxygen:_____ppm or mg/l

pH:_____ Turbidity: (secchi disc depth)_____cm or: clear to bottom ____

Salinity :_____ppt or ppm Total Dissolved Solids (TDS):_____ppm

Notes: Dry / damp



**U.S. Fish and Wildlife Service Vernal Pool Data Sheet**
**Wet Season Survey**

Note: Please fill out the required information completely for each site visit.

Species Observations: state none or estimate # of individuals present in terms of an order of magnitude (e.g., 10's, 100's, 1000's)

Anostracans:
(note reproductive status) None

Notostracans:
(note reproductive status) None

Species Observations (Optional) :

| | | | | | |
|---|---|---|---|---|---|
| Cladocerans: | yes | no | Insects: (adult or larvae) | | |
| Conchostracans: | yes | no | Anisoptera: | yes | no |
| Copepods: | yes | no | Zygoptera: | yes | no |
| Ostracods | yes | no | Hydrophilidae: | yes | no |
| Fish | yes | no | Dytiscidae: | yes | no |
| Frogs | yes | no | Corixidae: | yes | no |
| Salamanders | yes | no | Notonectidae: | yes | no |
| Waterfowl | yes | no | Belostomatidae: | yes | no |
| Other (specify)_____ | | | Other (specify)_____ | | |

Voucher Specimens

Specimens shall be preserved according to the standards of the institution in which they will be accessioned.

| Species | # Individuals | Accession/Catalog # | Pool # |
|---|---|---|---|
| N/A | | | |

2/3/15

33-3

**U.S. Fish and Wildlife Service Vernal Pool Data Sheet**
**Wet Season Survey**

Note: Please fill out the required information completely for each site visit.

This form is being submitted to serve as part of the 90-day report: ✓ no ___ yes

Required color slides and/or photographs for the project site are included: ✓ no ___ yes

Date: 2/3/15 Time: 1424 County: SD Quad: S.C.

Collector(s): R. Stolpe / M. Tu Permit #: TE8355495

Site/Project Name: TL695 Pool #: 43-2(33-3)

Township: N/A Range: N/A Section: N/A 3338 lat. -117.56 long.

Temperature: Water: N/A °C Air: 21.1 °C

Pool Depth:
at time of sampling: Ø cm
estimated maximum: — cm

Surface Area:
at time of sampling: Ø m x Ø m
estimated maximum: — m x — m

Habitat Condition: (circle where appropriate)

- undisturbed — disturbed: (tire tracks) garbage discing/plowing
- ungrazed — grazed: cattle horses sheep other_____ light moderate heavy
- land use of habitat: dirt road / Alpha 2 T.A.

(Optional) Water Chemistry Data

Alkalinity (total):_____ppm or mg/l Conductivity:_____uMHO

Dissolved $NH_4$:_____ppt or ppm Dissolved Oxygen:_____ppm or mg/l

pH:_____ Turbidity: (secchi disc depth)_____cm or: clear to bottom ____

Salinity :_____ppt or ppm Total Dissolved Solids (TDS):_____ppm

Notes: Dry



**U.S. Fish and Wildlife Service Vernal Pool Data Sheet**
**Wet Season Survey**

Note: Please fill out the required information completely for each site visit.

Species Observations: state none or estimate # of individuals present in terms of an order of magnitude (e.g., 10's, 100's, 1000's)

Anostracans:
(note reproductive status) None

Notostracans:
(note reproductive status) None

Species Observations (Optional) :

| | | | Insects: (adult or larvae) | | |
|---|---|---|---|---|---|
| Cladocerans: | yes | no | Anisoptera: | yes | no |
| Conchostracans: | yes | no | Zygoptera: | yes | no |
| Copepods: | yes | no | Hydrophilidae: | yes | no |
| Ostracods | yes | no | Dytiscidae: | yes | no |
| Fish | yes | no | Corixidae: | yes | no |
| Frogs | yes | no | Notonectidae: | yes | no |
| Salamanders | yes | no | Belostomatidae: | yes | no |
| Waterfowl | yes | no | Other (specify) | | |
| Other (specify) | | | | | |

Voucher Specimens

Specimens shall be preserved according to the standards of the institution in which they will be accessioned.

| Species | # Individuals | Accession/Catalog # | Pool # |
|---|---|---|---|
| | N/A | | |

3/16/15

33-3

**U.S. Fish and Wildlife Service Vernal Pool Data Sheet**
**Wet Season Survey**

Note: Please fill out the required information completely for each site visit.

This form is being submitted to serve as part of the 90-day report: ____ no ✓ yes

Required color slides and/or photographs for the project site are included: ____ no ✓ yes

Date: 3/16/15 Time: 0850 County: SD Quad: S.C.

Collector(s): R. Stolpe/J. Asmus Permit #: TE-835549-5/none

Site/Project Name: TL695 Pool #: 43-2(33-3)

Township: N/A Range: N/A Section: N/A 33.38 lat. 117.56 long.

Temperature: Water: ~ °C Air: 20 °C

Pool Depth:
at time of sampling: 3 cm
estimated maximum: ~ cm

Surface Area:
at time of sampling: ____ m x ____ m
estimated maximum: ~ m x ~ m

Habitat Condition: (circle where appropriate)

- undisturbed disturbed: (tire tracks) garbage discing/plowing
- ungrazed grazed: cattle horses sheep other____ light moderate heavy
- land use of habitat: dirt road / Alpha Two training area

(Optional) Water Chemistry Data

Alkalinity (total): ____ ppm or mg/l Conductivity: ____ uMHO

Dissolved $NH_4$: ____ ppt or ppm Dissolved Oxygen: ____ ppm or mg/l

pH: ____ Turbidity: (secchi disc depth) ____ cm or: clear to bottom ____

Salinity: ____ ppt or ppm Total Dissolved Solids (TDS): ____ ppm

Notes:

1

**U.S. Fish and Wildlife Service Vernal Pool Data Sheet**
**Wet Season Survey**

Note: Please fill out the required information completely for each site visit.

Species Observations: state none or estimate # of individuals present in terms of an order of magnitude (e.g., 10's, 100's, 1000's)

Anostracans:
(note reproductive status) None

Notostracans:
(note reproductive status) None

Species Observations (Optional):

| | | | Insects: (adult or larvae) | | |
|---|---|---|---|---|---|
| Cladocerans: | yes | no | Anisoptera: | yes | no |
| Conchostracans: | yes | no | Zygoptera: | yes | no |
| Copepods: | yes | no | Hydrophilidae: | yes | no |
| Ostracods | yes | no | Dytiscidae: | yes | no |
| Fish | yes | no | Corixidae: | yes | no |
| Frogs | yes | no | Notonectidae: | yes | no |
| Salamanders | yes | no | Belostomatidae: | yes | no |
| Waterfowl | yes | no | Other (specify) | | |
| Other (specify) | | | | | |

Voucher Specimens

Specimens shall be preserved according to the standards of the institution in which they will be accessioned.

| Species | # Individuals | Accession/Catalog # | Pool # |
|---|---|---|---|
| N/A | | | |

3/9/15

33-3

**U.S. Fish and Wildlife Service Vernal Pool Data Sheet**
**Wet Season Survey**

Note: Please fill out the required information completely for each site visit.

This form is being submitted to serve as part of the 90-day report: ___ no ✓ yes

Required color slides and/or photographs for the project site are included: ___ no ✓ yes

Date: 3/9/15 Time: 1236 County: SD Quad: S.C.

Collector(s): R. Stolpe/M. Tu Permit #: TE8355495

Site/Project Name: TL695 Pool #: 43-2(33-3)

Township: N/A Range: N/A Section: N/A 33.38 lat. 117.56 long.

Temperature: Water: N/A °C Air: 18.8 °C

Pool Depth:
at time of sampling: Ø cm
estimated maximum: — cm

Surface Area:
at time of sampling: Ø m x Ø m
estimated maximum: — m x — m

Habitat Condition: (circle where appropriate)

- undisturbed disturbed: (tire tracks) garbage discing/plowing
- ungrazed grazed: cattle horses sheep other_____ light moderate heavy
- land use of habitat: dirt road/Alpha 2 T.A.

(Optional) Water Chemistry Data

Alkalinity (total):_____ppm or mg/l Conductivity:_____uMHO

Dissolved $NH_4$:_____ppt or ppm Dissolved Oxygen:_____ppm or mg/l

pH:_____ Turbidity: (secchi disc depth)_____cm or: clear to bottom ____

Salinity :_____ppt or ppm Total Dissolved Solids (TDS):_____ppm

Notes: Fairy shrimp angels (casts) in mud. Not sampled.



**U.S. Fish and Wildlife Service Vernal Pool Data Sheet**
**Wet Season Survey**

Note: Please fill out the required information completely for each site visit.

Species Observations: state none or estimate # of individuals present in terms of an order of magnitude (e.g., 10's, 100's, 1000's)

Anostracans:
(note reproductive status) Unknown pop. (see notes)

Notostracans:
(note reproductive status) None

Species Observations (Optional) :

| | | | | | |
|---|---|---|---|---|---|
| Cladocerans: | yes | no | Insects: (adult or larvae) | | |
| Conchostracans: | yes | no | Anisoptera: | yes | no |
| Copepods: | yes | no | Zygoptera: | yes | no |
| Ostracods | yes | no | Hydrophilidae: | yes | no |
| Fish | yes | no | Dytiscidae: | yes | no |
| Frogs | yes | no | Corixidae: | yes | no |
| Salamanders | yes | no | Notonectidae: | yes | no |
| Waterfowl | yes | no | Belostomatidae: | yes | no |
| Other (specify)_____ | | | Other (speeify)_____ | | |

Voucher Specimens

Specimens shall be preserved according to the standards of the institution in which they will be accessioned.

| Species | # Individuals | Accession/Catalog # | Pool # |
|---|---|---|---|

3/13/15

33-3

**U.S. Fish and Wildlife Service Vernal Pool Data Sheet**
**Wet Season Survey**

Note: Please fill out the required information completely for each site visit.

This form is being submitted to serve as part of the 90-day report: ___ no ✓ yes

Required color slides and/or photographs for the project site are included: ___ no ✓ yes

Date: 3/13/15 Time: 0952 County: SD Quad: S.C

Collector(s): R. Stolpe/M. Tu Permit #: TE8355495

Site/Project Name: T2695 Pool #: 43-2(33-3)

Township: N/A Range: N/A Section: N/A 33.38 lat. 117.56 long.

Temperature: Water: N/A °C Air: 26.1 °C

Pool Depth:
at time of sampling: Ø cm
estimated maximum: — cm

Surface Area:
at time of sampling: Ø m x Ø m
estimated maximum: — m x — m

Habitat Condition: (circle where appropriate)

- undisturbed disturbed: (tire tracks) garbage discing/plowing
- ungrazed grazed: cattle horses sheep other_____
  light moderate heavy
- land use of habitat: dirt road / Alpha 2 T.A.

(Optional) Water Chemistry Data

Alkalinity (total):_____ppm or mg/l Conductivity:_____uMHO

Dissolved $NH_4$:_____ppt or ppm Dissolved Oxygen:_____ppm or mg/l

pH:_____ Turbidity: (secchi disc depth)_____cm or: clear to bottom ____

Salinity :_____ppt or ppm Total Dissolved Solids (TDS):_____ppm

Notes: Dry



**U.S. Fish and Wildlife Service Vernal Pool Data Sheet**
**Wet Season Survey**

Note: Please fill out the required information completely for each site visit.

Species Observations: state none or estimate # of individuals present in terms of an order of magnitude (e.g., 10's, 100's, 1000's)

Anostracans:
(note reproductive status) None

Notostracans:
(note reproductive status) None

Species Observations (Optional) :

| | | | | | |
|---|---|---|---|---|---|
| Cladocerans: | yes | no | Insects: (adult or larvae) | | |
| Conchostracans: | yes | no | Anisoptera: | yes | no |
| Copepods: | yes | no | Zygoptera: | yes | no |
| Ostracods | yes | no | Hydrophilidae: | yes | no |
| Fish | yes | no | Dytiscidae: | yes | no |
| Frogs | yes | no | Corixidae: | yes | no |
| Salamanders | yes | no | Notonectidae: | yes | no |
| Waterfowl | yes | no | Belostomatidae: | yes | no |
| Other (specify) | | | Other (specify) | | |

Voucher Specimens

Specimens shall be preserved according to the standards of the institution in which they will be accessioned.

| Species | # Individuals | Accession/Catalog # | Pool # |
|---|---|---|---|
| | N/A | | |

3/20/15

33-3

**U.S. Fish and Wildlife Service Vernal Pool Data Sheet**
**Wet Season Survey**

Note: Please fill out the required information completely for each site visit.

This form is being submitted to serve as part of the 90-day report: ____ no ✓ yes

Required color slides and/or photographs for the project site are included: ✓ no ____ yes

Date: 3/20/15 Time: 1248 County: SD Quad: S.C.-

Collector(s): R. Stolpe / M. Tu Permit #: TE8355495

Site/Project Name: TL695 Pool #: 43-2(33-3)

Township: N/A Range: N/A Section: N/A 3388 lat. -117.56 long.

Temperature: Water: N/A °C Air: 22.2 °C

Pool Depth:
at time of sampling: Ø cm
estimated maximum: — cm

Surface Area:
at time of sampling: Ø m x Ø m
estimated maximum: — m x — m

Habitat Condition: (circle where appropriate)

- undisturbed disturbed: (tire tracks) garbage discing/plowing
- ungrazed grazed: cattle horses sheep other_____
  light moderate heavy
- land use of habitat: dirt road / Alpha 2 T.A.

(Optional) Water Chemistry Data

Alkalinity (total): ____ ppm or mg/l Conductivity: ____ uMHO

Dissolved $NH_4$: ____ ppt or ppm Dissolved Oxygen: ____ ppm or mg/l

pH: ____ Turbidity: (secchi disc depth) ____ cm or: clear to bottom ____

Salinity: ____ ppt or ppm Total Dissolved Solids (TDS): ____ ppm

Notes:

1

**U.S. Fish and Wildlife Service Vernal Pool Data Sheet**
**Wet Season Survey**

Note: Please fill out the required information completely for each site visit.

Species Observations: state none or estimate # of individuals present in terms of an order of magnitude (e.g., 10's, 100's, 1000's)

Anostracans:
(note reproductive status) None

Notostracans:
(note reproductive status) None

Species Observations (Optional):

| | | | | | |
|---|---|---|---|---|---|
| Cladocerans: | yes | no | Insects: (adult or larvae) | | |
| Conchostracans: | yes | no | Anisoptera: | yes | no |
| Copepods: | yes | no | Zygoptera: | yes | no |
| Ostracods | yes | no | Hydrophilidae: | yes | no |
| Fish | yes | no | Dytiscidae: | yes | no |
| Frogs | yes | no | Corixidae: | yes | no |
| Salamanders | yes | no | Notonectidae: | yes | no |
| Waterfowl | yes | no | Belostomatidae: | yes | no |
| Other (specify) _____ | | | Other (specify) _____ | | |

Voucher Specimens

Specimens shall be preserved according to the standards of the institution in which they will be accessioned.

| Species | # Individuals | Accession/Catalog # | Pool # |
|---|---|---|---|
| N/A | | | |

3/26/15

33-3

**U.S. Fish and Wildlife Service Vernal Pool Data Sheet**
**Wet Season Survey**

Note: Please fill out the required information completely for each site visit.

This form is being submitted to serve as part of the 90-day report: ___ no ✓ yes

Required color slides and/or photographs for the project site are included: ✓ no ___ yes

Date: 3/26/15 Time: _____ County: SD Quad: S.C.

Collector(s): R. Stolpe Permit #: TE835595

Site/Project Name: TL695 Pool #: 43-2(33-3)

Township: N/A Range: N/A Section: N/A 33.38 lat. 117.56 long.

Temperature: Water: N/A °C Air: _____ °C

Pool Depth:
at time of sampling: Ø cm
estimated maximum: — cm

Surface Area:
at time of sampling: Ø m x Ø m
estimated maximum: — m x — m

Habitat Condition: (circle where appropriate)

- undisturbed disturbed: (tire tracks) garbage discing/plowing
- ungrazed grazed: cattle horses sheep other_____
  light moderate heavy
- land use of habitat: dirt road/Alpha 2 T.A.

(Optional) Water Chemistry Data

Alkalinity (total):_____ppm or mg/l Conductivity:_____uMHO

Dissolved $NH_4$:_____ppt or ppm Dissolved Oxygen:_____ppm or mg/l

pH:_____ Turbidity: (secchi disc depth)_____cm or: clear to bottom ____

Salinity :_____ppt or ppm Total Dissolved Solids (TDS):_____ppm

Notes:



**U.S. Fish and Wildlife Service Vernal Pool Data Sheet**
**Wet Season Survey**

Note: Please fill out the required information completely for each site visit.

Species Observations: state none or estimate # of individuals present in terms of an order of magnitude (e.g., 10's, 100's, 1000's)

Anostracans:
(note reproductive status) None

Notostracans:
(note reproductive status) None

Species Observations (Optional) :

| | | | Insects: (adult or larvae) | | |
|---|---|---|---|---|---|
| Cladocerans: | yes | no | | | |
| Conchostracans: | yes | no | Anisoptera: | yes | no |
| Copepods: | yes | no | Zygoptera: | yes | no |
| Ostracods | yes | no | Hydrophilidae: | yes | no |
| Fish | yes | no | Dytiscidae: | yes | no |
| Frogs | yes | no | Corixidae: | yes | no |
| Salamanders | yes | no | Notonectidae: | yes | no |
| Waterfowl | yes | no | Belostomatidae: | yes | no |
| Other (specify)_____ | | | Other (specify)_____ | | |

Voucher Specimens

Specimens shall be preserved according to the standards of the institution in which they will be accessioned.

| Species | # Individuals | Accession/Catalog # | Pool # |
|---|---|---|---|
| | N/A | | |

4/2/15

33-3

**U.S. Fish and Wildlife Service Vernal Pool Data Sheet**
**Wet Season Survey**

Note: Please fill out the required information completely for each site visit.

This form is being submitted to serve as part of the 90-day report: ___ no ✓ yes

Required color slides and/or photographs for the project site are included: ✓ no ___ yes

Date: 4/2/15 Time: _____ County: SD Quad: S.C.

Collector(s): R. Stolpe Permit #: TE835495

Site/Project Name: TL695 Pool #: 43-2(33-3)

Township: N/A Range: N/A Section: N/A 33.38 lat. 117.56 long.

Temperature: Water: N/A °C Air: _____ °C

Pool Depth:
at time of sampling: Ø cm
estimated maximum: — cm

Surface Area:
at time of sampling: Ø m x Ø m
estimated maximum: — m x — m

Habitat Condition: (circle where appropriate)

- undisturbed
- disturbed: (tire tracks) garbage discing/plowing
- ungrazed
- grazed: cattle horses sheep other_____ light moderate heavy
- land use of habitat: dirt road/Alpha 2 T.A.

(Optional) Water Chemistry Data

Alkalinity (total):_____ppm or mg/l Conductivity:_____uMHO

Dissolved $NH_4$:_____ppt or ppm Dissolved Oxygen:_____ppm or mg/l

pH:_____ Turbidity: (secchi disc depth)_____cm or: clear to bottom ____

Salinity :_____ppt or ppm Total Dissolved Solids (TDS):_____ppm

Notes: Dry

1

**U.S. Fish and Wildlife Service Vernal Pool Data Sheet**
**Wet Season Survey**

Note: Please fill out the required information completely for each site visit.

Species Observations: state none or estimate # of individuals present in terms of an order of magnitude (e.g., 10's, 100's, 1000's)

Anostracans:
(note reproductive status) None

Notostracans:
(note reproductive status) None

Species Observations (Optional) :

| | | | Insects: (adult or larvae) | | |
|---|---|---|---|---|---|
| Cladocerans: | yes | no | Anisoptera: | yes | no |
| Conchostracans: | yes | no | Zygoptera: | yes | no |
| Copepods: | yes | no | Hydrophilidae: | yes | no |
| Ostracods | yes | no | Dytiscidae: | yes | no |
| Fish | yes | no | Corixidae: | yes | no |
| Frogs | yes | no | Notonectidae: | yes | no |
| Salamanders | yes | no | Belostomatidae: | yes | no |
| Waterfowl | yes | no | | | |
| Other (specify) _____ | | | Other (specify) _____ | | |

Voucher Specimens

Specimens shall be preserved according to the standards of the institution in which they will be accessioned.

| Species | # Individuals | Accession/Catalog # | Pool # |
|---|---|---|---|
| | N/A | | |

5/20/15

33-3

**U.S. Fish and Wildlife Service Vernal Pool Data Sheet**
**Wet Season Survey**

Note: Please fill out the required information completely for each site visit.

This form is being submitted to serve as part of the 90-day report: ____ no ✓ yes

Required color slides and/or photographs for the project site are included: ____ no ✓ yes

Date: 5/20/15 Time: 1431 County: _____ Quad: _____

Collector(s): R. Stolpe Permit #: TE835495

Site/Project Name: TL695 Pool #: 33-3

Township: _____ Range: _____ Section: _____ _____lat. _____long.

Temperature: Water: N/A °C Air: 20 °C

Pool Depth:
at time of sampling: Ø cm
estimated maximum: _____cm

Surface Area:
at time of sampling: Ø m x Ø m
estimated maximum: _____m x _____m

Habitat Condition: (circle where appropriate)

- undisturbed disturbed: (tire tracks) garbage discing/plowing
- ungrazed grazed: cattle horses sheep other_____ light moderate heavy
- land use of habitat: dirt road/Alpha 2 T.A.

(Optional) Water Chemistry Data

Alkalinity (total):_____ppm or mg/l Conductivity:_____uMHO

Dissolved $NH_4$:_____ppt or ppm Dissolved Oxygen:_____ppm or mg/l

pH:_____ Turbidity: (secchi disc depth)_____cm or: clear to bottom ____

Salinity :_____ppt or ppm Total Dissolved Solids (TDS):_____ppm

Notes: Dry



**U.S. Fish and Wildlife Service Vernal Pool Data Sheet**
**Wet Season Survey**

Note: Please fill out the required information completely for each site visit.

Species Observations: state none or estimate # of individuals present in terms of an order of magnitude (e.g., 10's, 100's, 1000's)

Anostracans:
(note reproductive status)

Notostracans:
(note reproductive status)

Species Observations (Optional) :

| | | | | | |
|---|---|---|---|---|---|
| Cladocerans: | yes | no | Insects: (adult or larvae) | | |
| Conchostracans: | yes | no | Anisoptera: | yes | no |
| Copepods: | yes | no | Zygoptera: | yes | no |
| Ostracods | yes | no | Hydrophilidae: | yes | no |
| Fish | yes | no | Dytiscidae: | yes | no |
| Frogs | yes | no | Corixidae: | yes | no |
| Salamanders | yes | no | Notonectidae: | yes | no |
| Waterfowl | yes | no | Belostomatidae: | yes | no |
| Other (specify) _____ | | | Other (specify) _____ | | |

Voucher Specimens

Specimens shall be preserved according to the standards of the institution in which they will be accessioned.

| Species | # Individuals | Accession/Catalog # | Pool # |
|---|---|---|---|

7/21/15

33-3

**U.S. Fish and Wildlife Service Vernal Pool Data Sheet**
**Wet Season Survey**

Note: Please fill out the required information completely for each site visit.

This form is being submitted to serve as part of the 90-day report: ___ no ✓ yes

Required color slides and/or photographs for the project site are included: ___ no ✓ yes

Date: 7/21/15 Time: 1357 County: SD Quad: S.C.

Collector(s): R. Stolpe/J. Asmus Permit #: TE8355495

Site/Project Name: T2695 Pool #: 33-3

Township: N/A Range: N/A Section: N/A 33.38 lat. 117.56 long.

Temperature: Water: N/A °C Air: 25.5 °C

Pool Depth:
at time of sampling: Ø cm
estimated maximum: — cm

Surface Area:
at time of sampling: Ø m x Ø m
estimated maximum: — m x — m

Habitat Condition: (circle where appropriate)

- undisturbed — disturbed: (tire tracks) garbage discing/plowing
- ungrazed — grazed: cattle horses sheep other_____ light moderate heavy
- land use of habitat: dirt road / Alpha 2 T.A.

(Optional) Water Chemistry Data

Alkalinity (total):_____ppm or mg/l Conductivity:_____uMHO

Dissolved $NH_4$:_____ppt or ppm Dissolved Oxygen:_____ppm or mg/l

pH:_____ Turbidity: (secchi disc depth)_____cm or: clear to bottom_____

Salinity:_____ppt or ppm Total Dissolved Solids (TDS):_____ppm

Notes: Dry/damp



**U.S. Fish and Wildlife Service Vernal Pool Data Sheet**
**Wet Season Survey**

Note: Please fill out the required information completely for each site visit.

Species Observations: state none or estimate # of individuals present in terms of an order of magnitude (e.g., 10's, 100's, 1000's)

Anostracans:
(note reproductive status) None

Notostracans:
(note reproductive status) None

Species Observations (Optional):

| | | | Insects: (adult or larvae) | | |
|---|---|---|---|---|---|
| Cladocerans: | yes | no | Anisoptera: | yes | no |
| Conchostracans: | yes | no | Zygoptera: | yes | no |
| Copepods: | yes | no | Hydrophilidae: | yes | no |
| Ostracods | yes | no | Dytiscidae: | yes | no |
| Fish | yes | no | Corixidae: | yes | no |
| Frogs | yes | no | Notonectidae: | yes | no |
| Salamanders | yes | no | Belostomatidae: | yes | no |
| Waterfowl | yes | no | Other (specify)_____ | | |
| Other (specify)_____ | | | | | |

Voucher Specimens

Specimens shall be preserved according to the standards of the institution in which they will be accessioned.

| Species | # Individuals | Accession/Catalog # | Pool # |
|---|---|---|---|
| | N/A | | |

2/3/15

33-4

**U.S. Fish and Wildlife Service Vernal Pool Data Sheet**
**Wet Season Survey**

Note: Please fill out the required information completely for each site visit.

This form is being submitted to serve as part of the 90-day report: ✓ no ___ yes

Required color slides and/or photographs for the project site are included: ✓ no ___ yes

Date: 2/3/15 Time: 1426 County: SD Quad: S.C.

Collector(s): R. Stolpe / M. Tu Permit #: TE8355495

Site/Project Name: TL695 Pool #: 43-1(33-4)

Township: N/A Range: N/A Section: N/A 33.38 lat. 117.56 long.

Temperature: Water: N/A °C Air: 21.5 °C

Pool Depth:
at time of sampling: Ø cm
estimated maximum: — cm

Surface Area:
at time of sampling: Ø m x Ø m
estimated maximum: — m x — m

Habitat Condition: (circle where appropriate)

- undisturbed disturbed: (tire tracks) garbage discing/plowing
- ungrazed grazed: cattle horses sheep other_____ light moderate heavy
- land use of habitat: dirt road / Alpha 2 T.A.

(Optional) Water Chemistry Data

Alkalinity (total):____ppm or mg/l Conductivity:_____uMHO

Dissolved $NH_4$:_____ppt or ppm Dissolved Oxygen:_____ppm or mg/l

pH:_____ Turbidity: (secchi disc depth)_____cm or: clear to bottom _____

Salinity :_____ppt or ppm Total Dissolved Solids (TDS):_____ppm

Notes: Dry/damp



**U.S. Fish and Wildlife Service Vernal Pool Data Sheet**
**Wet Season Survey**

Note: Please fill out the required information completely for each site visit.

Species Observations: state none or estimate # of individuals present in terms of an order of magnitude (e.g., 10's, 100's, 1000's)

Anostracans:
(note reproductive status) None

Notostracans:
(note reproductive status) None

Species Observations (Optional) :

| | | | | | |
|---|---|---|---|---|---|
| Cladocerans: | yes | no | Insects: (adult or larvae) | | |
| Conchostracans: | yes | no | Anisoptera: | yes | no |
| Copepods: | yes | no | Zygoptera: | yes | no |
| Ostracods | (yes) | no | Hydrophilidae: | yes | no |
| Fish | yes | no | Dytiscidae: | yes | no |
| Frogs | yes | no | Corixidae: | yes | no |
| Salamanders | yes | no | Notonectidae: | yes | no |
| Waterfowl | yes | no | Belostomatidae: | yes | no |
| Other (specify) | | | Other (specify) | | |

Voucher Specimens

Specimens shall be preserved according to the standards of the institution in which they will be accessioned.

| Species | # Individuals | Accession/Catalog # | Pool # |
|---|---|---|---|
| | N/A | | |

3/6/15

33-4

**U.S. Fish and Wildlife Service Vernal Pool Data Sheet**
**Wet Season Survey**

Note: Please fill out the required information completely for each site visit.

This form is being submitted to serve as part of the 90-day report: ___ no ✓ yes

Required color slides and/or photographs for the project site are included: ___ no ✓ yes

Date: 3/6/15 Time: 0827 County: SD Quad: S.C.

Collector(s): R. Stolpe / J. Asmus Permit #: TE-835549-5 / none

Site/Project Name: TL695 Pool #: 43-1 (33-4)

Township: N/A Range: N/A Section: N/A 33.38 lat 117.56 long.

Temperature: Water: — °C Air: 15.5 °C

Pool Depth:
at time of sampling: 5 cm
estimated maximum: — cm

Surface Area:
at time of sampling: ____ m x ____ m
estimated maximum: — m x — m

Habitat Condition: (circle where appropriate)

- undisturbed disturbed: (tire tracks) garbage discing/plowing
- ungrazed grazed: cattle horses sheep other____
  light moderate heavy
- land use of habitat: dirt road / Alpha Two training area

(Optional) Water Chemistry Data

Alkalinity (total):____ppm or mg/l Conductivity:____uMHO

Dissolved $NH_4$:____ppt or ppm Dissolved Oxygen:____ppm or mg/l

pH:____ Turbidity: (secchi disc depth)____cm or: clear to bottom ____

Salinity:____ppt or ppm Total Dissolved Solids (TDS):____ppm

Notes:



**U.S. Fish and Wildlife Service Vernal Pool Data Sheet**
**Wet Season Survey**

Note: Please fill out the required information completely for each site visit.

Species Observations: state none or estimate # of individuals present in terms of an order of magnitude (e.g., 10's, 100's, 1000's)

Anostracans:
(note reproductive status) None

Notostracans:
(note reproductive status) None

Species Observations (Optional):

| | | | Insects: (adult or larvae) | | |
|---|---|---|---|---|---|
| Cladocerans: | yes | no | Anisoptera: | yes | no |
| Conchostracans: | yes | no | Zygoptera: | yes | no |
| Copepods: | yes | no | Hydrophilidae: | yes | no |
| Ostracods | yes | no | Dytiscidae: | yes | no |
| Fish | yes | no | Corixidae: | yes | no |
| Frogs | yes | no | Notonectidae: | yes | no |
| Salamanders | yes | no | Belostomatidae: | yes | no |
| Waterfowl | yes | no | Other (specify)_____ | | |
| Other (specify)_____ | | | | | |

Voucher Specimens

Specimens shall be preserved according to the standards of the institution in which they will be accessioned.

| Species | # Individuals | Accession/Catalog # | Pool # |
|---|---|---|---|
| N/A | | | |

3/9/15

334

**U.S. Fish and Wildlife Service Vernal Pool Data Sheet**
**Wet Season Survey**

Note: Please fill out the required information completely for each site visit.

This form is being submitted to serve as part of the 90-day report: ____ no ✓ yes

Required color slides and/or photographs for the project site are included: ____ no ✓ yes

Date: 3/9/15 Time: 1222 County: SD Quad: S.C

Collector(s): R. Stolpe / M. Tu Permit #: TE835549S

Site/Project Name: TL695 Pool #: 43-1(334)

Township: N/A Range: N/A Section: N/A 33.38 lat. 117.56 long.

Temperature: Water: — °C Air: 18.8 °C

Pool Depth:
at time of sampling: 3 cm
estimated maximum: — cm

Surface Area:
at time of sampling: ____ m x ____ m
estimated maximum: — m x — m

Habitat Condition: (circle where appropriate)

- undisturbed disturbed: (tire tracks) garbage discing/plowing
- ungrazed grazed: cattle horses sheep other____
  light moderate heavy
- land use of habitat: dirt road / Alpha 2 T.A.

(Optional) Water Chemistry Data

Alkalinity (total): ____ ppm or mg/l Conductivity: ____ uMHO

Dissolved $NH_4$: ____ ppt or ppm Dissolved Oxygen: ____ ppm or mg/l

pH: ____ Turbidity: (secchi disc depth) ____ cm or: clear to bottom ____

Salinity: ____ ppt or ppm Total Dissolved Solids (TDS): ____ ppm

Notes: FS collected 8M/4F
B. lindahli



**U.S. Fish and Wildlife Service Vernal Pool Data Sheet**
**Wet Season Survey**

Note: Please fill out the required information completely for each site visit.

Species Observations: state none or estimate # of individuals present in terms of an order of magnitude (e.g., 10's, 100's, 1000's)

Anostracans:
(note reproductive status) 10s (submature)

Notostracans:
(note reproductive status) None

Species Observations (Optional):

| | | | | | |
|---|---|---|---|---|---|
| Cladocerans: | yes | no | Insects: (adult or larvae) | | |
| Conchostracans: | yes | no | Anisoptera: | yes | no |
| Copepods: | yes | no | Zygoptera: | yes | no |
| Ostracods | yes | no | Hydrophilidae: | yes | no |
| Fish | yes | no | Dytiscidae: | yes | no |
| Frogs | yes | no | Corixidae: | yes | no |
| Salamanders | yes | no | Notonectidae: | yes | no |
| Waterfowl | yes | no | Belostomatidae: | yes | no |
| Other (specify) ____ | | | Other (specify) ____ | | |

Voucher Specimens

Specimens shall be preserved according to the standards of the institution in which they will be accessioned.

| Species | # Individuals | Accession/Catalog # | Pool # |
|---|---|---|---|

3/13/15

33-4

**U.S. Fish and Wildlife Service Vernal Pool Data Sheet**
**Wet Season Survey**

Note: Please fill out the required information completely for each site visit.

This form is being submitted to serve as part of the 90-day report: ___ no ✓ yes

Required color slides and/or photographs for the project site are included: ___ no ✓ yes

Date: 3/13/15 Time: 0948 County: SD Quad: S.C

Collector(s): R. Stolpe / M. Tu Permit #: TE835595

Site/Project Name: TL695 Pool #: 43-1(33-4)

Township: N/A Range: N/A Section: N/A 3338 lat. 117.56 long.

Temperature: Water: — °C Air: 25 °C

Pool Depth:
at time of sampling: Ø cm
estimated maximum: — cm

Surface Area:
at time of sampling: Ø m x Ø m
estimated maximum: — m x — m

Habitat Condition: (circle where appropriate)

- undisturbed disturbed: (tire tracks) garbage discing/plowing
- ungrazed grazed: cattle horses sheep other_____
  light moderate heavy
- land use of habitat: dirt road / Alpha 2 T.A.

(Optional) Water Chemistry Data

Alkalinity (total):_____ppm or mg/l Conductivity:_____uMHO

Dissolved $NH_4$:_____ppt or ppm Dissolved Oxygen:_____ppm or mg/l

pH:_____ Turbidity: (secchi disc depth)_____cm or: clear to bottom _____

Salinity :_____ppt or ppm Total Dissolved Solids (TDS):_____ppm

Notes: Dry



**U.S. Fish and Wildlife Service Vernal Pool Data Sheet**
**Wet Season Survey**

Note: Please fill out the required information completely for each site visit.

Species Observations: state none or estimate # of individuals present in terms of an order of magnitude (e.g., 10's, 100's, 1000's)

Anostracans:
(note reproductive status) None

Notostracans:
(note reproductive status) None

Species Observations (Optional) :

| | | | Insects: (adult or larvae) | | |
|---|---|---|---|---|---|
| Cladocerans: | yes | no | Anisoptera: | yes | no |
| Conchostracans: | yes | no | Zygoptera: | yes | no |
| Copepods: | yes | no | Hydrophilidae: | yes | no |
| Ostracods | yes | no | Dytiscidae: | yes | no |
| Fish | yes | no | Corixidae: | yes | no |
| Frogs | yes | no | Notonectidae: | yes | no |
| Salamanders | yes | no | Belostomatidae: | yes | no |
| Waterfowl | yes | no | | | |
| Other (specify)_____ | | | Other (specify)_____ | | |

Voucher Specimens

Specimens shall be preserved according to the standards of the institution in which they will be accessioned.

| Species | # Individuals | Accession/Catalog # | Pool # |
|---|---|---|---|
| | | N/A | |

3/20/15

33-4

**U.S. Fish and Wildlife Service Vernal Pool Data Sheet**
**Wet Season Survey**

Note: Please fill out the required information completely for each site visit.

This form is being submitted to serve as part of the 90-day report: ____ no ✓ yes

Required color slides and/or photographs for the project site are included: ✓ no ____ yes

Date: 3/2015 Time: 1242 County: SD Quad: S.C.

Collector(s): R. Stolpe / M. Tu Permit #: TE835549S

Site/Project Name: TL695 Pool #: 43-1(33-4)

Township: N/A Range: N/A Section: N/A 33.38 lat. 117.56 long.

Temperature: Water: N/A °C Air: 22.2 °C

Pool Depth:
at time of sampling: Ø cm
estimated maximum: — cm

Surface Area:
at time of sampling: Ø m x Ø m
estimated maximum: — m x — m

Habitat Condition: (circle where appropriate)

- undisturbed disturbed: (tire tracks) garbage discing/plowing
- ungrazed grazed: cattle horses sheep other_____ light moderate heavy
- land use of habitat: dirt road / Alpha 2 T.A.

(Optional) Water Chemistry Data

Alkalinity (total):____ppm or mg/l Conductivity:_____uMHO

Dissolved $NH_4$:_____ppt or ppm Dissolved Oxygen:_____ppm or mg/l

pH:_____ Turbidity: (secchi disc depth)_____cm or: clear to bottom ____

Salinity :_____ppt or ppm Total Dissolved Solids (TDS):_____ppm

Notes:



**U.S. Fish and Wildlife Service Vernal Pool Data Sheet**
**Wet Season Survey**

Note: Please fill out the required information completely for each site visit.

Species Observations: state none or estimate # of individuals present in terms of an order of magnitude (e.g., 10's, 100's, 1000's)

Anostracans:
(note reproductive status) None

Notostracans:
(note reproductive status) None

Species Observations (Optional) :

| | | | | | |
|---|---|---|---|---|---|
| Cladocerans: | yes | no | Insects: (adult or larvae) | | |
| Conchostracans: | yes | no | Anisoptera: | yes | no |
| Copepods: | yes | no | Zygoptera: | yes | no |
| Ostracods | yes | no | Hydrophilidae: | yes | no |
| Fish | yes | no | Dytiscidae: | yes | no |
| Frogs | yes | no | Corixidae: | yes | no |
| Salamanders | yes | no | Notonectidae: | yes | no |
| Waterfowl | yes | no | Belostomatidae: | yes | no |
| Other (specify) _____ | | | Other (specify) _____ | | |

Voucher Specimens

Specimens shall be preserved according to the standards of the institution in which they will be accessioned.

| Species | # Individuals | Accession/Catalog # | Pool # |
|---|---|---|---|
| | N/A | | |

3/26/15

33-4

**U.S. Fish and Wildlife Service Vernal Pool Data Sheet**
**Wet Season Survey**

Note: Please fill out the required information completely for each site visit.

This form is being submitted to serve as part of the 90-day report: ____ no ✓ yes

Required color slides and/or photographs for the project site are included: ✓ no ____ yes

Date: 3/26/15 Time: _____ County: SD Quad: S.C.

Collector(s): R. Stolpe Permit #: TE835495

Site/Project Name: TL695 Pool #: 43-1(33-4)

Township: N/A Range: N/A Section: N/A 33.30 lat. -117.56 long.

Temperature: Water: N/A °C Air: _____ °C

Pool Depth:
at time of sampling: Ø cm
estimated maximum: — cm

Surface Area:
at time of sampling: Ø m x Ø m
estimated maximum: — m x — m

Habitat Condition: (circle where appropriate)

- undisturbed disturbed: (tire tracks) garbage discing/plowing
- ungrazed grazed: cattle horses sheep other_____
  light moderate heavy
- land use of habitat: dirt road / Alpha 2 T.A.

(Optional) Water Chemistry Data

Alkalinity (total):_____ppm or mg/l Conductivity:_____uMHO

Dissolved $NH_4$:_____ppt or ppm Dissolved Oxygen:_____ppm or mg/l

pH:_____ Turbidity: (secchi disc depth)_____cm or: clear to bottom _____

Salinity:_____ppt or ppm Total Dissolved Solids (TDS):_____ppm

Notes:



**U.S. Fish and Wildlife Service Vernal Pool Data Sheet**
**Wet Season Survey**

Note: Please fill out the required information completely for each site visit.

Species Observations: state none or estimate # of individuals present in terms of an order of magnitude (e.g., 10's, 100's, 1000's)

Anostraeans:
(note reproductive status) None

Notostracans:
(note reproductive status) None

Species Observations (Optional) :

| | | | Insects: (adult or larvae) | | |
|---|---|---|---|---|---|
| Cladocerans: | yes | no | Anisoptera: | yes | no |
| Conchostracans: | yes | no | Zygoptera: | yes | no |
| Copepods: | yes | no | Hydrophilidae: | yes | no |
| Ostracods | yes | no | Dytiscidae: | yes | no |
| Fish | yes | no | Corixidae: | yes | no |
| Frogs | yes | no | Notonectidae: | yes | no |
| Salamanders | yes | no | Belostomatidae: | yes | no |
| Waterfowl | yes | no | Other (specify) _____ | | |
| Other (specify) _____ | | | | | |

Voucher Specimens

Specimens shall be preserved according to the standards of the institution in which they will be accessioned.

| Species | # Individuals | Accession/Catalog # | Pool # |
|---|---|---|---|
| N/A | | | |

4/2/15

33-4

**U.S. Fish and Wildlife Service Vernal Pool Data Sheet**
**Wet Season Survey**

Note: Please fill out the required information completely for each site visit.

This form is being submitted to serve as part of the 90-day report: ____ no ✓ yes

Required color slides and/or photographs for the project site are included: ✓ no ____ yes

Date: 4/2/15 Time: _____ County: SD Quad: S.C

Collector(s): R. Stolpe Permit #: TE835495

Site/Project Name: TL 695 Pool #: 43-1(33-4)

Township: N/A Range: N/A Section: N/A 33.38 lat. -117.56 long.

Temperature: Water: N/A °C Air: _____ °C

Pool Depth:
at time of sampling: 0 cm
estimated maximum: — cm

Surface Area:
at time of sampling: 0 m x 0 m
estimated maximum: — m x — m

Habitat Condition: (circle where appropriate)

- undisturbed disturbed: (tire tracks) garbage discing/plowing
- ungrazed grazed: cattle horses sheep other_____
  light moderate heavy
- land use of habitat: dirt road/Alpha 2 T.A.

(Optional) Water Chemistry Data

Alkalinity (total):_____ppm or mg/l Conductivity:_____uMHO

Dissolved $NH_4$:_____ppt or ppm Dissolved Oxygen:_____ppm or mg/l

pH:_____ Turbidity: (secchi disc depth)_____cm or: clear to bottom ____

Salinity :_____ppt or ppm Total Dissolved Solids (TDS):_____ppm

Notes: Dry



**U.S. Fish and Wildlife Service Vernal Pool Data Sheet**
**Wet Season Survey**

Note: Please fill out the required information completely for each site visit.

Species Observations: state none or estimate # of individuals present in terms of an order of magnitude (e.g., 10's, 100's, 1000's)

Anostracans:
(note reproductive status) None

Notostracans:
(note reproductive status) None

Species Observations (Optional) :

| | | | Insects: (adult or larvae) | | |
|---|---|---|---|---|---|
| Cladocerans: | yes | no | Anisoptera: | yes | no |
| Conchostracans: | yes | no | Zygoptera: | yes | no |
| Copepods: | yes | no | Hydrophilidae: | yes | no |
| Ostracods | yes | no | Dytiscidae: | yes | no |
| Fish | yes | no | Corixidae: | yes | no |
| Frogs | yes | no | Notonectidae: | yes | no |
| Salamanders | yes | no | Belostomatidae: | yes | no |
| Waterfowl | yes | no | Other (specify) _____ | | |
| Other (specify) _____ | | | | | |

Voucher Specimens

Specimens shall be preserved according to the standards of the institution in which they will be accessioned.

| Species | # Individuals | Accession/Catalog # | Pool # |
|---|---|---|---|
| | N/A | | |

5/1/15

33-4

**U.S. Fish and Wildlife Service Vernal Pool Data Sheet**
**Wet Season Survey**

Note: Please fill out the required information completely for each site visit.

This form is being submitted to serve as part of the 90-day report: ____ no ✓ yes

Required color slides and/or photographs for the project site are included: ____ no ✓ yes

Date: 5/1/15 Time: 0830 County: SD Quad: S.C

Collector(s): R. Stolpe / C. Scheuerman Permit #: TE8355495
TE448554D

Site/Project Name: TL695 Pool #: 33-4

Township: N/A Range: N/A Section: N/A 33.38 lat. 117.56 long.

Temperature: Water: N/A °C Air: 23.3 °C

Pool Depth:
at time of sampling: Ø cm
estimated maximum: — cm

Surface Area:
at time of sampling: Ø m x Ø m
estimated maximum: — m x — m

Habitat Condition: (circle where appropriate)

- undisturbed disturbed: (tire tracks) garbage discing/plowing
- ungrazed grazed: cattle horses sheep other_____
  light moderate heavy
- land use of habitat: dirt road / Alpha 2 T.A.

(Optional) Water Chemistry Data

Alkalinity (total):_____ppm or mg/l Conductivity:_____uMHO

Dissolved $NH_4$:_____ppt or ppm Dissolved Oxygen:_____ppm or mg/l

pH:_____ Turbidity: (secchi disc depth)_____cm or: clear to bottom ____

Salinity :_____ppt or ppm Total Dissolved Solids (TDS):_____ppm

Notes: Dry



**U.S. Fish and Wildlife Service Vernal Pool Data Sheet**
**Wet Season Survey**

Note: Please fill out the required information completely for each site visit.

Species Observations: state none or estimate # of individuals present in terms of an order of magnitude (e.g., 10's, 100's, 1000's)

Anostracans:
(note reproductive status) None

Notostracans:
(note reproductive status) None

Species Observations (Optional) :

| | | | | | |
|---|---|---|---|---|---|
| Cladocerans: | yes | no | Insects: (adult or larvae) | | |
| Conchostracans: | yes | no | Anisoptera: | yes | no |
| Copepods: | yes | no | Zygoptera: | yes | no |
| Ostracods | yes | no | Hydrophilidae: | yes | no |
| Fish | yes | no | Dytiscidae: | yes | no |
| Frogs | yes | no | Corixidae: | yes | no |
| Salamanders | yes | no | Notonectidae: | yes | no |
| Waterfowl | yes | no | Belostomatidae: | yes | no |
| Other (specify)_____ | | | Other (specify)_____ | | |

Voucher Specimens

Specimens shall be preserved according to the standards of the institution in which they will be accessioned.

| Species | # Individuals | Accession/Catalog # | Pool # |
|---|---|---|---|
| | | N/A | |

5/20/15

33-4

**U.S. Fish and Wildlife Service Vernal Pool Data Sheet**
**Wet Season Survey**

Note: Please fill out the required information completely for each site visit.

This form is being submitted to serve as part of the 90-day report: ____ no ✓ yes

Required color slides and/or photographs for the project site are included: ____ no ✓ yes

Date: 5/20/15 Time: 1432 County: _____ Quad: _____

Collector(s): R. Stolpe Permit #: TE835495

Site/Project Name: TL695 Pool #: _____

Township: _____ Range: _____ Section: _____ _____lat._____long.

Temperature: Water: N/A °C Air: 20 °C

Pool Depth:
at time of sampling: Ø cm
estimated maximum: _____cm

Surface Area:
at time of sampling: Ø m x Ø m
estimated maximum: _____m x _____m

Habitat Condition: (circle where appropriate)

- undisturbed — disturbed: (tire tracks) garbage discing/plowing
- ungrazed — grazed: cattle horses sheep other_____ light moderate heavy
- land use of habitat: dirt road / Alpha 2 T.A.

(Optional) Water Chemistry Data

Alkalinity (total):_____ppm or mg/l Conductivity:_____uMHO

Dissolved $NH_4$:_____ppt or ppm Dissolved Oxygen:_____ppm or mg/l

pH:_____ Turbidity: (secchi disc depth)_____cm or: clear to bottom ____

Salinity :_____ppt or ppm Total Dissolved Solids (TDS):_____ppm

Notes: Dry



**U.S. Fish and Wildlife Service Vernal Pool Data Sheet**
**Wet Season Survey**

Note: Please fill out the required information completely for each site visit.

Species Observations: state none or estimate # of individuals present in terms of an order of magnitude (e.g., 10's, 100's, 1000's)

Anostracans:
(note reproductive status)

Notostracans:
(note reproductive status)

Species Observations (Optional) :

| | | | | | |
|---|---|---|---|---|---|
| Cladocerans: | yes | no | Insects: (adult or larvae) | | |
| Conchostracans: | yes | no | Anisoptera: | yes | no |
| Copepods: | yes | no | Zygoptera: | yes | no |
| Ostracods | yes | no | Hydrophilidae: | yes | no |
| Fish | yes | no | Dytiscidae: | yes | no |
| Frogs | yes | no | Corixidae: | yes | no |
| Salamanders | yes | no | Notonectidae: | yes | no |
| Waterfowl | yes | no | Belostomatidae: | yes | no |
| Other (specify) _____ | | | Other (specify) _____ | | |

Voucher Specimens

Specimens shall be preserved according to the standards of the institution in which they will be accessioned.

| Species | # Individuals | Accession/Catalog # | Pool # |
|---|---|---|---|

7/21/15

33-4

**U.S. Fish and Wildlife Service Vernal Pool Data Sheet**
**Wet Season Survey**

Note: Please fill out the required information completely for each site visit.

This form is being submitted to serve as part of the 90-day report: ___ no ✓ yes

Required color slides and/or photographs for the project site are included: ___ no ✓ yes

Date: 7/21/15 Time: 1355 County: SD Quad: S.C.

Collector(s): R. Stolpe / J. Asmus Permit #: TE-835549-5

Site/Project Name: TL695 Pool #: 33-4

Township: N/A Range: N/A Section: N/A 33.38 lat 117.56 long.

Temperature: Water: N/A °C Air: 25 °C

Pool Depth:
at time of sampling: Ø cm
estimated maximum: — cm

Surface Area:
at time of sampling: Ø m x Ø m
estimated maximum: — m x — m

Habitat Condition: (circle where appropriate)

- undisturbed disturbed: (tire tracks) garbage discing/plowing
- ungrazed grazed: cattle horses sheep other_____
  light moderate heavy
- land use of habitat: dirt road / Alpha Two training area

(Optional) Water Chemistry Data

Alkalinity (total):_____ppm or mg/l Conductivity:_____uMHO

Dissolved $NH_4$:_____ppt or ppm Dissolved Oxygen:_____ppm or mg/l

pH:_____ Turbidity: (secchi disc depth)_____cm or: clear to bottom ____

Salinity :_____ppt or ppm Total Dissolved Solids (TDS):_____ppm

Notes:



**U.S. Fish and Wildlife Service Vernal Pool Data Sheet**
**Wet Season Survey**

Note: Please fill out the required information completely for each site visit.

Species Observations: state none or estimate # of individuals present in terms of an order of magnitude (e.g., 10's, 100's, 1000's)

Anostracans:
(note reproductive status) None

Notostracans:
(note reproductive status) None

Species Observations (Optional) :

| | | | Insects: (adult or larvae) | | |
|---|---|---|---|---|---|
| Cladocerans: | yes | no | | | |
| Conchostracans: | yes | no | Anisoptera: | yes | no |
| Copepods: | yes | no | Zygoptera: | yes | no |
| Ostracods | yes | no | Hydrophilidae: | yes | no |
| Fish | yes | no | Dytiscidae: | yes | no |
| Frogs | yes | no | Corixidae: | yes | no |
| Salamanders | yes | no | Notonectidae: | yes | no |
| Waterfowl | yes | no | Belostomatidae: | yes | no |
| Other (specify) _____ | | | Other (specify) _____ | | |

Voucher Specimens

Specimens shall be preserved according to the standards of the institution in which they will be accessioned.

| Species | # Individuals | Accession/Catalog # | Pool # |
|---|---|---|---|
| | N/A | | |

2/3/15

33-10

**U.S. Fish and Wildlife Service Vernal Pool Data Sheet**
**Wet Season Survey**

Note: Please fill out the required information completely for each site visit.

This form is being submitted to serve as part of the 90-day report: ✓ no ___ yes

Required color slides and/or photographs for the project site are included: ✓ no ___ yes

Date: 2/3/15 Time: 1328 County: SD Quad: S.C.

Collector(s): R. Stolpe / M. Tu Permit #: TE835495

Site/Project Name: TL695 Pool #: 44-2 (33-10)

Township: N/A Range: N/A Section: N/A 33.38 lat. -117.56 long.

Temperature: Water: N/A °C Air: 21.3 °C

Pool Depth:
at time of sampling: Ø cm
estimated maximum: — cm

Surface Area:
at time of sampling: Ø m x Ø m
estimated maximum: — m x — m

Habitat Condition: (circle where appropriate)

- undisturbed disturbed: (tire tracks) garbage discing/plowing
- ungrazed grazed: cattle horses sheep other_____
  light moderate heavy
- land use of habitat: dirt road / Alpha 2 T.A.

(Optional) Water Chemistry Data

Alkalinity (total):_____ppm or mg/l Conductivity:_____uMHO

Dissolved $NH_4$:_____ppt or ppm Dissolved Oxygen:_____ppm or mg/l

pH:_____ Turbidity: (secchi disc depth)_____cm or: clear to bottom ____

Salinity :_____ppt or ppm Total Dissolved Solids (TDS):_____ppm

Notes: Damp / dry



**U.S. Fish and Wildlife Service Vernal Pool Data Sheet**
**Wet Season Survey**

Note: Please fill out the required information completely for each site visit.

Species Observations: state none or estimate # of individuals present in terms of an order of magnitude (e.g., 10's, 100's, 1000's)

Anostracans:
(note reproductive status) None

Notostracans:
(note reproductive status) None

Species Observations (Optional) :

| | | | Insects: (adult or larvae) | | |
|---|---|---|---|---|---|
| Cladocerans: | yes | no | Anisoptera: | yes | no |
| Conchostracans: | yes | no | Zygoptera: | yes | no |
| Copepods: | yes | no | Hydrophilidae: | yes | no |
| Ostracods | yes | no | Dytiscidae: | yes | no |
| Fish | yes | no | Corixidae: | yes | no |
| Frogs | yes | no | Notonectidae: | yes | no |
| Salamanders | yes | no | Belostomatidae: | yes | no |
| Waterfowl | yes | no | | | |
| Other (specify) | | | Other (specify) | | |

Voucher Specimens

Specimens shall be preserved according to the standards of the institution in which they will be accessioned.

| Species | # Individuals | Accession/Catalog # | Pool # |
|---|---|---|---|
| | N/A | | |

3/6/15

33-10

**U.S. Fish and Wildlife Service Vernal Pool Data Sheet**
**Wet Season Survey**

Note: Please fill out the required information completely for each site visit.

This form is being submitted to serve as part of the 90-day report: ____ no ✓ yes

Required color slides and/or photographs for the project site are included: ____ no ✓ yes

Date: 3/6/15 Time: 0933 County: SD Quad: S.C.

Collector(s): R. Stolpe/J. Asmus Permit #: TE-835549-5/none

Site/Project Name: TL695 Pool #: 44-2(33-10)

Township: N/A Range: N/A Section: N/A 33.38 lat 117.56 long.

Temperature: Water: — °C Air: 23.7 °C

Pool Depth:
at time of sampling: 11 cm
estimated maximum: — cm

Surface Area:
at time of sampling: _____ m x _____ m
estimated maximum: — m x — m

Habitat Condition: (circle where appropriate)

- undisturbed disturbed: (tire tracks) garbage discing/plowing
- ungrazed grazed: cattle horses sheep other _____ light moderate heavy
- land use of habitat: dirt road/Alpha Two T.A.

(Optional) Water Chemistry Data

Alkalinity (total): _____ ppm or mg/l Conductivity: _____ uMHO

Dissolved $NH_4$: _____ ppt or ppm Dissolved Oxygen: _____ ppm or mg/l

pH: _____ Turbidity: (secchi disc depth) _____ cm or: clear to bottom ____

Salinity: _____ ppt or ppm Total Dissolved Solids (TDS): _____ ppm

Notes: FS collected 6M/1F
B. lindahli



**U.S. Fish and Wildlife Service Vernal Pool Data Sheet**
**Wet Season Survey**

Note: Please fill out the required information completely for each site visit.

Species Observations: state none or estimate # of individnals present in terms of an order of magnitude (e.g., 10's, 100's, 1000's)

Anostracans:
(note reproductive status) 100s (mature)

Notostracans:
(note reproductive status) None

Species Observations (Optional):

| | | | | | |
|---|---|---|---|---|---|
| Cladocerans: | yes | no | Insects: (adult or larvae) | | |
| Conchostracans: | yes | no | Anisoptera: | yes | no |
| Copepods: | yes | no | Zygoptera: | yes | no |
| Ostracods | yes | no | Hydrophilidae: | yes | no |
| Fish | yes | no | Dytiscidae: | yes | no |
| Frogs | yes | no | Corixidae: | yes | no |
| Salamanders | yes | no | Notonectidae: | yes | no |
| Waterfowl | yes | no | Belostomatidae: | yes | no |
| Other (specify) _____ | | | Other (specify) _____ | | |

Voucher Specimens

Specimens shall be preserved according to the standards of the institution in which they will be accessioned.

| Species | # Individuals | Accession/Catalog # | Pool # |
|---|---|---|---|

3/9/15

33-10

**U.S. Fish and Wildlife Service Vernal Pool Data Sheet**
**Wet Season Survey**

Note: Please fill out the required information completely for each site visit.

This form is being submitted to serve as part of the 90-day report: ___ no ✓ yes

Required color slides and/or photographs for the project site are included: ___ no ✓ yes

Date: 3/9/15 Time: 1325 County: SD Quad: S.C.

Collector(s): R. Stolpe / M. Tu Permit #: TE8355495

Site/Project Name: TL695 Pool #: 44-2 (33-10)

Township: N/A Range: N/A Section: N/A 33.38 lat. 117.56 long.

Temperature: Water: — °C Air: 19 °C

Pool Depth:
at time of sampling: 10 cm
estimated maximum: — cm

Surface Area:
at time of sampling: ____ m x ____ m
estimated maximum: — m x — m

Habitat Condition: (circle where appropriate)

- undisturbed disturbed: (tire tracks) garbage discing/plowing
- ungrazed grazed: cattle horses sheep other____ light moderate heavy
- land use of habitat: dirt road / Alpha 2 T.A.

(Optional) Water Chemistry Data

Alkalinity (total): ____ ppm or mg/l Conductivity: ____ uMHO

Dissolved $NH_3$: ____ ppt or ppm Dissolved Oxygen: ____ ppm or mg/l

pH: ____ Turbidity: (secchi disc depth) ____ cm or: clear to bottom ____

Salinity: ____ ppt or ppm Total Dissolved Solids (TDS): ____ ppm

Notes:
FS collected 8M/0F
B. lindahli



**U.S. Fish and Wildlife Service Vernal Pool Data Sheet**
**Wet Season Survey**

Note: Please fill out the required information completely for each site visit.

Species Observations: state none or estimate # of individuals present in terms of an order of magnitude (e.g., 10's, 100's, 1000's)

Anostracans:
(note reproductive status) 100s (mature)

Notostracans:
(note reproductive status) None

Species Observations (Optional):

| | | | Insects: (adult or larvae) | | |
|---|---|---|---|---|---|
| Cladocerans: | yes | no | | | |
| Conchostracans: | yes | no | Anisoptera: | yes | no |
| Copepods: | yes | no | Zygoptera: | yes | no |
| Ostracods | yes | no | Hydrophilidae: | yes | no |
| Fish | yes | no | Dytiscidae: | yes | no |
| Frogs | (yes) | no | Corixidae: | yes | no |
| Salamanders | yes | no | Notonectidae: | yes | no |
| Waterfowl | yes | no | Belostomatidae: | yes | no |
| Other (specify) ____ | | | Other (specify) ____ | | |

Voucher Specimens

Specimens shall be preserved according to the standards of the institution in which they will be accessioned.

| Species | # Individuals | Accession/Catalog # | Pool # |
|---|---|---|---|

3/13/15

33-10

**U.S. Fish and Wildlife Service Vernal Pool Data Sheet**
**Wet Season Survey**

Note: Please fill out the required information completely for each site visit.

This form is being submitted to serve as part of the 90-day report: ____ no ✓ yes

Required color slides and/or photographs for the project site are included: ____ no ✓ yes

Date: 3/13/15 Time: 1026 County: SD Quad: S.C.

Collector(s): B. Stalpe / M. Tu Permit #: TE8355495

Site/Project Name: TL695 Pool #: 44-2 (33-10)

Township: N/A Range: N/A Section: N/A 33.38 lat. 117.56 long.

Temperature: Water: — °C Air: 28 °C

Pool Depth:
at time of sampling: 7 cm
estimated maximum: — cm

Surface Area:
at time of sampling: ____ m x ____ m
estimated maximum: — m x — m

Habitat Condition: (circle where appropriate)

- undisturbed disturbed: (tire tracks) garbage discing/plowing
- ungrazed grazed: cattle horses sheep other____
  light moderate heavy
- land use of habitat: dirt road / Alpha 2 T.A.

(Optional) Water Chemistry Data

Alkalinity (total): ____ ppm or mg/l Conductivity: ____ uMHO

Dissolved $NH_4$: ____ ppt or ppm Dissolved Oxygen: ____ ppm or mg/l

pH: ____ Turbidity: (secchi disc depth) ____ cm or: clear to bottom ____

Salinity: ____ ppt or ppm Total Dissolved Solids (TDS): ____ ppm

Notes:

FS collected 6M/1F

B. lindahl: 1

**U.S. Fish and Wildlife Service Vernal Pool Data Sheet**
**Wet Season Survey**

Note: Please fill out the required information completely for each site visit.

Species Observations: state none or estimate # of individuals present in terms of an order of magnitude (e.g., 10's, 100's, 1000's)

Anostracans:
(note reproductive status) 100s (mature)

Notostracans:
(note reproductive status) None

Species Observations (Optional):

| | | | | | |
|---|---|---|---|---|---|
| Cladocerans: | yes | no | Insects: (adult or larvae) | | |
| Conchostracans: | yes | no | Anisoptera: | yes | no |
| Copepods: | yes | no | Zygoptera: | yes | no |
| Ostracods | yes | no | Hydrophilidae: | yes | no |
| Fish | yes | no | Dytiscidae: | yes | no |
| Frogs | yes | no | Corixidae: | yes | no |
| Salamanders | yes | no | Notonectidae: | yes | no |
| Waterfowl | yes | no | Belostomatidae: | yes | no |
| Other (specify) ____ | | | Other (specify) ____ | | |

Voucher Specimens

Specimens shall be preserved according to the standards of the institution in which they will be accessioned.

| Species | # Individuals | Accession/Catalog # | Pool # |
|---|---|---|---|

3/20/15

33-10

**U.S. Fish and Wildlife Service Vernal Pool Data Sheet**
**Wet Season Survey**

Note: Please fill out the required information completely for each site visit.

This form is being submitted to serve as part of the 90-day report: ____ no ✓ yes

Required color slides and/or photographs for the project site are included: ✓ no ____ yes

Date: 3/2015 Time: 1325 County: SD Quad: S.C.

Collector(s): R. Stolpe / M. Tu Permit #: TE8355495

Site/Project Name: TL695 Pool #: 44-2 (33-10)

Township: N/A Range: N/A Section: N/A 3338 lat. -117.56 long.

Temperature: Water: N/A °C Air: 23 °C

Pool Depth:
at time of sampling: Ø cm
estimated maximum: — cm

Surface Area:
at time of sampling: Ø m x Ø m
estimated maximum: — m x — m

Habitat Condition: (circle where appropriate)

- undisturbed disturbed: (tire tracks) garbage discing/plowing
- ungrazed grazed: cattle horses sheep other_____
  light moderate heavy
- land use of habitat: dirt road / Alpha 2 T.A.

(Optional) Water Chemistry Data

Alkalinity (total):_____ppm or mg/l Conductivity:_____uMHO

Dissolved $NH_4$:_____ppt or ppm Dissolved Oxygen:_____ppm or mg/l

pH:_____ Turbidity: (secchi disc depth)_____cm or: clear to bottom ____

Salinity :_____ppt or ppm Total Dissolved Solids (TDS):_____ppm

Notes:

1

**U.S. Fish and Wildlife Service Vernal Pool Data Sheet**
**Wet Season Survey**

Note: Please fill out the required information completely for each site visit.

Species Observations: state none or estimate # of individuals present in terms of an order of magnitude (e.g., 10's, 100's, 1000's)

Anostracans:
(note reproductive status) None

Notostracans:
(note reproductive status) None

Species Observations (Optional) :

| | | | | | |
|---|---|---|---|---|---|
| Cladocerans: | yes | no | Insects: (adult or larvae) | | |
| Conchostracans: | yes | no | Anisoptera: | yes | no |
| Copepods: | yes | no | Zygoptera: | yes | no |
| Ostracods | yes | no | Hydrophilidae: | yes | no |
| Fish | yes | no | Dytiscidae: | yes | no |
| Frogs | yes | no | Corixidae: | yes | no |
| Salamanders | yes | no | Notonectidae: | yes | no |
| Waterfowl | yes | no | Belostomatidae: | yes | no |
| Other (specify)_____ | | | Other (specify)_____ | | |

Voucher Specimens

Specimens shall be preserved according to the standards of the institution in which they will be accessioned.

| Species | # Individuals | Accession/Catalog # | Pool # |
|---|---|---|---|
| N/A | | | |

3/20/15

33-10

**U.S. Fish and Wildlife Service Vernal Pool Data Sheet**
**Wet Season Survey**

Note: Please fill out the required information completely for each site visit.

This form is being submitted to serve as part of the 90-day report: ___ no ✓ yes

Required color slides and/or photographs for the project site are included: ✓ no ___ yes

Date: 3/26/15 Time: _____ County: SD Quad: S.C.

Collector(s): R. Stolpe Permit #: TE835495

Site/Project Name: TL 695 Pool #: 44-2(33-10)

Township: N/A Range: N/A Section: N/A 33.38 lat. 717.56 long.

Temperature: Water: N/A °C Air: _____ °C

Pool Depth:
at time of sampling: Ø cm
estimated maximum: — cm

Surface Area:
at time of sampling: Ø m x Ø m
estimated maximum: — m x — m

Habitat Condition: (circle where appropriate)

- undisturbed disturbed: (tire tracks) garbage discing/plowing
- ungrazed grazed: cattle horses sheep other_____ light moderate heavy
- land use of habitat: dirt road/Alpha 2-T.A.

(Optional) Water Chemistry Data

Alkalinity (total):_____ppm or mg/l Conductivity:_____uMHO

Dissolved $NH_4$:_____ppt or ppm Dissolved Oxygen:_____ppm or mg/l

pH:_____ Turbidity: (secchi disc depth)_____cm or: clear to bottom_____

Salinity :_____ppt or ppm Total Dissolved Solids (TDS):_____ppm

Notes: Dry



**U.S. Fish and Wildlife Service Vernal Pool Data Sheet**
**Wet Season Survey**

Note: Please fill out the required information completely for each site visit.

Species Observations: state none or estimate # of individuals present in terms of an order of magnitude (e.g., 10's, 100's, 1000's)

Anostracans:
(note reproductive status) None

Notostracans:
(note reproductive status) None

Species Observations (Optional) :

| | | | | | |
|---|---|---|---|---|---|
| Cladocerans: | yes | no | Insects: (adult or larvae) | | |
| Conchostracans: | yes | no | Anisoptera: | yes | no |
| Copepods: | yes | no | Zygoptera: | yes | no |
| Ostracods | yes | no | Hydrophilidae: | yes | no |
| Fish | yes | no | Dytiscidae: | yes | no |
| Frogs | yes | no | Corixidae: | yes | no |
| Salamanders | yes | no | Notonectidae: | yes | no |
| Waterfowl | yes | no | Belostomatidae: | yes | no |
| Other (specify) _____ | | | Other (specify) _____ | | |

Voucher Specimens

Specimens shall be preserved according to the standards of the institution in which they will be accessioned.

| Species | # Individuals | Accession/Catalog # | Pool # |
|---|---|---|---|
| | N/A | | |

4/2/15

33-10

**U.S. Fish and Wildlife Service Vernal Pool Data Sheet**
**Wet Season Survey**

Note: Please fill out the required information completely for each site visit.

This form is being submitted to serve as part of the 90-day report: ____ no ✓ yes

Required color slides and/or photographs for the project site are included: ✓ no ____ yes

Date: 4/2/15 Time: _____ County: SD Quad: S.C.

Collector(s): R. Stolpe Permit #: TE835549S

Site/Project Name: TL695 Pool #: 44-2(33-10)

Township: N/A Range: N/A Section: N/A 33.38 lat 717.56 long

Temperature: Water: N/A °C Air: _____ °C

Pool Depth:
at time of sampling: Ø cm
estimated maximum: — cm

Surface Area:
at time of sampling: Ø m x Ø m
estimated maximum: — m x — m

Habitat Condition: (circle where appropriate)

- undisturbed disturbed: (tire tracks) garbage discing/plowing
- ungrazed grazed: cattle horses sheep other_____ light moderate heavy
- land use of habitat: dirt road/Alpha 2 T.A.

(Optional) Water Chemistry Data

Alkalinity (total):_____ppm or mg/l Conductivity:_____uMHO

Dissolved $NH_4$:_____ppt or ppm Dissolved Oxygen:_____ppm or mg/l

pH:_____ Turbidity: (secchi disc depth)_____cm or: clear to bottom _____

Salinity :_____ppt or ppm Total Dissolved Solids (TDS):_____ppm

Notes: Dry



**U.S. Fish and Wildlife Service Vernal Pool Data Sheet**
**Wet Season Survey**

Note: Please fill out the required information completely for each site visit.

Species Observations: state none or estimate # of individuals present in terms of an order of magnitude (e.g., 10's, 100's, 1000's)

Anostracans:
(note reproductive status) None

Notostracans:
(note reproductive status) None

Species Observations (Optional) :

| | | | Insects: (adult or larvae) | | |
|---|---|---|---|---|---|
| Cladocerans: | yes | no | Anisoptera: | yes | no |
| Conchostracans: | yes | no | Zygoptera: | yes | no |
| Copepods: | yes | no | Hydrophilidae: | yes | no |
| Ostracods | yes | no | Dytiscidae: | yes | no |
| Fish | yes | no | Corixidae: | yes | no |
| Frogs | yes | no | Notonectidae: | yes | no |
| Salamanders | yes | no | Belostomatidae: | yes | no |
| Waterfowl | yes | no | Other (specify) | | |
| Other (specify) | | | | | |

Voucher Specimens

Specimens shall be preserved according to the standards of the institution in which they will be accessioned.

| Species | # Individuals | Accession/Catalog # | Pool # |
|---|---|---|---|
| | N/A | | |

5/1/15

33-10

**U.S. Fish and Wildlife Service Vernal Pool Data Sheet**
**Wet Season Survey**

Note: Please fill out the required information completely for each site visit.

This form is being submitted to serve as part of the 90-day report: ____ no ✓ yes

Required color slides and/or photographs for the project site are included: ____ no ✓ yes

Date: 5/1/15 Time: 1026 County: SD Quad: S.C.

Collector(s): B. Stolpe / C. Schuerman Permit #: TE8355495
TE448554D

Site/Project Name: TL695 Pool #: 33-10

Township: N/A Range: N/A Section: N/A 33.38 lat. -117.56 long.

Temperature: Water: — °C Air: 28 °C

Pool Depth:
at time of sampling: Ø cm
estimated maximum: — cm

Surface Area:
at time of sampling: Ø m x Ø m
estimated maximum: — m x — m

Habitat Condition: (circle where appropriate)

- undisturbed disturbed: (tire tracks) garbage discing/plowing
- ungrazed grazed: cattle horses sheep other_____
  light moderate heavy
- land use of habitat: dirt road / Alpha 2 T.A.

(Optional) Water Chemistry Data

Alkalinity (total):_____ppm or mg/l Conductivity:_____uMHO

Dissolved $NH_4$:_____ppt or ppm Dissolved Oxygen:_____ppm or mg/l

pH:_____ Turbidity: (secchi disc depth)_____cm or: clear to bottom _____

Salinity :_____ppt or ppm Total Dissolved Solids (TDS):_____ppm

Notes: Dry



**U.S. Fish and Wildlife Service Vernal Pool Data Sheet**
**Wet Season Survey**

Note: Please fill out the required information completely for each site visit.

Species Observations: state none or estimate # of individuals present in terms of an order of magnitude (e.g., 10's, 100's, 1000's)

Anostracans:
(note reproductive status) None

Notostracans:
(note reproductive status) None

Species Observations (Optional) :

| | | | Insects: (adult or larvae) | | |
|---|---|---|---|---|---|
| Cladocerans: | yes | no | Anisoptera: | yes | no |
| Conchostracans: | yes | no | Zygoptera: | yes | no |
| Copepods: | yes | no | Hydrophilidae: | yes | no |
| Ostracods | yes | no | Dytiscidae: | yes | no |
| Fish | yes | no | Corixidae: | yes | no |
| Frogs | yes | no | Notonectidae: | yes | no |
| Salamanders | yes | no | Belostomatidae: | yes | no |
| Waterfowl | yes | no | Other (specify) | | |
| Other (specify) | | | | | |

Voucher Specimens

Specimens shall be preserved according to the standards of the institution in which they will be accessioned.

| Species | # Individuals | Accession/Catalog # | Pool # |
|---|---|---|---|
| N/A | | | |

5/20/15

33-10

**U.S. Fish and Wildlife Service Vernal Pool Data Sheet**
**Wet Season Survey**

Note: Please fill out the required information completely for each site visit.

This form is being submitted to serve as part of the 90-day report: ____ no ✓ yes

Required color slides and/or photographs for the project site are included: ____ no ✓ yes

Date: 5/20/15 Time: 1357 County: _____ Quad: _____

Collector(s): R. Stolpe Permit #: TE8355495

Site/Project Name: TL695 Pool #: 33-10

Township: _____ Range: _____ Section: _____ _____lat. _____long.

Temperature: Water: — °C Air: 20 °C

Pool Depth:
at time of sampling: 12 cm
estimated maximum: — cm

Surface Area:
at time of sampling: _____ m x _____ m
estimated maximum: — m x — m

Habitat Condition: (circle where appropriate)

- undisturbed disturbed: (tire tracks) garbage discing/plowing
- ungrazed grazed: cattle horses sheep other_____ light moderate heavy
- land use of habitat: dirt road / Alpha 2 T.A.

(Optional) Water Chemistry Data

Alkalinity (total):_____ppm or mg/l Conductivity:_____uMHO

Dissolved $NH_4$:_____ppt or ppm Dissolved Oxygen:_____ppm or mg/l

pH:_____ Turbidity: (secchi disc depth)_____cm or: clear to bottom ____

Salinity :_____ppt or ppm Total Dissolved Solids (TDS):_____ppm

Notes: FS collected 6M/8F
B. lindahli

1

**U.S. Fish and Wildlife Service Vernal Pool Data Sheet**
**Wet Season Survey**

Note: Please fill out the required information completely for each site visit.

Species Observations: state none or estimate # of individuals present in terms of an order of magnitude (e.g., 10's, 100's, 1000's)

Anostracans:
(note reproductive status) 1000s (mature)

Notostracans:
(note reproductive status) None

Species Observations (Optional) :

| | | | Insects: (adult or larvae) | | |
|---|---|---|---|---|---|
| Cladocerans: | yes | no | Anisoptera: | yes | no |
| Conchostracans: | yes | no | Zygoptera: | yes | no |
| Copepods: | yes | no | Hydrophilidae: | yes | no |
| Ostracods | yes | no | Dytiscidae: | yes | no |
| Fish | yes | no | Corixidae: | yes | no |
| Frogs | yes | no | Notonectidae: | yes | no |
| Salamanders | yes | no | Belostomatidae: | yes | no |
| Waterfowl | yes | no | | | |
| Other (specify)_____ | | | Other (specify)_____ | | |

Voucher Specimens

Specimens shall be preserved according to the standards of the institution in which they will be accessioned.

| Species | # Individuals | Accession/Catalog # | Pool # |
|---|---|---|---|

7/21/15

33-10

**U.S. Fish and Wildlife Service Vernal Pool Data Sheet**
**Wet Season Survey**

Note: Please fill out the required information completely for each site visit.

This form is being submitted to serve as part of the 90-day report: ____no ✓yes

Required color slides and/or photographs for the project site are included: ____ no ✓____yes

Date: 7/21/15 Time 1409 County: SD Quad: S.C.

Collector(s): R. Stolpe/J. Asmus Permit #: TE-835549-5

Site/Project Name: TL695 Pool #: 33-10

Township: N/A Range: N/A Section: N/A 33.38 lat. 117.56 long.

Temperature: Water: — °C Air: 25 °C

Pool Depth:
at time of sampling: Ø cm
estimated maximum: — cm

Surface Area:
at time of sampling: Ø m x Ø m
estimated maximum: — m x — m

Habitat Condition: (circle where appropriate)

- undisturbed disturbed: (tire tracks) garbage discing/plowing
- ungrazed grazed: cattle horses sheep other_____ light moderate heavy
- land use of habitat: dirt road/Alpha Two T.A.

(Optional) Water Chemistry Data

Alkalinity (total):_____ppm or mg/l Conductivity:_____uMHO

Dissolved $NH_4$:_____ppt or ppm Dissolved Oxygen:_____ppm or mg/l

pH:_____ Turbidity: (secchi disc depth)_____cm or: clear to bottom ____

Salinity:_____ppt or ppm Total Dissolved Solids (TDS):_____ppm

Notes:



**U.S. Fish and Wildlife Service Vernal Pool Data Sheet**
**Wet Season Survey**

Note: Please fill out the required information completely for each site visit.

Species Observations: state none or estimate # of individuals present in terms of an order of magnitude (e.g., 10's, 100's, 1000's)

Anostracans:
(note reproductive status) None

Notostracans:
(note reproductive status) None

Species Observations (Optional):

| | | | | | |
|---|---|---|---|---|---|
| Cladocerans: | yes | no | Insects: (adult or larvae) | | |
| Conchostracans: | yes | no | Anisoptera: | yes | no |
| Copepods: | yes | no | Zygoptera: | yes | no |
| Ostracods | yes | no | Hydrophilidae: | yes | no |
| Fish | yes | no | Dytiscidae: | yes | no |
| Frogs | yes | no | Corixidae: | yes | no |
| Salamanders | yes | no | Notonectidae: | yes | no |
| Waterfowl | yes | no | Belostomatidae: | yes | no |
| Other (specify)_____ | | | Other (specify)_____ | | |

Voucher Specimens

Specimens shall be preserved according to the standards of the institution in which they will be accessioned.

| Species | # Individuals | Accession/Catalog # | Pool # |
|---|---|---|---|
| | | N/A | |

2/3/15

33-11

**U.S. Fish and Wildlife Service Vernal Pool Data Sheet**
**Wet Season Survey**

Note: Please fill out the required information completely for each site visit.

This form is being submitted to serve as part of the 90-day report: ✓ no ___ yes

Required color slides and/or photographs for the project site are included: ___ no ✓ yes

Date: 2 / 3 / 15 Time: 1325 County: SD Quad: S.C.

Collector(s): R. Stolpe / M. Tu Permit #: TE8355495

Site/Project Name: TL 695 Pool #: 44-1(33-41)

Township: N/A Range: N/A Section: N/A 33.38 lat. 117.56 long.

Temperature: Water: N/A °C Air: 21.3 °C

Pool Depth:
at time of sampling: Ø cm
estimated maximum: — cm

Surface Area:
at time of sampling: Ø m x Ø m
estimated maximum: — m x — m

Habitat Condition: (circle where appropriate)

- undisturbed
- ungrazed

disturbed: (tire tracks) (garbage) discing/plowing

grazed: cattle horses sheep other_____
light moderate heavy

- land use of habitat: dirt road / Alpha 2 T.A.

(Optional) Water Chemistry Data

Alkalinity (total):_____ppm or mg/l Conductivity:_____uMHO

Dissolved $NH_4$:_____ppt or ppm Dissolved Oxygen:_____ppm or mg/l

pH:_____ Turbidity: (secchi disc depth)_____cm or: clear to bottom ____

Salinity :_____ppt or ppm Total Dissolved Solids (TDS):_____ppm

Notes: Dry



**U.S. Fish and Wildlife Service Vernal Pool Data Sheet**
**Wet Season Survey**

Note: Please fill out the required information completely for each site visit.

Species Observations: state none or estimate # of individuals present in terms of an order of magnitude (e.g., 10's, 100's, 1000's)

Anostracans:
(note reproductive status) None

Notostracans:
(note reproductive status) None

Species Observations (Optional) :

| | | | | | |
|---|---|---|---|---|---|
| Cladocerans: | yes | no | Insects: (adult or larvae) | | |
| Conchostraceans: | yes | no | Anisoptera: | yes | no |
| Copepods: | yes | no | Zygoptera: | yes | no |
| Ostracods | yes | no | Hydrophilidae: | yes | no |
| Fish | yes | no | Dytiscidae: | yes | no |
| Frogs | yes | no | Corixidae: | yes | no |
| Salamanders | yes | no | Notonectidae: | yes | no |
| Waterfowl | yes | no | Belostomatidae: | yes | no |
| Other (specify)_____ | | | Other (specify)_____ | | |

Voucher Specimens

Specimens shall be preserved according to the standards of the institution in which they will be accessioned.

| Species | # Individuals | Accession/Catalog # | Pool # |
|---|---|---|---|
| N/A | | | |

3/6/15

33-11

**U.S. Fish and Wildlife Service Vernal Pool Data Sheet**
**Wet Season Survey**

Note: Please fill out the required information completely for each site visit.

This form is being submitted to serve as part of the 90-day report: ____ no ✓ yes

Required color slides and/or photographs for the project site are included: ____ no ✓ yes

Date: 3/6/15 Time: 0930 County: SD Quad: S.C.

Collector(s): R. Stolpe/J. Asmus Permit #: TE-835549-5/nonc

Site/Project Name: TL695 Pool #: 44-1(33-11)

Township: N/A Range: N/A Section: N/A 33.38 lat. -117.56 long.

Temperature: Water: — °C Air: 23.6 °C

Pool Depth:
at time of sampling: 1 cm
estimated maximum: — cm

Surface Area:
at time of sampling: ____ m x ____ m
estimated maximum: — m x — m

Habitat Condition: (circle where appropriate)

- undisturbed . disturbed: (tire tracks) (garbage) discing/plowing

- ungrazed grazed: cattle horses sheep other____
light moderate heavy

- land use of habitat: dirt road / Alpha Two training area

(Optional) Water Chemistry Data

Alkalinity (total):____ppm or mg/l Conductivity:____uMHO

Dissolved $NH_4$:____ppt or ppm Dissolved Oxygen:____ppm or mg/l

pH:____ Turbidity: (secchi disc depth)____cm or: clear to bottom ____

Salinity :____ppt or ppm Total Dissolved Solids (TDS):____ppm

Notes:

1

**U.S. Fish and Wildlife Service Vernal Pool Data Sheet**
**Wet Season Survey**

Note: Please fill out the required information completely for each site visit.

Species Observations: state none or estimate # of individuals present in terms of an order of magnitude (e.g., 10's, 100's, 1000's)

Anostracans:
(note reproductive status) None

Notostracans:
(note reproductive status) None

Species Observations (Optional) :

| | | | Insects: (adult or larvae) | | |
|---|---|---|---|---|---|
| Cladocerans: | yes | no | Anisoptera: | yes | no |
| Conchostracans: | yes | no | Zygoptera: | yes | no |
| Copepods: | yes | no | Hydrophilidae: | yes | no |
| Ostracods | yes | no | Dytiscidae: | yes | no |
| Fish | yes | no | Corixidae: | yes | no |
| Frogs | yes | no | Notonectidae: | yes | no |
| Salamanders | yes | no | Belostomatidae: | yes | no |
| Waterfowl | yes | no | Other (specify) | | |
| Other (specify) | | | | | |

Voucher Specimens

Specimens shall be preserved according to the standards of the institution in which they will be accessioned.

| Species | # Individuals | Accession/Catalog # | Pool # |
|---|---|---|---|
| N/A | | | |

3/9/15

33-11

**U.S. Fish and Wildlife Service Vernal Pool Data Sheet**
**Wet Season Survey**

Note: Please fill out the required information completely for each site visit.

This form is being submitted to serve as part of the 90-day report: ____ no ✓ yes

Required color slides and/or photographs for the project site are included: ____ no ✓ yes

Date: 3/9/15 Time: 1320 County: SD Quad: S.C.

Collector(s): R. Stolpe / M. Tu Permit #: TE8355495

Site/Project Name: TL 695 Pool #: 44-1 (33-11)

Township: N/A Range: N/A Section: N/A 33.38 lat. 117.56 long.

Temperature: Water: N/A °C Air: 19 °C

Pool Depth:
at time of sampling: Ø cm
estimated maximum: — cm

Surface Area:
at time of sampling: Ø m x Ø m
estimated maximum: — m x — m

Habitat Condition: (circle where appropriate)

- undisturbed disturbed: (tire tracks) (garbage) discing/plowing
- ungrazed grazed: cattle horses sheep other_____
  light moderate heavy
- land use of habitat: dirt road / Alpha 2 T.A.

(Optional) Water Chemistry Data

Alkalinity (total):_____ppm or mg/l Conductivity:_____uMHO

Dissolved $NH_4$:_____ppt or ppm Dissolved Oxygen:_____ppm or mg/l

pH:_____ Turbidity: (secchi disc depth)_____cm or: clear to bottom ____

Salinity :_____ppt or ppm Total Dissolved Solids (TDS):_____ppm

Notes:

1

**U.S. Fish and Wildlife Service Vernal Pool Data Sheet**
**Wet Season Survey**

Note: Please fill out the required information completely for each site visit.

Species Observations: state none or estimate # of individuals present in terms of an order of magnitude (e.g., 10's, 100's, 1000's)

Anostracans:
(note reproductive status) None

Notostracans:
(note reproductive status) None

Species Observations (Optional) :

| | | | | | |
|---|---|---|---|---|---|
| Cladocerans: | yes | no | Insects: (adult or larvae) | | |
| Conchostracans: | yes | no | Anisoptera: | yes | no |
| Copepods: | yes | no | Zygoptera: | yes | no |
| Ostracods | yes | no | Hydrophilidae: | yes | no |
| Fish | yes | no | Dytiscidae: | yes | no |
| Frogs | yes | no | Corixidae: | yes | no |
| Salamanders | yes | no | Notonectidae: | yes | no |
| Waterfowl | yes | no | Belostomatidae: | yes | no |
| Other (specify)_____ | | | Other (specify)_____ | | |

Voucher Specimens

Specimens shall be preserved according to the standards of the institution in which they will be accessioned.

| Species | # Individuals | Accession/Catalog # | Pool # |
|---|---|---|---|
| N/A | | | |

3/13/15

33-11

**U.S. Fish and Wildlife Service Vernal Pool Data Sheet**
**Wet Season Survey**

Note: Please fill out the required information completely for each site visit.

This form is being submitted to serve as part of the 90-day report: ___ no ✓ yes

Required color slides and/or photographs for the project site are included: ✓ no ___ yes

Date: 3/13/15 Time: 1020 County: SD Quad: S.C.

Collector(s): R. Stolpe / M. Tu Permit #: TE835549S

Site/Project Name: TL695 Pool #: 44-1(33-1)

Township: N/A Range: N/A Section: N/A 33.38 lat. -117.56 long.

Temperature: Water: — °C Air: 27.2 °C

Pool Depth:
at time of sampling: Ø cm
estimated maximum: — cm

Surface Area:
at time of sampling: Ø m x Ø m
estimated maximum: — m x — m

Habitat Condition: (circle where appropriate)

- undisturbed disturbed: (tire tracks) (garbage) discing/plowing
- ungrazed grazed: cattle horses sheep other_____ light moderate heavy
- land use of habitat: dirt road / Alpha 2 T.A.

(Optional) Water Chemistry Data

Alkalinity (total):_____ppm or mg/l Conductivity:_____uMHO

Dissolved $NH_4$:_____ppt or ppm Dissolved Oxygen:_____ppm or mg/l

pH:_____ Turbidity: (secchi disc depth)_____cm or: clear to bottom ____

Salinity :_____ppt or ppm Total Dissolved Solids (TDS):_____ppm

Notes: Dry



**U.S. Fish and Wildlife Service Vernal Pool Data Sheet**
**Wet Season Survey**

Note: Please fill out the required information completely for each site visit.

Species Observations: state none or estimate # of individuals present in terms of an order of magnitude (e.g., 10's, 100's, 1000's)

Anostracans:
(note reproductive status) None

Notostracans:
(note reproductive status) None

Species Observations (Optional) :

| | | | Insects: (adult or larvae) | | |
|---|---|---|---|---|---|
| Cladocerans: | yes | no | Anisoptera: | yes | no |
| Conchostracans: | yes | no | Zygoptera: | yes | no |
| Copepods: | yes | no | Hydrophilidae: | yes | no |
| Ostracods | yes | no | Dytiscidae: | yes | no |
| Fish | yes | no | Corixidae: | yes | no |
| Frogs | yes | no | Notonectidae: | yes | no |
| Salamanders | yes | no | Belostomatidae: | yes | no |
| Waterfowl | yes | no | Other (specify) | | |
| Other (specify) | | | | | |

Voucher Specimens

Specimens shall be preserved according to the standards of the institution in which they will be accessioned.

| Species | # Individuals | Accession/Catalog # | Pool # |
|---|---|---|---|
| | N/A | | |

3/20/15

33-11

**U.S. Fish and Wildlife Service Vernal Pool Data Sheet**
**Wet Season Survey**

Note: Please fill out the required information completely for each site visit.

This form is being submitted to serve as part of the 90-day report: ____ no ✓ yes

Required color slides and/or photographs for the project site are included: ✓ no ____ yes

Date: 3 2015 Time: 1246 County: SD Quad: S.C

Collector(s): R. Stolpe / M. Tu Permit #: TE8355495

Site/Project Name: TL695 Pool #: 44-1(33+1)

Township: N/A Range: N/A Section: N/A 33.38 lat. 117.5 long.

Temperature: Water: N/A °C Air: _____ °C

Pool Depth:
at time of sampling: Ø cm
estimated maximum: — cm

Surface Area:
at time of sampling: Ø m x Ø m
estimated maximum: — m x — m

Habitat Condition: (circle where appropriate)

- undisturbed disturbed: tire tracks garbage discing/plowing
- ungrazed grazed: cattle horses sheep other_____
light moderate heavy
- land use of habitat: dirt road / Alpha Two T.A.

(Optional) Water Chemistry Data

Alkalinity (total):_____ppm or mg/l Conductivity:_____uMHO

Dissolved $NH_4$:_____ppt or ppm Dissolved Oxygen:_____ppm or mg/l

pH:_____ Turbidity: (secchi disc depth)_____cm or: clear to bottom _____

Salinity :_____ppt or ppm Total Dissolved Solids (TDS):_____ppm

Notes:



**U.S. Fish and Wildlife Service Vernal Pool Data Sheet**
**Wet Season Survey**

Note: Please fill out the required information completely for each site visit.

Species Observations: state none or estimate # of individuals present in terms of an order of magnitude (e.g., 10's, 100's, 1000's)

Anostracans:
(note reproductive status) None

Notostracans:
(note reproductive status) None

Species Observations (Optional) :

| | | | Insects: (adult or larvae) | | |
|---|---|---|---|---|---|
| Cladocerans: | yes | no | Anisoptera: | yes | no |
| Conchostracans: | yes | no | Zygoptera: | yes | no |
| Copepods: | yes | no | Hydrophilidae: | yes | no |
| Ostracods | yes | no | Dytiscidae: | yes | no |
| Fish | yes | no | Corixidae: | yes | no |
| Frogs | yes | no | Notonectidae: | yes | no |
| Salamanders | yes | no | Belostomatidae: | yes | no |
| Waterfowl | yes | no | Other (specify) _____ | | |
| Other (specify) _____ | | | | | |

Voucher Specimens

Specimens shall be preserved according to the standards of the institution in which they will be accessioned.

| Species | # Individuals | Accession/Catalog # | Pool # |
|---|---|---|---|
| N/A | | | |

3/26/15

33-11

**U.S. Fish and Wildlife Service Vernal Pool Data Sheet**
**Wet Season Survey**

Note: Please fill out the required information completely for each site visit.

This form is being submitted to serve as part of the 90-day report: ___ no ✓ yes

Required color slides and/or photographs for the project site are included: ✓ no ___ yes

Date: 3/26/15 Time: _____ County: SD Quad: S.C.

Collector(s): R. Stolpe Permit #: TE835549S

Site/Project Name: TL 695 Pool #: 44-1 (33-11)

Township: N/A Range: N/A Section: N/A 3338 lat. -117.56 long.

Temperature: Water: N/A °C Air: _____ °C

Pool Depth:
at time of sampling: Ø cm
estimated maximum: — cm

Surface Area:
at time of sampling: Ø m x Ø m
estimated maximum: — m x — m

Habitat Condition: (circle where appropriate)

- undisturbed disturbed: (tire tracks) (garbage) discing/plowing
- ungrazed grazed: cattle horses sheep other_____ light moderate heavy
- land use of habitat: dirt road / Alpha 2 T.A.

(Optional) Water Chemistry Data

Alkalinity (total):_____ppm or mg/l Conductivity:_____uMHO

Dissolved $NH_4$:_____ppt or ppm Dissolved Oxygen:_____ppm or mg/l

pH:_____ Turbidity: (secchi disc depth)_____cm or: clear to bottom ____

Salinity :_____ppt or ppm Total Dissolved Solids (TDS):_____ppm

Notes: Dry



**U.S. Fish and Wildlife Service Vernal Pool Data Sheet**
**Wet Season Survey**

Note: Please fill out the required information completely for each site visit.

Species Observations: state none or estimate # of individuals present in terms of an order of magnitude (e.g., 10's, 100's, 1000's)

Anostracans:
(note reproductive status) None

Notostracans:
(note reproductive status) None

Species Observations (Optional) :

| | | | | | |
|---|---|---|---|---|---|
| Cladocerans: | yes | no | Insects: (adult or larvae) | | |
| Conchostracans: | yes | no | Anisoptera: | yes | no |
| Copepods: | yes | no | Zygoptera: | yes | no |
| Ostracods | yes | no | Hydrophilidae: | yes | no |
| Fish | yes | no | Dytiscidae: | yes | no |
| Frogs | yes | no | Corixidae: | yes | no |
| Salamanders | yes | no | Notonectidae: | yes | no |
| Waterfowl | yes | no | Belostomatidae: | yes | no |
| Other (specify) _____ | | | Other (specify) _____ | | |

Voucher Specimens

Specimens shall be preserved according to the standards of the institution in which they will be accessioned.

| Species | # Individuals | Accession/Catalog # | Pool # |
|---|---|---|---|
| | N/A | | |

4/2/15

33-11

**U.S. Fish and Wildlife Service Vernal Pool Data Sheet**
**Wet Season Survey**

Note: Please fill out the required information completely for each site visit.

This form is being submitted to serve as part of the 90-day report: ____ no ✓ yes

Required color slides and/or photographs for the project site are included: ✓ no ____ yes

Date: 4/2/15 Time: _____ County: SD Quad: S.C.

Collector(s): R. Stolpe Permit #: TE835495

Site/Project Name: TL695 Pool #: 44-1 (33-11)

Township: N/A Range: N/A Section: N/A 33.38 lat. 117.58 long.

Temperature: Water: N/A °C Air: _____ °C

Pool Depth:
at time of sampling: Ø cm
estimated maximum: — cm

Surface Area:
at time of sampling: Ø m x Ø m
estimated maximum: — m x — m

Habitat Condition: (circle where appropriate)

- undisturbed disturbed: (tire tracks) (garbage) discing/plowing
- ungrazed grazed: cattle horses sheep other_____
  light moderate heavy
- land use of habitat: dirt road / Alpha 2 T.A.

(Optional) Water Chemistry Data

Alkalinity (total):_____ ppm or mg/l Conductivity:_____uMHO

Dissolved $NH_4$:_____ppt or ppm Dissolved Oxygen:_____ppm or mg/l

pH:_____ Turbidity: (secchi disc depth)_____cm or: clear to bottom _____

Salinity :_____ppt or ppm Total Dissolved Solids (TDS):_____ppm

Notes: Dry

1

**U.S. Fish and Wildlife Service Vernal Pool Data Sheet**
**Wet Season Survey**

Note: Please fill out the required information completely for each site visit.

Species Observations: state none or estimate # of individuals present in terms of an order of magnitude (e.g., 10's, 100's, 1000's)

Anostracans:
(note reproductive status) None

Notostracans:
(note reproductive status) None

Species Observations (Optional) :

| | | | Insects: (adult or larvae) | | |
|---|---|---|---|---|---|
| Cladocerans: | yes | no | Anisoptera: | yes | no |
| Conchostracans: | yes | no | Zygoptera: | yes | no |
| Copepods: | yes | no | Hydrophilidae: | yes | no |
| Ostracods | yes | no | Dytiscidae: | yes | no |
| Fish | yes | no | Corixidae: | yes | no |
| Frogs | yes | no | Notonectidae: | yes | no |
| Salamanders | yes | no | Belostomatidae: | yes | no |
| Waterfowl | yes | no | Other (specify) _____ | | |
| Other (specify) _____ | | | | | |

Voucher Specimens

Specimens shall be preserved according to the standards of the institution in which they will be accessioned.

| Species | # Individuals | Accession/Catalog # | Pool # |
|---|---|---|---|
| N/A | | | |

5/20/15

33-11

**U.S. Fish and Wildlife Service Vernal Pool Data Sheet**
**Wet Season Survey**

Note: Please fill out the required information completely for each site visit.

This form is being submitted to serve as part of the 90-day report: ____ no ✓ yes

Required color slides and/or photographs for the project site are included: ____ no ✓ yes

Date: 5/20/15 Time: 1416 County: _____ Quad: _____

Collector(s): R. Stolpe Permit #: TE835495

Site/Project Name: TL695 Pool #: 33-11

Township: _____ Range: _____ Section: _____ _____lat._____long.

Temperature: Water: N/A °C Air: 20 °C

Pool Depth:
at time of sampling: Ø cm
estimated maximum: _____cm

Surface Area:
at time of sampling: Ø m x Ø m
estimated maximum: _____m x _____m

Habitat Condition: (circle where appropriate)

- undisturbed disturbed: (fire tracks) (garbage) discing/plowing
- ungrazed grazed: cattle horses sheep other_____ light moderate heavy
- land use of habitat: dirt road/Alpha 2 T.A.

(Optional) Water Chemistry Data

Alkalinity (total):_____ppm or mg/l Conductivity:_____uMHO

Dissolved $NH_4$:_____ppt or ppm Dissolved Oxygen:_____ppm or mg/l

pH:_____ Turbidity: (secchi disc depth)_____cm or: clear to bottom ____

Salinity :_____ppt or ppm Total Dissolved Solids (TDS):_____ppm

Notes: Dry



**U.S. Fish and Wildlife Service Vernal Pool Data Sheet**
**Wet Season Survey**

Note: Please fill out the required information completely for each site visit.

Species Observations: state none or estimate # of individuals present in terms of an order of magnitude (e.g., 10's, 100's, 1000's)

Anostracans:
(note reproductive status) None

Notostracans:
(note reproductive status) None

Species Observations (Optional) :

| | | | Insects: (adult or larvae) | | |
|---|---|---|---|---|---|
| Cladocerans: | yes | no | Anisoptera: | yes | no |
| Conchostracans: | yes | no | Zygoptera: | yes | no |
| Copepods: | yes | no | Hydrophilidae: | yes | no |
| Ostracods | yes | no | Dytiscidae: | yes | no |
| Fish | yes | no | Corixidae: | yes | no |
| Frogs | yes | no | Notonectidae: | yes | no |
| Salamanders | yes | no | Belostomatidae: | yes | no |
| Waterfowl | yes | no | Other (specify) _____ | | |
| Other (specify) _____ | | | | | |

Voucher Specimens

Specimens shall be preserved according to the standards of the institution in which they will be accessioned.

| Species | # Individuals | Accession/Catalog # | Pool # |
|---|---|---|---|

7/21/15

33-11

**U.S. Fish and Wildlife Service Vernal Pool Data Sheet**
**Wet Season Survey**

Note: Please fill out the required information completely for each site visit.

This form is being submitted to serve as part of the 90-day report: ___ no ✓ yes

Required color slides and/or photographs for the project site are included: ___ no ✓ yes

Date: 7/21/15 Time: 1408 County: SD Quad: S.C.

Collector(s): R. Stolpe/J. Asmus Permit #: TE-835549-5

Site/Project Name: TL695 Pool #: _____

Township: N/A Range: N/A Section: N/A 33.38 lat. -117.56 long.

Temperature: Water: N/A °C Air: 26.1 °C

Pool Depth:
at time of sampling: Ø cm
estimated maximum: — cm

Surface Area:
at time of sampling: Ø m x Ø m
estimated maximum: — m x — m

Habitat Condition: (circle where appropriate)

- undisturbed disturbed: (tire tracks) (garbage) discing/plowing
- ungrazed grazed: cattle horses sheep other_____
light moderate heavy
- land use of habitat: dirt road / Alpha Two training area

(Optional) Water Chemistry Data

Alkalinity (total):_____ppm or mg/l Conductivity:_____uMHO

Dissolved $NH_4$:_____ppt or ppm Dissolved Oxygen:_____ppm or mg/l

pH:_____ Turbidity: (secchi disc depth)_____cm or: clear to bottom ____

Salinity :_____ppt or ppm Total Dissolved Solids (TDS):_____ppm

Notes: Dry



**U.S. Fish and Wildlife Service Vernal Pool Data Sheet**
**Wet Season Survey**

Note: Please fill out the required information completely for each site visit.

Species Observations: state none or estimate # of individuals present in terms of an order of magnitude (e.g., 10's, 100's, 1000's)

Anostracans:
(note reproductive status) None

Notostracans:
(note reproductive status) None

Species Observations (Optional) :

| | | | Insects: (adult or larvae) | | |
|---|---|---|---|---|---|
| Cladocerans: | yes | no | Anisoptera: | yes | no |
| Conchostracans: | yes | no | Zygoptera: | yes | no |
| Copepods: | yes | no | Hydrophilidae: | yes | no |
| Ostracods | yes | no | Dytiscidae: | yes | no |
| Fish | yes | no | Corixidae: | yes | no |
| Frogs | yes | no | Notonectidae: | yes | no |
| Salamanders | yes | no | Belostomatidae: | yes | no |
| Waterfowl | yes | no | Other (specify) | | |
| Other (specify) | | | | | |

Voucher Specimens

Specimens shall be preserved according to the standards of the institution in which they will be accessioned.

| Species | # Individuals | Accession/Catalog # | Pool # |
|---|---|---|---|
| N/A | | | |

# Dry Season Fairy Shrimp Technical Report for TL 695/6971 Reconductor Project

San Diego Gas & Electric Company

November 2015

Prepared for:
United States Fish and Wildlife Service

Prepared by:
Cardno

# Acronyms and Abbreviations

| | |
|---|---|
| ERS | Ecological Restoration Service |
| kV | kilovolt |
| MCAS | Marine Corps Air Station |
| MCB | Marine Corps Base |
| ml | milliliters |
| RFS | Riverside fairy shrimp |
| SDFS | San Diego fairy shrimp |
| SDG&E | San Diego Gas & Electric Company |
| SONGS | San Onofre Nuclear Generating Station |
| TL | Tie Line |
| USFWS | United States Fish and Wildlife Service |

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# 1.0 INTRODUCTION

This Dry Season Fairy Shrimp Survey Report provides the results of United States Fish and Wildlife Service (USFWS) protocol surveys for federally listed fairy shrimp species conducted in support of a Proponent's Environmental Assessment being prepared for San Diego Gas & Electric Company's (SDG&E) Proposed Tie Line (TL) 695/6971 Reconductor[1] Project (i.e., the Proposed Project) in northern San Diego County (Figure 1). Under contract to SDG&E, and subcontracted through Pangea Biological (agreement number PBCARDNO-1001 Task Order 25240.01-001), Cardno conducted USFWS protocol surveys for federally listed fairy shrimp species in the SDG&E TL 695/6971 Reconductor project area. This Dry Season Report is a follow-on to an earlier Wet Season Report of the same basins. Together, the Wet and Dry Season reports form a complete cycle of annual sampling that satisfies USFWS protocols for fairy shrimp presence/absence surveys under *Interim Survey Guidelines to Permittees for Recovery Permits under Section 10(a)(1)(A) of the Endangered Species Act for the Listed Vernal Pool Branchiopods* (USFWS 1996).

In accordance with the survey protocol (USFWS 1996), dry season tasks such as soil collection, and cyst hatching and identification, were performed by appropriately certified permitees in the SDG&E TL 695/6971 Reconductor Project Survey Area (PSA) within all potential vernal basin habitats. Protocol surveys were well underway prior to the USFWS issuance of the new protocol guidelines, *Survey Guidelines for the Listed Large Branchiopods* (USFWS 2015), and therefore these protocol surveys were conducted in accordance with the valid protocols in place at the time (USFWS 1996).

# 2.0 PROPOSED PROJECT AND PROJECT SURVEY AREA

## 2.1 Project Location and Description

SDG&E proposes to reconductor a 69-kilovolt (kV) power line in northern San Diego County near the border of Orange County. The power line is located primarily on federal military lands in the western portion of Marine Corps Base (MCB) Camp Pendleton (Figure 1). The proposal also includes removing wood poles, installing steel poles, and reconductoring within existing utility corridors and other areas devoted to electric utilities. The 69-kV power line will be reconductored between SDG&E's Talega, Basilone, and Japanese Mesa Substations.

The northern limit of the reconductor project is located outside MCB Camp Pendleton, into the eastern portion of the City of San Clemente, to the north and west of the Talega Substation. From this point, the project area runs west before turning south into MCB Camp Pendleton toward the San Mateo Junction (i.e., west of the Sierra Training Area) along the ridge tops of steep hills located to the north and west of Cristianitos Road. The hills in this area lie along the border of San Diego and Orange counties, and occur on lands that have been leased by the federal government to the California Department of Parks and Recreation. From San Mateo Junction, the Proposed Project runs in a southeasterly direction toward the northeastern corner of San Onofre Nuclear Generating Station (SONGS) Mesa. From this point, the Proposed Project extends to the northwest to the Basilone Substation, and to the southwest to the Japanese

[1] Reconductoring is a term used by utilities to describe the replacement of existing wires with new wires.

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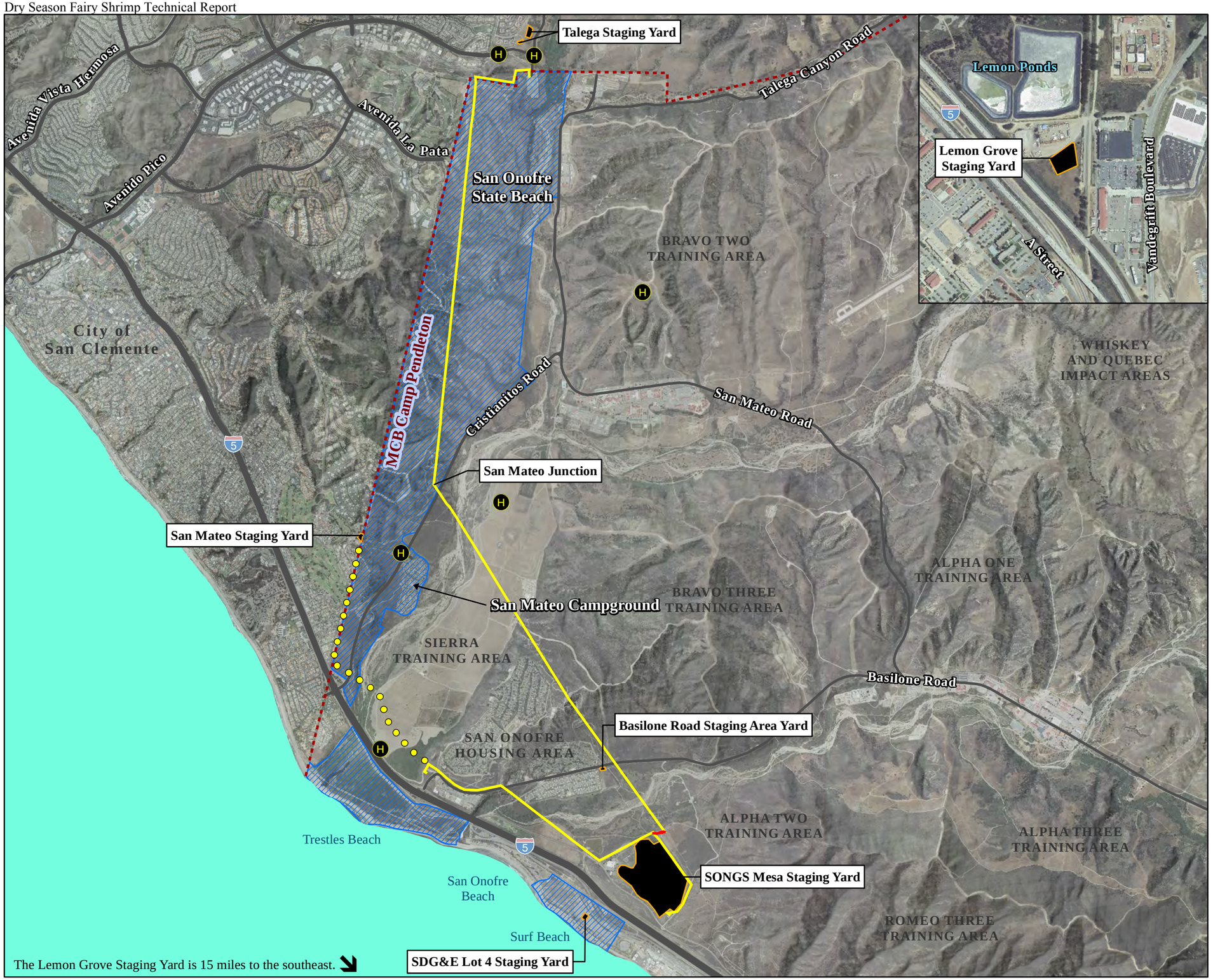


**Figure 1**
**TL695/6971 Proposed Project Area**

**LEGEND**

- MCB Camp Pendleton Boundary
- Proposed Project Overhead Route
- Proposed Project Underground Route
- Proposed Power Line Removal Segement
- Staging Yard
- Helicopter Incidental Landing Area
- State Parks Lease Area


Kilometers
0 2
0 1
Miles

Sources: City of San Clemente 2015, ESRI 2015

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Mesa Substation. The Proposed Project includes approximately 27 miles of existing dirt roads that will be utilized to access various elements of the Proposed Project for construction activities. Fairy shrimp protocol surveys occurred entirely within MCB Camp Pendleton-owned land.

## 2.2 Project Survey Area

The PSA for fairy shrimp surveys consists of a 300-foot buffer that originates from the power line (150-foot buffer on each side of the power line) and a 50-foot buffer around all laydown areas, substations, and stringing sites. In addition, a 20-foot buffer was used on both sides of dirt access roads, of which 11.8 miles occur within the main 300-foot survey buffer and 15.4 miles occur outside of the 300-foot survey buffer. Table 1 details the PSA.

**Table 1. TL 695/6971 Fairy Shrimp Project Survey Area**

| Project Component | Area |
|---|---|
| Power Line (including 300-foot survey buffer) | 393.70 acres |
| Substations (including 50-foot survey buffer) | |
| Basilone Substation | 1.14 acres |
| Japanese Mesa Substation | 0.28 acres |
| Talega Substation | 7.86 acres |
| Staging Yards (including 50-foot survey buffer) | |
| Basilone Staging Yard | 1.17 acres |
| Talega Staging Yard 1 of 2* | 3.72 acres |
| San Mateo Staging Yard | 1.31 acres |
| SONGS Mesa Staging Yard | 80.87 acres |
| SDG&E Lot 4 Staging Yard | 1.88 acres |
| Lemon Grove Staging Yard | 1.43 acres |
| Stringing Sites (including 50-foot buffer) | 2.23 acres |
| **TOTAL** | **496.90 acres** |

*Note:* *Talega Staging Yard 2 of 2 is a component that was added to the Proposed Project but is located outside of the PSA.

The 15 basins located within the PSA that were surveyed in the preceding Wet Season Report, were re-examined during the Dry Season Survey. These 15 basins examined were those proposed in the 15-Day Dry Season Request to Survey (Figure 2, Figure 3, and Table 2).

**Table 2. TL 695/6971 Basins Surveyed for Fairy Shrimp, 2014-2015 Wet Season**

| Basin ID | Approximate Lat./Long. | Dates Visited (Ponding = Bold) | Observed Species | Estimated Population | Wet Season Surveyed |
|---|---|---|---|---|---|
| Basin 5-1 | 33°26'39.17"N, 117°34'49.54"W | **2/3**; 3/20; 4/29; 5/12; 7/29 | *Branchinecta species* | 100s | No[1] |
| Basin 7-1 | 33°26'17.12"N, 117°34'52.64"W | 2/3; 3/20; 5/12 | None | - | Yes |
| Basin 21-1 | 33°23'3.94"N, 117°34'14.56"W | 2/3; **3/6, 9, 13, 20**, 26; 4/2; 5/20; **7/21, 29; 9/9** | *Branchinecta lindahli* | 100s | Yes |
| Basin 21-2 | 33°23'2.88"N, 117°34'12.98"W | 2/3; **3/6, 9, 13, 20**, 26; 4/2; 5/20; 7/21, 29 | *Branchinecta lindahli* | 1,000s | Yes |
| Basin 21-3 | 33°22'59.32"N, 117°34'7.84"W | 2/3; 3/6, 9, 13, 20, 26; 4/2; 5/20; 7/21, 29 | None | - | Yes |
| Basin 23-2 | 33°22'56.69"N, 117°33'20.04"W | 2/3; 3/6, 9, 13, 20, 26; 4/2; 5/20; 7/21 | None | - | Yes |
| Basin 23-4 | 33°22'55.79"N, 117°33'19.01"W | **2/3; 3/6, 9, 13, 20, 26; 4/2, 6**, 21; 5/20; 7/21 | None | - | Yes |
| Basin 23-8 | 33°22'59.05"N, 117°33'15.99"W | **5/20**; 7/21 | *Branchinecta lindahli* | 10s | Yes |

**Table 2. TL 695/6971 Basins Surveyed for Fairy Shrimp, 2014-2015 Wet Season**

| Basin ID | Approximate Lat./Long. | Dates Visited (Ponding = Bold) | Observed Species | Estimated Population | Wet Season Surveyed |
|---|---|---|---|---|---|
| Basin 24-1 | 33°22'30.01"N, 117°32'57.59"W | 2/3; **3/6, 9, 13**, 20; 4/2 | *Branchinecta lindahli* | 1s | Yes[2] |
| Basin 33-1 | 33°23'10.20"N, 117°33'35.19"W | 2/3; **3/6, 9, 13, 20, 26**; 4/2; 5/1, 20; 7/21 | *Branchinecta lindahli* | 10,000s | Yes |
| Basin 33-2 | 33°23'9.80"N, 117°33'39.02"W | 2/3; **3/6, 9, 13**, 20, 26; 4/2; 5/1, 20; 7/21 | *Branchinecta lindahli* | 100s | Yes |
| Basin 33-3 | 33°23'11.38"N, 117°33'38.02"W | 2/3; **3/6**, 9, 13, 20, 26; 4/2; 5/20; 7/21 | Undetermined[3] | 10s | Yes |
| Basin 33-4 | 33°23'12.03"N, 117°33'38.01"W | 2/3; **3/6, 9**, 13, 20, 26; 4/2; 5/1, 20; 7/21 | *Branchinecta lindahli* | 10s | Yes |
| Basin 33-10 | 33°23'1.02"N, 117°33'29.47"W | 2/3; **3/6, 9, 13**, 20, 26; 4/2; 5/1, **20**; 7/21 | *Branchinecta lindahli* | 1000's | Yes |
| Basin 33-11 | 33°23'2.83"N, 117°33'27.04"W | 2/3; **3/6**, 9, 13, 20, 26; 4/2; 5/20; 7/21 | None | - | Yes |

Notes: [1]Visual observation determined in the field by R. Stolpe during pre-survey reconnaissance. At the time of the observation, it was assumed that this basin would not be within the project area.
[2]Only one sampling event occurred in this basin, and it has been targeted for request for future surveys.
[3]Undetermined = fairy shrimp observed in dry/drying mud, but unable to sample.

# 3.0 BACKGROUND

Fairy shrimp are small, translucent crustaceans that are found in ephemeral (vernal) pools and occasionally in depressions (road ruts and ditches) that support suitable ponded habitat. When water begins to pond after the commencement of the rainy season, shrimp begin to hatch from encysted embryos (cysts). Two federally listed fairy shrimp species are known to occur in San Diego County, Riverside fairy shrimp (RFS) (*Streptocephalus woottoni*) and San Diego fairy shrimp (SDFS) (*Branchinecta sandiegonensis*), both of which are described below. Threats to both species include habitat loss and degradation due to urban and agricultural development, off-road vehicle use, vehicle trampling, and flood control measures (USFWS 2008a, 2008b). Both RFS and SDFS are known to co-occur with the more common, non-listed, versatile fairy shrimp (*Branchinecta lindahli*).

No federally listed fairy shrimp species were identified in any of the surveyed basins in the SDG&E TL 695/6971 Reconductor PSA during Wet Season sampling. The non-listed versatile fairy shrimp was observed in eight basins; however, this species is not afforded any protection under the federal Endangered Species Act. Two basins contained undetermined fairy shrimp; one *Branchinecta* species (but likely *B. lindahli*), and the other without positive identification of genus but likely *B. lindahli* species. As part of the Dry Season sampling, lab identification from the basins containing undetermined (and determined) fairy shrimp was expected to assist with determination of species (Table 2).

## 3.1 Riverside Fairy Shrimp

The RFS is a medium sized fairy shrimp, typically 0.5 to 1.0 inch that is generally restricted to vernal pools and other non-vegetated ephemeral pools greater than 12 inches in depth in Riverside, Orange, and San Diego counties in southern California, and northwestern Baja California, Mexico (USFWS 2008a). The northern range of RFS is defined by Skunk Hollow and the Santa Rosa Plateau in Riverside County and coastal sites in San Diego and Orange Counties. The species is documented from one vernal pool complex on Marine Corps Air Station (MCAS) Miramar, throughout MCB Camp Pendleton, and eight vernal pool complexes on Otay Mesa (MCB Camp Pendleton 2012). The USFWS listed the RFS as federally endangered on August 3, 1993 (USFWS 1993).

**Figure 2. TL 695/6971 Basins Targeted for 2015 Dry Season - North**

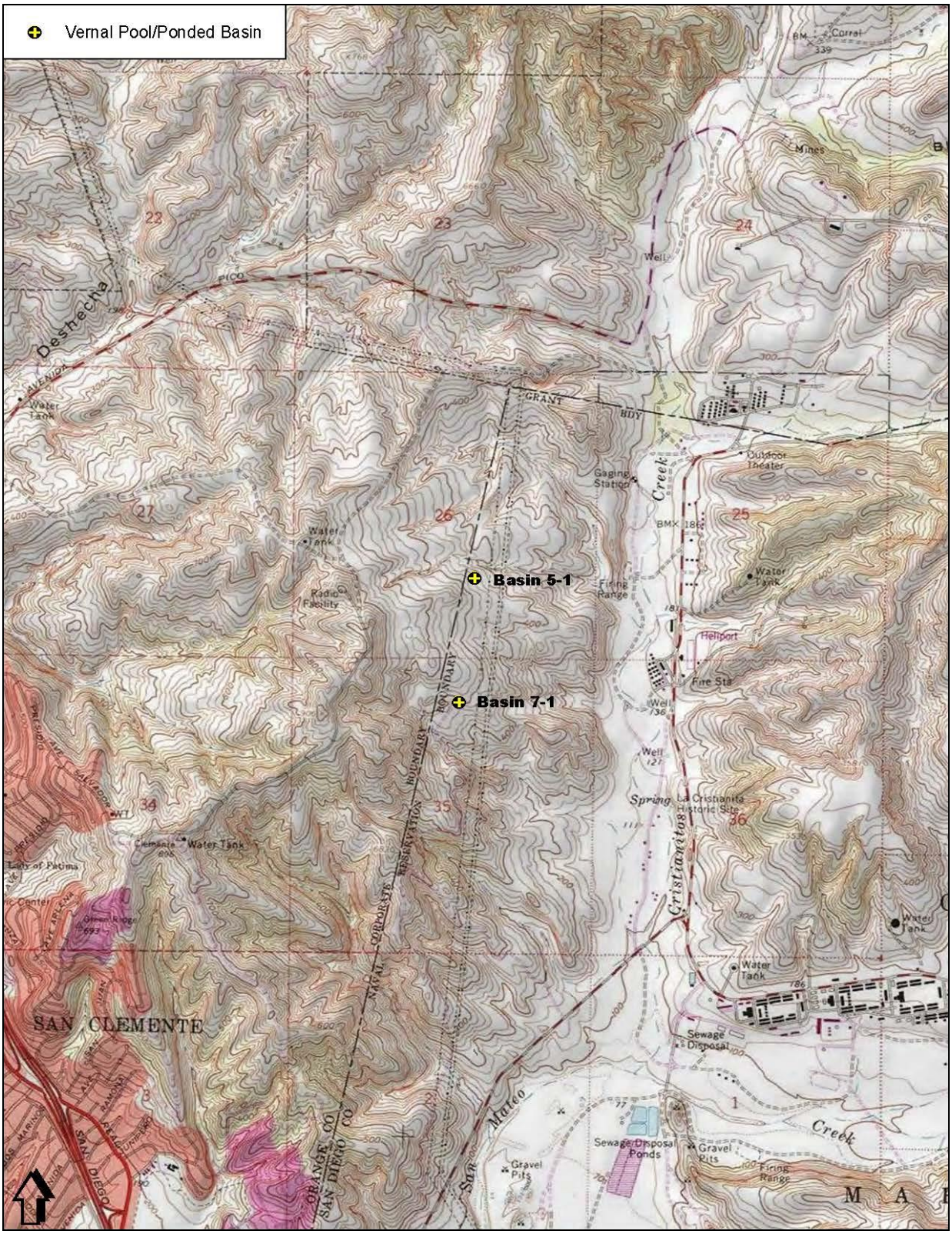
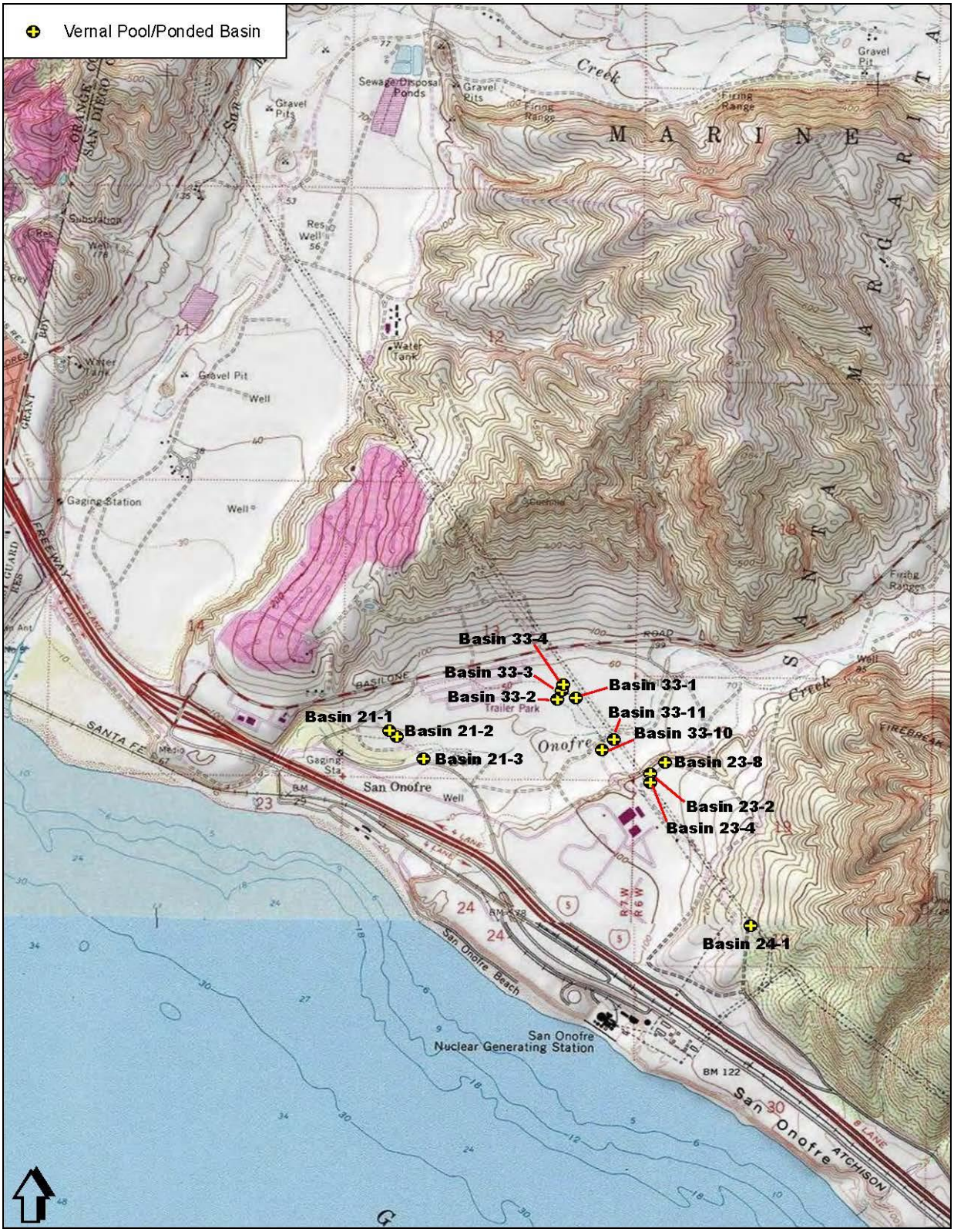


**Figure 3. TL 695/6971 Basins Targeted for 2015 Dry Season - South**



The RFS has the most limited range of any endemic California (including Baja California) fairy shrimp and is currently only known to occupy approximately 45 vernal pool complexes (approximately 200 occupied basins) (USFWS 2008a). More than half of all extant complexes known to contain RFS are in San Diego County, including eight complexes (containing at least 81 basins) on MCB Camp Pendleton (MCB Camp Pendleton 2012, USFWS 2008a).

### 3.2 San Diego Fairy Shrimp

The SDFS is a small fairy shrimp (growing to 0.6 inch) that is generally found in smaller, shallower (2 to 12 inches deep) vernal pools and ephemeral basins than RFS and occasionally in depressions such as ditches and road ruts (MCB Camp Pendleton 2012, USFWS 2008b). The USFWS listed the SDFS as federally endangered on February 3, 1997 (USFWS 1997).

SDFS are only known to occur in approximately 137 vernal basin complexes in San Diego, Orange, and Santa Barbara counties, and northwestern Baja California, Mexico, with the majority of occupied habitat being in San Diego County (USFWS 2008b).

## 4.0 METHODS

Before initiating the Dry Season sampling, a 15-day notice of intent (notification) letter was sent to the USFWS Carlsbad Field Office requesting permission to collect samples for the identification of fairy shrimp cysts. The Dry Season sampling notification letter was submitted on July 14, 2015 and approved on July 23, 2015 (Appendix A). Dry Season sampling for this project occurred on September 9, 2015. A photographic record of sampled basins is provided in Appendix B.

Fairy shrimp soil collection was conducted in accordance with the *Interim Survey Guidelines to Permittees for Recovery Permits under Section 10(a)(1)(A) of the Endangered Species Act for the Listed Vernal Pool Branchiopods* (USFWS 1996) with incorporation of the most recent guidance (USFWS 2015) wherever possible. Soil collection was conducted by USFWS permitted fairy shrimp and vernal pool biologists Richard Stolpe (Permit TE-25864A-1), with the assistance of Cardno colleagues Shannon Brown and Blake Claypool. Samples were collected in the following manner:

**Soil/substrate collection** - A hand spade was used to collect a maximum of one liter volume sample per basin consisting of the top 0.4 to 1.2 inches (1 to 3 cm) of basin sediment. Whenever possible, soil samples were collected in chunks and the spade was used to pry up intact chunks of sediment. Loosening the soil by raking or shoveling was avoided because of its potential to damage cysts.

**Soil/substrate sample volume** - At least ten soil samples were collected at each basin, but no more than 1.25 liters of total soil was taken from any basin. If a basin had had a surface area of less than 2.5 square meters, or more than 236 square meters, the number of samples and total volume of soil would have been adjusted accordingly (per Table 1 of *Survey Guidelines for the Listed Large Branchiopods* [USFWS 2015]). No more than 10% of any basin's surface area was disturbed while collecting soil/substrate. Tools and other gear used were disinfected between isolated basins after sampling.

**Soil/substrate sample locations** - Samples were collected from the deepest topographic area (or areas) within the basin. Interval sites between deep locations, as well as relevant sites radiating out in a transect manner from the deepest location to the basin margins were also sampled. This approach recommended by USFWS guidance (USFWS 2015) is also consistent with research findings of the author (Stolpe 2009).

**Soil/substrate sample storage** - Samples from the same basin were combined in the same storage container. The container was then labelled with the collection date, location of basin, and name of

permitted collector. Samples were well-ventilated and stored in a dry location out of direct sunlight to avoid excessive heating.

Only biologists who hold a valid 10(a)1(A) recovery permit for the listed large branchiopods with additional terms and conditions included in their permit specifically for conducting processing, isolating, and identifying listed large branchiopod eggs are authorized to conduct this procedure. At this time the preparation of materials to support the addition of an amendment to the permit of Mr. Stolpe is in-progress. Therefore, the services of an appropriately permitted individual, Dr. Charles Black (10[a][1][A] permit #TE835549-6[2]) were utilized for this purpose. Under Dr. Black's close supervision, Mr. Stolpe assisted with the various steps processing and identification. The results of Dr. Black's examination of soil samples are summarized in Chapter 5.0 *Results*, and the stand-alone report is included in Appendix C. The following methods were used by Dr. Black and Mr. Stolpe to isolate branchiopod eggs:

**Soil/substrate sample processing for cyst presence -** Approximately 1 liter bulk samples collected by Richard Stolpe from 12 different basins were delivered to Ecological Restoration Service (ERS) in September, 2015. The samples were processed per the USFWS protocol guidelines (USFWS 1996) that this project was initiated under, and modified by ERS as described below. Dr. Black of ERS is authorized by the USFWS to process dry samples for the presence of fairy shrimp cysts and to culture cysts to identify to species level as per the special conditions of his 10(a)(1)(A) permit.

The samples were hydrated for approximately 1-2 hours in tap water, and then washed through a set of sieves. Material passing through a Number 45 (.0139") USA Standard Testing Sieve, ASTM-11 specification and caught on a Number 70 (.0083") Sieve was rinsed into a container with approximately 50 milliliters (ml) of a saturated brine solution to float organic material, including fairy shrimp cysts. The material floating on the brine was decanted onto a paper filter placed in a filter funnel, and water was removed through the filter paper by way of vacuum suction. The material left on the paper was examined under a 6.3 - 570x power Olympus SZX9 Zoom Stereo Microscope. Distinctive fairy shrimp cysts, if present, were individually counted (if less than approximately 50) or estimated (for larger numbers) by examining ¼ or ½ subsections of the filter and multiplying the subset by the appropriate factor. The presences of ostracod shells and cladoceran ephippia were also noted in samples.

**Branchiopod egg specimen vouchers –** As required by the conditions of the Endangered Species Act Section 10(a)(1)(A) permit for the take of large branchiopods, a representative sample of eggs from each species of branchiopod collected from a basin surveyed will be deposited at the Natural History Museum of Los Angeles County in the manner listed in the protocol guidance (USFWS 2015 [Section VIII]).

# 5.0 RESULTS

Results of the Dry Season fairy shrimp surveys for the SDG&E TL 695/6971 Reconductor Project survey area are provided in Table 1 of Appendix C and summarized in Table 2 below. The Dry Season Vernal Pool Data sheet entries and Voucher Specimen Data Worksheet are both included in Appendix D.

In summary, distinctive *Branchinecta* cysts were present in medium to high numbers in five basins (21-2; 23-4; 33-1; 33-2; 33-10), low numbers (less than 20 total) in samples from four basins (23-2; 33-3; 33-4; 33-11), and no cysts or other structures were found in three basins (7-1; 21-3; 24-1). No *Streptocephalus* cysts were found in any sample.

[2] Effective to 3/9/2015 (in process of renewal)

**Table 3. TL 695/6971 Basins Surveyed for Fairy Shrimp, 2015 Dry Season**

| Basin ID | Observed Fairy Shrimp Wet Season | Observed Cysts Dry season | Cyst Abundance[1] | Ostracod Shells | Cladocera Ephippia |
|---|---|---|---|---|---|
| Basin 5-1 | *Branchinecta species* | Not sampled | Not sampled | Not sampled | Not sampled |
| Basin 7-1 | None | None | None | None | None |
| Basin 21-1 | *Branchinecta lindahli* | Not sampled | Not sampled | Not sampled | Not sampled |
| Basin 21-2 | *Branchinecta lindahli* | *Branchinecta species* | Medium | Yes | Yes |
| Basin 21-3 | None | None | None | None | None |
| Basin 23-2 | None | *Branchinecta species* | Low | Yes | None |
| Basin 23-4 | None | *Branchinecta species* | High | Yes | Yes |
| Basin 23-8 | *Branchinecta lindahli* | Not sampled | Not sampled | Not sampled | Not sampled |
| Basin 24-1 | *Branchinecta lindahli* | None | None | None | None |
| Basin 33-1 | *Branchinecta lindahli* | *Branchinecta species* | High | Yes | None |
| Basin 33-2 | *Branchinecta lindahli* | *Branchinecta species* | Medium | Yes | None |
| Basin 33-3 | Undetermined | *Branchinecta species* | Low | None | None |
| Basin 33-4 | *Branchinecta lindahli* | *Branchinecta species* | Low | None | None |
| Basin 33-10 | *Branchinecta lindahli* | *Branchinecta species* | High | Yes | None |
| Basin 33-11 | None | *Branchinecta species* | Low | Yes | None |

Notes: [1]Average number of cysts per 100 ml of soil (per sample): High = >50; Medium = 11-50; Low = 1-10 (USFWS 2015 [Section VI.d]).

Three basins were not surveyed for fairy shrimp cysts. Basin 21-1 did not dry out as expected due to a ruptured nearby irrigation pipe that repeatedly filled the basin with non-potable water. Basin 5-1 and Basin 23-8 were not sampled for fairy shrimp cysts because Wet Season sampling for those basins was insufficient.

Dry season sampling revealed Branchinecta species cysts in three basins in which fairy shrimp had not been observed during the Wet Season surveys. However, Basin 23-4 was rumored to have hosted fairy shrimp during the winter of 2014 and therefore cysts were anticipated and encountered. Dry season sampling of Basin 33-3 helped to reduce the uncertainty of findings during the Wet Season, and further the hypothesis that it may share characteristics with Basin 33-4.

Conversely, no cysts were encountered in Basin 24-1 even though on a single occasion (March 13, 2015) two mature *B. lindahli* fairy shrimp (one male and one female) were recovered from the basin. While anthropogenic translocation of the mature shrimp is possible, it is unlikely given the location of the basin and the measures taken by the surveyors to cleanse equipment between basins. It is difficult to reconcile the anomaly; however, it may suggest a very low fairy shrimp cyst population in the soil substrate.

# 6.0 DISCUSSION

All surveyed basins were non-naturally occurring disturbed depressions, ruts, and/or swales. No federally listed fairy shrimp species were identified in the Wet Season surveys, and no federally listed *Streptocephalus* cysts were identified during the Dry Season survey of basins for the SDG&E TL 695/6971 Reconductor Project. The *Branchinecta* species was identified in 13 of the 15 basins surveyed. The non-listed versatile fairy shrimp was observed in eight basins during the Wet Season. It is not possible at this time to distinguish between *Branchinecta* species of cysts that are or are not afforded protection under the federal Endangered Species Act without DNA-level examination.

This is an interim report, and the Dry and Wet Season reports will be combined in a Final Fairy Shrimp Report at the conclusion of the project.

# 7.0 REFERENCES

MCB Camp Pendleton. 2012. Integrated Natural Resource Management Plan Marine Corps Base and Marine Corps Air Station Camp Pendleton. Assistant Chief of Staff, Environmental Security. http://www.marines.mil/unit/basecamppendleton/Pages/BaseStaffandAgencies/Environmental/NaturalResourcesManagementPlan/Home.aspx.

Stolpe, R.C. 2009. Effects of Vehicular Disturbance on Physical and Biological Properties of Vernal Pools at Marine Corps Air Station, Miramar, San Diego County, CA. Published Master's Thesis. San Diego State University. Aztec Publishing.

USFWS. 1993. Endangered and Threatened Wildlife and Plants: Determination of Threatened Status for Three Vernal Pool Plants and the Riverside Fairy Shrimp. U.S. Fish and Wildlife Service. Federal Register 58: 41384-41392.

USFWS. 1996. Interim Survey Guidelines to Permittees for Recovery Permits under Section 10(a)(1)(A) of the Endangered Species Act for the Listed Vernal Pool Branchiopods. 19 August.

USFWS. 1997. Endangered and Threatened Wildlife and Plants: Determination of Endangered Status for the San Diego Fairy Shrimp. U.S. Fish and Wildlife Service. Federal Register 62: 4925-4939.

USFWS. 2008a. Riverside Fairy Shrimp (*Streptocephalus wootoni*) 5-Year Review: Summary and Evaluation. U.S. Fish and Wildlife Service Carlsbad Office. Carlsbad, California. September

USFWS. 2008b. San Diego Fairy Shrimp (*Branchinecta sandiegonensis*) 5-Year Review: Summary and Evaluation. U.S. Fish and Wildlife Service Carlsbad Office. Carlsbad, California. September

USFWS. 2015. Survey Guidelines for the Listed Large Branchiopods. Pacific Southwest Region. May 31.

# APPENDIX A

*15-Day Notification for Dry Season Fairy Shrimp Surveys*

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| | |
|---|---|
| **From:** | Love, Stacey |
| **To:** | Richard Stolpe |
| **Subject:** | Fwd: Dry Season Notification modified as requested |
| **Date:** | Tuesday, September 15, 2015 1:06:36 PM |
| **Attachments:** | USFWS Request Letter - Dry Season_modified.pdf |

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Hi Richard,

Thank you for the revised notification. Please consider this email our approval for you to use proposed methods and personnel described in the notification below.

Thank you,
Stacey
---------- Forwarded message ----------
From: **Richard Stolpe** <Richard.Stolpe@cardno-gs.com>
Date: Mon, Sep 14, 2015 at 10:32 AM
Subject: Dry Season Notification modified as requested
To: "Love, Stacey" <stacey_love@fws.gov>

Hi Stacey,

Just to be sure that I am satisfactorily meeting the request of your July 23rd email (refer to email chain below), I have modified the Dry Season notification as requested so that it identifies Chuck Black, 10(a)(1)(A) permit # TE-835549-5, as the individual to process the Dry Season samples and identify cysts. I only modified one other item in the letter, and that was to change the recipient from "Peter Beck" to "Stacey Love". Other than that it is the same letter that was approved back in July.

My apologies if this was unnecessary; I had not received a confirmation that the email update on September 8th was sufficient by itself.

Richard


Richard Stolpe
ENVIRONMENTAL ANALYST/PLANNER
GOVERNMENT SERVICES DIVISION, CARDNO
Fairy Shrimp Permitted Biologist
(CDFW SC-11445 / USFWS TE-25864A-0)
Office (+1) 858-509-3157 Mobile (+1) 619-818-8736 Fax (+1) 858-509-3158
Address 514 Via De La Valle, Suite 308, Solana Beach, CA 92075
Email richard.stolpe@cardno-gs.com Web www.cardno.com

**From:** Love, Stacey [mailto:stacey_love@fws.gov]
**Sent:** Thursday, July 23, 2015 12:35 PM
**To:** Richard Stolpe
**Cc:** Peter Beck
**Subject:** Fwd: 15-Day Dry Season Notification Letter - TL696/6971 project

Richard,

Thank you for the notification. Please consider this email our approval for you to commence dry season surveys for listed large branchiopods at this location using proposed methods described in the notification below.

As acknowledged in the notification, processing the soils and examination for listed large branchiopods can only be conducted by permittees with these authorizations per VI of the survey guidelines (please see attached list of permittees). Thus, I should receive a pre-activity notification from the permittee, or please resend this notification (once you have identified the permittee) and state their name and permit number in your email text.

Also, please be advised that hydration alone cannot determine absence per VI(f)(2) of the survey guidelines. Per number II(b) of the guidelines, a complete survey consists of one wet season survey and one dry season survey conducted within a 3-year period. Thus, the dry season survey coupled with a wet season may determine absence (assuming the wet season survey is determined to be valid by the Service). However, should *Branchinecta* sp. be detected this dry season in any pool where surveys from the 2014-2015 wet season survey found no listed shrimp, we recommend that you plan to conduct wet season surveys at these locations in 2015-2016 per IV(b)(7) of the guidelines.

I look forward to receiving your survey report.

Thank you,

Stacey

---------- Forwarded message ----------
From: **Beck, Peter** <peter_beck@fws.gov>
Date: Wed, Jul 15, 2015 at 3:17 PM
Subject: Fwd: 15-Day Dry Season Notification Letter - TL696/6971 project
To: "Stolpe, Richard" <Richard.Stolpe@cardno-gs.com>
Cc: Stacey Love <Stacey_Love@fws.gov>, Jonathan Snyder
<Jonathan_D_Snyder@fws.gov>

Richard,

Since you will be conducting surveys under your ESA 10a1A Recovery Permit, pre-activity survey notifications should always be directed to our office Permit Coordinator, Stacey Love. She typically forwards these notifications to staff biologists (like myself) for review and comment before she responds. Although she generally bases her response on our comments and recommendations, only she has the authority within our office to provide the official Service response. I will forward your notification to her, and separately provide my comments to her. She will respond to your request.

I understand that our process may be confusing at times, but I just want to make sure you are aware that all survey notifications need to go through the Permit Coordinator. You are always welcome to discuss a specific sampling strategy that will be applied to Camp Pendleton (my "turf"), as I am one of the ultimate users of the resulting survey information. Generally, sampling only needs further discussion if it varies from our established survey protocols, but there may be many case-specific situations you may wish to discuss due to the large number of vernal pools on Camp Pendleton and wealth of past survey information covering many of the pools on Camp Pendleton.

Thanks,

Pete

**********

Peter P. Beck

Fish & Wildlife Biologist

U.S. Fish and Wildlife Service

2177 Salk Avenue, Suite 250

Carlsbad, CA 92008

Phone: (760) 431-9440 x213

---------- Forwarded message ----------
From: **Richard Stolpe** <Richard.Stolpe@cardno-gs.com>
Date: Tue, Jul 14, 2015 at 11:28 AM
Subject: 15-Day Dry Season Notification Letter - TL696/6971 project
To: "peter_beck@fws.gov" <peter_beck@fws.gov>
Cc: "Amy Rowland (amy@pangeabiological.com)" <amy@pangeabiological.com>, "Scott Rowland (scott@pangeabiological.com)" <scott@pangeabiological.com>, "msaplanning@pangeabiological.com" <msaplanning@pangeabiological.com>, "shruti.ramaker@cardno.com" <shruti.ramaker@cardno.com>, Scott Barker <Scott.Barker@cardno-gs.com>, Clint Scheuerman <Clint.Scheuerman@cardno-gs.com>, Lisa Woeber <Lisa.Woeber@cardno-gs.com>, Jason Strayer <Jason.Strayer@cardno-gs.com>

Dear Mr. Beck,

Please find the attached request to conduct Dry Season surveys for listed vernal pool branchiopods in support of the San Diego Gas and Electric Company's TL 695/6971 Reconductor Project. All pertinent project and survey information is presented in the request. Please feel free to contact me should you have any questions or concerns.

Very Respectfully,

Richard Stolpe

Richard Stolpe
ENVIRONMENTAL ANALYST/PLANNER
Fairy Shrimp Permitted Biologist
(CDFW SC-11445 / USFWS TE-25864A-0)

GOVERNMENT SERVICES DIVISION
CARDNO

Cardno
Shaping the Future

Office (+1) 858-509-3157 Mobile (+1) 619-818-8736 Fax (+1) 858-509-3158
Address 514 Via De La Valle, Suite 308, Solana Beach, CA 92075
Email richard.stolpe@cardno-gs.com Web www.cardno.com

---

**Celebrating 70 Years** of Shaping the Future – *1945 - 2015*

---

**Richard C. Stolpe**
**514 Via De La Valle, Suite 308**
**Solana Beach, CA • 92075**
**Phone: (858) 509-3157**
**Email: richard.stolpe@cardno-gs.com**

July 14, 2015

Ms. Stacey Love
Biologist/Recovery Permits
Carlsbad Fish and Wildlife Office
2177 Salk Avenue, Suite 250
Carlsbad, CA. 92008

**SUBJECT:** 15-day notification for 2015 dry season fairy shrimp surveys on Marine Corps Base Camp Pendleton in San Diego County, California in support of the San Diego Gas and Electric Company's TL 695/6971 Reconductor Project

Dear Ms. Love,

I am writing to request permission for myself and my coworker, Mr. Clint Scheuerman (please see permit information below), to conduct dry season branchiopod sampling at 41 potential or known basins on Marine Corps Base (MCB) Camp Pendleton. All of the basins are located within the USGS SAN CLEMENTE 7.5' Quadrangle (please see Enclosure 1). The surveys would be conducted as part of the environmental analysis for the San Diego Gas and Electric Company's TL 695/6971 Reconductor Project, and as a follow-up to wet season surveys approved for some of those basins earlier this year (2015; refer to Enclosure 2). The Proposed Project would replace conductor wire and poles within San Diego Gas and Electric's right-of-way along an 11-mile-long transmission corridor located in the western portion of MCB Camp Pendleton. Basin IDs and approximate coordinates are presented below and their locations are shown on the accompanying maps in Enclosure 1.

For many of the 41 basins, surveys will be conducted to collect baseline information as they have not yet been surveyed for the presence of listed branchiopods. As noted above, others were wet season sampled by Cardno earlier this year, and the dry season sampling will complete their protocol surveys. For basins not sampled during the 2014-15 wet season, wet season sampling will be required during the upcoming 2015-16 wet season to complete their protocol surveys. A request for approval of 2015-16 wet season surveys will be submitted to USFWS in advance of that effort.

In February of 2015, Cardno requested permission (and was approved in March) to conduct wet season surveys on 7 known basins along the project alignment. The determination of 7 basins in the project area was based upon three sources: 1) the official MCB Camp Pendleton vernal pool database; 2) a 2014 reconnaissance survey performed by AECOM; and 3) a 2014 reconnaissance survey performed by LSA. During initial wet season survey activities, additional previously undocumented basins were observed

ponding in the project alignment, some containing fairy shrimp, and given the later start to our wet season sampling were also surveyed, although not necessarily sampled (e.g., Basin 5-1 and Basin 23-8 genus was determined visually in-the-field by a 10(a)(1)(A) fairy shrimp permitted biologist; see Table 1 below).

Since the wet season began, our survey area has expanded to include access roads approaching the project alignment. An initial survey of the access roads determined that there are another 31 potential basins which may need to be surveyed/sampled, resulting in a total of 49 basins. During both the wet season surveys/sampling and initial dry season reconnaissance survey, a total of 8 (of the 49) basins were eliminated from further consideration due to exceedingly poor basin characteristics and thus, exceedingly poor vernal pool or vernal pool flora/fauna potential. Therefore, there are 41 basins that Cardno is currently tracking; 13 that were carried over from the wet season, and 28 that will be new for this season's (2015) dry season survey/sampling event. It is the 41 basins shown both in Table 1 and on the maps in Enclosure 1, for which approval to conduct Dry Season sampling is being requested:

**Table 1. Basins Identified in the Project Area**

| # | Feature Number | Previous Feature Numbers | Approximate Lat./Long. | Potential Species | 2015 Wet Season Surveyed | 2015 Observed Species |
|---|---|---|---|---|---|---|
| 1 | Basin 3-1 | None | 33°27'16.32"N, 117°34'22.52"W | Potentially suitable for fairy shrimp. | No | - |
| 2 | Basin 3-2 | None | 33°27'14.95"N, 117°34'24.63"W | Potentially suitable for fairy shrimp. | No | - |
| 3 | Basin 3-3 | None | 33°27'12.18"N, 117°34'32.15"W | Potentially suitable for fairy shrimp. | No | - |
| 4 | Basin 4-1 | None | 33°27'9.72"N, 117°34'27.81"W | Potentially suitable for fairy shrimp. | No | - |
| 5 | Basin 4-2 | None | 33°27'3.63"N, 117°34'43.00"W | Potentially suitable for fairy shrimp. | No | - |
| 6 | Basin 4-3 | None | 33°27'3.03"N, 117°34'42.46"W | Potentially suitable for fairy shrimp. | No | - |
| 7 | Basin 5-1 | Basin 1 (Cardno). | 33°26'39.17"N, 117°34'49.54"W | Lindahl FS known to occupy | No | *B. species*[1] |
| 8 | Basin 7-1 | SP_59001 (MCBCP); 9-1 (Cardno). | 33°26'17.12"N, 117°34'52.64"W | Riverside FS known to occupy | Yes | None |
| 9 | Basin 7-4 | None | 33°25'59.37"N, 117°34'53.04"W | Potentially suitable for fairy shrimp. | No | - |
| 10 | Basin 11-1 | None | 33°25'18.54"N, 117°34'51.92"W | Potentially suitable for fairy shrimp. | No | - |
| 11 | Basin 21-1 | Basin 1 (AECOM); 29-1/2 (Cardno). | 33°23'3.94"N, 117°34'14.56"W | Lindahl FS known to occupy | Yes | *B. lindahli* |
| 12 | Basin 21-2 | 29-3 (Cardno) | 33°23'2.88"N, 117°34'12.98"W | Lindahl FS known to occupy | Yes | *B. lindahli* |
| 13 | Basin 21-3 | 29-4 (Cardno) | 33°22'59.32"N, 117°34'7.84"W | Suitable for fairy shrimp | Yes | None |
| 14 | Basin 21-4 | None | 33°22'58.30"N, 117°34'3.38"W | Potentially suitable for fairy shrimp. | No | - |
| 15 | Basin 21-5 | None | 33°22'54.21"N, 117°33'56.85"W | Potentially suitable for fairy shrimp. | No | - |
| 16 | Basin 23-1 | None | 33°22'56.07"N, 117°33'20.62"W | Potentially suitable for fairy shrimp. | No | - |

| # | Feature Number | Previous Feature Numbers | Approximate Lat./Long. | Potential Species | 2015 Wet Season Surveyed | 2015 Observed Species |
|---|---|---|---|---|---|---|
| 17 | Basin 23-2 | SO_83002 (MCBCP); 34-1 (Cardno). | 33°22'56.69"N, 117°33'20.04"W | Lindahl FS known to occupy | Yes | None |
| 18 | Basin 23-3 | None | 33°22'56.81"N, 117°33'19.65"W | Potentially suitable for fairy shrimp. | No | - |
| 19 | Basin 23-4 | SO_83001 (MCBCP); 34-2 (Cardno). | 33°22'55.79"N, 117°33'19.01"W | Lindahl FS known to occupy | Yes | None |
| 20 | Basin 23-5 | None | 33°22'55.76"N, 117°33'21.07"W | Potentially suitable for fairy shrimp. | No | - |
| 21 | Basin 23-6 | None | 33°22'55.73"N, 117°33'20.67"W | Potentially suitable for fairy shrimp. | No | - |
| 22 | Basin 23-7 | None | 33°22'56.80"N, 117°33'18.67"W | Potentially suitable for fairy shrimp. | No | - |
| 23 | Basin 23-8 | None | 33°22'59.05"N, 117°33'15.99"W | Lindahl FS known to occupy | No | *B. species*[1] |
| 24 | Basin 24-1 | Basin 2 (AECOM); 45-1 (Cardno). | 33°22'30.01"N, 117°32'57.59"W | Lindahl FS known to occupy | Yes | *B. lindahli* |
| 25 | Basin 27-1 | None | 33°24'41.14"N, 117°34'47.84"W | Potentially suitable for fairy shrimp. | No | - |
| 26 | Basin 28-1 | None | 33°24'29.59"N, 117°34'40.05"W | Potentially suitable for fairy shrimp. | No | - |
| 27 | Basin 28-2 | None | 33°24'29.40"N, 117°34'38.28"W | Potentially suitable for fairy shrimp. | No | - |
| 28 | Basin 28-3 | None | 33°24'27.85"N, 117°34'36.17"W | Potentially suitable for fairy shrimp. | No | - |
| 29 | Basin 30-1 | None | 33°23'54.55"N, 117°34'10.76"W | Potentially suitable for fairy shrimp. | No | - |
| 30 | Basin 33-1 | SO_74002 (MCBCP); 43-3 (Cardno). | 33°23'10.20"N, 117°33'35.19"W | Lindahl FS known to occupy | Yes | *B. lindahli* |
| 31 | Basin 33-2 | SO_74001 (MCBCP); 43-4 (Cardno). | 33°23'9.80"N, 117°33'39.02"W | Lindahl FS known to occupy | Yes | *B. lindahli* |
| 32 | Basin 33-3 | SO_74004 (MCBCP); 43-2 (Cardno). | 33°23'11.38"N, 117°33'38.02"W | Lindahl FS known to occupy | Yes | Undetermined |
| 33 | Basin 33-4 | SO_74003 (MCBCP); 43-1 (Cardno). | 33°23'12.03"N, 117°33'38.01"W | Lindahl FS known to occupy | Yes | *B. lindahli* |
| 34 | Basin 33-5 | None | 33°23'11.39"N, 117°33'37.58"W | Potentially suitable for fairy shrimp. | No | - |
| 35 | Basin 33-6 | None | 33°23'10.94"N, 117°33'37.08"W | Potentially suitable for fairy shrimp. | No | - |
| 36 | Basin 33-7 | None | 33°23'10.82"N, 117°33'36.85"W | Potentially suitable for fairy shrimp. | No | - |
| 37 | Basin 33-8 | None | 33°23'3.89"N, 117°33'30.31"W | Potentially suitable for fairy shrimp. | No | - |
| 38 | Basin 33-9 | None | 33°23'0.24"N, 117°33'32.07"W | Lindahl FS known to occupy | No | Undetermined |
| 39 | Basin 33-10 | SO_83003 (MCBCP); 44-2 (Cardno). | 33°23'1.02"N, 117°33'29.47"W | Lindahl FS known to occupy | Yes | *B. lindahli* |
| 40 | Basin 33-11 | SO_84001 (MCBCP); 44-1 (Cardno). | 33°23'2.83"N, 117°33'27.04"W | Lindahl FS known to occupy | Yes | None |
| 41 | Basin 33-12 | None | 33°22'59.48"N, 117°33'30.26"W | Potentially suitable for fairy shrimp. | No | - |

[1]Visual determination made in the field by 10(a)(1)(A) fairy shrimp permitted biologist R. Stolpe.

As a subcontractor to Pangea Biological for services provided to San Diego Gas and Electric Company for our employer Cardno, we, Richard Stolpe and/or Clint Scheuerman, will administer the 2015 dry season branchiopod surveys. The branchiopod surveys will be conducted in accordance with the most recent guidelines published by the Service under Section 10(a)(1)(A) of the Endangered Species Act for dry season surveys. Accordingly, Mr. Stolpe and/or Mr. Scheuerman will only collect soil samples, and will not process those soil samples themselves[1]. Soil samples, once collected by Mr. Stolpe and/or Mr. Scheuerman, will be processed by Dr. Chuck Black, 10(a)(1)(A) fairy shrimp permit TE-835549-5, whose permit includes the special condition that allows for the processing of dry season soil samples and identification of cysts.

Please refer to attached site maps of the areas we intend to survey. As always, please do not hesitate to contact me with any questions, or if I can provide anything further.

Very Respectfully,

Richard C. Stolpe

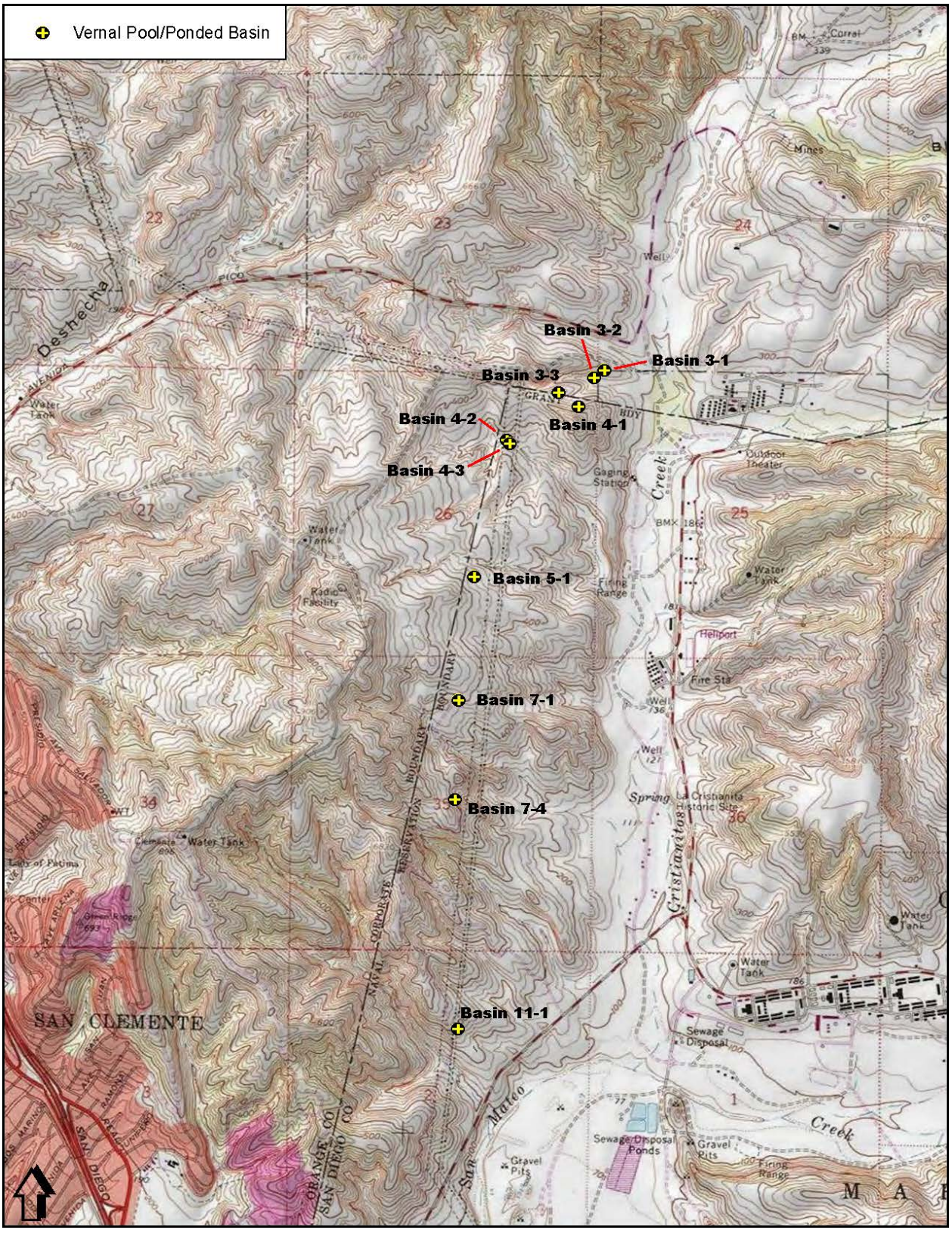
**Contact Information**
Richard Stolpe, Cardno (Recovery Permit TE-25864A-0)
514 Via De La Valle, Suite 308
Solana Beach, CA 92075
Phone: (858) 509-3157
Email: richard.stolpe@cardno-gs.com

Clint Scheuerman, Cardno (Recovery Permit TE-44855A-1)
1941 Devaul Ranch Drive
San Luis Obispo, CA 93405
Phone: (760) 809-4236
Email: clint.scheuerman@cardno-gs.com

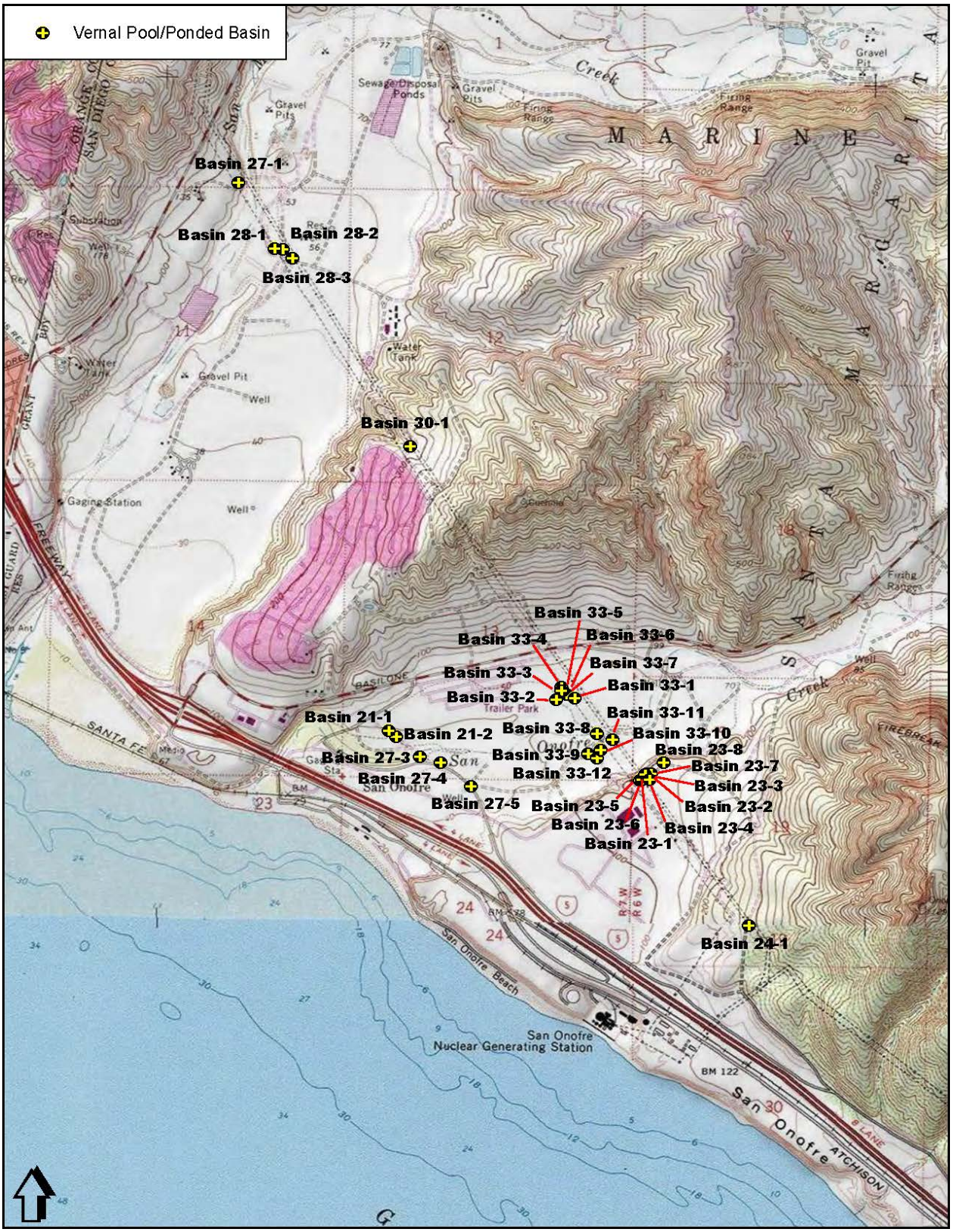
Enclosures (1) – Location of project alignment and basins listed in the table above on a USGS San Clemente 7.5' Quadrangle Map (2 pages).
(2) – Copy of the 15-Day Notification Letter for Wet Season Surveys (6 pages).

[1] Mr. Stolpe and/or Mr. Scheuerman endeavor to obtain the special condition on their permits that would allow them to process dry season samples. Until such time as this permit amendment is made and approved by USFWS however, all project dry season samples will be processed by Dr. Chuck Black, 10(a)(1)(A) fairy shrimp permit TE-835549-5.

**Enclosure 1.** Vernal Pool/Ponded Basin Locations for the TL 695/6971 Project in the USGS SAN CLEMENTE 7.5' Quadrangle



**Enclosure 1.** Vernal Pool/Ponded Basin Locations for the TL 695/6971 Project in the USGS SAN CLEMENTE 7.5' Quadrangle



**From:** Beck, Peter [mailto:peter_beck@fws.gov]
**Sent:** Monday, March 02, 2015 3:06 PM
**To:** Scheuerman, Clint
**Cc:** Stacey_Love@fws.gov; Barker, Scott; Stolpe, Richard; Jonathan Snyder
**Subject:** Re: TL 695/6971 ets 25240.01 – Wet Season Fairy Shrimp Notification

Clint,
Yes, if there is adequate ponding out there I think it makes sense to go ahead with the surveys now. Although I wouldn't normally directly approve such a request, considering our recent phone exchange, Stacey agreed I could go ahead and indicate our approval to save some time. Thanks for being patient and following up on this.
Sincerely,
Pete

**********

Peter P. Beck
Fish & Wildlife Biologist
U.S. Fish and Wildlife Service
2177 Salk Avenue, Suite 250
Carlsbad, CA 92008
Phone: (760) 431-9440 x213

On Mon, Mar 2, 2015 at 1:34 PM, Scheuerman, Clint <Clint.Scheuerman@cardno-gs.com> wrote:

Hi Stacey and Pete,

I received a voice message from Pete a couple weeks ago regarding our Notification of Intent to Conduct Wet Season Surveys at MCB Camp Pendleton. We ended up in a bit of phone-tag and never had a chance to talk, but we both agreed that at the time and with the dry weather patterns we were having, that it was too late in the season to conduct wet season surveys. However, with recent rains, it is likely that many of the vernal pools and other ponded basins in the area have ponded once again. Therefore, I am writing to check in with you and request your permission to begin wet season surveys as soon as possible. I appreciate your input and decision.

Respectfully,

Clint Scheuerman

SENIOR BIOLOGIST/WETLAND SCIENTIST
CARDNO, GOVERNMENT SERVICES DIVISION
Phone (+1) 805-755-6698 Mobile (+1) 760-809-4236
Address 1941 Devaul Ranch Drive, San Luis Obispo, CA 93405 USA

**From:** Scheuerman, Clint
**Sent:** Thursday, February 05, 2015 2:56 PM
**To:** Stacey_Love@fws.gov
**Cc:** 'teasely@semprautilities.com'; 'amy@pangeabiological.com'; 'ppotenza@pangeabiological.com'; 'msaplanning@pangeabiological.com'; Stolpe, Richard; Barker, Scott
**Subject:** TL 695/6971 ets 25240.01 – Wet Season Fairy Shrimp Notification

Dear Ms. Love,

Please find attached a request to conduct wet season surveys for listed vernal pool branchiopods in support of the San Diego Gas and Electric Company's TL 695/6971 Reconductor Project. All pertinent project and survey information is presented in the request. Please feel free to contact me should you have any questions or concerns.

Very Respectfully,


Clint Scheuerman

SENIOR BIOLOGIST/WETLAND SCIENTIST
CARDNO, GOVERNMENT SERVICES DIVISION

Cardno
Shaping the Future

Phone (+1) 805-755-6698 Mobile (+1) 760-809-4236
Address 1941 Devaul Ranch Drive, San Luis Obispo, CA 93405 USA
Email clint.scheuerman@cardno-gs.com Web www.cardno.com

# APPENDIX B

*2015 Dry Season Photographic Record*

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# Photographic Record

| BASIN 7-1 (33°26'17.12"N, 117°34'52.64"W) | BASIN 21-1 (33°23'3.94"N, 117°34'14.56"W) |
|---|---|
|  |  |
| **View West. Photo by RCS, 9 Sep 2015.** ***No cysts.*** | **View Southeast. Photo by RCS, 21 Jul 2015 [9 Sep 2015 photo missing]** ***Branchinecta cysts.*** |
| **BASIN 21-3 (33°22'2.59"N, 117°34'7.84"W)** | **BASIN 23-2 (33°22'56.69"N, 117°33'20.04"W)** |
|  |  |
| **View Northwest. Photo by RCS, 9 Sep 2015.** ***No cysts.*** | **View Northwest. Photo by RCS, 9 Sep 2015.** ***Branchinecta cysts.*** |

## Photographic Record

| BASIN 23-4 (33°22'55.79"N, 117°33'19.01"W) | BASIN 24-1 (33°22'30.01"N, 117°32'57.59"W) |
|---|---|
|  |  |
| **View Southeast. Photo by RCS, 9 Sep 2015.** ***Branchinecta cysts.*** | **View Southeast. Photo by RCS, 9 Sep 2015.** ***No cysts.*** |
| **BASIN 33-1 (33°23'10.20"N, 117°33'35.19"W)** | **BASIN 33-2 (33°23'9.80"N, 117°33'39.02"W)** |
|  |  |
| **View Southeast. Photo by RCS, 9 Sep 2015.** ***Branchinecta cysts.*** | **View South. Photo by RCS, 9 Sep 2015.** ***Branchinecta cysts.*** |

## Photographic Record

| BASIN 33-3 (33°23'11.38"N, 117°33'38.02"W) | BASIN 33-4 (33°23'12.03"N, 117°33'38.01"W) |
|---|---|
|  |  |
| **View Northeast. Photo by RCS, 9 Sep 2015.** ***Branchinecta cysts.*** | **View North. Photo by RCS, 9 Sep 2015.** ***Branchinecta cysts.*** |
| **BASIN 33-10 (33°23'1.02"N, 117°33'29.47"W)** | **BASIN 33-11 (33°23'2.83"N, 117°33'27.04"W)** |
|  |  |
| **View South. Photo by RCS, 9 Sep 2015.** ***Branchinecta cysts.*** | **View East. Photo by RCS, 9 Sep 2015.** ***Branchinecta cysts.*** |

**BASIN 21-1 (33°23'3.94"N, 117°34'14.56"W) [Unable to Sample]**

**View Southeast. Photo by RCS, 9 Sep 2015. Artificially flooded – Unable to Sample.**

**Burst irrigation pipe upslope and northwest of Basin 21-1. Photo by RCS, 9 Sep 2015.**


**View downslope from burst pipe. Photo by RCS, 9 Sep 2015.**

**View Southeast. Photo by RCS, 1 Oct 2015. Artificially flooded – Unable to Sample.**

# APPENDIX C

***2015 Dry Season Cyst Identification Report***

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# Examination of Soil Samples from the Newport Banning Ranch Site for Fairy Shrimp Cysts and Fairy Shrimp Species Determination

**21 September 2015**

Chuck Black
Ecological Restoration Service
San Diego, CA 92103
(619) 944-1964

10(a)(1)(A) permit
TE835549-6
Effective to 3/9/2015 (in process of renewal)

## Introduction

Ecological Restoration Service was contracted in September 2015 by Richard Stolpe of Cardno (514 Via De La Valle #308, Solana Beach, CA 92075) for determination of the presence of fairy shrimp cysts in dry soil samples from 12 basins collected at the San Diego Gas and Electric, Camp Pendleton Easement site.

## Methods

### Soil Processing for Cyst Presence

Approximately 1 liter bulk samples collected by Richard Stolpe [10(a)(1)(A) permit TE-25864A-1 (effective to 7/23/2019)] from 12 different Camp Pendleton basins were delivered to ERS in September, 2015. The samples were processed per the U.S. Fish and Wildlife Service (USFWS) April 19, 1996 Interim Survey Guidelines to Permittees for Recovery Permits under Section 10(a)(l)(A) of the Endangered Species Act for the Listed Vernal Pool Branchiopods, modified by Ecological Restoration Service as described below. Charles Black of Ecological Restoration Service is authorized by the U.S. fish and Wildlife Service to process dry samples for the presence of fairy shrimp cysts and to culture cysts to identify to species level as per the special conditions of his 10(a)(1)(A) permit. These samples were hydrated for approximately 1-2 hours in tap water, then washed through a set of sieves. Material passing through a Number 45 (.0139") USA Standard Testing Sieve, A.S.T.M.E.-11 specification and caught on a Number 70 (.0083") Sieve was rinsed into a container with approximately 50 ml of a saturated brine solution to float organic material, including fairy shrimp cysts. The material floating on the brine was decanted onto a paper filter on a filter funnel, and water was removed through the filter paper by vacuum suction. The material left on the paper was examined under a 6.3-570x power Olympus SZX9 Zoom Stereo Microscope. Distinctive fairy shrimp cysts, if present, were individually counted (if less than approximately 50) or estimated (for larger numbers) by examining ¼ or ½ subsections of the filter and multiplying the subset by the appropriate factor. The presences of ostracod shells and cladoceran ephippia were also noted in samples.

## Results

### Cyst Presence

Distinctive *Branchinecta* cysts were present in small numbers (less than 20 total) in samples from four basins, moderate to high numbers in five basins, with no cysts or other structures found in three basins (Table 1). No *Streptocephalus* cysts were found in any sample.

### Other Aquatic Invertebrates

Small to large numbers of ostracod shells and cladoceran ephippia were also found in several samples, with highest numbers generally correlating to basins where high numbers of *Branchinecta* cysts were found (Table 1).

I certify that the information in this survey report and attached exhibits fully and accurately represent my work.

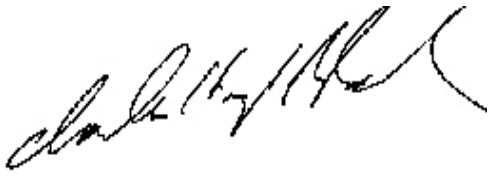

**Table 1 - Numbers of Branchinecta cysts, ostrocod shells, and cladoceran ephippia found in each of ten 100 ml soil samples for each basin (values left blank when no structures were found).**

| Pool | Branchinecta cysts | Ostrocod shells | Cladoceran ephippia | Pool | Branchinecta cysts | Ostrocod shells | Cladoceran ephippia | Pool | Branchinecta cysts | Ostrocod shells | Cladoceran ephippia |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 33-2 | 16 | | | 23-2 | 1 | | | 33-3 | | | |
| | 23 | | | | | | | | | | |
| | 43 | | | | | 2 | | | | | |
| | 23 | | | | | | | | 1 | | |
| | 24 | 1 | | | | | | | | | |
| | 9 | | | | 1 | 2 | | | 3 | | |
| | 26 | | | | | | | | | | |
| | 21 | | | | | 2 | | | | | |
| | 11 | 2 | | | | | | | 1 | | |
| | 11 | | | | | | | | 1 | | |
| | | | | | | | | | | | |
| 33-4 | 2 | | | 33-11 | 2 | 2 | | 21-2 | 85 | 20 | |
| | 1 | | | | | 1 | | | 52 | 8 | |
| | 2 | | | | 2 | | | | 64 | 8 | |
| | 3 | | | | 1 | | | | 64 | 2 | |
| | | | | | 1 | | | | 41 | 12 | |
| | | | | | | | | | 44 | 9 | |
| | 1 | | | | | | | | 28 | 400 | |
| | | | | | 1 | | | | 32 | 128 | |
| | 3 | | | | 1 | | | | 24 | 16 | |
| | 2 | | | | | | | | 15 | 2 | 1 |
| | | | | | | | | | | | |
| 33-1 | 260 | 65 | | 33-10 | 21 | 1 | | | | | |
| | 84 | 50 | | | 100 | 4 | | | | | |
| | 20 | 24 | | | 108 | | | | | | |
| | 96 | 28 | | | 14 | | | | | | |
| | 28 | 5 | | | 29 | | | | | | |
| | 151 | 7 | | | 165 | | | | | | |
| | 120 | | | | 78 | | | | | | |
| | 96 | 4 | | | 64 | | | | | | |
| | 184 | 4 | | | 210 | | | | | | |
| | 25 | 4 | | | 95 | | | | | | |
| | | | | | | | | | | | |
| 23-4 | 145 | 125 | | 24-1 | no cysts | | | | | | |
| | 60 | 30 | 20 | | | | | | | | |
| | 145 | 65 | 60 | | | | | | | | |
| | 150 | 70 | 30 | | | | | | | | |
| | 80 | 70 | 40 | | | | | | | | |
| | 28 | 10 | 50 | | | | | | | | |
| | 20 | 15 | 30 | | | | | | | | |
| | 85 | 20 | 75 | | | | | | | | |
| | 48 | 10 | 49 | | | | | | | | |
| | 102 | 10 | 120 | | | | | | | | |
| | | | | | | | | | | | |
| 7-1 | no cysts | | | 21-3 | no cysts | | | | | | |

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# APPENDIX D

*2015 Dry Season Sampling Data and Voucher Specimen Data Worksheets*

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## Appendix 2. U.S. Fish and Wildlife Service – Data Sheet for Dry Season Sample Analysis for Listed Large Branchiopods

**Project Information**

Project Name: TL695/6971 SDG&E
USFWS Project Number:
County: San Diego
Lat: (See reports)
Long:
Quad: San Clemente
Township: —
Range: —
Section: —

**Biologist Information**

Name of Person(2) Who Conducted the Following Tasks and Permit Number(s):

Soil Collection: Richard C. Stolpe TE-25864A-1
Soil Processing: Chuck Black TE-835549-6 with R.C.S. TE25864A-1
Soil Analysis/Cysts ID: (same as above)
Soil Collection Date: 9 September 2015

| Pool/ Habitat/ Basin No. | Invertbrates Present (X) | | | | | | | | | | | | | | | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Insect Exo-Skeletons | Micro-Turbellaria Cysts | Cladocera Ephippia | Ostracods Live/Cysts/ Carapaces | Copepods Live/Cysts | Number of Large Branchiopod Cysts: *Branchinecta* sp. | *Lepidurus packardi* | *Streptocephalus wootoni* | *Linderiella occidentalis* | *Lynceus brachyurus* | *Cyzicus californicus* | Hydracarina Live | Nematoda | Collembola | Other Species | |
| 7-1 | | | — | — | | — | — | — | — | — | — | | | | | — |
| 21-2 | | | Y | Y | | Y | — | — | — | — | — | | | | | To Be Accessioned (TBA) |
| 21-3 | | | — | — | | — | — | — | — | — | — | | | | | — |
| 23-2 | | | — | Y | | Y | — | — | — | — | — | | | | | TBA |
| 23-4 | | | Y | Y | | Y | — | — | — | — | — | | | | | TBA |
| 24-1 | | | — | — | | — | — | — | — | — | — | | | | | — |
| 33-1 | | | — | Y | | Y | — | — | — | — | — | | | | | TBA |
| 33-2 | | | — | Y | | Y | — | — | — | — | — | | | | | TBA |
| 33-3 | | | — | — | | Y | — | — | — | — | — | | | | | TBA |
| 33-4 | | | — | — | | Y | — | — | — | — | — | | | | | TBA |
| 33-10 | | | — | Y | | Y | — | — | — | — | — | | | | | TBA |
| 33-11 | | | — | Y | | Y | — | — | — | — | — | | | | | TBA |
| | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | |

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**Appendix E – Southwestern Willow Flycatcher, Least Bell's Vireo, and Arroyo Toad Survey Report Bloom 2015**

July 17, 2015

Ms. Stacey Love
U.S. Fish & Wildlife Service
2177 Salk Avenue, Suite 250
Carlsbad, California 92008

[via email]

**SUBJECT:** Results of protocol surveys for Southwestern Willow Flycatcher (*Empidonax traillii extimus*), Least Bell's Vireo (*Vireo bellii pusillus*), and Arroyo Toad (*Anaxyrus californicus*) for the San Diego Gas & Electric TL 695/6971 Reconductor Project in Orange and San Diego Counties, California.

Dear Ms. Love:

Bloom Biological, Incorporated (BBI) was retained by Pangea Biological (Pangea) for the San Diego Gas & Electric Company (SDG&E) to conduct protocol surveys for Southwestern Willow Flycatcher (*Empidonax traillii extimus*), Least Bell's Vireo (*Vireo bellii pusillus*), and Arroyo Toad (Anaxyrus *californicus*) within the TL 695/6971 Reconductor Project (Project), situated in the northwestern corner of Marine Corps Base Camp Pendleton (MCBCP), and in portions of both Orange and San Diego Counties, California. BBI conducted surveys within the study area from 24 March to 2 July, 2015 following the current survey protocols established by the U.S. Fish and Wildlife Service (USFWS). The following letter report documents the methods, results and conclusions of BBI's surveys.

## SURVEY AREA DESCRIPTION

The Survey Area for this report is comprised of approximately 58.9 acres of riparian and adjacent scrub habitats in the lower portions of the San Onofre Creek and San Mateo Creek drainages. The Survey Area includes all potential habitat for Southwestern Willow Flycatcher, Least Bell's Vireo and Arroyo Toad within 150 feet of Project components. Although portions of the Project are in Orange County, the Survey Area falls entirely within San Diego County due to the lack of potential habitat for the three species in the Orange County portions of the Project. The entirety of the Survey Area is located in the U.S. Geological Survey (USGS) 7.5-minute *San Clemente* quadrangle. Elevations in the Survey Area range from 30 to 120 feet (10 To 40 meters) above mean sea level (amsl). The Survey Area boundaries are depicted on USGS topographical map on the attached Exhibit.

Potential Least Bell's Vireo habitat within the survey area consists primarily of southern willow scrub, mulefat scrub, and sycamore alder riparian woodland within and adjacent to riparian corridors and streambeds. Arroyo Toad breeding and aestivation habitat is present in many of the same areas as potential LBVI habitat, whereas potential Southwestern Willow Flycatcher habitat exists primarily within the main stream channels, or seasonally wet areas where dense vegetation is present.

# SURVEY METHODS

## Arroyo Toad

Following the protocol recommended by the USFWS (1999), Peter H. Bloom, Ph.D. (USFWS Permit # TE 787376) conducted six (6) Arroyo Toad surveys between 24 March and 14 June, 2015 intended to provide an accurate assessment of the presence or absence of the species in the Survey Area (Table 1). As described by the USFWS in the protocol, the following components of an Arroyo Toad protocol survey were followed by Dr. Bloom during surveys:

- Daytime surveys - "conducted while walking slowly along stream margins and in adjacent riparian habitat, visually searching for (but not disturbing) eggs, larvae and juveniles. If necessary, surveyors may walk within the stream, taking care not to disturb or create silt deposits within breeding pools. If stream crossings are necessary, these should be on the downstream ends of potential breeding pools or in fast-flowing channels to minimize the likelihood of stirring up silt deposits."

- Nighttime surveys - "conducted by walking slowly and carefully on stream banks. Surveyors should stop periodically and remain still and silent for approximately 15 minutes at appropriate sites to wait for Arroyo Toads to begin calling." Nighttime surveys are to be conducted between one hour after dusk and midnight under the following conditions:

    - Temperatures of 55 degrees Fahrenheit or greater;
    - Absence of a full or near-full moon;
    - Absence of adverse weather conditions such as rain, high winds or flood flows.

- At least six (6) surveys are to be conducted during the breeding season, which is generally considered to last from March 15 through July 1. At least one survey should be conducted each month in April, May, and June with at least seven (7) days between surveys.

## Least Bell's Vireo

A total of eight presence/absence Least Bell's Vireo surveys were conducted by Dr. Bloom between 10 April and 21 June, 2015 (Table 1) in accordance with Service protocol (USFWS 2001). All potential Least Bell's Vireo habitat and riparian areas within the Survey Area were surveyed eight times during the breeding season (April 10 to July 31) with a minimum of ten days between survey visits. The surveys were conducted during the morning hours prior to 1000h and when the temperature exceeded 41° F (5° C). Dr. Bloom listened for Least Bell's Vireo songs, whisper songs, calls, and scolds and looked for adult and juvenile Least Bell's Vireos in all areas of potential suitable breeding habitat. Some Least Bell's Vireo surveys were conducted in the same Survey Areas simultaneously with Southwestern Willow Flycatcher surveys, as noted in Table 1.

## Southwestern Willow Flycatcher

Five surveys were conducted by Dr. Bloom between 21 May and 2 July, 2015 (Table 1) according to the revised protocol for project-related surveys for Southwestern Willow Flycatcher (Sogge et al. 2010). All potential habitat was surveyed once during Period 1 (May 15 to May 31), two times during Period 2 (June 1 to June 24), and twice during Period 3 (June 25 to July 17). Surveys were conducted at least five days apart and were conducted during morning hours (prior to 1030h). If a singing Southwestern Willow Flycatcher

was not heard in an area after one to two minutes, Dr. Bloom played a taped vocalization for approximately 30 seconds and observed the area for responding flycatchers. This was repeated approximately every 100 ft (30 m). If a willow flycatcher would have been detected, tape playing would be immediately discontinued according to protocol guidelines. Some Southwestern Willow Flycatcher surveys were conducted in the same Survey Areas simultaneously with Least Bell's Vireo Surveys, as noted in Table 1.

*Table 1. Survey dates, times and weather conditions*

| Date | Species | Time (h) | Temp (F°) | Cloud (%) | Wind (m.p.h) | Precip. | Biologist |
|---|---|---|---|---|---|---|---|
| 24-Mar-15 | ARTO | 1000-1300 | 63-67 | 0-0 | 0-0 | None | Pete Bloom (Permitted); Hiram Herrera |
| 24-Mar-15 | ARTO | 1900-2330 | 60-60 | 0-0 | 0-0 | None | Pete Bloom (Permitted); Hiram Herrera |
| 6-Apr-15 | ARTO | 1300-1600 | 65-66 | 0-0 | 0-0 | None | Pete Bloom (Permitted); Hiram Herrera |
| 6-Apr-15 | ARTO | 1900-2145 | 55-55 | 0-0 | 0-0 | None | Pete Bloom (Permitted); Hiram Herrera |
| 10-Apr-15 | LBVI | 0601-1100 | 55-64 | 0-0 | 0-0 | None | Pete Bloom (Permitted) |
| 19-Apr-15 | ARTO | 1200-1600 | 67-68 | 0-0 | 0-0 | None | Pete Bloom (Permitted) |
| 19-Apr-15 | ARTO | 1900-2300 | 65-65 | 0-0 | 0-0 | None | Pete Bloom (Permitted) |
| 20-Apr-15 | LBVI | 0500-1100 | 60-65 | 100-100 | 0-0 | None | Pete Bloom (Permitted) |
| 26-Apr-15 | ARTO | 1200-1630 | 66-67 | 30-40 | 2-5 | None | Pete Bloom (Permitted) |
| 26-Apr-15 | ARTO | 1900-2300 | 65-65 | 10-10 | 3-3 | None | Pete Bloom (Permitted) |
| 30-Apr-15 | LBVI | 0500-1100 | 52-65 | 10-10 | 0-0 | None | Pete Bloom (Permitted) |
| 10-May-15 | ARTO | 1400-1730 | 62-64 | 100-100 | 0-0 | None | Pete Bloom |
| 10-May-15 | ARTO | 2000-0000 | 60-60 | 100-100 | 0-0 | None | Pete Bloom |
| 11-May-15 | LBVI | 0500-1100 | 56-64 | 100-100 | 0-0 | None | Pete Bloom |
| 21-May-15 | LBVI/SWFL | 0500-1100 | 60-65 | 100-100 | 0-0 | None | Pete Bloom |
| 1-Jun-15 | LBVI/SWFL | 0430-1100 | 56-62 | 100-100 | 0-0 | None | Pete Bloom |
| 11-Jun-15 | LBVI | 0430-1100 | 56-66 | 75-80 | 0-0 | None | Pete Bloom |
| 14-Jun-15 | ARTO | 2100-2300 | 60-60 | 100-100 | 0-0 | None | Pete Bloom (Permitted) |
| 21-Jun-15 | LBVI/SWFL | 0500-1100 | 59-66 | 100-100 | 0-0 | None | Pete Bloom (Permitted) |
| 26-Jun-15 | SWFL | 0500-1000 | 60-66 | 70-70 | 0-0 | None | Pete Bloom (Permitted) |
| 2-Jul-15 | SWFL | 0500-1000 | 58-64 | 60-60 | 0-0 | None | Pete Bloom (Permitted) |

## RESULTS & DISCUSSION

Least Bell's Vireos were detected regularly throughout most of the Survey Area and Arroyo Toads were detected four times during nocturnal surveys at three locations. No Willow Flycatchers were detected during any survey. The dates and coordinates for all Least Bell's Vireo and Arroyo Toad observations are shown below in Table 2 and displayed in the attached Exhibit.

*Table 2. Species detection information*

| Date | Species | Quantity | Latitude | Longitude | Comments |
|---|---|---|---|---|---|
| 24-Mar-15 | Arroyo Toad | 1 | 33.41065 | -117.57890 | San Mateo East |
| 24-Mar-15 | Arroyo Toad | 1 | 33.38538 | -117.55780 | San Onofre East |
| 6-Apr-15 | Arroyo Toad | 1 | 33.38529 | -117.55790 | San Onofre East |
| 6-Apr-15 | Arroyo Toad | 1 | 33.38342 | -117.56924 | San Onofre West |
| 10-Apr-15 | Least Bell's Vireo | 1 | 33.41142 | -117.58332 | Singing male, San Mateo East |
| 10-Apr-15 | Least Bell's Vireo | 1 | 33.41067 | -117.57948 | Singing male, San Mateo East |
| 10-Apr-15 | Least Bell's Vireo | 1 | 33.40912 | -117.57773 | Singing male, San Mateo East |
| 10-Apr-15 | Least Bell's Vireo | 1 | 33.39628 | -117.58998 | Singing male, San Mateo West |
| 10-Apr-15 | Least Bell's Vireo | 1 | 33.39581 | -117.58995 | Singing male, San Mateo West |
| 10-Apr-15 | Least Bell's Vireo | 1 | 33.39503 | -117.58868 | Singing male, San Mateo West |
| 10-Apr-15 | Least Bell's Vireo | 1 | 33.38926 | -117.58360 | Singing male, San Mateo West |
| 10-Apr-15 | Least Bell's Vireo | 1 | 33.38839 | -117.56232 | Singing male, San Onofre East |
| 10-Apr-15 | Least Bell's Vireo | 1 | 33.38595 | -117.55893 | Singing male, San Onofre East |
| 10-Apr-15 | Least Bell's Vireo | 1 | 33.38372 | -117.56929 | Singing male, San Onofre West |
| 10-Apr-15 | Least Bell's Vireo | 1 | 33.38337 | -117.56965 | Singing male, San Onofre West |
| 10-Apr-15 | Least Bell's Vireo | 1 | 33.38303 | -117.55612 | Singing male, San Onofre East |
| 10-Apr-15 | Least Bell's Vireo | 1 | 33.38167 | -117.56543 | Singing male, San Onofre West |
| 10-Apr-15 | Least Bell's Vireo | 1 | 33.38152 | -117.56751 | Singing male, San Onofre West |
| 20-Apr-15 | Least Bell's Vireo | 1 | 33.40881 | -117.57787 | Singing male, San Mateo East |
| 20-Apr-15 | Least Bell's Vireo | 1 | 33.38930 | -117.58364 | Singing male, San Mateo West |
| 20-Apr-15 | Least Bell's Vireo | 1 | 33.38593 | -117.55890 | Singing male, San Onofre East |
| 20-Apr-15 | Least Bell's Vireo | 1 | 33.38504 | -117.57207 | Singing male, San Onofre West |
| 20-Apr-15 | Least Bell's Vireo | 1 | 33.38370 | -117.56882 | Singing male, San Onofre West |
| 20-Apr-15 | Least Bell's Vireo | 1 | 33.38340 | -117.56968 | Singing male, San Onofre West |
| 30-Apr-15 | Least Bell's Vireo | 1 | 33.41120 | -117.58284 | Singing male, San Mateo East |
| 30-Apr-15 | Least Bell's Vireo | 1 | 33.38920 | -117.58353 | Singing male, San Mateo West |
| 30-Apr-15 | Least Bell's Vireo | 1 | 33.38603 | -117.55938 | Singing male, San Onofre East |
| 30-Apr-15 | Least Bell's Vireo | 1 | 33.38565 | -117.55848 | Singing male, San Onofre East |
| 30-Apr-15 | Least Bell's Vireo | 1 | 33.38414 | -117.57037 | Singing male, San Onofre West |
| 30-Apr-15 | Least Bell's Vireo | 1 | 33.38334 | -117.56979 | Singing male, San Onofre West |
| 30-Apr-15 | Least Bell's Vireo | 1 | 33.38259 | -117.56670 | Singing male, San Onofre West |
| 30-Apr-15 | Least Bell's Vireo | 1 | 33.38168 | -117.56526 | Singing male, San Onofre West |
| 30-Apr-15 | Least Bell's Vireo | 1 | 33.38168 | -117.56335 | Singing male, San Onofre West |
| 11-May-15 | Least Bell's Vireo | 1 | 33.41158 | -117.57918 | Singing male, San Mateo East |
| 11-May-15 | Least Bell's Vireo | 1 | 33.41154 | -117.58168 | Singing male, San Mateo East |
| 11-May-15 | Least Bell's Vireo | 1 | 33.41139 | -117.58330 | Singing male, San Mateo East |
| 11-May-15 | Least Bell's Vireo | 1 | 33.38304 | -117.56386 | Singing male, San Onofre West |
| 21-May-15 | Least Bell's Vireo | 1 | 33.41143 | -117.58235 | Singing male, San Mateo East |
| 21-May-15 | Least Bell's Vireo | 1 | 33.41142 | -117.58228 | Singing male, San Mateo East |
| 21-May-15 | Least Bell's Vireo | 1 | 33.39604 | -117.59013 | Singing male, San Mateo West |
| 21-May-15 | Least Bell's Vireo | 1 | 33.39600 | -117.59017 | Singing male, San Mateo West |

| Date | Species | Quantity | Latitude | Longitude | Comments |
|---|---|---|---|---|---|
| 21-May-15 | Least Bell's Vireo | 1 | 33.38598 | -117.55885 | Singing male, San Onofre East |
| 21-May-15 | Least Bell's Vireo | 1 | 33.38379 | -117.56941 | Singing male, San Onofre West |
| 21-May-15 | Least Bell's Vireo | 1 | 33.38368 | -117.56935 | Singing male, San Onofre West |
| 21-May-15 | Least Bell's Vireo | 1 | 33.38167 | -117.56557 | Singing male, San Onofre West |
| 21-May-15 | Least Bell's Vireo | 1 | 33.38165 | -117.56564 | Singing male, San Onofre West |
| 11-Jun-15 | Least Bell's Vireo | 1 | 33.41145 | -117.58224 | Singing male, San Mateo East |
| 11-Jun-15 | Least Bell's Vireo | 1 | 33.39600 | -117.59014 | Singing male, San Mateo West |
| 11-Jun-15 | Least Bell's Vireo | 1 | 33.38737 | -117.55977 | Singing male, San Onofre East |
| 11-Jun-15 | Least Bell's Vireo | 1 | 33.38317 | -117.56901 | Singing male, San Onofre West |
| 11-Jun-15 | Least Bell's Vireo | 1 | 33.38295 | -117.56800 | Singing male, San Onofre West |
| 21-Jun-15 | Least Bell's Vireo | 1 | 33.41145 | -117.58228 | Singing male, San Mateo East |
| 21-Jun-15 | Least Bell's Vireo | 1 | 33.39605 | -117.59010 | Singing male, San Mateo West |
| 21-Jun-15 | Least Bell's Vireo | 1 | 33.38737 | -117.55987 | Singing male, San Onofre East |
| 21-Jun-15 | Least Bell's Vireo | 1 | 33.38323 | -117.56904 | Singing male, San Onofre West |
| 21-Jun-15 | Least Bell's Vireo | 1 | 33.38301 | -117.56798 | Singing male, San Onofre West |

No flowing water was present in the streambeds at any point during surveys, but they may contain water in years with greater precipitation. Based on the lack of surface water, breeding habitat for Southwestern Willow Flycatchers within the Survey area is marginal, but migrant Willow Flycatchers may utilize the drainages.

Some areas where we did not find Arroyo Toads may yet yield toads in a future wet year as the sandy portion within this section of western San Mateo Creek wash soil lends itself to being a good aestivation site and is only 0.25 miles downstream of occupied breeding habitat.

A list of all wildlife species detected during the survey is provided as Attachment A.

If you have any questions or comments regarding this letter please feel free to call us at 949-272-0905.

Sincerely,

**BLOOM BIOLOGICAL, INC.**

Peter H. Bloom
Zoologist/President

Michael Kuehn
Senior Biologist/Statistical Analyst

Cc: Ms. Amy Rowland
Managing Partner
Pangea Biological
374 North Coast Hwy. 101, Suite B
Encinitas, California 92024

## LITERATURE CITED

Sogge, M.K., Ahlers, Darrell, and Sferra, S.J. 2010. A natural history summary and survey protocol for the southwestern willow flycatcher: U.S. Geological Survey Techniques and Methods 2A-10, 38 pages.

U.S. Fish and Wildlife Service (USFWS). 1999. Survey protocol for the Arroyo Toad. May 19, 1999.

U.S. Fish and Wildlife Service (USFWS). 2001. Least Bell's Vireo survey guidelines protocol (as amended 19 January 2001).

# CERTIFICATION

I certify that the information in this survey report and attached exhibits fully and accurately represents my work. If you have any questions or require additional information please feel free to contact me at (949) 272-0905 or petebloom@bloombiological.com.

_____

Peter H. Bloom, Ph.D.
TE-787376-8

# APPENDIX A. FAUNAL COMPENDIUM

The following 22 bird, one mammal, and two reptile species were detected in Survey Area during surveys conducted by BBI biologist Peter Bloom, Ph.D. from 24 March to 2 July, 2015.

## Birds

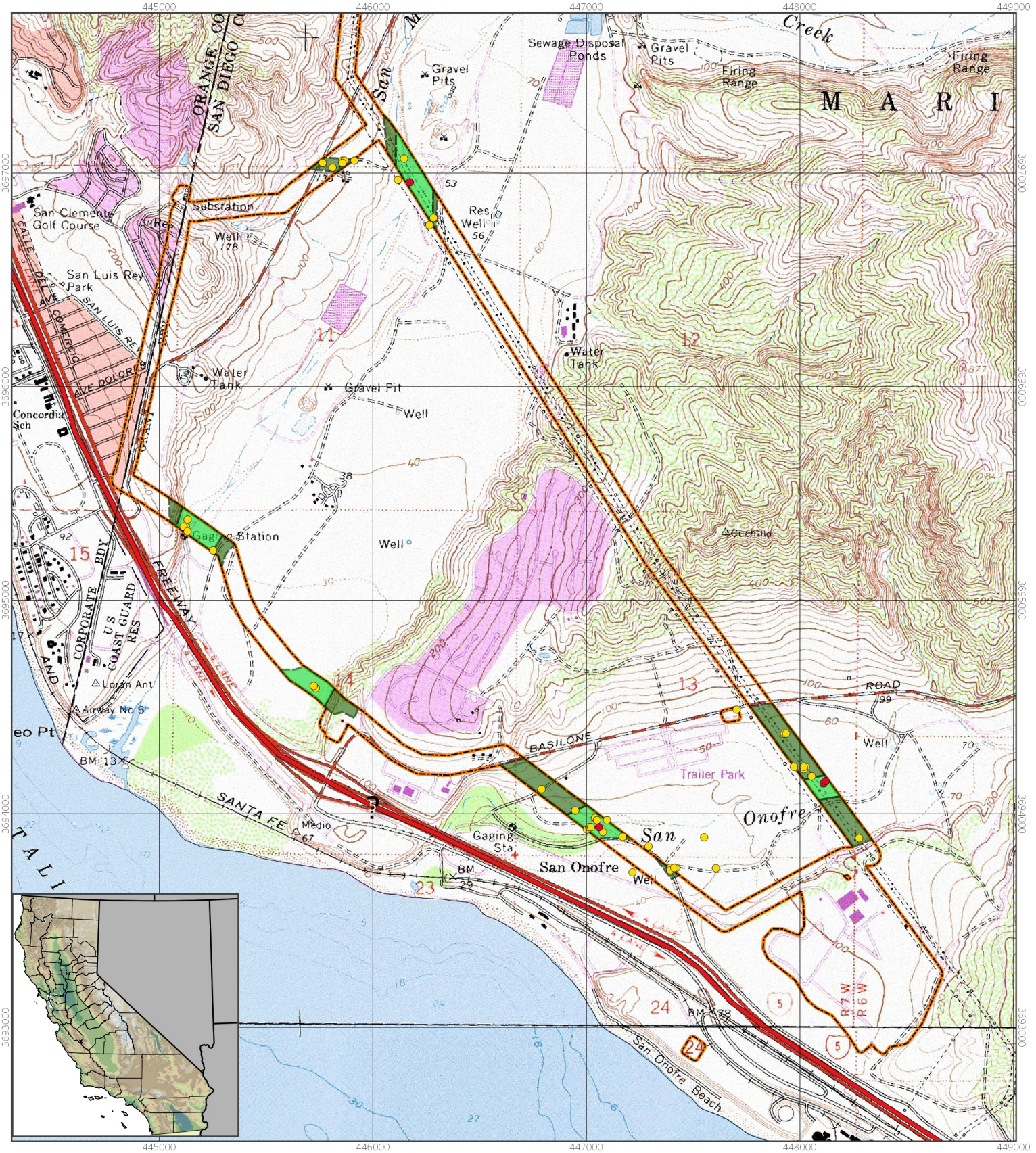
| Common Name | Scientific Name | FE | FT | CE | CT | CFP | CP | SSC |
|---|---|---|---|---|---|---|---|---|
| California Quail | Callipepla californica | | | | | | | |
| Red-shouldered Hawk | Buteo lineatus | | | | | | | |
| Red-tailed Hawk | Buteo jamaicensis | | | | | | | |
| Mourning Dove | Zenaida macroura | | | | | | | |
| Greater Roadrunner | Geococcyx californianus | | | | | | | |
| Anna's Hummingbird | Calypte anna | | | | | | | |
| Nuttall's Woodpecker | Picoides nuttallii | | | | | | | |
| Pacific-slope Flycatcher | Empidonax difficilis | | | | | | | |
| Black Phoebe | Sayornis nigricans | | | | | | | |
| Say's Phoebe | Sayornis saya | | | | | | | |
| Least Bell's Vireo | Vireo bellii pusillus | X | | | | | | |
| Western Scrub-Jay | Aphelocoma californica | | | | | | | |
| Common Raven | Corvus corax | | | | | | | |
| Cliff Swallow | Petrochelidon pyrrhonota | | | | | | | |
| California Thrasher | Toxostoma redivivum | | | | | | | |
| European Starling | Sturnus vulgaris | | | | | | | |
| Common Yellowthroat | Geothlypis trichas | | | | | | | |
| Yellow-breasted Chat | Icteria virens | | | | | | | |
| California Towhee | Melozone crissalis | | | | | | | |
| Song Sparrow | Melospiza melodia | | | | | | | |
| House Finch | Haemorhous mexicanus | | | | | | | |
| Lesser Goldfinch | Spinus psaltria | | | | | | | |

## Mammals

| Common Name | Scientific Name | FE | FT | CE | CT | SSC |
|---|---|---|---|---|---|---|
| California Ground Squirrel | Spermophilus beecheyi | | | | | |

## Reptiles

| Common Name | Scientific Name | FE | FT | CE | CT | SSC |
|---|---|---|---|---|---|---|
| Western Fence Lizard | Sceloporus occidentalis | | | | | |
| Western Whiptail | Cnimidophorus tigris | | | | | |




## Survey Areas

- *LBVI & ARTO*
- *LBVI, ARTO & SWFL*

*TL695 150-meter Buffer*

## Species Observations

- *Arroyo Toad*
- *Least Bell's Vireo*

250 0 250 500 750 1000 m

1:24,000

Coordinate Grid: UTM NAD 83 Zone 11
Background: US Geological Survey 24k Topo Series
San Clemente quadrangle
Map Date: July 16, 2015
Author: Michael J. Kuehn

# Exhibit 1. Protocol Survey Results

SDG&E TL 695/6971 Reconductor Project | San Diego County, California

BBI BLOOM BIOLOGICAL INC.
research | consulting | conservation

**Appendix F – Nonbreeding Season Western Burrowing Owl Survey Report AECOM 2015**

# NONBREEDING SEASON WESTERN BURROWING OWL SURVEY REPORT FOR TRANSMISSION LINE 695 WOOD TO STEEL POLE REPLACEMENT PROJECT, MARINE CORPS BASE CAMP PENDLETON, SAN DIEGO COUNTY, CALIFORNIA

***Prepared for:***

Todd Easley
San Diego Gas and Electric Environmental Programs
571 Enterprise St. – SD 1460
Escondido, California 92029

***Prepared by:***

AECOM
401 West A Street, Suite 1200
San Diego, California 92101
Phone: (619) 610-7600
Fax: (619) 610-7601
Contact: Andrew Fisher

February 2015

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## LIST OF FIGURES



## LIST OF TABLES

# LIST OF ACRONYMS

| | |
|---|---|
| BSA | Biological Study Area |
| CDFW | California Department of Fish and Wildlife |
| INRMP | Integrated Natural Resources Management Plan |
| MCBCP | Marine Corps Base Camp Pendleton |
| Navy | U.S. Department of the Navy |
| NCCP | Natural Community Conservation Plan |
| SDG&E | San Diego Gas and Electric |
| SONGS | San Onofre Nuclear Generating Station |
| TL | Transmission Line |
| WBO | western burrowing owl |

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# CHAPTER 1
# INTRODUCTION

## 1.1 PURPOSE AND PROJECT DESCRIPTION

Focused western burrowing owl (*Athene cunicularia hypugaea;* WBO) surveys were conducted by AECOM on behalf of San Diego Gas and Electric (SDG&E) on Marine Corps Base Camp Pendleton (MCBCP), San Diego County, California. This report discusses the findings of surveys conducted between December 18, 2014 and January 23, 2015. AECOM complied with the guiding principles in the California Department of Fish and Wildlife (CDFW; formerly California Department of Fish and Game [CDFG]) protocol, as stated in Staff Report on Burrowing Owl Mitigation (CDFG 2012).

The Transmission Line (TL) 695 Wood to Steel Pole Replacement Project (the "project") would involve the replacement of existing wooden structures with steel poles. Some wooden poles and associated anchors would be completely removed and not replaced due to the longer span between steel poles. The project would be covered by the SDG&E Natural Community Conservation Plan (NCCP) and includes the transmission line, several stringing sites, and a staging area. The project is located along the northern boundary of MCBCP (or Base), with the northern end at the Talega Substation and the southern end near the San Onofre Nuclear Generating Station (SONGS).

## 1.2 DESCRIPTION OF SURVEY AREA

MCBCP is a 200-square-mile military training facility located along the Pacific coast in northwestern San Diego County, 40 miles north of downtown San Diego. Orange County is contiguous with the northwest boundary of MCBCP, and Riverside County is northeast of, but not adjacent to, the boundary of MCBCP. The city of San Clemente and Cleveland National Forest border MCBCP to the northwest and north, respectively. The city of Oceanside is to the south. The San Diego County community of Fallbrook is to the east.

MCBCP occupies approximately 125,000 acres of largely undeveloped land, with more than 17 miles of coastline in northwestern San Diego County in Southern California. It is the U.S. Marine Corps' premier amphibious training base, and the U.S. Marine Corps' only west coast amphibious training base, promoting the combat readiness of operating forces by providing facilities, services, and support responsive to the needs of marines, sailors, and their families.

The project is located in the coastal province in northern San Diego County on MCBCP (Figure 1). This region is characterized by warm, dry summers and mild winters, with mean temperatures ranging from 75 to 78 degrees Fahrenheit. Although close enough to the coast to benefit from maritime clouds and fog, MCBCP is relatively dry. Elevation within the project area ranges from approximately 30 to 570 feet above mean sea level.

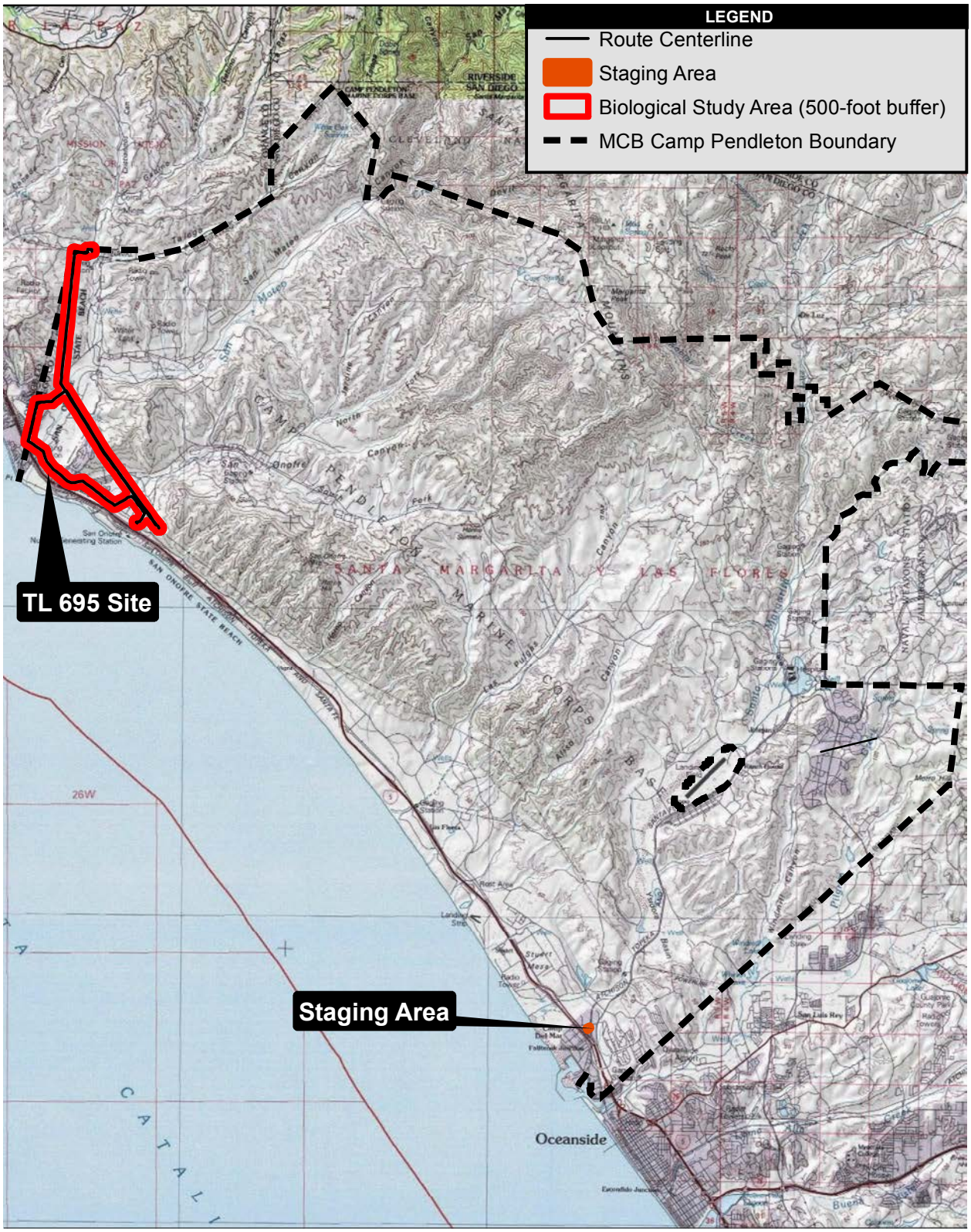
The project is located in the far northern boundary of MCBCP and extends from the Talega Substation, and then heads west toward the Pacific Ocean along the ridgetops of steep hills along the north side of Cristianitos Road. These hills are along the border of San Diego and Orange Counties, and occur on lands that are under lease by California State Parks. As the project heads west, it splits and crosses San Mateo Creek heading south at two points. The two separate lines head south through MCBCP, with one line roughly paralleling Interstate 5, and the other line going up and over a steep hill on the east side of the San Onofre Housing Area. The two lines join again after they cross San Onofre Creek, and then terminate opposite and east of SONGS. The staging area for the project is located at the south end of MCBCP and consists of a developed gravel lot (Figure 1).

The Biological Study Area (BSA) is defined as the transmission line centerline plus an adjacent 500-foot buffer. Specifically, the BSA for WBO surveys includes only the habitat that has a potential to support wintering WBO, which is defined below in the Survey Methodology Section (Figure 2). The vegetation within and around the BSA was historically agricultural lands that have now converted to nonnative grasslands and ruderal habitat. The potentially suitable WBO habitat within the BSA is located in two active military training areas (Sierra 1 and Alpha 2). There are scattered shrubs around the BSA with open, low-growing vegetation between them. Representative site photographs of the BSA are provided in Appendix A.

## 1.3 STATUS OF WESTERN BURROWING OWL AT MARINE CORPS BASE CAMP PENDLETON

The WBO is a California Species of Special Concern and considered by the U.S. Fish and Wildlife Service to be a Bird of Conservation Concern (CDFW 2014) at the national level that is declining throughout its range, especially California's coastal populations (Klute et al. 2003). WBO are year-round residents of Southern California. Throughout their range, they are threatened by habitat loss, predation, vehicle impacts, and control programs for ground squirrels. The WBO's population has been declining especially in Southern California (Unitt 2004).

WBO breed in grassland and open scrub using the burrows of small mammals or man-made substitutes such as pipes or culverts. Within Southern California, the most commonly used burrows are those created by California ground squirrels (*Otospermophilus beecheyi*).





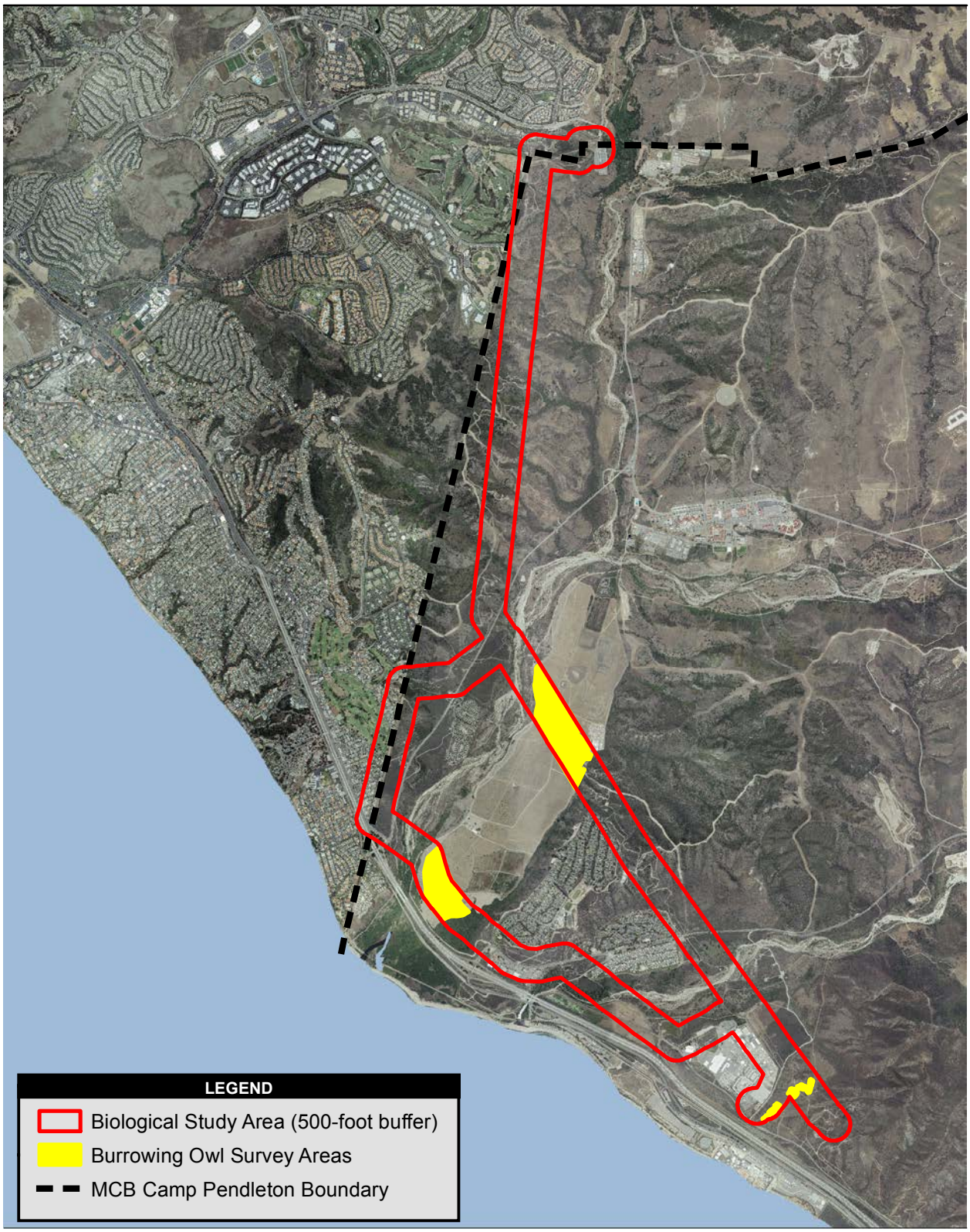

3 1.5 0 3 Miles

Scale: 1:190,080; 1 inch = 3 miles

**Figure 1**
**Vicinity Map**



*Path: \\ussdg1fp001.na.aecomnet.com\data\projects\2014\60329186_TM_Easley\900-CAD-GIS\920 GIS\922_Maps\Owl_SurveyRPT\Fig_1_Vicinity.mxd, 1/26/2015, SorensenJ*




Source: SanGIS 2012; SDG&E 2014; MCBCP 2007

4,500 2,250 0 4,500 Feet

Scale: 1:54,000; 1 inch = 4,500 feet

**Figure 2**
**Western Burrowing Owl Survey Areas**



*Path: P:\2014\60329186_TM_Easley\900-CAD-GIS\920 GIS\922_Maps\Owl_SurveyRPT\Fig_2_BUOW_SurveyAReas.mxd, 1/22/2015, sorensenj*

Consequently, WBO are vulnerable to predation by a wide variety of terrestrial predators such as raccoon (*Procyon lotor*), striped skunk (*Mephitis mephitis*), coyote (*Canis latrans*), and red fox (*Vulpes vulpes*). WBO feed primarily on invertebrates but also forage on rodents, reptiles, amphibians, and small birds. WBO can form loose colonies made up of both year-round resident owls and winter migratory owls. During the breeding season, eggs are produced from late March to mid-June (Unitt 2004), and fledglings are active through August. Within Southern California, during the winter months or nonbreeding season generally September 1 through January 31, there is an influx of migratory WBO.

For historical context, within San Diego County in 2003, there were approximately 25–30 resident pairs of WBO (Lincer and Bloom 2007). In 2007, approximately 41–46 pairs were breeding within San Diego County. In 2007, approximately 148–168 resident WBO (including breeding pairs and their offspring) were estimated as wintering within San Diego County. These resident WBO are joined by migrant and wintering WBO during the nonbreeding season. During 2007, it was estimated that 50 to 100 migrant WBO winter in, or migrate through MCBCP and adjacent military lands. In total, for all of San Diego County in 2007, there was estimated to be approximately 300-370 wintering WBO (Lincer and Bloom 2007).

The status of WBO on MCBCP is one that has gone from breeding resident to occasional winter resident. In the 1970s approximately 15 pairs of WBO were documented as breeding on MCBCP (Lincer and Bloom 2007). This number dropped to two pairs in the 1980s and the last pair of breeding WBO was documented in 1994. By 1995, WBO were no longer documented as breeding on MCBCP (Lincer and Bloom 2007). Currently, on MCBCP the WBO is a winter resident only. The extirpation of WBO as a breeding resident on MCBCP may have been caused by a variety of factors. These include land use changes from agriculture and cattle grazing to heavy tank training and off-road maneuvers that crush ground squirrel burrows and compact the soil. Cattle were historically grazed on MCBCP; once the military eliminated cattle, the vegetation changed to permit tall nonnative grasses and sweet fennel (*Foeniculum vulgare*) to flourish (Lincer and Bloom 2007). Increased military training activities coupled with vegetation changes led to increased fire activity. Occasional fires are useful in WBO habitat and potentially positive as they open up the habitat, but increased fire frequency can lead to a decrease in essential WBO prey items, such as arthropods, herpetofauna, and small mammals (Lincer and Bloom 2007). Consequently, the habitat on MCBCP has become less conducive to breeding WBO, and now only wintering WBO are found on MCBCP.

Currently, there are scattered records of wintering WBO along the coastal plain of MCBCP. Based on a review of the historical WBO occurrences on MCBCP, there are no WBO locations within or adjacent to the BSA within the last several decades. The closest WBO location recorded in recent history is 7 miles south of the BSA from 2010 (U.S. Navy 2015). An

additional winter WBO location found during the course of biological surveys for another project in 2013 was 8 miles south of the BSA (AECOM 2013). Based on historical data and recent WBO observations only during the winter, nonbreeding season WBO surveys were conducted for the project.

# CHAPTER 2
# METHODOLOGY

## 2.1 SURVEY METHOD

Prior to conducting WBO surveys, the California Natural Diversity Database was reviewed for a 1-mile radius buffer around the BSA to determine if any WBO were historically known from the area. Additionally, a records search of historical data from MCBCP was conducted to determine if any historical WBO locations were known from the BSA and vicinity (U.S. Navy 2015). After historical data were reviewed, a detailed habitat assessment was conducted. The initial habitat assessment for the entire TL 695 Project was conducted on July 30, 31, and August 4, 2014. A follow-up focused WBO habitat assessment was conducted on November 25, 2014. A total of 109.5 acres of potentially suitable WBO was identified within the BSA. Habitat that was considered not suitable for WBO included dense Diegan coastal sage scrub, chaparral, riparian vegetation types, developed areas, dense ruderal or weedy vegetation on steep slopes, firebreaks, dirt access roads, other areas with no burrows, dense vegetation, and steep slopes. Potentially suitable WBO habitat contained elements such as the following:

1. The presence of potentially suitable burrows. These may include plastic pipes sticking out of the ground, rock piles or riprap, culverts, and burrows created by fossorial mammals such as the California ground squirrel.
2. Short, sparse vegetation with gentle topography and well-drained soils (CDFG 2012). This may include ruderal grassy fields, agricultural areas, vacant lots, pastures, and similar habitats that are open and have low vegetative cover.
3. The presence of nearby foraging habitat. This is defined as habitat within the estimated home range of an occupied burrow that supports a suitable prey base and allows for effective foraging (CDFG 2012).

Following the habitat assessment, potential WBO habitat was mapped within the BSA in three main areas. The first two main areas were located within a historically agricultural area within the Sierra Training Area, which is currently used as a training area for heavy tank maneuvers (Figure 2). These areas are located along the south side of the San Mateo River floodplain and have flat topography. At the time of the habitat assessment, the vegetation within these two areas was short ruderal and weedy vegetation. There were scattered Mexican elderberry (*Sambucus mexicana*) and coyote brush (*Baccharis pilularis*) shrubs with nonnative vegetation growing between them. The military routinely mows the vegetation to keep it short. This area also had many California ground squirrel burrows. The third area with potentially suitable WBO habitat

was located south of the two main areas and was located along gently sloping hills above SONGS within the Alpha 2 Training Area (Figure 2). This area consisted of low-growing and open native grassland intermixed with Diegan coastal sage scrub, but no California ground squirrel burrows were observed in this area.

Since WBO are currently winter residents only on MCBCP, four nonbreeding WBO season (September 1 through January 31) surveys were conducted according to the Staff Report on Burrowing Owl Mitigation (CDFG 2012). This report reflects the most recent regulatory agency/industry standard protocols for WBO surveys. Nonbreeding WBO surveys generally occurred over a 1- or 2-day period per survey. There were three main areas surveyed for WBO. The two areas located within the Sierra Training Area were surveyed during the morning, and the third area within Alpha 2 Training Area was surveyed in the evening. The first nonbreeding WBO survey was conducted on December 18 and 19, 2014; the second survey on December 29, 2014; the third survey on January 8 and 9, 2015; and the fourth survey on January 22 and 23, 2015 as noted in Table 1. Surveys were conducted approximately 10 days to 2 weeks apart when possible.

**Table 1**
**Survey Dates, Personnel, and Weather Conditions**

| Survey Number | Date | Survey Personnel | Time | Weather Conditions |
|---|---|---|---|---|
| 1 | 12/18/2014 | Andrew Fisher, Donna Germann | 1535–1611 | Start: 64°F, wind 2 mph, 90% cover<br>End: 62°F, wind 1 mph, 80% cover |
| 1 | 12/19/2014 | Donna Germann | 0644–1000 | Start: 49°F, wind 4 mph, 15% cover<br>End: 68°F, wind 0 mph, 0% cover |
| 1 | 12/19/2014 | Brennan Mulrooney | 0645–1000 | Start: 49°F, wind 4 mph, 15% cover<br>End: 68°F, wind 0 mph, 0% cover |
| 1 | 12/19/2014 | James McMorran | 0646–1000 | Start: 49°F, wind 4 mph, 15% cover<br>End: 62°F, wind 3 mph, 10% cover |
| 1 | 12/19/2014 | Andrew Fisher | 0647–1000 | Start: 49°F, wind 4 mph, 15% cover<br>End: 68°F, wind 0 mph, 0% cover |
| 2 | 12/29/2014 | Brennan Mulrooney | 0640–1000 | Start: 40°F, wind 2 mph, 15% cover<br>End: 63°F, wind 3 mph, 5% cover |
| 2 | 12/29/2014 | Matthew Kedziora | 0641–1000 | Start: 40°F, wind 2 mph, 15% cover<br>End: 63°F, wind 3 mph, 2% cover |
| 2 | 12/29/2014 | James McMorran | 0645–1000 | Start: 40°F, wind 2 mph, 20% cover<br>End: 63°F, wind 3 mph, 5% cover |
| 2 | 12/29/2014 | Andrew Fisher | 0645–1000 | Start: 40°F, wind 2 mph, 35% cover<br>End: 63°F, wind 3 mph, 5% cover |
| 2 | 12/29/2014 | Andrew Fisher | 1557–1637 | Start: 59°F, wind 2 mph, 0% cover<br>End: 56°F, wind 0 mph, 0% cover |
| 3 | 1/8/2015 | Andrew Fisher | 1514–1626 | Start: 65°F, wind 1 mph, 5% cover<br>End: 61°F, wind 1 mph, 20% cover |
| 3 | 1/9/2015 | Brynne Mulrooney | 0644–1000 | Start: 51°F, wind 0 mph, 100% cover<br>End: 62°F, wind 1 mph, 100% cover |
| 3 | 1/9/2015 | Andrew Fisher | 0649–1000 | Start: 53°F, wind 0 mph, 100% cover<br>End: 62°F, wind 1 mph, 100% cover |

| Survey Number | Date | Survey Personnel | Time | Weather Conditions |
|---|---|---|---|---|
| 3 | 1/9/2015 | Brennan Mulrooney | 0649–1000 | Start: 51°F, wind 0 mph, 100% cover<br>End: 69°F, wind 0 mph, 100% cover |
| 3 | 1/9/2015 | James McMorran | 0649–1000 | Start: 53°F, wind 0 mph, 100% cover<br>End: 62°F, wind 1 mph, 100% cover |
| 4 | 1/22/2015 | Andrew Fisher | 1432–1627 | Start: 65°F, wind 0 mph, 90% cover<br>End: 60°F, wind 0 mph, 95% cover |
| 4 | 1/23/2015 | Donna Germann | 0622–1000 | Start: 47°F, wind 4 mph, 0% cover<br>End: 68°F, wind 3 mph, 0% cover |
| 4 | 1/23/2015 | Keoni Calantas | 0644–1000 | Start: 47°F, wind 4 mph, 0% cover<br>End: 68°F, wind 3 mph, 0% cover |
| 4 | 1/23/2015 | Andrew Fisher | 0655–1000 | Start: 47°F, wind 4 mph, 0% cover<br>End: 68°F, wind 3 mph, 0% cover |

°F = degrees Fahrenheit; mph = miles per hour

The four WBO surveys were conducted during the nonbreeding season (September 1 through January 31). Surveys were conducted by walking generally straight-line transects through all suitable habitat within the BSA using 100 percent visual coverage, focusing on visual signs of WBO (e.g., burrows, pellets, feathers, white wash). Distance between transects was no greater than 65 feet during each survey. While walking transects, biologists scanned the BSA to search for WBO and suitable WBO burrows. Any individual WBO detections, including foraging observations and suitable WBO burrow locations, were mapped using Global Positioning System equipment. Suitable WBO burrows were defined as burrows greater than approximately 4 inches in diameter (height and width) and greater than approximately 60 inches in depth (CDFG 2012). A burrow was considered suitable if it had an adequate diameter and the end could not be seen. At each suitable burrow, presence of any WBO sign (e.g., pellets, prey remains, whitewash, decorations, tracks) and number of WBO present at that burrow were recorded during each survey visit. Each suitable burrow was classified as follows:

- Occupied – at least one WBO individual observed to be present at the burrow
- Active – a burrow with fresh WBO sign, but no WBO individual present at the time of the survey
- Inactive – suitable for WBO but no WBO or fresh sign observed
- No longer suitable – burrow either destroyed or physical characteristics have changed in such a manner that it is no longer suitable habitat for WBO

After a burrow was marked, it was revisited during each subsequent survey and biologists continued to survey for new potentially suitable burrows during each subsequent survey. After each survey was completed, the cumulative burrow status for all burrows detected during that

survey was determined. Cumulative burrow status includes burrows that were occupied by WBO, active, suitable but inactive, and no longer suitable.

To ensure the greatest detection probability, surveys were conducted at times of high WBO activity: between morning civil twilight and 10:00 AM, and 2 hours before sunset until evening civil twilight. Surveys were not conducted when wind speeds exceeded 12.4 miles per hour or when it was raining or during the presence of dense fog.

During the WBO surveys, all wildlife species detected were recorded and are listed in a table included in Appendix B of this document.

# CHAPTER 3
# RESULTS AND DISCUSSION

## 3.1 RESULTS

No WBO or their sign (e.g., pellets, prey remains, whitewash, decorations, tracks) were observed within the BSA during nonbreeding season surveys. Hundreds of potentially suitable burrows created by California ground squirrels as well as rock piles and pipes were documented within the BSA. A summary of burrows recorded and their status is provided in Table 2 below and the locations of all potentially suitable burrows are provided in Figure 3.

**Table 2**
**Progression of Cumulative Burrow Status by Survey Number within the BSA**

| | Number of Burrows by Survey Number | | | |
|---|---|---|---|---|
| **Cumulative Burrow Status** | **1** | **2** | **3** | **4** |
| Occupied | 0 | 0 | 0 | 0 |
| Active | 0 | 0 | 0 | 0 |
| Inactive | 220 | 284 | 306 | 302 |
| No longer suitable | 0 | 0 | 3 | 7 |
| **Total** | **220** | **284** | **309** | **309** |

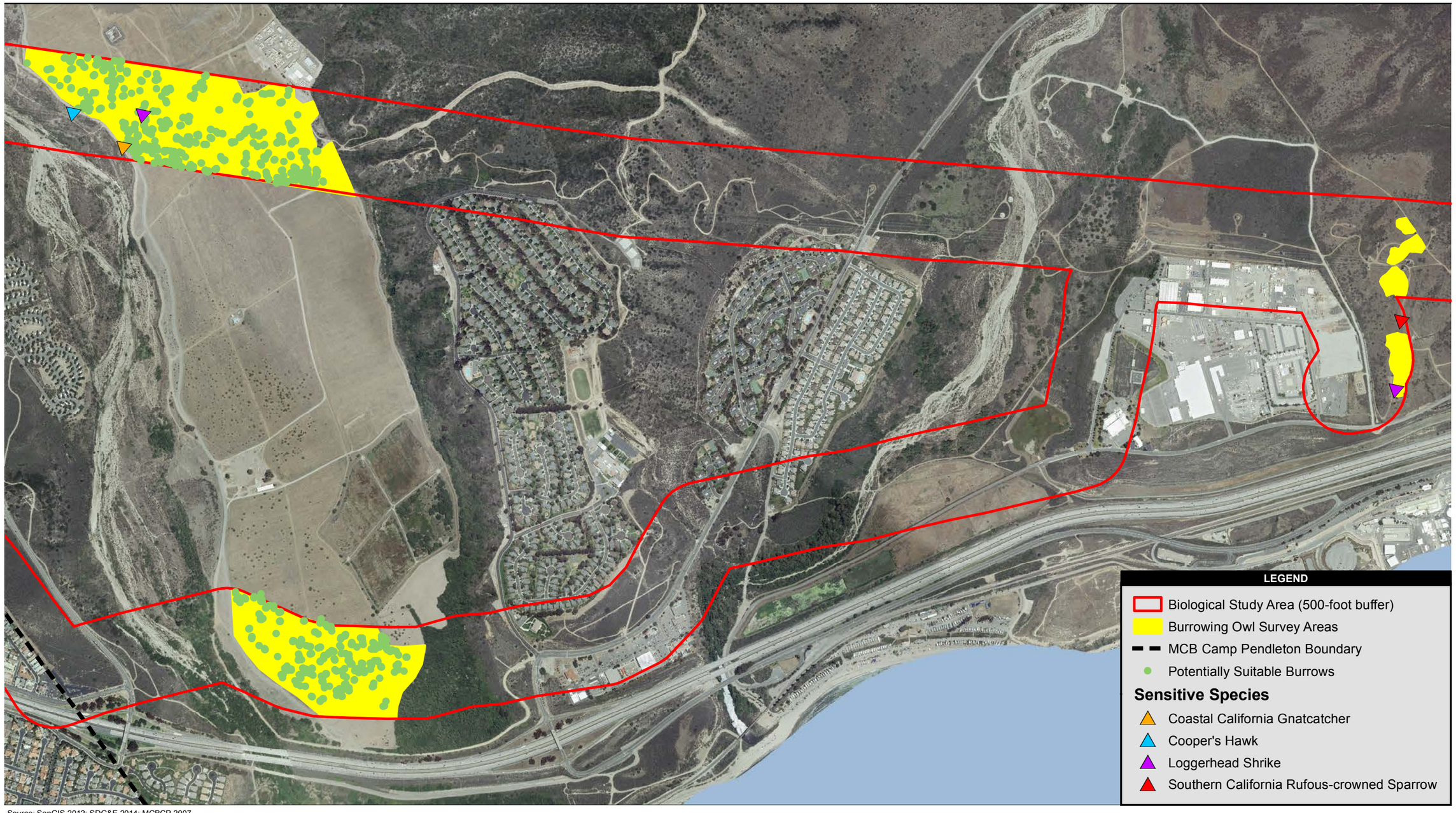
All suitable burrows found within the BSA were either inactive or became no longer suitable during surveys. No WBO sign was found at any burrow and no WBO were encountered during the surveys. Three burrows were considered destroyed or no longer suitable during Survey 3 and seven burrows were no longer suitable during Survey 4. This is likely due to rain events filling in the burrows (with mud or other debris), or ground squirrels modifying the burrows. Additionally, during the course of surveys, the vegetation surrounding several burrows grew and covered the entrances to the burrows, rendering them no longer suitable.

Five special-status species were detected during WBO surveys. These are Cooper's hawk (*Accipiter cooperii*; NCCP covered), Southern California rufous-crowned sparrow (*Aimophila ruficeps canescens*; NCCP covered), loggerhead shrike (*Lanius ludovicianus*; CDFW Species of Special Concern), coastal California gnatcatcher (*Polioptila californica californica*; federally threatened, NCCP covered), and mule deer (*Odocoileus hemionus*; NCCP covered). The locations of the special-status avian species are included in Figure 3. A full list of wildlife species detected during WBO surveys is included in Appendix B, and the raw field data in Excel tabular format are located in Appendix C.

## 3.2 DISCUSSION

Due to the extirpation of WBO as a breeding resident on MCBCP, and current state as a winter resident only, nonbreeding season WBO surveys were conducted within the BSA. Protocol nonbreeding season WBO surveys were conducted and no WBO or WBO sign were detected. There were hundreds of potentially suitable burrows created by California ground squirrels plus a few small culverts, pipes, and rock piles that could be used by WBO. The vegetation within and around the BSA is open nonnative ruderal habitat that is considered suitable for WBO. The BSA is located within an active military training area that includes off-road tank maneuvers. Many tank tracks crisscross the BSA and, where recent tank training activity was observed, there were few to almost no California ground squirrel burrows. Generally, areas with low levels of tank training or no tank training (as evidenced by tank tracks on the ground) had higher numbers of California ground squirrel burrows. Areas with many tank tracks had fewer California ground squirrel burrows.

Throughout the course of surveys, the ruderal and weedy vegetation within the BSA grew many inches to several feet in height in a few areas. At the beginning of surveys, the vegetation was low growing and the ground cover was a few inches high. By the end of surveys, the ground cover was several feet high in some locations. Most of the ground cover is weedy ruderal vegetation that proliferates in disturbed habitats. It tends to grow very quickly and, by the end of WBO surveys, several large patches of formerly suitable habitat had become too tall and dense to be considered suitable for WBO. Since WBO prefer low-growing vegetation that permits them to easily see prey and predators when standing on the ground, tall vegetation can inhibit WBO from occurring in certain areas. Several potentially suitable burrows that were recorded during the first survey could no longer be located by the last survey due to dense vegetative growth. MCBCP periodically mows the vegetation within most of the BSA, which makes it suitable again for WBO. Despite the high number of potentially suitable burrows, generally open low-growing vegetation (until the last survey), and nearby foraging habitat, no wintering WBO were detected.




Source: SanGIS 2012; SDG&E 2014; MCBCP 2007

1,050 525 0 1,050 Feet

Scale: 1:12,600; 1 inch = 1,050 feet

**Figure 3**
**Potentially Suitable Burrows and Sensitive Species Detected**



*Path: P:\2014\60329186_TM_Easley\900-CAD-GIS\920 GIS\922_Maps\Owl_SurveyRPT\Fig_3_BUOW_Burrows_SSpecies.mxd, 1/29/2015, SorensenJ*

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# CHAPTER 4
# LITERATURE CITED


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# APPENDIX A

# REPRESENTATIVE SITE PHOTOGRAPHS

# Appendix A – Representative Site Photographs

Photo 1. View north of California ground squirrel burrows that could serve as potentially suitable western burrowing owl burrow in foreground and TL 695 power lines in the background.

Photo 2. View north of California ground squirrel complex that could serve as potentially suitable western burrowing owl burrows.

# APPENDIX B

# WILDLIFE SPECIES DETECTED DURING NONBREEDING SEASON WESTERN BURROWING OWL SURVEYS

# Appendix B. Wildlife Species Detected during Nonbreeding Season Western Burrowing Owl Surveys

| Common Name | Scientific Name | Order | Family | Federal and California Status (Endangered/Threatened/Species of Special Concern)[1] | SDG&E NCCP Status |
|---|---|---|---|---|---|
| **Invertebrates** | | | | | |
| pygmy blue | *Brephidium exilis* | Lepidoptera | Lycaenidae | none | none |
| painted lady | *Vanessa cardui* | Lepidoptera | Nymphalidae | none | none |
| **Reptiles & Amphibians** | | | | | |
| Baja California treefrog | *Pseudacris hypochondriaca* | Anura | Hylidae | none | none |
| **Avian** | | | | | |
| Cooper's hawk | *Accipiter cooperii* | Accipitriformes | Accipitridae | none | covered |
| red-tailed hawk | *Buteo jamaicensis* | Accipitriformes | Accipitridae | none | none |
| white-throated swift | *Aeronautes saxatalis* | Apodiformes | Apodidae | none | none |
| Anna's hummingbird | *Calypte anna* | Apodiformes | Trochilidae | none | none |
| killdeer | *Charadrius vociferus* | Charadriiformes | Charadriidae | none | none |
| black-bellied plover | *Pluvialis squatarola* | Charadriiformes | Charadriidae | none | none |
| horned lark | *Eremophila alpestris* | Passeriformes | Alaudidae | none | none |
| American crow | *Corvus brachyrhynchos* | Passeriformes | Corvidae | none | none |
| common raven | *Corvus corax* | Passeriformes | Corvidae | none | none |
| southern California rufous-crowned | *Aimophila ruficeps canescens* | Passeriformes | Emberizidae | none | covered |

| Common Name | Scientific Name | Order | Family | Federal and California Status (Endangered/Threatened/Species of Special Concern)[1] | SDG&E NCCP Status |
|---|---|---|---|---|---|
| sparrow | | | | | |
| Lincoln's sparrow | *Melospiza lincolnii* | Passeriformes | Emberizidae | none | none |
| song sparrow | *Melospiza melodia* | Passeriformes | Emberizidae | none | none |
| California towhee | *Melozone crissalis* | Passeriformes | Emberizidae | none | none |
| savannah sparrow | *Passerculus sandwichensis* | Passeriformes | Emberizidae | none | none |
| spotted towhee | *Pipilo maculatus* | Passeriformes | Emberizidae | none | none |
| white-crowned sparrow | *Zonotrichia leucophrys* | Passeriformes | Emberizidae | none | none |
| American goldfinch | *Spinus tristis* | Passeriformes | Fringillidae | none | none |
| western meadowlark | *Sturnella neglecta* | Passeriformes | Icteridae | none | none |
| loggerhead shrike | *Lanius ludovicianus* | Passeriformes | Laniidae | species of special concern | covered |
| American pipit | *Anthus rubrescens* | Passeriformes | Motacillidae | none | none |
| yellow-rumped warbler | *Setophaga coronata* | Passeriformes | Parulidae | none | none |
| blue-gray gnatcatcher | *Polioptila caerulea* | Passeriformes | Polioptilidae | none | none |
| coastal California gnatcatcher | *Polioptila californica californica* | Passeriformes | Polioptilidae | threatened | covered |
| European | *Sturnus vulgaris* | Passeriformes | Sturnidae | none | none |

| Common Name | Scientific Name | Order | Family | Federal and California Status (Endangered/Threatened/Species of Special Concern)[1] | SDG&E NCCP Status |
|---|---|---|---|---|---|
| starling | | | | | |
| wrentit | *Chamaea fasciata* | Passeriformes | Sylviidae | none | none |
| Bewick's Wren | *Thryomanes bewickii* | Passeriformes | Troglodytidae | none | none |
| house wren | *Troglodytes aedon* | Passeriformes | Troglodytidae | none | none |
| hermit thrush | *Catharus guttatus* | Passeriformes | Turdidae | none | none |
| Say's phoebe | *Sayornis saya* | Passeriformes | Tyrannidae | none | none |
| Hutton's vireo | *Vireo huttoni* | Passeriformes | Vireonidae | none | none |
| northern flicker | *Colaptes auratus* | Piciformes | Picidae | none | none |
| Nuttall's woodpecker | *Picoides nuttallii* | Piciformes | Picidae | none | none |
| downy woodpecker | *Picoides pubescens* | Piciformes | Picidae | none | none |
| **Mammals** | | | | | |
| mule deer | *Odocoileus hemionus* | Artiodactyla | Cervidae | none | covered |
| coyote | *Canis latrans* | Carnivora | Canidae | none | none |
| California ground squirrel | *Spermophilus beecheyi* | Rodentia | Sciuridae | none | none |

[1] Species sensitivity status taken from CDFW Special Animals List September (CDFW 2014).

# APPENDIX C

# RAW FIELD DATA IN EXCEL TABULAR FORMAT

# Appendix C – Raw Field Data

| Primary_Bio | Survey Number | Date | Time | Cumulative_ Burrow_ Status | Field_ Burrow_ Status | Burrow ID | Sign | Notes | GPSLocation | Longitude | Latitude | Zone | Avg_ Northing_ Final | Avg_ Easting_ Final |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Andrew Fisher | 1 | 12/19/2014 | 6:57:23 AM | Inactive | Inactive | 1 | none | Grnd squirrel burrow | 33 24.5888 N 117 34.5751 W::12/19/14 at 14:54:39 (UTC) | 117.576252 W | 33.409813 N | 11S | 3696868.65 | 446417.38 |
| Brennan Mulrooney | 2 | 12/29/2014 | 7:00:34 AM | Inactive | Inactive | 1 | none | | 33 24.5887 N 117 34.5770 W::12/29/14 at 14:57:49 (UTC) | 117.576283 W | 33.409812 N | 11S | 3696868.65 | 446417.38 |
| Brennan Mulrooney | 3 | 1/9/2015 | 6:50:25 AM | Inactive | Inactive | 1 | none | | 33 24.5906 N 117 34.5771 W::1/9/15 at 14:57:34 (UTC) | 117.576285 W | 33.409843 N | 11S | 3696871.45 | 446416 |
| Andrew Fisher | 4 | 1/22/2015 | 3:06:13 PM | Inactive | Inactive | 1 | none | | 33 24.5899 N 117 34.5768 W::1/22/15 at 23:00:12 (UTC) | 117.576280 W | 33.409832 N | 11S | 3696871.45 | 446416 |
| Andrew Fisher | 1 | 12/19/2014 | 7:16:59 AM | Inactive | Inactive | 10 | none | multiple burrow entrances | 33 24.3860 N 117 34.4245 W::12/19/14 at 15:13:57 (UTC) | 117.573742 W | 33.406433 N | 11S | 3696494.3 | 446647.08 |
| Brennan Mulrooney | 2 | 12/29/2014 | 7:19:51 AM | Inactive | Inactive | 10 | none | | 33 24.3878 N 117 34.4283 W::12/29/14 at 15:16:17 (UTC) | 117.573808 W | 33.406462 N | 11S | 3696494.3 | 446647.08 |
| Brennan Mulrooney | 3 | 1/9/2015 | 7:16:05 AM | Inactive | Inactive | 10 | none | | 33 24.3853 N 117 34.4248 W::1/9/15 at 15:11:16 (UTC) | 117.573747 W | 33.406422 N | 11S | 3696490.7 | 446648.365 |
| Andrew Fisher | 4 | 1/22/2015 | 3:28:28 PM | Inactive | Inactive | 10 | none | | 33 24.3845 N 117 34.4265 W::1/22/15 at 23:22:47 (UTC) | 117.573775 W | 33.406408 N | 11S | 3696490.7 | 446648.365 |
| Brennan Mulrooney | 1 | 12/19/2014 | 7:35:17 AM | Inactive | Inactive | 100 | none | multiple burrow entrances | 33 24.2658 N 117 34.4406 W::12/19/14 at 15:32:21 (UTC) | 117.573967 W | 33.404453 N | 11S | 3696275.35 | 446627.975 |
| Andrew Fisher | 2 | 12/29/2014 | 7:44:57 AM | Inactive | Inactive | 100 | none | multiple burrow entrances | 33 24.2694 N 117 34.4381 W::12/29/14 at 15:40:53 (UTC) | 117.573968 W | 33.404490 N | 11S | 3696275.35 | 446627.975 |
| Andrew Fisher | 3 | 1/9/2015 | 7:32:22 AM | Inactive | Inactive | 100 | none | multiple burrow entrances | 33 24.2696 N 117 34.4389 W::1/9/15 at 15:27:27 (UTC) | 117.573982 W | 33.404493 N | 11S | 3696277 | 446626.17 |
| Donna Germann | 4 | 1/23/2015 | 7:22:28 AM | Inactive | Inactive | 100 | none | | 33 24.2688 N 117 34.4395 W::1/23/15 at 15:19:29 (UTC) | 117.573992 W | 33.404480 N | 11S | 3696277 | 446626.17 |
| Brennan Mulrooney | 1 | 12/19/2014 | 7:39:28 AM | Inactive | Inactive | 101 | none | multiple burrow entrances | 33 24.3585 N 117 34.5070 W::12/19/14 at 15:36:39 (UTC) | 117.575117 W | 33.405975 N | 11S | 3696443 | 446521.96 |
| Andrew Fisher | 2 | 12/29/2014 | 8:16:17 AM | Inactive | Inactive | 101 | none | multiple burrow entrances | 33 24.3589 N 117 34.5071 W::12/29/14 at 16:12:11 (UTC) | 117.575118 W | 33.405982 N | 11S | 3696443 | 446521.96 |
| Andrew Fisher | 3 | 1/9/2015 | 8:04:59 AM | Inactive | Inactive | 101 | none | multiple burrow entrances | 33 24.3583 N 117 34.5077 W::1/9/15 at 16:00:07 (UTC) | 117.575128 W | 33.405972 N | 11S | 3696443.55 | 446519.965 |
| Keoni Calantas | 4 | 1/23/2015 | 7:25:40 AM | Inactive | Inactive | 101 | none | | 33 24.3597 N 117 34.5090 W::1/23/15 at 15:24:32 (UTC) | 117.575150 W | 33.405995 N | 11S | 3696443.55 | 446519.965 |
| Brennan Mulrooney | 1 | 12/19/2014 | 7:44:29 AM | Inactive | Inactive | 102 | none | | 33 24.4375 N 117 34.5636 W::12/19/14 at 15:41:27 (UTC) | 117.576060 W | 33.407292 N | 11S | 3696589.45 | 446436.15 |
| Andrew Fisher | 2 | 12/29/2014 | 7:53:56 AM | Inactive | Inactive | 102 | none | multiple burrow entrances | 33 24.4378 N 117 34.5622 W::12/29/14 at 15:49:55 (UTC) | 117.576038 W | 33.407298 N | 11S | 3696589.45 | 446436.15 |
| Andrew Fisher | 3 | 1/9/2015 | 7:41:02 AM | Inactive | Inactive | 102 | none | occupied by ground squirrel | 33 24.4368 N 117 34.5633 W::1/9/15 at 15:36:06 (UTC) | 117.576055 W | 33.407280 N | 11S | 3696589 | 446435.915 |
| Donna Germann | 4 | 1/23/2015 | 7:33:44 AM | Inactive | Inactive | 102 | none | | 33 24.4381 N 117 34.5629 W::1/23/15 at 15:30:46 (UTC) | 117.576048 W | 33.407302 N | 11S | 3696589 | 446435.915 |
| Brennan Mulrooney | 1 | 12/19/2014 | 7:47:31 AM | Inactive | Inactive | 103 | none | multiple burrow entrances | 33 24.4925 N 117 34.6129 W::12/19/14 at 15:44:38 (UTC) | 117.576888 W | 33.408217 N | 11S | 3696691.6 | 446361.535 |
| Andrew Fisher | 2 | 12/29/2014 | 8:06:51 AM | Inactive | Inactive | 103 | none | multiple burrow entrances | 33 24.4925 N 117 34.6096 W::12/29/14 at 16:02:52 (UTC) | 117.576827 W | 33.408208 N | 11S | 3696691.6 | 446361.535 |
| Andrew Fisher | 3 | 1/9/2015 | 7:56:31 AM | Inactive | Inactive | 103 | none | multiple burrow entrances | 33 24.4922 N 117 34.6089 W::1/9/15 at 15:51:36 (UTC) | 117.576815 W | 33.408203 N | 11S | 3696691.65 | 446360.975 |
| Keoni Calantas | 4 | 1/23/2015 | 8:34:16 AM | Inactive | Inactive | 103 | none | | 33 24.4934 N 117 34.6147 W::1/23/15 at 16:33:16 (UTC) | 117.576912 W | 33.408223 N | 11S | 3696691.65 | 446360.975 |
| Brennan Mulrooney | 1 | 12/19/2014 | 7:48:49 AM | Inactive | Inactive | 104 | none | multiple burrow entrances | 33 24.5248 N 117 34.6099 W::12/19/14 at 15:45:55 (UTC) | 117.576832 W | 33.408747 N | 11S | 3696747.5 | 446363.05 |
| Brennan Mulrooney | 2 | 12/29/2014 | 7:58:10 AM | Inactive | Inactive | 104 | none | | 33 24.5212 N 117 34.6114 W::12/29/14 at 15:54:18 (UTC) | 117.576857 W | 33.408687 N | 11S | 3696747.5 | 446363.05 |
| Brennan Mulrooney | 3 | 1/9/2015 | 7:48:51 AM | Inactive | Inactive | 104 | none | | 33 24.5206 N 117 34.6102 W::1/9/15 at 15:44:01 (UTC) | 117.576837 W | 33.408677 N | 11S | 3696749.15 | 446365.48 |
| Donna Germann | 4 | 1/23/2015 | 6:58:43 AM | Inactive | Inactive | 104 | none | | 33 24.5272 N 117 34.6080 W::1/23/15 at 14:55:38 (UTC) | 117.576800 W | 33.408787 N | 11S | 3696749.15 | 446365.48 |
| Brennan Mulrooney | 1 | 12/19/2014 | 7:57:43 AM | Inactive | Inactive | 105 | none | | 33 24.4382 N 117 34.6088 W::12/19/14 at 15:54:48 (UTC) | 117.576813 W | 33.407303 N | 11S | 3696591.75 | 446366.65 |
| Matthew Kedziora | 2 | 12/29/2014 | 8:05:24 AM | Inactive | Inactive | 105 | none | | 33 24.4393 N 117 34.6068 W::12/29/14 at 16:04:34 (UTC) | 117.576780 W | 33.407322 N | 11S | 3696591.75 | 446366.65 |
| Brynne Mulrooney | 3 | 1/9/2015 | 7:52:52 AM | Inactive | Inactive | 105 | none | | 33 24.4362 N 117 34.6069 W::1/9/15 at 15:53:30 (UTC) | 117.576782 W | 33.407270 N | 11S | 3696592.3 | 446367.265 |
| Andrew Fisher | 4 | 1/23/2015 | 7:42:25 AM | Inactive | Inactive | 105 | none | | 33 24.4419 N 117 34.6079 W::1/23/15 at 15:36:36 (UTC) | 117.576798 W | 33.407365 N | 11S | 3696592.3 | 446367.265 |
| Brennan Mulrooney | 1 | 12/19/2014 | 7:58:53 AM | Inactive | Inactive | 106 | none | multiple burrow entrances | 33 24.4337 N 117 34.6072 W::12/19/14 at 15:56:04 (UTC) | 117.576787 W | 33.407228 N | 11S | 3696575.3 | 446366.145 |
| Matthew Kedziora | 2 | 12/29/2014 | 8:06:40 AM | Inactive | Inactive | 106 | none | | 33 24.4260 N 117 34.6089 W::12/29/14 at 16:05:37 (UTC) | 117.576815 W | 33.407100 N | 11S | 3696575.3 | 446366.145 |
| James McMorran | 3 | 1/9/2015 | 7:58:39 AM | Inactive | Inactive | 106 | none | | 33 24.4263 N 117 34.6019 W::1/9/15 at 15:53:45 (UTC) | 117.576698 W | 33.407105 N | 11S | 3696571.65 | 446375.38 |
| Andrew Fisher | 4 | 1/23/2015 | 7:44:06 AM | Inactive | Inactive | 106 | none | | 33 24.4295 N 117 34.6023 W::1/23/15 at 15:38:07 (UTC) | 117.576705 W | 33.407158 N | 11S | 3696571.65 | 446375.38 |
| Brennan Mulrooney | 1 | 12/19/2014 | 7:59:47 AM | Inactive | Inactive | 107 | none | multiple burrow entrances | 33 24.4214 N 117 34.5960 W::12/19/14 at 15:56:47 (UTC) | 117.576602 W | 33.407022 N | 11S | 3696562.8 | 446381.555 |
| Matthew Kedziora | 2 | 12/29/2014 | 8:08:51 AM | Inactive | Inactive | 107 | none | | 33 24.4249 N 117 34.6000 W::12/29/14 at 16:07:55 (UTC) | 117.576667 W | 33.407082 N | 11S | 3696562.8 | 446381.555 |
| Brynne Mulrooney | 3 | 1/9/2015 | 7:54:52 AM | Inactive | Inactive | 107 | none | | 33 24.4238 N 117 34.5941 W::1/9/15 at 15:55:28 (UTC) | 117.576568 W | 33.407063 N | 11S | 3696565.65 | 446386.97 |
| Andrew Fisher | 4 | 1/23/2015 | 7:45:31 AM | Inactive | Inactive | 107 | none | | 33 24.4256 N 117 34.5951 W::1/23/15 at 15:39:36 (UTC) | 117.576585 W | 33.407093 N | 11S | 3696565.65 | 446386.97 |
| Brennan Mulrooney | 1 | 12/19/2014 | 8:00:50 AM | Inactive | Inactive | 108 | none | multiple burrow entrances | 33 24.4065 N 117 34.5845 W::12/19/14 at 15:57:57 (UTC) | 117.576387 W | 33.406760 N | 11S | 3696528.5 | 446407.635 |
| Matthew Kedziora | 2 | 12/29/2014 | 8:10:08 AM | Inactive | Inactive | 108 | none | | 33 24.4024 N 117 34.5778 W::12/29/14 at 16:09:10 (UTC) | 117.576317 W | 33.406728 N | 11S | 3696528.5 | 446407.635 |
| Brynne Mulrooney | 3 | 1/9/2015 | 7:56:14 AM | Inactive | Inactive | 108 | none | | 33 24.4065 N 117 34.5819 W::1/9/15 at 15:56:26 (UTC) | 117.576365 W | 33.406775 N | 11S | 3696531.95 | 446408.31 |
| Andrew Fisher | 4 | 1/23/2015 | 7:47:27 AM | Inactive | Inactive | 108 | none | | 33 24.4065 N 117 34.5795 W::1/23/15 at 15:41:53 (UTC) | 117.576325 W | 33.406775 N | 11S | 3696531.95 | 446408.31 |
| Brennan Mulrooney | 1 | 12/19/2014 | 8:05:33 AM | Inactive | Inactive | 109 | none | | 33 24.3564 N 117 34.5488 W::12/19/14 at 16:02:42 (UTC) | 117.575813 W | 33.405940 N | 11S | 3696435.35 | 446456.31 |
| James McMorran | 2 | 12/29/2014 | 8:14:24 AM | Inactive | Inactive | 109 | none | | 33 24.3523 N 117 34.5500 W::12/29/14 at 16:10:30 (UTC) | 117.575833 W | 33.405872 N | 11S | 3696435.35 | 446456.31 |
| James McMorran | 3 | 1/9/2015 | 8:03:44 AM | Inactive | Inactive | 109 | none | | 33 24.3541 N 117 34.5526 W::1/9/15 at 15:58:30 (UTC) | 117.575877 W | 33.405902 N | 11S | 3696437.3 | 446453.025 |
| Keoni Calantas | 4 | 1/23/2015 | 7:45:54 AM | Inactive | Inactive | 109 | none | | 33 24.3567 N 117 34.5504 W::1/23/15 at 15:44:47 (UTC) | 117.575840 W | 33.405945 N | 11S | 3696437.3 | 446453.025 |
| Andrew Fisher | 1 | 12/19/2014 | 7:18:38 AM | Inactive | Inactive | 11 | none | multiple burrow entrances | 33 24.3908 N 117 34.4116 W::12/19/14 at 15:15:35 (UTC) | 117.573523 W | 33.406507 N | 11S | 3696499.15 | 446672.865 |
| Andrew Fisher | 2 | 12/29/2014 | 7:20:29 AM | Inactive | Inactive | 11 | none | multiple burrow entrances | 33 24.3887 N 117 34.4084 W::12/29/14 at 15:16:35 (UTC) | 117.573473 W | 33.406478 N | 11S | 3696499.15 | 446672.865 |
| Andrew Fisher | 3 | 1/9/2015 | 7:16:15 AM | Inactive | Inactive | 11 | none | occupied by ground squirrel | 33 24.3889 N 117 34.4098 W::1/9/15 at 15:11:40 (UTC) | 117.573497 W | 33.406482 N | 11S | 3696498.9 | 446671.56 |
| Andrew Fisher | 4 | 1/22/2015 | 3:16:28 PM | Inactive | Inactive | 11 | none | | 33 24.3899 N 117 34.4116 W::1/22/15 at 23:10:27 (UTC) | 117.573527 W | 33.406498 N | 11S | 3696498.9 | 446671.56 |
| Brennan Mulrooney | 1 | 12/19/2014 | 8:06:44 AM | Inactive | Inactive | 110 | none | multiple burrow entrances | 33 24.3387 N 117 34.5333 W::12/19/14 at 16:03:47 (UTC) | 117.575555 W | 33.405645 N | 11S | 3696406.8 | 446482.935 |
| Matthew Kedziora | 2 | 12/29/2014 | 8:13:45 AM | Inactive | Inactive | 110 | none | | 33 24.3393 N 117 34.5309 W::12/29/14 at 16:12:49 (UTC) | 117.575515 W | 33.405655 N | 11S | 3696406.8 | 446482.935 |

# Appendix C – Raw Field Data

| Primary_Bio | Survey Number | Date | Time | Cumulative_ Burrow_ Status | Field_ Burrow_ Status | Burrow ID | Sign | Notes | GPSLocation | Longitude | Latitude | Zone | Avg_ Northing_ Final | Avg_ Easting_ Final |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Brynne Mulrooney | 3 | 1/9/2015 | 7:59:49 AM | Inactive | Inactive | 110 | none | | 33 24.3410 N 117 34.5337 W::1/9/15 at 15:59:59 (UTC) | 117.575562 W | 33.405683 N | 11S | 3696410.45 | 446479.985 |
| Andrew Fisher | 4 | 1/23/2015 | 7:50:54 AM | Inactive | Inactive | 110 | none | | 33 24.3409 N 117 34.5343 W::1/23/15 at 15:44:55 (UTC) | 117.575572 W | 33.405682 N | 11S | 3696410.45 | 446479.985 |
| Brennan Mulrooney | 1 | 12/19/2014 | 8:11:27 AM | Inactive | Inactive | 111 | none | | 33 24.2753 N 117 34.4801 W::12/19/14 at 16:08:31 (UTC) | 117.574668 W | 33.404588 N | 11S | 3696285.2 | 446566.145 |
| Matthew Kedziora | 2 | 12/29/2014 | 8:18:53 AM | Inactive | Inactive | 111 | none | | 33 24.2722 N 117 34.4765 W::12/29/14 at 16:17:54 (UTC) | 117.574598 W | 33.404527 N | 11S | 3696285.2 | 446566.145 |
| Brynne Mulrooney | 3 | 1/9/2015 | 8:04:14 AM | Inactive | Inactive | 111 | none | | 33 24.2742 N 117 34.4808 W::1/9/15 at 16:04:21 (UTC) | 117.574680 W | 33.404570 N | 11S | 3696286.9 | 446561.78 |
| Andrew Fisher | 4 | 1/23/2015 | 7:56:34 AM | Inactive | Inactive | 111 | none | | 33 24.2747 N 117 34.4808 W::1/23/15 at 15:50:49 (UTC) | 117.574680 W | 33.404575 N | 11S | 3696286.9 | 446561.78 |
| Brennan Mulrooney | 1 | 12/19/2014 | 8:17:57 AM | Inactive | Inactive | 112 | none | | 33 24.1672 N 117 34.3941 W::12/19/14 at 16:14:54 (UTC) | 117.573233 W | 33.402782 N | 11S | 3696084 | 446697.685 |
| Matthew Kedziora | 2 | 12/29/2014 | 8:25:36 AM | Inactive | Inactive | 112 | none | | 33 24.1630 N 117 34.3908 W::12/29/14 at 16:24:59 (UTC) | 117.573180 W | 33.402717 N | 11S | 3696084 | 446697.685 |
| Brynne Mulrooney | 3 | 1/9/2015 | 8:10:53 AM | Inactive | Inactive | 112 | none | | 33 24.1649 N 117 34.3921 W::1/9/15 at 16:11:09 (UTC) | 117.573202 W | 33.402748 N | 11S | 3696083 | 446698.33 |
| Andrew Fisher | 4 | 1/23/2015 | 8:05:53 AM | Inactive | Inactive | 112 | none | | 33 24.1639 N 117 34.3918 W::1/23/15 at 15:59:54 (UTC) | 117.573197 W | 33.402732 N | 11S | 3696083 | 446698.33 |
| Brennan Mulrooney | 1 | 12/19/2014 | 8:23:12 AM | Inactive | Inactive | 113 | none | | 33 24.1056 N 117 34.4154 W::12/19/14 at 16:20:15 (UTC) | 117.573590 W | 33.401760 N | 11S | 3695973.4 | 446660.855 |
| Brennan Mulrooney | 2 | 12/29/2014 | 8:35:10 AM | Inactive | Inactive | 113 | none | | 33 24.1044 N 117 34.4161 W::12/29/14 at 16:31:22 (UTC) | 117.573602 W | 33.401740 N | 11S | 3695973.4 | 446660.855 |
| Brennan Mulrooney | 3 | 1/9/2015 | 8:23:14 AM | Inactive | Inactive | 113 | none | | 33 24.1198 N 117 34.4151 W::1/9/15 at 16:18:32 (UTC) | 117.573585 W | 33.401997 N | 11S | 3695997.25 | 446661.87 |
| Keoni Calantas | 4 | 1/23/2015 | 8:07:03 AM | Inactive | Inactive | 113 | none | | 33 24.1160 N 117 34.4153 W::1/23/15 at 16:06:00 (UTC) | 117.573588 W | 33.401933 N | 11S | 3695997.25 | 446661.87 |
| Brennan Mulrooney | 1 | 12/19/2014 | 8:24:15 AM | Inactive | Inactive | 114 | none | | 33 24.1187 N 117 34.4216 W::12/19/14 at 16:21:20 (UTC) | 117.573732 W | 33.401988 N | 11S | 3696001.75 | 446647.2 |
| Brennan Mulrooney | 2 | 12/29/2014 | 8:36:00 AM | Inactive | Inactive | 114 | none | | 33 24.1213 N 117 34.4254 W::12/29/14 at 16:32:04 (UTC) | 117.573757 W | 33.402022 N | 11S | 3696001.75 | 446647.2 |
| Brennan Mulrooney | 3 | 1/9/2015 | 8:23:53 AM | Inactive | Inactive | 114 | none | | 33 24.1206 N 117 34.4257 W::1/9/15 at 16:19:06 (UTC) | 117.573760 W | 33.402010 N | 11S | 3696012.15 | 446641.54 |
| Keoni Calantas | 4 | 1/23/2015 | 8:08:42 AM | Inactive | Inactive | 114 | none | | 33 24.1312 N 117 34.4311 W::1/23/15 at 16:07:38 (UTC) | 117.573852 W | 33.402187 N | 11S | 3696012.15 | 446641.54 |
| Brennan Mulrooney | 1 | 12/19/2014 | 8:26:11 AM | Inactive | Inactive | 115 | none | | 33 24.1419 N 117 34.4391 W::12/19/14 at 16:23:16 (UTC) | 117.573997 W | 33.402375 N | 11S | 3696042.25 | 446623.9 |
| Brennan Mulrooney | 2 | 12/29/2014 | 8:37:40 AM | Inactive | Inactive | 115 | none | | 33 24.1418 N 117 34.4399 W::12/29/14 at 16:33:45 (UTC) | 117.573998 W | 33.402363 N | 11S | 3696042.25 | 446623.9 |
| Brennan Mulrooney | 3 | 1/9/2015 | 8:24:57 AM | Inactive | Inactive | 115 | none | | 33 24.1430 N 117 34.4373 W::1/9/15 at 16:20:28 (UTC) | 117.573955 W | 33.402383 N | 11S | 3696058.9 | 446621.11 |
| Keoni Calantas | 4 | 1/23/2015 | 8:09:41 AM | Inactive | Inactive | 115 | none | | 33 24.1593 N 117 34.4461 W::1/23/15 at 16:11:05 (UTC) | 117.574102 W | 33.402655 N | 11S | 3696058.9 | 446621.11 |
| Brennan Mulrooney | 1 | 12/19/2014 | 8:27:42 AM | Inactive | Inactive | 116 | none | | 33 24.1579 N 117 34.4469 W::12/19/14 at 16:24:39 (UTC) | 117.574113 W | 33.402633 N | 11S | 3696071.3 | 446613.55 |
| Brennan Mulrooney | 2 | 12/29/2014 | 8:38:56 AM | Inactive | Inactive | 116 | none | | 33 24.1577 N 117 34.4465 W::12/29/14 at 16:35:05 (UTC) | 117.574108 W | 33.402628 N | 11S | 3696071.3 | 446613.55 |
| Brennan Mulrooney | 3 | 1/9/2015 | 8:26:37 AM | Inactive | Inactive | 116 | none | | 33 24.1583 N 117 34.4452 W::1/9/15 at 16:21:49 (UTC) | 117.574087 W | 33.402638 N | 11S | 3696073.15 | 446614.445 |
| Keoni Calantas | 4 | 1/23/2015 | 8:12:38 AM | Inactive | Inactive | 116 | none | | 33 24.1594 N 117 34.4469 W::1/23/15 at 16:11:36 (UTC) | 117.574115 W | 33.402657 N | 11S | 3696073.15 | 446614.445 |
| Brennan Mulrooney | 1 | 12/19/2014 | 8:28:59 AM | Inactive | Inactive | 117 | none | | 33 24.1657 N 117 34.4608 W::12/19/14 at 16:26:05 (UTC) | 117.574347 W | 33.402762 N | 11S | 3696094 | 446595.635 |
| Brennan Mulrooney | 2 | 12/29/2014 | 8:40:55 AM | Inactive | Inactive | 117 | none | | 33 24.1744 N 117 34.4557 W::12/29/14 at 16:37:01 (UTC) | 117.574262 W | 33.402907 N | 11S | 3696094 | 446595.635 |
| Brynne Mulrooney | 3 | 1/9/2015 | 8:22:43 AM | Inactive | Inactive | 117 | none | | 33 24.1737 N 117 34.4542 W::1/9/15 at 16:22:57 (UTC) | 117.574237 W | 33.402895 N | 11S | 3696099.4 | 446601.48 |
| Donna Germann | 4 | 1/23/2015 | 8:13:56 AM | Inactive | Inactive | 117 | none | | 33 24.1723 N 117 34.4548 W::1/23/15 at 16:10:47 (UTC) | 117.574247 W | 33.402872 N | 11S | 3696099.4 | 446601.48 |
| Brennan Mulrooney | 1 | 12/19/2014 | 8:32:23 AM | Inactive | Inactive | 118 | none | | 33 24.2011 N 117 34.4985 W::12/19/14 at 16:29:32 (UTC) | 117.574975 W | 33.403352 N | 11S | 3696153.8 | 446533.52 |
| Andrew Fisher | 2 | 12/29/2014 | 8:44:24 AM | Inactive | Inactive | 118 | none | multiple burrow entrances | 33 24.2034 N 117 34.4986 W::12/29/14 at 16:40:20 (UTC) | 117.574977 W | 33.403390 N | 11S | 3696153.8 | 446533.52 |
| Andrew Fisher | 3 | 1/9/2015 | 8:30:40 AM | Inactive | Inactive | 118 | none | occupied by ground squirrel | 33 24.2015 N 117 34.4992 W::1/9/15 at 16:25:44 (UTC) | 117.574987 W | 33.403358 N | 11S | 3696153.35 | 446532.45 |
| Andrew Fisher | 4 | 1/23/2015 | 8:20:43 AM | Inactive | Inactive | 118 | none | | 33 24.2025 N 117 34.4993 W::1/23/15 at 16:14:40 (UTC) | 117.574988 W | 33.403375 N | 11S | 3696153.35 | 446532.45 |
| Brennan Mulrooney | 1 | 12/19/2014 | 8:33:36 AM | Inactive | Inactive | 119 | none | | 33 24.2220 N 117 34.5107 W::12/19/14 at 16:30:31 (UTC) | 117.575178 W | 33.403700 N | 11S | 3696190.95 | 446516.245 |
| Andrew Fisher | 2 | 12/29/2014 | 8:45:50 AM | Inactive | Inactive | 119 | none | occupied by ground squirrel | 33 24.2226 N 117 34.5090 W::12/29/14 at 16:41:51 (UTC) | 117.575150 W | 33.403710 N | 11S | 3696190.95 | 446516.245 |
| Andrew Fisher | 3 | 1/9/2015 | 8:31:50 AM | Inactive | Inactive | 119 | none | occupied by ground squirrel | 33 24.2219 N 117 34.5097 W::1/9/15 at 16:26:58 (UTC) | 117.575162 W | 33.403698 N | 11S | 3696190.6 | 446516.845 |
| Keoni Calantas | 4 | 1/23/2015 | 8:17:23 AM | Inactive | Inactive | 119 | none | | 33 24.2223 N 117 34.5092 W::1/23/15 at 16:16:15 (UTC) | 117.575153 W | 33.403705 N | 11S | 3696190.6 | 446516.845 |
| Andrew Fisher | 1 | 12/19/2014 | 7:36:39 AM | Inactive | Inactive | 12 | none | multiple burrow entrances | 33 24.1916 N 117 34.3904 W::12/19/14 at 15:33:32 (UTC) | 117.573173 W | 33.403193 N | 11S | 3696132.9 | 446702.745 |
| Andrew Fisher | 2 | 12/29/2014 | 8:26:47 AM | Inactive | Inactive | 12 | none | multiple burrow entrances | 33 24.1913 N 117 34.3882 W::12/29/14 at 16:22:48 (UTC) | 117.573137 W | 33.403188 N | 11S | 3696132.9 | 446702.745 |
| Andrew Fisher | 3 | 1/9/2015 | 8:17:15 AM | Inactive | Inactive | 12 | none | multiple burrow entrances | 33 24.1902 N 117 34.3887 W::1/9/15 at 16:12:21 (UTC) | 117.573145 W | 33.403170 N | 11S | 3696130.9 | 446701.43 |
| Keoni Calantas | 4 | 1/23/2015 | 7:14:28 AM | Inactive | Inactive | 12 | none | | 33 24.1905 N 117 34.3916 W::1/23/15 at 15:13:29 (UTC) | 117.573193 W | 33.403175 N | 11S | 3696130.9 | 446701.43 |
| Brennan Mulrooney | 1 | 12/19/2014 | 8:38:31 AM | Inactive | Inactive | 120 | none | | 33 24.3025 N 117 34.5759 W::12/19/14 at 16:35:39 (UTC) | 117.576265 W | 33.405042 N | 11S | 3696341.5 | 446416.18 |
| Andrew Fisher | 2 | 12/29/2014 | 8:52:41 AM | Inactive | Inactive | 120 | none | multiple burrow entrances | 33 24.3044 N 117 34.5739 W::12/29/14 at 16:48:49 (UTC) | 117.576233 W | 33.405073 N | 11S | 3696341.5 | 446416.18 |
| Andrew Fisher | 3 | 1/9/2015 | 8:37:16 AM | Inactive | Inactive | 120 | none | multiple burrow entrances | 33 24.3040 N 117 34.5749 W::1/9/15 at 16:32:19 (UTC) | 117.576250 W | 33.405067 N | 11S | 3696342.95 | 446415.955 |
| Andrew Fisher | 4 | 1/23/2015 | 8:26:48 AM | Inactive | Inactive | 120 | none | | 33 24.3045 N 117 34.5752 W::1/23/15 at 16:20:45 (UTC) | 117.576253 W | 33.405075 N | 11S | 3696342.95 | 446415.955 |
| Brennan Mulrooney | 1 | 12/19/2014 | 8:39:52 AM | Inactive | Inactive | 121 | none | | 33 24.3211 N 117 34.5897 W::12/19/14 at 16:37:02 (UTC) | 117.576495 W | 33.405352 N | 11S | 3696374.3 | 446391.065 |
| Andrew Fisher | 2 | 12/29/2014 | 8:54:14 AM | Inactive | Inactive | 121 | none | multiple burrow entrances | 33 24.3211 N 117 34.5928 W::12/29/14 at 16:50:12 (UTC) | 117.576547 W | 33.405352 N | 11S | 3696374.3 | 446391.065 |
| Andrew Fisher | 3 | 1/9/2015 | 8:38:23 AM | Inactive | Inactive | 121 | none | occupied by ground squirrel | 33 24.3218 N 117 34.5935 W::1/9/15 at 16:33:30 (UTC) | 117.576558 W | 33.405363 N | 11S | 3696374.9 | 446387.305 |
| Andrew Fisher | 4 | 1/23/2015 | 8:28:37 AM | Inactive | Inactive | 121 | none | | 33 24.3211 N 117 34.5939 W::1/23/15 at 16:22:33 (UTC) | 117.576565 W | 33.405352 N | 11S | 3696374.9 | 446387.305 |
| Brennan Mulrooney | 1 | 12/19/2014 | 8:40:40 AM | Inactive | Inactive | 122 | none | multiple burrow entrances | 33 24.3331 N 117 34.6010 W::12/19/14 at 16:37:46 (UTC) | 117.576683 W | 33.405552 N | 11S | 3696397.1 | 446376.645 |
| Andrew Fisher | 2 | 12/29/2014 | 8:55:22 AM | Inactive | Inactive | 122 | none | multiple burrow entrances | 33 24.3338 N 117 34.6003 W::12/29/14 at 16:51:17 (UTC) | 117.576672 W | 33.405563 N | 11S | 3696397.1 | 446376.645 |
| Andrew Fisher | 3 | 1/9/2015 | 8:39:30 AM | Inactive | Inactive | 122 | none | multiple burrow entrances | 33 24.3347 N 117 34.6011 W::1/9/15 at 16:34:41 (UTC) | 117.576685 W | 33.405578 N | 11S | 3696403 | 446376.35 |
| Andrew Fisher | 4 | 1/23/2015 | 8:31:09 AM | Inactive | Inactive | 122 | none | | 33 24.3386 N 117 34.6006 W::1/23/15 at 16:25:07 (UTC) | 117.576677 W | 33.405643 N | 11S | 3696403 | 446376.35 |

# Appendix C – Raw Field Data

| Primary_Bio | Survey Number | Date | Time | Cumulative_ Burrow_ Status | Field_ Burrow_ Status | Burrow ID | Sign | Notes | GPSLocation | Longitude | Latitude | Zone | Avg_ Northing_ Final | Avg_ Easting_ Final |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Brennan Mulrooney | 1 | 12/19/2014 | 8:41:29 AM | Inactive | Inactive | 123 | none | multiple burrow entrances | 33 24.3382 N 117 34.6027 W::12/19/14 at 16:38:34 (UTC) | 117.576712 W | 33.405637 N | 11S | 3696408.65 | 446372.75 |
| Andrew Fisher | 2 | 12/29/2014 | 8:55:52 AM | Inactive | Inactive | 123 | none | multiple burrow entrances | 33 24.3411 N 117 34.6037 W::12/29/14 at 16:51:53 (UTC) | 117.576728 W | 33.405685 N | 11S | 3696408.65 | 446372.75 |
| Andrew Fisher | 3 | 1/9/2015 | 8:40:11 AM | Inactive | Inactive | 123 | none | occupied by ground squirrel | 33 24.3425 N 117 34.6056 W::1/9/15 at 16:35:14 (UTC) | 117.576760 W | 33.405708 N | 11S | 3696413.45 | 446367.2 |
| Andrew Fisher | 4 | 1/23/2015 | 8:31:34 AM | Inactive | Inactive | 123 | none | | 33 24.3420 N 117 34.6080 W::1/23/15 at 16:25:29 (UTC) | 117.576800 W | 33.405700 N | 11S | 3696413.45 | 446367.2 |
| Brennan Mulrooney | 1 | 12/19/2014 | 8:43:59 AM | Inactive | Inactive | 124 | none | | 33 24.3905 N 117 34.6305 W::12/19/14 at 16:41:01 (UTC) | 117.577175 W | 33.406508 N | 11S | 3696502.45 | 446334.12 |
| Brennan Mulrooney | 2 | 12/29/2014 | 8:58:03 AM | Inactive | Inactive | 124 | none | | 33 24.3901 N 117 34.6264 W::12/29/14 at 16:54:08 (UTC) | 117.577107 W | 33.406502 N | 11S | 3696502.45 | 446334.12 |
| Brennan Mulrooney | 3 | 1/9/2015 | 8:42:27 AM | Inactive | Inactive | 124 | none | | 33 24.3896 N 117 34.6270 W::1/9/15 at 16:37:35 (UTC) | 117.577117 W | 33.406493 N | 11S | 3696502.15 | 446335.655 |
| Keoni Calantas | 4 | 1/23/2015 | 8:26:51 AM | Inactive | Inactive | 124 | none | | 33 24.3907 N 117 34.6279 W::1/23/15 at 16:25:44 (UTC) | 117.577132 W | 33.406512 N | 11S | 3696502.15 | 446335.655 |
| Brennan Mulrooney | 1 | 12/19/2014 | 8:44:49 AM | Inactive | Inactive | 125 | none | | 33 24.3993 N 117 34.6338 W::12/19/14 at 16:41:48 (UTC) | 117.577225 W | 33.406650 N | 11S | 3696526.4 | 446324.955 |
| Brennan Mulrooney | 2 | 12/29/2014 | 8:59:18 AM | Inactive | Inactive | 125 | none | | 33 24.4075 N 117 34.6354 W::12/29/14 at 16:55:34 (UTC) | 117.577257 W | 33.406792 N | 11S | 3696526.4 | 446324.955 |
| Brennan Mulrooney | 3 | 1/9/2015 | 8:43:34 AM | Inactive | Inactive | 125 | none | | 33 24.3969 N 117 34.6346 W::1/9/15 at 16:39:27 (UTC) | 117.577243 W | 33.406615 N | 11S | 3696519.8 | 446324.085 |
| Keoni Calantas | 4 | 1/23/2015 | 8:27:49 AM | Inactive | Inactive | 125 | none | | 33 24.4024 N 117 34.6354 W::1/23/15 at 16:27:09 (UTC) | 117.577257 W | 33.406707 N | 11S | 3696519.8 | 446324.085 |
| Brennan Mulrooney | 1 | 12/19/2014 | 9:11:42 AM | Inactive | Inactive | 126 | none | multiple burrow entrances | 33 23.6794 N 117 35.1835 W::12/19/14 at 17:08:45 (UTC) | 117.586392 W | 33.394657 N | 11S | 3695193.95 | 445466.225 |
| Brennan Mulrooney | 2 | 12/29/2014 | 9:27:29 AM | Inactive | Inactive | 126 | none | | 33 23.6798 N 117 35.1839 W::12/29/14 at 17:23:49 (UTC) | 117.586398 W | 33.394663 N | 11S | 3695193.95 | 445466.225 |
| Andrew Fisher | 3 | 1/9/2015 | 9:55:39 AM | Inactive | Inactive | 126 | none | | 33 23.6798 N 117 35.1839 W::12/29/14 at 17:23:49 (UTC) | 117.586398 W | 33.394663 N | 11S | 3695195.1 | 445464.835 |
| Andrew Fisher | 4 | 1/23/2015 | 8:59:35 AM | Inactive | Inactive | 126 | none | | 33 23.6806 N 117 35.1853 W::1/23/15 at 16:53:33 (UTC) | 117.586422 W | 33.394677 N | 11S | 3695195.1 | 445464.835 |
| Brennan Mulrooney | 1 | 12/19/2014 | 9:18:37 AM | Inactive | Inactive | 127 | none | multiple burrow entrances | 33 23.5783 N 117 35.1526 W::12/19/14 at 17:15:46 (UTC) | 117.585877 W | 33.392972 N | 11S | 3695011.55 | 445512.67 |
| Brennan Mulrooney | 2 | 12/29/2014 | 9:33:51 AM | Inactive | Inactive | 127 | none | | 33 23.5837 N 117 35.1535 W::12/29/14 at 17:29:58 (UTC) | 117.585892 W | 33.393062 N | 11S | 3695011.55 | 445512.67 |
| James McMorran | 3 | 1/9/2015 | 9:12:14 AM | Inactive | Inactive | 127 | none | | 33 23.5850 N 117 35.1549 W::1/9/15 at 17:07:00 (UTC) | 117.585915 W | 33.393083 N | 11S | 3695019.65 | 445515.325 |
| Keoni Calantas | 4 | 1/23/2015 | 8:57:57 AM | Inactive | Inactive | 127 | none | | 33 23.5858 N 117 35.1479 W::1/23/15 at 16:56:51 (UTC) | 117.585798 W | 33.393097 N | 11S | 3695019.65 | 445515.325 |
| Brennan Mulrooney | 1 | 12/19/2014 | 9:23:34 AM | Inactive | Inactive | 128 | none | | 33 23.5229 N 117 35.1180 W::12/19/14 at 17:20:37 (UTC) | 117.585315 W | 33.392038 N | 11S | 3694899.9 | 445562.92 |
| Matthew Kedziora | 2 | 12/29/2014 | 9:37:39 AM | Inactive | Inactive | 128 | none | | 33 23.5192 N 117 35.1216 W::12/29/14 at 17:36:42 (UTC) | 117.585360 W | 33.391987 N | 11S | 3694899.9 | 445562.92 |
| Brynne Mulrooney | 3 | 1/9/2015 | 9:09:56 AM | Inactive | Inactive | 128 | none | | 33 23.5208 N 117 35.1236 W::1/9/15 at 17:10:13 (UTC) | 117.585393 W | 33.392013 N | 11S | 3694900 | 445558.04 |
| Donna Germann | 4 | 1/23/2015 | 9:03:17 AM | Inactive | Inactive | 128 | none | | 33 23.5208 N 117 35.1232 W::1/23/15 at 17:00:10 (UTC) | 117.585387 W | 33.392013 N | 11S | 3694900 | 445558.04 |
| Brennan Mulrooney | 1 | 12/19/2014 | 9:24:40 AM | Inactive | Inactive | 129 | none | multiple burrow entrances | 33 23.5066 N 117 35.1057 W::12/19/14 at 17:21:44 (UTC) | 117.585095 W | 33.391777 N | 11S | 3694876.5 | 445588.135 |
| Matthew Kedziora | 2 | 12/29/2014 | 9:39:01 AM | Inactive | Inactive | 129 | none | | 33 23.5097 N 117 35.1021 W::12/29/14 at 17:38:06 (UTC) | 117.585035 W | 33.391828 N | 11S | 3694876.5 | 445588.135 |
| Brynne Mulrooney | 3 | 1/9/2015 | 9:11:30 AM | Inactive | Inactive | 129 | none | | 33 23.5048 N 117 35.1066 W::1/9/15 at 17:11:37 (UTC) | 117.585110 W | 33.391747 N | 11S | 3694870.5 | 445583.075 |
| Donna Germann | 4 | 1/23/2015 | 9:04:30 AM | Inactive | Inactive | 129 | none | | 33 23.5050 N 117 35.1078 W::1/23/15 at 17:01:27 (UTC) | 117.585128 W | 33.391750 N | 11S | 3694870.5 | 445583.075 |
| Andrew Fisher | 1 | 12/19/2014 | 7:37:41 AM | Inactive | Inactive | 13 | none | multiple burrow entrances | 33 24.2102 N 117 34.4075 W::12/19/14 at 15:34:31 (UTC) | 117.573458 W | 33.403503 N | 11S | 3696164.5 | 446674.325 |
| Brennan Mulrooney | 2 | 12/29/2014 | 8:26:05 AM | Inactive | Inactive | 13 | none | | 33 24.2067 N 117 34.4080 W::12/29/14 at 16:22:09 (UTC) | 117.573467 W | 33.403445 N | 11S | 3696164.5 | 446674.325 |
| Andrew Fisher | 3 | 1/9/2015 | 8:15:49 AM | Inactive | Inactive | 13 | none | occupied by ground squirrel | 33 24.2092 N 117 34.4084 W::1/9/15 at 16:10:56 (UTC) | 117.573473 W | 33.403487 N | 11S | 3696165.95 | 446673.59 |
| Keoni Calantas | 4 | 1/23/2015 | 7:16:13 AM | Inactive | Inactive | 13 | none | | 33 24.2093 N 117 34.4081 W::1/23/15 at 15:15:07 (UTC) | 117.573468 W | 33.403488 N | 11S | 3696165.95 | 446673.59 |
| Brennan Mulrooney | 1 | 12/19/2014 | 9:27:06 AM | Inactive | Inactive | 130 | none | multiple burrow entrances | 33 23.4674 N 117 35.0809 W::12/19/14 at 17:24:11 (UTC) | 117.584687 W | 33.391118 N | 11S | 3694793.7 | 445623.75 |
| James McMorran | 2 | 12/29/2014 | 9:45:09 AM | Inactive | Inactive | 130 | none | | 33 23.4598 N 117 35.0800 W::12/29/14 at 17:41:14 (UTC) | 117.584667 W | 33.390997 N | 11S | 3694793.7 | 445623.75 |
| Brynne Mulrooney | 3 | 1/9/2015 | 9:18:24 AM | Inactive | Inactive | 130 | none | | 33 23.4649 N 117 35.0812 W::1/9/15 at 17:18:39 (UTC) | 117.584687 W | 33.391082 N | 11S | 3694797 | 445623.495 |
| Donna Germann | 4 | 1/23/2015 | 9:09:25 AM | Inactive | Inactive | 130 | none | | 33 23.4656 N 117 35.0804 W::1/23/15 at 17:06:35 (UTC) | 117.584673 W | 33.391093 N | 11S | 3694797 | 445623.495 |
| Brennan Mulrooney | 1 | 12/19/2014 | 9:28:40 AM | Inactive | Inactive | 131 | none | | 33 23.4760 N 117 35.0779 W::12/19/14 at 17:25:41 (UTC) | 117.584638 W | 33.391153 N | 11S | 3694803.4 | 445625.945 |
| Andrew Fisher | 2 | 12/29/2014 | 9:45:36 AM | Inactive | Inactive | 131 | none | occupied by ground squirrel | 33 23.4683 N 117 35.0802 W::12/29/14 at 17:41:33 (UTC) | 117.584670 W | 33.391138 N | 11S | 3694803.4 | 445625.945 |
| Brennan Mulrooney | 3 | 1/9/2015 | 9:20:34 AM | Inactive | Inactive | 131 | none | | 33 23.4687 N 117 35.0794 W::1/9/15 at 17:17:18 (UTC) | 117.584657 W | 33.391145 N | 11S | 3694804.35 | 445628.555 |
| Donna Germann | 4 | 1/23/2015 | 9:14:44 AM | Inactive | Inactive | 131 | none | | 33 23.4700 N 117 35.0757 W::1/23/15 at 17:11:33 (UTC) | 117.584595 W | 33.391163 N | 11S | 3694804.35 | 445628.555 |
| Brennan Mulrooney | 1 | 12/19/2014 | 9:30:35 AM | Inactive | Inactive | 132 | none | | 33 23.4524 N 117 35.0710 W::12/19/14 at 17:27:38 (UTC) | 117.584517 W | 33.390873 N | 11S | 3694767.4 | 445635.2 |
| James McMorran | 2 | 12/29/2014 | 9:46:44 AM | Inactive | Inactive | 132 | none | | 33 23.4446 N 117 35.0738 W::12/29/14 at 17:42:55 (UTC) | 117.584563 W | 33.390743 N | 11S | 3694767.4 | 445635.2 |
| Brennan Mulrooney | 3 | 1/9/2015 | 9:23:42 AM | Inactive | Inactive | 132 | none | | 33 23.4515 N 117 35.0712 W::1/9/15 at 17:18:50 (UTC) | 117.584520 W | 33.390858 N | 11S | 3694770.2 | 445638.69 |
| Donna Germann | 4 | 1/23/2015 | 9:13:15 AM | Inactive | Inactive | 132 | none | | 33 23.4501 N 117 35.0706 W::1/23/15 at 17:10:09 (UTC) | 117.584510 W | 33.390835 N | 11S | 3694770.2 | 445638.69 |
| Brennan Mulrooney | 1 | 12/19/2014 | 9:36:30 AM | Inactive | Inactive | 133 | none | | 33 23.4348 N 117 35.0942 W::12/19/14 at 17:33:30 (UTC) | 117.584903 W | 33.390580 N | 11S | 3694740 | 445606.665 |
| Brennan Mulrooney | 2 | 12/29/2014 | 9:52:16 AM | Inactive | Inactive | 133 | none | | 33 23.4339 N 117 35.0888 W::12/29/14 at 17:48:36 (UTC) | 117.584812 W | 33.390565 N | 11S | 3694740 | 445606.665 |
| James McMorran | 3 | 1/9/2015 | 9:30:23 AM | Inactive | Inactive | 133 | none | | 33 23.4345 N 117 35.0896 W::1/9/15 at 17:25:22 (UTC) | 117.584827 W | 33.390575 N | 11S | 3694738.7 | 445611.445 |
| Andrew Fisher | 4 | 1/23/2015 | 9:16:43 AM | Inactive | Inactive | 133 | none | | 33 23.4328 N 117 35.0871 W::1/23/15 at 17:10:48 (UTC) | 117.584785 W | 33.390547 N | 11S | 3694738.7 | 445611.445 |
| Brennan Mulrooney | 1 | 12/19/2014 | 9:39:11 AM | Inactive | Inactive | 134 | none | multiple burrow entrances | 33 23.4701 N 117 35.1169 W::12/19/14 at 17:36:14 (UTC) | 117.585285 W | 33.391167 N | 11S | 3694801.25 | 445570.36 |
| Matthew Kedziora | 2 | 12/29/2014 | 9:51:57 AM | Inactive | Inactive | 134 | none | | 33 23.4648 N 117 35.1131 W::12/29/14 at 17:50:57 (UTC) | 117.585218 W | 33.391080 N | 11S | 3694801.25 | 445570.36 |
| Brynne Mulrooney | 3 | 1/9/2015 | 9:26:57 AM | Inactive | Inactive | 134 | none | | 33 23.4660 N 117 35.1118 W::1/9/15 at 17:27:15 (UTC) | 117.585197 W | 33.391100 N | 11S | 3694800.75 | 445575.15 |
| Andrew Fisher | 4 | 1/23/2015 | 9:18:03 AM | Inactive | Inactive | 134 | none | | 33 23.4682 N 117 35.1122 W::1/23/15 at 17:12:04 (UTC) | 117.585203 W | 33.391137 N | 11S | 3694800.75 | 445575.15 |
| Brennan Mulrooney | 1 | 12/19/2014 | 9:41:25 AM | Inactive | Inactive | 135 | none | | 33 23.5056 N 117 35.1540 W::12/19/14 at 17:38:30 (UTC) | 117.585895 W | 33.391775 N | 11S | 3694873.85 | 445514.875 |
| Matthew Kedziora | 2 | 12/29/2014 | 9:55:19 AM | Inactive | Inactive | 135 | none | Caution bees nest! | 33 23.5065 N 117 35.1486 W::12/29/14 at 17:54:48 (UTC) | 117.585810 W | 33.391775 N | 11S | 3694873.85 | 445514.875 |

# Appendix C – Raw Field Data

| Primary_Bio | Survey Number | Date | Time | Cumulative_ Burrow_ Status | Field_ Burrow_ Status | Burrow ID | Sign | Notes | GPSLocation | Longitude | Latitude | Zone | Avg_ Northing_ Final | Avg_ Easting_ Final |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Brynne Mulrooney | 3 | 1/9/2015 | 9:30:01 AM | Inactive | Inactive | 135 | none | Bees in burrow | 33 23.5077 N 117 35.1489 W::1/9/15 at 17:30:36 (UTC) | 117.585815 W | 33.391795 N | 11S | 3694875.65 | 445518 |
| Andrew Fisher | 4 | 1/23/2015 | 9:20:33 AM | Inactive | Inactive | 135 | none | | 33 23.5073 N 117 35.1494 W::1/23/15 at 17:14:41 (UTC) | 117.585823 W | 33.391788 N | 11S | 3694875.65 | 445518 |
| Brennan Mulrooney | 1 | 12/19/2014 | 9:43:14 AM | Inactive | Inactive | 136 | none | | 33 23.5247 N 117 35.1707 W::12/19/14 at 17:40:16 (UTC) | 117.586187 W | 33.392097 N | 11S | 3694908.5 | 445483.73 |
| Brennan Mulrooney | 2 | 12/29/2014 | 10:00:16 AM | Inactive | Inactive | 136 | none | | 33 23.5245 N 117 35.1715 W::12/29/14 at 17:56:33 (UTC) | 117.586192 W | 33.392075 N | 11S | 3694908.5 | 445483.73 |
| Brynne Mulrooney | 3 | 1/9/2015 | 9:31:59 AM | Inactive | Inactive | 136 | none | | 33 23.5268 N 117 35.1701 W::1/9/15 at 17:32:09 (UTC) | 117.586168 W | 33.392113 N | 11S | 3694910.6 | 445485.505 |
| Andrew Fisher | 4 | 1/23/2015 | 9:21:52 AM | Inactive | Inactive | 136 | none | | 33 23.5258 N 117 35.1703 W::1/23/15 at 17:15:51 (UTC) | 117.586173 W | 33.392097 N | 11S | 3694910.6 | 445485.505 |
| Brennan Mulrooney | 1 | 12/19/2014 | 9:44:12 AM | Inactive | Inactive | 137 | none | | 33 23.5411 N 117 35.1858 W::12/19/14 at 17:41:16 (UTC) | 117.586430 W | 33.392352 N | 11S | 3694941.4 | 445466.055 |
| Matthew Kedziora | 2 | 12/29/2014 | 9:59:45 AM | Inactive | Inactive | 137 | none | | 33 23.5447 N 117 35.1800 W::12/29/14 at 17:58:49 (UTC) | 117.586333 W | 33.392412 N | 11S | 3694941.4 | 445466.055 |
| Brynne Mulrooney | 3 | 1/9/2015 | 9:33:03 AM | Inactive | Inactive | 137 | none | | 33 23.5429 N 117 35.1832 W::1/9/15 at 17:33:07 (UTC) | 117.586387 W | 33.392382 N | 11S | 3694937.8 | 445465.615 |
| Andrew Fisher | 4 | 1/23/2015 | 9:22:52 AM | Inactive | Inactive | 137 | none | | 33 23.5387 N 117 35.1831 W::1/23/15 at 17:16:46 (UTC) | 117.586385 W | 33.392317 N | 11S | 3694937.8 | 445465.615 |
| Brennan Mulrooney | 1 | 12/19/2014 | 9:45:44 AM | Inactive | Inactive | 138 | none | multiple burrow entrances | 33 23.5648 N 117 35.1965 W::12/19/14 at 17:43:02 (UTC) | 117.586610 W | 33.392747 N | 11S | 3694981.7 | 445446.655 |
| Matthew Kedziora | 2 | 12/29/2014 | 10:00:58 AM | Inactive | Inactive | 138 | none | | 33 23.5645 N 117 35.1945 W::12/29/14 at 18:00:13 (UTC) | 117.586575 W | 33.392742 N | 11S | 3694981.7 | 445446.655 |
| Brynne Mulrooney | 3 | 1/9/2015 | 9:34:12 AM | Inactive | Inactive | 138 | none | | 33 23.5643 N 117 35.1936 W::1/9/15 at 17:34:22 (UTC) | 117.586562 W | 33.392738 N | 11S | 3694979.15 | 445447.805 |
| Andrew Fisher | 4 | 1/23/2015 | 9:24:30 AM | Inactive | Inactive | 138 | none | | 33 23.5624 N 117 35.1959 W::1/23/15 at 17:18:29 (UTC) | 117.586598 W | 33.392705 N | 11S | 3694979.15 | 445447.805 |
| Brennan Mulrooney | 1 | 12/19/2014 | 9:56:39 AM | Inactive | Inactive | 139 | none | | 33 23.5491 N 117 35.2494 W::12/19/14 at 17:53:42 (UTC) | 117.587490 W | 33.392485 N | 11S | 3694956.55 | 445366.765 |
| Brennan Mulrooney | 2 | 12/29/2014 | 10:19:15 AM | Inactive | Inactive | 139 | none | | 33 23.5525 N 117 35.2446 W::12/29/14 at 18:15:19 (UTC) | 117.587410 W | 33.392542 N | 11S | 3694956.55 | 445366.765 |
| James McMorran | 3 | 1/9/2015 | 9:50:36 AM | Inactive | Inactive | 139 | none | | 33 23.5556 N 117 35.2450 W::1/9/15 at 17:45:17 (UTC) | 117.587417 W | 33.392593 N | 11S | 3694959.45 | 445368.405 |
| Donna Germann | 4 | 1/23/2015 | 10:01:11 AM | Inactive | Inactive | 139 | none | | 33 23.5492 N 117 35.2469 W::1/23/15 at 17:58:01 (UTC) | 117.587448 W | 33.392487 N | 11S | 3694959.45 | 445368.405 |
| Andrew Fisher | 1 | 12/19/2014 | 7:38:47 AM | Inactive | Inactive | 14 | none | multiple burrow entrances | 33 24.2462 N 117 34.4322 W::12/19/14 at 15:35:31 (UTC) | 117.573870 W | 33.404102 N | 11S | 3696234.75 | 446638.115 |
| Andrew Fisher | 2 | 12/29/2014 | 8:22:50 AM | Inactive | Inactive | 14 | none | multiple burrow entrances | 33 24.2466 N 117 34.4305 W::12/29/14 at 16:18:46 (UTC) | 117.573842 W | 33.404110 N | 11S | 3696234.75 | 446638.115 |
| Andrew Fisher | 3 | 1/9/2015 | 8:13:03 AM | Inactive | Inactive | 14 | none | multiple burrow entrances | 33 24.2457 N 117 34.4313 W::1/9/15 at 16:08:08 (UTC) | 117.573855 W | 33.404095 N | 11S | 3696233.9 | 446637.745 |
| Keoni Calantas | 4 | 1/23/2015 | 7:19:23 AM | Inactive | Inactive | 14 | none | | 33 24.2461 N 117 34.4319 W::1/23/15 at 15:18:15 (UTC) | 117.573865 W | 33.404102 N | 11S | 3696233.9 | 446637.745 |
| Brennan Mulrooney | 1 | 12/19/2014 | 9:59:22 AM | Inactive | Inactive | 140 | none | | 33 23.5172 N 117 35.2239 W::12/19/14 at 17:56:24 (UTC) | 117.587065 W | 33.391953 N | 11S | 3694892 | 445402.765 |
| Brennan Mulrooney | 2 | 12/29/2014 | 10:20:54 AM | Inactive | Inactive | 140 | none | | 33 23.5148 N 117 35.2233 W::12/29/14 at 18:17:00 (UTC) | 117.587053 W | 33.391913 N | 11S | 3694892 | 445402.765 |
| James McMorran | 3 | 1/9/2015 | 9:52:49 AM | Inactive | Inactive | 140 | none | | 33 23.5158 N 117 35.2243 W::1/9/15 at 17:47:19 (UTC) | 117.587072 W | 33.391930 N | 11S | 3694888.35 | 445401.255 |
| Donna Germann | 4 | 1/23/2015 | 9:59:35 AM | Inactive | Inactive | 140 | none | | 33 23.5122 N 117 35.2247 W::1/23/15 at 17:56:26 (UTC) | 117.587078 W | 33.391870 N | 11S | 3694888.35 | 445401.255 |
| Brennan Mulrooney | 1 | 12/19/2014 | 10:01:28 AM | Inactive | Inactive | 141 | none | | 33 23.4820 N 117 35.1968 W::12/19/14 at 17:58:50 (UTC) | 117.586613 W | 33.391367 N | 11S | 3694828.6 | 445445.285 |
| Brennan Mulrooney | 2 | 12/29/2014 | 10:22:27 AM | Inactive | Inactive | 141 | none | | 33 23.4816 N 117 35.1950 W::12/29/14 at 18:18:33 (UTC) | 117.586583 W | 33.391360 N | 11S | 3694828.6 | 445445.285 |
| James McMorran | 3 | 1/9/2015 | 9:55:51 AM | Inactive | Inactive | 141 | none | | 33 23.4824 N 117 35.1966 W::1/9/15 at 17:50:21 (UTC) | 117.586610 W | 33.391373 N | 11S | 3694827.4 | 445446.575 |
| Donna Germann | 4 | 1/23/2015 | 9:56:43 AM | Inactive | Inactive | 141 | none | | 33 23.4799 N 117 35.1935 W::1/23/15 at 17:53:33 (UTC) | 117.586558 W | 33.391332 N | 11S | 3694827.4 | 445446.575 |
| Brennan Mulrooney | 1 | 12/19/2014 | 10:05:04 AM | Inactive | Inactive | 142 | none | | 33 23.4409 N 117 35.1602 W::12/19/14 at 18:02:22 (UTC) | 117.586003 W | 33.390682 N | 11S | 3694753.7 | 445498.855 |
| Brennan Mulrooney | 2 | 12/29/2014 | 10:25:45 AM | Inactive | Inactive | 142 | none | | 33 23.4420 N 117 35.1619 W::12/29/14 at 18:21:49 (UTC) | 117.586032 W | 33.390700 N | 11S | 3694753.7 | 445498.855 |
| James McMorran | 3 | 1/9/2015 | 9:58:56 AM | Inactive | Inactive | 142 | none | | 33 23.4441 N 117 35.1543 W::1/9/15 at 17:53:25 (UTC) | 117.585905 W | 33.390735 N | 11S | 3694755 | 445507.555 |
| Donna Germann | 4 | 1/23/2015 | 9:53:14 AM | No Longer Suitable | No Longer Suitable | 142 | none | Overgrown with vegetation | 33 23.4402 N 117 35.1566 W::1/23/15 at 17:50:17 (UTC) | 117.585943 W | 33.390670 N | 11S | 3694755 | 445507.555 |
| Brennan Mulrooney | 1 | 12/19/2014 | 10:06:27 AM | Inactive | Inactive | 143 | none | | 33 23.4033 N 117 35.1757 W::12/19/14 at 18:06:17 (UTC) | 117.586262 W | 33.390055 N | 11S | 3694684.6 | 445473.26 |
| Brennan Mulrooney | 2 | 12/29/2014 | 10:29:27 AM | Inactive | Inactive | 143 | none | | 33 23.4046 N 117 35.1789 W::12/29/14 at 18:25:30 (UTC) | 117.586315 W | 33.390077 N | 11S | 3694684.6 | 445473.26 |
| James McMorran | 3 | 1/9/2015 | 10:01:30 AM | Inactive | Inactive | 143 | none | | 33 23.4062 N 117 35.1670 W::1/9/15 at 17:55:59 (UTC) | 117.586117 W | 33.390103 N | 11S | 3694682.65 | 445484.08 |
| Andrew Fisher | 4 | 1/23/2015 | 9:56:03 AM | No Longer Suitable | No Longer Suitable | 143 | none | Overgrown with weeds | 33 23.3997 N 117 35.1736 W::1/23/15 at 17:50:15 (UTC) | 117.586227 W | 33.389995 N | 11S | 3694682.65 | 445484.08 |
| Donna Germann | 1 | 12/19/2014 | 6:59:08 AM | Inactive | Inactive | 144 | none | TWO BURROW | 33 24.5406 N 117 34.5674 W::12/19/14 at 14:59:08 (UTC) | 117.576125 W | 33.409012 N | 11S | 3696779.8 | 446430.14 |
| James McMorran | 2 | 12/29/2014 | 7:01:50 AM | Inactive | Inactive | 144 | none | | 33 24.5406 N 117 34.5674 W::12/19/14 at 14:59:08 (UTC) | 117.576125 W | 33.409012 N | 11S | 3696779.8 | 446430.14 |
| James McMorran | 3 | 1/9/2015 | 7:03:50 AM | Inactive | Inactive | 144 | none | | 33 24.5411 N 117 34.5645 W::1/9/15 at 14:58:45 (UTC) | 117.576075 W | 33.409018 N | 11S | 3696779.8 | 446431.3 |
| Andrew Fisher | 4 | 1/22/2015 | 3:48:27 PM | Inactive | Inactive | 144 | none | | 33 24.5403 N 117 34.5690 W::1/22/15 at 23:42:25 (UTC) | 117.576150 W | 33.409005 N | 11S | 3696779.8 | 446431.3 |
| Donna Germann | 1 | 12/19/2014 | 7:02:20 AM | Inactive | Inactive | 145 | none | | 33 24.5163 N 117 34.5556 W::12/19/14 at 15:02:10 (UTC) | 117.575927 W | 33.408605 N | 11S | 3696734.6 | 446448.3 |
| James McMorran | 2 | 12/29/2014 | 7:03:56 AM | Inactive | Inactive | 145 | none | | 33 24.5163 N 117 34.5556 W::12/19/14 at 15:02:10 (UTC) | 117.575927 W | 33.408605 N | 11S | 3696734.6 | 446448.3 |
| James McMorran | 3 | 1/9/2015 | 7:05:30 AM | Inactive | Inactive | 145 | none | | 33 24.5163 N 117 34.5416 W::1/9/15 at 15:00:12 (UTC) | 117.575693 W | 33.408605 N | 11S | 3696734.1 | 446458.34 |
| Andrew Fisher | 4 | 1/22/2015 | 4:25:14 PM | Inactive | Inactive | 145 | none | | 33 24.5158 N 117 34.5567 W::1/23/15 at 00:19:17 (UTC) | 117.575945 W | 33.408597 N | 11S | 3696734.1 | 446458.34 |
| Donna Germann | 1 | 12/19/2014 | 7:03:45 AM | Inactive | Inactive | 146 | none | multiple burrow entrances | 33 24.5096 N 117 34.5502 W::12/19/14 at 15:04:04 (UTC) | 117.575837 W | 33.408493 N | 11S | 3696724.1 | 446459.63 |
| James McMorran | 2 | 12/29/2014 | 7:04:41 AM | Inactive | Inactive | 146 | none | | 33 24.5117 N 117 34.5463 W::12/29/14 at 15:00:37 (UTC) | 117.575772 W | 33.408528 N | 11S | 3696724.1 | 446459.63 |
| James McMorran | 3 | 1/9/2015 | 7:06:26 AM | Inactive | Inactive | 146 | none | | 33 24.5089 N 117 34.5463 W::1/9/15 at 15:01:15 (UTC) | 117.575772 W | 33.408482 N | 11S | 3696722.05 | 446457.485 |
| Andrew Fisher | 4 | 1/22/2015 | 4:24:45 PM | Inactive | Inactive | 146 | none | | 33 24.5101 N 117 34.5530 W::1/23/15 at 00:18:50 (UTC) | 117.575883 W | 33.408502 N | 11S | 3696722.05 | 446457.485 |
| Donna Germann | 1 | 12/19/2014 | 7:05:12 AM | Inactive | Inactive | 147 | none | multiple burrow entrances | 33 24.5003 N 117 34.5346 W::12/19/14 at 15:05:05 (UTC) | 117.575577 W | 33.408338 N | 11S | 3696705.1 | 446480.68 |
| Matthew Kedziora | 2 | 12/29/2014 | 7:10:09 AM | Inactive | Inactive | 147 | none | | 33 24.5006 N 117 34.5346 W::12/29/14 at 15:09:04 (UTC) | 117.575577 W | 33.408343 N | 11S | 3696705.1 | 446480.68 |
| Brynne Mulrooney | 3 | 1/9/2015 | 7:04:08 AM | Inactive | Inactive | 147 | none | Mammal tracks | 33 24.5014 N 117 34.5352 W::1/9/15 at 15:04:27 (UTC) | 117.575587 W | 33.408357 N | 11S | 3696706.45 | 446478.315 |
| Andrew Fisher | 4 | 1/22/2015 | 3:50:04 PM | Inactive | Inactive | 147 | none | | 33 24.5009 N 117 34.5371 W::1/22/15 at 23:44:13 (UTC) | 117.575618 W | 33.408348 N | 11S | 3696706.45 | 446478.315 |

# Appendix C – Raw Field Data

| Primary_Bio | Survey Number | Date | Time | Cumulative_ Burrow_ Status | Field_ Burrow_ Status | Burrow ID | Sign | Notes | GPSLocation | Longitude | Latitude | Zone | Avg_ Northing_ Final | Avg_ Easting_ Final |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Donna Germann | 1 | 12/19/2014 | 7:12:04 AM | Inactive | Inactive | 148 | none | Vegetation in entrance | 33 24.4201 N 117 34.4818 W::12/19/14 at 15:12:27 (UTC) | 117.574702 W | 33.407003 N | 11S | 3696558.45 | 446562.72 |
| James McMorran | 2 | 12/29/2014 | 7:16:47 AM | Inactive | Inactive | 148 | none | | 33 24.4224 N 117 34.4802 W::12/29/14 at 15:12:42 (UTC) | 117.574670 W | 33.407040 N | 11S | 3696558.45 | 446562.72 |
| James McMorran | 3 | 1/9/2015 | 7:14:05 AM | Inactive | Inactive | 148 | none | | 33 24.4266 N 117 34.4864 W::1/9/15 at 15:08:36 (UTC) | 117.574773 W | 33.407110 N | 11S | 3696567.85 | 446552.13 |
| Andrew Fisher | 4 | 1/22/2015 | 4:20:06 PM | Inactive | Inactive | 148 | none | | 33 24.4261 N 117 34.4897 W::1/23/15 at 00:14:10 (UTC) | 117.574828 W | 33.407102 N | 11S | 3696567.85 | 446552.13 |
| Donna Germann | 1 | 12/19/2014 | 7:14:30 AM | Inactive | Inactive | 149 | none | multiple burrow entrances | 33 24.3795 N 117 34.4631 W::12/19/14 at 15:14:16 (UTC) | 117.574385 W | 33.406325 N | 11S | 3696482.65 | 446592.25 |
| James McMorran | 2 | 12/29/2014 | 7:18:47 AM | Inactive | Inactive | 149 | none | | 33 24.3813 N 117 34.4606 W::12/29/14 at 15:14:53 (UTC) | 117.574343 W | 33.406355 N | 11S | 3696482.65 | 446592.25 |
| James McMorran | 3 | 1/9/2015 | 7:16:00 AM | Inactive | Inactive | 149 | none | | 33 24.3857 N 117 34.4639 W::1/9/15 at 15:10:45 (UTC) | 117.574398 W | 33.406428 N | 11S | 3696488.45 | 446588.79 |
| Andrew Fisher | 4 | 1/22/2015 | 4:15:25 PM | Inactive | Inactive | 149 | none | | 33 24.3813 N 117 34.4643 W::1/23/15 at 00:09:28 (UTC) | 117.574405 W | 33.406355 N | 11S | 3696488.45 | 446588.79 |
| Andrew Fisher | 1 | 12/19/2014 | 7:39:23 AM | Inactive | Inactive | 15 | none | | 33 24.2540 N 117 34.4373 W::12/19/14 at 15:36:05 (UTC) | 117.573955 W | 33.404233 N | 11S | 3696249.15 | 446629.13 |
| Andrew Fisher | 2 | 12/29/2014 | 8:22:17 AM | Inactive | Inactive | 15 | none | occupied by ground squirrel | 33 24.2543 N 117 34.4371 W::12/29/14 at 16:18:12 (UTC) | 117.573952 W | 33.404238 N | 11S | 3696249.15 | 446629.13 |
| Andrew Fisher | 3 | 1/9/2015 | 8:12:34 AM | Inactive | Inactive | 15 | none | occupied by ground squirrel | 33 24.2548 N 117 34.4372 W::1/9/15 at 16:07:38 (UTC) | 117.573953 W | 33.404247 N | 11S | 3696249.6 | 446628.3 |
| Keoni Calantas | 4 | 1/23/2015 | 7:20:03 AM | Inactive | Inactive | 15 | none | | 33 24.2539 N 117 34.4383 W::1/23/15 at 15:18:55 (UTC) | 117.573972 W | 33.404232 N | 11S | 3696249.6 | 446628.3 |
| Donna Germann | 1 | 12/19/2014 | 7:29:13 AM | Inactive | Inactive | 150 | none | | 33 24.2102 N 117 34.3766 W::12/19/14 at 15:29:03 (UTC) | 117.572943 W | 33.403503 N | 11S | 3696166.4 | 446721.295 |
| Brennan Mulrooney | 2 | 12/29/2014 | 7:39:58 AM | Inactive | Inactive | 150 | none | | 33 24.2091 N 117 34.3783 W::12/29/14 at 15:36:19 (UTC) | 117.572972 W | 33.403485 N | 11S | 3696166.4 | 446721.295 |
| Andrew Fisher | 3 | 1/9/2015 | 7:28:05 AM | Inactive | Inactive | 150 | none | occupied by ground squirrel | 33 24.2083 N 117 34.3744 W::1/9/15 at 15:23:21 (UTC) | 117.572907 W | 33.403472 N | 11S | 3696164.9 | 446723.985 |
| Donna Germann | 4 | 1/23/2015 | 7:16:55 AM | Inactive | Inactive | 150 | none | | 33 24.2093 N 117 34.3770 W::1/23/15 at 15:13:51 (UTC) | 117.572950 W | 33.403488 N | 11S | 3696164.9 | 446723.985 |
| Donna Germann | 1 | 12/19/2014 | 7:43:40 AM | Inactive | Inactive | 151 | none | multiple burrow entrances | 33 24.4893 N 117 34.5767 W::12/19/14 at 15:43:33 (UTC) | 117.576278 W | 33.408155 N | 11S | 3696687.3 | 446414 |
| Matthew Kedziora | 2 | 12/29/2014 | 7:53:12 AM | Inactive | Inactive | 151 | none | | 33 24.4899 N 117 34.5786 W::12/29/14 at 15:52:13 (UTC) | 117.576308 W | 33.408198 N | 11S | 3696687.3 | 446414 |
| Brennan Mulrooney | 3 | 1/9/2015 | 7:44:48 AM | Inactive | Inactive | 151 | none | | 33 24.4880 N 117 34.5778 W::1/9/15 at 15:40:03 (UTC) | 117.576297 W | 33.408133 N | 11S | 3696687.45 | 446410.56 |
| Donna Germann | 4 | 1/23/2015 | 7:00:06 AM | Inactive | Inactive | 151 | none | | 33 24.4933 N 117 34.5818 W::1/23/15 at 14:57:01 (UTC) | 117.576363 W | 33.408222 N | 11S | 3696687.45 | 446410.56 |
| Donna Germann | 1 | 12/19/2014 | 7:47:04 AM | Inactive | Inactive | 152 | none | | 33 24.5380 N 117 34.6106 W::12/19/14 at 15:46:53 (UTC) | 117.576843 W | 33.408967 N | 11S | 3696772.85 | 446367.89 |
| Matthew Kedziora | 2 | 12/29/2014 | 7:56:16 AM | Inactive | Inactive | 152 | none | | 33 24.5348 N 117 34.6045 W::12/29/14 at 15:55:18 (UTC) | 117.576745 W | 33.408925 N | 11S | 3696772.85 | 446367.89 |
| Brynne Mulrooney | 3 | 1/9/2015 | 7:44:16 AM | Inactive | Inactive | 152 | none | | 33 24.5379 N 117 34.6127 W::1/9/15 at 15:44:22 (UTC) | 117.576878 W | 33.408965 N | 11S | 3696775 | 446363.855 |
| Donna Germann | 4 | 1/23/2015 | 6:56:15 AM | Inactive | Inactive | 152 | none | | 33 24.5379 N 117 34.6078 W::1/23/15 at 14:53:30 (UTC) | 117.576797 W | 33.408965 N | 11S | 3696775 | 446363.855 |
| Donna Germann | 1 | 12/19/2014 | 7:48:28 AM | Inactive | Inactive | 153 | none | multiple burrow entrances | 33 24.5572 N 117 34.6178 W::12/19/14 at 15:48:39 (UTC) | 117.576963 W | 33.409287 N | 11S | 3696810.55 | 446351.505 |
| James McMorran | 2 | 12/29/2014 | 7:57:23 AM | Inactive | Inactive | 153 | none | | 33 24.5570 N 117 34.6189 W::12/29/14 at 15:53:30 (UTC) | 117.576982 W | 33.409283 N | 11S | 3696810.55 | 446351.505 |
| Brynne Mulrooney | 3 | 1/9/2015 | 7:45:03 AM | Inactive | Inactive | 153 | none | | 33 24.5555 N 117 34.6199 W::1/9/15 at 15:45:07 (UTC) | 117.576998 W | 33.409258 N | 11S | 3696807.3 | 446354.595 |
| Keoni Calantas | 4 | 1/23/2015 | 6:53:12 AM | Inactive | Inactive | 153 | none | | 33 24.5552 N 117 34.6128 W::1/23/15 at 14:52:12 (UTC) | 117.576880 W | 33.409253 N | 11S | 3696807.3 | 446354.595 |
| Donna Germann | 1 | 12/19/2014 | 7:57:43 AM | Inactive | Inactive | 154 | none | | 33 24.4170 N 117 34.6331 W::12/19/14 at 15:57:34 (UTC) | 117.577218 W | 33.406950 N | 11S | 3696546.4 | 446329.58 |
| Matthew Kedziora | 2 | 12/29/2014 | 8:58:21 AM | Inactive | Inactive | 154 | none | | 33 24.4112 N 117 34.6300 W::12/29/14 at 16:57:13 (UTC) | 117.577167 W | 33.406853 N | 11S | 3696546.4 | 446329.58 |
| James McMorran | 3 | 1/9/2015 | 8:44:13 AM | Inactive | Inactive | 154 | none | | 33 24.4116 N 117 34.6350 W::1/9/15 at 16:38:42 (UTC) | 117.577250 W | 33.406860 N | 11S | 3696542.55 | 446325.745 |
| Donna Germann | 4 | 1/23/2015 | 8:31:56 AM | Inactive | Inactive | 154 | none | | 33 24.4124 N 117 34.6330 W::1/23/15 at 16:28:54 (UTC) | 117.577217 W | 33.406873 N | 11S | 3696542.55 | 446325.745 |
| Donna Germann | 1 | 12/19/2014 | 7:58:38 AM | Inactive | Inactive | 155 | none | multiple burrow entrances | 33 24.4074 N 117 34.6230 W::12/19/14 at 15:58:37 (UTC) | 117.577050 W | 33.406790 N | 11S | 3696534.45 | 446342.67 |
| Matthew Kedziora | 2 | 12/29/2014 | 8:57:45 AM | Inactive | Inactive | 155 | none | | 33 24.4079 N 117 34.6230 W::12/29/14 at 16:56:39 (UTC) | 117.577052 W | 33.406798 N | 11S | 3696534.45 | 446342.67 |
| Brynne Mulrooney | 3 | 1/9/2015 | 8:39:20 AM | Inactive | Inactive | 155 | none | | 33 24.4097 N 117 34.6262 W::1/9/15 at 16:39:30 (UTC) | 117.577103 W | 33.406828 N | 11S | 3696537.35 | 446340.225 |
| Donna Germann | 4 | 1/23/2015 | 8:30:42 AM | Inactive | Inactive | 155 | none | | 33 24.4088 N 117 34.6231 W::1/23/15 at 16:27:35 (UTC) | 117.577052 W | 33.406813 N | 11S | 3696537.35 | 446340.225 |
| Donna Germann | 1 | 12/19/2014 | 8:00:45 AM | Inactive | Inactive | 156 | none | | 33 24.3884 N 117 34.6064 W::12/19/14 at 16:00:38 (UTC) | 117.576773 W | 33.406473 N | 11S | 3696501.75 | 446368.615 |
| James McMorran | 2 | 12/29/2014 | 8:57:36 AM | Inactive | Inactive | 156 | none | | 33 24.3917 N 117 34.6060 W::12/29/14 at 16:53:29 (UTC) | 117.576767 W | 33.406528 N | 11S | 3696501.75 | 446368.615 |
| James McMorran | 3 | 1/9/2015 | 8:38:43 AM | Inactive | Inactive | 156 | none | | 33 24.3892 N 117 34.6096 W::1/9/15 at 16:33:25 (UTC) | 117.576827 W | 33.406487 N | 11S | 3696504.2 | 446363.425 |
| Donna Germann | 4 | 1/23/2015 | 8:28:59 AM | Inactive | Inactive | 156 | none | | 33 24.3935 N 117 34.6095 W::1/23/15 at 16:25:51 (UTC) | 117.576825 W | 33.406558 N | 11S | 3696504.2 | 446363.425 |
| Donna Germann | 1 | 12/19/2014 | 8:01:40 AM | Inactive | Inactive | 157 | none | multiple burrow entrances | 33 24.3814 N 117 34.6019 W::12/19/14 at 16:01:30 (UTC) | 117.576700 W | 33.406357 N | 11S | 3696474.95 | 446379.395 |
| James McMorran | 2 | 12/29/2014 | 8:54:53 AM | Inactive | Inactive | 157 | none | | 33 24.3697 N 117 34.5963 W::12/29/14 at 16:50:49 (UTC) | 117.576605 W | 33.406162 N | 11S | 3696474.95 | 446379.395 |
| Brynne Mulrooney | 3 | 1/9/2015 | 8:35:21 AM | Inactive | Inactive | 157 | none | | 33 24.3789 N 117 34.6030 W::1/9/15 at 16:35:23 (UTC) | 117.576717 W | 33.406315 N | 11S | 3696483.25 | 446372.605 |
| Donna Germann | 4 | 1/23/2015 | 8:27:38 AM | Inactive | Inactive | 157 | none | | 33 24.3812 N 117 34.6041 W::1/23/15 at 16:24:31 (UTC) | 117.576735 W | 33.406353 N | 11S | 3696483.25 | 446372.605 |
| Donna Germann | 1 | 12/19/2014 | 8:02:26 AM | Inactive | Inactive | 158 | none | TWO BURROW | 33 24.3757 N 117 34.5964 W::12/19/14 at 16:02:33 (UTC) | 117.576607 W | 33.406262 N | 11S | 3696469.65 | 446383.69 |
| James McMorran | 2 | 12/29/2014 | 8:54:11 AM | Inactive | Inactive | 158 | none | | 33 24.3697 N 117 34.5963 W::12/29/14 at 16:50:10 (UTC) | 117.576605 W | 33.406162 N | 11S | 3696469.65 | 446383.69 |
| Brynne Mulrooney | 3 | 1/9/2015 | 8:34:38 AM | Inactive | Inactive | 158 | none | | 33 24.3730 N 117 34.6032 W::1/9/15 at 16:34:46 (UTC) | 117.576720 W | 33.406217 N | 11S | 3696472.75 | 446375.105 |
| Donna Germann | 4 | 1/23/2015 | 8:26:57 AM | Inactive | Inactive | 158 | none | | 33 24.3757 N 117 34.6006 W::1/23/15 at 16:23:53 (UTC) | 117.576677 W | 33.406262 N | 11S | 3696472.75 | 446375.105 |
| Donna Germann | 1 | 12/19/2014 | 8:21:49 AM | Inactive | Inactive | 159 | none | TWO POSSIBLE BURROWS | 33 24.1244 N 117 34.4076 W::12/19/14 at 16:21:53 (UTC) | 117.573462 W | 33.402073 N | 11S | 3696012.2 | 446674.225 |
| James McMorran | 2 | 12/29/2014 | 8:35:10 AM | Inactive | Inactive | 159 | none | | 33 24.1277 N 117 34.4068 W::12/29/14 at 16:31:17 (UTC) | 117.573447 W | 33.402128 N | 11S | 3696012.2 | 446674.225 |
| James McMorran | 3 | 1/9/2015 | 8:23:01 AM | Inactive | Inactive | 159 | none | | 33 24.1283 N 117 34.4058 W::1/9/15 at 16:17:41 (UTC) | 117.573430 W | 33.402138 N | 11S | 3696012.45 | 446674.415 |
| Donna Germann | 4 | 1/23/2015 | 8:05:27 AM | Inactive | Inactive | 159 | none | | 33 24.1241 N 117 34.4085 W::1/23/15 at 16:02:21 (UTC) | 117.573475 W | 33.402068 N | 11S | 3696012.45 | 446674.415 |
| Andrew Fisher | 1 | 12/19/2014 | 7:39:58 AM | Inactive | Inactive | 16 | none | multiple burrow entrances | 33 24.2685 N 117 34.4484 W::12/19/14 at 15:36:40 (UTC) | 117.574140 W | 33.404475 N | 11S | 3696275.7 | 446612.495 |
| Andrew Fisher | 2 | 12/29/2014 | 8:21:06 AM | Inactive | Inactive | 16 | none | multiple burrow entrances | 33 24.2684 N 117 34.4477 W::12/29/14 at 16:17:02 (UTC) | 117.574128 W | 33.404473 N | 11S | 3696275.7 | 446612.495 |

# Appendix C – Raw Field Data

| Primary_Bio | Survey Number | Date | Time | Cumulative_ Burrow_ Status | Field_ Burrow_ Status | Burrow ID | Sign | Notes | GPSLocation | Longitude | Latitude | Zone | Avg_ Northing_ Final | Avg_ Easting_ Final |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Andrew Fisher | 3 | 1/9/2015 | 8:09:27 AM | Inactive | Inactive | 16 | none | occupied by ground squirrel | 33 24.2684 N 117 34.4483 W::1/9/15 at 16:04:40 (UTC) | 117.574138 W | 33.404473 N | 11S | 3696276.65 | 446612.405 |
| Keoni Calantas | 4 | 1/23/2015 | 7:21:08 AM | Inactive | Inactive | 16 | none | | 33 24.2695 N 117 34.4479 W::1/23/15 at 15:19:59 (UTC) | 117.574132 W | 33.404492 N | 11S | 3696276.65 | 446612.405 |
| Donna Germann | 1 | 12/19/2014 | 8:23:49 AM | Inactive | Inactive | 160 | none | TWO BURROW IN DEAD THISTLE | 33 24.1384 N 117 34.4033 W::12/19/14 at 16:23:34 (UTC) | 117.573630 W | 33.402333 N | 11S | 3696038.75 | 446658.055 |
| James McMorran | 2 | 12/29/2014 | 8:36:27 AM | Inactive | Inactive | 160 | none | | 33 24.1407 N 117 34.4178 W::12/29/14 at 16:32:45 (UTC) | 117.573630 W | 33.402345 N | 11S | 3696038.75 | 446658.055 |
| James McMorran | 3 | 1/9/2015 | 8:23:50 AM | Inactive | Inactive | 160 | none | | 33 24.1446 N 117 34.4160 W::1/9/15 at 16:18:23 (UTC) | 117.573600 W | 33.402410 N | 11S | 3696051.55 | 446663.8 |
| Donna Germann | 4 | 1/23/2015 | 8:03:27 AM | Inactive | Inactive | 160 | none | | 33 24.1500 N 117 34.4123 W::1/23/15 at 16:01:15 (UTC) | 117.573538 W | 33.402500 N | 11S | 3696051.55 | 446663.8 |
| Donna Germann | 1 | 12/19/2014 | 8:33:10 AM | Inactive | Inactive | 161 | none | | 33 24.2690 N 117 34.5209 W::12/19/14 at 16:32:58 (UTC) | 117.575348 W | 33.404483 N | 11S | 3696281.7 | 446501.54 |
| Matthew Kedziora | 2 | 12/29/2014 | 8:46:17 AM | Inactive | Inactive | 161 | none | | 33 24.2737 N 117 34.5184 W::12/29/14 at 16:45:22 (UTC) | 117.575307 W | 33.404562 N | 11S | 3696281.7 | 446501.54 |
| Brynne Mulrooney | 3 | 1/9/2015 | 8:28:24 AM | Inactive | Inactive | 161 | none | | 33 24.2715 N 117 34.5201 W::1/9/15 at 16:28:27 (UTC) | 117.575335 W | 33.404525 N | 11S | 3696279.4 | 446499.76 |
| Donna Germann | 4 | 1/23/2015 | 8:20:44 AM | Inactive | Inactive | 161 | none | | 33 24.2687 N 117 34.5216 W::1/23/15 at 16:17:43 (UTC) | 117.575358 W | 33.404478 N | 11S | 3696279.4 | 446499.76 |
| Donna Germann | 1 | 12/19/2014 | 8:36:03 AM | Inactive | Inactive | 162 | none | | 33 24.3204 N 117 34.5700 W::12/19/14 at 16:35:56 (UTC) | 117.576167 W | 33.405340 N | 11S | 3696381.65 | 446425.61 |
| Matthew Kedziora | 2 | 12/29/2014 | 8:49:05 AM | Inactive | Inactive | 162 | none | | 33 24.3300 N 117 34.5680 W::12/29/14 at 16:48:09 (UTC) | 117.576133 W | 33.405500 N | 11S | 3696381.65 | 446425.61 |
| Brynne Mulrooney | 3 | 1/9/2015 | 8:31:11 AM | Inactive | Inactive | 162 | none | | 33 24.3346 N 117 34.5695 W::1/9/15 at 16:31:26 (UTC) | 117.576158 W | 33.405577 N | 11S | 3695997.6 | 446105.1633 |
| Donna Germann | 4 | 1/23/2015 | 8:23:25 AM | Inactive | Inactive | 162 | none | | 33 24.3310 N 117 34.5717 W::1/23/15 at 16:20:19 (UTC) | 117.576195 W | 33.405517 N | 11S | 3695997.6 | 446105.1633 |
| Donna Germann | 1 | 12/19/2014 | 8:39:12 AM | Inactive | Inactive | 163 | none | multiple burrow entrances | 33 24.3530 N 117 34.5848 W::12/19/14 at 16:39:06 (UTC) | 117.576413 W | 33.405883 N | 11S | 3696436.45 | 446398.945 |
| Matthew Kedziora | 2 | 12/29/2014 | 8:52:16 AM | Inactive | Inactive | 163 | none | | 33 24.3566 N 117 34.5880 W::12/29/14 at 16:51:23 (UTC) | 117.576467 W | 33.405943 N | 11S | 3696436.45 | 446398.945 |
| Brynne Mulrooney | 3 | 1/9/2015 | 8:33:11 AM | Inactive | Inactive | 163 | none | | 33 24.3545 N 117 34.5907 W::1/9/15 at 16:33:16 (UTC) | 117.576512 W | 33.405908 N | 11S | 3696435.85 | 446393.04 |
| Donna Germann | 4 | 1/23/2015 | 8:25:12 AM | No Longer Suitable | No Longer Suitable | 163 | none | | 33 24.3544 N 117 34.5897 W::1/23/15 at 16:22:09 (UTC) | 117.576495 W | 33.405907 N | 11S | 3696435.85 | 446393.04 |
| Donna Germann | 1 | 12/19/2014 | 8:40:43 AM | Inactive | Inactive | 164 | none | multiple burrow entrances | 33 24.3661 N 117 34.5813 W::12/19/14 at 16:40:33 (UTC) | 117.576568 W | 33.406178 N | 11S | 3696465 | 446385.475 |
| James McMorran | 2 | 12/29/2014 | 8:53:17 AM | Inactive | Inactive | 164 | none | | 33 24.3697 N 117 34.5963 W::12/29/14 at 16:49:31 (UTC) | 117.576605 W | 33.406162 N | 11S | 3696465 | 446385.475 |
| Brynne Mulrooney | 3 | 1/9/2015 | 8:34:08 AM | Inactive | Inactive | 164 | none | | 33 24.3663 N 117 34.5970 W::1/9/15 at 16:34:10 (UTC) | 117.576617 W | 33.406105 N | 11S | 3696462.9 | 446386.535 |
| Donna Germann | 4 | 1/23/2015 | 8:26:17 AM | Inactive | Inactive | 164 | none | | 33 24.3718 N 117 34.5920 W::1/23/15 at 16:23:13 (UTC) | 117.576533 W | 33.406197 N | 11S | 3696462.9 | 446386.535 |
| Donna Germann | 1 | 12/19/2014 | 8:41:38 AM | Inactive | Inactive | 165 | none | multiple burrow entrances | 33 24.3836 N 117 34.6091 W::12/19/14 at 16:41:28 (UTC) | 117.576818 W | 33.406393 N | 11S | 3696486.3 | 446364.35 |
| Matthew Kedziora | 2 | 12/29/2014 | 8:55:06 AM | Inactive | Inactive | 165 | none | | 33 24.3798 N 117 34.6087 W::12/29/14 at 16:54:05 (UTC) | 117.576812 W | 33.406330 N | 11S | 3696486.3 | 446364.35 |
| Brynne Mulrooney | 3 | 1/9/2015 | 8:36:12 AM | Inactive | Inactive | 165 | none | | 33 24.3804 N 117 34.6119 W::1/9/15 at 16:36:18 (UTC) | 117.576865 W | 33.406340 N | 11S | 3696485.65 | 446360.16 |
| Donna Germann | 4 | 1/23/2015 | 8:28:19 AM | Inactive | Inactive | 165 | none | | 33 24.3822 N 117 34.6113 W::1/23/15 at 16:25:10 (UTC) | 117.576855 W | 33.406370 N | 11S | 3696485.65 | 446360.16 |
| Donna Germann | 1 | 12/19/2014 | 8:42:58 AM | Inactive | Inactive | 166 | none | TWO BURROWS | 33 24.4070 N 117 34.6152 W::12/19/14 at 16:42:51 (UTC) | 117.576920 W | 33.406783 N | 11S | 3696533.1 | 446354.84 |
| Matthew Kedziora | 2 | 12/29/2014 | 10:28:32 AM | Inactive | Inactive | 166 | none | | 33 24.4070 N 117 34.6152 W::12/19/14 at 16:42:51 (UTC) | 117.576920 W | 33.406783 N | 11S | 3696533.1 | 446354.84 |
| James McMorran | 3 | 1/9/2015 | 8:41:57 AM | Inactive | Inactive | 166 | none | | 33 24.4086 N 117 34.6191 W::1/9/15 at 16:36:42 (UTC) | 117.576985 W | 33.406810 N | 11S | 3696538.65 | 446349.625 |
| Donna Germann | 4 | 1/23/2015 | 7:43:21 AM | Inactive | Inactive | 166 | none | | 33 24.4113 N 117 34.6181 W::1/23/15 at 15:40:27 (UTC) | 117.576968 W | 33.406855 N | 11S | 3696538.65 | 446349.625 |
| Donna Germann | 1 | 12/19/2014 | 9:06:09 AM | Inactive | Inactive | 167 | none | | 33 23.7210 N 117 35.2118 W::12/19/14 at 17:06:11 (UTC) | 117.586863 W | 33.395350 N | 11S | 3695270.7 | 445423.13 |
| Brennan Mulrooney | 2 | 12/29/2014 | 10:29:27 AM | Inactive | Inactive | 167 | none | | 33 23.7210 N 117 35.2118 W::12/19/14 at 17:06:11 (UTC) | 117.586863 W | 33.395350 N | 11S | 3695270.7 | 445423.13 |
| James McMorran | 3 | 1/9/2015 | 9:06:04 AM | Inactive | Inactive | 167 | none | | 33 23.7222 N 117 35.2115 W::1/9/15 at 17:00:34 (UTC) | 117.586858 W | 33.395370 N | 11S | 3695272.8 | 445425.28 |
| Keoni Calantas | 4 | 1/23/2015 | 8:52:33 AM | Inactive | Inactive | 167 | none | | 33 23.7221 N 117 35.2093 W::1/23/15 at 16:51:23 (UTC) | 117.586822 W | 33.395368 N | 11S | 3695272.8 | 445425.28 |
| Donna Germann | 1 | 12/19/2014 | 9:08:00 AM | Inactive | Inactive | 168 | none | multiple burrow entrances | 33 23.6932 N 117 35.1813 W::12/19/14 at 17:07:50 (UTC) | 117.586355 W | 33.394888 N | 11S | 3695217.95 | 445471.47 |
| Brennan Mulrooney | 2 | 12/29/2014 | 9:26:01 AM | Inactive | Inactive | 168 | none | | 33 23.6919 N 117 35.1795 W::12/29/14 at 17:22:07 (UTC) | 117.586325 W | 33.394865 N | 11S | 3695217.95 | 445471.47 |
| Andrew Fisher | 3 | 1/9/2015 | 9:07:29 AM | Inactive | Inactive | 168 | none | multiple burrow entrances | 33 23.6931 N 117 35.1809 W::1/9/15 at 17:02:46 (UTC) | 117.586350 W | 33.394888 N | 11S | 3695217.3 | 445470.215 |
| Andrew Fisher | 4 | 1/23/2015 | 8:59:02 AM | Inactive | Inactive | 168 | none | | 33 23.6912 N 117 35.1814 W::1/23/15 at 16:52:58 (UTC) | 117.586357 W | 33.394853 N | 11S | 3695217.3 | 445470.215 |
| Donna Germann | 1 | 12/19/2014 | 9:11:49 AM | Inactive | Inactive | 169 | none | multiple burrow entrances | 33 23.6440 N 117 35.1857 W::12/19/14 at 17:11:38 (UTC) | 117.586428 W | 33.394067 N | 11S | 3695128.95 | 445462.925 |
| Brennan Mulrooney | 2 | 12/29/2014 | 9:29:20 AM | Inactive | Inactive | 169 | none | | 33 23.6448 N 117 35.1855 W::12/29/14 at 17:25:40 (UTC) | 117.586425 W | 33.394080 N | 11S | 3695128.95 | 445462.925 |
| Brynne Mulrooney | 3 | 1/9/2015 | 9:03:54 AM | Inactive | Inactive | 169 | none | | 33 23.6447 N 117 35.1874 W::1/9/15 at 17:04:07 (UTC) | 117.586457 W | 33.394078 N | 11S | 3695128.2 | 445465.385 |
| Keoni Calantas | 4 | 1/23/2015 | 8:55:02 AM | Inactive | Inactive | 169 | none | | 33 23.6433 N 117 35.1806 W::1/23/15 at 16:54:02 (UTC) | 117.586343 W | 33.394055 N | 11S | 3695128.2 | 445465.385 |
| Andrew Fisher | 1 | 12/19/2014 | 7:41:58 AM | Inactive | Inactive | 17 | none | multiple burrow entrances | 33 24.3194 N 117 34.4891 W::12/19/14 at 15:38:42 (UTC) | 117.574818 W | 33.405323 N | 11S | 3696369.6 | 446549.685 |
| Andrew Fisher | 2 | 12/29/2014 | 8:17:55 AM | Inactive | Inactive | 17 | none | multiple burrow entrances | 33 24.3187 N 117 34.4887 W::12/29/14 at 16:13:54 (UTC) | 117.574812 W | 33.405312 N | 11S | 3696369.6 | 446549.685 |
| Andrew Fisher | 3 | 1/9/2015 | 8:06:50 AM | Inactive | Inactive | 17 | none | occupied by ground squirrel | 33 24.3188 N 117 34.4893 W::1/9/15 at 16:01:53 (UTC) | 117.574820 W | 33.405313 N | 11S | 3696373.25 | 446548.405 |
| Keoni Calantas | 4 | 1/23/2015 | 7:23:51 AM | Inactive | Inactive | 17 | none | | 33 24.3272 N 117 34.4919 W::1/23/15 at 15:22:50 (UTC) | 117.574838 W | 33.405388 N | 11S | 3696373.25 | 446548.405 |
| Donna Germann | 1 | 12/19/2014 | 9:19:44 AM | Inactive | Inactive | 170 | none | multiple burrow entrances | 33 23.5414 N 117 35.1270 W::12/19/14 at 17:19:33 (UTC) | 117.585452 W | 33.392357 N | 11S | 3694939.85 | 445552.96 |
| Brennan Mulrooney | 2 | 12/29/2014 | 9:37:51 AM | Inactive | Inactive | 170 | none | | 33 23.5432 N 117 35.1265 W::12/29/14 at 17:34:07 (UTC) | 117.585442 W | 33.392387 N | 11S | 3694939.85 | 445552.96 |
| Brynne Mulrooney | 3 | 1/9/2015 | 9:08:27 AM | Inactive | Inactive | 170 | none | | 33 23.5415 N 117 35.1291 W::1/9/15 at 17:08:43 (UTC) | 117.585485 W | 33.392358 N | 11S | 3694938.25 | 445550.58 |
| Donna Germann | 4 | 1/23/2015 | 9:02:03 AM | Inactive | Inactive | 170 | none | | 33 23.5414 N 117 35.1276 W::1/23/15 at 16:59:00 (UTC) | 117.585460 W | 33.392357 N | 11S | 3694938.25 | 445550.58 |
| Donna Germann | 1 | 12/19/2014 | 9:21:24 AM | Inactive | Inactive | 171 | none | multiple burrow entrances | 33 23.5143 N 117 35.0978 W::12/19/14 at 17:21:20 (UTC) | 117.584963 W | 33.391905 N | 11S | 3694887.25 | 445597.91 |
| Brennan Mulrooney | 2 | 12/29/2014 | 9:41:26 AM | Inactive | Inactive | 171 | none | | 33 23.5137 N 117 35.0975 W::12/29/14 at 17:37:35 (UTC) | 117.584958 W | 33.391895 N | 11S | 3694887.25 | 445597.91 |
| James McMorran | 3 | 1/9/2015 | 9:16:46 AM | Inactive | Inactive | 171 | none | | 33 23.5157 N 117 35.0995 W::1/9/15 at 17:11:37 (UTC) | 117.584992 W | 33.391928 N | 11S | 3694896.8 | 445595.5 |
| Keoni Calantas | 4 | 1/23/2015 | 9:02:01 AM | Inactive | Inactive | 171 | none | | 33 23.5227 N 117 35.0989 W::1/23/15 at 17:00:55 (UTC) | 117.584982 W | 33.392045 N | 11S | 3694896.8 | 445595.5 |

# Appendix C – Raw Field Data

| Primary_Bio | Survey Number | Date | Time | Cumulative_ Burrow_ Status | Field_ Burrow_ Status | Burrow ID | Sign | Notes | GPSLocation | Longitude | Latitude | Zone | Avg_ Northing_ Final | Avg_ Easting_ Final |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Donna Germann | 1 | 12/19/2014 | 9:23:36 AM | Inactive | Inactive | 172 | none | multiple burrow entrances | 33 23.4782 N 117 35.0800 W::12/19/14 at 17:23:25 (UTC) | 117.584667 W | 33.391303 N | 11S | 3694818.9 | 445626.41 |
| Matthew Kedziora | 2 | 12/29/2014 | 9:42:02 AM | Inactive | Inactive | 172 | none | | 33 23.4760 N 117 35.0780 W::12/29/14 at 17:41:10 (UTC) | 117.584633 W | 33.391267 N | 11S | 3694818.9 | 445626.41 |
| Brynne Mulrooney | 3 | 1/9/2015 | 9:15:34 AM | Inactive | Inactive | 172 | none | | 33 23.4778 N 117 35.0803 W::1/9/15 at 17:15:47 (UTC) | 117.584672 W | 33.391297 N | 11S | 3694815.5 | 445594.9533 |
| Donna Germann | 4 | 1/23/2015 | 9:07:15 AM | Inactive | Inactive | 172 | none | | 33 23.4787 N 117 35.0827 W::1/23/15 at 17:04:44 (UTC) | 117.584712 W | 33.391312 N | 11S | 3694815.5 | 445594.9533 |
| Donna Germann | 1 | 12/19/2014 | 9:24:36 AM | Inactive | Inactive | 173 | none | multiple burrow entrances | 33 23.4722 N 117 35.0751 W::12/19/14 at 17:24:23 (UTC) | 117.584585 W | 33.391205 N | 11S | 3694811 | 445631.85 |
| Brennan Mulrooney | 2 | 12/29/2014 | 9:44:05 AM | Inactive | Inactive | 173 | none | | 33 23.4734 N 117 35.0758 W::12/29/14 at 17:40:11 (UTC) | 117.584597 W | 33.391223 N | 11S | 3694811 | 445631.85 |
| James McMorran | 3 | 1/9/2015 | 9:20:50 AM | Inactive | Inactive | 173 | none | | 33 23.4818 N 117 35.0794 W::1/9/15 at 17:15:34 (UTC) | 117.584662 W | 33.391353 N | 11S | 3694822.8 | 445625.73 |
| Donna Germann | 4 | 1/23/2015 | 9:08:35 AM | Inactive | Inactive | 173 | none | | 33 23.4773 N 117 35.0792 W::1/23/15 at 17:05:30 (UTC) | 117.584653 W | 33.391288 N | 11S | 3694822.8 | 445625.73 |
| Donna Germann | 1 | 12/19/2014 | 9:34:23 AM | Inactive | Inactive | 174 | none | multiple burrow entrances | 33 23.4530 N 117 35.1175 W::12/19/14 at 17:34:08 (UTC) | 117.585292 W | 33.390883 N | 11S | 3694775.55 | 445566.92 |
| Brennan Mulrooney | 2 | 12/29/2014 | 9:53:57 AM | Inactive | Inactive | 174 | none | | 33 23.4540 N 117 35.1169 W::12/29/14 at 17:50:05 (UTC) | 117.585282 W | 33.390900 N | 11S | 3694775.55 | 445566.92 |
| James McMorran | 3 | 1/9/2015 | 9:32:13 AM | Inactive | Inactive | 174 | none | | 33 23.4546 N 117 35.1171 W::1/9/15 at 17:26:56 (UTC) | 117.585285 W | 33.390910 N | 11S | 3694776.9 | 445566.41 |
| Andrew Fisher | 4 | 1/23/2015 | 9:49:11 AM | Inactive | Inactive | 174 | none | | 33 23.4538 N 117 35.1180 W::1/23/15 at 17:43:09 (UTC) | 117.585300 W | 33.390897 N | 11S | 3694776.9 | 445566.41 |
| Donna Germann | 1 | 12/19/2014 | 9:36:31 AM | Inactive | Inactive | 175 | none | | 33 23.4693 N 117 35.1291 W::12/19/14 at 17:36:14 (UTC) | 117.585485 W | 33.391155 N | 11S | 3694804.9 | 445549.69 |
| Brennan Mulrooney | 2 | 12/29/2014 | 9:55:05 AM | Inactive | Inactive | 175 | none | | 33 23.4693 N 117 35.1278 W::12/29/14 at 17:51:28 (UTC) | 117.585463 W | 33.391155 N | 11S | 3694804.9 | 445549.69 |
| James McMorran | 3 | 1/9/2015 | 9:33:13 AM | Inactive | Inactive | 175 | none | | 33 23.4728 N 117 35.1267 W::1/9/15 at 17:27:43 (UTC) | 117.585445 W | 33.391213 N | 11S | 3694808.5 | 445549.385 |
| Andrew Fisher | 4 | 1/23/2015 | 9:47:40 AM | Inactive | Inactive | 175 | none | | 33 23.4697 N 117 35.1306 W::1/23/15 at 17:41:39 (UTC) | 117.585510 W | 33.391162 N | 11S | 3694808.5 | 445549.385 |
| Donna Germann | 1 | 12/19/2014 | 9:38:12 AM | Inactive | Inactive | 176 | none | | 33 23.4826 N 117 35.1385 W::12/19/14 at 17:37:58 (UTC) | 117.585642 W | 33.391377 N | 11S | 3694829.6 | 445534.2 |
| Andrew Fisher | 2 | 12/29/2014 | 10:29:32 AM | Inactive | Inactive | 176 | none | | 33 23.4826 N 117 35.1385 W::12/19/14 at 17:37:58 (UTC) | 117.585642 W | 33.391377 N | 11S | 3694829.6 | 445534.2 |
| Brynne Mulrooney | 3 | 1/9/2015 | 9:28:45 AM | Inactive | Inactive | 176 | none | | 33 23.4849 N 117 35.1393 W::1/9/15 at 17:28:49 (UTC) | 117.585655 W | 33.391413 N | 11S | 3694833 | 445532.69 |
| Andrew Fisher | 4 | 1/23/2015 | 9:19:39 AM | Inactive | Inactive | 176 | none | | 33 23.4841 N 117 35.1397 W::1/23/15 at 17:13:34 (UTC) | 117.585662 W | 33.391402 N | 11S | 3694833 | 445532.69 |
| Donna Germann | 1 | 12/19/2014 | 9:39:11 AM | Inactive | Inactive | 177 | none | | 33 23.4965 N 117 35.1548 W::12/19/14 at 17:38:54 (UTC) | 117.585913 W | 33.391608 N | 11S | 3694857.45 | 445507.57 |
| Brennan Mulrooney | 2 | 12/29/2014 | 9:58:05 AM | Inactive | Inactive | 177 | none | | 33 23.4987 N 117 35.1568 W::12/29/14 at 17:54:23 (UTC) | 117.585947 W | 33.391645 N | 11S | 3694857.45 | 445507.57 |
| James McMorran | 3 | 1/9/2015 | 9:35:34 AM | Inactive | Inactive | 177 | none | | 33 23.4986 N 117 35.1535 W::1/9/15 at 17:30:18 (UTC) | 117.585892 W | 33.391643 N | 11S | 3694858.8 | 445508.325 |
| Andrew Fisher | 4 | 1/23/2015 | 9:44:58 AM | Inactive | Inactive | 177 | none | | 33 23.4981 N 117 35.1571 W::1/23/15 at 17:38:56 (UTC) | 117.585952 W | 33.391635 N | 11S | 3694858.8 | 445508.325 |
| Donna Germann | 1 | 12/19/2014 | 9:41:14 AM | Inactive | Inactive | 178 | none | multiple burrow entrances | 33 23.5422 N 117 35.1944 W::12/19/14 at 17:41:00 (UTC) | 117.586573 W | 33.392370 N | 11S | 3694940.85 | 445447.915 |
| Brennan Mulrooney | 2 | 12/29/2014 | 10:01:39 AM | Inactive | Inactive | 178 | none | | 33 23.5429 N 117 35.1948 W::12/29/14 at 17:58:48 (UTC) | 117.586580 W | 33.392382 N | 11S | 3694940.85 | 445447.915 |
| James McMorran | 3 | 1/9/2015 | 9:38:46 AM | Inactive | Inactive | 178 | none | | 33 23.5431 N 117 35.1938 W::1/9/15 at 17:33:30 (UTC) | 117.586563 W | 33.392385 N | 11S | 3694939.75 | 445450.33 |
| Andrew Fisher | 4 | 1/23/2015 | 9:23:19 AM | Inactive | Inactive | 178 | none | | 33 23.5409 N 117 35.1923 W::1/23/15 at 17:17:25 (UTC) | 117.586538 W | 33.392348 N | 11S | 3694939.75 | 445450.33 |
| Donna Germann | 1 | 12/19/2014 | 9:43:45 AM | Inactive | Inactive | 179 | none | TWO BURROWUNDER TREE | 33 23.5705 N 117 35.2177 W::12/19/14 at 17:43:48 (UTC) | 117.586962 W | 33.392842 N | 11S | 3694993.8 | 445411.06 |
| Brennan Mulrooney | 2 | 12/29/2014 | 10:03:01 AM | Inactive | Inactive | 179 | none | | 33 23.5717 N 117 35.2194 W::12/29/14 at 18:02:13 (UTC) | 117.586990 W | 33.392862 N | 11S | 3694993.8 | 445411.06 |
| James McMorran | 3 | 1/9/2015 | 9:40:22 AM | Inactive | Inactive | 179 | none | | 33 23.5741 N 117 35.2229 W::1/9/15 at 17:35:05 (UTC) | 117.587048 W | 33.392902 N | 11S | 3694997.2 | 445405.31 |
| Andrew Fisher | 4 | 1/23/2015 | 9:38:51 AM | Inactive | Inactive | 179 | none | | 33 23.5717 N 117 35.2217 W::1/23/15 at 17:32:46 (UTC) | 117.587028 W | 33.392862 N | 11S | 3694997.2 | 445405.31 |
| Andrew Fisher | 1 | 12/19/2014 | 7:43:28 AM | Inactive | Inactive | 18 | none | multiple burrow entrances | 33 24.3637 N 117 34.5243 W::12/19/14 at 15:40:13 (UTC) | 117.575405 W | 33.406062 N | 11S | 3696453.15 | 446494.82 |
| Andrew Fisher | 2 | 12/29/2014 | 8:15:20 AM | Inactive | Inactive | 18 | none | multiple burrow entrances | 33 24.3645 N 117 34.5249 W::12/29/14 at 16:11:16 (UTC) | 117.575415 W | 33.406075 N | 11S | 3696453.15 | 446494.82 |
| Andrew Fisher | 3 | 1/9/2015 | 8:04:11 AM | Inactive | Inactive | 18 | none | occupied by ground squirrel | 33 24.3645 N 117 34.5268 W::1/9/15 at 15:59:17 (UTC) | 117.575447 W | 33.406075 N | 11S | 3696451.65 | 446493.925 |
| Andrew Fisher | 4 | 1/23/2015 | 7:31:17 AM | Inactive | Inactive | 18 | none | | 33 24.3630 N 117 34.5227 W::1/23/15 at 15:25:25 (UTC) | 117.575392 W | 33.406035 N | 11S | 3696451.65 | 446493.925 |
| Donna Germann | 1 | 12/19/2014 | 9:47:39 AM | Inactive | Inactive | 180 | none | multiple burrow entrances | 33 23.6628 N 117 35.2538 W::12/19/14 at 17:47:23 (UTC) | 117.587563 W | 33.394380 N | 11S | 3695164.2 | 445358.96 |
| Brennan Mulrooney | 2 | 12/29/2014 | 10:09:25 AM | Inactive | Inactive | 180 | none | | 33 23.6635 N 117 35.2518 W::12/29/14 at 18:05:51 (UTC) | 117.587530 W | 33.394392 N | 11S | 3695164.2 | 445358.96 |
| James McMorran | 3 | 1/9/2015 | 9:44:51 AM | Inactive | Inactive | 180 | none | | 33 23.6644 N 117 35.2509 W::1/9/15 at 17:39:32 (UTC) | 117.587515 W | 33.394407 N | 11S | 3695170.95 | 445357.835 |
| Andrew Fisher | 4 | 1/23/2015 | 9:34:19 AM | Inactive | Inactive | 180 | none | | 33 23.6692 N 117 35.2562 W::1/23/15 at 17:28:33 (UTC) | 117.587603 W | 33.394487 N | 11S | 3695170.95 | 445357.835 |
| Donna Germann | 1 | 12/19/2014 | 9:56:06 AM | Inactive | Inactive | 181 | none | | 33 23.5361 N 117 35.2265 W::12/19/14 at 17:55:49 (UTC) | 117.587108 W | 33.392268 N | 11S | 3694936.6 | 445396.835 |
| James McMorran | 2 | 12/29/2014 | 10:19:44 AM | Inactive | Inactive | 181 | none | | 33 23.5441 N 117 35.2286 W::12/29/14 at 18:15:40 (UTC) | 117.587143 W | 33.392402 N | 11S | 3694936.6 | 445396.835 |
| Andrew Fisher | 3 | 1/9/2015 | 9:52:51 AM | Inactive | Inactive | 181 | none | occupied by ground squirrel | 33 23.5391 N 117 35.2269 W::1/9/15 at 17:48:36 (UTC) | 117.587115 W | 33.392318 N | 11S | 3695589.933 | 445715.85 |
| Andrew Fisher | 4 | 1/22/2015 | 3:45:53 PM | Inactive | Inactive | 181 | none | | 33 24.6075 N 117 34.6187 W::1/22/15 at 23:39:56 (UTC) | 117.576978 W | 33.410125 N | 11S | 3695589.933 | 445715.85 |
| Donna Germann | 1 | 12/19/2014 | 9:57:19 AM | Inactive | Inactive | 182 | none | multiple burrow entrances | 33 23.5212 N 117 35.2163 W::12/19/14 at 17:57:03 (UTC) | 117.586938 W | 33.392020 N | 11S | 3694901.4 | 445415.375 |
| James McMorran | 2 | 12/29/2014 | 10:20:38 AM | Inactive | Inactive | 182 | none | | 33 23.5210 N 117 35.2146 W::12/29/14 at 18:16:44 (UTC) | 117.586910 W | 33.392017 N | 11S | 3694901.4 | 445415.375 |
| Andrew Fisher | 3 | 1/9/2015 | 9:54:08 AM | Inactive | Inactive | 182 | none | multiple burrow entrances | 33 23.5237 N 117 35.2166 W::1/9/15 at 17:49:19 (UTC) | 117.586943 W | 33.392057 N | 11S | 3694904 | 445413.855 |
| Donna Germann | 4 | 1/23/2015 | 9:38:16 AM | Inactive | Inactive | 182 | none | | 33 23.5216 N 117 35.2163 W::1/23/15 at 17:35:08 (UTC) | 117.586938 W | 33.392027 N | 11S | 3694904 | 445413.855 |
| James McMorran | 1 | 12/19/2014 | 6:55:07 AM | Inactive | Inactive | 183 | none | 2 BURROWS 5 METERS APART | 33 24.6070 N 117 34.6160 W::12/19/14 at 14:53:59 (UTC) | 117.576933 W | 33.410117 N | 11S | 3696906.3 | 446350.725 |
| Matthew Kedziora | 2 | 12/29/2014 | 6:56:02 AM | Inactive | Inactive | 183 | none | | 33 24.6108 N 117 34.6224 W::12/29/14 at 14:55:00 (UTC) | 117.577040 W | 33.410180 N | 11S | 3696906.3 | 446350.725 |
| Brynne Mulrooney | 3 | 1/9/2015 | 6:54:30 AM | Inactive | Inactive | 183 | none | | 33 24.6103 N 117 34.6219 W::1/9/15 at 14:55:09 (UTC) | 117.577032 W | 33.410172 N | 11S | 1848454.45 | 223173.255 |
| Keoni Calantas | 4 | 1/26/2015 | 2:34:57 PM | Inactive | Inactive | 183 | none | | 33 24.6103 N 117 34.6219 W::1/9/15 at 14:55:09 (UTC) | 117.577032 W | 33.410172 N | 11S | 1848454.45 | 223173.255 |
| James McMorran | 1 | 12/19/2014 | 7:00:09 AM | Inactive | Inactive | 184 | none | MULTIPLE BURROWS | 33 24.5632 N 117 34.5653 W::12/19/14 at 14:58:07 (UTC) | 117.576088 W | 33.409387 N | 11S | 3696821.85 | 446433.395 |
| Brennan Mulrooney | 2 | 12/29/2014 | 7:03:51 AM | Inactive | Inactive | 184 | none | | 33 24.5638 N 117 34.5658 W::12/29/14 at 14:59:57 (UTC) | 117.576097 W | 33.409395 N | 11S | 3696821.85 | 446433.395 |

# Appendix C – Raw Field Data

| Primary_Bio | Survey Number | Date | Time | Cumulative_ Burrow_ Status | Field_ Burrow_ Status | Burrow ID | Sign | Notes | GPSLocation | Longitude | Latitude | Zone | Avg_ Northing_ Final | Avg_ Easting_ Final |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Brennan Mulrooney | 3 | 1/9/2015 | 7:04:39 AM | Inactive | Inactive | 184 | none | | 33 24.5651 N 117 34.5661 W::1/9/15 at 14:59:49 (UTC) | 117.576102 W | 33.409418 N | 11S | 3696824.4 | 446432.705 |
| Andrew Fisher | 4 | 1/22/2015 | 3:39:14 PM | Inactive | Inactive | 184 | none | | 33 24.5646 N 117 34.5659 W::1/22/15 at 23:33:16 (UTC) | 117.576098 W | 33.409410 N | 11S | 3696824.4 | 446432.705 |
| James McMorran | 1 | 12/19/2014 | 7:09:31 AM | Inactive | Inactive | 185 | none | | 33 24.4688 N 117 34.5089 W::12/19/14 at 15:06:57 (UTC) | 117.575135 W | 33.407810 N | 11S | 3696648.85 | 446521.33 |
| Matthew Kedziora | 2 | 12/29/2014 | 7:11:32 AM | Inactive | Inactive | 185 | none | | 33 24.4723 N 117 34.5085 W::12/29/14 at 15:10:34 (UTC) | 117.575138 W | 33.407860 N | 11S | 3696648.85 | 446521.33 |
| Brynne Mulrooney | 3 | 1/9/2015 | 7:06:27 AM | Inactive | Inactive | 185 | none | | 33 24.4695 N 117 34.5089 W::1/9/15 at 15:06:36 (UTC) | 117.575148 W | 33.407825 N | 11S | 3696647.55 | 446518.675 |
| Andrew Fisher | 4 | 1/22/2015 | 3:51:33 PM | Inactive | Inactive | 185 | none | | 33 24.4693 N 117 34.5109 W::1/22/15 at 23:45:43 (UTC) | 117.575182 W | 33.407822 N | 11S | 3696647.55 | 446518.675 |
| James McMorran | 1 | 12/19/2014 | 7:13:14 AM | Inactive | Inactive | 186 | none | multiple burrow entrances | 33 24.4249 N 117 34.4893 W::12/19/14 at 15:10:47 (UTC) | 117.574822 W | 33.407082 N | 11S | 3696563.3 | 446548.475 |
| James McMorran | 2 | 12/29/2014 | 7:15:56 AM | Inactive | Inactive | 186 | none | | 33 24.4229 N 117 34.4914 W::12/29/14 at 15:12:01 (UTC) | 117.574857 W | 33.407048 N | 11S | 3696563.3 | 446548.475 |
| James McMorran | 3 | 1/9/2015 | 7:13:06 AM | Inactive | Inactive | 186 | none | | 33 24.4262 N 117 34.4920 W::1/9/15 at 15:07:53 (UTC) | 117.574867 W | 33.407103 N | 11S | 3696565.3 | 446547.555 |
| Andrew Fisher | 4 | 1/22/2015 | 4:17:47 PM | Inactive | Inactive | 186 | none | | 33 24.4238 N 117 34.4899 W::1/23/15 at 00:11:50 (UTC) | 117.574832 W | 33.407063 N | 11S | 3696565.3 | 446547.555 |
| James McMorran | 1 | 12/19/2014 | 7:48:22 AM | Inactive | Inactive | 187 | none | multiple burrow entrances | 33 24.4365 N 117 34.5452 W::12/19/14 at 15:45:41 (UTC) | 117.575753 W | 33.407275 N | 11S | 3696588.6 | 446466.225 |
| Brennan Mulrooney | 2 | 12/29/2014 | 7:52:42 AM | Inactive | Inactive | 187 | none | | 33 24.4382 N 117 34.5419 W::12/29/14 at 15:48:53 (UTC) | 117.575698 W | 33.407303 N | 11S | 3696588.6 | 446466.225 |
| Brennan Mulrooney | 3 | 1/9/2015 | 7:40:40 AM | Inactive | Inactive | 187 | none | | 33 24.4377 N 117 34.5399 W::1/9/15 at 15:36:00 (UTC) | 117.575657 W | 33.407305 N | 11S | 3696591.3 | 446470.755 |
| Donna Germann | 4 | 1/23/2015 | 7:04:12 AM | Inactive | Inactive | 187 | none | | 33 24.4393 N 117 34.5419 W::1/23/15 at 15:01:05 (UTC) | 117.575697 W | 33.407322 N | 11S | 3696591.3 | 446470.755 |
| James McMorran | 1 | 12/19/2014 | 7:58:42 AM | Inactive | Inactive | 188 | none | multiple burrow entrances | 33 24.4130 N 117 34.6221 W::12/19/14 at 15:56:05 (UTC) | 117.577035 W | 33.406883 N | 11S | 3696543.8 | 446347.555 |
| James McMorran | 2 | 12/29/2014 | 8:58:47 AM | Inactive | Inactive | 188 | none | | 33 24.4122 N 117 34.6179 W::12/29/14 at 16:54:52 (UTC) | 117.576963 W | 33.406875 N | 11S | 3696543.8 | 446347.555 |
| James McMorran | 3 | 1/9/2015 | 8:43:14 AM | Inactive | Inactive | 188 | none | | 33 24.4198 N 117 34.6198 W::1/9/15 at 16:37:44 (UTC) | 117.576997 W | 33.406997 N | 11S | 3696555.25 | 446346.04 |
| Donna Germann | 4 | 1/23/2015 | 7:42:54 AM | Inactive | Inactive | 188 | none | | 33 24.4180 N 117 34.6221 W::1/23/15 at 15:39:48 (UTC) | 117.577035 W | 33.406967 N | 11S | 3696555.25 | 446346.04 |
| James McMorran | 1 | 12/19/2014 | 7:59:46 AM | Inactive | Inactive | 189 | none | multiple burrow entrances | 33 24.4265 N 117 34.6104 W::12/19/14 at 15:57:02 (UTC) | 117.576840 W | 33.407108 N | 11S | 3696569.9 | 446362.115 |
| James McMorran | 2 | 12/29/2014 | 8:07:46 AM | Inactive | Inactive | 189 | none | | 33 24.4273 N 117 34.6109 W::12/29/14 at 16:03:53 (UTC) | 117.576848 W | 33.407122 N | 11S | 3696569.9 | 446362.115 |
| James McMorran | 3 | 1/9/2015 | 7:59:54 AM | Inactive | Inactive | 189 | none | | 33 24.4263 N 117 34.6019 W::1/9/15 at 15:54:28 (UTC) | 117.576698 W | 33.407105 N | 11S | 3696573.6 | 446370.505 |
| Keoni Calantas | 4 | 1/23/2015 | 7:39:11 AM | Inactive | Inactive | 189 | none | | 33 24.4320 N 117 34.6088 W::1/23/15 at 15:38:12 (UTC) | 117.576810 W | 33.407193 N | 11S | 3696573.6 | 446370.505 |
| Andrew Fisher | 1 | 12/19/2014 | 7:44:23 AM | Inactive | Inactive | 19 | none | multiple burrow entrances | 33 24.3821 N 117 34.5386 W::12/19/14 at 15:41:08 (UTC) | 117.575645 W | 33.406368 N | 11S | 3696486.15 | 446473.935 |
| Andrew Fisher | 2 | 12/29/2014 | 8:14:00 AM | Inactive | Inactive | 19 | none | multiple burrow entrances | 33 24.3817 N 117 34.5377 W::12/29/14 at 16:09:56 (UTC) | 117.575628 W | 33.406362 N | 11S | 3696486.15 | 446473.935 |
| Andrew Fisher | 3 | 1/9/2015 | 8:03:04 AM | Inactive | Inactive | 19 | none | occupied by ground squirrel | 33 24.3848 N 117 34.5402 W::1/9/15 at 15:58:07 (UTC) | 117.575670 W | 33.406413 N | 11S | 3696491.15 | 446471.175 |
| Keoni Calantas | 4 | 1/23/2015 | 7:27:14 AM | Inactive | Inactive | 19 | none | | 33 24.3844 N 117 34.5398 W::1/23/15 at 15:26:04 (UTC) | 117.575663 W | 33.406407 N | 11S | 3696491.15 | 446471.175 |
| James McMorran | 1 | 12/19/2014 | 8:00:25 AM | Inactive | Inactive | 190 | none | multiple burrow entrances | 33 24.4086 N 117 34.6027 W::12/19/14 at 15:57:47 (UTC) | 117.576712 W | 33.406810 N | 11S | 3696537.75 | 446375.79 |
| James McMorran | 2 | 12/29/2014 | 8:09:11 AM | Inactive | Inactive | 190 | none | | 33 24.4105 N 117 34.6007 W::12/29/14 at 16:05:21 (UTC) | 117.576678 W | 33.406842 N | 11S | 3696537.75 | 446375.79 |
| James McMorran | 3 | 1/9/2015 | 8:00:36 AM | Inactive | Inactive | 190 | none | | 33 24.4115 N 117 34.6024 W::1/9/15 at 15:55:06 (UTC) | 117.576707 W | 33.406858 N | 11S | 3696540.75 | 446375.395 |
| Keoni Calantas | 4 | 1/23/2015 | 7:41:04 AM | Inactive | Inactive | 190 | none | | 33 24.4109 N 117 34.6015 W::1/23/15 at 15:40:00 (UTC) | 117.576692 W | 33.406848 N | 11S | 3696540.75 | 446375.395 |
| James McMorran | 1 | 12/19/2014 | 8:05:25 AM | Inactive | Inactive | 191 | none | 2 BURROWS | 33 24.3436 N 117 34.5485 W::12/19/14 at 16:02:55 (UTC) | 117.575808 W | 33.405727 N | 11S | 3696420.5 | 446457.44 |
| James McMorran | 2 | 12/29/2014 | 8:15:30 AM | Inactive | Inactive | 191 | none | | 33 24.3490 N 117 34.5487 W::12/29/14 at 16:11:40 (UTC) | 117.575812 W | 33.405817 N | 11S | 3696420.5 | 446457.44 |
| James McMorran | 3 | 1/9/2015 | 8:04:44 AM | Inactive | Inactive | 191 | none | | 33 24.3387 N 117 34.5478 W::1/9/15 at 15:59:30 (UTC) | 117.575797 W | 33.405645 N | 11S | 3696412.85 | 446459.77 |
| Keoni Calantas | 4 | 1/23/2015 | 7:46:35 AM | Inactive | Inactive | 191 | none | | 33 24.3457 N 117 34.5463 W::1/23/15 at 15:45:29 (UTC) | 117.575772 W | 33.405762 N | 11S | 3696412.85 | 446459.77 |
| James McMorran | 1 | 12/19/2014 | 8:06:24 AM | Inactive | Inactive | 192 | none | multiple burrow entrances | 33 24.3317 N 117 34.5433 W::12/19/14 at 16:03:40 (UTC) | 117.575722 W | 33.405528 N | 11S | 3696399.45 | 446462.575 |
| James McMorran | 2 | 12/29/2014 | 8:16:29 AM | Inactive | Inactive | 192 | none | | 33 24.3382 N 117 34.5471 W::12/29/14 at 16:12:38 (UTC) | 117.575785 W | 33.405637 N | 11S | 3696399.45 | 446462.575 |
| James McMorran | 3 | 1/9/2015 | 8:05:27 AM | Inactive | Inactive | 192 | none | | 33 24.3306 N 117 34.5438 W::1/9/15 at 15:59:59 (UTC) | 117.575730 W | 33.405510 N | 11S | 3696394.45 | 446465.575 |
| Keoni Calantas | 4 | 1/23/2015 | 7:48:39 AM | Inactive | Inactive | 192 | none | | 33 24.3339 N 117 34.5427 W::1/23/15 at 15:47:31 (UTC) | 117.575712 W | 33.405565 N | 11S | 3696394.45 | 446465.575 |
| James McMorran | 1 | 12/19/2014 | 8:07:35 AM | Inactive | Inactive | 193 | none | multiple burrow entrances | 33 24.3231 N 117 34.5311 W::12/19/14 at 16:04:58 (UTC) | 117.575518 W | 33.405385 N | 11S | 3696385.35 | 446480.91 |
| James McMorran | 2 | 12/29/2014 | 8:17:29 AM | Inactive | Inactive | 193 | none | | 33 24.3317 N 117 34.5356 W::12/29/14 at 16:13:35 (UTC) | 117.575593 W | 33.405528 N | 11S | 3696385.35 | 446480.91 |
| James McMorran | 3 | 1/9/2015 | 8:07:57 AM | No Longer Suitable | No Longer Suitable | 193 | none | has gotten too small to be suitable | 33 24.3256 N 117 34.5326 W::1/9/15 at 16:02:59 (UTC) | 117.575543 W | 33.405427 N | 11S | 3696384.85 | 446483.14 |
| Keoni Calantas | 4 | 1/23/2015 | 7:49:54 AM | Inactive | Inactive | 193 | none | | 33 24.3286 N 117 34.5312 W::1/23/15 at 15:48:45 (UTC) | 117.575520 W | 33.405477 N | 11S | 3696384.85 | 446483.14 |
| James McMorran | 1 | 12/19/2014 | 8:08:35 AM | Inactive | Inactive | 194 | none | | 33 24.3072 N 117 34.5193 W::12/19/14 at 16:05:56 (UTC) | 117.575322 W | 33.405120 N | 11S | 3696348.3 | 446501.21 |
| James McMorran | 2 | 12/29/2014 | 8:18:38 AM | Inactive | Inactive | 194 | none | | 33 24.3076 N 117 34.5209 W::12/29/14 at 16:14:44 (UTC) | 117.575348 W | 33.405127 N | 11S | 3696348.3 | 446501.21 |
| James McMorran | 3 | 1/9/2015 | 8:09:28 AM | Inactive | Inactive | 194 | none | | 33 24.3101 N 117 34.5234 W::1/9/15 at 16:03:58 (UTC) | 117.575390 W | 33.405168 N | 11S | 3696352.65 | 446497.605 |
| Keoni Calantas | 4 | 1/23/2015 | 7:51:09 AM | Inactive | Inactive | 194 | none | | 33 24.3094 N 117 34.5215 W::1/23/15 at 15:50:00 (UTC) | 117.575358 W | 33.405157 N | 11S | 3696352.65 | 446497.605 |
| James McMorran | 1 | 12/19/2014 | 8:12:46 AM | Inactive | Inactive | 195 | none | multiple burrow entrances | 33 24.2350 N 117 34.4513 W::12/19/14 at 16:10:09 (UTC) | 117.574188 W | 33.403917 N | 11S | 3696223.7 | 446607.65 |
| Matthew Kedziora | 2 | 12/29/2014 | 8:20:33 AM | Inactive | Inactive | 195 | none | | 33 24.2468 N 117 34.4504 W::12/29/14 at 16:19:36 (UTC) | 117.574178 W | 33.404092 N | 11S | 3696223.7 | 446607.65 |
| Brynne Mulrooney | 3 | 1/9/2015 | 8:06:24 AM | Inactive | Inactive | 195 | none | | 33 24.2353 N 117 34.4514 W::1/9/15 at 16:06:32 (UTC) | 117.574190 W | 33.403922 N | 11S | 3696214.1 | 446608.9 |
| Andrew Fisher | 4 | 1/23/2015 | 8:00:09 AM | Inactive | Inactive | 195 | none | | 33 24.2349 N 117 34.4487 W::1/23/15 at 15:54:22 (UTC) | 117.574148 W | 33.403915 N | 11S | 3696214.1 | 446608.9 |
| James McMorran | 1 | 12/19/2014 | 8:15:26 AM | Inactive | Inactive | 196 | none | multiple burrow entrances | 33 24.1778 N 117 34.4201 W::12/19/14 at 16:12:44 (UTC) | 117.573668 W | 33.402963 N | 11S | 3696110.6 | 446656.545 |
| James McMorran | 2 | 12/29/2014 | 8:24:57 AM | Inactive | Inactive | 196 | none | | 33 24.1804 N 117 34.4201 W::12/29/14 at 16:21:01 (UTC) | 117.573633 W | 33.403012 N | 11S | 3696110.6 | 446656.545 |
| James McMorran | 3 | 1/9/2015 | 8:14:16 AM | Inactive | Inactive | 196 | none | | 33 24.1794 N 117 34.4199 W::1/9/15 at 16:09:03 (UTC) | 117.573665 W | 33.402990 N | 11S | 3696110.75 | 446656.965 |
| Keoni Calantas | 4 | 1/23/2015 | 7:59:01 AM | Inactive | Inactive | 196 | none | | 33 24.1792 N 117 34.4176 W::1/23/15 at 15:57:54 (UTC) | 117.573627 W | 33.402987 N | 11S | 3696110.75 | 446656.965 |

# Appendix C – Raw Field Data

| Primary_Bio | Survey Number | Date | Time | Cumulative_ Burrow_ Status | Field_ Burrow_ Status | Burrow ID | Sign | Notes | GPSLocation | Longitude | Latitude | Zone | Avg_ Northing_ Final | Avg_ Easting_ Final |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| James McMorran | 1 | 12/19/2014 | 8:17:21 AM | Inactive | Inactive | 197 | none | | 33 24.1516 N 117 34.4066 W::12/19/14 at 16:15:27 (UTC) | 117.573443 W | 33.402527 N | 11S | 3696076.5 | 446682.765 |
| James McMorran | 2 | 12/29/2014 | 8:26:33 AM | Inactive | Inactive | 197 | none | | 33 24.1701 N 117 34.3974 W::12/29/14 at 16:22:43 (UTC) | 117.573290 W | 33.402835 N | 11S | 3696076.5 | 446682.765 |
| James McMorran | 3 | 1/9/2015 | 8:16:04 AM | Inactive | Inactive | 197 | none | | 33 24.1586 N 117 34.4034 W::1/9/15 at 16:10:34 (UTC) | 117.573390 W | 33.402643 N | 11S | 3696075.85 | 446680.255 |
| Keoni Calantas | 4 | 1/23/2015 | 8:01:05 AM | Inactive | Inactive | 197 | none | | 33 24.1624 N 117 34.4038 W::1/23/15 at 16:00:01 (UTC) | 117.573397 W | 33.402707 N | 11S | 3696075.85 | 446680.255 |
| James McMorran | 1 | 12/19/2014 | 8:23:06 AM | Inactive | Inactive | 198 | none | multiple burrow entrances | 33 24.1200 N 117 34.4164 W::12/19/14 at 16:20:33 (UTC) | 117.573607 W | 33.402000 N | 11S | 3696004.25 | 446662.89 |
| Matthew Kedziora | 2 | 12/29/2014 | 8:32:20 AM | Inactive | Inactive | 198 | none | | 33 24.1234 N 117 34.4127 W::12/29/14 at 16:31:25 (UTC) | 117.573545 W | 33.402057 N | 11S | 3696004.25 | 446662.89 |
| Brynne Mulrooney | 3 | 1/9/2015 | 8:18:11 AM | Inactive | Inactive | 198 | none | | 33 24.1220 N 117 34.4165 W::1/9/15 at 16:18:32 (UTC) | 117.573608 W | 33.402033 N | 11S | 3696007.25 | 446659.46 |
| Donna Germann | 4 | 1/23/2015 | 8:08:51 AM | Inactive | Inactive | 198 | none | | 33 24.1247 N 117 34.4171 W::1/23/15 at 16:05:48 (UTC) | 117.573618 W | 33.402077 N | 11S | 3696007.25 | 446659.46 |
| James McMorran | 1 | 12/19/2014 | 8:24:56 AM | Inactive | Inactive | 199 | none | multiple burrow entrances | 33 24.1344 N 117 34.4249 W::12/19/14 at 16:22:18 (UTC) | 117.573748 W | 33.402240 N | 11S | 3696028 | 446643.905 |
| Matthew Kedziora | 2 | 12/29/2014 | 8:33:42 AM | Inactive | Inactive | 199 | none | | 33 24.1346 N 117 34.4289 W::12/29/14 at 16:32:48 (UTC) | 117.573815 W | 33.402243 N | 11S | 3696028 | 446643.905 |
| Brynne Mulrooney | 3 | 1/9/2015 | 8:19:30 AM | Inactive | Inactive | 199 | none | | 33 24.1384 N 117 34.4274 W::1/9/15 at 16:19:37 (UTC) | 117.573790 W | 33.402307 N | 11S | 3696031.65 | 446644.07 |
| Donna Germann | 4 | 1/23/2015 | 8:10:09 AM | Inactive | Inactive | 199 | none | | 33 24.1346 N 117 34.4262 W::1/23/15 at 16:07:04 (UTC) | 117.573770 W | 33.402242 N | 11S | 3696031.65 | 446644.07 |
| Andrew Fisher | 1 | 12/19/2014 | 6:59:39 AM | Inactive | Inactive | 2 | none | 4 burrows in area | 33 24.5907 N 117 34.5663 W::12/19/14 at 14:56:31 (UTC) | 117.576098 W | 33.409837 N | 11S | 3696871.85 | 446433.76 |
| Andrew Fisher | 2 | 12/29/2014 | 6:58:48 AM | Inactive | Inactive | 2 | none | multiple burrow entrances | 33 24.5906 N 117 34.5652 W::12/29/14 at 14:54:46 (UTC) | 117.576085 W | 33.409847 N | 11S | 3696871.85 | 446433.76 |
| Andrew Fisher | 3 | 1/9/2015 | 7:01:50 AM | Inactive | Inactive | 2 | none | occupied by ground squirrel | 33 24.5909 N 117 34.5659 W::1/9/15 at 14:57:03 (UTC) | 117.576098 W | 33.409848 N | 11S | 3696873.2 | 446430.745 |
| Andrew Fisher | 4 | 1/22/2015 | 3:06:55 PM | Inactive | Inactive | 2 | none | | 33 24.5916 N 117 34.5690 W::1/22/15 at 23:00:56 (UTC) | 117.576150 W | 33.409860 N | 11S | 3696873.2 | 446430.745 |
| Andrew Fisher | 1 | 12/19/2014 | 7:44:57 AM | Inactive | Inactive | 20 | none | multiple burrow entrances | 33 24.3894 N 117 34.5377 W::12/19/14 at 15:41:44 (UTC) | 117.575628 W | 33.406490 N | 11S | 3696500 | 446475.78 |
| Andrew Fisher | 2 | 12/29/2014 | 8:13:13 AM | Inactive | Inactive | 20 | none | occupied by ground squirrel | 33 24.3894 N 117 34.5364 W::12/29/14 at 16:09:08 (UTC) | 117.575607 W | 33.406490 N | 11S | 3696500 | 446475.78 |
| Andrew Fisher | 3 | 1/9/2015 | 8:02:19 AM | Inactive | Inactive | 20 | none | multiple burrow entrances | 33 24.3884 N 117 34.5378 W::1/9/15 at 15:57:31 (UTC) | 117.575630 W | 33.406475 N | 11S | 3696504.15 | 446473.62 |
| Keoni Calantas | 4 | 1/23/2015 | 7:28:04 AM | Inactive | Inactive | 20 | none | | 33 24.3948 N 117 34.5391 W::1/23/15 at 15:27:18 (UTC) | 117.575652 W | 33.406580 N | 11S | 3696504.15 | 446473.62 |
| James McMorran | 1 | 12/19/2014 | 8:25:57 AM | Inactive | Inactive | 200 | none | multiple burrow entrances | 33 24.1443 N 117 34.4294 W::12/19/14 at 16:23:19 (UTC) | 117.573823 W | 33.402405 N | 11S | 3696053.2 | 446635.305 |
| Matthew Kedziora | 2 | 12/29/2014 | 8:34:56 AM | Inactive | Inactive | 200 | none | | 33 24.1520 N 117 34.4355 W::12/29/14 at 16:34:07 (UTC) | 117.573928 W | 33.402532 N | 11S | 3696053.2 | 446635.305 |
| Brynne Mulrooney | 3 | 1/9/2015 | 8:20:27 AM | Inactive | Inactive | 200 | none | | 33 24.1540 N 117 34.4360 W::1/9/15 at 16:20:30 (UTC) | 117.573933 W | 33.402567 N | 11S | 3696061.75 | 446630.75 |
| Donna Germann | 4 | 1/23/2015 | 8:12:16 AM | Inactive | Inactive | 200 | none | | 33 24.1514 N 117 34.4350 W::1/23/15 at 16:09:11 (UTC) | 117.573917 W | 33.402523 N | 11S | 3696061.75 | 446630.75 |
| James McMorran | 1 | 12/19/2014 | 8:29:32 AM | Inactive | Inactive | 201 | none | multiple burrow entrances | 33 24.1708 N 117 34.4733 W::12/19/14 at 16:26:57 (UTC) | 117.574555 W | 33.402847 N | 11S | 3696096.7 | 446571.89 |
| Andrew Fisher | 2 | 12/29/2014 | 8:41:42 AM | Inactive | Inactive | 201 | none | occupied by ground squirrel | 33 24.1721 N 117 34.4739 W::12/29/14 at 16:37:44 (UTC) | 117.574565 W | 33.402868 N | 11S | 3696096.7 | 446571.89 |
| Andrew Fisher | 3 | 1/9/2015 | 8:29:00 AM | Inactive | Inactive | 201 | none | occupied by ground squirrel | 33 24.1707 N 117 34.4742 W::1/9/15 at 16:24:10 (UTC) | 117.574570 W | 33.402845 N | 11S | 3696094.75 | 446571.505 |
| Andrew Fisher | 4 | 1/23/2015 | 8:18:34 AM | Inactive | Inactive | 201 | none | | 33 24.1699 N 117 34.4734 W::1/23/15 at 16:12:32 (UTC) | 117.574558 W | 33.402835 N | 11S | 3696094.75 | 446571.505 |
| James McMorran | 1 | 12/19/2014 | 8:30:57 AM | Inactive | Inactive | 202 | none | multiple burrow entrances | 33 24.1938 N 117 34.4799 W::12/19/14 at 16:28:20 (UTC) | 117.574665 W | 33.403230 N | 11S | 3696133.9 | 446558.7 |
| Brennan Mulrooney | 2 | 12/29/2014 | 8:43:34 AM | Inactive | Inactive | 202 | none | | 33 24.1893 N 117 34.4846 W::12/29/14 at 16:39:45 (UTC) | 117.574743 W | 33.403155 N | 11S | 3696133.9 | 446558.7 |
| Brennan Mulrooney | 3 | 1/9/2015 | 8:29:31 AM | Inactive | Inactive | 202 | none | | 33 24.1884 N 117 34.4844 W::1/9/15 at 16:24:45 (UTC) | 117.574740 W | 33.403140 N | 11S | 3696129.5 | 446557.655 |
| Keoni Calantas | 4 | 1/23/2015 | 8:15:23 AM | Inactive | Inactive | 202 | none | | 33 24.1899 N 117 34.4814 W::1/23/15 at 16:14:21 (UTC) | 117.574690 W | 33.403165 N | 11S | 3696129.5 | 446557.655 |
| James McMorran | 1 | 12/19/2014 | 8:34:35 AM | Inactive | Inactive | 203 | none | multiple burrow entrances | 33 24.2641 N 117 34.5210 W::12/19/14 at 16:31:59 (UTC) | 117.575350 W | 33.404402 N | 11S | 3696267.8 | 446499.695 |
| Matthew Kedziora | 2 | 12/29/2014 | 8:45:32 AM | Inactive | Inactive | 203 | none | | 33 24.2636 N 117 34.5206 W::12/29/14 at 16:44:32 (UTC) | 117.575343 W | 33.404393 N | 11S | 3696267.8 | 446499.695 |
| Brynne Mulrooney | 3 | 1/9/2015 | 8:27:33 AM | Inactive | Inactive | 203 | none | | 33 24.2639 N 117 34.5185 W::1/9/15 at 16:27:46 (UTC) | 117.575307 W | 33.404398 N | 11S | 3696265.05 | 446500.985 |
| Donna Germann | 4 | 1/23/2015 | 8:20:04 AM | Inactive | Inactive | 203 | none | | 33 24.2608 N 117 34.5215 W::1/23/15 at 16:17:00 (UTC) | 117.575358 W | 33.404347 N | 11S | 3696265.05 | 446500.985 |
| James McMorran | 1 | 12/19/2014 | 8:39:09 AM | Inactive | Inactive | 204 | none | multiple burrow entrances | 33 24.3271 N 117 34.5857 W::12/19/14 at 16:36:32 (UTC) | 117.576428 W | 33.405452 N | 11S | 3696390.55 | 446402.875 |
| Brennan Mulrooney | 2 | 12/29/2014 | 8:52:11 AM | Inactive | Inactive | 204 | none | | 33 24.3328 N 117 34.5817 W::12/29/14 at 16:48:16 (UTC) | 117.576362 W | 33.405547 N | 11S | 3696390.55 | 446402.875 |
| Brennan Mulrooney | 3 | 1/9/2015 | 8:38:25 AM | Inactive | Inactive | 204 | none | | 33 24.3254 N 117 34.5854 W::1/9/15 at 16:33:46 (UTC) | 117.576420 W | 33.405420 N | 11S | 3696390.65 | 446402.64 |
| Keoni Calantas | 4 | 1/23/2015 | 8:22:11 AM | Inactive | Inactive | 204 | none | | 33 24.3348 N 117 34.5825 W::1/23/15 at 16:21:04 (UTC) | 117.576375 W | 33.405580 N | 11S | 3696390.65 | 446402.64 |
| James McMorran | 1 | 12/19/2014 | 8:40:52 AM | Inactive | Inactive | 205 | none | multiple burrow entrances | 33 24.3343 N 117 34.5914 W::12/19/14 at 16:38:10 (UTC) | 117.576523 W | 33.405572 N | 11S | 3696400.95 | 446393.59 |
| Brennan Mulrooney | 2 | 12/29/2014 | 8:54:45 AM | Inactive | Inactive | 205 | none | | 33 24.3368 N 117 34.5881 W::12/29/14 at 16:50:50 (UTC) | 117.576468 W | 33.405613 N | 11S | 3696400.95 | 446393.59 |
| Brennan Mulrooney | 3 | 1/9/2015 | 8:39:35 AM | Inactive | Inactive | 205 | none | | 33 24.3381 N 117 34.5879 W::1/9/15 at 16:34:43 (UTC) | 117.576467 W | 33.405635 N | 11S | 3696405.5 | 446396.26 |
| Keoni Calantas | 4 | 1/23/2015 | 8:22:43 AM | Inactive | Inactive | 205 | none | | 33 24.3380 N 117 34.5880 W::1/23/15 at 16:21:35 (UTC) | 117.576467 W | 33.405633 N | 11S | 3696405.5 | 446396.26 |
| James McMorran | 1 | 12/19/2014 | 8:43:35 AM | Inactive | Inactive | 206 | none | multiple burrow entrances | 33 24.3876 N 117 34.6169 W::12/19/14 at 16:40:50 (UTC) | 117.576948 W | 33.406460 N | 11S | 3696497.75 | 446352.555 |
| Matthew Kedziora | 2 | 12/29/2014 | 8:56:08 AM | Inactive | Inactive | 206 | none | | 33 24.3881 N 117 34.6162 W::12/29/14 at 16:55:11 (UTC) | 117.576937 W | 33.406468 N | 11S | 3696497.75 | 446352.555 |
| Brynne Mulrooney | 3 | 1/9/2015 | 8:37:16 AM | Inactive | Inactive | 206 | none | | 33 24.3921 N 117 34.6225 W::1/9/15 at 16:37:19 (UTC) | 117.577042 W | 33.406535 N | 11S | 3696508 | 446345.78 |
| Keoni Calantas | 4 | 1/23/2015 | 8:26:09 AM | Inactive | Inactive | 206 | none | | 33 24.3946 N 117 34.6194 W::1/23/15 at 16:25:00 (UTC) | 117.576990 W | 33.406577 N | 11S | 3696508 | 446345.78 |
| James McMorran | 1 | 12/19/2014 | 8:44:27 AM | Inactive | Inactive | 207 | none | multiple burrow entrances | 33 24.3985 N 117 34.6203 W::12/19/14 at 16:42:02 (UTC) | 117.577005 W | 33.406642 N | 11S | 3696523.35 | 446347.675 |
| Matthew Kedziora | 2 | 12/29/2014 | 8:57:06 AM | Inactive | Inactive | 207 | none | | 33 24.4048 N 117 34.6193 W::12/29/14 at 16:56:11 (UTC) | 117.576988 W | 33.406747 N | 11S | 3696523.35 | 446347.675 |
| Brynne Mulrooney | 3 | 1/9/2015 | 8:38:39 AM | Inactive | Inactive | 207 | none | | 33 24.4038 N 117 34.6183 W::1/9/15 at 16:38:45 (UTC) | 117.576972 W | 33.406732 N | 11S | 3696527.55 | 446349.84 |
| Donna Germann | 4 | 1/23/2015 | 8:29:59 AM | Inactive | Inactive | 207 | none | | 33 24.4040 N 117 34.6185 W::1/23/15 at 16:26:53 (UTC) | 117.576975 W | 33.406733 N | 11S | 3696527.55 | 446349.84 |
| James McMorran | 1 | 12/19/2014 | 9:12:53 AM | Inactive | Inactive | 208 | none | multiple burrow entrances | 33 23.6715 N 117 35.2056 W::12/19/14 at 17:10:16 (UTC) | 117.586760 W | 33.394525 N | 11S | 3695188.75 | 445433.78 |
| Matthew Kedziora | 2 | 12/29/2014 | 9:23:37 AM | Inactive | Inactive | 208 | none | | 33 23.6818 N 117 35.2036 W::12/29/14 at 17:22:38 (UTC) | 117.586727 W | 33.394697 N | 11S | 3695188.75 | 445433.78 |

# Appendix C – Raw Field Data

| Primary_Bio | Survey Number | Date | Time | Cumulative_ Burrow_ Status | Field_ Burrow_ Status | Burrow ID | Sign | Notes | GPSLocation | Longitude | Latitude | Zone | Avg_ Northing_ Final | Avg_ Easting_ Final |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Brynne Mulrooney | 3 | 1/9/2015 | 9:01:36 AM | Inactive | Inactive | 208 | none | | 33 23.6787 N 117 35.2051 W::1/9/15 at 17:01:50 (UTC) | 117.586752 W | 33.394645 N | 11S | 3695192.05 | 445433.1 |
| Donna Germann | 4 | 1/23/2015 | 8:54:48 AM | Inactive | Inactive | 208 | none | | 33 23.6782 N 117 35.2050 W::1/23/15 at 16:51:57 (UTC) | 117.586750 W | 33.394637 N | 11S | 3695192.05 | 445433.1 |
| James McMorran | 1 | 12/19/2014 | 9:25:20 AM | Inactive | Inactive | 209 | none | multiple burrow entrances | 33 23.4882 N 117 35.0991 W::12/19/14 at 17:22:50 (UTC) | 117.584985 W | 33.391470 N | 11S | 3694838.5 | 445593.265 |
| Andrew Fisher | 2 | 12/29/2014 | 9:42:20 AM | Inactive | Inactive | 209 | none | multiple burrow entrances | 33 23.4870 N 117 35.1018 W::12/29/14 at 17:38:22 (UTC) | 117.585030 W | 33.391450 N | 11S | 3694838.5 | 445593.265 |
| Brennan Mulrooney | 3 | 1/9/2015 | 9:17:09 AM | Inactive | Inactive | 209 | none | | 33 23.4887 N 117 35.1024 W::1/9/15 at 17:12:22 (UTC) | 117.585040 W | 33.391478 N | 11S | 3694838.5 | 445590.8 |
| Donna Germann | 4 | 1/23/2015 | 9:17:01 AM | Inactive | Inactive | 209 | none | | 33 23.4865 N 117 35.1017 W::1/23/15 at 17:13:54 (UTC) | 117.585028 W | 33.391442 N | 11S | 3694838.5 | 445590.8 |
| Andrew Fisher | 1 | 12/19/2014 | 7:45:34 AM | Inactive | Inactive | 21 | none | multiple burrow entrances | 33 24.3960 N 117 34.5476 W::12/19/14 at 15:42:15 (UTC) | 117.575793 W | 33.406600 N | 11S | 3696511.9 | 446459.76 |
| Andrew Fisher | 2 | 12/29/2014 | 8:12:31 AM | Inactive | Inactive | 21 | none | multiple burrow entrances | 33 24.3956 N 117 34.5473 W::12/29/14 at 16:08:24 (UTC) | 117.575788 W | 33.406593 N | 11S | 3696511.9 | 446459.76 |
| Andrew Fisher | 3 | 1/9/2015 | 8:01:38 AM | Inactive | Inactive | 21 | none | multiple burrow entrances | 33 24.3951 N 117 34.5475 W::1/9/15 at 15:56:40 (UTC) | 117.575792 W | 33.406585 N | 11S | 3696511.8 | 446458.92 |
| Keoni Calantas | 4 | 1/23/2015 | 7:29:13 AM | Inactive | Inactive | 21 | none | | 33 24.3964 N 117 34.5484 W::1/23/15 at 15:28:03 (UTC) | 117.575807 W | 33.406607 N | 11S | 3696511.8 | 446458.92 |
| James McMorran | 1 | 12/19/2014 | 9:26:52 AM | Inactive | Inactive | 210 | none | multiple burrow entrances | 33 23.4840 N 117 35.0945 W::12/19/14 at 17:24:14 (UTC) | 117.584908 W | 33.391400 N | 11S | 3694830.85 | 445600.85 |
| Andrew Fisher | 2 | 12/29/2014 | 9:43:16 AM | Inactive | Inactive | 210 | none | multiple burrow entrances | 33 23.4830 N 117 35.0966 W::12/29/14 at 17:39:12 (UTC) | 117.584943 W | 33.391383 N | 11S | 3694830.85 | 445600.85 |
| Brennan Mulrooney | 3 | 1/9/2015 | 9:19:03 AM | Inactive | Inactive | 210 | none | | 33 23.4838 N 117 35.0987 W::1/9/15 at 17:14:14 (UTC) | 117.584978 W | 33.391398 N | 11S | 3694831.6 | 445595.55 |
| Donna Germann | 4 | 1/23/2015 | 9:16:40 AM | Inactive | Inactive | 210 | none | | 33 23.4839 N 117 35.0992 W::1/23/15 at 17:13:31 (UTC) | 117.584987 W | 33.391398 N | 11S | 3694831.6 | 445595.55 |
| James McMorran | 1 | 12/19/2014 | 9:41:29 AM | Inactive | Inactive | 211 | none | multiple burrow entrances | 33 23.5133 N 117 35.1457 W::12/19/14 at 17:38:54 (UTC) | 117.585762 W | 33.391888 N | 11S | 3694885.15 | 445525.54 |
| Andrew Fisher | 2 | 12/29/2014 | 9:57:21 AM | Inactive | Inactive | 211 | none | multiple burrow entrances | 33 23.5120 N 117 35.1429 W::12/29/14 at 17:53:29 (UTC) | 117.585715 W | 33.391867 N | 11S | 3694885.15 | 445525.54 |
| Brennan Mulrooney | 3 | 1/9/2015 | 9:35:07 AM | Inactive | Inactive | 211 | none | | 33 23.5131 N 117 35.1445 W::1/9/15 at 17:30:15 (UTC) | 117.585742 W | 33.391885 N | 11S | 3694886.7 | 445526.85 |
| Keoni Calantas | 4 | 1/23/2015 | 9:15:13 AM | Inactive | Inactive | 211 | none | | 33 23.5139 N 117 35.1424 W::1/23/15 at 17:14:21 (UTC) | 117.585707 W | 33.391898 N | 11S | 3694886.7 | 445526.85 |
| James McMorran | 1 | 12/19/2014 | 9:43:05 AM | Inactive | Inactive | 212 | none | multiple burrow entrances | 33 23.5237 N 117 35.1514 W::12/19/14 at 17:40:26 (UTC) | 117.585857 W | 33.392062 N | 11S | 3694900.1 | 445518.42 |
| Andrew Fisher | 2 | 12/29/2014 | 9:59:25 AM | Inactive | Inactive | 212 | none | multiple burrow entrances | 33 23.5177 N 117 35.1466 W::12/29/14 at 17:55:20 (UTC) | 117.585775 W | 33.391962 N | 11S | 3694900.1 | 445518.42 |
| Andrew Fisher | 3 | 1/9/2015 | 9:55:39 AM | Inactive | Inactive | 212 | none | multiple burrow entrances | 33 23.5177 N 117 35.1466 W::12/29/14 at 17:55:20 (UTC) | 117.585775 W | 33.391962 N | 11S | 3694897.3 | 445520.68 |
| Keoni Calantas | 4 | 1/23/2015 | 9:16:25 AM | Inactive | Inactive | 212 | none | | 33 23.5207 N 117 35.1485 W::1/23/15 at 17:15:15 (UTC) | 117.585808 W | 33.392012 N | 11S | 3694897.3 | 445520.68 |
| James McMorran | 1 | 12/19/2014 | 9:44:15 AM | Inactive | Inactive | 213 | none | | 33 23.5380 N 117 35.1681 W::12/19/14 at 17:41:35 (UTC) | 117.586128 W | 33.392347 N | 11S | 3694937.7 | 445488.03 |
| Matthew Kedziora | 2 | 12/29/2014 | 9:58:27 AM | Inactive | Inactive | 213 | none | | 33 23.5423 N 117 35.1714 W::12/29/14 at 17:57:28 (UTC) | 117.586162 W | 33.392352 N | 11S | 3694937.7 | 445488.03 |
| Brennan Mulrooney | 3 | 1/9/2015 | 9:38:01 AM | Inactive | Inactive | 213 | none | | 33 23.5411 N 117 35.1740 W::1/9/15 at 17:33:09 (UTC) | 117.586233 W | 33.392353 N | 11S | 3694938.05 | 445481.71 |
| Keoni Calantas | 4 | 1/23/2015 | 9:19:03 AM | Inactive | Inactive | 213 | none | | 33 23.5411 N 117 35.1717 W::1/23/15 at 17:17:52 (UTC) | 117.586193 W | 33.392352 N | 11S | 3694938.05 | 445481.71 |
| James McMorran | 1 | 12/19/2014 | 9:45:07 AM | Inactive | Inactive | 214 | none | multiple burrow entrances | 33 23.5615 N 117 35.1757 W::12/19/14 at 17:42:28 (UTC) | 117.586262 W | 33.392692 N | 11S | 3694974 | 445481.305 |
| Andrew Fisher | 2 | 12/29/2014 | 9:37:35 AM | Inactive | Inactive | 214 | none | multiple burrow entrances | 33 23.5597 N 117 35.1706 W::12/29/14 at 17:33:33 (UTC) | 117.586177 W | 33.392662 N | 11S | 3694974 | 445481.305 |
| Brennan Mulrooney | 3 | 1/9/2015 | 9:12:15 AM | Inactive | Inactive | 214 | none | | 33 23.5598 N 117 35.1711 W::1/9/15 at 17:07:27 (UTC) | 117.586185 W | 33.392663 N | 11S | 3694971.3 | 445484.965 |
| Donna Germann | 4 | 1/23/2015 | 9:20:46 AM | Inactive | Inactive | 214 | none | | 33 23.5585 N 117 35.1705 W::1/23/15 at 17:17:35 (UTC) | 117.586175 W | 33.392642 N | 11S | 3694971.3 | 445484.965 |
| James McMorran | 1 | 12/19/2014 | 9:46:39 AM | Inactive | Inactive | 215 | none | multiple burrow entrances | 33 23.5805 N 117 35.1886 W::12/19/14 at 17:43:52 (UTC) | 117.586477 W | 33.393008 N | 11S | 3695019.65 | 445450.495 |
| Andrew Fisher | 2 | 12/29/2014 | 9:35:22 AM | Inactive | Inactive | 215 | none | multiple burrow entrances | 33 23.5899 N 117 35.1978 W::12/29/14 at 17:31:27 (UTC) | 117.586630 W | 33.393165 N | 11S | 3695019.65 | 445450.495 |
| Brennan Mulrooney | 3 | 1/9/2015 | 9:40:55 AM | Inactive | Inactive | 215 | none | | 33 23.5907 N 117 35.1971 W::1/9/15 at 17:36:13 (UTC) | 117.586622 W | 33.393182 N | 11S | 3695030.55 | 445442.89 |
| Keoni Calantas | 4 | 1/23/2015 | 9:21:53 AM | Inactive | Inactive | 215 | none | | 33 23.5913 N 117 35.1990 W::1/23/15 at 17:20:51 (UTC) | 117.586650 W | 33.393188 N | 11S | 3695030.55 | 445442.89 |
| James McMorran | 1 | 12/19/2014 | 9:47:17 AM | Inactive | Inactive | 216 | none | multiple burrow entrances | 33 23.6042 N 117 35.1989 W::12/19/14 at 17:44:34 (UTC) | 117.586648 W | 33.393403 N | 11S | 3695053.35 | 445442.6 |
| Andrew Fisher | 2 | 12/29/2014 | 9:31:43 AM | Inactive | Inactive | 216 | none | multiple burrow entrances | 33 23.6027 N 117 35.1980 W::12/29/14 at 17:27:51 (UTC) | 117.586633 W | 33.393378 N | 11S | 3695053.35 | 445442.6 |
| Brennan Mulrooney | 3 | 1/9/2015 | 9:41:55 AM | Inactive | Inactive | 216 | none | | 33 23.6034 N 117 35.2009 W::1/9/15 at 17:37:04 (UTC) | 117.586682 W | 33.393390 N | 11S | 3695054.7 | 445437.77 |
| Keoni Calantas | 4 | 1/23/2015 | 9:22:56 AM | Inactive | Inactive | 216 | none | | 33 23.6049 N 117 35.2022 W::1/23/15 at 17:21:56 (UTC) | 117.586703 W | 33.393415 N | 11S | 3695054.7 | 445437.77 |
| James McMorran | 1 | 12/19/2014 | 9:56:02 AM | Inactive | Inactive | 217 | none | multiple burrow entrances | 33 23.5744 N 117 35.2741 W::12/19/14 at 17:53:34 (UTC) | 117.587902 W | 33.392907 N | 11S | 3695005.15 | 445327.555 |
| Matthew Kedziora | 2 | 12/29/2014 | 10:15:03 AM | Inactive | Inactive | 217 | none | | 33 23.5796 N 117 35.2708 W::12/29/14 at 18:14:06 (UTC) | 117.587847 W | 33.392993 N | 11S | 3695005.15 | 445327.555 |
| Brynne Mulrooney | 3 | 1/9/2015 | 9:44:55 AM | Inactive | Inactive | 217 | none | | 33 23.5776 N 117 35.2673 W::1/9/15 at 17:45:08 (UTC) | 117.587783 W | 33.392967 N | 11S | 3695002.55 | 445334.89 |
| Donna Germann | 4 | 1/23/2015 | 10:03:01 AM | Inactive | Inactive | 217 | none | | 33 23.5732 N 117 35.2685 W::1/23/15 at 17:59:51 (UTC) | 117.587808 W | 33.392887 N | 11S | 3695002.55 | 445334.89 |
| James McMorran | 1 | 12/19/2014 | 9:59:31 AM | Inactive | Inactive | 218 | none | multiple burrow entrances | 33 23.5007 N 117 35.2219 W::12/19/14 at 17:56:57 (UTC) | 117.587032 W | 33.391678 N | 11S | 3694868.65 | 445398.17 |
| Matthew Kedziora | 2 | 12/29/2014 | 10:18:48 AM | Inactive | Inactive | 218 | none | | 33 23.5060 N 117 35.2309 W::12/29/14 at 18:17:53 (UTC) | 117.587182 W | 33.391767 N | 11S | 3694868.65 | 445398.17 |
| James McMorran | 3 | 1/9/2015 | 9:53:23 AM | Inactive | Inactive | 218 | none | | 33 23.5075 N 117 35.2291 W::1/9/15 at 17:47:55 (UTC) | 117.587152 W | 33.391792 N | 11S | 3694870.533 | 445393.87 |
| Donna Germann | 4 | 1/23/2015 | 9:58:41 AM | Inactive | Inactive | 218 | none | | 33 23.4994 N 117 35.2268 W::1/23/15 at 17:55:31 (UTC) | 117.587113 W | 33.391657 N | 11S | 3694870.533 | 445393.87 |
| James McMorran | 1 | 12/19/2014 | 10:00:53 AM | Inactive | Inactive | 219 | none | | 33 23.4784 N 117 35.2100 W::12/19/14 at 17:58:15 (UTC) | 117.586833 W | 33.391307 N | 11S | 3694829.8 | 445416.225 |
| Matthew Kedziora | 2 | 12/29/2014 | 10:20:37 AM | Inactive | Inactive | 219 | none | | 33 23.4863 N 117 35.2193 W::12/29/14 at 18:19:39 (UTC) | 117.586988 W | 33.391438 N | 11S | 3694829.8 | 445416.225 |
| Brynne Mulrooney | 3 | 1/9/2015 | 9:51:12 AM | Inactive | Inactive | 219 | none | | 33 23.4845 N 117 35.2118 W::1/9/15 at 17:51:18 (UTC) | 117.586863 W | 33.391408 N | 11S | 3694833.65 | 445420.205 |
| Keoni Calantas | 4 | 1/23/2015 | 9:56:37 AM | Inactive | Inactive | 219 | none | | 33 23.4844 N 117 35.2124 W::1/23/15 at 17:55:42 (UTC) | 117.586873 W | 33.391407 N | 11S | 3694833.65 | 445420.205 |
| Andrew Fisher | 1 | 12/19/2014 | 7:46:24 AM | Inactive | Inactive | 22 | none | multiple burrow entrances | 33 24.4224 N 117 34.5627 W::12/19/14 at 15:43:09 (UTC) | 117.576045 W | 33.407040 N | 11S | 3696559.9 | 446436.735 |
| Andrew Fisher | 2 | 12/29/2014 | 8:09:48 AM | Inactive | Inactive | 22 | none | multiple burrow entrances | 33 24.4210 N 117 34.5622 W::12/29/14 at 16:05:42 (UTC) | 117.576037 W | 33.407017 N | 11S | 3696559.9 | 446436.735 |
| Andrew Fisher | 3 | 1/9/2015 | 7:59:48 AM | Inactive | Inactive | 22 | none | multiple burrow entrances | 33 24.4229 N 117 34.5628 W::1/9/15 at 15:54:57 (UTC) | 117.576047 W | 33.407048 N | 11S | 3696559.85 | 446438.215 |
| Keoni Calantas | 4 | 1/23/2015 | 7:30:28 AM | Inactive | Inactive | 22 | none | | 33 24.4205 N 117 34.5602 W::1/23/15 at 15:29:21 (UTC) | 117.576003 W | 33.407008 N | 11S | 3696559.85 | 446438.215 |

# Appendix C – Raw Field Data

| Primary_Bio | Survey Number | Date | Time | Cumulative_ Burrow_ Status | Field_ Burrow_ Status | Burrow ID | Sign | Notes | GPSLocation | Longitude | Latitude | Zone | Avg_ Northing_ Final | Avg_ Easting_ Final |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| James McMorran | 1 | 12/19/2014 | 10:02:30 AM | Inactive | Inactive | 220 | none | multiple burrow entrances | 33 23.4727 N 117 35.1962 W::12/19/14 at 17:59:53 (UTC) | 117.586603 W | 33.391212 N | 11S | 3694813.8 | 445441.06 |
| Matthew Kedziora | 2 | 12/29/2014 | 10:21:38 AM | Inactive | Inactive | 220 | none | | 33 23.4749 N 117 35.2009 W::12/29/14 at 18:20:45 (UTC) | 117.586682 W | 33.391248 N | 11S | 3694813.8 | 445441.06 |
| Brynne Mulrooney | 3 | 1/9/2015 | 9:52:43 AM | Inactive | Inactive | 220 | none | | 33 23.4742 N 117 35.1998 W::1/9/15 at 17:52:47 (UTC) | 117.586663 W | 33.391237 N | 11S | 3694810.3 | 445441.97 |
| Keoni Calantas | 4 | 1/23/2015 | 9:52:23 AM | Inactive | Inactive | 220 | none | | 33 23.4696 N 117 35.1961 W::1/23/15 at 17:51:26 (UTC) | 117.586602 W | 33.391160 N | 11S | 3694810.3 | 445441.97 |
| Andrew Fisher | 1 | 12/19/2014 | 7:49:14 AM | Inactive | Inactive | 23 | none | multiple burrow entrances | 33 24.5076 N 117 34.6247 W::12/19/14 at 15:45:59 (UTC) | 117.577078 W | 33.408460 N | 11S | 3696717.85 | 446336.76 |
| Andrew Fisher | 2 | 12/29/2014 | 8:05:55 AM | Inactive | Inactive | 23 | none | multiple burrow entrances | 33 24.5062 N 117 34.6304 W::12/29/14 at 16:01:49 (UTC) | 117.577173 W | 33.408437 N | 11S | 3696717.85 | 446336.76 |
| Andrew Fisher | 3 | 1/9/2015 | 7:55:39 AM | Inactive | Inactive | 23 | none | occupied by ground squirrel | 33 24.5061 N 117 34.6305 W::1/9/15 at 15:50:43 (UTC) | 117.577175 W | 33.408435 N | 11S | 3696718.05 | 446332.53 |
| Keoni Calantas | 4 | 1/23/2015 | 8:35:50 AM | Inactive | Inactive | 23 | none | | 33 24.5079 N 117 34.6300 W::1/23/15 at 16:34:48 (UTC) | 117.577167 W | 33.408465 N | 11S | 3696718.05 | 446332.53 |
| Andrew Fisher | 1 | 12/19/2014 | 7:50:05 AM | Inactive | Inactive | 24 | none | | 33 24.5237 N 117 34.6417 W::12/19/14 at 15:46:57 (UTC) | 117.577362 W | 33.408728 N | 11S | 3696744.9 | 446319.66 |
| Andrew Fisher | 2 | 12/29/2014 | 8:03:48 AM | Inactive | Inactive | 24 | none | multiple burrow entrances | 33 24.5193 N 117 34.6356 W::12/29/14 at 16:00:03 (UTC) | 117.577260 W | 33.408655 N | 11S | 3696744.9 | 446319.66 |
| Andrew Fisher | 3 | 1/9/2015 | 7:54:58 AM | Inactive | Inactive | 24 | none | occupied by ground squirrel | 33 24.5167 N 117 34.6357 W::1/9/15 at 15:50:07 (UTC) | 117.577262 W | 33.408612 N | 11S | 3696738.75 | 446323.81 |
| Keoni Calantas | 4 | 1/23/2015 | 8:36:53 AM | Inactive | Inactive | 24 | none | | 33 24.5196 N 117 34.6362 W::1/23/15 at 16:35:50 (UTC) | 117.577270 W | 33.408660 N | 11S | 3696738.75 | 446323.81 |
| Andrew Fisher | 1 | 12/19/2014 | 7:58:09 AM | Inactive | Inactive | 25 | none | multiple burrow entrances | 33 24.4409 N 117 34.5997 W::12/19/14 at 15:54:55 (UTC) | 117.576663 W | 33.407358 N | 11S | 3696599.2 | 446377.53 |
| Brennan Mulrooney | 2 | 12/29/2014 | 8:08:46 AM | Inactive | Inactive | 25 | none | | 33 24.4442 N 117 34.6018 W::12/29/14 at 16:04:54 (UTC) | 117.576697 W | 33.407403 N | 11S | 3696599.2 | 446377.53 |
| Brennan Mulrooney | 3 | 1/9/2015 | 7:57:40 AM | Inactive | Inactive | 25 | none | | 33 24.4424 N 117 34.6020 W::1/9/15 at 15:53:01 (UTC) | 117.576695 W | 33.407435 N | 11S | 3696604.45 | 446374.91 |
| Andrew Fisher | 4 | 1/23/2015 | 7:39:02 AM | Inactive | Inactive | 25 | none | | 33 24.4452 N 117 34.6033 W::1/23/15 at 15:33:14 (UTC) | 117.576722 W | 33.407420 N | 11S | 3696604.45 | 446374.91 |
| Andrew Fisher | 1 | 12/19/2014 | 8:00:07 AM | Inactive | Inactive | 26 | none | | 33 24.4180 N 117 34.5657 W::12/19/14 at 15:56:51 (UTC) | 117.576095 W | 33.406967 N | 11S | 3696552.55 | 446431.995 |
| Andrew Fisher | 2 | 12/29/2014 | 8:10:18 AM | Inactive | Inactive | 26 | none | multiple burrow entrances | 33 24.4174 N 117 34.5653 W::12/29/14 at 16:06:27 (UTC) | 117.576088 W | 33.406957 N | 11S | 3696552.55 | 446431.995 |
| Andrew Fisher | 3 | 1/9/2015 | 8:00:17 AM | Inactive | Inactive | 26 | none | multiple burrow entrances | 33 24.4180 N 117 34.5664 W::1/9/15 at 15:55:22 (UTC) | 117.576107 W | 33.406967 N | 11S | 3696552.7 | 446431.95 |
| Andrew Fisher | 4 | 1/23/2015 | 7:35:30 AM | Inactive | Inactive | 26 | none | | 33 24.4176 N 117 34.5646 W::1/23/15 at 15:29:36 (UTC) | 117.576077 W | 33.406960 N | 11S | 3696552.7 | 446431.95 |
| Andrew Fisher | 1 | 12/19/2014 | 8:01:12 AM | Inactive | Inactive | 27 | none | multiple burrow entrances | 33 24.4141 N 117 34.5767 W::12/19/14 at 15:57:55 (UTC) | 117.576278 W | 33.406902 N | 11S | 3696545.05 | 446414.84 |
| Brennan Mulrooney | 2 | 12/29/2014 | 8:11:05 AM | Inactive | Inactive | 27 | none | | 33 24.4131 N 117 34.5768 W::12/29/14 at 16:07:23 (UTC) | 117.576273 W | 33.406885 N | 11S | 3696545.05 | 446414.84 |
| Brennan Mulrooney | 3 | 1/9/2015 | 8:01:21 AM | Inactive | Inactive | 27 | none | | 33 24.4147 N 117 34.5773 W::1/9/15 at 15:56:30 (UTC) | 117.576288 W | 33.406912 N | 11S | 3696546.25 | 446413.36 |
| Andrew Fisher | 4 | 1/23/2015 | 7:36:34 AM | Inactive | Inactive | 27 | none | | 33 24.4138 N 117 34.5777 W::1/23/15 at 15:30:34 (UTC) | 117.576295 W | 33.406897 N | 11S | 3696546.25 | 446413.36 |
| Andrew Fisher | 1 | 12/19/2014 | 8:02:07 AM | Inactive | Inactive | 28 | none | multiple burrow entrances | 33 24.3968 N 117 34.5727 W::12/19/14 at 15:58:58 (UTC) | 117.576212 W | 33.406613 N | 11S | 3696514.45 | 446422.67 |
| Matthew Kedziora | 2 | 12/29/2014 | 8:11:05 AM | Inactive | Inactive | 28 | none | | 33 24.3974 N 117 34.5700 W::12/29/14 at 16:10:04 (UTC) | 117.576167 W | 33.406623 N | 11S | 3696514.45 | 446422.67 |
| Brynne Mulrooney | 3 | 1/9/2015 | 7:57:13 AM | Inactive | Inactive | 28 | none | | 33 24.3991 N 117 34.5713 W::1/9/15 at 15:57:17 (UTC) | 117.576188 W | 33.406650 N | 11S | 3696518.45 | 446422.18 |
| Andrew Fisher | 4 | 1/23/2015 | 7:48:29 AM | Inactive | Inactive | 28 | none | | 33 24.3997 N 117 34.5718 W::1/23/15 at 15:42:28 (UTC) | 117.576202 W | 33.406658 N | 11S | 3696518.45 | 446422.18 |
| Andrew Fisher | 1 | 12/19/2014 | 8:03:18 AM | Inactive | Inactive | 29 | none | multiple burrow entrances | 33 24.3861 N 117 34.5557 W::12/19/14 at 16:00:07 (UTC) | 117.575928 W | 33.406435 N | 11S | 3696494.2 | 446446.685 |
| Brennan Mulrooney | 2 | 12/29/2014 | 8:12:33 AM | Inactive | Inactive | 29 | none | | 33 24.3863 N 117 34.5559 W::12/29/14 at 16:08:38 (UTC) | 117.575932 W | 33.406438 N | 11S | 3696494.2 | 446446.685 |
| Brynne Mulrooney | 3 | 1/9/2015 | 7:58:09 AM | Inactive | Inactive | 29 | none | | 33 24.3860 N 117 34.5561 W::1/9/15 at 15:58:21 (UTC) | 117.575935 W | 33.406433 N | 11S | 3696494.05 | 446445.665 |
| Andrew Fisher | 4 | 1/23/2015 | 7:33:53 AM | Inactive | Inactive | 29 | none | | 33 24.3862 N 117 34.5568 W::1/23/15 at 15:27:57 (UTC) | 117.575947 W | 33.406437 N | 11S | 3696494.05 | 446445.665 |
| Andrew Fisher | 1 | 12/19/2014 | 7:01:19 AM | Inactive | Inactive | 3 | none | 1 burrow | 33 24.5708 N 117 34.5460 W::12/19/14 at 14:58:06 (UTC) | 117.575767 W | 33.409513 N | 11S | 3696834.95 | 446463.59 |
| Andrew Fisher | 2 | 12/29/2014 | 7:00:55 AM | Inactive | Inactive | 3 | none | occupied by ground squirrel | 33 24.5705 N 117 34.5462 W::12/29/14 at 14:56:52 (UTC) | 117.575770 W | 33.409508 N | 11S | 3696834.95 | 446463.59 |
| Andrew Fisher | 3 | 1/9/2015 | 7:03:07 AM | Inactive | Inactive | 3 | none | occupied by ground squirrel | 33 24.5701 N 117 34.5471 W::1/9/15 at 14:58:18 (UTC) | 117.575785 W | 33.409502 N | 11S | 3696835.65 | 446460.76 |
| Andrew Fisher | 4 | 1/22/2015 | 3:08:26 PM | Inactive | Inactive | 3 | none | | 33 24.5719 N 117 34.5488 W::1/22/15 at 23:02:29 (UTC) | 117.575813 W | 33.409532 N | 11S | 3696835.65 | 446460.76 |
| Andrew Fisher | 1 | 12/19/2014 | 8:03:57 AM | Inactive | Inactive | 30 | none | multiple burrow entrances | 33 24.3833 N 117 34.5526 W::12/19/14 at 16:00:44 (UTC) | 117.575877 W | 33.406388 N | 11S | 3696487.8 | 446453.21 |
| Brennan Mulrooney | 2 | 12/29/2014 | 8:13:26 AM | Inactive | Inactive | 30 | none | | 33 24.3822 N 117 34.5505 W::12/29/14 at 16:09:30 (UTC) | 117.575842 W | 33.406370 N | 11S | 3696487.8 | 446453.21 |
| Brennan Mulrooney | 3 | 1/9/2015 | 8:03:24 AM | Inactive | Inactive | 30 | none | | 33 24.3829 N 117 34.5513 W::1/9/15 at 15:58:35 (UTC) | 117.575855 W | 33.406382 N | 11S | 3696487.9 | 446455.115 |
| Andrew Fisher | 4 | 1/23/2015 | 7:32:41 AM | Inactive | Inactive | 30 | none | | 33 24.3827 N 117 34.5494 W::1/23/15 at 15:27:06 (UTC) | 117.575823 W | 33.406378 N | 11S | 3696487.9 | 446455.115 |
| Andrew Fisher | 2 | 12/29/2014 | 6:56:21 AM | Inactive | Inactive | 300 | none | occupied by ground squirrel | 33 24.6007 N 117 34.5771 W::12/29/14 at 14:53:14 (UTC) | 117.576285 W | 33.410012 N | 11S | 3696890.8 | 446415.87 |
| Andrew Fisher | 3 | 1/9/2015 | 6:59:17 AM | Inactive | Inactive | 300 | none | occupied by ground squirrel | 33 24.6014 N 117 34.5800 W::1/9/15 at 14:54:52 (UTC) | 117.576333 W | 33.410023 N | 11S | 3696892.25 | 446407.84 |
| Andrew Fisher | 4 | 1/22/2015 | 3:03:41 PM | Inactive | Inactive | 300 | none | | 33 24.6016 N 117 34.5846 W::1/22/15 at 22:59:35 (UTC) | 117.576410 W | 33.410027 N | 11S | 3696892.25 | 446407.84 |
| Andrew Fisher | 2 | 12/29/2014 | 7:57:19 AM | Inactive | Inactive | 301 | none | multiple burrow entrances | 33 24.5164 N 117 34.6142 W::12/29/14 at 15:53:36 (UTC) | 117.576903 W | 33.408605 N | 11S | 3696735.1 | 446357.55 |
| Andrew Fisher | 3 | 1/9/2015 | 7:44:32 AM | Inactive | Inactive | 301 | none | occupied by ground squirrel | 33 24.5149 N 117 34.6136 W::1/9/15 at 15:39:36 (UTC) | 117.576893 W | 33.408582 N | 11S | 3696733.45 | 446358.93 |
| Andrew Fisher | 4 | 1/23/2015 | 8:39:50 AM | Inactive | Inactive | 301 | none | | 33 24.5159 N 117 34.6130 W::1/23/15 at 16:33:48 (UTC) | 117.576883 W | 33.408598 N | 11S | 3696733.45 | 446358.93 |
| Andrew Fisher | 2 | 12/29/2014 | 7:58:40 AM | Inactive | Inactive | 302 | none | multiple burrow entrances | 33 24.5216 N 117 34.6254 W::12/29/14 at 15:54:45 (UTC) | 117.577090 W | 33.408693 N | 11S | 3696745 | 446340.21 |
| Andrew Fisher | 3 | 1/9/2015 | 7:45:34 AM | Inactive | Inactive | 302 | none | occupied by ground squirrel | 33 24.5194 N 117 34.6250 W::1/9/15 at 15:40:40 (UTC) | 117.577085 W | 33.408657 N | 11S | 3696743.65 | 446340.665 |
| Andrew Fisher | 4 | 1/23/2015 | 8:41:18 AM | Inactive | Inactive | 302 | none | | 33 24.5223 N 117 34.6251 W::1/23/15 at 16:35:15 (UTC) | 117.577085 W | 33.408705 N | 11S | 3696743.65 | 446340.665 |
| Andrew Fisher | 2 | 12/29/2014 | 8:23:38 AM | Inactive | Inactive | 303 | none | multiple burrow entrances | 33 24.2443 N 117 34.4199 W::12/29/14 at 16:19:39 (UTC) | 117.573665 W | 33.404072 N | 11S | 3696230.9 | 446655.86 |
| Andrew Fisher | 3 | 1/9/2015 | 8:13:33 AM | Inactive | Inactive | 303 | none | multiple burrow entrances | 33 24.2439 N 117 34.4204 W::1/9/15 at 16:08:42 (UTC) | 117.573673 W | 33.404065 N | 11S | 3696229.95 | 446654.18 |
| Keoni Calantas | 4 | 1/23/2015 | 7:18:41 AM | Inactive | Inactive | 303 | none | | 33 24.2438 N 117 34.4216 W::1/23/15 at 15:17:33 (UTC) | 117.573693 W | 33.404062 N | 11S | 3696229.95 | 446654.18 |
| Andrew Fisher | 2 | 12/29/2014 | 8:25:14 AM | Inactive | Inactive | 304 | none | multiple burrow entrances | 33 24.2141 N 117 34.4016 W::12/29/14 at 16:21:19 (UTC) | 117.573360 W | 33.403568 N | 11S | 3696174.8 | 446683.91 |
| Andrew Fisher | 3 | 1/9/2015 | 8:14:57 AM | Inactive | Inactive | 304 | none | occupied by ground squirrel | 33 24.2181 N 117 34.4033 W::1/9/15 at 16:10:08 (UTC) | 117.573388 W | 33.403633 N | 11S | 3696184.55 | 446682.805 |

# Appendix C – Raw Field Data

| Primary_Bio | Survey Number | Date | Time | Cumulative_ Burrow_ Status | Field_ Burrow_ Status | Burrow ID | Sign | Notes | GPSLocation | Longitude | Latitude | Zone | Avg_ Northing_ Final | Avg_ Easting_ Final |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Keoni Calantas | 4 | 1/23/2015 | 7:17:03 AM | Inactive | Inactive | 304 | none | | 33 24.2207 N 117 34.4014 W::1/23/15 at 15:16:08 (UTC) | 117.573357 W | 33.403678 N | 11S | 3696184.55 | 446682.805 |
| Andrew Fisher | 2 | 12/29/2014 | 9:25:25 AM | Inactive | Inactive | 305 | none | multiple burrow entrances | 33 23.6713 N 117 35.2091 W::12/29/14 at 17:22:07 (UTC) | 117.586818 W | 33.394522 N | 11S | 3695178.9 | 445426.8 |
| Brennan Mulrooney | 3 | 1/9/2015 | 9:07:03 AM | Inactive | Inactive | 305 | none | | 33 23.6736 N 117 35.2107 W::1/9/15 at 17:02:18 (UTC) | 117.586845 W | 33.394560 N | 11S | 3695182.7 | 445424.91 |
| Donna Germann | 4 | 1/23/2015 | 8:55:46 AM | Inactive | Inactive | 305 | none | | 33 23.6732 N 117 35.2099 W::1/23/15 at 16:52:50 (UTC) | 117.586832 W | 33.394553 N | 11S | 3695182.7 | 445424.91 |
| Andrew Fisher | 2 | 12/29/2014 | 8:44:56 AM | Inactive | Inactive | 306 | none | occupied by ground squirrel | 33 24.2097 N 117 34.5036 W::12/29/14 at 16:40:58 (UTC) | 117.575062 W | 33.403497 N | 11S | 3696167.9 | 446525.6 |
| Andrew Fisher | 3 | 1/9/2015 | 8:31:08 AM | Inactive | Inactive | 306 | none | occupied by ground squirrel | 33 24.2082 N 117 34.5045 W::1/9/15 at 16:26:17 (UTC) | 117.575075 W | 33.403470 N | 11S | 3696165.45 | 446524.61 |
| Andrew Fisher | 4 | 1/23/2015 | 8:21:31 AM | Inactive | Inactive | 306 | none | | 33 24.2088 N 117 34.5042 W::1/23/15 at 16:15:35 (UTC) | 117.575070 W | 33.403480 N | 11S | 3696165.45 | 446524.61 |
| Andrew Fisher | 2 | 12/29/2014 | 9:33:02 AM | Inactive | Inactive | 307 | none | multiple burrow entrances | 33 23.5930 N 117 35.1872 W::12/29/14 at 17:29:12 (UTC) | 117.586453 W | 33.393217 N | 11S | 3695034 | 445459.93 |
| Brennan Mulrooney | 3 | 1/9/2015 | 9:10:51 AM | Inactive | Inactive | 307 | none | | 33 23.5946 N 117 35.1860 W::1/9/15 at 17:06:01 (UTC) | 117.586433 W | 33.393243 N | 11S | 3695035.8 | 445460.91 |
| Donna Germann | 4 | 1/23/2015 | 9:24:26 AM | Inactive | Inactive | 307 | none | | 33 23.5934 N 117 35.1871 W::1/23/15 at 17:21:19 (UTC) | 117.586452 W | 33.393223 N | 11S | 3695035.8 | 445460.91 |
| Andrew Fisher | 2 | 12/29/2014 | 9:39:13 AM | Inactive | Inactive | 308 | none | multiple burrow entrances | 33 23.5321 N 117 35.1427 W::12/29/14 at 17:35:20 (UTC) | 117.585712 W | 33.392202 N | 11S | 3694921.1 | 445528.21 |
| Brennan Mulrooney | 3 | 1/9/2015 | 9:13:44 AM | Inactive | Inactive | 308 | none | | 33 23.5352 N 117 35.1417 W::1/9/15 at 17:08:55 (UTC) | 117.585695 W | 33.392253 N | 11S | 3694924.5 | 445530.275 |
| Donna Germann | 4 | 1/23/2015 | 9:19:08 AM | Inactive | Inactive | 308 | none | | 33 23.5328 N 117 35.1411 W::1/23/15 at 17:16:00 (UTC) | 117.585685 W | 33.392213 N | 11S | 3694924.5 | 445530.275 |
| Andrew Fisher | 2 | 12/29/2014 | 9:44:12 AM | Inactive | Inactive | 309 | none | multiple burrow entrances | 33 23.4796 N 117 35.0886 W::12/29/14 at 17:40:15 (UTC) | 117.584812 W | 33.391327 N | 11S | 3694823.6 | 445611.36 |
| Brennan Mulrooney | 3 | 1/9/2015 | 9:19:36 AM | Inactive | Inactive | 309 | none | | 33 23.4800 N 117 35.0881 W::1/9/15 at 17:14:46 (UTC) | 117.584803 W | 33.391335 N | 11S | 3694823.4 | 445612.2 |
| Donna Germann | 4 | 1/23/2015 | 9:15:34 AM | Inactive | Inactive | 309 | none | | 33 23.4789 N 117 35.0882 W::1/23/15 at 17:12:26 (UTC) | 117.584803 W | 33.391315 N | 11S | 3694823.4 | 445612.2 |
| Andrew Fisher | 1 | 12/19/2014 | 8:07:58 AM | Inactive | Inactive | 31 | none | multiple burrow entrances | 33 24.3281 N 117 34.5164 W::12/19/14 at 16:04:56 (UTC) | 117.575273 W | 33.405468 N | 11S | 3696390.933 | 446507.4633 |
| Matthew Kedziora | 2 | 12/29/2014 | 8:15:53 AM | Inactive | Inactive | 31 | none | | 33 24.3296 N 117 34.5152 W::12/29/14 at 16:14:54 (UTC) | 117.575243 W | 33.405498 N | 11S | 3696390.933 | 446507.4633 |
| Brynne Mulrooney | 3 | 1/9/2015 | 8:01:13 AM | Inactive | Inactive | 31 | none | | 33 24.3318 N 117 34.5178 W::1/9/15 at 16:01:16 (UTC) | 117.575297 W | 33.405530 N | 11S | 3696392.3 | 446505.17 |
| Andrew Fisher | 4 | 1/23/2015 | 7:51:56 AM | Inactive | Inactive | 31 | none | | 33 24.3306 N 117 34.5176 W::1/23/15 at 15:46:03 (UTC) | 117.575293 W | 33.405510 N | 11S | 3696392.3 | 446505.17 |
| Andrew Fisher | 2 | 12/29/2014 | 9:46:38 AM | Inactive | Inactive | 310 | none | multiple burrow entrances | 33 23.4599 N 117 35.0768 W::12/29/14 at 17:42:41 (UTC) | 117.584613 W | 33.390998 N | 11S | 3694787 | 445629.67 |
| Andrew Fisher | 3 | 1/9/2015 | 9:23:25 AM | Inactive | Inactive | 310 | none | occupied by ground squirrel | 33 23.4588 N 117 35.0753 W::1/9/15 at 17:18:34 (UTC) | 117.584588 W | 33.390980 N | 11S | 3694784.55 | 445631.885 |
| Donna Germann | 4 | 1/23/2015 | 9:13:56 AM | Inactive | Inactive | 310 | none | | 33 23.4583 N 117 35.0754 W::1/23/15 at 17:10:49 (UTC) | 117.584590 W | 33.390972 N | 11S | 3694784.55 | 445631.885 |
| Andrew Fisher | 2 | 12/29/2014 | 7:07:20 AM | Inactive | Inactive | 311 | none | multiple burrow entrances | 33 24.5282 N 117 34.5126 W::12/29/14 at 15:03:23 (UTC) | 117.575210 W | 33.408803 N | 11S | 3696756.2 | 446515.09 |
| Andrew Fisher | 3 | 1/9/2015 | 7:07:03 AM | Inactive | Inactive | 311 | none | multiple burrow entrances | 33 24.5301 N 117 34.5140 W::1/9/15 at 15:02:07 (UTC) | 117.575233 W | 33.408835 N | 11S | 3696758.85 | 446513.195 |
| Andrew Fisher | 4 | 1/22/2015 | 3:11:41 PM | Inactive | Inactive | 311 | none | | 33 24.5291 N 117 34.5137 W::1/22/15 at 23:05:43 (UTC) | 117.575228 W | 33.408818 N | 11S | 3696758.85 | 446513.195 |
| Andrew Fisher | 2 | 12/29/2014 | 10:00:39 AM | Inactive | Inactive | 312 | none | multiple burrow entrances | 33 23.5360 N 117 35.1591 W::12/29/14 at 17:56:48 (UTC) | 117.585985 W | 33.392267 N | 11S | 3694928.5 | 445502.86 |
| Brennan Mulrooney | 3 | 1/9/2015 | 9:37:10 AM | Inactive | Inactive | 312 | none | | 33 23.5403 N 117 35.1608 W::1/9/15 at 17:32:28 (UTC) | 117.586013 W | 33.392338 N | 11S | 3694933.65 | 445500.565 |
| Keoni Calantas | 4 | 1/23/2015 | 9:17:56 AM | Inactive | Inactive | 312 | none | | 33 23.5374 N 117 35.1605 W::1/23/15 at 17:17:09 (UTC) | 117.586007 W | 33.392290 N | 11S | 3694933.65 | 445500.565 |
| Andrew Fisher | 2 | 12/29/2014 | 10:03:05 AM | Inactive | Inactive | 313 | none | occupied by ground squirrel | 33 23.5736 N 117 35.1843 W::12/29/14 at 17:59:10 (UTC) | 117.586405 W | 33.392893 N | 11S | 3694998.1 | 445464.19 |
| Brennan Mulrooney | 3 | 1/9/2015 | 9:39:44 AM | Inactive | Inactive | 313 | none | | 33 23.5751 N 117 35.1863 W::1/9/15 at 17:34:53 (UTC) | 117.586438 W | 33.392918 N | 11S | 3694999.6 | 445461.41 |
| Keoni Calantas | 4 | 1/23/2015 | 9:20:34 AM | Inactive | Inactive | 313 | none | | 33 23.5737 N 117 35.1859 W::1/23/15 at 17:19:30 (UTC) | 117.586432 W | 33.392895 N | 11S | 3694999.6 | 445461.41 |
| Andrew Fisher | 2 | 12/29/2014 | 10:09:22 AM | Inactive | Inactive | 314 | none | multiple burrow entrances | 33 23.6772 N 117 35.2413 W::12/29/14 at 18:05:26 (UTC) | 117.587355 W | 33.394620 N | 11S | 3695190 | 445376.92 |
| Brynne Mulrooney | 3 | 1/9/2015 | 9:39:52 AM | Inactive | Inactive | 314 | none | | 33 23.6775 N 117 35.2430 W::1/9/15 at 17:40:02 (UTC) | 117.587378 W | 33.394628 N | 11S | 3695190.6 | 445373.29 |
| Andrew Fisher | 4 | 1/23/2015 | 9:29:31 AM | Inactive | Inactive | 314 | none | | 33 23.6773 N 117 35.2446 W::1/23/15 at 17:23:31 (UTC) | 117.587410 W | 33.394622 N | 11S | 3695190.6 | 445373.29 |
| Andrew Fisher | 2 | 12/29/2014 | 10:18:35 AM | Inactive | Inactive | 315 | none | multiple burrow entrances | 33 23.5413 N 117 35.2613 W::12/29/14 at 18:14:46 (UTC) | 117.587688 W | 33.392355 N | 11S | 3694939.1 | 445344.53 |
| Brennan Mulrooney | 3 | 1/9/2015 | 9:51:57 AM | Inactive | Inactive | 315 | none | | 33 23.5477 N 117 35.2648 W::1/9/15 at 17:47:55 (UTC) | 117.587745 W | 33.392463 N | 11S | 3694951.4 | 445339.67 |
| Keoni Calantas | 4 | 1/23/2015 | 10:00:07 AM | Inactive | Inactive | 315 | none | | 33 23.5481 N 117 35.2642 W::1/23/15 at 17:59:00 (UTC) | 117.587737 W | 33.392468 N | 11S | 3694951.4 | 445339.67 |
| Andrew Fisher | 2 | 12/29/2014 | 10:19:39 AM | Inactive | Inactive | 316 | none | multiple burrow entrances | 33 23.5337 N 117 35.2549 W::12/29/14 at 18:15:44 (UTC) | 117.587582 W | 33.392228 N | 11S | 3694925 | 445354.31 |
| Brynne Mulrooney | 3 | 1/9/2015 | 9:48:05 AM | Inactive | Inactive | 316 | none | | 33 23.5339 N 117 35.2563 W::1/9/15 at 17:48:09 (UTC) | 117.587605 W | 33.392232 N | 11S | 3694923.65 | 445353.325 |
| Keoni Calantas | 4 | 1/23/2015 | 9:59:09 AM | Inactive | Inactive | 316 | none | | 33 23.5320 N 117 35.2548 W::1/23/15 at 17:58:06 (UTC) | 117.587580 W | 33.392200 N | 11S | 3694923.65 | 445353.325 |
| Andrew Fisher | 2 | 12/29/2014 | 10:25:41 AM | Inactive | Inactive | 317 | none | multiple burrow entrances | 33 23.4692 N 117 35.2021 W::12/29/14 at 18:22:09 (UTC) | 117.586702 W | 33.391153 N | 11S | 3694805.3 | 445435.48 |
| Brynne Mulrooney | 3 | 1/9/2015 | 9:53:49 AM | Inactive | Inactive | 317 | none | | 33 23.4689 N 117 35.2011 W::1/9/15 at 17:53:53 (UTC) | 117.586685 W | 33.391148 N | 11S | 3694805 | 445436.455 |
| Andrew Fisher | 4 | 1/23/2015 | 9:59:41 AM | Inactive | Inactive | 317 | none | | 33 23.4691 N 117 35.2019 W::1/23/15 at 17:53:51 (UTC) | 117.586698 W | 33.391152 N | 11S | 3694805 | 445436.455 |
| Andrew Fisher | 2 | 12/29/2014 | 10:29:32 AM | Inactive | Inactive | 318 | none | multiple burrow entrances | 33 23.4962 N 117 35.2590 W::12/29/14 at 18:25:40 (UTC) | 117.587650 W | 33.391603 N | 11S | 3694855.7 | 445347.59 |
| Brennan Mulrooney | 3 | 1/9/2015 | 10:02:34 AM | Inactive | Inactive | 318 | none | | 33 23.4964 N 117 35.2587 W::1/9/15 at 17:57:43 (UTC) | 117.587645 W | 33.391607 N | 11S | 3694855.2 | 445347.915 |
| Andrew Fisher | 4 | 1/23/2015 | 10:04:03 AM | Inactive | Inactive | 318 | none | | 33 23.4954 N 117 35.2589 W::1/23/15 at 17:57:58 (UTC) | 117.587648 W | 33.391590 N | 11S | 3694855.2 | 445347.915 |
| Andrew Fisher | 2 | 12/29/2014 | 7:27:45 AM | Inactive | Inactive | 319 | none | multiple burrow entrances | 33 24.2914 N 117 34.3588 W::12/29/14 at 15:23:48 (UTC) | 117.572647 W | 33.404857 N | 11S | 3696317.4 | 446751 |
| Brennan Mulrooney | 3 | 1/9/2015 | 7:21:26 AM | Inactive | Inactive | 319 | none | | 33 24.2870 N 117 34.3563 W::1/9/15 at 15:16:49 (UTC) | 117.572605 W | 33.404783 N | 11S | 3696311.4 | 446754.035 |
| Andrew Fisher | 4 | 1/22/2015 | 3:21:41 PM | Inactive | Inactive | 319 | none | | 33 24.2894 N 117 34.3574 W::1/22/15 at 23:15:49 (UTC) | 117.572623 W | 33.404823 N | 11S | 3696311.4 | 446754.035 |
| Andrew Fisher | 1 | 12/19/2014 | 8:09:56 AM | Inactive | Inactive | 32 | none | multiple burrow entrances | 33 24.3049 N 117 34.4852 W::12/19/14 at 16:06:39 (UTC) | 117.574753 W | 33.405082 N | 11S | 3696343.7 | 446554.745 |
| Brennan Mulrooney | 2 | 12/29/2014 | 8:18:59 AM | Inactive | Inactive | 32 | none | | 33 24.3052 N 117 34.4859 W::12/29/14 at 16:15:03 (UTC) | 117.574765 W | 33.405087 N | 11S | 3696343.7 | 446554.745 |
| Brennan Mulrooney | 3 | 1/9/2015 | 8:07:59 AM | Inactive | Inactive | 32 | none | | 33 24.3095 N 117 34.4852 W::1/9/15 at 16:03:21 (UTC) | 117.574753 W | 33.405158 N | 11S | 3696347.5 | 446554.305 |
| Andrew Fisher | 4 | 1/23/2015 | 7:27:49 AM | Inactive | Inactive | 32 | none | | 33 24.3048 N 117 34.4865 W::1/23/15 at 15:21:58 (UTC) | 117.574775 W | 33.405080 N | 11S | 3696347.5 | 446554.305 |

# Appendix C – Raw Field Data

| Primary_Bio | Survey Number | Date | Time | Cumulative_ Burrow_ Status | Field_ Burrow_ Status | Burrow ID | Sign | Notes | GPSLocation | Longitude | Latitude | Zone | Avg_ Northing_ Final | Avg_ Easting_ Final |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Andrew Fisher | 2 | 12/29/2014 | 7:29:51 AM | Inactive | Inactive | 320 | none | occupied by ground squirrel | 33 24.2594 N 117 34.3162 W::12/29/14 at 15:25:50 (UTC) | 117.571937 W | 33.404323 N | 11S | 3696257.8 | 446816.7 |
| Andrew Fisher | 3 | 1/9/2015 | 7:21:54 AM | Inactive | Inactive | 320 | none | occupied by ground squirrel | 33 24.2603 N 117 34.3154 W::1/9/15 at 15:17:13 (UTC) | 117.571923 W | 33.404338 N | 11S | 3696260.3 | 446816.06 |
| Andrew Fisher | 4 | 1/22/2015 | 3:23:23 PM | Inactive | Inactive | 320 | none | | 33 24.2611 N 117 34.3179 W::1/22/15 at 23:17:31 (UTC) | 117.571965 W | 33.404352 N | 11S | 3696260.3 | 446816.06 |
| Andrew Fisher | 2 | 12/29/2014 | 7:42:35 AM | Inactive | Inactive | 321 | none | multiple burrow entrances | 33 24.2635 N 117 34.4249 W::12/29/14 at 15:38:43 (UTC) | 117.573748 W | 33.404392 N | 11S | 3696266.4 | 446648.34 |
| Andrew Fisher | 3 | 1/9/2015 | 7:30:30 AM | Inactive | Inactive | 321 | none | multiple burrow entrances | 33 24.2627 N 117 34.4251 W::1/9/15 at 15:25:34 (UTC) | 117.573752 W | 33.404378 N | 11S | 3696265.7 | 446648.845 |
| Donna Germann | 4 | 1/23/2015 | 7:20:15 AM | Inactive | Inactive | 321 | none | | 33 24.2636 N 117 34.4240 W::1/23/15 at 15:17:10 (UTC) | 117.573733 W | 33.404393 N | 11S | 3696265.7 | 446648.845 |
| Andrew Fisher | 2 | 12/29/2014 | 7:48:02 AM | Inactive | Inactive | 322 | none | multiple burrow entrances | 33 24.3627 N 117 34.4983 W::12/29/14 at 15:44:14 (UTC) | 117.574972 W | 33.406045 N | 11S | 3696450.3 | 446535.53 |
| Andrew Fisher | 3 | 1/9/2015 | 7:35:40 AM | Inactive | Inactive | 322 | none | multiple burrow entrances | 33 24.3643 N 117 34.4989 W::1/9/15 at 15:30:53 (UTC) | 117.574985 W | 33.406072 N | 11S | 3696451.7 | 446533.54 |
| Donna Germann | 4 | 1/23/2015 | 7:28:36 AM | Inactive | Inactive | 322 | none | | 33 24.3626 N 117 34.5001 W::1/23/15 at 15:25:34 (UTC) | 117.575002 W | 33.406043 N | 11S | 3696451.7 | 446533.54 |
| Andrew Fisher | 2 | 12/29/2014 | 7:43:24 AM | Inactive | Inactive | 323 | none | multiple burrow entrances | 33 24.2644 N 117 34.4299 W::12/29/14 at 15:39:29 (UTC) | 117.573832 W | 33.404407 N | 11S | 3696268.1 | 446640.53 |
| Andrew Fisher | 3 | 1/9/2015 | 7:31:14 AM | Inactive | Inactive | 323 | none | multiple burrow entrances | 33 24.2645 N 117 34.4303 W::1/9/15 at 15:26:17 (UTC) | 117.573838 W | 33.404408 N | 11S | 3696269.15 | 446641.195 |
| Donna Germann | 4 | 1/23/2015 | 7:20:53 AM | Inactive | Inactive | 323 | none | | 33 24.2655 N 117 34.4287 W::1/23/15 at 15:17:51 (UTC) | 117.573812 W | 33.404425 N | 11S | 3696269.15 | 446641.195 |
| Andrew Fisher | 2 | 12/29/2014 | 7:49:17 AM | Inactive | Inactive | 324 | none | occupied by ground squirrel | 33 24.3706 N 117 34.5087 W::12/29/14 at 15:45:24 (UTC) | 117.575145 W | 33.406177 N | 11S | 3696465 | 446519.52 |
| Andrew Fisher | 3 | 1/9/2015 | 7:36:31 AM | Inactive | Inactive | 324 | none | occupied by ground squirrel | 33 24.3705 N 117 34.5099 W::1/9/15 at 15:31:36 (UTC) | 117.575165 W | 33.406175 N | 11S | 3696465.8 | 446518.365 |
| Donna Germann | 4 | 1/23/2015 | 7:29:24 AM | Inactive | Inactive | 324 | none | | 33 24.3715 N 117 34.5091 W::1/23/15 at 15:26:18 (UTC) | 117.575150 W | 33.406193 N | 11S | 3696465.8 | 446518.365 |
| Andrew Fisher | 2 | 12/29/2014 | 7:51:15 AM | Inactive | Inactive | 325 | none | multiple burrow entrances | 33 24.4124 N 117 34.5351 W::12/29/14 at 15:47:16 (UTC) | 117.575585 W | 33.406873 N | 11S | 3696542.4 | 446479.04 |
| Andrew Fisher | 3 | 1/9/2015 | 7:38:58 AM | Inactive | Inactive | 325 | none | multiple burrow entrances | 33 24.4136 N 117 34.5363 W::1/9/15 at 15:34:09 (UTC) | 117.575607 W | 33.406892 N | 11S | 3696543.45 | 446476.065 |
| Donna Germann | 4 | 1/23/2015 | 7:31:39 AM | Inactive | Inactive | 325 | none | | 33 24.4124 N 117 34.5376 W::1/23/15 at 15:28:42 (UTC) | 117.575627 W | 33.406873 N | 11S | 3696543.45 | 446476.065 |
| Andrew Fisher | 2 | 12/29/2014 | 7:53:06 AM | Inactive | Inactive | 326 | none | multiple burrow entrances | 33 24.4344 N 117 34.5543 W::12/29/14 at 15:49:10 (UTC) | 117.575905 W | 33.407240 N | 11S | 3696583.3 | 446449.51 |
| Andrew Fisher | 3 | 1/9/2015 | 7:40:36 AM | Inactive | Inactive | 326 | none | occupied by ground squirrel | 33 24.4341 N 117 34.5548 W::1/9/15 at 15:35:38 (UTC) | 117.575913 W | 33.407235 N | 11S | 3696583.25 | 446448.345 |
| Donna Germann | 4 | 1/23/2015 | 7:33:08 AM | Inactive | Inactive | 326 | none | | 33 24.4347 N 117 34.5553 W::1/23/15 at 15:30:00 (UTC) | 117.575922 W | 33.407245 N | 11S | 3696583.25 | 446448.345 |
| Andrew Fisher | 2 | 12/29/2014 | 7:52:00 AM | Inactive | Inactive | 327 | none | multiple burrow entrances | 33 24.4184 N 117 34.5403 W::12/29/14 at 15:48:02 (UTC) | 117.575672 W | 33.406973 N | 11S | 3696553.5 | 446471.01 |
| Andrew Fisher | 3 | 1/9/2015 | 7:39:35 AM | Inactive | Inactive | 327 | none | multiple burrow entrances | 33 24.4186 N 117 34.5409 W::1/9/15 at 15:34:37 (UTC) | 117.575682 W | 33.406977 N | 11S | 3696558.2 | 446468.245 |
| Donna Germann | 4 | 1/23/2015 | 7:32:30 AM | Inactive | Inactive | 327 | none | | 33 24.4232 N 117 34.5433 W::1/23/15 at 15:29:25 (UTC) | 117.575722 W | 33.407053 N | 11S | 3696558.2 | 446468.245 |
| Brennan Mulrooney | 2 | 12/29/2014 | 7:26:53 AM | Inactive | Inactive | 328 | none | | 33 24.2791 N 117 34.3455 W::12/29/14 at 15:23:14 (UTC) | 117.572425 W | 33.404652 N | 11S | 3696294.6 | 446771.52 |
| Brennan Mulrooney | 3 | 1/9/2015 | 7:22:39 AM | Inactive | Inactive | 328 | none | | 33 24.2820 N 117 34.3482 W::1/9/15 at 15:17:51 (UTC) | 117.572470 W | 33.404700 N | 11S | 3696300 | 446766.665 |
| Andrew Fisher | 4 | 1/22/2015 | 3:22:23 PM | Inactive | Inactive | 328 | none | | 33 24.2821 N 117 34.3492 W::1/22/15 at 23:16:28 (UTC) | 117.572485 W | 33.404702 N | 11S | 3696300 | 446766.665 |
| Brennan Mulrooney | 2 | 12/29/2014 | 8:10:16 AM | Inactive | Inactive | 329 | none | | 33 24.4277 N 117 34.5869 W::12/29/14 at 16:06:23 (UTC) | 117.576448 W | 33.407128 N | 11S | 3696571.1 | 446398.95 |
| Brennan Mulrooney | 3 | 1/9/2015 | 8:00:25 AM | Inactive | Inactive | 329 | none | | 33 24.4272 N 117 34.5877 W::1/9/15 at 15:55:36 (UTC) | 117.576462 W | 33.407120 N | 11S | 3696570 | 446398.895 |
| Andrew Fisher | 4 | 1/23/2015 | 7:37:24 AM | Inactive | Inactive | 329 | none | | 33 24.4269 N 117 34.5860 W::1/23/15 at 15:31:56 (UTC) | 117.576435 W | 33.407115 N | 11S | 3696570 | 446398.895 |
| Andrew Fisher | 1 | 12/19/2014 | 8:10:29 AM | Inactive | Inactive | 33 | none | multiple burrow entrances | 33 24.2984 N 117 34.4794 W::12/19/14 at 16:07:13 (UTC) | 117.574657 W | 33.404973 N | 11S | 3696331.8 | 446563.8 |
| Brennan Mulrooney | 2 | 12/29/2014 | 8:19:28 AM | Inactive | Inactive | 33 | none | | 33 24.2989 N 117 34.4799 W::12/29/14 at 16:15:31 (UTC) | 117.574665 W | 33.404982 N | 11S | 3696331.8 | 446563.8 |
| Brennan Mulrooney | 3 | 1/9/2015 | 8:08:45 AM | Inactive | Inactive | 33 | none | | 33 24.2974 N 117 34.4794 W::1/9/15 at 16:03:53 (UTC) | 117.574657 W | 33.404957 N | 11S | 3696332.75 | 446561.245 |
| Andrew Fisher | 4 | 1/23/2015 | 7:26:48 AM | Inactive | Inactive | 33 | none | | 33 24.3009 N 117 34.4832 W::1/23/15 at 15:21:03 (UTC) | 117.574720 W | 33.405015 N | 11S | 3696332.75 | 446561.245 |
| Brennan Mulrooney | 2 | 12/29/2014 | 8:49:33 AM | Inactive | Inactive | 330 | none | | 33 24.2918 N 117 34.5561 W::12/29/14 at 16:45:49 (UTC) | 117.575935 W | 33.404863 N | 11S | 3696319.7 | 446445.26 |
| Brennan Mulrooney | 3 | 1/9/2015 | 8:34:26 AM | Inactive | Inactive | 330 | none | | 33 24.2922 N 117 34.5567 W::1/9/15 at 16:29:47 (UTC) | 117.575945 W | 33.404870 N | 11S | 3696345.55 | 446447.025 |
| Keoni Calantas | 4 | 1/23/2015 | 8:20:10 AM | Inactive | Inactive | 330 | none | | 33 24.3193 N 117 34.5534 W::1/23/15 at 16:19:07 (UTC) | 117.575890 W | 33.405322 N | 11S | 3696345.55 | 446447.025 |
| Brennan Mulrooney | 2 | 12/29/2014 | 10:17:25 AM | Inactive | Inactive | 331 | none | | 33 23.5721 N 117 35.2494 W::12/29/14 at 18:14:31 (UTC) | 117.587490 W | 33.392868 N | 11S | 3694995.9 | 445363.27 |
| Andrew Fisher | 3 | 1/9/2015 | 9:50:29 AM | Inactive | Inactive | 331 | none | multiple burrow entrances | 33 23.5726 N 117 35.2486 W::1/9/15 at 17:45:38 (UTC) | 117.587477 W | 33.392877 N | 11S | 3694996.75 | 445364.435 |
| Donna Germann | 4 | 1/23/2015 | 9:34:44 AM | Inactive | Inactive | 331 | none | | 33 23.5725 N 117 35.2487 W::1/23/15 at 17:31:35 (UTC) | 117.587478 W | 33.392875 N | 11S | 3694996.75 | 445364.435 |
| Matthew Kedziora | 2 | 12/29/2014 | 6:58:41 AM | Inactive | Inactive | 332 | none | | 33 24.5778 N 117 34.5864 W::12/29/14 at 14:57:58 (UTC) | 117.576443 W | 33.409632 N | 11S | 3696848.7 | 446400.95 |
| Brynne Mulrooney | 3 | 1/9/2015 | 6:57:00 AM | Inactive | Inactive | 332 | none | Mammal tracks | 33 24.5788 N 117 34.5900 W::1/9/15 at 14:57:36 (UTC) | 117.576500 W | 33.409647 N | 11S | 3696849.65 | 446396.025 |
| Andrew Fisher | 4 | 1/22/2015 | 3:47:09 PM | Inactive | Inactive | 332 | none | | 33 24.5780 N 117 34.5895 W::1/22/15 at 23:41:12 (UTC) | 117.576492 W | 33.409633 N | 11S | 3696849.65 | 446396.025 |
| Matthew Kedziora | 2 | 12/29/2014 | 7:04:56 AM | Inactive | Inactive | 333 | none | | 33 24.5173 N 117 34.5354 W::12/29/14 at 15:04:17 (UTC) | 117.575590 W | 33.408622 N | 11S | 3696736.3 | 446479.64 |
| Brynne Mulrooney | 3 | 1/9/2015 | 7:02:22 AM | Inactive | Inactive | 333 | none | | 33 24.5176 N 117 34.5372 W::1/9/15 at 15:02:36 (UTC) | 117.575620 W | 33.408627 N | 11S | 3696732.9 | 446476.605 |
| Andrew Fisher | 4 | 1/22/2015 | 3:49:34 PM | Inactive | Inactive | 333 | none | | 33 24.5133 N 117 34.5375 W::1/22/15 at 23:43:34 (UTC) | 117.575625 W | 33.408555 N | 11S | 3696732.9 | 446476.605 |
| Matthew Kedziora | 2 | 12/29/2014 | 7:17:11 AM | Inactive | Inactive | 334 | none | | 33 24.3871 N 117 34.4422 W::12/29/14 at 15:16:13 (UTC) | 117.574037 W | 33.406452 N | 11S | 3696494.9 | 446622.72 |
| Brynne Mulrooney | 3 | 1/9/2015 | 7:10:55 AM | Inactive | Inactive | 334 | none | | 33 24.3886 N 117 34.4443 W::1/9/15 at 15:11:09 (UTC) | 117.574072 W | 33.406477 N | 11S | 3696497.05 | 446619.48 |
| Andrew Fisher | 4 | 1/22/2015 | 4:00:08 PM | Inactive | Inactive | 334 | none | | 33 24.3879 N 117 34.4443 W::1/22/15 at 23:54:08 (UTC) | 117.574072 W | 33.406465 N | 11S | 3696497.05 | 446619.48 |
| Matthew Kedziora | 2 | 12/29/2014 | 7:37:57 AM | Inactive | Inactive | 335 | none | | 33 24.2237 N 117 34.3700 W::12/29/14 at 15:36:58 (UTC) | 117.572830 W | 33.403690 N | 11S | 3696188.1 | 446733.27 |
| Brennan Mulrooney | 3 | 1/9/2015 | 7:28:07 AM | Inactive | Inactive | 335 | none | | 33 24.2150 N 117 34.3734 W::1/9/15 at 15:23:30 (UTC) | 117.572890 W | 33.403583 N | 11S | 3696179.15 | 446731.27 |
| Donna Germann | 4 | 1/23/2015 | 7:12:41 AM | Inactive | Inactive | 335 | none | | 33 24.2181 N 117 34.3687 W::1/23/15 at 15:09:35 (UTC) | 117.572812 W | 33.403635 N | 11S | 3696179.15 | 446731.27 |
| Matthew Kedziora | 2 | 12/29/2014 | 7:42:46 AM | Inactive | Inactive | 336 | none | | 33 24.3299 N 117 34.4458 W::12/29/14 at 15:41:44 (UTC) | 117.574097 W | 33.405498 N | 11S | 3696389.2 | 446616.56 |
| Brynne Mulrooney | 3 | 1/9/2015 | 7:30:22 AM | Inactive | Inactive | 336 | none | | 33 24.3307 N 117 34.4461 W::1/9/15 at 15:30:36 (UTC) | 117.574102 W | 33.405512 N | 11S | 3696389.85 | 446616.05 |

# Appendix C – Raw Field Data

| Primary_Bio | Survey Number | Date | Time | Cumulative_ Burrow_ Status | Field_ Burrow_ Status | Burrow ID | Sign | Notes | GPSLocation | Longitude | Latitude | Zone | Avg_ Northing_ Final | Avg_ Easting_ Final |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Keoni Calantas | 4 | 1/23/2015 | 7:06:40 AM | Inactive | Inactive | 336 | none | | 33 24.3297 N 117 34.4462 W::1/23/15 at 15:05:32 (UTC) | 117.574103 W | 33.405495 N | 11S | 3696389.85 | 446616.05 |
| Matthew Kedziora | 2 | 12/29/2014 | 7:47:07 AM | Inactive | Inactive | 337 | none | | 33 24.4102 N 117 34.5081 W::12/29/14 at 15:46:09 (UTC) | 117.575135 W | 33.406837 N | 11S | 3696538.2 | 446520.86 |
| Brynne Mulrooney | 3 | 1/9/2015 | 7:34:07 AM | Inactive | Inactive | 337 | none | | 33 24.4146 N 117 34.5072 W::1/9/15 at 15:34:20 (UTC) | 117.575102 W | 33.406890 N | 11S | 3696541.8 | 446514.6 |
| Keoni Calantas | 4 | 1/23/2015 | 7:02:50 AM | Inactive | Inactive | 337 | none | | 33 24.4109 N 117 34.5182 W::1/23/15 at 15:01:47 (UTC) | 117.575303 W | 33.406848 N | 11S | 3696541.8 | 446514.6 |
| Matthew Kedziora | 2 | 12/29/2014 | 7:51:35 AM | Inactive | Inactive | 338 | none | | 33 24.4772 N 117 34.5600 W::12/29/14 at 15:50:34 (UTC) | 117.576000 W | 33.407953 N | 11S | 3696662.4 | 446441.11 |
| Brynne Mulrooney | 3 | 1/9/2015 | 7:37:54 AM | Inactive | Inactive | 338 | none | | 33 24.4760 N 117 34.5569 W::1/9/15 at 15:38:10 (UTC) | 117.575948 W | 33.407933 N | 11S | 3696661.6 | 446446.17 |
| Keoni Calantas | 4 | 1/23/2015 | 6:59:23 AM | Inactive | Inactive | 338 | none | | 33 24.4776 N 117 34.5566 W::1/23/15 at 14:58:15 (UTC) | 117.575943 W | 33.407960 N | 11S | 3696661.6 | 446446.17 |
| Matthew Kedziora | 2 | 12/29/2014 | 7:54:39 AM | Inactive | Inactive | 339 | none | | 33 24.5214 N 117 34.5953 W::12/29/14 at 15:53:42 (UTC) | 117.576588 W | 33.408690 N | 11S | 3696744.4 | 446386.89 |
| Brynne Mulrooney | 3 | 1/9/2015 | 7:43:01 AM | Inactive | Inactive | 339 | none | | 33 24.5185 N 117 34.5920 W::1/9/15 at 15:43:06 (UTC) | 117.576533 W | 33.408642 N | 11S | 3696739.55 | 446392.81 |
| Keoni Calantas | 4 | 1/23/2015 | 6:55:14 AM | Inactive | Inactive | 339 | none | | 33 24.5191 N 117 34.5909 W::1/23/15 at 14:54:09 (UTC) | 117.576515 W | 33.408652 N | 11S | 3696739.55 | 446392.81 |
| Andrew Fisher | 1 | 12/19/2014 | 8:12:01 AM | Inactive | Inactive | 34 | none | multiple burrow entrances | 33 24.2701 N 117 34.4622 W::12/19/14 at 16:08:44 (UTC) | 117.574370 W | 33.404502 N | 11S | 3696278.8 | 446592.05 |
| Brennan Mulrooney | 2 | 12/29/2014 | 8:20:52 AM | Inactive | Inactive | 34 | none | | 33 24.2700 N 117 34.4604 W::12/29/14 at 16:16:59 (UTC) | 117.574338 W | 33.404500 N | 11S | 3696278.8 | 446592.05 |
| Brennan Mulrooney | 3 | 1/9/2015 | 8:10:11 AM | Inactive | Inactive | 34 | none | | 33 24.2693 N 117 34.4581 W::1/9/15 at 16:05:32 (UTC) | 117.574302 W | 33.404488 N | 11S | 3696277.6 | 446595.72 |
| Andrew Fisher | 4 | 1/23/2015 | 7:24:27 AM | Inactive | Inactive | 34 | none | | 33 24.2697 N 117 34.4597 W::1/23/15 at 15:18:38 (UTC) | 117.574327 W | 33.404493 N | 11S | 3696277.6 | 446595.72 |
| Matthew Kedziora | 2 | 12/29/2014 | 8:17:18 AM | Inactive | Inactive | 340 | none | | 33 24.3073 N 117 34.5031 W::12/29/14 at 16:16:20 (UTC) | 117.575052 W | 33.405122 N | 11S | 3696348 | 446527.53 |
| Brynne Mulrooney | 3 | 1/9/2015 | 8:02:18 AM | Inactive | Inactive | 340 | none | | 33 24.3103 N 117 34.5024 W::1/9/15 at 16:02:26 (UTC) | 117.575040 W | 33.405172 N | 11S | 3696354.5 | 446528.35 |
| Andrew Fisher | 4 | 1/23/2015 | 7:53:31 AM | Inactive | Inactive | 340 | none | | 33 24.3113 N 117 34.5027 W::1/23/15 at 15:47:33 (UTC) | 117.575047 W | 33.405190 N | 11S | 3696354.5 | 446528.35 |
| Matthew Kedziora | 2 | 12/29/2014 | 8:22:02 AM | Inactive | Inactive | 341 | none | | 33 24.2280 N 117 34.4381 W::12/29/14 at 16:21:03 (UTC) | 117.573968 W | 33.403800 N | 11S | 3696200.9 | 446627.52 |
| Brynne Mulrooney | 3 | 1/9/2015 | 8:07:35 AM | Inactive | Inactive | 341 | none | | 33 24.2297 N 117 34.4416 W::1/9/15 at 16:07:39 (UTC) | 117.574027 W | 33.403828 N | 11S | 3696202.45 | 446622.275 |
| Andrew Fisher | 4 | 1/23/2015 | 8:01:16 AM | Inactive | Inactive | 341 | none | | 33 24.2280 N 117 34.4413 W::1/23/15 at 15:55:27 (UTC) | 117.574022 W | 33.403800 N | 11S | 3696202.45 | 446622.275 |
| Matthew Kedziora | 2 | 12/29/2014 | 8:41:33 AM | Inactive | Inactive | 342 | none | | 33 24.2074 N 117 34.4768 W::12/29/14 at 16:40:37 (UTC) | 117.574597 W | 33.403477 N | 11S | 3696165.4 | 446568.83 |
| Brynne Mulrooney | 3 | 1/9/2015 | 8:24:32 AM | Inactive | Inactive | 342 | none | | 33 24.2107 N 117 34.4749 W::1/9/15 at 16:24:44 (UTC) | 117.574573 W | 33.403523 N | 11S | 3696168.1 | 446571.82 |
| Donna Germann | 4 | 1/23/2015 | 8:16:29 AM | Inactive | Inactive | 342 | none | | 33 24.2088 N 117 34.4734 W::1/23/15 at 16:13:25 (UTC) | 117.574557 W | 33.403480 N | 11S | 3696168.1 | 446571.82 |
| Matthew Kedziora | 2 | 12/29/2014 | 8:43:15 AM | Inactive | Inactive | 343 | none | | 33 24.2347 N 117 34.4967 W::12/29/14 at 16:42:20 (UTC) | 117.574945 W | 33.403912 N | 11S | 3696213.8 | 446536.73 |
| Brynne Mulrooney | 3 | 1/9/2015 | 8:25:53 AM | Inactive | Inactive | 343 | none | | 33 24.2305 N 117 34.4962 W::1/9/15 at 16:26:02 (UTC) | 117.574937 W | 33.403842 N | 11S | 3696204.65 | 446536.455 |
| Donna Germann | 4 | 1/23/2015 | 8:18:03 AM | Inactive | Inactive | 343 | none | | 33 24.2290 N 117 34.4975 W::1/23/15 at 16:15:21 (UTC) | 117.574958 W | 33.403817 N | 11S | 3696204.65 | 446536.455 |
| Matthew Kedziora | 2 | 12/29/2014 | 8:50:54 AM | Inactive | Inactive | 344 | none | | 33 24.3427 N 117 34.5762 W::12/29/14 at 16:50:00 (UTC) | 117.576270 W | 33.405712 N | 11S | 3696414 | 446414.63 |
| Brynne Mulrooney | 3 | 1/9/2015 | 8:32:19 AM | Inactive | Inactive | 344 | none | | 33 24.3474 N 117 34.5808 W::1/9/15 at 16:32:27 (UTC) | 117.576348 W | 33.405790 N | 11S | 3696422.55 | 446407.465 |
| Donna Germann | 4 | 1/23/2015 | 8:24:27 AM | Inactive | Inactive | 344 | none | | 33 24.3472 N 117 34.5808 W::1/23/15 at 16:21:20 (UTC) | 117.576347 W | 33.405787 N | 11S | 3696422.55 | 446407.465 |
| Matthew Kedziora | 2 | 12/29/2014 | 9:40:25 AM | Inactive | Inactive | 345 | none | | 33 23.4918 N 117 35.0894 W::12/29/14 at 17:39:32 (UTC) | 117.584823 W | 33.391530 N | 11S | 3694846.1 | 445610.47 |
| Brynne Mulrooney | 3 | 1/9/2015 | 9:12:47 AM | Inactive | Inactive | 345 | none | | 33 23.4935 N 117 35.0905 W::1/9/15 at 17:12:51 (UTC) | 117.584842 W | 33.391558 N | 11S | 3694850.45 | 445609.98 |
| Donna Germann | 4 | 1/23/2015 | 9:05:53 AM | No Longer Suitable | No Longer Suitable | 345 | none | Knee high grass. Couldnt find. | 33 23.4947 N 117 35.0889 W::1/23/15 at 17:03:12 (UTC) | 117.584815 W | 33.391580 N | 11S | 3694850.45 | 445609.98 |
| Matthew Kedziora | 2 | 12/29/2014 | 9:49:11 AM | Inactive | Inactive | 346 | none | | 33 23.4301 N 117 35.0659 W::12/29/14 at 17:48:15 (UTC) | 117.584432 W | 33.390502 N | 11S | 3694732 | 445646.19 |
| Brynne Mulrooney | 3 | 1/9/2015 | 9:23:41 AM | No Longer Suitable | No Longer Suitable | 346 | none | Could not find burrow. No sign | 33 23.4313 N 117 35.0671 W::1/9/15 at 17:24:28 (UTC) | 117.584452 W | 33.390522 N | 11S | 3694734.9 | 445645.84 |
| Keoni Calantas | 4 | 1/23/2015 | 9:10:51 AM | Inactive | Inactive | 346 | none | | 33 23.4320 N 117 35.0647 W::1/23/15 at 17:09:46 (UTC) | 117.584420 W | 33.390535 N | 11S | 3694734.9 | 445645.84 |
| Matthew Kedziora | 2 | 12/29/2014 | 10:04:05 AM | Inactive | Inactive | 347 | none | | 33 23.5780 N 117 35.2150 W::12/29/14 at 18:03:16 (UTC) | 117.586917 W | 33.392967 N | 11S | 3695006.5 | 445416.62 |
| Brynne Mulrooney | 3 | 1/9/2015 | 9:35:30 AM | Inactive | Inactive | 347 | none | | 33 23.5805 N 117 35.2136 W::1/9/15 at 17:35:32 (UTC) | 117.586893 W | 33.393008 N | 11S | 3695009.1 | 445418.4 |
| Andrew Fisher | 4 | 1/23/2015 | 9:25:40 AM | Inactive | Inactive | 347 | none | | 33 23.5783 N 117 35.2143 W::1/23/15 at 17:19:38 (UTC) | 117.586903 W | 33.392972 N | 11S | 3695009.1 | 445418.4 |
| Matthew Kedziora | 2 | 12/29/2014 | 10:16:27 AM | Inactive | Inactive | 348 | none | | 33 23.5537 N 117 35.2619 W::12/29/14 at 18:15:36 (UTC) | 117.587698 W | 33.392562 N | 11S | 3694962.1 | 445343.73 |
| Brynne Mulrooney | 3 | 1/9/2015 | 9:46:27 AM | Inactive | Inactive | 348 | none | | 33 23.5527 N 117 35.2613 W::1/9/15 at 17:46:38 (UTC) | 117.587688 W | 33.392545 N | 11S | 3694959.25 | 445344.46 |
| Keoni Calantas | 4 | 1/23/2015 | 10:01:16 AM | Inactive | Inactive | 348 | none | | 33 23.5517 N 117 35.2615 W::1/23/15 at 18:00:10 (UTC) | 117.587692 W | 33.392528 N | 11S | 3694959.25 | 445344.46 |
| Matthew Kedziora | 2 | 12/29/2014 | 10:25:46 AM | Inactive | Inactive | 349 | none | | 33 23.4958 N 117 35.2511 W::12/29/14 at 18:24:52 (UTC) | 117.587518 W | 33.391597 N | 11S | 3694855 | 445359.87 |
| Brennan Mulrooney | 3 | 1/9/2015 | 10:01:58 AM | Inactive | Inactive | 349 | none | | 33 23.4943 N 117 35.2507 W::1/9/15 at 17:57:07 (UTC) | 117.587512 W | 33.391572 N | 11S | 3694850.6 | 445361.515 |
| Andrew Fisher | 4 | 1/23/2015 | 10:03:32 AM | Inactive | Inactive | 349 | none | | 33 23.4926 N 117 35.2493 W::1/23/15 at 17:57:29 (UTC) | 117.587488 W | 33.391543 N | 11S | 3694850.6 | 445361.515 |
| Andrew Fisher | 1 | 12/19/2014 | 8:14:52 AM | Inactive | Inactive | 35 | none | multiple burrow entrances | 33 24.2130 N 117 34.4153 W::12/19/14 at 16:11:47 (UTC) | 117.573588 W | 33.403550 N | 11S | 3696173.7 | 446660.285 |
| Brennan Mulrooney | 2 | 12/29/2014 | 8:24:18 AM | Inactive | Inactive | 35 | none | | 33 24.2138 N 117 34.4184 W::12/29/14 at 16:20:23 (UTC) | 117.573640 W | 33.403563 N | 11S | 3696173.7 | 446660.285 |
| Brennan Mulrooney | 3 | 1/9/2015 | 8:15:52 AM | Inactive | Inactive | 35 | none | | 33 24.2129 N 117 34.4173 W::1/9/15 at 16:11:07 (UTC) | 117.573622 W | 33.403548 N | 11S | 3696172.6 | 446659.26 |
| Andrew Fisher | 4 | 1/23/2015 | 7:21:42 AM | Inactive | Inactive | 35 | none | | 33 24.2127 N 117 34.4177 W::1/23/15 at 15:15:54 (UTC) | 117.573628 W | 33.403545 N | 11S | 3696172.6 | 446659.26 |
| Matthew Kedziora | 2 | 12/29/2014 | 10:28:32 AM | Inactive | Inactive | 350 | none | | 33 23.5122 N 117 35.2628 W::12/29/14 at 18:27:36 (UTC) | 117.587713 W | 33.391870 N | 11S | 3694885.3 | 445341.9 |
| Brennan Mulrooney | 3 | 1/9/2015 | 10:03:25 AM | Inactive | Inactive | 350 | none | | 33 23.5135 N 117 35.2628 W::1/9/15 at 17:58:34 (UTC) | 117.587713 W | 33.391892 N | 11S | 3694884.8 | 445342.645 |
| Andrew Fisher | 4 | 1/23/2015 | 10:05:12 AM | No Longer Suitable | No Longer Suitable | 350 | none | Weedy | 33 23.5103 N 117 35.2618 W::1/23/15 at 17:59:14 (UTC) | 117.587697 W | 33.391838 N | 11S | 3694884.8 | 445342.645 |
| James McMorran | 2 | 12/29/2014 | 7:53:18 AM | Inactive | Inactive | 351 | none | | 33 24.4690 N 117 34.5426 W::12/29/14 at 15:49:28 (UTC) | 117.575710 W | 33.407817 N | 11S | 3696647.1 | 446467.99 |
| James McMorran | 3 | 1/9/2015 | 7:41:48 AM | Inactive | Inactive | 351 | none | | 33 24.4602 N 117 34.5271 W::1/9/15 at 15:36:18 (UTC) | 117.575452 W | 33.407670 N | 11S | 3696637.8 | 446484.49 |
| Andrew Fisher | 4 | 1/23/2015 | 7:05:02 AM | Inactive | Inactive | 351 | none | | 33 24.4670 N 117 34.5368 W::1/23/15 at 14:59:12 (UTC) | 117.575612 W | 33.407797 N | 11S | 3696637.8 | 446484.49 |

# Appendix C – Raw Field Data

| Primary_Bio | Survey Number | Date | Time | Cumulative_ Burrow_ Status | Field_ Burrow_ Status | Burrow ID | Sign | Notes | GPSLocation | Longitude | Latitude | Zone | Avg_ Northing_ Final | Avg_ Easting_ Final |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| James McMorran | 2 | 12/29/2014 | 8:45:08 AM | Inactive | Inactive | 352 | none | | 33 24.2374 N 117 34.4844 W::12/29/14 at 16:41:20 (UTC) | 117.574740 W | 33.403957 N | 11S | 3696218.7 | 446555.82 |
| James McMorran | 3 | 1/9/2015 | 8:30:57 AM | Inactive | Inactive | 352 | none | | 33 24.2423 N 117 34.4790 W::1/9/15 at 16:25:26 (UTC) | 117.574650 W | 33.404038 N | 11S | 3696227.35 | 446561.82 |
| Donna Germann | 4 | 1/23/2015 | 7:57:14 AM | Inactive | Inactive | 352 | none | | 33 24.2420 N 117 34.4821 W::1/23/15 at 15:54:12 (UTC) | 117.574702 W | 33.404033 N | 11S | 3696227.35 | 446561.82 |
| James McMorran | 2 | 12/29/2014 | 10:18:43 AM | Inactive | Inactive | 353 | none | multiple burrow entrances | 33 23.5500 N 117 35.2336 W::12/29/14 at 18:14:49 (UTC) | 117.587227 W | 33.392500 N | 11S | 3694954.9 | 445387.5 |
| Andrew Fisher | 3 | 1/9/2015 | 9:51:29 AM | Inactive | Inactive | 353 | none | multiple burrow entrances | 33 23.5524 N 117 35.2373 W::1/9/15 at 17:46:32 (UTC) | 117.587288 W | 33.392540 N | 11S | 3694959.95 | 445384.64 |
| Donna Germann | 4 | 1/23/2015 | 9:36:29 AM | Inactive | Inactive | 353 | none | | 33 23.5530 N 117 35.2337 W::1/23/15 at 17:33:22 (UTC) | 117.587228 W | 33.392550 N | 11S | 3694959.95 | 445384.64 |
| James McMorran | 2 | 12/29/2014 | 8:40:32 AM | Inactive | Inactive | 354 | none | multiple burrow entrances | 33 24.1961 N 117 34.4481 W::12/29/14 at 16:36:41 (UTC) | 117.574135 W | 33.403268 N | 11S | 3696142 | 446611.66 |
| James McMorran | 3 | 1/9/2015 | 8:28:30 AM | Inactive | Inactive | 354 | none | | 33 24.1966 N 117 34.4496 W::1/9/15 at 16:23:01 (UTC) | 117.574160 W | 33.403277 N | 11S | 3696145.5 | 446609.125 |
| Donna Germann | 4 | 1/23/2015 | 8:00:59 AM | Inactive | Inactive | 354 | none | | 33 24.1993 N 117 34.4499 W::1/23/15 at 15:58:00 (UTC) | 117.574165 W | 33.403322 N | 11S | 3696145.5 | 446609.125 |
| James McMorran | 2 | 12/29/2014 | 8:38:26 AM | Inactive | Inactive | 355 | none | multiple burrow entrances | 33 24.1564 N 117 34.4320 W::12/29/14 at 16:34:36 (UTC) | 117.573867 W | 33.402607 N | 11S | 3696068.6 | 446636.18 |
| James McMorran | 3 | 1/9/2015 | 8:26:17 AM | Inactive | Inactive | 355 | none | | 33 24.1616 N 117 34.4327 W::1/9/15 at 16:21:04 (UTC) | 117.573878 W | 33.402693 N | 11S | 3696077.3 | 446633.625 |
| Donna Germann | 4 | 1/23/2015 | 8:13:01 AM | Inactive | Inactive | 355 | none | | 33 24.1607 N 117 34.4347 W::1/23/15 at 16:09:53 (UTC) | 117.573912 W | 33.402678 N | 11S | 3696077.3 | 446633.625 |
| James McMorran | 2 | 12/29/2014 | 8:41:57 AM | Inactive | Inactive | 356 | none | multiple burrow entrances | 33 24.2107 N 117 34.4603 W::12/29/14 at 16:38:02 (UTC) | 117.574338 W | 33.403512 N | 11S | 3696169.1 | 446592.93 |
| James McMorran | 3 | 1/9/2015 | 8:29:20 AM | Inactive | Inactive | 356 | none | | 33 24.2142 N 117 34.4592 W::1/9/15 at 16:24:08 (UTC) | 117.574320 W | 33.403570 N | 11S | 3696174.45 | 446598.26 |
| Donna Germann | 4 | 1/23/2015 | 7:59:14 AM | Inactive | Inactive | 356 | none | | 33 24.2130 N 117 34.4545 W::1/23/15 at 15:56:07 (UTC) | 117.574242 W | 33.403550 N | 11S | 3696174.45 | 446598.26 |
| James McMorran | 2 | 12/29/2014 | 8:11:55 AM | Inactive | Inactive | 357 | none | | 33 24.3938 N 117 34.5798 W::12/29/14 at 16:08:00 (UTC) | 117.576350 W | 33.406560 N | 11S | 3696508.1 | 446407.71 |
| James McMorran | 3 | 1/9/2015 | 8:01:42 AM | Inactive | Inactive | 357 | none | | 33 24.3988 N 117 34.5828 W::1/9/15 at 15:56:27 (UTC) | 117.576380 W | 33.406647 N | 11S | 3696517.15 | 446403.805 |
| Keoni Calantas | 4 | 1/23/2015 | 7:43:11 AM | Inactive | Inactive | 357 | none | | 33 24.3981 N 117 34.5843 W::1/23/15 at 15:42:12 (UTC) | 117.576405 W | 33.406635 N | 11S | 3696517.15 | 446403.805 |
| James McMorran | 2 | 12/29/2014 | 10:22:54 AM | Inactive | Inactive | 358 | none | multiple burrow entrances | 33 23.4749 N 117 35.1755 W::12/29/14 at 18:18:59 (UTC) | 117.586258 W | 33.391248 N | 11S | 3694815.6 | 445476.83 |
| Andrew Fisher | 3 | 1/9/2015 | 9:57:35 AM | Inactive | Inactive | 358 | none | occupied by ground squirrel | 33 23.4745 N 117 35.1767 W::1/9/15 at 17:52:42 (UTC) | 117.586278 W | 33.391242 N | 11S | 3694813.633 | 445479.7067 |
| Donna Germann | 4 | 1/23/2015 | 9:42:40 AM | Inactive | Inactive | 358 | none | | 33 23.4742 N 117 35.1672 W::1/23/15 at 17:39:34 (UTC) | 117.586120 W | 33.391237 N | 11S | 3694813.633 | 445479.7067 |
| James McMorran | 2 | 12/29/2014 | 7:54:53 AM | Inactive | Inactive | 359 | none | | 33 24.5018 N 117 34.5578 W::12/29/14 at 15:51:01 (UTC) | 117.575963 W | 33.408363 N | 11S | 3696707.8 | 446444.8 |
| James McMorran | 3 | 1/9/2015 | 7:43:19 AM | Inactive | Inactive | 359 | none | | 33 24.5009 N 117 34.5564 W::1/9/15 at 15:37:50 (UTC) | 117.575940 W | 33.408348 N | 11S | 3696705.55 | 446444.465 |
| Andrew Fisher | 4 | 1/23/2015 | 7:01:57 AM | Inactive | Inactive | 359 | none | | 33 24.5003 N 117 34.5596 W::1/23/15 at 14:56:06 (UTC) | 117.575993 W | 33.408338 N | 11S | 3696705.55 | 446444.465 |
| Andrew Fisher | 1 | 12/19/2014 | 8:16:18 AM | Inactive | Inactive | 36 | none | multiple burrow entrances | 33 24.1930 N 117 34.3971 W::12/19/14 at 16:13:05 (UTC) | 117.573285 W | 33.403217 N | 11S | 3696135.8 | 446690.58 |
| Brennan Mulrooney | 2 | 12/29/2014 | 8:26:46 AM | Inactive | Inactive | 36 | none | | 33 24.1929 N 117 34.3972 W::12/29/14 at 16:22:54 (UTC) | 117.573287 W | 33.403215 N | 11S | 3696135.8 | 446690.58 |
| Brennan Mulrooney | 3 | 1/9/2015 | 8:17:06 AM | Inactive | Inactive | 36 | none | | 33 24.1922 N 117 34.3994 W::1/9/15 at 16:12:21 (UTC) | 117.573323 W | 33.403203 N | 11S | 3696134.75 | 446688.06 |
| Andrew Fisher | 4 | 1/23/2015 | 7:20:18 AM | Inactive | Inactive | 36 | none | | 33 24.1926 N 117 34.3982 W::1/23/15 at 15:14:28 (UTC) | 117.573303 W | 33.403210 N | 11S | 3696134.75 | 446688.06 |
| James McMorran | 2 | 12/29/2014 | 7:59:51 AM | Inactive | Inactive | 360 | none | | 33 24.5718 N 117 34.6110 W::12/29/14 at 15:55:58 (UTC) | 117.576850 W | 33.409530 N | 11S | 3696837.6 | 446363.04 |
| James McMorran | 3 | 1/9/2015 | 7:46:31 AM | Inactive | Inactive | 360 | none | | 33 24.5723 N 117 34.6085 W::1/9/15 at 15:41:03 (UTC) | 117.576808 W | 33.409538 N | 11S | 3696836.25 | 446363.5 |
| Andrew Fisher | 4 | 1/23/2015 | 6:57:29 AM | Inactive | Inactive | 360 | none | | 33 24.5698 N 117 34.6129 W::1/23/15 at 14:51:31 (UTC) | 117.576882 W | 33.409497 N | 11S | 3696836.25 | 446363.5 |
| James McMorran | 2 | 12/29/2014 | 8:23:04 AM | Inactive | Inactive | 361 | none | multiple burrow entrances | 33 24.2128 N 117 34.4464 W::12/29/14 at 16:19:05 (UTC) | 117.574107 W | 33.403547 N | 11S | 3696172.9 | 446614.44 |
| James McMorran | 3 | 1/9/2015 | 8:12:31 AM | Inactive | Inactive | 361 | none | | 33 24.2122 N 117 34.4514 W::1/9/15 at 16:07:15 (UTC) | 117.574190 W | 33.403537 N | 11S | 3696174.35 | 446610.585 |
| Keoni Calantas | 4 | 1/23/2015 | 7:56:44 AM | Inactive | Inactive | 361 | none | | 33 24.2152 N 117 34.4452 W::1/23/15 at 15:55:42 (UTC) | 117.574107 W | 33.403583 N | 11S | 3696174.35 | 446610.585 |
| James McMorran | 2 | 12/29/2014 | 9:22:18 AM | Inactive | Inactive | 362 | none | | 33 23.7375 N 117 35.2039 W::12/29/14 at 17:18:22 (UTC) | 117.586732 W | 33.395625 N | 11S | 3695301.1 | 445435.48 |
| Andrew Fisher | 3 | 1/9/2015 | 9:03:49 AM | Inactive | Inactive | 362 | none | occupied by ground squirrel | 33 23.7396 N 117 35.2013 W::1/9/15 at 16:59:06 (UTC) | 117.586688 W | 33.395660 N | 11S | 3695306.8 | 445438.445 |
| Andrew Fisher | 4 | 1/23/2015 | 8:55:46 AM | Inactive | Inactive | 362 | none | | 33 23.7414 N 117 35.2028 W::1/23/15 at 16:49:46 (UTC) | 117.586713 W | 33.395692 N | 11S | 3695306.8 | 445438.445 |
| James McMorran | 2 | 12/29/2014 | 8:01:03 AM | Inactive | Inactive | 363 | none | multiple burrow entrances | 33 24.5893 N 117 34.6302 W::12/29/14 at 15:57:13 (UTC) | 117.577170 W | 33.409822 N | 11S | 3696870.2 | 446333.47 |
| James McMorran | 3 | 1/9/2015 | 7:48:24 AM | Inactive | Inactive | 363 | none | | 33 24.5940 N 117 34.6327 W::1/9/15 at 15:43:07 (UTC) | 117.577212 W | 33.409900 N | 11S | 3696877.75 | 446329.605 |
| Andrew Fisher | 4 | 1/23/2015 | 6:56:12 AM | Inactive | Inactive | 363 | none | | 33 24.5928 N 117 34.6327 W::1/23/15 at 14:50:12 (UTC) | 117.577212 W | 33.409880 N | 11S | 3696877.75 | 446329.605 |
| Andrew Fisher | 1 | 12/19/2014 | 8:19:27 AM | Inactive | Inactive | 37 | none | multiple burrow entrances | 33 24.1489 N 117 34.3739 W::12/19/14 at 16:16:27 (UTC) | 117.572905 W | 33.402478 N | 11S | 3696055.15 | 446724.775 |
| Andrew Fisher | 2 | 12/29/2014 | 8:28:46 AM | Inactive | Inactive | 37 | none | multiple burrow entrances | 33 24.1502 N 117 34.3753 W::12/29/14 at 16:24:41 (UTC) | 117.572922 W | 33.402503 N | 11S | 3696055.15 | 446724.775 |
| Brynne Mulrooney | 3 | 1/9/2015 | 8:12:36 AM | Inactive | Inactive | 37 | none | | 33 24.1502 N 117 34.3764 W::1/9/15 at 16:12:54 (UTC) | 117.572940 W | 33.402503 N | 11S | 3696055.75 | 446722.08 |
| Andrew Fisher | 4 | 1/23/2015 | 7:18:25 AM | Inactive | Inactive | 37 | none | | 33 24.1493 N 117 34.3767 W::1/23/15 at 15:12:36 (UTC) | 117.572945 W | 33.402488 N | 11S | 3696055.75 | 446722.08 |
| Andrew Fisher | 1 | 12/19/2014 | 8:24:24 AM | Inactive | Inactive | 38 | none | ground squirrel sign | 33 24.1189 N 117 34.4338 W::12/19/14 at 16:21:20 (UTC) | 117.573897 W | 33.401982 N | 11S | 3695993.8 | 446636.885 |
| Andrew Fisher | 2 | 12/29/2014 | 8:36:12 AM | Inactive | Inactive | 38 | none | occupied by ground squirrel | 33 24.1119 N 117 34.4287 W::12/29/14 at 16:32:17 (UTC) | 117.573813 W | 33.401883 N | 11S | 3695993.8 | 446636.885 |
| Andrew Fisher | 3 | 1/9/2015 | 8:23:53 AM | Inactive | Inactive | 38 | none | occupied by ground squirrel | 33 24.1168 N 117 34.4326 W::1/9/15 at 16:19:10 (UTC) | 117.573877 W | 33.401947 N | 11S | 3695995.45 | 446633.92 |
| Andrew Fisher | 4 | 1/23/2015 | 8:12:01 AM | Inactive | Inactive | 38 | none | | 33 24.1169 N 117 34.4338 W::1/23/15 at 16:06:11 (UTC) | 117.573897 W | 33.401948 N | 11S | 3695995.45 | 446633.92 |
| Andrew Fisher | 1 | 12/19/2014 | 8:25:35 AM | Inactive | Inactive | 39 | none | multiple burrow entrances | 33 24.1266 N 117 34.4365 W::12/19/14 at 16:22:26 (UTC) | 117.573942 W | 33.402112 N | 11S | 3696014.25 | 446629.135 |
| Brennan Mulrooney | 2 | 12/29/2014 | 8:36:57 AM | Inactive | Inactive | 39 | none | | 33 24.1273 N 117 34.4362 W::12/29/14 at 16:33:01 (UTC) | 117.573937 W | 33.402122 N | 11S | 3696014.25 | 446629.135 |
| Andrew Fisher | 3 | 1/9/2015 | 8:24:42 AM | Inactive | Inactive | 39 | none | occupied by ground squirrel | 33 24.1270 N 117 34.4396 W::1/9/15 at 16:19:54 (UTC) | 117.573995 W | 33.402115 N | 11S | 3696015.3 | 446627.47 |
| Andrew Fisher | 4 | 1/23/2015 | 8:13:21 AM | Inactive | Inactive | 39 | none | | 33 24.1282 N 117 34.4352 W::1/23/15 at 16:07:23 (UTC) | 117.573920 W | 33.402137 N | 11S | 3696015.3 | 446627.47 |
| Andrew Fisher | 1 | 12/19/2014 | 7:02:39 AM | Inactive | Inactive | 4 | none | 3 burrows | 33 24.5545 N 117 34.5350 W::12/19/14 at 14:59:26 (UTC) | 117.575583 W | 33.409242 N | 11S | 3696804.95 | 446481.28 |
| Andrew Fisher | 2 | 12/29/2014 | 7:02:05 AM | Inactive | Inactive | 4 | none | occupied by ground squirrel | 33 24.5544 N 117 34.5342 W::12/29/14 at 14:58:02 (UTC) | 117.575570 W | 33.409240 N | 11S | 3696804.95 | 446481.28 |

# Appendix C – Raw Field Data

| Primary_Bio | Survey Number | Date | Time | Cumulative_ Burrow_ Status | Field_ Burrow_ Status | Burrow ID | Sign | Notes | GPSLocation | Longitude | Latitude | Zone | Avg_ Northing_ Final | Avg_ Easting_ Final |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Andrew Fisher | 3 | 1/9/2015 | 7:04:08 AM | Inactive | Inactive | 4 | none | occupied by ground squirrel | 33 24.5560 N 117 34.5360 W::1/9/15 at 14:59:13 (UTC) | 117.575600 W | 33.409267 N | 11S | 3696810.1 | 446477.17 |
| Andrew Fisher | 4 | 1/22/2015 | 3:09:12 PM | Inactive | Inactive | 4 | none | | 33 24.5585 N 117 34.5385 W::1/22/15 at 23:03:14 (UTC) | 117.575642 W | 33.409308 N | 11S | 3696810.1 | 446477.17 |
| Andrew Fisher | 1 | 12/19/2014 | 8:26:15 AM | Inactive | Inactive | 40 | none | multiple burrow entrances | 33 24.1337 N 117 34.4447 W::12/19/14 at 16:23:00 (UTC) | 117.574078 W | 33.402228 N | 11S | 3696026.9 | 446618.235 |
| Andrew Fisher | 2 | 12/29/2014 | 8:37:23 AM | Inactive | Inactive | 40 | none | occupied by ground squirrel | 33 24.1339 N 117 34.4422 W::12/29/14 at 16:33:31 (UTC) | 117.574037 W | 33.402232 N | 11S | 3696026.9 | 446618.235 |
| Andrew Fisher | 3 | 1/9/2015 | 8:25:21 AM | Inactive | Inactive | 40 | none | occupied by ground squirrel | 33 24.1328 N 117 34.4440 W::1/9/15 at 16:20:29 (UTC) | 117.574067 W | 33.402213 N | 11S | 3696024.55 | 446618.92 |
| Andrew Fisher | 4 | 1/23/2015 | 8:14:12 AM | Inactive | Inactive | 40 | none | | 33 24.1323 N 117 34.4420 W::1/23/15 at 16:08:19 (UTC) | 117.574033 W | 33.402205 N | 11S | 3696024.55 | 446618.92 |
| Brennan Mulrooney | 3 | 1/9/2015 | 8:40:43 AM | Inactive | Inactive | 400 | none | | 33 24.3575 N 117 34.6088 W::1/9/15 at 16:35:54 (UTC) | 117.576813 W | 33.405957 N | 11S | 3696442.3 | 446366.665 |
| Keoni Calantas | 4 | 1/23/2015 | 8:23:54 AM | Inactive | Inactive | 400 | none | | 33 24.3583 N 117 34.6057 W::1/23/15 at 16:22:49 (UTC) | 117.576762 W | 33.405972 N | 11S | 3696442.3 | 446366.665 |
| Brynne Mulrooney | 3 | 1/9/2015 | 7:26:14 AM | Inactive | Inactive | 401 | none | | 33 24.2835 N 117 34.4102 W::1/9/15 at 15:27:10 (UTC) | 117.573503 W | 33.404725 N | 11S | 3696303.3 | 446670.995 |
| Keoni Calantas | 4 | 1/23/2015 | 7:08:37 AM | Inactive | Inactive | 401 | none | | 33 24.2836 N 117 34.4106 W::1/23/15 at 15:07:28 (UTC) | 117.573510 W | 33.404727 N | 11S | 3696303.3 | 446670.995 |
| Andrew Fisher | 3 | 1/9/2015 | 7:42:53 AM | Inactive | Inactive | 402 | none | occupied by ground squirrel | 33 24.4802 N 117 34.5901 W::1/9/15 at 15:38:05 (UTC) | 117.576502 W | 33.408003 N | 11S | 3696668.95 | 446393.49 |
| Donna Germann | 4 | 1/23/2015 | 8:36:30 AM | Inactive | Inactive | 402 | none | | 33 24.4810 N 117 34.5914 W::1/23/15 at 16:33:22 (UTC) | 117.576523 W | 33.408017 N | 11S | 3696668.95 | 446393.49 |
| Brennan Mulrooney | 3 | 1/9/2015 | 8:41:28 AM | Inactive | Inactive | 403 | none | | 33 24.3695 N 117 34.6102 W::1/9/15 at 16:36:38 (UTC) | 117.576837 W | 33.406158 N | 11S | 3696465.45 | 446360.19 |
| Keoni Calantas | 4 | 1/23/2015 | 8:24:44 AM | Inactive | Inactive | 403 | none | | 33 24.3713 N 117 34.6128 W::1/23/15 at 16:23:34 (UTC) | 117.576880 W | 33.406188 N | 11S | 3696465.45 | 446360.19 |
| Brennan Mulrooney | 3 | 1/9/2015 | 9:09:00 AM | Inactive | Inactive | 404 | none | | 33 23.6354 N 117 35.2118 W::1/9/15 at 17:04:20 (UTC) | 117.586863 W | 33.393923 N | 11S | 3695108.25 | 445426.445 |
| Donna Germann | 4 | 1/23/2015 | 9:26:27 AM | Inactive | Inactive | 404 | none | | 33 23.6308 N 117 35.2063 W::1/23/15 at 17:23:19 (UTC) | 117.586772 W | 33.393847 N | 11S | 3695108.25 | 445426.445 |
| Brennan Mulrooney | 3 | 1/9/2015 | 9:15:52 AM | Inactive | Inactive | 405 | none | | 33 23.5103 N 117 35.1193 W::1/9/15 at 17:11:03 (UTC) | 117.585322 W | 33.391838 N | 11S | 3694880.5 | 445562.39 |
| Donna Germann | 4 | 1/23/2015 | 9:18:06 AM | Inactive | Inactive | 405 | none | | 33 23.5102 N 117 35.1217 W::1/23/15 at 17:14:56 (UTC) | 117.585362 W | 33.391837 N | 11S | 3694880.5 | 445562.39 |
| Brynne Mulrooney | 3 | 1/9/2015 | 7:08:16 AM | Inactive | Inactive | 406 | none | | 33 24.4516 N 117 34.4884 W::1/9/15 at 15:08:24 (UTC) | 117.574805 W | 33.407527 N | 11S | 3696613.75 | 446551.125 |
| Andrew Fisher | 4 | 1/22/2015 | 3:55:22 PM | Inactive | Inactive | 406 | none | | 33 24.4508 N 117 34.4894 W::1/22/15 at 23:49:27 (UTC) | 117.574823 W | 33.407513 N | 11S | 3696613.75 | 446551.125 |
| Brynne Mulrooney | 3 | 1/9/2015 | 7:46:33 AM | Inactive | Inactive | 407 | none | | 33 24.5750 N 117 34.6307 W::1/9/15 at 15:46:54 (UTC) | 117.577178 W | 33.409583 N | 11S | 3696850 | 446333.82 |
| Keoni Calantas | 4 | 1/23/2015 | 6:46:27 AM | Inactive | Inactive | 407 | none | | 33 24.5818 N 117 34.6291 W::1/23/15 at 14:50:35 (UTC) | 117.577152 W | 33.409697 N | 11S | 3696850 | 446333.82 |
| Brynne Mulrooney | 3 | 1/9/2015 | 7:41:31 AM | Inactive | Inactive | 408 | none | | 33 24.4971 N 117 34.5682 W::1/9/15 at 15:42:01 (UTC) | 117.576137 W | 33.408285 N | 11S | 3696699.1 | 446428.295 |
| Keoni Calantas | 4 | 1/23/2015 | 6:57:29 AM | Inactive | Inactive | 408 | none | | 33 24.4970 N 117 34.5686 W::1/23/15 at 14:56:20 (UTC) | 117.576143 W | 33.408283 N | 11S | 3696699.1 | 446428.295 |
| James McMorran | 3 | 1/9/2015 | 7:28:02 AM | Inactive | Inactive | 409 | none | | 33 24.2179 N 117 34.3438 W::1/9/15 at 15:22:41 (UTC) | 117.572397 W | 33.403632 N | 11S | 3696174.8 | 446774.815 |
| Andrew Fisher | 4 | 1/23/2015 | 7:16:17 AM | Inactive | Inactive | 409 | none | | 33 24.2107 N 117 34.3421 W::1/23/15 at 15:10:24 (UTC) | 117.572368 W | 33.403512 N | 11S | 3696174.8 | 446774.815 |
| Andrew Fisher | 1 | 12/19/2014 | 8:27:24 AM | Inactive | Inactive | 41 | none | ground squirrel sign | 33 24.1445 N 117 34.4512 W::12/19/14 at 16:24:17 (UTC) | 117.574187 W | 33.402408 N | 11S | 3696047.05 | 446608.35 |
| Andrew Fisher | 2 | 12/29/2014 | 8:38:33 AM | Inactive | Inactive | 41 | none | occupied by ground squirrel | 33 24.1449 N 117 34.4485 W::12/29/14 at 16:34:26 (UTC) | 117.574143 W | 33.402415 N | 11S | 3696047.05 | 446608.35 |
| Andrew Fisher | 3 | 1/9/2015 | 8:26:06 AM | Inactive | Inactive | 41 | none | occupied by ground squirrel | 33 24.1435 N 117 34.4511 W::1/9/15 at 16:21:10 (UTC) | 117.574185 W | 33.402392 N | 11S | 3696045.05 | 446607.5 |
| Andrew Fisher | 4 | 1/23/2015 | 8:15:12 AM | Inactive | Inactive | 41 | none | | 33 24.1438 N 117 34.4499 W::1/23/15 at 16:09:08 (UTC) | 117.574163 W | 33.402395 N | 11S | 3696045.05 | 446607.5 |
| James McMorran | 3 | 1/9/2015 | 7:39:46 AM | Inactive | Inactive | 410 | none | | 33 24.4247 N 117 34.5048 W::1/9/15 at 15:34:32 (UTC) | 117.575080 W | 33.407078 N | 11S | 3696568.6 | 446525.77 |
| Andrew Fisher | 4 | 1/23/2015 | 7:07:11 AM | Inactive | Inactive | 410 | none | | 33 24.4287 N 117 34.5053 W::1/23/15 at 15:01:18 (UTC) | 117.575088 W | 33.407145 N | 11S | 3696568.6 | 446525.77 |
| James McMorran | 3 | 1/9/2015 | 7:42:28 AM | Inactive | Inactive | 411 | none | multiple burrow entrances | 33 24.4841 N 117 34.5453 W::1/9/15 at 15:37:03 (UTC) | 117.575755 W | 33.408068 N | 11S | 3696672.9 | 446461.855 |
| Andrew Fisher | 4 | 1/23/2015 | 7:03:03 AM | Inactive | Inactive | 411 | none | | 33 24.4818 N 117 34.5480 W::1/23/15 at 14:57:10 (UTC) | 117.575800 W | 33.408030 N | 11S | 3696672.9 | 446461.855 |
| James McMorran | 3 | 1/9/2015 | 7:16:51 AM | Inactive | Inactive | 412 | none | | 33 24.3825 N 117 34.4554 W::1/9/15 at 15:11:33 (UTC) | 117.574257 W | 33.406375 N | 11S | 3696481.8 | 446601.215 |
| Andrew Fisher | 4 | 1/22/2015 | 4:14:53 PM | Inactive | Inactive | 412 | none | | 33 24.3775 N 117 34.4565 W::1/23/15 at 00:08:52 (UTC) | 117.574278 W | 33.406290 N | 11S | 3696481.8 | 446601.215 |
| Andrew Fisher | 3 | 1/9/2015 | 9:34:10 AM | Inactive | Inactive | 413 | none | multiple burrow entrances | 33 23.4771 N 117 35.1593 W::1/9/15 at 17:29:15 (UTC) | 117.585988 W | 33.391285 N | 11S | 3694820 | 445500.855 |
| Keoni Calantas | 4 | 1/23/2015 | 9:41:22 AM | No Longer Suitable | No Longer Suitable | 413 | none | | 33 23.4775 N 117 35.1607 W::1/23/15 at 17:40:13 (UTC) | 117.586012 W | 33.391292 N | 11S | 3694820 | 445500.855 |
| Andrew Fisher | 3 | 1/9/2015 | 9:35:56 AM | Inactive | Inactive | 414 | none | occupied by ground squirrel | 33 23.5010 N 117 35.1723 W::1/9/15 at 17:31:01 (UTC) | 117.586205 W | 33.391683 N | 11S | 3694864.2 | 445480.545 |
| Andrew Fisher | 4 | 1/23/2015 | 9:41:57 AM | Inactive | Inactive | 414 | none | | 33 23.5014 N 117 35.1742 W::1/23/15 at 17:36:05 (UTC) | 117.586237 W | 33.391690 N | 11S | 3694864.2 | 445480.545 |
| Andrew Fisher | 3 | 1/9/2015 | 9:59:28 AM | Inactive | Inactive | 415 | none | WHITE PIPES | 33 23.4423 N 117 35.1383 W::1/9/15 at 17:54:45 (UTC) | 117.585638 W | 33.390705 N | 11S | 3694755.35 | 445533.975 |
| Donna Germann | 4 | 1/23/2015 | 9:44:44 AM | Inactive | Inactive | 415 | none | | 33 23.4426 N 117 35.1385 W::1/23/15 at 17:41:51 (UTC) | 117.585642 W | 33.390710 N | 11S | 3694755.35 | 445533.975 |
| Andrew Fisher | 3 | 1/9/2015 | 9:36:31 AM | Inactive | Inactive | 416 | none | multiple burrow entrances | 33 23.5030 N 117 35.1805 W::1/9/15 at 17:31:35 (UTC) | 117.586342 W | 33.391715 N | 11S | 3694868.8 | 445469.505 |
| Keoni Calantas | 4 | 1/23/2015 | 9:39:40 AM | Inactive | Inactive | 416 | none | | 33 23.5044 N 117 35.1803 W::1/23/15 at 17:38:30 (UTC) | 117.586338 W | 33.391740 N | 11S | 3694868.8 | 445469.505 |
| James McMorran | 3 | 1/9/2015 | 8:27:34 AM | Inactive | Inactive | 417 | none | multiple burrow entrances | 33 24.1818 N 117 34.4382 W::1/9/15 at 16:22:13 (UTC) | 117.573970 W | 33.403030 N | 11S | 3696118.85 | 446623.25 |
| Donna Germann | 4 | 1/23/2015 | 8:01:49 AM | Inactive | Inactive | 417 | none | | 33 24.1854 N 117 34.4429 W::1/23/15 at 15:58:43 (UTC) | 117.574048 W | 33.403090 N | 11S | 3696118.85 | 446623.25 |
| James McMorran | 3 | 1/9/2015 | 8:37:11 AM | Inactive | Inactive | 418 | none | multiple burrow entrances | 33 24.3805 N 117 34.5870 W::1/9/15 at 16:32:03 (UTC) | 117.576450 W | 33.406342 N | 11S | 3696486.2 | 446397.825 |
| Donna Germann | 4 | 1/23/2015 | 7:46:06 AM | Inactive | Inactive | 418 | none | | 33 24.3829 N 117 34.5876 W::1/23/15 at 15:43:00 (UTC) | 117.576460 W | 33.406382 N | 11S | 3696486.2 | 446397.825 |
| Andrew Fisher | 3 | 1/9/2015 | 9:09:59 AM | Inactive | Inactive | 419 | none | multiple burrow entrances | 33 23.6545 N 117 35.1706 W::1/9/15 at 17:05:07 (UTC) | 117.586177 W | 33.394242 N | 11S | 3695147.85 | 445485.495 |
| Andrew Fisher | 4 | 1/23/2015 | 9:01:07 AM | Inactive | Inactive | 419 | none | | 33 23.6549 N 117 35.1716 W::1/23/15 at 16:55:07 (UTC) | 117.586193 W | 33.394248 N | 11S | 3695147.85 | 445485.495 |
| Andrew Fisher | 1 | 12/19/2014 | 8:28:06 AM | Inactive | Inactive | 42 | none | ground squirrel sign | 33 24.1488 N 117 34.4555 W::12/19/14 at 16:25:10 (UTC) | 117.574258 W | 33.402480 N | 11S | 3696054.95 | 446600.02 |
| Andrew Fisher | 2 | 12/29/2014 | 8:39:02 AM | Inactive | Inactive | 42 | none | occupied by ground squirrel | 33 24.1491 N 117 34.4551 W::12/29/14 at 16:34:56 (UTC) | 117.574252 W | 33.402485 N | 11S | 3696054.95 | 446600.02 |
| Andrew Fisher | 3 | 1/9/2015 | 8:26:32 AM | Inactive | Inactive | 42 | none | occupied by ground squirrel | 33 24.1482 N 117 34.4565 W::1/9/15 at 16:21:43 (UTC) | 117.574275 W | 33.402470 N | 11S | 3696051.8 | 446599.31 |
| Andrew Fisher | 4 | 1/23/2015 | 8:15:44 AM | Inactive | Inactive | 42 | none | | 33 24.1463 N 117 34.4550 W::1/23/15 at 16:09:46 (UTC) | 117.574250 W | 33.402438 N | 11S | 3696051.8 | 446599.31 |

# Appendix C – Raw Field Data

| Primary_Bio | Survey Number | Date | Time | Cumulative_ Burrow_ Status | Field_ Burrow_ Status | Burrow ID | Sign | Notes | GPSLocation | Longitude | Latitude | Zone | Avg_ Northing_ Final | Avg_ Easting_ Final |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Andrew Fisher | 3 | 1/9/2015 | 7:23:05 AM | Inactive | Inactive | 420 | none | occupied by ground squirrel | 33 24.2552 N 117 34.3261 W::1/9/15 at 15:18:20 (UTC) | 117.572102 W | 33.404253 N | 11S | 3696249.55 | 446803.355 |
| Andrew Fisher | 4 | 1/22/2015 | 3:24:32 PM | Inactive | Inactive | 420 | none | | 33 24.2546 N 117 34.3234 W::1/22/15 at 23:18:30 (UTC) | 117.572058 W | 33.404242 N | 11S | 3696249.55 | 446803.355 |
| James McMorran | 3 | 1/9/2015 | 7:11:27 AM | Inactive | Inactive | 421 | none | multiple burrow entrances | 33 24.4402 N 117 34.5002 W::1/9/15 at 15:06:25 (UTC) | 117.575003 W | 33.407337 N | 11S | 3696593.3 | 446530 |
| Andrew Fisher | 4 | 1/22/2015 | 4:20:58 PM | Inactive | Inactive | 421 | none | | 33 24.4399 N 117 34.5046 W::1/23/15 at 00:15:00 (UTC) | 117.575077 W | 33.407332 N | 11S | 3696593.3 | 446530 |
| Andrew Fisher | 3 | 1/9/2015 | 9:43:13 AM | Inactive | Inactive | 422 | none | multiple burrow entrances | 33 23.6061 N 117 35.2462 W::1/9/15 at 17:38:18 (UTC) | 117.587437 W | 33.393435 N | 11S | 3695063.3 | 445371.6 |
| Keoni Calantas | 4 | 1/23/2015 | 9:31:37 AM | Inactive | Inactive | 422 | none | | 33 23.6157 N 117 35.2422 W::1/23/15 at 17:30:37 (UTC) | 117.587372 W | 33.393518 N | 11S | 3695063.3 | 445371.6 |
| Andrew Fisher | 3 | 1/9/2015 | 9:49:55 AM | Inactive | Inactive | 423 | none | multiple burrow entrances | 33 23.5758 N 117 35.2545 W::1/9/15 at 17:45:08 (UTC) | 117.587575 W | 33.392930 N | 11S | 3695003.8 | 445355.035 |
| Donna Germann | 4 | 1/23/2015 | 9:35:10 AM | Inactive | Inactive | 423 | none | | 33 23.5769 N 117 35.2550 W::1/23/15 at 17:32:05 (UTC) | 117.587583 W | 33.392948 N | 11S | 3695003.8 | 445355.035 |
| James McMorran | 3 | 1/9/2015 | 6:56:28 AM | Inactive | Inactive | 424 | none | | 33 24.6429 N 117 34.6407 W::1/9/15 at 14:51:17 (UTC) | 117.577352 W | 33.410757 N | 11S | 3696971.75 | 446315.34 |
| Andrew Fisher | 4 | 1/22/2015 | 3:43:49 PM | Inactive | Inactive | 424 | none | Plastic culvert opening | 33 24.6431 N 117 34.6434 W::1/22/15 at 23:38:07 (UTC) | 117.577390 W | 33.410718 N | 11S | 3696971.75 | 446315.34 |
| James McMorran | 3 | 1/9/2015 | 7:07:46 AM | Inactive | Inactive | 425 | none | | 33 24.5018 N 117 34.5509 W::1/9/15 at 15:02:26 (UTC) | 117.575848 W | 33.408363 N | 11S | 3696702.85 | 446455.05 |
| Andrew Fisher | 4 | 1/22/2015 | 4:23:55 PM | Inactive | Inactive | 425 | none | | 33 24.4964 N 117 34.5514 W::1/23/15 at 00:18:09 (UTC) | 117.575857 W | 33.408275 N | 11S | 3696702.85 | 446455.05 |
| Andrew Fisher | 1 | 12/19/2014 | 8:29:10 AM | Inactive | Inactive | 43 | none | ground squirrel sign | 33 24.1538 N 117 34.4686 W::12/19/14 at 16:25:56 (UTC) | 117.574477 W | 33.402565 N | 11S | 3696064.3 | 446581.01 |
| Andrew Fisher | 2 | 12/29/2014 | 8:39:36 AM | Inactive | Inactive | 43 | none | occupied by ground squirrel | 33 24.1540 N 117 34.4666 W::12/29/14 at 16:35:31 (UTC) | 117.574443 W | 33.402567 N | 11S | 3696064.3 | 446581.01 |
| Andrew Fisher | 3 | 1/9/2015 | 8:27:15 AM | Inactive | Inactive | 43 | none | occupied by ground squirrel | 33 24.1532 N 117 34.4676 W::1/9/15 at 16:22:28 (UTC) | 117.574460 W | 33.402553 N | 11S | 3696063.65 | 446580.865 |
| Andrew Fisher | 4 | 1/23/2015 | 8:16:29 AM | Inactive | Inactive | 43 | none | | 33 24.1540 N 117 34.4678 W::1/23/15 at 16:10:27 (UTC) | 117.574463 W | 33.402567 N | 11S | 3696063.65 | 446580.865 |
| Andrew Fisher | 1 | 12/19/2014 | 8:29:54 AM | Inactive | Inactive | 44 | none | multiple burrow entrances | 33 24.1613 N 117 34.4739 W::12/19/14 at 16:26:37 (UTC) | 117.574565 W | 33.402688 N | 11S | 3696077.45 | 446572.945 |
| Andrew Fisher | 2 | 12/29/2014 | 8:40:11 AM | Inactive | Inactive | 44 | none | multiple burrow entrances | 33 24.1608 N 117 34.4718 W::12/29/14 at 16:36:05 (UTC) | 117.574530 W | 33.402680 N | 11S | 3696077.45 | 446572.945 |
| Andrew Fisher | 3 | 1/9/2015 | 8:27:54 AM | Inactive | Inactive | 44 | none | occupied by ground squirrel | 33 24.1590 N 117 34.4720 W::1/9/15 at 16:22:55 (UTC) | 117.574533 W | 33.402652 N | 11S | 3696073.95 | 446573.855 |
| Andrew Fisher | 4 | 1/23/2015 | 8:17:02 AM | Inactive | Inactive | 44 | none | | 33 24.1592 N 117 34.4725 W::1/23/15 at 16:11:02 (UTC) | 117.574542 W | 33.402653 N | 11S | 3696073.95 | 446573.855 |
| Andrew Fisher | 1 | 12/19/2014 | 8:30:33 AM | Inactive | Inactive | 45 | none | multiple burrow entrances | 33 24.1675 N 117 34.4833 W::12/19/14 at 16:27:15 (UTC) | 117.574722 W | 33.402792 N | 11S | 3696089.3 | 446557.435 |
| Andrew Fisher | 2 | 12/29/2014 | 8:41:03 AM | Inactive | Inactive | 45 | none | occupied by ground squirrel | 33 24.1673 N 117 34.4825 W::12/29/14 at 16:37:04 (UTC) | 117.574708 W | 33.402788 N | 11S | 3696089.3 | 446557.435 |
| Andrew Fisher | 3 | 1/9/2015 | 8:28:29 AM | Inactive | Inactive | 45 | none | occupied by ground squirrel | 33 24.1658 N 117 34.4834 W::1/9/15 at 16:23:34 (UTC) | 117.574723 W | 33.402762 N | 11S | 3696087.2 | 446556.725 |
| Andrew Fisher | 4 | 1/23/2015 | 8:18:03 AM | Inactive | Inactive | 45 | none | | 33 24.1668 N 117 34.4833 W::1/23/15 at 16:11:58 (UTC) | 117.574722 W | 33.402780 N | 11S | 3696087.2 | 446556.725 |
| Andrew Fisher | 1 | 12/19/2014 | 8:31:24 AM | Inactive | Inactive | 46 | none | ground squirrel sign | 33 24.1815 N 117 34.4882 W::12/19/14 at 16:28:09 (UTC) | 117.574803 W | 33.403025 N | 11S | 3696115.85 | 446549.305 |
| Andrew Fisher | 2 | 12/29/2014 | 8:42:53 AM | Inactive | Inactive | 46 | none | occupied by ground squirrel | 33 24.1820 N 117 34.4883 W::12/29/14 at 16:38:55 (UTC) | 117.574805 W | 33.403033 N | 11S | 3696115.85 | 446549.305 |
| Andrew Fisher | 3 | 1/9/2015 | 8:29:45 AM | Inactive | Inactive | 46 | none | multiple burrow entrances | 33 24.1808 N 117 34.4889 W::1/9/15 at 16:24:48 (UTC) | 117.574815 W | 33.403013 N | 11S | 3696115.6 | 446547.955 |
| Andrew Fisher | 4 | 1/23/2015 | 8:19:42 AM | Inactive | Inactive | 46 | none | | 33 24.1824 N 117 34.4893 W::1/23/15 at 16:13:41 (UTC) | 117.574822 W | 33.403040 N | 11S | 3696115.6 | 446547.955 |
| Andrew Fisher | 1 | 12/19/2014 | 8:35:57 AM | Inactive | Inactive | 47 | none | ground squirrel sign | 33 24.2656 N 117 34.5478 W::12/19/14 at 16:32:44 (UTC) | 117.575797 W | 33.404427 N | 11S | 3696270.75 | 446460.095 |
| Andrew Fisher | 2 | 12/29/2014 | 8:47:55 AM | Inactive | Inactive | 47 | none | occupied by ground squirrel | 33 24.2650 N 117 34.5449 W::12/29/14 at 16:43:50 (UTC) | 117.575748 W | 33.404417 N | 11S | 3696270.75 | 446460.095 |
| Andrew Fisher | 3 | 1/9/2015 | 8:33:28 AM | Inactive | Inactive | 47 | none | occupied by ground squirrel | 33 24.2644 N 117 34.5456 W::1/9/15 at 16:28:34 (UTC) | 117.575760 W | 33.404408 N | 11S | 3696270.55 | 446461.165 |
| Andrew Fisher | 4 | 1/23/2015 | 8:23:39 AM | Inactive | Inactive | 47 | none | | 33 24.2659 N 117 34.5457 W::1/23/15 at 16:17:42 (UTC) | 117.575762 W | 33.404432 N | 11S | 3696270.55 | 446461.165 |
| Andrew Fisher | 1 | 12/19/2014 | 8:36:47 AM | Inactive | Inactive | 48 | none | multiple burrow entrances | 33 24.2728 N 117 34.5624 W::12/19/14 at 16:33:39 (UTC) | 117.576040 W | 33.404547 N | 11S | 3696284.3 | 446436.6 |
| Andrew Fisher | 2 | 12/29/2014 | 8:48:39 AM | Inactive | Inactive | 48 | none | multiple burrow entrances | 33 24.2723 N 117 34.5607 W::12/29/14 at 16:44:34 (UTC) | 117.576012 W | 33.404538 N | 11S | 3696284.3 | 446436.6 |
| Andrew Fisher | 3 | 1/9/2015 | 8:34:12 AM | Inactive | Inactive | 48 | none | occupied by ground squirrel | 33 24.2723 N 117 34.5600 W::1/9/15 at 16:29:19 (UTC) | 117.576000 W | 33.404538 N | 11S | 3696283.65 | 446437.945 |
| Andrew Fisher | 4 | 1/23/2015 | 8:24:29 AM | Inactive | Inactive | 48 | none | | 33 24.2722 N 117 34.5614 W::1/23/15 at 16:18:30 (UTC) | 117.576023 W | 33.404537 N | 11S | 3696283.65 | 446437.945 |
| Andrew Fisher | 1 | 12/19/2014 | 8:37:29 AM | Inactive | Inactive | 49 | none | multiple burrow entrances | 33 24.2779 N 117 34.5644 W::12/19/14 at 16:34:12 (UTC) | 117.576073 W | 33.404632 N | 11S | 3696294.75 | 446433.68 |
| Andrew Fisher | 2 | 12/29/2014 | 8:49:58 AM | Inactive | Inactive | 49 | none | multiple burrow entrances | 33 24.2785 N 117 34.5626 W::12/29/14 at 16:45:57 (UTC) | 117.576043 W | 33.404642 N | 11S | 3696294.75 | 446433.68 |
| Andrew Fisher | 3 | 1/9/2015 | 8:34:49 AM | Inactive | Inactive | 49 | none | occupied by ground squirrel | 33 24.2780 N 117 34.5631 W::1/9/15 at 16:29:53 (UTC) | 117.576052 W | 33.404633 N | 11S | 3696295.25 | 446433.545 |
| Andrew Fisher | 4 | 1/23/2015 | 8:25:13 AM | Inactive | Inactive | 49 | none | | 33 24.2790 N 117 34.5640 W::1/23/15 at 16:19:09 (UTC) | 117.576067 W | 33.404650 N | 11S | 3696295.25 | 446433.545 |
| Andrew Fisher | 1 | 12/19/2014 | 7:03:38 AM | Inactive | Inactive | 5 | none | 2 burrows | 33 24.5415 N 117 34.5339 W::12/19/14 at 15:00:27 (UTC) | 117.575565 W | 33.409025 N | 11S | 3696781.4 | 446482.92 |
| Andrew Fisher | 2 | 12/29/2014 | 7:05:08 AM | Inactive | Inactive | 5 | none | occupied by ground squirrel | 33 24.5419 N 117 34.5330 W::12/29/14 at 15:01:03 (UTC) | 117.575550 W | 33.409032 N | 11S | 3696781.4 | 446482.92 |
| Andrew Fisher | 3 | 1/9/2015 | 7:05:01 AM | Inactive | Inactive | 5 | none | multiple burrow entrances | 33 24.5445 N 117 34.5358 W::1/9/15 at 15:00:02 (UTC) | 117.575597 W | 33.409073 N | 11S | 3696788.5 | 446478.91 |
| Andrew Fisher | 4 | 1/22/2015 | 3:09:46 PM | Inactive | Inactive | 5 | none | | 33 24.5467 N 117 34.5363 W::1/22/15 at 23:03:45 (UTC) | 117.575605 W | 33.409112 N | 11S | 3696788.5 | 446478.91 |
| Andrew Fisher | 1 | 12/19/2014 | 8:38:28 AM | Inactive | Inactive | 50 | none | multiple burrow entrances | 33 24.2972 N 117 34.5764 W::12/19/14 at 16:35:14 (UTC) | 117.576273 W | 33.404953 N | 11S | 3696331.95 | 446415.425 |
| Andrew Fisher | 2 | 12/29/2014 | 8:51:06 AM | Inactive | Inactive | 50 | none | multiple burrow entrances | 33 24.2994 N 117 34.5744 W::12/29/14 at 16:47:11 (UTC) | 117.576240 W | 33.404990 N | 11S | 3696331.95 | 446415.425 |
| Andrew Fisher | 3 | 1/9/2015 | 8:35:53 AM | Inactive | Inactive | 50 | none | occupied by ground squirrel | 33 24.2984 N 117 34.5738 W::1/9/15 at 16:31:02 (UTC) | 117.576230 W | 33.404973 N | 11S | 3696333.75 | 446416.04 |
| Andrew Fisher | 4 | 1/23/2015 | 8:26:07 AM | Inactive | Inactive | 50 | none | | 33 24.3002 N 117 34.5762 W::1/23/15 at 16:20:01 (UTC) | 117.576270 W | 33.405003 N | 11S | 3696333.75 | 446416.04 |
| Andrew Fisher | 1 | 12/19/2014 | 8:39:05 AM | Inactive | Inactive | 51 | none | multiple burrow entrances | 33 24.3010 N 117 34.5807 W::12/19/14 at 16:35:53 (UTC) | 117.576345 W | 33.405017 N | 11S | 3696338.3 | 446407.005 |
| Andrew Fisher | 2 | 12/29/2014 | 8:52:09 AM | Inactive | Inactive | 51 | none | multiple burrow entrances | 33 24.3024 N 117 34.5810 W::12/29/14 at 16:48:04 (UTC) | 117.576350 W | 33.405040 N | 11S | 3696338.3 | 446407.005 |
| Andrew Fisher | 3 | 1/9/2015 | 8:36:44 AM | Inactive | Inactive | 51 | none | multiple burrow entrances | 33 24.3032 N 117 34.5822 W::1/9/15 at 16:31:46 (UTC) | 117.576368 W | 33.405053 N | 11S | 3696340.3 | 446405.015 |
| Andrew Fisher | 4 | 1/23/2015 | 8:27:18 AM | Inactive | Inactive | 51 | none | | 33 24.3024 N 117 34.5822 W::1/23/15 at 16:21:14 (UTC) | 117.576370 W | 33.405040 N | 11S | 3696340.3 | 446405.015 |
| Andrew Fisher | 1 | 12/19/2014 | 8:39:56 AM | Inactive | Inactive | 52 | none | multiple burrow entrances | 33 24.3140 N 117 34.5911 W::12/19/14 at 16:36:50 (UTC) | 117.576518 W | 33.405233 N | 11S | 3696360.75 | 446391.5 |
| Andrew Fisher | 2 | 12/29/2014 | 8:53:37 AM | Inactive | Inactive | 52 | none | multiple burrow entrances | 33 24.3136 N 117 34.5908 W::12/29/14 at 16:49:31 (UTC) | 117.576513 W | 33.405227 N | 11S | 3696360.75 | 446391.5 |

# Appendix C – Raw Field Data

| Primary_Bio | Survey Number | Date | Time | Cumulative_ Burrow_ Status | Field_ Burrow_ Status | Burrow ID | Sign | Notes | GPSLocation | Longitude | Latitude | Zone | Avg_ Northing_ Final | Avg_ Easting_ Final |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Andrew Fisher | 3 | 1/9/2015 | 8:37:53 AM | Inactive | Inactive | 52 | none | multiple burrow entrances | 33 24.3140 N 117 34.5910 W::1/9/15 at 16:32:55 (UTC) | 117.576517 W | 33.405233 N | 11S | 3696361.5 | 446390.905 |
| Andrew Fisher | 4 | 1/23/2015 | 8:27:55 AM | Inactive | Inactive | 52 | none | | 33 24.3144 N 117 34.5916 W::1/23/15 at 16:21:51 (UTC) | 117.576527 W | 33.405240 N | 11S | 3696361.5 | 446390.905 |
| Andrew Fisher | 1 | 12/19/2014 | 8:40:45 AM | Inactive | Inactive | 53 | none | multiple burrow entrances | 33 24.3244 N 117 34.5978 W::12/19/14 at 16:37:30 (UTC) | 117.576630 W | 33.405407 N | 11S | 3696384 | 446381.36 |
| Andrew Fisher | 2 | 12/29/2014 | 8:54:55 AM | Inactive | Inactive | 53 | none | multiple burrow entrances | 33 24.3283 N 117 34.5973 W::12/29/14 at 16:50:50 (UTC) | 117.576622 W | 33.405472 N | 11S | 3696384 | 446381.36 |
| Andrew Fisher | 3 | 1/9/2015 | 8:39:06 AM | Inactive | Inactive | 53 | none | multiple burrow entrances | 33 24.3282 N 117 34.5975 W::1/9/15 at 16:34:08 (UTC) | 117.576625 W | 33.405468 N | 11S | 3696388.8 | 446383.245 |
| Andrew Fisher | 4 | 1/23/2015 | 8:29:14 AM | Inactive | Inactive | 53 | none | | 33 24.3298 N 117 34.5952 W::1/23/15 at 16:23:10 (UTC) | 117.576587 W | 33.405497 N | 11S | 3696388.8 | 446383.245 |
| Andrew Fisher | 1 | 12/19/2014 | 8:41:48 AM | Inactive | Inactive | 54 | none | multiple burrow entrances | 33 24.3481 N 117 34.6130 W::12/19/14 at 16:39:09 (UTC) | 117.576883 W | 33.405802 N | 11S | 3696423.8 | 446358.19 |
| Andrew Fisher | 2 | 12/29/2014 | 8:56:36 AM | Inactive | Inactive | 54 | none | multiple burrow entrances | 33 24.3476 N 117 34.6123 W::12/29/14 at 16:52:31 (UTC) | 117.576872 W | 33.405793 N | 11S | 3696423.8 | 446358.19 |
| Andrew Fisher | 3 | 1/9/2015 | 8:40:43 AM | Inactive | Inactive | 54 | none | multiple burrow entrances | 33 24.3492 N 117 34.6136 W::1/9/15 at 16:35:49 (UTC) | 117.576893 W | 33.405820 N | 11S | 3696427.15 | 446357.14 |
| Andrew Fisher | 4 | 1/23/2015 | 8:32:04 AM | Inactive | Inactive | 54 | none | | 33 24.3501 N 117 34.6131 W::1/23/15 at 16:25:59 (UTC) | 117.576885 W | 33.405835 N | 11S | 3696427.15 | 446357.14 |
| Andrew Fisher | 1 | 12/19/2014 | 8:43:02 AM | Inactive | Inactive | 55 | none | multiple burrow entrances | 33 24.3554 N 117 34.6236 W::12/19/14 at 16:39:48 (UTC) | 117.577062 W | 33.405923 N | 11S | 3696437.45 | 446341.435 |
| Andrew Fisher | 2 | 12/29/2014 | 8:57:17 AM | Inactive | Inactive | 55 | none | multiple burrow entrances | 33 24.3549 N 117 34.6233 W::12/29/14 at 16:53:12 (UTC) | 117.577055 W | 33.405915 N | 11S | 3696437.45 | 446341.435 |
| Andrew Fisher | 3 | 1/9/2015 | 8:41:20 AM | Inactive | Inactive | 55 | none | multiple burrow entrances | 33 24.3557 N 117 34.6232 W::1/9/15 at 16:36:26 (UTC) | 117.577053 W | 33.405928 N | 11S | 3696440.25 | 446343.82 |
| Andrew Fisher | 4 | 1/23/2015 | 8:33:08 AM | Inactive | Inactive | 55 | none | | 33 24.3577 N 117 34.6208 W::1/23/15 at 16:27:02 (UTC) | 117.577013 W | 33.405962 N | 11S | 3696440.25 | 446343.82 |
| Andrew Fisher | 1 | 12/19/2014 | 8:44:21 AM | Inactive | Inactive | 56 | none | multiple burrow entrances | 33 24.3772 N 117 34.6379 W::12/19/14 at 16:41:06 (UTC) | 117.577298 W | 33.406287 N | 11S | 3696478.1 | 446319.205 |
| Andrew Fisher | 2 | 12/29/2014 | 8:58:15 AM | Inactive | Inactive | 56 | none | multiple burrow entrances | 33 24.3770 N 117 34.6381 W::12/29/14 at 16:54:18 (UTC) | 117.577302 W | 33.406283 N | 11S | 3696478.1 | 446319.205 |
| Andrew Fisher | 3 | 1/9/2015 | 8:42:04 AM | Inactive | Inactive | 56 | none | multiple burrow entrances | 33 24.3776 N 117 34.6367 W::1/9/15 at 16:37:20 (UTC) | 117.577278 W | 33.406293 N | 11S | 3696480.6 | 446321.725 |
| Andrew Fisher | 4 | 1/23/2015 | 8:34:33 AM | Inactive | Inactive | 56 | none | | 33 24.3793 N 117 34.6361 W::1/23/15 at 16:28:28 (UTC) | 117.577268 W | 33.406322 N | 11S | 3696480.6 | 446321.725 |
| Andrew Fisher | 1 | 12/19/2014 | 8:45:17 AM | Inactive | Inactive | 57 | none | multiple burrow entrances | 33 24.3878 N 117 34.6387 W::12/19/14 at 16:42:10 (UTC) | 117.577312 W | 33.406463 N | 11S | 3696497.3 | 446318.1967 |
| Andrew Fisher | 2 | 12/29/2014 | 8:59:11 AM | Inactive | Inactive | 57 | none | multiple burrow entrances | 33 24.3870 N 117 34.6387 W::12/29/14 at 16:55:17 (UTC) | 117.577312 W | 33.406450 N | 11S | 3696497.3 | 446318.1967 |
| Andrew Fisher | 3 | 1/9/2015 | 8:42:50 AM | Inactive | Inactive | 57 | none | multiple burrow entrances | 33 24.3875 N 117 34.6393 W::1/9/15 at 16:37:59 (UTC) | 117.577322 W | 33.406458 N | 11S | 3696501.6 | 446315.985 |
| Andrew Fisher | 4 | 1/23/2015 | 8:35:33 AM | Inactive | Inactive | 57 | none | | 33 24.3921 N 117 34.6410 W::1/23/15 at 16:29:27 (UTC) | 117.577350 W | 33.406535 N | 11S | 3696501.6 | 446315.985 |
| Andrew Fisher | 1 | 12/19/2014 | 9:08:47 AM | Inactive | Inactive | 58 | none | multiple burrow entrances | 33 23.7292 N 117 35.2056 W::12/19/14 at 17:05:38 (UTC) | 117.586760 W | 33.395487 N | 11S | 3695283.65 | 445432.08 |
| Brennan Mulrooney | 2 | 12/29/2014 | 9:22:44 AM | Inactive | Inactive | 58 | none | | 33 23.7268 N 117 35.2065 W::12/29/14 at 17:18:49 (UTC) | 117.586775 W | 33.395447 N | 11S | 3695283.65 | 445432.08 |
| James McMorran | 3 | 1/9/2015 | 9:05:18 AM | Inactive | Inactive | 58 | none | | 33 23.7295 N 117 35.2118 W::1/9/15 at 17:00:06 (UTC) | 117.586863 W | 33.395492 N | 11S | 3695287 | 445427.685 |
| Keoni Calantas | 4 | 1/23/2015 | 8:51:58 AM | Inactive | Inactive | 58 | none | | 33 23.7301 N 117 35.2060 W::1/23/15 at 16:50:52 (UTC) | 117.586767 W | 33.395502 N | 11S | 3695287 | 445427.685 |
| Andrew Fisher | 1 | 12/19/2014 | 9:09:37 AM | Inactive | Inactive | 59 | none | multiple burrow entrances | 33 23.7201 N 117 35.1984 W::12/19/14 at 17:06:33 (UTC) | 117.586640 W | 33.395335 N | 11S | 3695270.6 | 445446.5633 |
| Brennan Mulrooney | 2 | 12/29/2014 | 9:23:41 AM | Inactive | Inactive | 59 | none | | 33 23.7180 N 117 35.1983 W::12/29/14 at 17:19:46 (UTC) | 117.586638 W | 33.395300 N | 11S | 3695270.6 | 445446.5633 |
| Andrew Fisher | 3 | 1/9/2015 | 9:05:21 AM | Inactive | Inactive | 59 | none | multiple burrow entrances | 33 23.7203 N 117 35.1988 W::1/9/15 at 17:00:26 (UTC) | 117.586647 W | 33.395338 N | 11S | 3695269.1 | 445444.79 |
| Andrew Fisher | 4 | 1/23/2015 | 8:56:38 AM | Inactive | Inactive | 59 | none | | 33 23.7201 N 117 35.1968 W::1/23/15 at 16:50:36 (UTC) | 117.586613 W | 33.395335 N | 11S | 3695269.1 | 445444.79 |
| Andrew Fisher | 1 | 12/19/2014 | 7:04:15 AM | Inactive | Inactive | 6 | none | multiple burrow entrances | 33 24.5359 N 117 34.5340 W::12/19/14 at 15:01:17 (UTC) | 117.575567 W | 33.408932 N | 11S | 3696770.95 | 446482.625 |
| Brennan Mulrooney | 2 | 12/29/2014 | 7:05:35 AM | Inactive | Inactive | 6 | none | | 33 24.5362 N 117 34.5332 W::12/29/14 at 15:01:43 (UTC) | 117.575553 W | 33.408937 N | 11S | 3696770.95 | 446482.625 |
| Andrew Fisher | 3 | 1/9/2015 | 7:05:39 AM | Inactive | Inactive | 6 | none | multiple burrow entrances | 33 24.5363 N 117 34.5352 W::1/9/15 at 15:00:41 (UTC) | 117.575587 W | 33.408938 N | 11S | 3696772.9 | 446479.385 |
| Andrew Fisher | 4 | 1/22/2015 | 3:10:23 PM | Inactive | Inactive | 6 | none | | 33 24.5379 N 117 34.5362 W::1/22/15 at 23:04:23 (UTC) | 117.575603 W | 33.408965 N | 11S | 3696772.9 | 446479.385 |
| Andrew Fisher | 1 | 12/19/2014 | 9:11:18 AM | Inactive | Inactive | 60 | none | multiple burrow entrances | 33 23.7082 N 117 35.1836 W::12/19/14 at 17:08:04 (UTC) | 117.586393 W | 33.395137 N | 11S | 3695247.3 | 445466.85 |
| Brennan Mulrooney | 2 | 12/29/2014 | 9:24:34 AM | Inactive | Inactive | 60 | none | | 33 23.7087 N 117 35.1834 W::12/29/14 at 17:20:43 (UTC) | 117.586390 W | 33.395145 N | 11S | 3695247.3 | 445466.85 |
| Andrew Fisher | 3 | 1/9/2015 | 9:06:08 AM | Inactive | Inactive | 60 | none | occupied by ground squirrel | 33 23.7077 N 117 35.1846 W::1/9/15 at 17:01:15 (UTC) | 117.586412 W | 33.395128 N | 11S | 3695246.7 | 445465.725 |
| Andrew Fisher | 4 | 1/23/2015 | 8:57:27 AM | Inactive | Inactive | 60 | none | | 33 23.7086 N 117 35.1837 W::1/23/15 at 16:51:28 (UTC) | 117.586395 W | 33.395143 N | 11S | 3695246.7 | 445465.725 |
| Andrew Fisher | 1 | 12/19/2014 | 9:12:10 AM | Inactive | Inactive | 61 | none | | 33 23.6955 N 117 35.1765 W::12/19/14 at 17:08:55 (UTC) | 117.586275 W | 33.394925 N | 11S | 3695229.75 | 445483.725 |
| James McMorran | 2 | 12/29/2014 | 9:26:06 AM | Inactive | Inactive | 61 | none | | 33 23.7025 N 117 35.1686 W::12/29/14 at 17:22:31 (UTC) | 117.586143 W | 33.395042 N | 11S | 3695229.75 | 445483.725 |
| Andrew Fisher | 3 | 1/9/2015 | 9:07:05 AM | Inactive | Inactive | 61 | none | multiple burrow entrances | 33 23.7008 N 117 35.1773 W::1/9/15 at 17:02:09 (UTC) | 117.586288 W | 33.395013 N | 11S | 3695234.4 | 445476.68 |
| Andrew Fisher | 4 | 1/23/2015 | 8:58:01 AM | Inactive | Inactive | 61 | none | | 33 23.7022 N 117 35.1769 W::1/23/15 at 16:52:01 (UTC) | 117.586282 W | 33.395037 N | 11S | 3695234.4 | 445476.68 |
| Andrew Fisher | 1 | 12/19/2014 | 9:13:12 AM | Inactive | Inactive | 62 | none | multiple burrow entrances | 33 23.6776 N 117 35.1757 W::12/19/14 at 17:09:59 (UTC) | 117.586262 W | 33.394627 N | 11S | 3695190.4 | 445478.29 |
| James McMorran | 2 | 12/29/2014 | 9:27:45 AM | Inactive | Inactive | 62 | none | | 33 23.6778 N 117 35.1761 W::12/29/14 at 17:23:52 (UTC) | 117.586268 W | 33.394630 N | 11S | 3695190.4 | 445478.29 |
| Andrew Fisher | 3 | 1/9/2015 | 9:08:24 AM | Inactive | Inactive | 62 | none | multiple burrow entrances | 33 23.6787 N 117 35.1785 W::1/9/15 at 17:03:26 (UTC) | 117.586308 W | 33.394645 N | 11S | 3695191.85 | 445474.995 |
| Andrew Fisher | 4 | 1/23/2015 | 9:00:01 AM | Inactive | Inactive | 62 | none | | 33 23.6782 N 117 35.1776 W::1/23/15 at 16:53:55 (UTC) | 117.586293 W | 33.394637 N | 11S | 3695191.85 | 445474.995 |
| Andrew Fisher | 1 | 12/19/2014 | 9:14:31 AM | Inactive | Inactive | 63 | none | multiple burrow entrances | 33 23.6561 N 117 35.1735 W::12/19/14 at 17:11:19 (UTC) | 117.586225 W | 33.394268 N | 11S | 3695164.1 | 445483.96 |
| James McMorran | 2 | 12/29/2014 | 9:28:54 AM | Inactive | Inactive | 63 | none | | 33 23.6709 N 117 35.1708 W::12/29/14 at 17:24:59 (UTC) | 117.586180 W | 33.394515 N | 11S | 3695164.1 | 445483.96 |
| Andrew Fisher | 3 | 1/9/2015 | 9:08:56 AM | Inactive | Inactive | 63 | none | multiple burrow entrances | 33 23.6678 N 117 35.1747 W::1/9/15 at 17:04:08 (UTC) | 117.586245 W | 33.394463 N | 11S | 3695171.8 | 445480.605 |
| Andrew Fisher | 4 | 1/23/2015 | 9:00:32 AM | Inactive | Inactive | 63 | none | | 33 23.6675 N 117 35.1740 W::1/23/15 at 16:54:31 (UTC) | 117.586233 W | 33.394458 N | 11S | 3695171.8 | 445480.605 |
| Andrew Fisher | 1 | 12/19/2014 | 9:17:04 AM | Inactive | Inactive | 64 | none | multiple burrow entrances | 33 23.6117 N 117 35.1517 W::12/19/14 at 17:13:59 (UTC) | 117.585862 W | 33.393528 N | 11S | 3695072.033 | 445517.2133 |
| Brennan Mulrooney | 2 | 12/29/2014 | 9:32:11 AM | Inactive | Inactive | 64 | none | | 33 23.6127 N 117 35.1524 W::12/29/14 at 17:28:23 (UTC) | 117.585873 W | 33.393545 N | 11S | 3695072.033 | 445517.2133 |
| Andrew Fisher | 3 | 1/9/2015 | 9:11:17 AM | Inactive | Inactive | 64 | none | multiple burrow entrances | 33 23.6122 N 117 35.1529 W::1/9/15 at 17:06:26 (UTC) | 117.585882 W | 33.393538 N | 11S | 3695069.15 | 445513.185 |
| Andrew Fisher | 4 | 1/23/2015 | 9:02:37 AM | Inactive | Inactive | 64 | none | | 33 23.6121 N 117 35.1530 W::1/23/15 at 16:56:34 (UTC) | 117.585883 W | 33.393535 N | 11S | 3695069.15 | 445513.185 |

# Appendix C – Raw Field Data

| Primary_Bio | Survey Number | Date | Time | Cumulative_ Burrow_ Status | Field_ Burrow_ Status | Burrow ID | Sign | Notes | GPSLocation | Longitude | Latitude | Zone | Avg_ Northing_ Final | Avg_ Easting_ Final |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Andrew Fisher | 1 | 12/19/2014 | 9:18:54 AM | Inactive | Inactive | 65 | none | multiple burrow entrances | 33 23.5885 N 117 35.1325 W::12/19/14 at 17:15:43 (UTC) | 117.585542 W | 33.393142 N | 11S | 3695028 | 445550.755 |
| James McMorran | 2 | 12/29/2014 | 9:33:53 AM | Inactive | Inactive | 65 | none | | 33 23.5916 N 117 35.1246 W::12/29/14 at 17:29:52 (UTC) | 117.585410 W | 33.393193 N | 11S | 3695028 | 445550.755 |
| Andrew Fisher | 3 | 1/9/2015 | 9:13:15 AM | Inactive | Inactive | 65 | none | multiple burrow entrances | 33 23.5882 N 117 35.1333 W::1/9/15 at 17:08:16 (UTC) | 117.585555 W | 33.393137 N | 11S | 3695025.85 | 445545.725 |
| Andrew Fisher | 4 | 1/23/2015 | 9:03:47 AM | Inactive | Inactive | 65 | none | | 33 23.5895 N 117 35.1303 W::1/23/15 at 16:57:46 (UTC) | 117.585505 W | 33.393158 N | 11S | 3695025.85 | 445545.725 |
| Andrew Fisher | 1 | 12/19/2014 | 9:19:49 AM | Inactive | Inactive | 66 | none | multiple burrow entrances | 33 23.5734 N 117 35.1289 W::12/19/14 at 17:16:38 (UTC) | 117.585482 W | 33.392890 N | 11S | 3695001.9 | 445550.985 |
| James McMorran | 2 | 12/29/2014 | 9:35:05 AM | Inactive | Inactive | 66 | none | | 33 23.5784 N 117 35.1277 W::12/29/14 at 17:31:13 (UTC) | 117.585462 W | 33.392973 N | 11S | 3695001.9 | 445550.985 |
| Andrew Fisher | 3 | 1/9/2015 | 9:13:53 AM | Inactive | Inactive | 66 | none | multiple burrow entrances | 33 23.5747 N 117 35.1280 W::1/9/15 at 17:08:54 (UTC) | 117.585467 W | 33.392912 N | 11S | 3694999.75 | 445550.74 |
| Andrew Fisher | 4 | 1/23/2015 | 9:04:33 AM | Inactive | Inactive | 66 | none | | 33 23.5748 N 117 35.1289 W::1/23/15 at 16:58:26 (UTC) | 117.585482 W | 33.392913 N | 11S | 3694999.75 | 445550.74 |
| Andrew Fisher | 1 | 12/19/2014 | 9:20:28 AM | Inactive | Inactive | 67 | none | multiple burrow entrances | 33 23.5633 N 117 35.1291 W::12/19/14 at 17:17:19 (UTC) | 117.585485 W | 33.392722 N | 11S | 3694984.3 | 445554.79 |
| James McMorran | 2 | 12/29/2014 | 9:36:02 AM | Inactive | Inactive | 67 | none | | 33 23.5695 N 117 35.1225 W::12/29/14 at 17:32:06 (UTC) | 117.585375 W | 33.392825 N | 11S | 3694984.3 | 445554.79 |
| Andrew Fisher | 3 | 1/9/2015 | 9:14:18 AM | Inactive | Inactive | 67 | none | multiple burrow entrances | 33 23.5669 N 117 35.1254 W::1/9/15 at 17:09:24 (UTC) | 117.585423 W | 33.392782 N | 11S | 3694984.6 | 445555.445 |
| Andrew Fisher | 4 | 1/23/2015 | 9:04:59 AM | Inactive | Inactive | 67 | none | | 33 23.5662 N 117 35.1254 W::1/23/15 at 16:58:59 (UTC) | 117.585423 W | 33.392770 N | 11S | 3694984.6 | 445555.445 |
| Andrew Fisher | 1 | 12/19/2014 | 9:22:15 AM | Inactive | Inactive | 68 | none | multiple burrow entrances | 33 23.5403 N 117 35.1176 W::12/19/14 at 17:19:13 (UTC) | 117.585290 W | 33.392340 N | 11S | 3694936.3 | 445569.26 |
| Brennan Mulrooney | 2 | 12/29/2014 | 9:38:35 AM | Inactive | Inactive | 68 | none | | 33 23.5405 N 117 35.1152 W::12/29/14 at 17:34:41 (UTC) | 117.585253 W | 33.392342 N | 11S | 3694936.3 | 445569.26 |
| James McMorran | 3 | 1/9/2015 | 9:14:29 AM | Inactive | Inactive | 68 | none | | 33 23.5391 N 117 35.1187 W::1/9/15 at 17:10:00 (UTC) | 117.585312 W | 33.392318 N | 11S | 3694939.2 | 445560.86 |
| Keoni Calantas | 4 | 1/23/2015 | 9:00:30 AM | Inactive | Inactive | 68 | none | | 33 23.5449 N 117 35.1247 W::1/23/15 at 16:59:31 (UTC) | 117.585412 W | 33.392415 N | 11S | 3694939.2 | 445560.86 |
| Andrew Fisher | 1 | 12/19/2014 | 9:25:53 AM | Inactive | Inactive | 69 | none | multiple burrow entrances | 33 23.4834 N 117 35.0724 W::12/19/14 at 17:22:41 (UTC) | 117.584532 W | 33.391432 N | 11S | 3694835.25 | 445638.865 |
| Brennan Mulrooney | 2 | 12/29/2014 | 9:43:10 AM | Inactive | Inactive | 69 | none | | 33 23.4861 N 117 35.0702 W::12/29/14 at 17:39:17 (UTC) | 117.584502 W | 33.391435 N | 11S | 3694835.25 | 445638.865 |
| James McMorran | 3 | 1/9/2015 | 9:18:28 AM | Inactive | Inactive | 69 | none | | 33 23.4899 N 117 35.0674 W::1/9/15 at 17:13:17 (UTC) | 117.584457 W | 33.391498 N | 11S | 3694841.85 | 445645.65 |
| Keoni Calantas | 4 | 1/23/2015 | 9:04:02 AM | Inactive | Inactive | 69 | none | | 33 23.4893 N 117 35.0659 W::1/23/15 at 17:02:53 (UTC) | 117.584432 W | 33.391488 N | 11S | 3694841.85 | 445645.65 |
| Andrew Fisher | 1 | 12/19/2014 | 7:05:09 AM | Inactive | Inactive | 7 | none | multiple burrow entrances | 33 24.5316 N 117 34.5269 W::12/19/14 at 15:01:57 (UTC) | 117.575447 W | 33.408862 N | 11S | 3696763.35 | 446493.09 |
| Andrew Fisher | 2 | 12/29/2014 | 7:06:01 AM | Inactive | Inactive | 7 | none | multiple burrow entrances | 33 24.5322 N 117 34.5268 W::12/29/14 at 15:01:59 (UTC) | 117.575447 W | 33.408870 N | 11S | 3696763.35 | 446493.09 |
| Andrew Fisher | 3 | 1/9/2015 | 7:06:13 AM | Inactive | Inactive | 7 | none | multiple burrow entrances | 33 24.5315 N 117 34.5277 W::1/9/15 at 15:01:18 (UTC) | 117.575462 W | 33.408858 N | 11S | 3696764.85 | 446492.26 |
| Andrew Fisher | 4 | 1/22/2015 | 3:11:04 PM | Inactive | Inactive | 7 | none | | 33 24.5341 N 117 34.5270 W::1/22/15 at 23:05:03 (UTC) | 117.575450 W | 33.408902 N | 11S | 3696764.85 | 446492.26 |
| Andrew Fisher | 1 | 12/19/2014 | 9:26:44 AM | Inactive | Inactive | 70 | none | multiple burrow entrances | 33 23.4781 N 117 35.0670 W::12/19/14 at 17:23:39 (UTC) | 117.584450 W | 33.391302 N | 11S | 3694826.65 | 445645.425 |
| James McMorran | 2 | 12/29/2014 | 9:43:32 AM | Inactive | Inactive | 70 | none | | 33 23.4846 N 117 35.0665 W::12/29/14 at 17:39:37 (UTC) | 117.584442 W | 33.391410 N | 11S | 3694826.65 | 445645.425 |
| Andrew Fisher | 3 | 1/9/2015 | 9:18:39 AM | Inactive | Inactive | 70 | none | multiple burrow entrances | 33 23.4811 N 117 35.0654 W::1/9/15 at 17:13:48 (UTC) | 117.584423 W | 33.391352 N | 11S | 3694825.4 | 445646.53 |
| Keoni Calantas | 4 | 1/23/2015 | 9:04:40 AM | Inactive | Inactive | 70 | none | | 33 23.4803 N 117 35.0667 W::1/23/15 at 17:03:34 (UTC) | 117.584445 W | 33.391338 N | 11S | 3694825.4 | 445646.53 |
| Andrew Fisher | 1 | 12/19/2014 | 9:35:49 AM | Inactive | Inactive | 71 | none | multiple burrow entrances | 33 23.4295 N 117 35.1079 W::12/19/14 at 17:32:45 (UTC) | 117.585132 W | 33.390492 N | 11S | 3694720.6 | 445593.065 |
| James McMorran | 2 | 12/29/2014 | 9:52:22 AM | Inactive | Inactive | 71 | none | | 33 23.4181 N 117 35.0924 W::12/29/14 at 17:48:29 (UTC) | 117.584873 W | 33.390302 N | 11S | 3694720.6 | 445593.065 |
| Andrew Fisher | 3 | 1/9/2015 | 9:29:40 AM | Inactive | Inactive | 71 | none | occupied by ground squirrel | 33 23.4272 N 117 35.0985 W::1/9/15 at 17:25:09 (UTC) | 117.584975 W | 33.390453 N | 11S | 3694725.95 | 445595.285 |
| Keoni Calantas | 4 | 1/23/2015 | 9:43:55 AM | No Longer Suitable | No Longer Suitable | 71 | none | | 33 23.4263 N 117 35.0990 W::1/23/15 at 17:44:22 (UTC) | 117.584983 W | 33.390438 N | 11S | 3694725.95 | 445595.285 |
| Andrew Fisher | 1 | 12/19/2014 | 9:38:14 AM | Inactive | Inactive | 72 | none | multiple burrow entrances | 33 23.4649 N 117 35.1364 W::12/19/14 at 17:35:02 (UTC) | 117.585607 W | 33.391082 N | 11S | 3694798.35 | 445537 |
| James McMorran | 2 | 12/29/2014 | 9:54:53 AM | Inactive | Inactive | 72 | none | | 33 23.4665 N 117 35.1368 W::12/29/14 at 17:50:57 (UTC) | 117.585613 W | 33.391108 N | 11S | 3694798.35 | 445537 |
| Andrew Fisher | 4 | 1/23/2015 | 9:48:11 AM | Inactive | Inactive | 72 | none | | 33 23.4662 N 117 35.1368 W::1/23/15 at 17:42:14 (UTC) | 117.585613 W | 33.391103 N | 11S | 1847399.6 | 222768.365 |
| Keoni Calantas | 4 | 1/26/2015 | 2:35:23 PM | Inactive | Inactive | 72 | none | | 33 23.4662 N 117 35.1368 W::1/23/15 at 17:42:14 (UTC) | 117.585613 W | 33.391103 N | 11S | 1847399.6 | 222768.365 |
| Andrew Fisher | 1 | 12/19/2014 | 9:39:16 AM | Inactive | Inactive | 73 | none | multiple burrow entrances | 33 23.4754 N 117 35.1485 W::12/19/14 at 17:36:01 (UTC) | 117.585808 W | 33.391257 N | 11S | 3694813.65 | 445519.885 |
| James McMorran | 2 | 12/29/2014 | 9:56:01 AM | Inactive | Inactive | 73 | none | | 33 23.4725 N 117 35.1469 W::12/29/14 at 17:52:12 (UTC) | 117.585782 W | 33.391208 N | 11S | 3694813.65 | 445519.885 |
| Andrew Fisher | 3 | 1/9/2015 | 9:33:22 AM | Inactive | Inactive | 73 | none | occupied by ground squirrel | 33 23.4756 N 117 35.1487 W::1/9/15 at 17:28:27 (UTC) | 117.585812 W | 33.391260 N | 11S | 3694818.65 | 445515.635 |
| Andrew Fisher | 4 | 1/23/2015 | 9:46:44 AM | Inactive | Inactive | 73 | none | | 33 23.4777 N 117 35.1522 W::1/23/15 at 17:40:40 (UTC) | 117.585870 W | 33.391295 N | 11S | 3694818.65 | 445515.635 |
| Andrew Fisher | 1 | 12/19/2014 | 9:39:45 AM | Inactive | Inactive | 74 | none | multiple burrow entrances | 33 23.4803 N 117 35.1454 W::12/19/14 at 17:36:34 (UTC) | 117.585757 W | 33.391338 N | 11S | 3694826.25 | 445522.325 |
| Brennan Mulrooney | 2 | 12/29/2014 | 9:56:51 AM | Inactive | Inactive | 74 | none | | 33 23.4813 N 117 35.1469 W::12/29/14 at 17:53:08 (UTC) | 117.585782 W | 33.391355 N | 11S | 3694826.25 | 445522.325 |
| James McMorran | 3 | 1/9/2015 | 9:34:30 AM | Inactive | Inactive | 74 | none | | 33 23.4816 N 117 35.1447 W::1/9/15 at 17:29:05 (UTC) | 117.585745 W | 33.391360 N | 11S | 3694830 | 445520.765 |
| Andrew Fisher | 4 | 1/23/2015 | 9:45:49 AM | Inactive | Inactive | 74 | none | | 33 23.4840 N 117 35.1497 W::1/23/15 at 17:39:46 (UTC) | 117.585828 W | 33.391400 N | 11S | 3694830 | 445520.765 |
| Andrew Fisher | 1 | 12/19/2014 | 9:40:25 AM | Inactive | Inactive | 75 | none | multiple burrow entrances | 33 23.4840 N 117 35.1544 W::12/19/14 at 17:37:10 (UTC) | 117.585907 W | 33.391400 N | 11S | 3694833.25 | 445504.695 |
| James McMorran | 2 | 12/29/2014 | 9:57:42 AM | Inactive | Inactive | 75 | none | | 33 23.4850 N 117 35.1607 W::12/29/14 at 17:53:34 (UTC) | 117.586012 W | 33.391417 N | 11S | 3694833.25 | 445504.695 |
| Andrew Fisher | 3 | 1/9/2015 | 9:34:46 AM | Inactive | Inactive | 75 | none | occupied by ground squirrel | 33 23.4854 N 117 35.1586 W::1/9/15 at 17:29:51 (UTC) | 117.585977 W | 33.391422 N | 11S | 3694835.4 | 445501.78 |
| Keoni Calantas | 4 | 1/23/2015 | 9:40:45 AM | Inactive | Inactive | 75 | none | | 33 23.4860 N 117 35.1603 W::1/23/15 at 17:39:38 (UTC) | 117.586005 W | 33.391433 N | 11S | 3694835.4 | 445501.78 |
| Andrew Fisher | 1 | 12/19/2014 | 9:42:12 AM | Inactive | Inactive | 76 | none | ground squirrel sign | 33 23.5106 N 117 35.1873 W::12/19/14 at 17:39:19 (UTC) | 117.586455 W | 33.391843 N | 11S | 3694884 | 445458.8 |
| James McMorran | 2 | 12/29/2014 | 10:00:02 AM | Inactive | Inactive | 76 | none | | 33 23.5131 N 117 35.1874 W::12/29/14 at 17:56:09 (UTC) | 117.586457 W | 33.391885 N | 11S | 3694884 | 445458.8 |
| Andrew Fisher | 3 | 1/9/2015 | 9:37:01 AM | Inactive | Inactive | 76 | none | multiple burrow entrances | 33 23.5090 N 117 35.1874 W::1/9/15 at 17:32:06 (UTC) | 117.586457 W | 33.391817 N | 11S | 3694881 | 445458.555 |
| Keoni Calantas | 4 | 1/23/2015 | 9:38:56 AM | Inactive | Inactive | 76 | none | | 33 23.5114 N 117 35.1876 W::1/23/15 at 17:37:54 (UTC) | 117.586460 W | 33.391857 N | 11S | 3694881 | 445458.555 |
| Andrew Fisher | 1 | 12/19/2014 | 9:48:57 AM | Inactive | Inactive | 77 | none | multiple burrow entrances | 33 23.6333 N 117 35.2519 W::12/19/14 at 17:45:41 (UTC) | 117.587532 W | 33.393888 N | 11S | 3695107.45 | 445359.06 |
| James McMorran | 2 | 12/29/2014 | 10:07:47 AM | Inactive | Inactive | 77 | none | | 33 23.6316 N 117 35.2531 W::12/29/14 at 18:03:41 (UTC) | 117.587552 W | 33.393860 N | 11S | 3695107.45 | 445359.06 |

# Appendix C – Raw Field Data

| Primary_Bio | Survey Number | Date | Time | Cumulative_ Burrow_ Status | Field_ Burrow_ Status | Burrow ID | Sign | Notes | GPSLocation | Longitude | Latitude | Zone | Avg_ Northing_ Final | Avg_ Easting_ Final |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| James McMorran | 3 | 1/9/2015 | 9:43:07 AM | Inactive | Inactive | 77 | none | | 33 23.6316 N 117 35.2531 W::12/29/14 at 18:03:41 (UTC) | 117.587552 W | 33.393860 N | 11S | 3695077.65 | 445369.585 |
| Keoni Calantas | 4 | 1/23/2015 | 9:33:02 AM | Inactive | Inactive | 77 | none | | 33 23.6011 N 117 35.2381 W::1/23/15 at 17:31:54 (UTC) | 117.587302 W | 33.393352 N | 11S | 3695077.65 | 445369.585 |
| Andrew Fisher | 1 | 12/19/2014 | 9:49:36 AM | Inactive | Inactive | 78 | none | multiple burrow entrances | 33 23.6439 N 117 35.2550 W::12/19/14 at 17:46:20 (UTC) | 117.587583 W | 33.394065 N | 11S | 3695117.25 | 445356.745 |
| James McMorran | 2 | 12/29/2014 | 10:08:18 AM | Inactive | Inactive | 78 | none | | 33 23.6316 N 117 35.2531 W::12/29/14 at 18:04:21 (UTC) | 117.587552 W | 33.393860 N | 11S | 3695117.25 | 445356.745 |
| James McMorran | 3 | 1/9/2015 | 9:43:36 AM | Inactive | Inactive | 78 | none | | 33 23.6316 N 117 35.2531 W::12/29/14 at 18:04:21 (UTC) | 117.587552 W | 33.393860 N | 11S | 3695082.8 | 445370.315 |
| Andrew Fisher | 4 | 1/23/2015 | 9:36:43 AM | Inactive | Inactive | 78 | none | | 33 23.6067 N 117 35.2372 W::1/23/15 at 17:30:45 (UTC) | 117.587287 W | 33.393445 N | 11S | 3695082.8 | 445370.315 |
| Andrew Fisher | 1 | 12/19/2014 | 9:54:46 AM | Inactive | Inactive | 79 | none | multiple burrow entrances | 33 23.5819 N 117 35.2486 W::12/19/14 at 17:51:44 (UTC) | 117.587477 W | 33.393032 N | 11S | 3695012.3 | 445357.22 |
| James McMorran | 2 | 12/29/2014 | 10:16:59 AM | Inactive | Inactive | 79 | none | | 33 23.5800 N 117 35.2581 W::12/29/14 at 18:13:10 (UTC) | 117.587635 W | 33.393000 N | 11S | 3695012.3 | 445357.22 |
| Andrew Fisher | 3 | 1/9/2015 | 9:48:59 AM | Inactive | Inactive | 79 | none | multiple burrow entrances | 33 23.5811 N 117 35.2552 W::1/9/15 at 17:44:17 (UTC) | 117.587595 W | 33.393042 N | 11S | 3695015.45 | 445357.47 |
| Donna Germann | 4 | 1/23/2015 | 9:34:08 AM | Inactive | Inactive | 79 | none | | 33 23.5828 N 117 35.2507 W::1/23/15 at 17:31:00 (UTC) | 117.587512 W | 33.393047 N | 11S | 3695015.45 | 445357.47 |
| Andrew Fisher | 1 | 12/19/2014 | 7:07:38 AM | Inactive | Inactive | 8 | none | multiple burrow entrances | 33 24.5198 N 117 34.5063 W::12/19/14 at 15:04:21 (UTC) | 117.575105 W | 33.408663 N | 11S | 3696741.25 | 446526.03 |
| Andrew Fisher | 2 | 12/29/2014 | 7:08:28 AM | Inactive | Inactive | 8 | none | occupied by ground squirrel | 33 24.5205 N 117 34.5047 W::12/29/14 at 15:04:23 (UTC) | 117.575078 W | 33.408675 N | 11S | 3696741.25 | 446526.03 |
| Andrew Fisher | 3 | 1/9/2015 | 7:07:41 AM | Inactive | Inactive | 8 | none | occupied by ground squirrel | 33 24.5209 N 117 34.5048 W::1/9/15 at 15:02:46 (UTC) | 117.575080 W | 33.408682 N | 11S | 3696743.05 | 446524.545 |
| Andrew Fisher | 4 | 1/22/2015 | 3:12:10 PM | Inactive | Inactive | 8 | none | | 33 24.5213 N 117 34.5081 W::1/22/15 at 23:06:09 (UTC) | 117.575135 W | 33.408688 N | 11S | 3696743.05 | 446524.545 |
| Andrew Fisher | 1 | 12/19/2014 | 9:56:32 AM | Inactive | Inactive | 80 | none | multiple burrow entrances | 33 23.5581 N 117 35.2300 W::12/19/14 at 17:53:21 (UTC) | 117.587167 W | 33.392635 N | 11S | 3694968.25 | 445392.64 |
| James McMorran | 2 | 12/29/2014 | 10:04:53 AM | Inactive | Inactive | 80 | none | | 33 23.5563 N 117 35.2307 W::12/29/14 at 18:00:48 (UTC) | 117.587178 W | 33.392605 N | 11S | 3694968.25 | 445392.64 |
| Andrew Fisher | 3 | 1/9/2015 | 9:40:42 AM | Inactive | Inactive | 80 | none | multiple burrow entrances | 33 23.5574 N 117 35.2292 W::1/9/15 at 17:35:46 (UTC) | 117.587153 W | 33.392623 N | 11S | 3694970 | 445395.765 |
| Keoni Calantas | 4 | 1/23/2015 | 9:34:54 AM | Inactive | Inactive | 80 | none | | 33 23.5590 N 117 35.2275 W::1/23/15 at 17:33:43 (UTC) | 117.587125 W | 33.392650 N | 11S | 3694970 | 445395.765 |
| Andrew Fisher | 1 | 12/19/2014 | 9:57:33 AM | Inactive | Inactive | 81 | none | multiple burrow entrances | 33 23.5523 N 117 35.2274 W::12/19/14 at 17:54:20 (UTC) | 117.587123 W | 33.392538 N | 11S | 3694962.85 | 445394.655 |
| James McMorran | 2 | 12/29/2014 | 10:03:49 AM | Inactive | Inactive | 81 | none | | 33 23.5563 N 117 35.2307 W::12/29/14 at 17:59:58 (UTC) | 117.587178 W | 33.392605 N | 11S | 3694962.85 | 445394.655 |
| Andrew Fisher | 3 | 1/9/2015 | 9:41:34 AM | Inactive | Inactive | 81 | none | occupied by ground squirrel | 33 23.5546 N 117 35.2317 W::1/9/15 at 17:36:37 (UTC) | 117.587195 W | 33.392577 N | 11S | 3694962.15 | 445394.37 |
| Keoni Calantas | 4 | 1/23/2015 | 9:35:22 AM | Inactive | Inactive | 81 | none | | 33 23.5532 N 117 35.2267 W::1/23/15 at 17:34:13 (UTC) | 117.587112 W | 33.392553 N | 11S | 3694962.15 | 445394.37 |
| Andrew Fisher | 1 | 12/19/2014 | 9:58:32 AM | Inactive | Inactive | 82 | none | multiple burrow entrances | 33 23.5457 N 117 35.2196 W::12/19/14 at 17:55:17 (UTC) | 117.586993 W | 33.392428 N | 11S | 3694946.9 | 445411.21 |
| James McMorran | 2 | 12/29/2014 | 10:02:37 AM | Inactive | Inactive | 82 | none | | 33 23.5458 N 117 35.2170 W::12/29/14 at 17:58:45 (UTC) | 117.586950 W | 33.392430 N | 11S | 3694946.9 | 445411.21 |
| Andrew Fisher | 3 | 1/9/2015 | 9:38:59 AM | Inactive | Inactive | 82 | none | multiple burrow entrances | 33 23.5452 N 117 35.2181 W::1/9/15 at 17:34:01 (UTC) | 117.586968 W | 33.392420 N | 11S | 3694947.3 | 445410.75 |
| Keoni Calantas | 4 | 1/23/2015 | 9:36:13 AM | Inactive | Inactive | 82 | none | | 33 23.5467 N 117 35.2191 W::1/23/15 at 17:35:13 (UTC) | 117.586985 W | 33.392445 N | 11S | 3694947.3 | 445410.75 |
| Andrew Fisher | 1 | 12/19/2014 | 9:59:50 AM | Inactive | Inactive | 83 | none | multiple burrow entrances | 33 23.5199 N 117 35.2073 W::12/19/14 at 17:56:43 (UTC) | 117.586788 W | 33.391998 N | 11S | 3694899.5 | 445429.455 |
| James McMorran | 2 | 12/29/2014 | 10:01:16 AM | Inactive | Inactive | 83 | none | | 33 23.5204 N 117 35.2054 W::12/29/14 at 17:57:20 (UTC) | 117.586757 W | 33.392007 N | 11S | 3694899.5 | 445429.455 |
| Andrew Fisher | 3 | 1/9/2015 | 9:38:00 AM | Inactive | Inactive | 83 | none | occupied by ground squirrel | 33 23.5206 N 117 35.2069 W::1/9/15 at 17:33:05 (UTC) | 117.586782 W | 33.392010 N | 11S | 3694901.05 | 445429.835 |
| Keoni Calantas | 4 | 1/23/2015 | 9:37:40 AM | Inactive | Inactive | 83 | none | | 33 23.5213 N 117 35.2053 W::1/23/15 at 17:36:38 (UTC) | 117.586755 W | 33.392022 N | 11S | 3694901.05 | 445429.835 |
| Andrew Fisher | 1 | 12/19/2014 | 10:01:22 AM | Inactive | Inactive | 84 | none | multiple burrow entrances | 33 23.4944 N 117 35.1843 W::12/19/14 at 17:58:10 (UTC) | 117.586405 W | 33.391573 N | 11S | 3694846.85 | 445464.36 |
| James McMorran | 2 | 12/29/2014 | 9:58:48 AM | Inactive | Inactive | 84 | none | | 33 23.4891 N 117 35.1830 W::12/29/14 at 17:54:54 (UTC) | 117.586383 W | 33.391485 N | 11S | 3694846.85 | 445464.36 |
| Andrew Fisher | 3 | 1/9/2015 | 9:55:39 AM | Inactive | Inactive | 84 | none | multiple burrow entrances | 33 23.4944 N 117 35.1846 W::1/9/15 at 17:50:46 (UTC) | 117.586410 W | 33.391573 N | 11S | 3694852.25 | 445462.53 |
| Donna Germann | 4 | 1/23/2015 | 9:41:07 AM | Inactive | Inactive | 84 | none | | 33 23.4950 N 117 35.1851 W::1/23/15 at 17:38:00 (UTC) | 117.586418 W | 33.391583 N | 11S | 3694852.25 | 445462.53 |
| Andrew Fisher | 1 | 12/19/2014 | 10:03:59 AM | Inactive | Inactive | 85 | none | multiple burrow entrances | 33 23.4695 N 117 35.1518 W::12/19/14 at 18:00:52 (UTC) | 117.585858 W | 33.391157 N | 11S | 3694808.1 | 445517.53 |
| James McMorran | 2 | 12/29/2014 | 9:56:42 AM | Inactive | Inactive | 85 | none | | 33 23.4725 N 117 35.1469 W::12/29/14 at 17:52:41 (UTC) | 117.585782 W | 33.391208 N | 11S | 3694808.1 | 445517.53 |
| Andrew Fisher | 3 | 1/9/2015 | 9:32:29 AM | Inactive | Inactive | 85 | none | multiple burrow entrances | 33 23.4704 N 117 35.1495 W::1/9/15 at 17:27:33 (UTC) | 117.585825 W | 33.391173 N | 11S | 3694809 | 445521.58 |
| Keoni Calantas | 4 | 1/23/2015 | 9:42:12 AM | Inactive | Inactive | 85 | none | | 33 23.4725 N 117 35.1437 W::1/23/15 at 17:41:19 (UTC) | 117.585728 W | 33.391208 N | 11S | 3694809 | 445521.58 |
| Andrew Fisher | 1 | 12/19/2014 | 10:14:30 AM | Inactive | Inactive | 86 | none | multiple burrow entrances | 33 23.4732 N 117 35.2210 W::12/19/14 at 18:11:16 (UTC) | 117.587017 W | 33.391220 N | 11S | 3694819.4 | 445402.035 |
| Andrew Fisher | 2 | 12/29/2014 | 10:23:25 AM | Inactive | Inactive | 86 | none | occupied by ground squirrel | 33 23.4798 N 117 35.2263 W::12/29/14 at 18:19:31 (UTC) | 117.587108 W | 33.391337 N | 11S | 3694819.4 | 445402.035 |
| Brennan Mulrooney | 3 | 1/9/2015 | 9:56:05 AM | Inactive | Inactive | 86 | none | | 33 23.4718 N 117 35.2191 W::1/9/15 at 17:51:18 (UTC) | 117.586985 W | 33.391197 N | 11S | 3694809.65 | 445408.625 |
| Andrew Fisher | 4 | 1/23/2015 | 10:01:49 AM | Inactive | Inactive | 86 | none | | 33 23.4711 N 117 35.2198 W::1/23/15 at 17:55:46 (UTC) | 117.586997 W | 33.391185 N | 11S | 3694809.65 | 445408.625 |
| Brennan Mulrooney | 1 | 12/19/2014 | 6:59:50 AM | Inactive | Inactive | 87 | none | multiple burrow entrances | 33 24.5733 N 117 34.5653 W::12/19/14 at 14:58:04 (UTC) | 117.576088 W | 33.409555 N | 11S | 3696840 | 446435.21 |
| Brennan Mulrooney | 2 | 12/29/2014 | 7:02:36 AM | Inactive | Inactive | 87 | none | | 33 24.5733 N 117 34.5635 W::12/29/14 at 14:58:55 (UTC) | 117.576060 W | 33.409555 N | 11S | 3696840 | 446435.21 |
| Brennan Mulrooney | 3 | 1/9/2015 | 7:03:29 AM | Inactive | Inactive | 87 | none | | 33 24.5754 N 117 34.5651 W::1/9/15 at 14:58:44 (UTC) | 117.576085 W | 33.409590 N | 11S | 3696843.55 | 446431.65 |
| Andrew Fisher | 4 | 1/22/2015 | 3:07:41 PM | Inactive | Inactive | 87 | none | | 33 24.5750 N 117 34.5683 W::1/22/15 at 23:01:41 (UTC) | 117.576140 W | 33.409583 N | 11S | 3696843.55 | 446431.65 |
| Brennan Mulrooney | 1 | 12/19/2014 | 7:02:22 AM | Inactive | Inactive | 88 | none | | 33 24.5496 N 117 34.5464 W::12/19/14 at 14:59:32 (UTC) | 117.575773 W | 33.409160 N | 11S | 3696796.5 | 446463.8 |
| Brennan Mulrooney | 2 | 12/29/2014 | 7:04:42 AM | Inactive | Inactive | 88 | none | | 33 24.5501 N 117 34.5453 W::12/29/14 at 15:00:46 (UTC) | 117.575755 W | 33.409168 N | 11S | 3696796.5 | 446463.8 |
| Brennan Mulrooney | 3 | 1/9/2015 | 7:05:35 AM | Inactive | Inactive | 88 | none | | 33 24.5509 N 117 34.5464 W::1/9/15 at 15:00:46 (UTC) | 117.575773 W | 33.409182 N | 11S | 3696798.1 | 446462.785 |
| Andrew Fisher | 4 | 1/22/2015 | 3:38:16 PM | Inactive | Inactive | 88 | none | | 33 24.5505 N 117 34.5466 W::1/22/15 at 23:32:18 (UTC) | 117.575777 W | 33.409175 N | 11S | 3696798.1 | 446462.785 |
| Brennan Mulrooney | 1 | 12/19/2014 | 7:03:43 AM | Inactive | Inactive | 89 | none | multiple burrow entrances | 33 24.5331 N 117 34.5442 W::12/19/14 at 15:00:50 (UTC) | 117.575737 W | 33.408885 N | 11S | 3696766.25 | 446464.935 |
| Matthew Kedziora | 2 | 12/29/2014 | 7:03:16 AM | Inactive | Inactive | 89 | none | | 33 24.5338 N 117 34.5458 W::12/29/14 at 15:02:14 (UTC) | 117.575763 W | 33.408897 N | 11S | 3696766.25 | 446464.935 |
| Brynne Mulrooney | 3 | 1/9/2015 | 7:00:39 AM | Inactive | Inactive | 89 | none | Mammal tracks | 33 24.5356 N 117 34.5449 W::1/9/15 at 15:01:12 (UTC) | 117.575748 W | 33.408927 N | 11S | 3696771.4 | 446463.75 |
| Andrew Fisher | 4 | 1/22/2015 | 3:36:30 PM | Inactive | Inactive | 89 | none | | 33 24.5369 N 117 34.5467 W::1/22/15 at 23:30:56 (UTC) | 117.575778 W | 33.408948 N | 11S | 3696771.4 | 446463.75 |

# Appendix C – Raw Field Data

| Primary_Bio | Survey Number | Date | Time | Cumulative_ Burrow_ Status | Field_ Burrow_ Status | Burrow ID | Sign | Notes | GPSLocation | Longitude | Latitude | Zone | Avg_ Northing_ Final | Avg_ Easting_ Final |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Andrew Fisher | 1 | 12/19/2014 | 7:10:35 AM | Inactive | Inactive | 9 | none | 1 burrow | 33 24.4578 N 117 34.4759 W::12/19/14 at 15:07:25 (UTC) | 117.574600 W | 33.407630 N | 11S | 3696626.25 | 446571.7 |
| Brennan Mulrooney | 2 | 12/29/2014 | 7:14:56 AM | Inactive | Inactive | 9 | none | | 33 24.4583 N 117 34.4752 W::12/29/14 at 15:11:12 (UTC) | 117.574587 W | 33.407638 N | 11S | 3696626.25 | 446571.7 |
| Brennan Mulrooney | 3 | 1/9/2015 | 7:12:30 AM | Inactive | Inactive | 9 | none | | 33 24.4574 N 117 34.4767 W::1/9/15 at 15:07:42 (UTC) | 117.574612 W | 33.407623 N | 11S | 3696626.4 | 446570.63 |
| Andrew Fisher | 4 | 1/22/2015 | 3:31:09 PM | Inactive | Inactive | 9 | none | | 33 24.4588 N 117 34.4759 W::1/22/15 at 23:25:10 (UTC) | 117.574598 W | 33.407647 N | 11S | 3696626.4 | 446570.63 |
| Brennan Mulrooney | 1 | 12/19/2014 | 7:05:00 AM | Inactive | Inactive | 90 | none | multiple burrow entrances | 33 24.5256 N 117 34.5314 W::12/19/14 at 15:02:10 (UTC) | 117.575523 W | 33.408760 N | 11S | 3696751.3 | 446486.655 |
| Brennan Mulrooney | 2 | 12/29/2014 | 7:06:48 AM | Inactive | Inactive | 90 | none | | 33 24.5254 N 117 34.5307 W::12/29/14 at 15:02:57 (UTC) | 117.575508 W | 33.408755 N | 11S | 3696751.3 | 446486.655 |
| Brennan Mulrooney | 3 | 1/9/2015 | 7:07:37 AM | Inactive | Inactive | 90 | none | | 33 24.5248 N 117 34.5316 W::1/9/15 at 15:02:45 (UTC) | 117.575527 W | 33.408747 N | 11S | 3696750.9 | 446485.445 |
| Andrew Fisher | 4 | 1/22/2015 | 3:35:22 PM | Inactive | Inactive | 90 | none | | 33 24.5256 N 117 34.5318 W::1/22/15 at 23:29:26 (UTC) | 117.575530 W | 33.408760 N | 11S | 3696750.9 | 446485.445 |
| Brennan Mulrooney | 1 | 12/19/2014 | 7:07:39 AM | Inactive | Inactive | 91 | none | | 33 24.5160 N 117 34.5165 W::12/19/14 at 15:04:38 (UTC) | 117.575283 W | 33.408593 N | 11S | 3696731.45 | 446507.835 |
| Brennan Mulrooney | 2 | 12/29/2014 | 7:10:12 AM | Inactive | Inactive | 91 | none | | 33 24.5139 N 117 34.5174 W::12/29/14 at 15:06:30 (UTC) | 117.575290 W | 33.408565 N | 11S | 3696731.45 | 446507.835 |
| Brennan Mulrooney | 3 | 1/9/2015 | 7:08:43 AM | Inactive | Inactive | 91 | none | | 33 24.5138 N 117 34.5186 W::1/9/15 at 15:03:52 (UTC) | 117.575310 W | 33.408563 N | 11S | 3696730.4 | 446506.67 |
| Andrew Fisher | 4 | 1/22/2015 | 3:34:31 PM | Inactive | Inactive | 91 | none | | 33 24.5146 N 117 34.5173 W::1/22/15 at 23:28:31 (UTC) | 117.575288 W | 33.408577 N | 11S | 3696730.4 | 446506.67 |
| Brennan Mulrooney | 1 | 12/19/2014 | 7:08:26 AM | Inactive | Inactive | 92 | none | multiple burrow entrances | 33 24.4992 N 117 34.5160 W::12/19/14 at 15:06:23 (UTC) | 117.575267 W | 33.408320 N | 11S | 3696704.15 | 446512.055 |
| Brennan Mulrooney | 2 | 12/29/2014 | 7:11:31 AM | Inactive | Inactive | 92 | none | | 33 24.5008 N 117 34.5127 W::12/29/14 at 15:07:35 (UTC) | 117.575212 W | 33.408347 N | 11S | 3696704.15 | 446512.055 |
| Brennan Mulrooney | 3 | 1/9/2015 | 7:09:26 AM | Inactive | Inactive | 92 | none | | 33 24.5014 N 117 34.5145 W::1/9/15 at 15:04:37 (UTC) | 117.575242 W | 33.408357 N | 11S | 3696707.5 | 446509.15 |
| Andrew Fisher | 4 | 1/22/2015 | 3:33:28 PM | Inactive | Inactive | 92 | none | | 33 24.5022 N 117 34.5180 W::1/22/15 at 23:27:59 (UTC) | 117.575300 W | 33.408370 N | 11S | 3696707.5 | 446509.15 |
| Brennan Mulrooney | 1 | 12/19/2014 | 7:10:58 AM | Inactive | Inactive | 93 | none | | 33 24.4730 N 117 34.4902 W::12/19/14 at 15:08:06 (UTC) | 117.574827 W | 33.407858 N | 11S | 3696650.1 | 446551.51 |
| Brennan Mulrooney | 2 | 12/29/2014 | 7:13:15 AM | Inactive | Inactive | 93 | none | | 33 24.4702 N 117 34.4878 W::12/29/14 at 15:09:52 (UTC) | 117.574797 W | 33.407838 N | 11S | 3696650.1 | 446551.51 |
| Brennan Mulrooney | 3 | 1/9/2015 | 7:11:35 AM | Inactive | Inactive | 93 | none | | 33 24.4701 N 117 34.4890 W::1/9/15 at 15:06:44 (UTC) | 117.574817 W | 33.407835 N | 11S | 3696647.95 | 446550.43 |
| Andrew Fisher | 4 | 1/22/2015 | 3:31:55 PM | Inactive | Inactive | 93 | none | | 33 24.4693 N 117 34.4898 W::1/22/15 at 23:25:57 (UTC) | 117.574830 W | 33.407822 N | 11S | 3696647.95 | 446550.43 |
| Brennan Mulrooney | 1 | 12/19/2014 | 7:12:13 AM | Inactive | Inactive | 94 | none | | 33 24.4496 N 117 34.4824 W::12/19/14 at 15:09:24 (UTC) | 117.574707 W | 33.407493 N | 11S | 3696612.6 | 446557.535 |
| Matthew Kedziora | 2 | 12/29/2014 | 7:13:26 AM | Inactive | Inactive | 94 | none | | 33 24.4516 N 117 34.4870 W::12/29/14 at 15:12:28 (UTC) | 117.574783 W | 33.407527 N | 11S | 3696612.6 | 446557.535 |
| Andrew Fisher | 3 | 1/9/2015 | 9:55:39 AM | Inactive | Inactive | 94 | none | | 33 24.4516 N 117 34.4870 W::12/29/14 at 15:12:28 (UTC) | 117.574783 W | 33.407527 N | 11S | 3696610.5 | 446556.13 |
| Andrew Fisher | 4 | 1/22/2015 | 3:54:13 PM | Inactive | Inactive | 94 | none | | 33 24.4473 N 117 34.4842 W::1/22/15 at 23:48:23 (UTC) | 117.574737 W | 33.407455 N | 11S | 3696610.5 | 446556.13 |
| Brennan Mulrooney | 1 | 12/19/2014 | 7:17:22 AM | Inactive | Inactive | 95 | none | | 33 24.3780 N 117 34.4316 W::12/19/14 at 15:14:31 (UTC) | 117.573860 W | 33.406300 N | 11S | 3696477.45 | 446636.435 |
| Matthew Kedziora | 2 | 12/29/2014 | 7:18:12 AM | Inactive | Inactive | 95 | none | | 33 24.3774 N 117 34.4350 W::12/29/14 at 15:17:12 (UTC) | 117.573917 W | 33.406290 N | 11S | 3696477.45 | 446636.435 |
| Brynne Mulrooney | 3 | 1/9/2015 | 7:12:19 AM | Inactive | Inactive | 95 | none | | 33 24.3771 N 117 34.4330 W::1/9/15 at 15:12:29 (UTC) | 117.573883 W | 33.406285 N | 11S | 3696475.95 | 446637.68 |
| Andrew Fisher | 4 | 1/22/2015 | 4:00:58 PM | Inactive | Inactive | 95 | none | | 33 24.3766 N 117 34.4320 W::1/22/15 at 23:55:02 (UTC) | 117.573867 W | 33.406277 N | 11S | 3696475.95 | 446637.68 |
| Brennan Mulrooney | 1 | 12/19/2014 | 7:21:17 AM | Inactive | Inactive | 96 | none | | 33 24.3226 N 117 34.4075 W::12/19/14 at 15:18:18 (UTC) | 117.573428 W | 33.405322 N | 11S | 3696371.1 | 446684.945 |
| James McMorran | 2 | 12/29/2014 | 7:24:09 AM | Inactive | Inactive | 96 | none | | 33 24.3213 N 117 34.3976 W::12/29/14 at 15:20:10 (UTC) | 117.573293 W | 33.405355 N | 11S | 3696371.1 | 446684.945 |
| James McMorran | 3 | 1/9/2015 | 7:20:18 AM | Inactive | Inactive | 96 | none | | 33 24.3193 N 117 34.4021 W::1/9/15 at 15:15:03 (UTC) | 117.573368 W | 33.405322 N | 11S | 3696367.4 | 446684.46 |
| Andrew Fisher | 4 | 1/22/2015 | 4:03:51 PM | Inactive | Inactive | 96 | none | | 33 24.3173 N 117 34.4018 W::1/22/15 at 23:57:50 (UTC) | 117.573363 W | 33.405288 N | 11S | 3696367.4 | 446684.46 |
| Brennan Mulrooney | 1 | 12/19/2014 | 7:22:23 AM | Inactive | Inactive | 97 | none | | 33 24.2987 N 117 34.3955 W::12/19/14 at 15:19:21 (UTC) | 117.573258 W | 33.404978 N | 11S | 3696331.6 | 446699.425 |
| James McMorran | 2 | 12/29/2014 | 7:25:31 AM | Inactive | Inactive | 97 | none | | 33 24.2992 N 117 34.3888 W::12/29/14 at 15:21:38 (UTC) | 117.573147 W | 33.404987 N | 11S | 3696331.6 | 446699.425 |
| James McMorran | 3 | 1/9/2015 | 7:21:18 AM | Inactive | Inactive | 97 | none | | 33 24.3008 N 117 34.3950 W::1/9/15 at 15:16:00 (UTC) | 117.573265 W | 33.405032 N | 11S | 3696334.95 | 446693.77 |
| Andrew Fisher | 4 | 1/22/2015 | 4:10:40 PM | Inactive | Inactive | 97 | none | | 33 24.2996 N 117 34.3957 W::1/23/15 at 00:04:56 (UTC) | 117.573262 W | 33.404993 N | 11S | 3696334.95 | 446693.77 |
| Brennan Mulrooney | 1 | 12/19/2014 | 7:24:27 AM | Inactive | Inactive | 98 | none | | 33 24.2564 N 117 34.3489 W::12/19/14 at 15:21:36 (UTC) | 117.572480 W | 33.404272 N | 11S | 3696250.85 | 446769.325 |
| Matthew Kedziora | 2 | 12/29/2014 | 7:25:35 AM | Inactive | Inactive | 98 | none | | 33 24.2546 N 117 34.3447 W::12/29/14 at 15:24:37 (UTC) | 117.572412 W | 33.404243 N | 11S | 3696250.85 | 446769.325 |
| Brynne Mulrooney | 3 | 1/9/2015 | 7:18:12 AM | No Longer Suitable | No Longer Suitable | 98 | none | | 33 24.2552 N 117 34.3479 W::1/9/15 at 15:18:30 (UTC) | 117.572465 W | 33.404253 N | 11S | 3696245.75 | 446765.675 |
| Andrew Fisher | 4 | 1/22/2015 | 4:06:38 PM | Inactive | Inactive | 98 | none | | 33 24.2502 N 117 34.3503 W::1/23/15 at 00:00:55 (UTC) | 117.572505 W | 33.404170 N | 11S | 3696245.75 | 446765.675 |
| Brennan Mulrooney | 1 | 12/19/2014 | 7:34:21 AM | Inactive | Inactive | 99 | none | multiple burrow entrances | 33 24.2656 N 117 34.4337 W::12/19/14 at 15:31:31 (UTC) | 117.573895 W | 33.404427 N | 11S | 3696270.3 | 446633.665 |
| Andrew Fisher | 2 | 12/29/2014 | 7:44:17 AM | Inactive | Inactive | 99 | none | multiple burrow entrances | 33 24.2655 N 117 34.4350 W::12/29/14 at 15:40:19 (UTC) | 117.573917 W | 33.404425 N | 11S | 3696270.3 | 446633.665 |
| Andrew Fisher | 3 | 1/9/2015 | 7:31:52 AM | Inactive | Inactive | 99 | none | occupied by ground squirrel | 33 24.2651 N 117 34.4359 W::1/9/15 at 15:26:53 (UTC) | 117.573932 W | 33.404418 N | 11S | 3696271.6 | 446631.72 |
| Donna Germann | 4 | 1/23/2015 | 7:22:00 AM | Inactive | Inactive | 99 | none | | 33 24.2675 N 117 34.4353 W::1/23/15 at 15:18:53 (UTC) | 117.573922 W | 33.404458 N | 11S | 3696271.6 | 446631.72 |

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**Appendix G – Coastal Cactus Wren Breeding Survey Report Bloom 2015**

**THIS APPENDIX HAS BEEN OMITTED – IT HAS BEEN SUBMITTED UNDER CONFIDENTIAL COVER**

**Appendix H – Coastal California Gnatcatcher Survey Report AECOM 2014**

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October 6, 2014

Stacey Love
Recovery Permit Coordinator
Carlsbad Fish and Wildlife Office
2177 Salk Avenue, Suite 250
Carlsbad, CA 92008

**RE: 2014 Transmission Line 695 Wood to Steel Replacement Project, Coastal California Gnatcatcher 45-Day Summary Report, Orange and San Diego Counties, California**

Dear Ms. Love:

In compliance with the Special Terms and Conditions for Endangered Species Permit TE-820658-6, AECOM biologists conducted focused surveys in August 2014 to determine the presence or absence of the federally threatened coastal California gnatcatcher (*Polioptila californica californica*) (CAGN) within the proposed Transmission Line (TL) 695 Wood to Steel Replacement Project (the "project") in both Orange and San Diego Counties, California (Figure 1). As an environmental consultant, AECOM is contracted by San Diego Gas & Electric (SDG&E) to conduct protocol CAGN surveys within potentially suitable habitat proposed for the project and an adjacent 150-foot buffer (Figure 2).

## Project Description

The project would involve the replacement of existing wooden structures with steel poles. Some wooden poles and associated anchors would be completely removed and not replaced due to the longer span between steel poles. The project would be covered by the SDG&E Natural Community Conservation Plan (NCCP), and would include a 150-foot survey buffer around the tie-line centerline, for a total width of 300 feet. Several stringing sites located throughout the project area also included a 150-foot buffer. The staging area is located in a developed area, so no buffer was placed around the staging area. The project is located along the northern boundary of Marine Corps Base Camp Pendleton (MCBCP or Base), with the northern end in Orange County and the southern end near the San Onofre Nuclear Generating Station (SONGS).

## Site Description

MCBCP is a 200-square-mile military training facility located along the Pacific coast in northwestern San Diego County, 40 miles north of downtown San Diego. Orange County is contiguous with the northwest boundary of MCBCP, and Riverside County is northeast of, but not adjacent to, the boundary of MCBCP. The city of San Clemente and Cleveland National Forest border MCBCP to the northwest and north, respectively. The city of Oceanside is to the south. The San Diego County community of Fallbrook is to the east.

MCBCP occupies approximately 125,000 acres of largely undeveloped land, with more than 17 miles of coastline in northwestern San Diego County of Southern California. It is the

U.S. Marine Corp's premier amphibious training base, and the U.S. Marine Corps' only west coast amphibious training base, promoting the combat readiness of operating forces by providing facilities, services, and support responsive to the needs of Marines, sailors, and their families.

The project is located in the coastal province in northern San Diego County on MCBCP (Figure 1). This region is characterized by warm, dry summers and mild winters, with mean temperatures ranging from 75 to 78 degrees Fahrenheit (°F). Although close enough to the coast to benefit from maritime clouds and fog, MCBCP is relatively dry. Elevation within the project area ranges from approximately 30 to 570 feet above mean sea level.

The project area is located in the far northern boundary of MCBCP and extends into Orange County. The project area extends from a small substation in Orange County, and then heads west toward the Pacific Ocean along the ridgetops of steep hills along the north side of Christianitos Road. These hills are along the border of San Diego and Orange Counties, and occur on lands that are under lease from California State Parks. As the project area heads west, it splits and crosses San Mateo Creek heading south at two points. The two separate lines head south through MCBCP, with one line roughly paralleling Interstate 5, and the other line going up and over a steep hill on the east side of the San Onofre Housing Area. The two lines join again after they cross San Onofre Creek, and then terminate opposite and east of SONGS.

**Background Information**

CAGN, a subspecies of California gnatcatcher (*Polioptila californica*), is federally listed as threatened by the U.S. Fish and Wildlife Service (USFWS) (1993) and considered a species of special concern by the California Department of Fish and Wildlife (CDFW) (State of California 2011). No recovery plan has been drafted for CAGN. CAGN is an uncommon year-round resident of Southern California. This species is declining proportionately with the continued loss of coastal sage scrub habitat in the six Southern California counties (San Bernardino, Ventura, Los Angeles, Orange, San Diego, and Riverside) located within the coastal plain.

The primary cause of the decline of CAGN is the cumulative loss of coastal sage scrub vegetation to urban and agricultural development. Studies suggest that CAGN may be highly sensitive to the effects of habitat fragmentation and development activity (Atwood 1990; ERCE 1990). USFWS has estimated that coastal sage scrub habitat has been reduced by 70 to 90% of its historical extent (USFWS 1991), and little of what remains is protected in natural open space.

CAGN generally inhabits Diegan coastal sage scrub and Riversidian coastal sage scrub dominated by California sagebrush (*Artemesia californica*) and flat-topped buckwheat (*Eriogonum fasciculatum*), usually at lower than 1,500 feet in elevation along the coastal slope. When nesting, CAGN typically avoids slopes greater than 25% that have tall, dense vegetation. CAGN pairs will attempt several nests each year, each placed in a different

location inside of their breeding territory, but most nest attempts are unsuccessful due to depredation by a variety of species (Atwood and Bontrager 2001). Clutch size ranges from one to five eggs, with three or four eggs most common. CAGN typically experiences a high rate of nest failure, with an annual mean number of four nest attempts per pair in San Diego County (Grishaver et al. 1998). CAGN tends to have slightly smaller clutches in years with poor rainfall, and will experience a higher rate of mortality during cold winters (Atwood and Bontrager 2001; Grishaver et al. 1998). CAGN will remain paired through the nonbreeding season, and will generally expand their home range when not breeding.

CAGN is particularly vulnerable to habitat destruction and fragmentation because of poor dispersal, reliance on a specific habitat type, and difficulty in successful breeding. On average, juvenile CAGN disperse less than 1.2 miles from their natal territories, making colonization of distant habitat patches difficult. CAGN is closely tied to coastal sage scrub, and has been described as “obligate residents of coastal sage scrub” (Atwood and Bontrager 2001).

Critical habitat was originally designated for CAGN by USFWS in 2000, but this was revised, and a final rule was published in 2007 (USFWS 2007). No critical habitat for CAGN occurs on MCBCP (MCBCP 2007) or adjacent to the project area. MCBCP supports one of the core populations of CAGN within San Diego County due to the extensive amount of intact coastal sage scrub occurring on the Base (Unitt 2004).

**Survey Methodology**

The CAGN survey area includes the proposed project tie-line centerline and stringing sites plus an adjacent 150-foot-radius survey buffer around the project area. Before surveys, AECOM biologists conducted a habitat assessment and vegetation mapping within the survey area on July 30 and 31, and August 4, 2014, to outline potentially suitable CAGN habitat and to delineate the vegetation community boundaries. Potentially suitable CAGN habitat was then digitized onto maps to establish a CAGN survey area of approximately 405 acres (Figure 2). The vegetation as mapped by AECOM botanists in summer 2014 was used to delineate the CAGN survey area. Potentially suitable CAGN habitat includes Diegan coastal sage scrub, disturbed Diegan coastal sage scrub interspersed with grassland, and mulefat and coyote bush scrub interspersed with Diegan coastal sage scrub.

CAGN surveys were completed during the 2014 breeding season per USFWS guidelines (USFWS 1997). Since the CAGN survey area is included within SDG&E’s NCCP area, the protocol requires three surveys to be conducted during the breeding season (February 15 through August 30). Surveys were conducted within the survey area in suitable CAGN habitat. All surveys followed the current USFWS protocol for the species, dated February 28, 1997 (and as amended July 28, 1997) (USFWS 1997). AECOM biologists Andrew Fisher, Bonnie Hendricks, James McMorran, and Brennan Mulrooney conducted the surveys under Endangered Species Permit TE-820658-6. CAGN surveys were conducted during morning hours when conditions were suitable to detect CAGN and continued to no later than noon when bird activity decreased. The three protocol surveys were separated by a minimum of 7

days, and were conducted from August 11 through August 27, 2014. Approximately 405 acres of potentially suitable CAGN habitat spread across the project area were surveyed per the protocol during each survey (Figure 2).

Each survey consisted of walking meandering transects through potential CAGN habitat, including all scrub associations, uplands, and canyons. The biologist conducted passive surveillance (i.e., listening and looking for the species) in all habitats with potential to support CAGN. If an observation was not made after approximately 5 to 10 minutes of passive survey activity, a recorded vocalization of CAGN was played for approximately 5 to 10 seconds (i.e., active survey activity), followed by another period of passive observation. If CAGN was detected, its location, sex, and behavior were recorded with a Global Positioning System (GPS) unit within an HP Travel Companion. Each CAGN was observed for a few minutes to determine if it was single, a pair, nesting, feeding young, exhibiting territoriality, or other behavior. When a CAGN was detected during a survey, it was observed for several minutes, and different GPS points were taken each time the CAGN moved to record the area being used by the CAGN at the time of the survey. In this way, the CAGN "use area" at the time of the survey was determined and is depicted on the figures (Figures 3c and 3d). Sometimes a CAGN was only heard once or only briefly seen and, therefore, no "use area" could be determined.

Surveys were not conducted during periods of inclement weather such as extreme wind or during a rain event. As allowed under AECOM's endangered species permit, the survey activity "takes" CAGN through harassment with playback of taped CAGN vocalizations. No individual CAGNs were captured.

## Results

Survey results for the project are depicted in Figures 3a through 3j. Prior to the start of CAGN surveys, several CAGNs were detected during habitat assessments. These CAGNs consisted of one pair, one family group of four birds, and two individual juveniles. The locations of these CAGNs are depicted in Figures 3e and 3g.

A summary of survey dates, permitted biologists, times, and weather conditions are presented in Table 1. During surveys, temperature ranged from 63 to 88°F, and wind speed ranged 0 to 8 miles per hour (mph).

**Table 1**
**Survey Dates, Permitted Biologist, and Weather Conditions**

| Survey Number | Date | Permitted Biologist | Time | Weather Conditions |
|---|---|---|---|---|
| 1 | 8/11/2014 | Andrew Fisher | 0610–1155 | Start: 63°F, wind 0 mph, 100% cover<br>End: 76°F, wind 3 mph, 15% cover |
| 1 | 8/12/2014 | Andrew Fisher | 0608–1152 | Start: 59°F, wind 0 mph, 100% cover<br>End: 76°F, wind 4 mph, 0% cover |
| 1 | 8/13/2014 | Brennan Mulrooney | 0643–1200 | Start: 69°F, wind 1 mph, 100% cover<br>End: 79°F, wind 7 mph, 10% cover |
| 1 | 8/13/2014 | Andrew Fisher | 0648–1200 | Start: 69°F, wind 2 mph, 100% cover<br>End: 80°F, wind 4 mph, 5% cover |
| 2 | 8/19/2014 | James McMorran | 0631–1150 | Start: 69°F, wind 3 mph, 100% cover<br>End: 84°F, wind 6 mph, 0% cover |
| 2 | 8/19/2014 | Brennan Mulrooney | 0634–1157 | Start: 64°F, wind 1 mph, 100% cover<br>End: 84°F, wind 8 mph, 10% cover |
| 2 | 8/20/2014 | Andrew Fisher | 0651–1055 | Start: 65°F, wind 0 mph, 35% cover<br>End: 75°F, wind 0 mph, 80% cover |
| 2 | 8/20/2014 | Brennan Mulrooney | 0656–1126 | Start: 66°F, wind 0 mph, 30% cover<br>End: 73°F, wind 6 mph, 50% cover |
| 2 | 8/20/2014 | James McMorran | 0659–1135 | Start: 62°F, wind 3 mph, 50% cover<br>End: 74°F, wind 4 mph, 50% cover |
| 3 | 8/26/2014 | Bonnie Hendricks | 0624–1200 | Start: 66°F, wind 3 mph, 5% cover<br>End: 79°F, wind 8 mph, 5% cover |
| 3 | 8/26/2014 | Brennan Mulrooney | 0657–1200 | Start: 66°F, wind 3 mph, 10% cover<br>End: 79°F, wind 8 mph, 5% cover |
| 3 | 8/27/2014 | Bonnie Hendricks | 0656–1200 | Start: 65°F, wind 0 mph, 0% cover<br>End: 88°F, wind 3 mph, 0% cover |
| 3 | 8/27/2014 | Brennan Mulrooney | 0657–1200 | Start: 65°F, wind 3 mph, 0% cover<br>End: 85°F, wind 7 mph, 0% cover |

The CAGN survey area consisted of approximately 405 acres of Diegan coastal sage scrub and various scrub associations that constitute potential CAGN habitat. Potentially suitable habitat included the slopes of several large drainages, mesa tops, hillsides, alluvial floodplain areas, and other areas with Diegan coastal sage scrub within the project area. In many areas, the Diegan coastal sage scrub was mature enough to support breeding CAGN and did not appear to have burned for many years. Table 2 details the CAGN observations within the project area. All survey results for the project are depicted in Figures 3a through 3j.

**Table 2**
**Coastal California Gnatcatcher Detections**

| Survey Number | Date | Survey Personnel | CAGN Detections* |
|---|---|---|---|
| 1 | 8/11/2014 | Andrew Fisher | 1 pair and 1 unknown individual |
| 1 | 8/12/2014 | Andrew Fisher | 4 individual males, 4 individual females, 1 male plus an unknown bird, 2 females plus an unknown bird and 1 juvenile, 1 juvenile, and 1 unknown individual |
| 1 | 8/13/2014 | Brennan Mulrooney | 1 male, 1 male plus and unknown bird, and 4 unknown individuals |
| 1 | 8/13/2014 | Andrew Fisher | 5 pairs, 1 individual male, 1 male plus an unknown individual, 1 family group of 3 birds, 1 family group of 4 birds, 3 juvenile birds, and 1 unknown individual |
| 2 | 8/19/2014 | James McMorran | 6 unknown individuals |
| 2 | 8/19/2014 | Brennan Mulrooney | 1 unknown individual |
| 2 | 8/20/2014 | Andrew Fisher | 1 pair, 2 individual males, 5 juvenile birds, and 2 unknown individuals |
| 2 | 8/20/2014 | Brennan Mulrooney | 1 pair, 1 family group of three birds, and 4 unknown individuals |
| 2 | 8/20/2014 | James McMorran | 1 pair, 1 male plus an unknown individual, and 9 unknown individuals |
| 3 | 8/26/2014 | Bonnie Hendricks | 1 pair and 3 unknown individuals |
| 3 | 8/26/2014 | Brennan Mulrooney | 1 female and 3 unknown individuals |
| 3 | 8/27/2014 | Bonnie Hendricks | 3 unknown individuals |
| 3 | 8/27/2014 | Brennan Mulrooney | 1 pair and 5 unknown individuals |

* Unknown birds were detected aurally, but never seen and, therefore, their age or sex could not be determined.

CAGNs were detected during all surveys between August 11 and August 27, 2014. In some cases CAGN were detected slightly outside the project area but were still recorded because they were detected during a survey, and could move into or use the project area. Surveys were conducted near the end of the breeding season, and, therefore, CAGNs were beginning to molt (males lose their distinguishing black cap), juveniles were dispersing, and many females and juveniles could not be differentiated. Additionally, many birds were beginning to leave their primary nesting areas and beginning to expand their territories for the nonbreeding season. Since surveys were conducted at the end of the breeding season, many CAGN were less responsive to a taped playback compared to the beginning of the breeding season. Therefore, it was difficult to elicit a behavioral response (birds may fly toward the taped playback or tend to “pop-up” out of the shrubs to get a visual on the

intruding bird), and surveyors were less likely to get a visual on CAGN in the area. Due to the time of year, many birds were unresponsive and simply gave a short “mew” call and were never seen. Several male birds were detected with a second unknown bird that could possibly represent a pair, as the second bird was likely an unresponsive female. In addition, 2014 was an exceptionally dry year, and instead of having an extended breeding season, the vegetation was extremely dry and no evidence of nesting was observed during surveys.

Table 3 summarizes the CAGN detections within the project area based on the type of CAGN detection (pair, family group, etc.) and the number of detections.

**Table 3**
**Summary of Coastal California Gnatcatcher Detections**

| Type of CAGN Detection | Number of Detections |
|---|---|
| Pair | 11 |
| Individual Male | 7 |
| Individual Female | 5 |
| Family Group | 3 (3 to 4 birds per group) |
| Male with Unknown Bird (potential pair) | 4 |
| Female with Unknown Bird | 2 |
| Juvenile | 9 |
| Unknown Individual | 43 |
| **Total CAGN Detections** | **108** |

There were 108 CAGN detections during protocol surveys. This number does not necessarily represent the total number of individual CAGNs detected, but simply the number of birds detected across all three surveys. Most likely, several of the same pairs, family groups, juveniles, and unknown individuals were detected in the same general area across the three surveys.

One federally listed endangered species, least Bell’s vireo (*Vireo bellii pusillus*), and three special-status wildlife species (CDFW species of special concern) were detected during focused CAGN surveys within the project area: coastal cactus wren (*Campylorhynchus brunneicapillus sandiegensis*), yellow-breasted chat (*Icteria virens*), and yellow warbler (*Setophaga petechia brewsteri*) (State of California 2011). Locations of these species are depicted in Figure 4. Field data collected during 2014 CAGN surveys are presented in Appendix A and a list of all wildlife species detected is presented in Appendix B.

## Discussion

Across all three protocol surveys in August 2014, there were 108 CAGN detections. These detections most likely include CAGNs that were detected on multiple surveys in the same general area. Multiple pairs, males, females, family groups, juveniles, and unknown birds were detected throughout the length of the project. Generally, CAGNs were more numerous closer to the coast and became less abundant farther east. The far northeast corner of the

project area did not have any CAGN detections. In that area, the Diegan coastal sage scrub was beginning to transition into chaparral-type vegetation, and contained more large shrubs with nearby trees. Generally, mature Diegan coastal sage scrub along southwest-facing slopes, shallow drainages, valleys, and gradually sloping areas at the base of hills tended to have the most CAGN.

Throughout fall 2013 and spring 2014, rainfall was very low. Rainfall was approximately 68% below the average between October 2013 and May 2014 (NOAA 2014). Rainfall can be both positive and negative for CAGN. With low winter rainfall (such as during winter 2013), there tends to be lower adult mortality during the nonbreeding season, and more adult CAGN survive the winter to breed the following spring. However, low rainfall (in both winter and spring months) also leads to lower reproductive success and a shorter nesting season. Since no active nests were detected within the project area, it is not possible to confirm nesting, but the presence of several family groups and juveniles may indicate successful nesting earlier in the season. Since surveys were conducted at the end of the breeding season, several adult CAGN males were molting into nonbreeding plumage, and birds appeared less interested in the taped playback. Many juvenile birds were dispersing, and pairs were no longer actively defending their territories. Despite dry conditions, many CAGN were detected during surveys.

If you have any questions or require additional information, contact me at (619) 233-1454.

Andrew Fisher
Wildlife Biologist

cc: Todd Easley, SDG&E
Karen Click, SDG&E
Brynne Mulrooney, AECOM
Cecilia Meyer Lovell, AECOM

Attachments: Figure 1 – Vicinity Map
Figure 2 – Coastal California Gnatcatcher Survey Areas
Figure 3a–3j – Coastal California Gnatcatcher Observations
Figure 4 – Other Sensitive Species Observations
Appendix A – Field Data Collected during 2014 CAGN Surveys
Appendix B – Wildlife Species Detected during 2014 CAGN Surveys

**Certification Statement**

"I certify that the information in this survey report and attached exhibits fully and accurately represent my work."

Andrew Fisher
Wildlife Biologist
TE-820658-6

"I certify that the information in this survey report and attached exhibits fully and accurately represent my work."

Bonnie Hendricks
Wildlife Biologist
TE-820658-6

"I certify that the information in this survey report and attached exhibits fully and accurately represent my work."

James McMorran
Wildlife Biologist
TE-820658-6

"I certify that the information in this survey report and attached exhibits fully and accurately represent my work."

Brennan Mulrooney
Wildlife Biologist
TE-820658-6

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# FIGURES

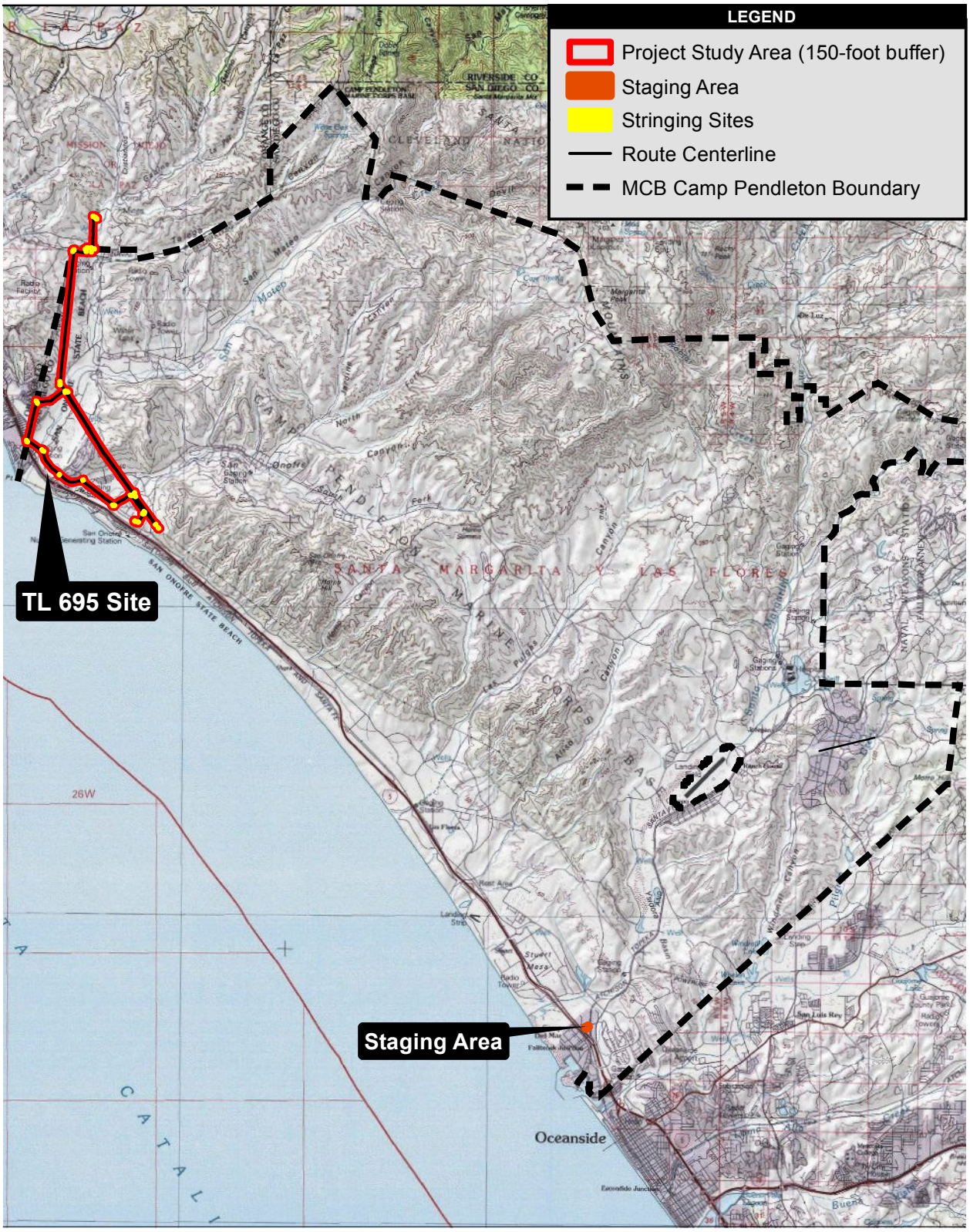




**Figure 1**
**Vicinity Map**



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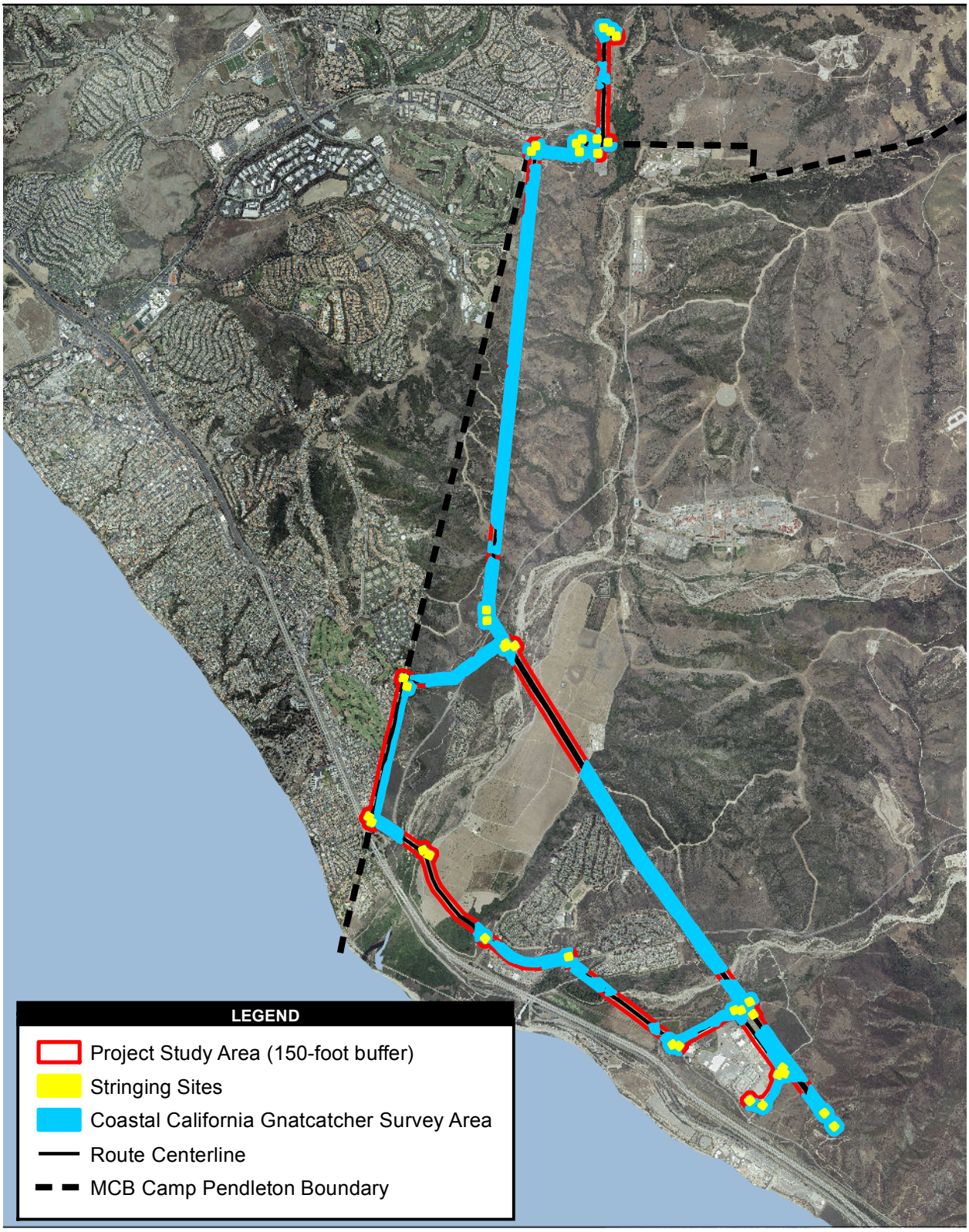


Source: SanGIS 2012; SDG&E 2014; MCBCP 2007

4,500 2,250 0 4,500 Feet

Scale: 1:54,000; 1 inch = 4,500 feet

**Figure 2**
**Coastal California Gnatcatcher Survey Areas**



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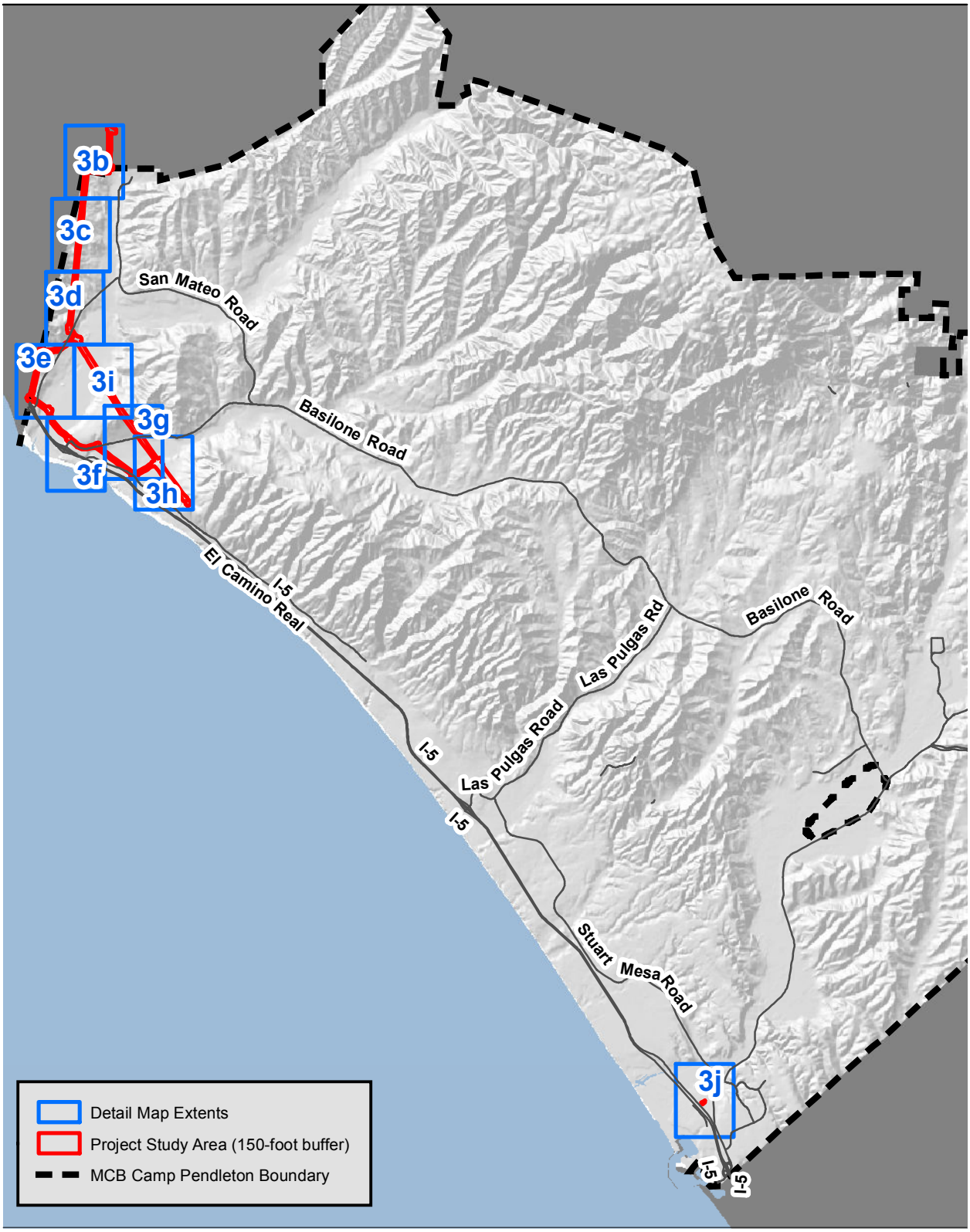


Source: SanGIS 2012; SDG&E 2014; MCBCP 2007

2.5 1.25 0 2.5 Miles

Scale: 1:158,400; 1 inch = 2.5 miles

**Figure 3a**
**Coastal California Gnatcatcher Observations - Overview Map**



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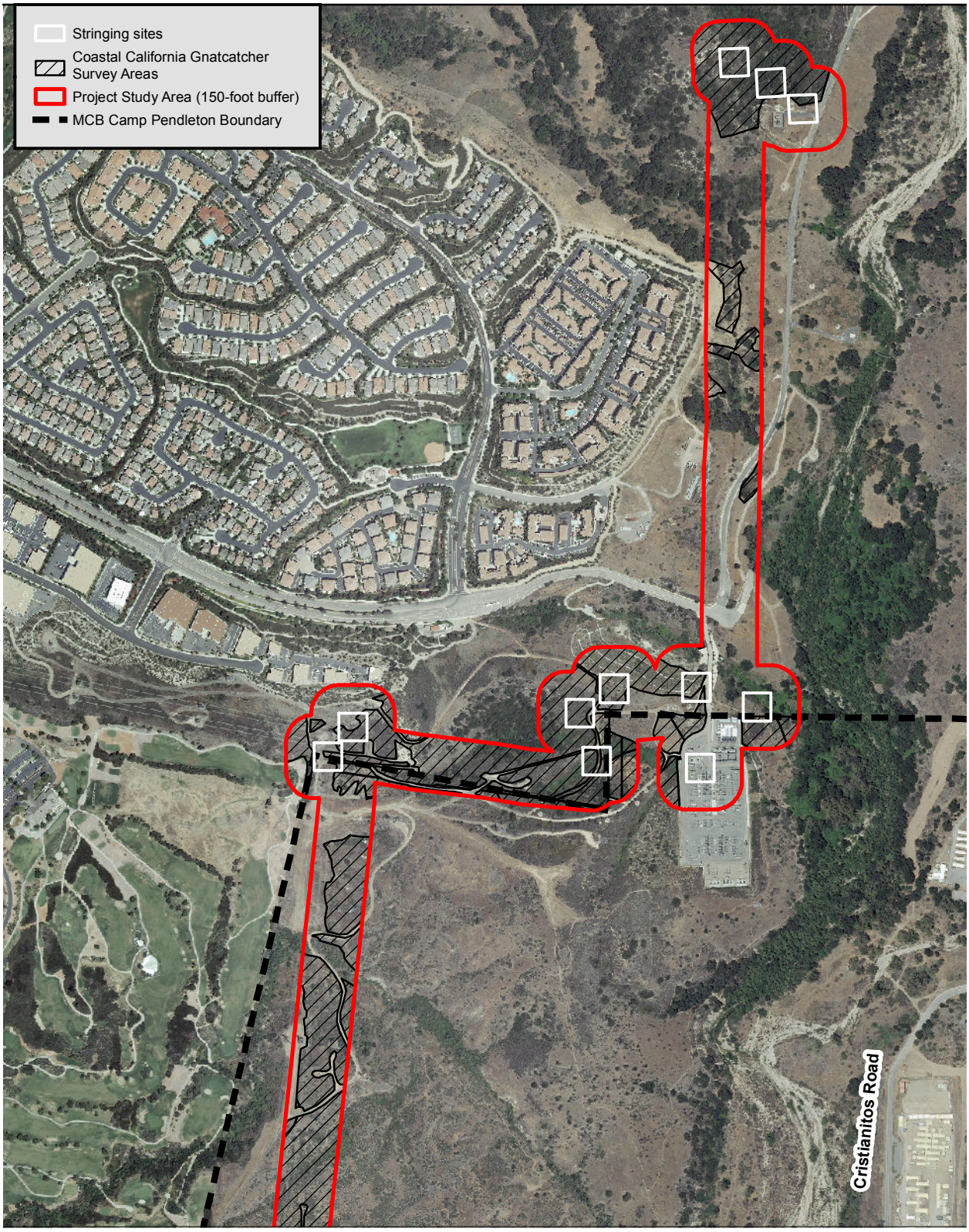


Source: SanGIS 2012; SDG&E 2014; MCBCP 2007

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Scale: 1:9,600; 1 inch = 800 feet

**Figure 3b**
**Coastal California Gnatcatcher Observations - Detail Map 1 of 9**



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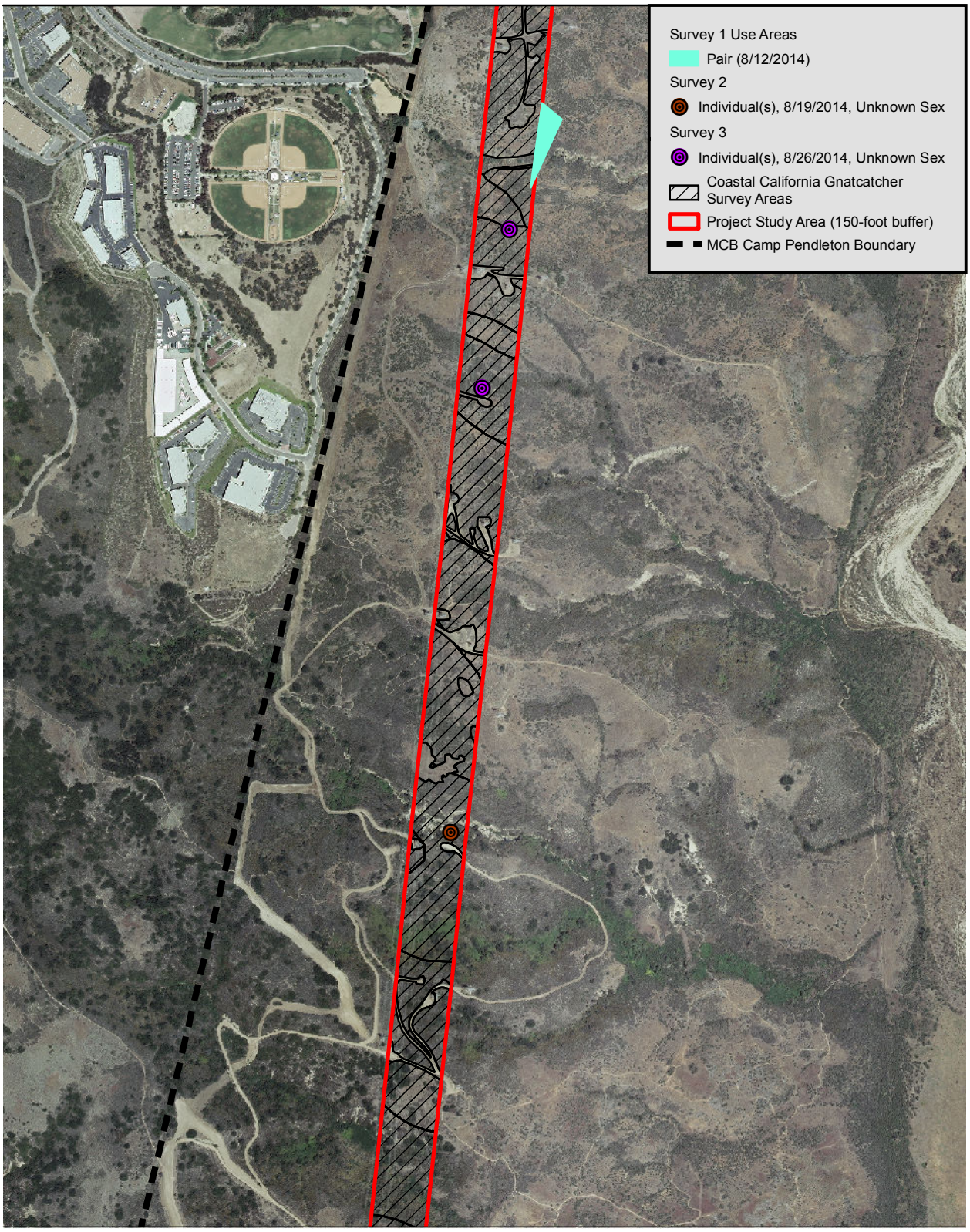


Source: SanGIS 2012; SDG&E 2014; MCBCP 2007

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Scale: 1:9,600; 1 inch = 800 feet

**Figure 3c**
**Coastal California Gnatcatcher Observations - Detail Map 2 of 9**



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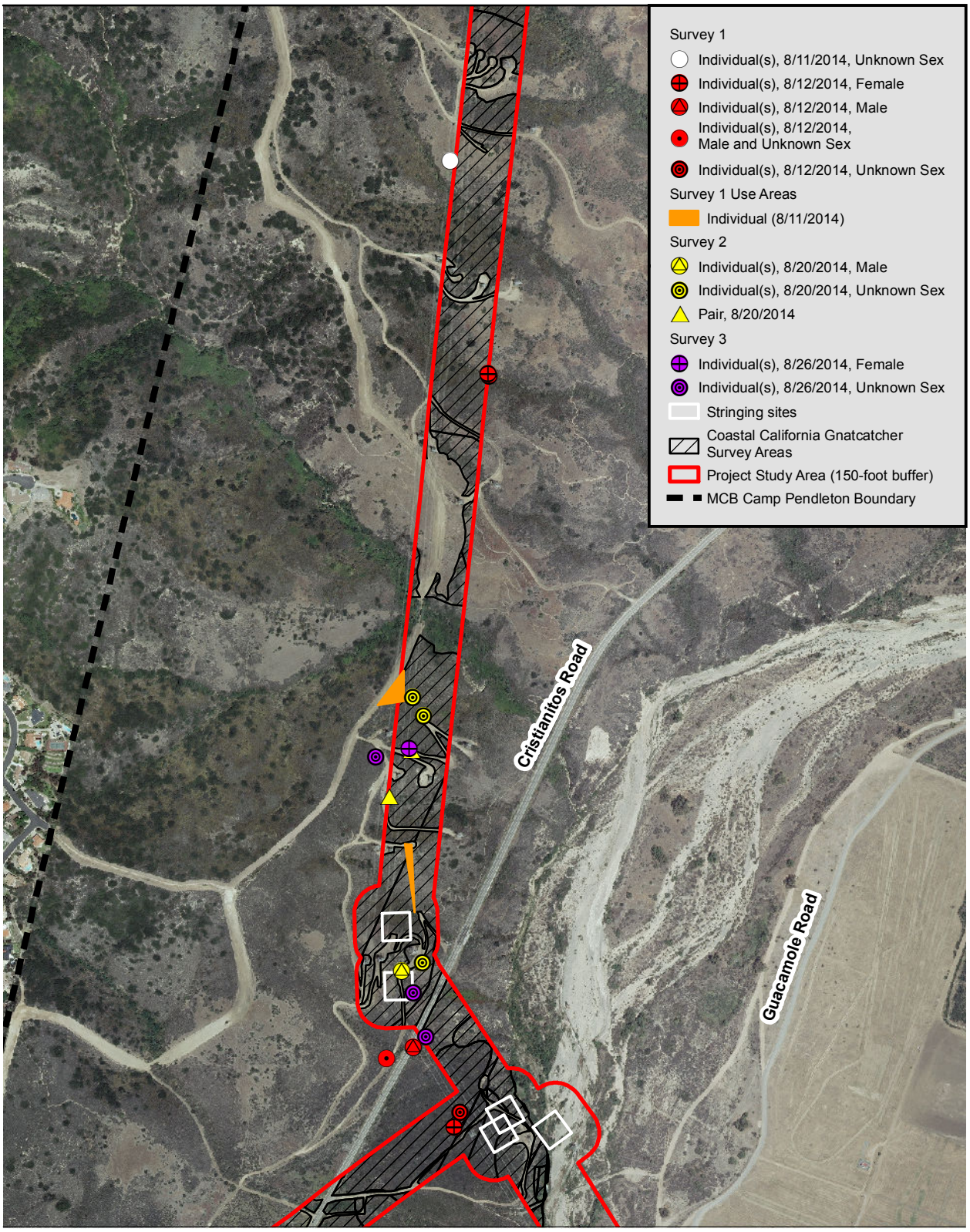


Source: SanGIS 2012; SDG&E 2014; MCBCP 2007

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**Figure 3d**
**Coastal California Gnatcatcher Observations - Detail Map 3 of 9**



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Source: SanGIS 2012; SDG&E 2014; MCBCP 2007

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Scale: 1:9,600; 1 inch = 800 feet

**Figure 3e**
**Coastal California Gnatcatcher Observations - Detail Map 4 of 9**



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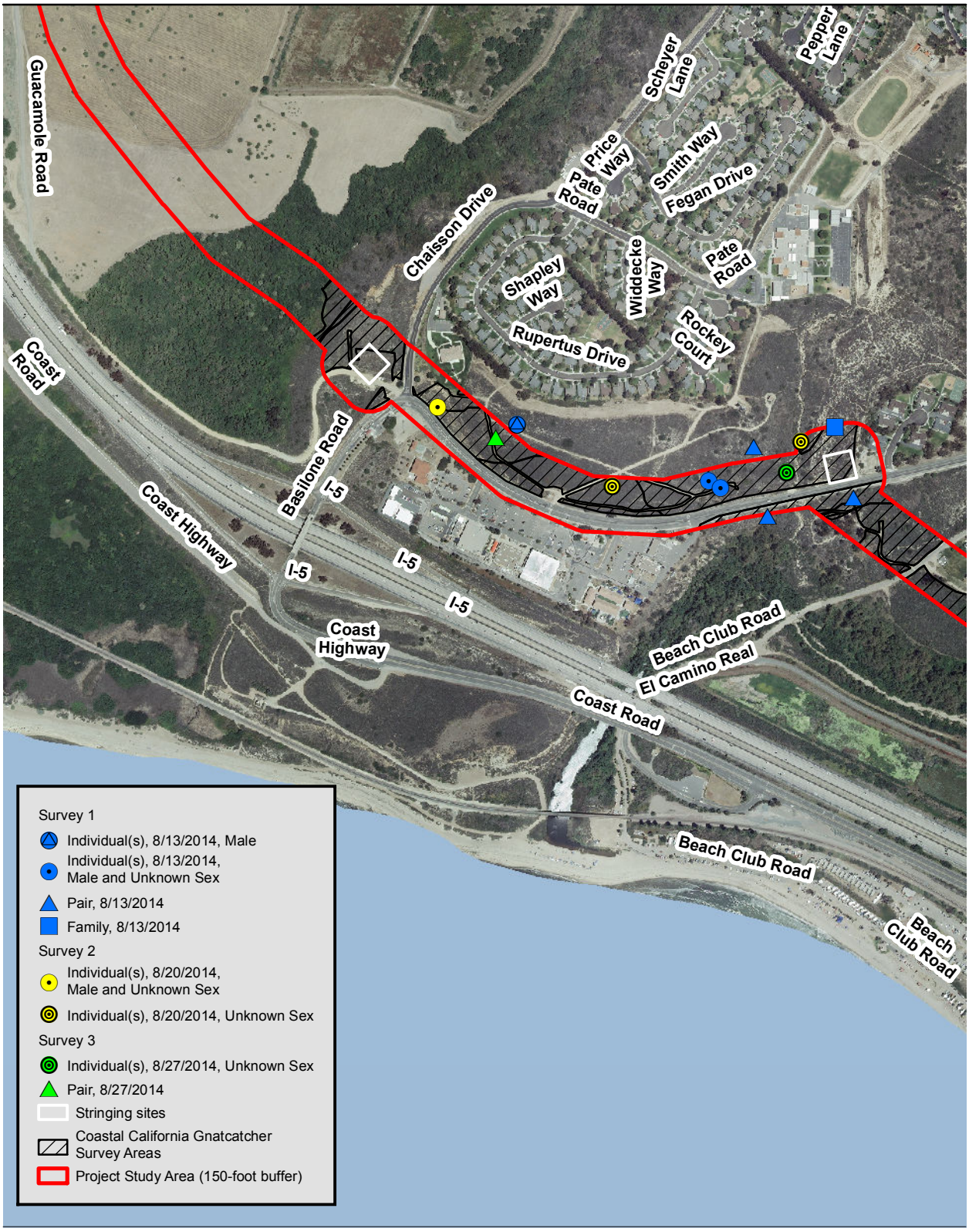


Source: SanGIS 2012; SDG&E 2014; MCBCP 2007

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**Figure 3f**
**Coastal California Gnatcatcher Observations - Detail Map 5 of 9**



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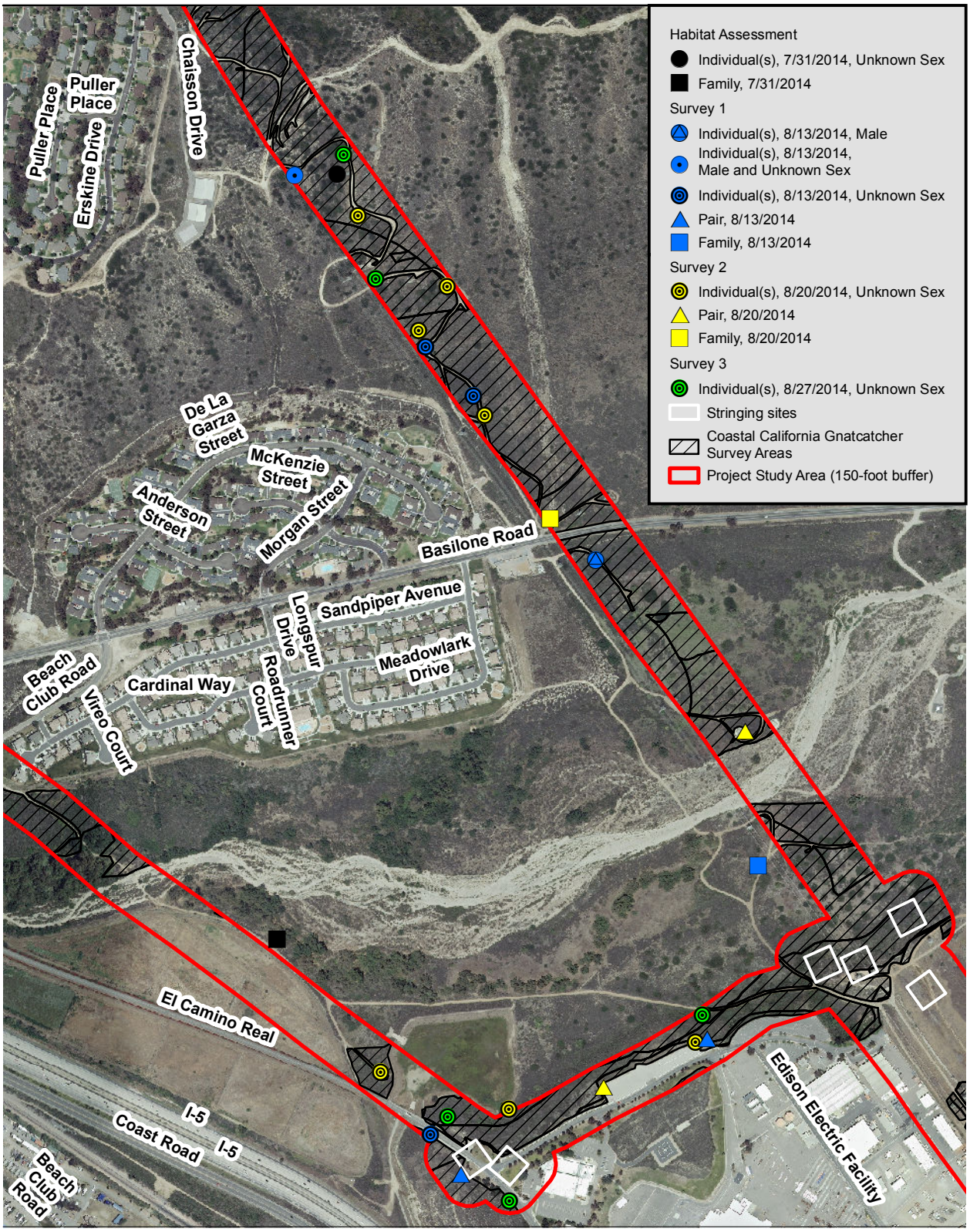


Source: SanGIS 2012; SDG&E 2014; MCBCP 2007

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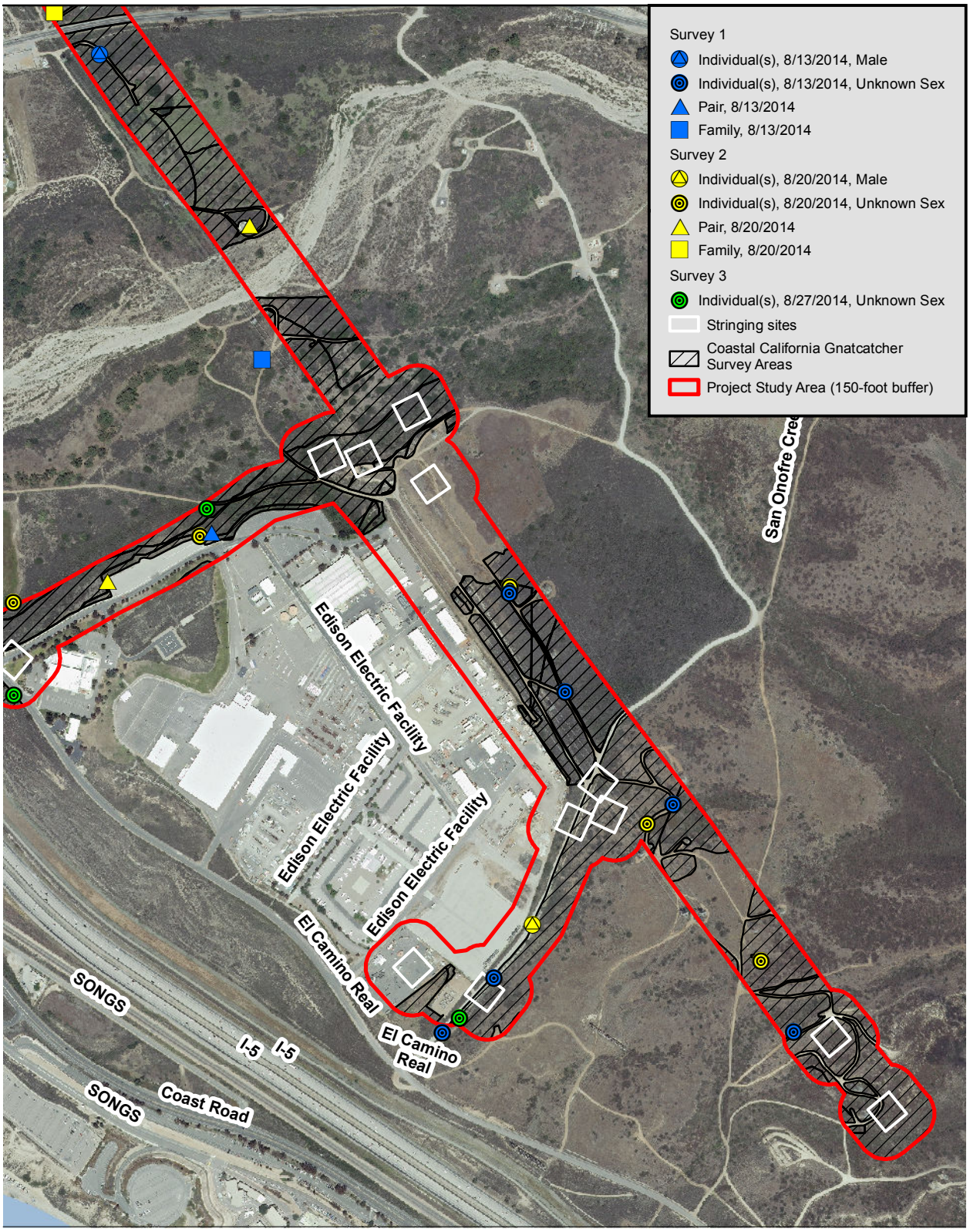
**Figure 3g**
**Coastal California Gnatcatcher Observations - Detail Map 6 of 9**



*Path: P:\2014\60329186_TM_Easley\900-CAD-GIS\920 GIS\922_Maps\CAGN 45-day Rpt\ObsSeries.mxd, 10/6/2014, janssenn*




Source: SanGIS 2012; SDG&E 2014; MCBCP 2007

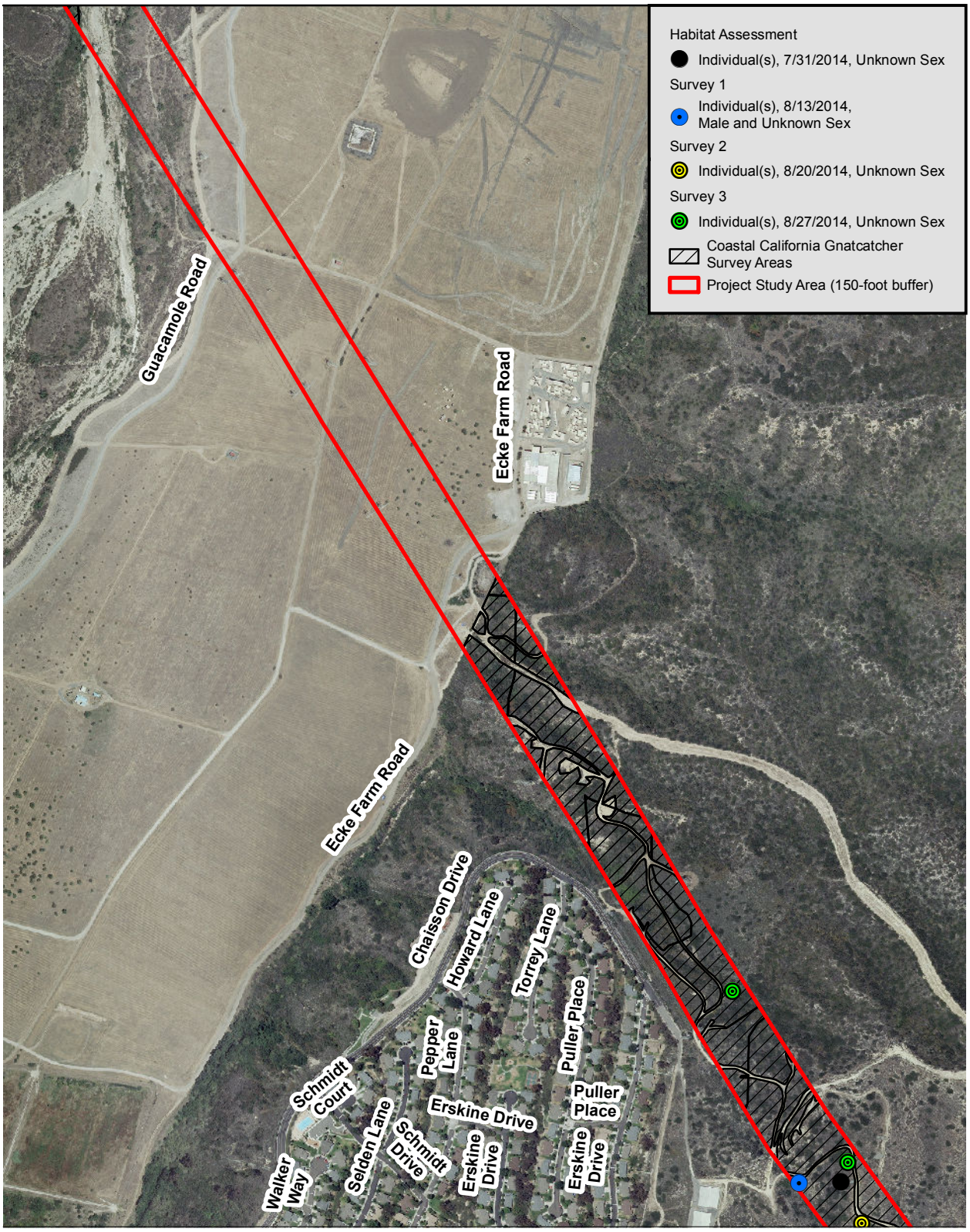
800 400 0 800 Feet

Scale: 1:9,600; 1 inch = 800 feet

**Figure 3h**
**Coastal California Gnatcatcher Observations - Detail Map 7 of 9**



*Path: P:\2014\60329186_TM_Easley\900-CAD-GIS\920 GIS\922_Maps\CAGN 45-day Rpt\ObsSeries.mxd, 10/6/2014, janssenn*




Source: SanGIS 2012; SDG&E 2014; MCBCP 2007

800 400 0 800 Feet

Scale: 1:9,600; 1 inch = 800 feet

**Figure 3i**
**Coastal California Gnatcatcher Observations - Detail Map 8 of 9**



*Path: P:\2014\60329186_TM_Easley\900-CAD-GIS\920 GIS\922_Maps\CAGN 45-day Rpt\ObsSeries.mxd, 10/6/2014, janssenn*


Source: SanGIS 2012; SDG&E 2014; MCBCP 2007

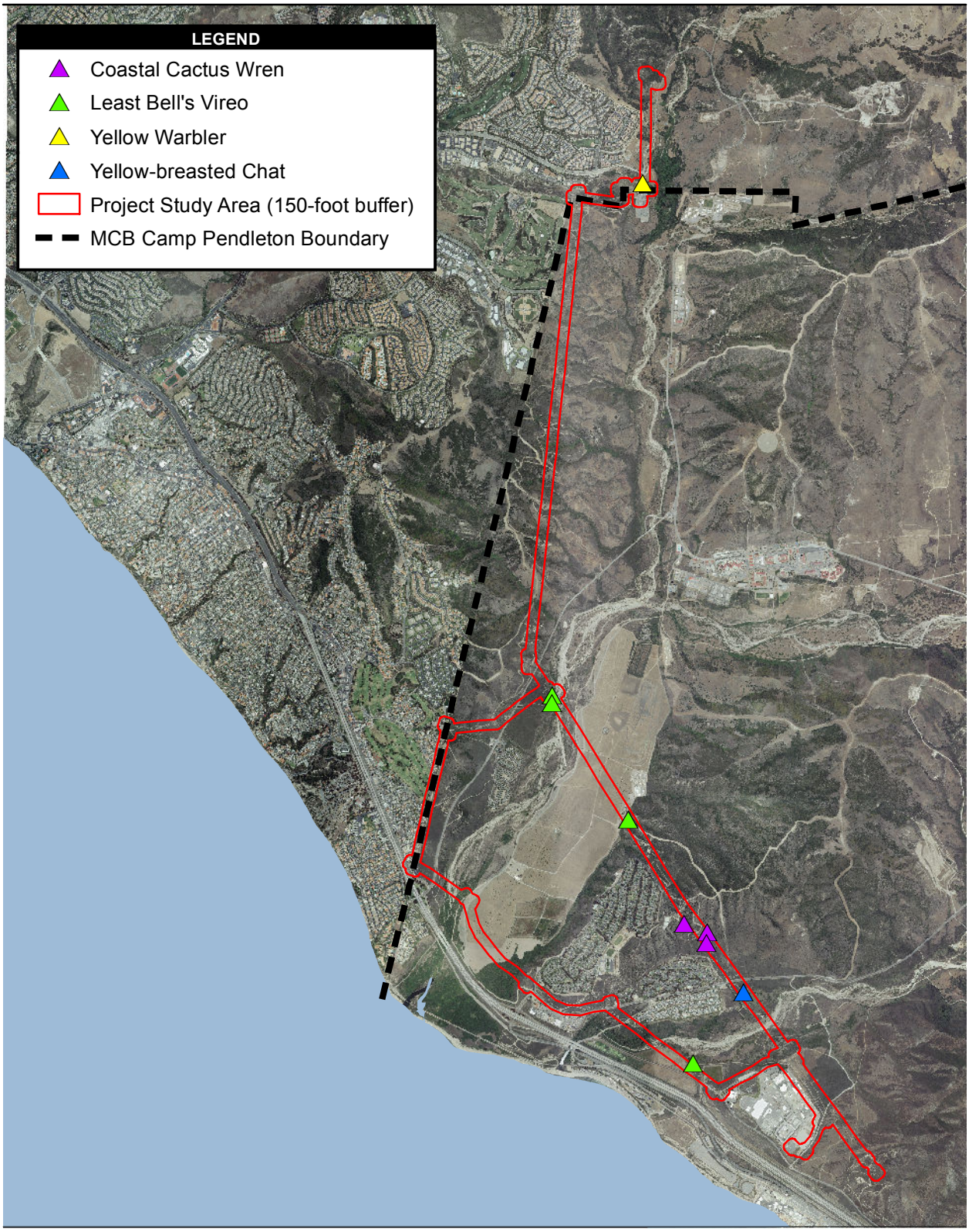
800 400 0 800 Feet

Scale: 1:9,600; 1 inch = 800 feet

**Figure 3j**
**Coastal California Gnatcatcher Observations - Detail Map 9 of 9**



*Path: P:\2014\60329186_TM_Easley\900-CAD-GIS\920 GIS\922_Maps\CAGN 45-day Rpt\ObsSeries.mxd, 10/6/2014, janssenn*




Source: SanGIS 2012; SDG&E 2014; MCBCP 2007

4,500 2,250 0 4,500 Feet

Scale: 1:54,000; 1 inch = 4,500 feet

**Figure 4**
**Other Sensitive Species Observations**

2014 TL 695 Wood to Steel Pole Replacement Project Coastal California Gnatcatcher 45-day Survey Report

*Path: \\ussdg1fp001.na.aecomnet.com\data\projects\2014\60329186_TM_Easley\900-CAD-GIS\920 GIS\922_Maps\CAGN 45-day Rpt\Fig_4.mxd, 9/30/2014, janssenn*

# APPENDIX A

# FIELD DATA COLLECTED DURING 2014 CAGN SURVEYS

# Appendix A
# Field Data Collected during 2014 CAGN Surveys

| Primary_ Bio | Survey # | Date | Time | Territory ID | Obs Type | Age | Sex | Count | Behavior Notes | GPS Location | Latitude | Longitude | Zone | Northing_ Final | Easting_ Final |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Andrew Fisher | 1 | 8/11/2014 | 9:26:23 AM | AFI01 | Individual(s) | Adult | Female | 1 | Calling sporadically | 33 26.7364 N 117 34.6997 W::8/11/14 at 16:20:47 (UTC) | 33.445607 N | 117.578328 W | 11S | 3700838.3 | 446247.85 |
| Andrew Fisher | 1 | 8/11/2014 | 9:27:47 AM | AFI01 | Individual(s) | Adult | Female and unknown | 2 | Calling sporadically and a second bird only heard once, could not see the second bird | 33 26.7224 N 117 34.6782 W::8/11/14 at 16:23:30 (UTC) | 33.445373 N | 117.577970 W | 11S | 3700812.1 | 446280.98 |
| Andrew Fisher | 1 | 8/11/2014 | 9:43:28 AM | AFI01 | Pair | Adult | Male and Female | 2 | Calling, black cap almost totally gone, small spot of black on rear right side of head. | 33 26.6611 N 117 34.7103 W::8/11/14 at 16:38:40 (UTC) | 33.444352 N | 117.578505 W | 11S | 3700699.2 | 446230.63 |
| Andrew Fisher | 1 | 8/11/2014 | 9:45:58 AM | AFI01 | Pair | Adult | Male and Female | 2 | Calling, black cap almost totally gone, small spot of black on rear right side of head. | 33 26.6611 N 117 34.7103 W::8/11/14 at 16:40:26 (UTC) | 33.444352 N | 117.578505 W | 11S | 3700699.2 | 446230.63 |
| Andrew Fisher | 1 | 8/11/2014 | 11:48:21 AM | AFI02 | Individual(s) | Unknown | Unknown | 1 | One faint mew call heard across canyon. | 33 25.5889 N 117 34.8721 W::8/11/14 at 18:42:12 (UTC) | 33.426482 N | 117.581202 W | 11S | 3698758.371 | 445946.38 |
| Andrew Fisher | 1 | 8/12/2014 | 6:45:15 AM | AFI03 | Individual(s) | Unknown | Unknown | 1 | One heard give a brief mew call. | 33 24.1769 N 117 35.4780 W::8/12/14 at 13:39:09 (UTC) | 33.402948 N | 117.591300 W | 11S | 3696115.4 | 445015.28 |
| Andrew Fisher | 1 | 8/12/2014 | 6:47:09 AM | AFI03 | Individual(s) | Adult | Male | 1 | One heard give a brief mew call, black cap gone, faded dark head. | 33 24.1769 N 117 35.4780 W::8/12/14 at 13:40:43 (UTC) | 33.402948 N | 117.591300 W | 11S | 3696115.4 | 445015.28 |
| Andrew Fisher | 0 | 7/31/2014 | 7:30:18 AM | AFI04 | Pair | Adult | Male and Female | 2 | Pair detected during habitat assessment. | 33 23.8255 N 117 35.4871 W::7/31/14 at 14:24:10 (UTC) | 33.397092 N | 117.591452 W | 11S | 3695466.3 | 444997.46 |
| Andrew Fisher | 1 | 8/12/2014 | 7:38:41 AM | AFI05 | Individual(s) | Adult and Juvenile | Female | 2 | 1 female and a juvenile observed giving short mew and contact calls. | 33 23.7740 N 117 35.4768 W::8/12/14 at 14:32:45 (UTC) | 33.396233 N | 117.591280 W | 11S | 3695370.9 | 445012.91 |
| Andrew Fisher | 1 | 8/12/2014 | 7:43:52 AM | AFI06 | Individual(s) | Adult | Male | 1 | Popped up in veg in front of me totally silently, still retaining most of its black cap. | 33 23.8051 N 117 35.4471 W::8/12/14 at 14:38:17 (UTC) | 33.396752 N | 117.590785 W | 11S | 3695428.2 | 445059.27 |
| Andrew Fisher | 1 | 8/12/2014 | 7:48:32 AM | AFI06 | Individual(s) | Adult | Male | 1 | Popped up in veg in front of me totally silently, still retaining most of its black cap. | 33 23.8187 N 117 35.4476 W::8/12/14 at 14:42:20 (UTC) | 33.396978 N | 117.590793 W | 11S | 3695453.3 | 445058.67 |
| Andrew Fisher | 1 | 8/12/2014 | 8:08:28 AM | AFI07 | Individual(s) | Unknown | Unknown | 1 | Heard a brief mew, no bird seen. | 33 24.6492 N 117 35.0520 W::8/12/14 at 15:02:17 (UTC) | 33.410820 N | 117.584200 W | 11S | 3696984.5 | 445680.41 |
| Andrew Fisher | 1 | 8/12/2014 | 8:21:37 AM | AFI08 | Individual(s) | Adult | Female | 1 | Observed moving through Baccharis scrub giving brief mew calls, overall very silent. May be the same bird as AFI07. | 33 24.6063 N 117 35.1334 W::8/12/14 at 15:15:49 (UTC) | 33.410105 N | 117.585557 W | 11S | 3696905.9 | 445553.79 |
| Andrew Fisher | 1 | 8/12/2014 | 9:10:08 AM | AFI09 | Individual(s) | Adult | Female | 1 | Female flew in silently to taped callback and then disappeared. | 33 24.7469 N 117 34.8736 W::8/12/14 at 16:03:53 (UTC) | 33.412448 N | 117.581227 W | 11S | 3697163.4 | 445957.86 |
| Andrew Fisher | 1 | 8/12/2014 | 9:13:56 AM | AFI09 | Individual(s) | Adult | Female | 1 | Female flew in silently to taped callback and then disappeared. | 33 24.7508 N 117 34.8653 W::8/12/14 at 16:07:07 (UTC) | 33.412513 N | 117.581088 W | 11S | 3697170.6 | 445970.82 |
| Andrew Fisher | 1 | 8/12/2014 | 9:31:50 AM | AFI10 | Individual(s) | Juvenile | Unknown | 1 | A juvenile-looking bird calling infrequently and moving through sage scrub. | 33 24.7619 N 117 34.8631 W::8/12/14 at 16:25:43 (UTC) | 33.412698 N | 117.581052 W | 11S | 3697191.1 | 445974.29 |

| Primary_ Bio | Survey # | Date | Time | Territory ID | Obs Type | Age | Sex | Count | Behavior Notes | GPS Location | Latitude | Longitude | Zone | Northing_ Final | Easting_ Final |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Andrew Fisher | 1 | 8/12/2014 | 9:51:32 AM | AFI11 | Individual(s) | Adult | Male, and unknown | 2 | Male with almost no black in cap that gave very few faint mew calls. A second bird heard calling nearby but never seen. | 33 24.8020 N 117 34.9464 W::8/12/14 at 16:45:19 (UTC) | 33.413367 N | 117.582440 W | 11S | 3697265.9 | 445845.64 |
| Andrew Fisher | 1 | 8/12/2014 | 9:55:23 AM | AFI11 | Individual(s) | Adult | Male, and unknown | 2 | Male with almost no black in cap that gave very few faint mew calls. A second bird heard calling nearby but never seen. | 33 24.8161 N 117 34.9351 W::8/12/14 at 16:49:05 (UTC) | 33.413602 N | 117.582252 W | 11S | 3697291.9 | 445863.27 |
| Andrew Fisher | 1 | 8/12/2014 | 10:05:03 AM | AFI12 | Individual(s) | Adult | Male | 1 | Observed calling from sage scrub, brief mew calls, lots of black remaining on head. | 33 24.8194 N 117 34.9137 W::8/12/14 at 16:59:12 (UTC) | 33.413657 N | 117.581895 W | 11S | 3697297.8 | 445896.5 |
| Andrew Fisher | 1 | 8/12/2014 | 10:30:38 AM | AFI13 | Individual(s) | Adult | Male | 1 | Vocal male that is molting and black cap is almost entirely gone. | 33 24.9996 N 117 34.9183 W::8/12/14 at 17:24:49 (UTC) | 33.416660 N | 117.581972 W | 11S | 3697630.8 | 445891.2 |
| Andrew Fisher | 1 | 8/12/2014 | 10:31:51 AM | AFI13 | Individual(s) | Adult | Male | 1 | Vocal male that is molting and black cap is almost entirely gone. | 33 25.0005 N 117 34.9256 W::8/12/14 at 17:25:37 (UTC) | 33.416675 N | 117.582093 W | 11S | 3697632.5 | 445879.96 |
| Andrew Fisher | 1 | 8/12/2014 | 10:44:47 AM | AFI13 | Individual(s) | Adult | Male | 1 | Vocal male that is molting and black cap is almost entirely gone. | 33 24.9396 N 117 34.9142 W::8/12/14 at 17:37:58 (UTC) | 33.415660 N | 117.581903 W | 11S | 3697519.9 | 445897 |
| Andrew Fisher | 1 | 8/12/2014 | 11:17:53 AM | AFI14 | Individual(s) | Adult | Female | 1 | One faint mew call heard across canyon. Then bird flew in. | 33 25.3897 N 117 34.8763 W::8/12/14 at 18:11:50 (UTC) | 33.423162 N | 117.581272 W | 11S | 3698404.333 | 446013.343 |
| Andrew Fisher | 1 | 8/12/2014 | 11:22:06 AM | AFI14 | Individual(s) | Adult | Female | 1 | One faint mew call heard across canyon. Then bird flew in. | 33 25.3916 N 117 34.8776 W::8/12/14 at 18:15:23 (UTC) | 33.423193 N | 117.581293 W | 11S | 3698407.833 | 446011.413 |
| Andrew Fisher | 1 | 8/12/2014 | 11:34:21 AM | AFI15 | Individual(s) | Adult | Female | 1 | Female-type bird flew in to playback, very responsive. | 33 25.1547 N 117 34.9289 W::8/12/14 at 18:28:33 (UTC) | 33.419245 N | 117.582148 W | 11S | 3697867.5 | 445876.44 |
| Andrew Fisher | 1 | 8/12/2014 | 11:35:41 AM | AFI15 | Individual(s) | Adult | Female | 1 | Female-type bird flew in to playback, very responsive. | 33 25.1547 N 117 34.9289 W::8/12/14 at 18:30:05 (UTC) | 33.419245 N | 117.582148 W | 11S | 3697917.5 | 445876.44 |
| Andrew Fisher | 1 | 8/12/2014 | 11:42:10 AM | AFI15 | Individual(s) | Adult | Female, and unknown | 2 | Female-type bird flew in to playback, very responsive, then heard a second bird, but could not get a visual. | 33 25.1238 N 117 34.9564 W::8/12/14 at 18:36:12 (UTC) | 33.418730 N | 117.582607 W | 11S | 3697860.6 | 445833.45 |
| Andrew Fisher | 1 | 8/13/2014 | 7:54:25 AM | AFI16 | Individual(s) | Adult | Male | 1 | Mewed a few times but overall nonresponsive, some black in cap. | 33 23.2288 N 117 34.7615 W::8/13/14 at 14:48:31 (UTC) | 33.387147 N | 117.579358 W | 11S | 3694357.4 | 446116.03 |
| Andrew Fisher | 1 | 8/13/2014 | 7:55:37 AM | AFI16 | Individual(s) | Adult | Male | 1 | Mewed a few times but overall nonresponsive, some black in cap. | 33 23.2288 N 117 34.7615 W::8/13/14 at 14:49:11 (UTC) | 33.387147 N | 117.579358 W | 11S | 3694357.4 | 446116.03 |
| Andrew Fisher | 1 | 8/13/2014 | 8:10:06 AM | AFI17 | Individual(s) | Adult | Male, and unknown | 2 | Most of the black is gone, dark patch above eyes. Second bird only heard and not seen. | 33 23.1812 N 117 34.5571 W::8/13/14 at 15:08:59 (UTC) | 33.386353 N | 117.575952 W | 11S | 3694267.6 | 446432.32 |
| Andrew Fisher | 1 | 8/13/2014 | 8:16:10 AM | AFI17 | Individual(s) | Adult | Male, and unknown | 2 | Most of the black is gone, dark patch above eyes. Second bird only heard and not seen. | 33 23.1750 N 117 34.5448 W::8/13/14 at 15:09:49 (UTC) | 33.386250 N | 117.575747 W | 11S | 3694256 | 446451.33 |
| Andrew Fisher | 1 | 8/13/2014 | 8:24:47 AM | AFI18 | Pair | Adult | Male and Female | 2 | Different birds than AFI17, male has very little black left. | 33 23.2118 N 117 34.5101 W::8/13/14 at 15:19:12 (UTC) | 33.386863 N | 117.575168 W | 11S | 3694323.7 | 446505.55 |
| Andrew Fisher | 1 | 8/13/2014 | 8:35:11 AM | AFI19 | Family | Adult and Fledgling | Male and Female | 3 | Group of three moving around together in short scrub. | 33 23.2300 N 117 34.4240 W::8/13/14 at 15:29:12 (UTC) | 33.387167 N | 117.573733 W | 11S | 3694356.7 | 446639.21 |

| Primary_ Bio | Survey # | Date | Time | Territory ID | Obs Type | Age | Sex | Count | Behavior Notes | GPS Location | Latitude | Longitude | Zone | Northing_ Final | Easting_ Final |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Andrew Fisher | 1 | 8/13/2014 | 8:45:10 AM | AFI20 | Pair | Adult | Male and Female | 2 | One faint mew call heard, pair finally seen. | 33 23.1788 N 117 34.4037 W::8/13/14 at 15:38:55 (UTC) | 33.386313 N | 117.573395 W | 11S | 3694241.8 | 446670.12 |
| Andrew Fisher | 1 | 8/13/2014 | 8:57:46 AM | AFI21 | Pair | Adult | Male and Female | 2 | Pair foraging along slope. | 33 23.1503 N 117 34.4944 W::8/13/14 at 15:52:16 (UTC) | 33.385838 N | 117.574907 W | 11S | 3694209.9 | 446529.2 |
| Andrew Fisher | 1 | 8/13/2014 | 9:49:00 AM | AFI22 | Individual(s) | Unknown | Unknown | 1 | Bird only gave a brief mew once, never seen. | 33 22.7826 N 117 33.8357 W::8/13/14 at 16:42:58 (UTC) | 33.379710 N | 117.563928 W | 11S | 3693524.9 | 447546.67 |
| Andrew Fisher | 1 | 8/13/2014 | 9:53:15 AM | AFI23 | Pair | Adult | Male and Female | 2 | Pair foraging together. | 33 22.7477 N 117 33.8028 W::8/13/14 at 16:46:52 (UTC) | 33.379128 N | 117.563380 W | 11S | 3693460.1 | 447597.29 |
| Andrew Fisher | 1 | 8/13/2014 | 10:16:05 AM | AFI24 | Pair | Adult | Male and Female | 2 | Most of the black cap is gone. | 33 22.8711 N 117 33.5432 W::8/13/14 at 17:09:38 (UTC) | 33.381185 N | 117.559053 W | 11S | 3693686 | 448000.99 |
| Andrew Fisher | 1 | 8/13/2014 | 10:57:15 AM | AFI25 | Individual(s) | Juvenile | Unknown | 2 | Two female-type birds, probably juveniles. | 33 22.4775 N 117 33.2375 W::8/13/14 at 17:50:47 (UTC) | 33.374625 N | 117.553958 W | 11S | 3692956.2 | 448471.03 |
| Andrew Fisher | 1 | 8/13/2014 | 11:02:47 AM | AFI25 | Individual(s) | Juvenile | Unknown | 2 | Two female-type birds, probably juveniles. | 33 22.4281 N 117 33.2915 W::8/13/14 at 17:56:01 (UTC) | 33.373802 N | 117.554858 W | 11S | 3692865.4 | 448386.83 |
| Andrew Fisher | 1 | 8/13/2014 | 11:34:33 AM | AFI26 | Individual(s) | Juvenile | Unknown | 1 | One juvenile, probably dispersing. | 33 22.7334 N 117 33.1654 W::8/13/14 at 18:28:20 (UTC) | 33.378890 N | 117.552757 W | 11S | 3693428.5 | 448585.26 |
| Andrew Fisher | 1 | 8/13/2014 | 11:40:26 AM | AFI26 | Individual(s) | Juvenile | Unknown | 1 | One juvenile, probably dispersing. | 33 22.8207 N 117 33.2262 W::8/13/14 at 18:33:42 (UTC) | 33.380345 N | 117.553770 W | 11S | 3693590.3 | 448491.89 |
| Andrew Fisher | 1 | 8/13/2014 | 12:00:59 PM | AFI27 | Family | Adult and Fledgling | Male and Female | 4 | Pair with two juveniles. | 33 23.0260 N 117 33.4917 W::8/13/14 at 19:07:30 (UTC) | 33.383767 N | 117.558195 W | 11S | 3693971.9 | 448082.34 |
| Brennan Mulrooney | 1 | 8/13/2014 | 8:45:36 AM | Bmu01 | Individual(s) | Adult and Unknown | Male and Unknown | 2 | Foraging together. Adult male and bird of unk age/sex. | 33 23.6361 N 117 33.9862 W::8/13/14 at 15:45:10 (UTC) | 33.393935 N | 117.566437 W | 11S | 3695103.3 | 447311.87 |
| Brennan Mulrooney | 1 | 8/13/2014 | 9:33:05 AM | Bmu02 | Individual(s) | Unknown | Unknown | 1 | Calling | 33 23.4843 N 117 33.8519 W::8/13/14 at 16:31:43 (UTC) | 33.391405 N | 117.564198 W | 11S | 3694821.7 | 447528.58 |
| Brennan Mulrooney | 1 | 8/13/2014 | 9:40:02 AM | Bmu03 | Individual(s) | Unknown | Unknown | 1 | Calling | 33 23.4415 N 117 33.8000 W::8/13/14 at 16:39:39 (UTC) | 33.390692 N | 117.563333 W | 11S | 3694742.2 | 447608.6 |
| Brennan Mulrooney | 1 | 8/13/2014 | 10:08:34 AM | Bmu04 | Individual(s) | Adult | Male | 1 | Foraging | 33 23.2973 N 117 33.6681 W::8/13/14 at 17:07:11 (UTC) | 33.388273 N | 117.561135 W | 11S | 3694472.9 | 447811.57 |
| Brennan Mulrooney | 1 | 8/13/2014 | 11:41:28 AM | Bmu05 | Individual(s) | Unknown | Unknown | 1 | Calling | 33 22.4328 N 117 32.9187 W::8/13/14 at 18:40:21 (UTC) | 33.373880 N | 117.548645 W | 11S | 3692871 | 448964.82 |
| Brennan Mulrooney | 1 | 8/13/2014 | 12:00:23 PM | Bmu06 | Individual(s) | Unknown | Unknown | 1 | Calling | 33 22.6341 N 117 33.0495 W::8/13/14 at 19:07:25 (UTC) | 33.377235 N | 117.550825 W | 11S | 3693244 | 448764 |
| Brennan Mulrooney | 2 | 8/19/2014 | 9:34:56 AM | Bmu01 | Individual(s) | Unknown | Unknown | 1 | Calling | 33 26.0750 N 117 34.7887 W::8/19/14 at 16:36:46 (UTC) | 33.434583 N | 117.579812 W | 11S | 3699636.496 | 446106.583 |
| James McMorran | 2 | 8/19/2014 | 7:10:23 AM | CAGN1 | Individual(s) | Unknown | Unknown | 1 | Calling | 33 23.9262 N 117 35.5729 W::8/19/14 at 14:10:10 (UTC) | 33.398767 N | 117.592883 W | 11S | 3695642.7 | 444882.7505 |
| James McMorran | 2 | 8/19/2014 | 7:16:01 AM | CAGN2 | Individual(s) | Unknown | Unknown | 1 | Calling | 33 23.9885 N 117 35.5536 W::8/19/14 at 14:15:59 (UTC) | 33.399808 N | 117.592560 W | 11S | 3695758 | 444913.4505 |
| James McMorran | 2 | 8/19/2014 | 7:35:49 AM | CAGN 3 | Individual(s) | Unknown | Unknown | 1 | Calling | 33 24.1483 N 117 35.5150 W::8/19/14 at 14:35:45 (UTC) | 33.402473 N | 117.591915 W | 11S | 3696057.891 | 444987.3342 |
| James McMorran | 2 | 8/19/2014 | 9:11:49 AM | CAGN 4 | Individual(s) | Unknown | Unknown | 2 | Calling | 33 24.5828 N 117 35.1897 W::8/19/14 at 16:13:54 (UTC) | 33.409713 N | 117.586495 W | 11S | 3696877.9 | 445466.33 |

| Primary_ Bio | Survey # | Date | Time | Territory ID | Obs Type | Age | Sex | Count | Behavior Notes | GPS Location | Latitude | Longitude | Zone | Northing_ Final | Easting_ Final |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| James McMorran | 2 | 8/19/2014 | 9:14:50 AM | CAGN 5 | Individual(s) | Unknown | Unknown | 1 | Calling | 33 24.5827 N 117 35.1880 W::8/19/14 at 16:14:34 (UTC) | 33.409712 N | 117.586467 W | 11S | 3696844.006 | 445462.0896 |
| Andrew Fisher | 2 | 8/20/2014 | 7:00:08 AM | AFI01 | Individual(s) | Juvenile | Unknown | 1 | One juvenile in fresh plumage. | 33 25.1150 N 117 34.9075 W::8/20/14 at 13:53:36 (UTC) | 33.418583 N | 117.581792 W | 11S | 3697843.9 | 445909.13 |
| Andrew Fisher | 2 | 8/20/2014 | 7:01:13 AM | AFI01 | Individual(s) | Juvenile | Unknown | 1 | One juvenile in fresh plumage. | 33 25.1150 N 117 34.9075 W::8/20/14 at 13:53:47 (UTC) | 33.418583 N | 117.581792 W | 11S | 3697874.211 | 445891.63 |
| Andrew Fisher | 2 | 8/20/2014 | 7:07:19 AM | AFI02 | Pair | Adult | Male and Female | 2 | Calling and foraging around. | 33 25.0843 N 117 34.9192 W::8/20/14 at 14:00:41 (UTC) | 33.418072 N | 117.581987 W | 11S | 3697787.4 | 445890.68 |
| Andrew Fisher | 2 | 8/20/2014 | 7:17:54 AM | AFI02 | Pair | Adult | Male and Female | 2 | Calling and foraging around. | 33 25.0426 N 117 34.9422 W::8/20/14 at 14:10:54 (UTC) | 33.417377 N | 117.582370 W | 11S | 3697710.5 | 445854.64 |
| Andrew Fisher | 2 | 8/20/2014 | 7:53:47 AM | AFI03 | Individual(s) | Juvenile | Unknown | 1 | One juvenile in fresh plumage calling occassionally. | 33 24.8950 N 117 34.9051 W::8/20/14 at 14:49:00 (UTC) | 33.414917 N | 117.581752 W | 11S | 3697437.4 | 445910.57 |
| Andrew Fisher | 2 | 8/20/2014 | 7:58:17 AM | AFI04 | Individual(s) | Adult | Male | 1 | Retaining most of his black cap. | 33 24.8869 N 117 34.9267 W::8/20/14 at 14:51:43 (UTC) | 33.414782 N | 117.582112 W | 11S | 3697422.7 | 445877.02 |
| Andrew Fisher | 2 | 8/20/2014 | 8:56:34 AM | AFI05 | Individual(s) | Juvenile | Unknown | 2 | Two juvenile birds moving around scrub. | 33 22.4960 N 117 32.9538 W::8/20/14 at 15:49:41 (UTC) | 33.374933 N | 117.549230 W | 11S | 3692988 | 448911.01 |
| Andrew Fisher | 2 | 8/20/2014 | 9:23:40 AM | AFI06 | Individual(s) | Juvenile | Unknown | 1 | Dispersing juvenile. | 33 22.6163 N 117 33.0767 W::8/20/14 at 16:16:43 (UTC) | 33.376938 N | 117.551278 W | 11S | 3693211.3 | 448721.68 |
| Andrew Fisher | 2 | 8/20/2014 | 9:42:13 AM | AFI07 | Individual(s) | Adult | Male | 1 | A single male observed along powerline. | 33 22.5255 N 117 33.1972 W::8/20/14 at 16:35:28 (UTC) | 33.375425 N | 117.553287 W | 11S | 3693044.6 | 448533.92 |
| Andrew Fisher | 2 | 8/20/2014 | 10:23:59 AM | AFI09 | Individual(s) | Unknown | Unknown | 1 | Heard briefly and then observed flying away from surveyor. | 33 22.8265 N 117 33.2256 W::8/20/14 at 17:17:31 (UTC) | 33.380442 N | 117.553760 W | 11S | 3693601 | 448492.88 |
| Andrew Fisher | 2 | 8/20/2014 | 10:25:09 AM | AFI09 | Individual(s) | Unknown | Unknown | 1 | Heard briefly and then observed flying away from surveyor. | 33 22.8265 N 117 33.2256 W::8/20/14 at 17:18:05 (UTC) | 33.380442 N | 117.553760 W | 11S | 3693601 | 448492.88 |
| Brennan Mulrooney | 2 | 8/20/2014 | 8:55:33 AM | Bmu01 | Individual(s) | Unknown | Unknown | 1 | Calling | 33 23.6005 N 117 33.9125 W::8/20/14 at 15:53:35 (UTC) | 33.393342 N | 117.565208 W | 11S | 3695037 | 447415.81 |
| Brennan Mulrooney | 2 | 8/20/2014 | 9:24:49 AM | Bmu02 | Individual(s) | Unknown | Unknown | 1 | Calling | 33 23.5387 N 117 33.8262 W::8/20/14 at 16:22:48 (UTC) | 33.392312 N | 117.563770 W | 11S | 3694922 | 447563.93 |
| Brennan Mulrooney | 2 | 8/20/2014 | 9:30:46 AM | Bmu03 | Individual(s) | Unknown | Unknown | 1 | Calling | 33 23.4989 N 117 33.8398 W::8/20/14 at 16:28:48 (UTC) | 33.391648 N | 117.563997 W | 11S | 3694848.5 | 447517.42 |
| Brennan Mulrooney | 2 | 8/20/2014 | 9:37:40 AM | Bmu04 | Individual(s) | Unknown | Unknown | 1 | Calling | 33 23.4402 N 117 33.7847 W::8/20/14 at 16:35:42 (UTC) | 33.390670 N | 117.563078 W | 11S | 3694710.056 | 447627.0906 |
| Brennan Mulrooney | 2 | 8/20/2014 | 9:47:27 AM | Bmu05 | Family | Adult and Juvenile | Unknown | 3 | Foraging | 33 23.3329 N 117 33.7169 W::8/20/14 at 16:45:32 (UTC) | 33.388882 N | 117.561948 W | 11S | 3694540.8 | 447736.33 |
| Brennan Mulrooney | 2 | 8/20/2014 | 10:24:01 AM | Bmu06 | Pair | Adult | Male and Female | 2 | Foraging | 33 23.1454 N 117 33.5086 W::8/20/14 at 17:22:15 (UTC) | 33.385757 N | 117.558477 W | 11S | 3694192.6 | 448060.29 |
| James McMorran | 2 | 8/20/2014 | 7:29:35 AM | CAGN 1 | Individual(s) | Unknown | Unknown | 1 | Calling | 33 23.1861 N 117 34.6596 W::8/20/14 at 14:29:32 (UTC) | 33.386435 N | 117.577660 W | 11S | 3694257.5 | 446273.51 |
| James McMorran | 2 | 8/20/2014 | 7:58:16 AM | CAGN 2 | Individual(s) | Adult and unknown | Male and Unknown | 2 | Calling, two birds, one adule male, the other either adult female, or juvenile bird. | 33 23.2382 N 117 34.8470 W::8/20/14 at 14:59:02 (UTC) | 33.387303 N | 117.580783 W | 11S | 3694385.248 | 445985.3265 |
| James McMorran | 2 | 8/20/2014 | 8:16:50 AM | CAGN 3 | Individual(s) | Unknown | Unknown | 2 | Calling, individuals heard only. | 33 23.2030 N 117 34.4499 W::8/20/14 at 15:17:24 (UTC) | 33.386717 N | 117.574167 W | 11S | 3694332.981 | 446583.56 |

| Primary_ Bio | Survey # | Date | Time | Territory ID | Obs Type | Age | Sex | Count | Behavior Notes | GPS Location | Latitude | Longitude | Zone | Northing_ Final | Easting_ Final |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| James McMorran | 2 | 8/20/2014 | 9:17:36 AM | CAGN 5 | Individual(s) | Unknown | Unknown | 2 | Calling | 33 22.8381 N 117 33.8897 W::8/20/14 at 16:18:02 (UTC) | 33.380635 N | 117.564828 W | 11S | 3693627.9 | 447463.51 |
| James McMorran | 2 | 8/20/2014 | 9:28:35 AM | CAGN 6 | Individual(s) | Unknown | Unknown | 2 | Carrying food | 33 22.8103 N 117 33.7784 W::8/20/14 at 16:28:11 (UTC) | 33.380172 N | 117.562973 W | 11S | 3693568.754 | 447675.1623 |
| James McMorran | 2 | 8/20/2014 | 9:34:00 AM | CAGN 7 | Pair | Adult | Male and Female | 2 | Calling | 33 22.8267 N 117 33.6527 W::8/20/14 at 17:09:55 (UTC) | 33.380445 N | 117.560878 W | 11S | 3693604.9 | 447830.8 |
| James McMorran | 2 | 8/20/2014 | 10:16:11 AM | CAGN 8 | Individual(s) | Unknown | Unknown | 2 | Calling | 33 22.8680 N 117 33.5556 W::8/20/14 at 17:16:02 (UTC) | 33.381133 N | 117.559260 W | 11S | 3693680.4 | 447981.71 |
| Bonnie Hendricks | 3 | 8/26/2014 | 7:32:07 AM | Bhe01 | Individual(s) | Unknown | Unknown | 1 | Called a few times from artemesia at this location then moved NW. Only saw and heard one but could have been pair. | 33 24.5882 N 117 35.2017 W::8/26/14 at 14:35:44 (UTC) | 33.409803 N | 117.586695 W | 11S | 3696873 | 445447.79 |
| Bonnie Hendricks | 3 | 8/26/2014 | 7:38:22 AM | Bhe01 | Individual(s) | Unknown | Unknown | 1 | Called a few times from artemesia at this location then moved NW. Only saw and heard one but could have been pair. | 33 24.5668 N 117 35.2361 W::8/26/14 at 14:42:21 (UTC) | 33.409447 N | 117.587268 W | 11S | 3696833.9 | 445394.28 |
| Bonnie Hendricks | 3 | 8/26/2014 | 8:07:37 AM | Bhe02 | Pair | Adult | Male and Female | 2 | Calling and foraging in artemisia. | 33 24.5703 N 117 35.2760 W::8/26/14 at 15:07:38 (UTC) | 33.409505 N | 117.587933 W | 11S | 3696840.6 | 445332.49 |
| Bonnie Hendricks | 3 | 8/26/2014 | 11:07:46 AM | Bhe03 | Individual(s) | Unknown | Unknown | 2 | Moving around habitat area calling from elderberry bush and heard calling from both sides of Christianitos road. | 33 24.8288 N 117 34.9003 W::8/26/14 at 18:11:41 (UTC) | 33.413813 N | 117.581672 W | 11S | 3697315 | 445917.33 |
| Bonnie Hendricks | 3 | 8/26/2014 | 11:20:44 AM | Bhe03 | Individual(s) | Unknown | Unknown | 1 | Same bird new location other side of road. | 33 24.8680 N 117 34.9148 W::8/26/14 at 18:20:43 (UTC) | 33.414467 N | 117.581913 W | 11S | 3697387.6 | 445895.33 |
| Brennan Mulrooney | 3 | 8/26/2014 | 8:59:30 AM | Bmu01 | Individual(s) | Unknown | Unknown | 1 | Calling | 33 26.6159 N 117 34.7415 W::8/26/14 at 15:56:58 (UTC) | 33.443598 N | 117.579025 W | 11S | 3700630.042 | 446195.9721 |
| Brennan Mulrooney | 3 | 8/26/2014 | 9:13:46 AM | Bmu02 | Individual(s) | Unknown | Unknown | 1 | Calling | 33 26.4823 N 117 34.7591 W::8/26/14 at 16:11:40 (UTC) | 33.441372 N | 117.579320 W | 11S | 3700369.2 | 446153.04 |
| Brennan Mulrooney | 3 | 8/26/2014 | 11:56:41 AM | Bmu03 | Individual(s) | Unknown | Unknown | 1 | Calling | 33 25.0816 N 117 34.9534 W::8/26/14 at 18:55:12 (UTC) | 33.418027 N | 117.582557 W | 11S | 3697775.04 | 445831.2321 |
| Brennan Mulrooney | 3 | 8/26/2014 | 12:00:17 PM | Bmu04 | Individual(s) | Adult | Female | 1 | Calling | 33 25.0853 N 117 34.9219 W::8/26/14 at 18:58:39 (UTC) | 33.418088 N | 117.582032 W | 11S | 3697789.2 | 445886.51 |
| Bonnie Hendricks | 3 | 8/27/2014 | 8:32:40 AM | Bhe04 | Individual(s) | Unknown | Unknown | 1 | Heard call and did not see, in California sagebrush patch. | 33 23.8063 N 117 34.0662 W::8/27/14 at 15:32:42 (UTC) | 33.396772 N | 117.567770 W | 11S | 3695418.5 | 447199.62 |
| Bonnie Hendricks | 3 | 8/27/2014 | 9:35:52 AM | Bhe05 | Individual(s) | Unknown | Unknown | 1 | Came to recording, perched on rhus integrifolia. | 33 23.6552 N 117 33.9410 W::8/27/14 at 16:38:02 (UTC) | 33.394253 N | 117.565683 W | 11S | 3695138.2 | 447392.18 |
| Bonnie Hendricks | 3 | 8/27/2014 | 10:10:03 AM | Bhe06 | Individual(s) | Unknown | Unknown | 1 | Responded to playback. Ing | 33 23.5453 N 117 33.8994 W::8/27/14 at 17:09:53 (UTC) | 33.392422 N | 117.564990 W | 11S | 3694933.064 | 447445.6819 |
| Brennan Mulrooney | 3 | 8/27/2014 | 7:26:40 AM | Bmu01 | Pair | Adult | Male and Female | 2 | Calling | 33 23.2176 N 117 34.7839 W::8/27/14 at 14:25:28 (UTC) | 33.386960 N | 117.579733 W | 11S | 3694336.8 | 446081.03 |
| Brennan Mulrooney | 3 | 8/27/2014 | 8:10:23 AM | Bmu02 | Individual(s) | Unknown | Unknown | 1 | Calling | 33 23.1893 N 117 34.4747 W::8/27/14 at 15:08:00 (UTC) | 33.386488 N | 117.574578 W | 11S | 3694281.8 | 446560.2 |
| Brennan Mulrooney | 3 | 8/27/2014 | 10:19:51 AM | Bmu03 | Individual(s) | Unknown | Unknown | 1 | Calling | 33 22.4521 N 117 33.2736 W::8/27/14 at 17:17:24 (UTC) | 33.374202 N | 117.554560 W | 11S | 3692889.6 | 448414.78 |

| Primary_ Bio | Survey # | Date | Time | Territory ID | Obs Type | Age | Sex | Count | Behavior Notes | GPS Location | Latitude | Longitude | Zone | Northing_ Final | Easting_ Final |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Brennan Mulrooney | 3 | 8/27/2014 | 11:08:12 AM | Bmu04 | Individual(s) | Unknown | Unknown | 1 | Calling | 33 22.8977 N 117 33.5474 W::8/27/14 at 18:06:13 (UTC) | 33.381628 N | 117.559123 W | 11S | 3693725.352 | 447993.0135 |
| Brennan Mulrooney | 3 | 8/27/2014 | 11:33:48 AM | Bmu05 | Individual(s) | Unknown | Unknown | 1 | Calling | 33 22.7986 N 117 33.8178 W::8/27/14 at 18:31:17 (UTC) | 33.379977 N | 117.563630 W | 11S | 3693554.4 | 447574.55 |
| Brennan Mulrooney | 3 | 8/27/2014 | 11:58:06 AM | Bmu06 | Individual(s) | Unknown | Unknown | 1 | Calling | 33 22.7193 N 117 33.7500 W::8/27/14 at 18:55:36 (UTC) | 33.378760 N | 117.562360 W | 11S | 3693416.195 | 447677.1779 |

# APPENDIX B

# WILDLIFE SPECIES DETECTED DURING 2014 CAGN SURVEYS

# Appendix B
# Wildlife Species Detected during 2014 CAGN Surveys

| Common Name | Scientific Name | Order | Family | Federal Status (Endangered/ Threatened) | California Status (Endangered/ Threatened/Species of Special Concern) | NCCP Covered Species (NC) or NCCP Narrow Endemic (NE) |
|---|---|---|---|---|---|---|
| **Invertebrates** | | | | | | |
| Gray hairstreak | *Strymon melinus* | Lepidoptera | Lycaenidae | None | None | None |
| Western tiger swallowtail | *Papilio rutulus* | Lepidoptera | Papilionidae | None | None | None |
| Anise swallowtail | *Papilio zelicaon* | Lepidoptera | Papilionidae | None | None | None |
| Checkered white | *Pontia protodice* | Lepidoptera | Pieridae | None | None | None |
| Behr's metalmark | *Apodemia mormo virgulti* | Lepidoptera | Riodinidae | None | None | None |
| **Avian** | | | | | | |
| Cooper's hawk | *Accipiter cooperii* | Accipitriformes | Accipitridae | None | None | NC |
| Red-tailed hawk | *Buteo jamaicensis* | Accipitriformes | Accipitridae | None | None | None |
| Turkey vulture | *Cathartes aura* | Accipitriformes | Cathartidae | None | None | None |
| Anna's hummingbird | *Calypte anna* | Apodiformes | Trochilidae | None | None | None |
| Rufous hummingbird | *Selasphorus rufus/sasin* | Apodiformes | Trochilidae | None | None | None |
| Allen's hummingbird | *Selasphorus sasin* | Apodiformes | Trochilidae | None | None | None |
| Lesser nighthawk | *Chordeiles acutipennis* | Caprimulgiformes | Caprimulgidae | None | None | None |
| Killdeer | *Charadrius vociferus* | Charadriiformes | Charadriidae | None | None | None |
| Greater yellowlegs | *Tringa melanoleuca* | Charadriiformes | Scolopacidae | None | None | None |
| Eurasian collared-dove | *Streptopelia decaocto* | Columbiformes | Columbidae | None | None | None |
| Mourning dove | *Zenaida macroura* | Columbiformes | Columbidae | None | None | None |
| Greater roadrunner | *Geococcyx californianus* | Cuculiformes | Cuculidae | None | None | None |
| American kestrel | *Falco sparverius* | Falconiformes | Falconidae | None | None | None |
| California quail | *Callipepla californica* | Galliformes | Odontophoridae | None | None | None |
| Bushtit | *Psaltriparus minimus* | Passeriformes | Aegithalidae | None | None | None |
| Lazuli bunting | *Passerina amoena* | Passeriformes | Cardinalidae | None | None | None |
| Blue grosbeak | *Passerina caerulea* | Passeriformes | Cardinalidae | None | None | None |
| Black-headed grosbeak | *Pheucticus melanocephalus* | Passeriformes | Cardinalidae | None | None | None |
| Western tanager | *Piranga ludoviciana* | Passeriformes | Cardinalidae | None | None | None |
| Western scrub-jay | *Aphelocoma californica* | Passeriformes | Corvidae | None | None | None |
| American crow | *Corvus brachyrhynchos* | Passeriformes | Corvidae | None | None | None |
| Common raven | *Corvus corax* | Passeriformes | Corvidae | None | None | None |
| Southern California rufous-crowned sparrow | *Aimophila ruficeps canescens* | Passeriformes | Emberizidae | None | None | NC |
| Song sparrow | *Melospiza melodia* | Passeriformes | Emberizidae | None | None | None |
| California towhee | *Melozone crissalis* | Passeriformes | Emberizidae | None | None | None |
| Spotted towhee | *Pipilo maculatus* | Passeriformes | Emberizidae | None | None | None |
| Scaly-breasted munia | *Lonchura punctulata* | Passeriformes | Estrildidae | None | None | None |
| House finch | *Haemorhous mexicanus* | Passeriformes | Fringillidae | None | None | None |
| Lesser goldfinch | *Spinus psaltria* | Passeriformes | Fringillidae | None | None | None |
| Cliff swallow | *Petrochelidon pyrrhonota* | Passeriformes | Hirundinidae | None | None | None |

| Common Name | Scientific Name | Order | Family | Federal Status (Endangered/ Threatened) | California Status (Endangered/ Threatened/Species of Special Concern) | NCCP Covered Species (NC) or NCCP Narrow Endemic (NE) |
|---|---|---|---|---|---|---|
| Northern rough-winged swallow | *Stelgidopteryx serripennis* | Passeriformes | Hirundinidae | None | None | None |
| Bullock's oriole | *Icterus bullockii* | Passeriformes | Icteridae | None | None | None |
| Brown-headed cowbird | *Molothrus ater* | Passeriformes | Icteridae | None | None | None |
| Northern mockingbird | *Mimus polyglottos* | Passeriformes | Mimidae | None | None | None |
| California thrasher | *Toxostoma redivivum* | Passeriformes | Mimidae | None | None | None |
| Oak titmouse | *Baeolophus inornatus* | Passeriformes | Paridae | None | None | None |
| Wilson's warbler | *Cardellina pusilla* | Passeriformes | Parulidae | None | None | None |
| Common yellowthroat | *Geothlypis trichas* | Passeriformes | Parulidae | None | None | None |
| Yellow-breasted chat | *Icteria virens* | Passeriformes | Parulidae | None | Species of Special Concern | None |
| Orange-crowned warbler | *Oreothlypis celata* | Passeriformes | Parulidae | None | None | None |
| Yellow warbler | *Setophaga petechia brewsteri* | Passeriformes | Parulidae | None | Species of Special Concern | None |
| Blue-gray gnatcatcher | *Polioptila caerulea* | Passeriformes | Polioptilidae | None | None | None |
| Coastal California gnatcatcher | *Polioptila californica californica* | Passeriformes | Polioptilidae | Threatened | Species of Special Concern | NC |
| Phainopepla | *Phainopepla nitens* | Passeriformes | Ptilogonatidae | None | None | None |
| Wrentit | *Chamaea fasciata* | Passeriformes | Sylviidae | None | None | None |
| Coastal cactus wren | *Campylorhynchus brunneicapillus sandiegensis* | Passeriformes | Troglodytidae | None | Species of Special Concern | NE |
| Bewick's wren | *Thryomanes bewickii* | Passeriformes | Troglodytidae | None | None | None |
| House wren | *Troglodytes aedon* | Passeriformes | Troglodytidae | None | None | None |
| Western bluebird | *Sialia mexicana* | Passeriformes | Turdidae | None | None | NC |
| Ash-throated flycatcher | *Myiarchus cinerascens* | Passeriformes | Tyrannidae | None | None | None |
| Black phoebe | *Sayornis nigricans* | Passeriformes | Tyrannidae | None | None | None |
| Western kingbird | *Tyrannus verticalis* | Passeriformes | Tyrannidae | None | None | None |
| Cassin's kingbird | *Tyrannus vociferans* | Passeriformes | Tyrannidae | None | None | None |
| Least Bell's vireo | *Vireo bellii pusillus* | Passeriformes | Vireonidae | Endangered | Endangered | NC |
| Northern flicker | *Colaptes auratus* | Piciformes | Picidae | None | None | None |
| Acorn woodpecker | *Melanerpes formicivorus* | Piciformes | Picidae | None | None | None |
| Nuttall's woodpecker | *Picoides nuttallii* | Piciformes | Picidae | None | None | None |
| Downy woodpecker | *Picoides pubescens* | Piciformes | Picidae | None | None | None |
| **Mammals** | | | | | | |
| Southern mule deer | *Odocoileus hemionus fuliginatus* | Artiodactyla | Cervidae | None | None | NC |
| Coyote | *Canis latrans* | Carnivora | Canidae | None | None | None |
| Bobcat | *Lynx rufus* | Carnivora | Felidae | None | None | None |
| Desert cottontail | *Sylvilagus audubonii* | Lagomorpha | Leporidae | None | None | None |
| Botta's pocket gopher | *Thomomys bottae* | Rodentia | Geomyidae | None | None | None |
| Dusky-footed woodrat | *Neotoma fuscipes* | Rodentia | Muridae | None | None | None |
| California ground squirrel | *Spermophilus beecheyi* | Rodentia | Sciuridae | None | None | None |

*Species sensitivity status taken from State of California 2011.

**Appendix I – Pacific Pocket Mouse Focused Survey Reports Tremor 2013**

**THIS APPENDIX HAS BEEN OMITTED – IT HAS BEEN SUBMITTED UNDER CONFIDENTIAL COVER**

**Appendix J – Jurisdictional Delineation Report**
**Pangea Biological and Borcher Environmental Management 2015**

**(Refer to Appendix 4.9-A of the PEA for the Jurisdictional Delineation Report)**

# Appendix K – Plant and Wildlife Species Lists

| **General Plant Species Observed** | |
|---|---|
| **Common Name** | **Scientific Name** |
| **Equisetaceae** | |
| Smooth Horsetail | *Equisetum laevigatum* |
| **Polypodiaceae** | |
| Polypody Fern | *Polypodium californicum* |
| **Pteridaceae** | |
| Goldback Fern | *Pentagramma triangularis* |
| **Selaginellaceae** | |
| Bigelow's Spike Moss | *Seliginella bigelovii* |
| **Dicots** | |
| **Adocaceae** | |
| Blue Elderberry | *Sambucus nigra* ssp. *caerulea* |
| **Aizoaceae** | |
| Sea Fig | *Carpobrotus chilensis** |
| Hottentot Fig | *Carpobrotus edulis** |
| Common Ice Plant | *Mesembryanthemum crystallinum** |
| New Zealand Spinach | *Tetragonia tetragonioides** |
| **Amaranthaceae** | |
| Tumbleweed | *Amaranthus albus** |
| **Anacardiaceae** | |
| Laurel Sumac | *Malosma laurina* |
| Lemonade Berry | *Rhus integrifolia* |
| Peruvian Pepper | *Schinus molle** |
| Brazilian Pepper | *Schinus terebinthifolius** |
| Poison Oak | *Toxicodendron diversilobum* |
| **Apiaceae** | |
| Celery | *Apium graveolens** |
| Poison Hemlock | *Conium maculatum** |
| Rattlesnake Weed | *Daucus pusillus* |
| Fennel | *Foeniculum vulgare** |
| Pacific Sanicle | *Sanicula crassicaulis* |
| **Apocynaceae** | |
| Narrowleaf Milkweed | *Asclepias fascicularis* |
| **Asteraceae** | |
| Sacapellote | *Acourtia microcephala* |
| Western Ragweed | *Ambrosia psilostachya* |
| California Sagebrush | *Artemisia californica* |
| Mugwort | *Artemisia douglasiana* |
| Tarragon | *Artemisia dracunculus* |
| Coyote Bush | *Baccharis pilularis* |
| Mule Fat | *Baccharis salicifolia* |
| Sweet Bush | *Bebbia juncea* |
| California Brickelbush | *Brickellia californica* |
| Italian Thistle | *Carduus pycnocephalus** |
| Tocalote | *Centaurea melitensis** |
| **Common Name** | **Family - Scientific Name** |

| **General Plant Species Observed** | |
|---|---|
| **Common Name** | **Scientific Name** |
| Yellow Pincushion | *Chaenactis glabriuscula* var. *glabriuscula* |
| Cobweb Thistle | *Cirsium occidentale* |
| Bull Thistle | *Cirsium vulgare** |
| Common Sand Aster | *Corethrogyne filaginifolia* var. *filaginifolia* |
| Brass Buttons | *Cotula coronopifolia** |
| Artichoke Thistle | *Cynara cardunculus** |
| Clustered Tarweed | *Deinandra fasciculata* |
| Paniculate Tarplant | *Deinandra paniculata* |
| California Encelia | *Encelia californica* |
| Brittlebush | *Encelia farinosa* |
| Flax-leaved Horseweed | *Erigeron bonariensis** |
| Leafy Daisy | *Erigeron foliosus* |
| Golden Yarrow | *Eriophyllum confertiflorum* |
| Grass-Leaf Goldenrod | *Euthamia occidentalis* |
| Crown Daisy | *Glebionis coronaria** |
| Gum Plant | *Grindelia camporum* |
| Cretanweed | *Hedypnois cretica** |
| Bristly Ox Tongue | *Helminthotheca echioides** |
| Telegraph Weed | *Heterotheca grandiflora* |
| Smooth Cat's Ear | *Hypochaeris glabra** |
| Menzies' Goldenbush | *Isocoma menziesii* |
| Fleshy Jaumea | *Jaumea carnosa* |
| Wild Lettuce | *Lactuca serriola** |
| California Goldfields | *Lasthenia californica* |
| California Cottonrose | *Logfia filaginoides* |
| Dwarf Cottonrose | *Logfia gallica* |
| Pineapple Weed | *Matricaria discoidea** |
| False Rosinweed | *Osmadenia tenella* |
| Bicolor Cudweed | *Pseudognaphalium biolettii* |
| California Everlasting | *Pseudognaphalium californicum* |
| Jersey Cudweed | *Pseudognaphalium luteoalbum** |
| Cottonbatting Plant | *Pseudognaphalium stramineum* |
| Slender Woolly Marbles | *Psilocarphus tenellus* |
| California Chicory | *Rafinesquia californica* |
| Common Groundsel | *Senecio vulgaris** |
| Milk Thistle | *Silybum marianum** |
| Spiney-leaved Sow Thistle | *Sonchus asper** |
| Common Sow Thistle | *Sonchus oleraceus** |
| Small Wirelettuce | *Stephanomeria exigua* |
| Everlasting Nest Straw | *Stylocline gnaphaloides* |
| Dandelion | *Taraxacum officinale** |
| Silver Puffs | *Uropappus lindleyi* |
| Canyon Sunflower | *Venegasia carpesioides* |
| Rough Cockleburr | *Xanthium strumarium* |
| **Boraginaceae** | |

| **General Plant Species Observed** | |
|---|---|
| **Common Name** | **Scientific Name** |
| Menzie's Fiddleneck | *Amsinckia mensiezii* var. *intermedia* |
| Common Cryptantha | *Cryptantha clevelandii* |
| Clearwater Cryptantha | *Cryptantha intermedia* |
| Whispering Bells | *Emmenanthe penduliflora* |
| Spotted Eucrypta | *Eucrypta chrysanthemifolia* |
| Salt Heliotrope | *Heliotropium curassavicum* |
| Caterpillar Phacelia | *Phacelia cicutaria* var. *hispida* |
| California Bluebell | *Phacelia minor* |
| Fiesta Flower | *Pholistoma auritum* var. *auritum* |
| Cooper's Popcorn Flower | *Plagiobothrys collinus* |
| **Brassicaceae** | |
| Black Mustard | *Brassica nigra** |
| Field Mustard | *Brassica rapa** |
| Saharan Mustard | *Brassica tournefortii* |
| Shepherd's Purse | *Capsella bursa-pastoris** |
| Milk Maids | *Cardamine californica* |
| Shortpod Mustard | *Hirschfeldia incana** |
| Shining Pepperweed | *Lepidium nitidum* |
| White Watercress | *Nasturtium officinale* |
| Wild Radish | *Raphanus sativus** |
| Tumbling Mustard | *Sisymbrium altissimum** |
| **Cactaceae** | |
| Coast Cholla | *Cylindropuntia prolifera* |
| Coast Prickly Pear | *Opuntia littoralis* |
| Chaparral Prickly Pear | *Opuntia oricola* |
| Western Prickly Pear | *Opuntia ×occidentalis* |
| **Caryophyllaceae** | |
| Sand Mat | *Cardionema ramosissima* |
| Mouse-eared Chickweed | *Cerastium glomeratum** |
| Four Leaved Allseed | *Polycarpon tetraphyllum* |
| Common Catchfly | *Silene gallica** |
| Red Sandspurry | *Spergularia rubra** |
| Common Chickweed | *Stellaria media** |
| **Chenopodiaceae** | |
| Big Saltbush | *Atriplex lentiformis* |
| Fat-hen | *Atriplex prostrata* |
| Australian Saltbush | *Atriplex semibaccata** |
| California Goosefoot | *Chenopodium californicum* |
| Pickleweed | *Salicornia pacifica* |
| Russian Thistle | *Salsola tragus** |
| **Cistaceae** | |
| Bisbee Peak Rushrose | *Helianthemum scoparium* |
| **Cleomaceae** | |
| Bladderpod | *Peritoma arborea var. arborea* |
| **Convolvulaceae** | |

| **General Plant Species Observed** | |
|---|---|
| **Common Name** | **Scientific Name** |
| Southern California Morning Glory | *Calystegia macrostegia* ssp. *arida* |
| Spreading Alkali Weed | *Cressa truxillensis* |
| California Dodder | *Cuscuta californica* |
| Western Pony's Foot | *Dichondra occidentalis* |
| **Crassulaceae** | |
| Aquatic Pygmy Weed | *Crassula aquatica* |
| Pygmy Weed | *Crassula connata* |
| Jade Plant | *Crassula ovata** |
| Fingertips | *Dudleya edulis* |
| Coastal Dudleya | *Dudleya lanceolata* |
| Chalk Dudleya | *Dudleya pulverulenta* |
| **Cucurbitaceae** | |
| Calabazilla | *Cucurbita foetidissima* |
| Wild Cucumber | *Marah macrocarpa* |
| **Datiscaceae** | |
| Durango Root | *Datisca glomerata* |
| **Euphorbiaceae** | |
| Small Seeded Spurge | *Chamaesyce polycarpa* |
| Creeping Spurge | *Chamaesyce serpens* |
| California Croton | *Croton californicus* |
| Doveweed | *Croton setigerus* |
| Gopher Plant | *Euphorbia lathyris** |
| Castor Bean | *Ricinus communis** |
| **Fabaceae** | |
| Golden Wattle | *Acacia longifolia** |
| Deer Weed | *Acmispon glaber* var. *glaber* |
| Heermann's Lotus | *Acmispon heermannii* var. *heermannii* |
| Small Flowered Lotus | *Acmispon micranthus* |
| Hairy Lotus | *Acmispon strigosus* |
| Desert Indigobush | *Amorpha fruticosa* |
| Miniature Lupine | *Lupinus bicolor* |
| Arroyo Lupine | *Lupinus succulentus* |
| Blunt Leaved Lupine | *Lupinus truncatus* |
| Bur Clover | *Medicago polymorpha** |
| White Sweet Clover | *Melilotus albus** |
| Indian Sweet Clover | *Melilotus indica** |
| Rose Clover | *Trifolium hirtum** |
| Garden Vetch | *Vicia sativa* ssp. *nigra* |
| Winter Vetch | *Vicia villosa** |
| **Fagaceae** | |
| Coast Live Oak | *Quercus agrifolia* |
| **Frankeniaceae** | |
| Alkali Heath | *Frankenia salina* |
| **Gentianaceae** | |
| Charming Centaury | *Zeltnera venusta* |

| **General Plant Species Observed** | |
|---|---|
| **Common Name** | **Scientific Name** |
| **Geraniaceae** | |
| Long Beaked Filaree | *Erodium botrys** |
| Red Stemmed Filaree | *Erodium cicutarium** |
| White Stemmed Filaree | *Erodium moschatum** |
| Carolina Geranium | *Geranium carolinianum* |
| **Grossulariaceae** | |
| Fuschia-flowered Gooseberry | *Ribes speciosum* |
| **Lamiaceae** | |
| Henbit Deadnettle | *Lamium amplexicaule** |
| Horehound | *Marrubium vulgare** |
| White Sage | *Salvia apiana* |
| Chia | *Salvia columbariae* |
| Black Sage | *Salvia mellifera* |
| **Lythraceae** | |
| Hyssop Loosestrife | *Lythrum hyssopifolia** |
| **Malvaceae** | |
| Chaparral Mallow | *Malacothamnus fasciculatus* |
| Cheeseweed | *Malva parviflora** |
| Alkali Mallow | *Malvella leprosa* |
| Checker Bloom | *Sidalcea sparsifolia* |
| **Montiaceae** | |
| Red Maids | *Calandrinia ciliata* |
| Miner's Lettuce | *Claytonia perfoliata* |
| **Myrsinaceae** | |
| Scarlet Pimpernel | *Anagallis arvensis** |
| **Nyctaginaceae** | |
| Wishbone Bush | *Mirabilis laevis* var. *crassifolia* |
| **Onagraceae** | |
| California Sun Cup | *Camissoniopsis bistorta* |
| Purple Clarkia | *Clarkia purpurea* |
| Fringed Willowherb | *Epilobium ciliatum* |
| Great Marsh Evening-Primrose | *Oenothera elata* |
| **Orobanchaceae** | |
| Coast Indian Paintbrush | *Castilleja affinis* ssp. *affinis* |
| Purple Owl's Clover | *Castilleja exserta* ssp. *exserta* |
| **Oxalidaceae** | |
| Bermuda Buttercup | *Oxalis pes-caprae** |
| **Papavaraceae** | |
| California Poppy | *Eschscholzia californica* |
| Coulter's matilija poppy | *Romneya coulteri* |
| **Phrymaceae** | |
| Bush Monkey Flower | *Mimulus aurantiacus* |
| Common Monkey Flower | *Mimulus guttatus* |
| **Plantaginaceae** | |
| Nuttall's Snapdragon | *Antirrhinum nuttallianum* ssp. *nuttallianum* |

| **General Plant Species Observed** | |
|---|---|
| **Common Name** | **Scientific Name** |
| Heart-leaved Penstemon | *Keckiella cordifolia* |
| Blue Toadflax | *Nuttallanthus texanus* |
| Cut-leaf Plantain | *Plantago coronopus** |
| Coast Plantain | *Plantago elongata* |
| Dot-seed Plantain | *Plantago erecta* |
| English Plantain | *Plantago lanceolata** |
| Common Plantain | *Plantago major** |
| **Platanaceae** | |
| California Sycamore | *Platanus racemosa* |
| **Polemoniaceae** | |
| Fringed Linanthus | *Linanthus dianthiflorus* |
| Chaparral Gilia | *Gilia angelensis* |
| **Polygonaceae** | |
| Turkish Rugging | *Chorizanthe staticoides* |
| Longstem Buckwheat | *Eriogonum elongatum* |
| California Buckwheat | *Eriogonum fasciculatum* |
| Slender Woolly Buckwheat | *Eriogonum gracile* |
| Leather Spineflower | *Lastarriaea coriacea* |
| Fairy Mist | *Pterostegia drymarioides* |
| Curly Dock | *Rumex crispus** |
| **Primulaceae** | |
| Padre's Shooting Star | *Dodecatheon clevelandii* ssp. *clevelandii* |
| **Ranunculaceae** | |
| Western Virgin's Bower | *Clematis ligusticifolia* |
| Parry's Larkspur | *Delphinium parryi* ssp. *parryi* |
| California Buttercup | *Ranunculus californicus* |
| **Rosaceae** | |
| Chamise | *Adenostoma fasciculatum* |
| Smooth Mountain Mahogany | *Cercocarpus minutiflorus* |
| Sticky Cinquefoil | *Drymocallis glandulosa* |
| Toyon | *Heteromeles arbutifolia* |
| California Rose | *Rosa californica* |
| California Blackberry | *Rubus ursinus* |
| **Rubiaceae** | |
| Narrowleaf Bedstraw | *Galium angustifolium* ssp. *angustifolium* |
| Common Bedstraw | *Galium aparine* |
| Climbing Bedstraw | *Galium porrigens* |
| **Salicaceae** | |
| Fremont Cottonwood | *Populus fremontii* |
| Sandbar Willow | *Salix exigua* |
| Black Willow | *Salix gooddingii* |
| Red Willow | *Salix laevigata* |
| Arroyo Willow | *Salix lasiolepis* |
| **Saururaceae** | |
| Yerba Mansa | *Anemopsis californica* |

| **General Plant Species Observed** | |
|---|---|
| **Common Name** | **Scientific Name** |
| **Solanaceae** | |
| Sacred Datura | *Datura wrightii* |
| California Boxthorn | *Lycium californicum* |
| Tree Tobacco | *Nicotiana glauca** |
| Douglas' Nightshade | *Solanum douglasii* |
| Black Nightshade | *Solanum nigrum** |
| Parish's Purple Nightshade | *Solanum parishii* |
| Purple Nightshade | *Solanum xanti* |
| **Tamaricaceae** | |
| Saltcedar | *Tamarix ramosissima** |
| **Urticaceae** | |
| Western Nettle | *Hesperocnide tenella* |
| Pellitory | *Parietaria hespera* var. *hespera* |
| Stinging Nettle | *Urtica dioica* |
| **Verbenaceae** | |
| Western Verbena | *Verbena lasiostachys* |
| **Viscaceae** | |
| Big Leaf Mistletoe | *Phoradendron macrophyllum* |
| **Monocots** | |
| **Agavaceae** | |
| Smallflower Soap Plant | *Chlorogalum parviflorum* |
| Chaparral Yucca | *Hesperoyucca whipplei* |
| **Arecaceae** | |
| Mexican Fan Palm | *Washingtonia robusta** |
| Canary Island Date Palm | *Phoenix canariensis** |
| **Asphodelaceae** | |
| Onion Weed | *Asphodelus fistulosus** |
| **Cyperaceae** | |
| Sedge | *Carex* spp. |
| Tall Flatsedge | *Cyperus eragrostis* |
| Umbrella Sedge | *Cyperus involucratus** |
| Creeping Spike Rush | *Eleocharis macrostachya* |
| Hardstem Bulrush | *Schoenoplectus acutus* |
| California Bulrush | *Schoenoplectus californicus* |
| **Juncaceae** | |
| Baltic Rush | *Juncus balticus* |
| Mexican Rush | *Juncus mexicanus* |
| Wrinkled Rush | *Juncus rugulosus* |
| **Iridaceae** | |
| Blue Eyed Grass | *Sisyrinchium bellum* |
| **Liliaceae** | |
| Splendid Mariposa Lily | *Calochortus splendens* |
| **Melanthiaceae** | |
| Fremont's Star Lily | *Toxicoscordion fremontii* |
| **Poaceae** | |

| **General Plant Species Observed** | |
|---|---|
| **Common Name** | **Scientific Name** |
| Giant Reed | *Arundo donax** |
| Slim Oat | *Avena barbata** |
| Common Oat | *Avena fatua** |
| Beard Grass | *Bothriochloa barbinodis* |
| Ripgut Brome | *Bromus diandrus** |
| Soft Chess Brome | *Bromus hordeaceus** |
| Red Brome | *Bromus madritensis** |
| Pampas Grass | *Cortaderia selloana* |
| Salt Grass | *Distichlis spicata* |
| Giant Ryegrass | *Elymus condensatus* |
| Small Fescue | *Festuca microstachys* |
| Italian Ryegrass | *Festuca perennis** |
| Foxtail Barley | *Hordeum murinum** |
| Goldentop Grass | *Lamarckia aurea** |
| Mexican Sprangletop | *Leptochloa fusca* ssp. *uninervia* |
| California Melic | *Melica imperfecta* |
| Mediterranean Canarygrass | *Phalaris minor** |
| Annual Bluegrass | *Poa annua** |
| Rabbitsfoot Grass | *Polypogon monspeliensis** |
| Mediterranean Grass | *Schismus barbatus** |
| Foothill Needlegrass | *Stipa lepida* |
| Purple Needlegrass | *Stipa pulchra* |
| **Themidaceae** | |
| Goldenstar | *Bloomeria crocea* |
| Thread Leaved Brodiaea | *Brodiaea filifolia* |
| Blue Dicks | *Dichelostemma capitatum* |
| Common Muilla | *Muilla maritima* |
| **Typhaceae** | |
| Cattail | *Typha* spp. |

*Denotes nonnative species

| **General Wildlife Species Observed** | |
|---|---|
| **Common Name** | **Scientific Name** |
| **Invertebrates** | |
| Anise Swallowtail | *Papilio zelicaon* |
| Behr's metalmark | *Apodemia mormo virqulti* |
| Checkered White | *Pontia protodice* |
| Gray Hairstreak | *Strymon melinus* |
| Painted Lady | *Vanessa cardui* |
| Pygmy Blue | *Brephidium exilis* |
| Versatile Fairy Shrimp | *Branchinecta lindahli* |
| Western Tiger Swallowtail | *Papilio rutulus* |
| **Amphibians** | |
| Baja California treefrog | *Pseudacris hypochondriaca* |
| **Reptiles** | |
| Western fence lizard | *Sceloporus occidentalis* |
| Western Whiptail | *Cnimidophorus tigris* |
| **Birds** | |
| Acorn Woodpecker | Melanerpes formicivorus |
| Allen's Hummingbird | *Selasphorus sasin* |
| American Crow | *Corvus brachyrhychos* |
| American Goldfinch | *Spinus tristis* |
| American Kestrel | *Falco sparverius* |
| American Pipit | *Anthus rubrescens* |
| Anna's Hummingbird | *Calypte anna* |
| Ash-throated flycatcher | Myiarchus cinerascens |
| Bewick's Wren | *Thryomanes bewickii* |
| Black Phoebe | *Sayornis nigricans* |
| Black-bellied Plover | *Pluvialis squatarola* |
| Black-headed Grosbeak | *Pheuticus melanocephalus* |
| Blue Grosbeak | *Passerina caerulea* |
| Blue-gray Gnatcatcher | *Polioptila caerulea* |
| Brown-headed Cowbird | *Molothrus ater* |
| Bullock's Oriole | *Icterus bullockii* |
| Bushtit | *Psaltriparus minimus* |
| Caifornia Towhee | *Melospiza crissalis* |
| California quail | *Callipepta californica* |
| California Thrasher | *Toxostoma redivivum* |
| Cassin's Kingbird | *Tyrannus vociferans* |
| Cliff Swallow | *Petrochelidon pyrrhonota* |
| Coastal Cactus Wren | *Campylorhynchus brunneicapillus* |
| Coastal California Gnatcatcher | *Polioptila californica californica* |
| Common Quail | *Callipepla californica* |
| Common Raven | *Corvus corax* |
| Common Yellowthroat | *Geothylpis trichas* |
| Cooper's Hawk | *Accipiter cooperii* |
| Downy Woodpecker | *Picoides pubescens* |
| Eurasian Collared-dove | *Streptopelia decaocto* |

| **General Wildlife Species Observed** | |
|---|---|
| **Common Name** | **Scientific Name** |
| European Starling | *Sturnus vulgaris* |
| Greater Roadrunner | *Geococcyx californianus* |
| Greater Yellowlegs | *Tringa melanolecua* |
| Hermit Thrush | *Catharus guttatus* |
| Horned Lark | *Eremophila alpestris* |
| House Finch | *Haemorhous mexicanus* |
| House Wren | *Troglodytes aedon* |
| Hutton's Vireo | *Vireo huttoni* |
| Killdeer | *Charadrius vociferus* |
| Lazuli bunting | *Passerina amoena* |
| Least Bell's Vireo | *Vireo bellii pusillis* |
| Lesser Goldfinch | *Spinus psaltria* |
| Lesser Nighthawk | *Chordeiles acutipennis* |
| Lincoln's Sparrow | *Melospiza lincolnii* |
| Loggerhead Shrike | *Lanius ludovicianus* |
| Mourning Dove | *Zenaida macroura* |
| Northern Flicker | *Colaptes auratus* |
| Northern Mockingbird | *Mimus polyglottos* |
| Northern Rough-winged swallow | *Stelqidopteryx serripennis* |
| Nuttall's Woodpecker | *Picoides nuttallii* |
| Oak titmouse | *Baeolophus inornatus* |
| Orange-crowned Warbler | *Oreothylpis trichas* |
| Pacific-slope Flycatcher | *Empidonax difficilis* |
| Phainopepla | Phainopepla nitens |
| Red-shouldered Hawk | *Buteo lineatus* |
| Red-tailed Hawk | *Buteo jamaicensis* |
| Rufous Hummingbird | *Selasphorus rufus/sasin* |
| Savannah Sparrow | *Passerculus sandwichensis* |
| Say's Phoebe | *Sayornis saya* |
| Scaly-breasted Munia | *Lonchura punctulata* |
| Song Sparrow | *Melospiza melodia* |
| Southern California Rufous-Crowned Sparrow | *Aimophila ruficeps canescens* |
| Spotted Towhee | *Pipilo maculatus* |
| Turkey Vulture | *Cathartes aura* |
| Western Bluebird | *Sialia mexicana* |
| Western Kingbird | Tyrannus verticalis |
| Western Meadowlark | *Sturnella neglecta* |
| Western Scrub-Jay | *Aphelocoma californica* |
| Western Tanager | *Piranga ludoviciana* |
| White-crowned Sparrow | *Zonotrichia leucophrys* |
| White-throated Swift | *Aeronautes saxatalis* |
| Wilson's Warbler | *Cardellina pusilla* |
| Wrentit | *Chamaea fasciata* |
| Yellow Warbler | *Setophaga petechia brewsteri* |
| Yellow-breasted Chat | *Icteria virens* |

| **General Wildlife Species Observed** | |
|---|---|
| **Common Name** | **Scientific Name** |
| Yellow-rumped Warbler | *Setophaga coronata* |
| **Mammals** | |
| Bobcat | *Lynx rufus* |
| Botta's Pocket Gopher | *Thomoys bottae* |
| Brush mouse | *Peromyscus boylii* |
| Bryant's woodrat | *Neotoma bryanti* |
| California Ground Squirrel | *Spermophilus beecheyi* |
| California mouse | *Peromyscus californicus* |
| Coyote | *Canis latrans* |
| Deer mouse | *Peromyscus maniculatus gambellii* |
| Desert Cottontail | *Sylvilagus audubonii* |
| Dulzura pocket mouse | *Chaetodipus californicus femoralis* |
| Dusky-footed Woodrat | *Neotoma fuscipes* |
| Mule Deer | *Odocoileus hemionus* |
| Northern Baja deer mouse | *Peromyscus fraterculus* |
| Western harvest mouse | *Reithrodontomys megalotis* |