

Appendix C

Biological Assessment for the Development of the P205 Alert Force Complex Project

REVISED DRAFT
BIOLOGICAL ASSESSMENT
For
DEVELOPMENT OF THE P205 ALERT FORCE COMPLEX PROJECT
At
TRAVIS AIR FORCE BASE, CALIFORNIA

JANUARY 2019

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1 Introduction

This Biological Assessment (BA) is prepared pursuant to Section 7 of the Endangered Species Act (ESA) of 1973 (16 United States Code [U.S.C.] 1536). Section 7 of the ESA requires consultation with the United States Fish and Wildlife Service (USFWS) to determine if Federal actions will affect threatened or endangered species, and to ensure that any action will not jeopardize the continued existence of any threatened or endangered species.

This BA evaluates the effects of the proposed P205 Alert Force Complex Project (Proposed Action) at Travis Air Force Base (AFB or Base), located in Solano County, California (Figure 1). It summarizes current data regarding federally listed threatened and endangered (T&E) species, or species that are proposed for federal listing as threatened or endangered on Travis AFB. Information in this BA is drawn primarily from the Travis AFB Integrated Natural Resources Management Plan (60 CE/CEIE 2016) and the Final Programmatic Biological Assessment for six federally threatened and endangered species (Final PBA; Travis AFB 2018), which include extensive literature reviews, and incorporate data from 28 previous studies of biological resources on Travis AFB conducted between 1994 and 2016.

This BA identifies proposed avoidance, minimization, or compensation measures intended to avoid or reduce potential effects of the Proposed Action which could adversely affect federally listed species. These measures are taken from the Final PBA, in order to ensure consistency of the Proposed Action with base-wide conservation requirements.

1.1 Threatened and Endangered Species

This BA addresses the following federally listed as threatened or endangered species:

- Vernal pool fairy shrimp (*Branchinecta lynchi*)
- California tiger salamander (*Ambystoma californiense*)
- Vernal pool tadpole shrimp (*Lepidurus packardii*)
- Delta green ground beetle (*Elaphrus viridis*)

1.2 Special Status Species removed from further discussion

The following regionally occurring federally listed species are considered to have no potential to occur in the Proposed Action Area and are not analyzed further in this BA:

- Conservancy fairy shrimp (*Branchinecta conservatio*)
- Contra Costa goldfields (*Lasthenia conjugens*)
- Crampton's Tuctoria (*Tuctoria mucronata*)
- Colusa grass (*Neostapfia colusana*)

1.3 Critical Habitat

The Proposed Action Area includes no designated critical habitat.

2 Consultation to Date

There has been no consultation to date between Travis AFB and the USFWS regarding the Proposed Action.

3 Purpose and Description of the Proposed Project

3.1 Purpose and Need

The purpose of the Proposed Action is to construct adequate and efficiently configured facilities to provide a secure Alert Force Complex (Complex) for the Fleet Air Reconnaissance Squadron Three Detachment Travis (VQ-3 Det Travis) Operations Command. The action is needed because the facilities at the existing Complex have reached the end of their serviceable life and the current facilities have inadequate security. Constructing a new compound north of the flight line and outside of the runway clear zone corrects critical capacity, condition, and configuration issues that degrade mission capability and threaten the ability to maintain continuity of communication capabilities.

Recent studies, including a Balanced Survivability Assessment (BSA), Critical Infrastructure Protection (CIP) assessment, and Integrated Nuclear Survivability and Endurability Report (INSER) analysis indicate significant Anti-Terrorism/Force Protection (AT/FP) concerns resulting from the existing Complex's proximity to Travis AFB's installation boundary fence line. The area outside of the installation boundary fence line is an open field, which allows unimpeded access to the existing Complex. The INSER analysis documents the lack of appropriate High Altitude Electromagnetic Pulse (HEMP) hardened power for critical command, control, and alerting circuits. The existing facilities are not sized or configured adequately to accommodate requirements as documented in the Basic Facility Requirements (BFR). The square footage needed to adequately support VQ-3 Det Travis operations is approximately 61,000 square feet (sf), but the operations command is operating with only 37,000 sf at the Existing Complex.

The existing Complex has not been improved to accommodate the operational requirements for VQ-3 Det Travis and larger personnel requirements. The existing Complex is undersized and does not provide appropriate configuration. Crew support areas most impacted include the inadequate male and female head/shower areas and insufficient space for alert crew sleeping quarters. Meals and other activities must be conducted in shifts due to the limited dining space and general use areas, which impacts crew rest and mission efficiency. Operations Control and Communication Center space is constrained and limits watch crews and equipment.

The other existing facilities present significant space shortfalls as the lack of space for security functions impact training operations and proper storage of security force equipment. Weapons are stored at the Travis AFB armory, which causes a 45-minute transition between shifts. Construction of the proposed new Complex at the Proposed Action Area would reduce the travel time to the armory by approximately 38 minutes round-trip. Under existing conditions, response times are significantly impeded by the substantial travel distance. Limited maintenance space

provides insufficient space for tools, equipment, offices, and storage for maintainers to support alert aircraft.

The existing Complex site poses multiple constraints including violation of the runway safety clear zone, flooding, and danger of wildfire. The majority of the existing facilities are currently within Travis AFB's runway safety clear zone, and new building construction within the clear zone is prohibited. The Travis AFB runway safety clear zone is defined as an obstruction-free surface (except for features essential for aircraft operations) on the ground symmetrically centered on the extended runway centerline beginning at the end of the runway and extending outward 3,000 feet. The runway safety clear zone width is 3,000 feet (1,500 feet to either side of runway centerline) (Travis AFB 2009). Travis AFB has requested relocation and may eliminate the existing clear zone waiver under which the VQ-3 Det Travis operations are currently operating. Site conditions at the existing Complex direct drainage toward the building, leading to flooding and persistent moisture issues in the crew's sleeping quarters. Therefore, mold remediation due to flooding is a constant concern at the existing facility. The risk of wildfire is increased by the proximity to Travis AFB's exterior fence line. The aircraft, aircrew, and detachment personnel have had to evacuate due to wildfires that breached the outer perimeter of the base and entered the existing Complex.

3.2 Description of the Proposed Project

Under the Proposed Action, a new Alert Force Complex (New Complex Site) would be constructed on an approximately 8-acre site outside of the runway safety clear zone and the facilities within the Existing Complex would be demolished.

Existing Complex Site

With the exception of the spares storage and AGE maintenance facilities outside the complex (Buildings 1164, 1177, and 1179) that would be returned to the Air Force for their reuse, the facilities that would be demolished include Buildings 1165, 1171, 1174, 1175, 1176, 1178, booths (1167 and 1168), a carport (1162), a hazardous waste storage locker (1180), a table and pavilion (1191), tennis courts (1193 and 1893). Five steel shipping containers (1181 and unnumbered) would be removed and stored/reused in another location, and any associated concrete pads removed. Existing facilities to be demolished/removed are depicted on Figure 4. Demolition includes removal of the buildings and structures listed above, along with their associated concrete pads, foundations, and below-ground utilities.

New Complex Site

The Complex includes an Alert Force/Security Facility, an Entry Control Facility (ECF), SATCOM Facilities and AGE Maintenance Repair and Aircraft Storage Facilities. ("SATCOM" refers to a constellation of satellites and associated ground-based equipment that provide secure and jam-resistant worldwide communications capabilities for the U.S. armed forces.) The Alert Force/Security Facility and SATCOM Facilities would be fenced within a secure inner compound supported by the ECF, and all Alert Force Complex facilities would be constructed in areas that are compliant with Travis AFB's Installation Development Plan.

The New Complex includes the construction of an approximately 17,500-sf, two-story Alert Force facility and would include a controlled access operations control center and communication center, crew sleeping quarters, galley, recreational areas, administrative spaces and security spaces. West of the Alert Force facility, a SATCOM facility would be constructed and include a building and a reinforced concrete pad for the SATCOM antenna with dome. An aircraft maintenance repair complex is proposed along the southern boundary of the proposed site and would include a maintenance facility, Ground Support Equipment (GSE) maintenance and repair facility, aircraft spare parts warehouse, open storage, GSE washrack, and hazardous material (HAZMAT) storage. Construction of an ECF is proposed along the western boundary of the proposed site and would include a single-story physical inspection building.

The New Complex would provide AT/FP features and comply with AT/FP regulations, and physical security mitigation in accordance with DoD Minimum Anti-Terrorism Standards for Buildings. AT/FP features would include security fencing, vehicle barriers, security gates, intrusion detection system (IDS), closed-circuit television (CCTV) and pedestrian turnstiles.

This site location would allow for two access routes to the new aircraft parking, north of the flight line, while meeting the Navy's time requirements. The proposed Complex site would utilize existing Travis AFB aircraft parking spaces for at least two E-6B Mercury aircraft to be parked near the new facility at all times. If a third aircraft is located at Travis AFB, it may be parked anywhere on base. A range of existing aircraft parking spaces could be used; however, no new construction is required for the aircraft parking.

A 1-acre construction staging area would be located on an existing hardscaped pad south of Vandenberg Drive.

Site preparation would include site clearing, excavation, and preparation for construction. Additional site preparation features include excavation of undocumented fill (the site is a hill that will need to be graded prior to construction). Paving and site improvements include grading, parking, roadways, curbs, sidewalks, landscaping and pedestrian features. Improvements also include the GSE wash rack.

Electrical utilities would include primary and secondary distribution systems, HEMP protected emergency generators and Uninterrupted Power Suppliers (UPS), lighting, transformers and telecommunications infrastructure, and mechanical utilities would include water lines, gas lines, sanitary sewer lines, fire protection systems and supply lines. Current VQ-3 Det Travis operations are supported by five existing generators that would be relocated to the main side of the base and reused to support the New Complex. Relocation of the facilities to the main side of base as proposed would be more cost effective by avoiding the installation of substantial utility connections under the runways. There is a need for redundant and backup utilities to support the New Complex. Ground disturbance (trenching) to connect utilities is included as part of the project.

3.3 Summary of Project Characteristics

This section provides a brief summary of the project in list and table format for ease of review.

3.3.1 Project Summary

- Date:
 - Proposed Complex Construction Start: June 2020
 - Proposed Complex Construction End: June 2022
 - Existing Complex Demolition Start: June 2020
 - Existing Complex Demolition End: June 2022
- Construction Ingress/Egress Routes:
 - Proposed Complex: existing pavement on Vandenberg Drive
 - Existing Complex: Perimeter Road and tarmac near the flight line
- Depth of Digging:
 - Proposed New Complex: 3 feet to install utility lines.
 - Existing Complex: 3 feet to cap existing utility lines.

3.3.2 Construction Equipment Used for Completing Work

- Excavator
- Tractor, loader, or backhoe
- Trucks
- Concrete breaking equipment
- Cement and mortar mixer
- Paving equipment
- Boring Equipment
- Roller
- Grader
- Rubber-tired dozer
- Water truck

3.3.3 Ground Disturbance

The total ground disturbance for the Proposed Action is 9.85 acres, which includes a buffer of 20 feet around buildings and other structures proposed for demolition/removal at the existing Complex site.

4 Description of the Action Area

4.1 Existing Conditions

The following discussions provide a description of the existing conditions in the Proposed Action Area. The proposed Action Area consists of three separate areas on the base:

Existing Complex site: A 2.22-acre complex containing 0.74-acre of buildings and infrastructure currently being used by U.S. Navy's VQ-3 Det Travis.

New Complex site: An 8.42-acre undeveloped site proposed for relocation of the U.S. Navy's VQ-3 Det Travis buildings and infrastructure.

Project staging and storage area: a 1.0-acre hardscaped area proposed for temporary use as a staging area during construction.

Threatened and endangered species are discussed in Sections 4.1.3 and 4.1.4.

4.1.1 Current Uses

Existing Complex Site

The existing Complex is currently used by the U.S. Navy's VQ-3 Det Travis. The action area for the existing Complex includes the 14 buildings and other structures listed above as proposed for demolition or removal, as well as their associated concrete foundations and pads. The total building footprint proposed for demolition is 32,143 square feet, which includes an Alert Force facility as well as maintenance and storage buildings. Footprints of existing structures range from 93 square feet to 9,900 square feet. Activities in the existing Complex include dormitory and recreation for crews, maintenance, security, communications, and vehicle parking. The existing Complex is situated near the southwest end of Runway 3R/21L and is a high-use area.

Proposed New Complex Site

The proposed Complex site is currently not associated with any active land use. The site is vacant except for a few temporary storage structures and paved pads that would be removed during construction. The proposed staging and storage area is hardscaped but not currently used.

4.1.2 Terrestrial Vegetation

Vegetation includes upland plants, vernal pool plant species, as well as freshwater aquatic communities (Union Creek) and constituent plant species. Base-wide characterization of the terrestrial habitat types found in the undeveloped areas of Travis AFB was completed in 1994 by Weston, Inc. (Travis AFB 2018). Terrestrial habitats include undeveloped areas on Travis AFB that support natural vegetation communities. Natural terrestrial habitats present in the Proposed Action Area include annual grassland, vernal pools, and seasonal wetlands and swales.

Annual Grassland

This community is predominantly composed of introduced annual grasses, often in association with native and non-native wildflowers and weedy forbs. The annual grasses germinate with the onset of fall rains, and they continue to grow throughout the winter. Flowering occurs throughout the spring months. By summer, the annual grasses have set seed and died (Travis AFB 2018). The dominant vegetation in these areas includes non-native grasses such as soft chess (*Bromus hordeaceus*), Italian ryegrass (*Festuca perennis*), rattail fescue (*Festuca myuros* var. *myuros*),

wild oats (*Avena* spp.), ripgut brome (*Bromus diandrus*), and harding grass (*Phalaris aquatica*). Weedy forbs include filaree (*Erodium* spp.), yellow starthistle (*Centurea solstitialis*), rose clover (*Trifolium hirtum*), cranesbill (*Geranium dissectum*), and vetch (*Vicia* spp.). Common native wildflower species include California poppy (*Eschscholzia californica*), white brodiaea (*Triteleia hyacinthina*), butter and eggs (*Triphysaria eriantha* ssp. *eriantha*), and blue-eyed grass (*Sisyrinchium bellum*). Shrub species occasionally found in annual grassland on the base include coyote brush (*Baccharis pilularis*), Peruvian pepper tree (*Schinus molle*), and black locust (*Robinia pseudoacacia*) (60 CES/CEIE 2016). This plant community supports a variety of birds, reptiles, and mammals (60 CES/CEIE 2016).

Existing Complex Site

Annual grassland also covers portions of the existing Complex site around the existing buildings; however, the existing Complex is adjacent to the flight line, and the Bird/Wildlife Aircraft Strike Hazard Reduction Program (BASH Plan) calls for maintaining an effective grass height of 7-14 inches around the flight line (Travis AFB 2015). The existing Complex site is designated as an “Improved” area for mowing and fire management and scheduled for mowing once per week (Travis AFB 2018). Small mammal burrows are abundant within this area of the project.

New Complex Site

Annual grassland is the predominant land cover at the New Complex site, which is designated as “Semi-improved” for mowing and fire management and scheduled for mowing one to three times per year (Travis AFB 2018). The area is composed of an undocumented fill mound in the center of the site. During a site visit conducted 15 January 2019 by Deanne Weber, CEMML, burrows of California ground squirrel (*Otospermophilus beecheyi*) and pocket gopher were observed throughout the proposed New Complex site, mostly on the slopes of the undocumented fill.

Vernal Pools

Vernal pools and swales are found within grassland habitat. Vernal pools are shallow depressions or small, shallow ponds that fill with water during the rainy season and then dry out during the spring, becoming completely dry by late spring or early summer. Central to the formation of vernal pools is a climate of mild winters with moderate rainfall, and hot, dry summers; this unusual regime is found only in Mediterranean climate regions (Marty 2005). This hydrologic regime supports the unique plant and animal communities characteristic of vernal pools (60 CES/CEIE 2016). The vernal pools on Travis AFB are classified as northern claypan vernal pools which occur on soils derived from alluvium that have a layer of accumulated clay and minerals forming claypan a few feet below surface soils (Travis AFB 2018). The claypan forms a restrictive layer resulting in a perched water table, which often forms large complexes of associated vernal pools.

Vegetation varies among pools in both cover and species composition, but the majority of pools support several characteristic species. Characteristic vernal pool plant species on Travis AFB include goldfields (*Lasthenia* spp.), slender popcorn-flower (*Plagiobothrys stipitatus*),

downingia (*Downingia* spp.), woolly marbles (*Psilocarphus brevissimus* ssp. *brevissimus*), and coyote thistle (*Eryngium vaseyi*) (Travis AFB 2018). Federally listed species identified in vernal pools at Travis AFB include vernal pool fairy shrimp (*Branchinecta lynchi*), California tiger salamander (*Ambystoma californiense*), and Contra Costa goldfields (*Lasthenia conjugens*) (60 CES/CEIE 2016); however, none of these species has been identified in vernal pool habitat within the Proposed Action Area (Travis AFB 2018; Marty 2017a).

Existing Complex Site

There are nine (9) vernal pools within 250 feet of the Action Area: VP.FL.798, VP.FL.797, VP.FL.796, VP.FL.597, VP.FL.504, VP.FL.505, VP.FL.803, VP.FL.594, VP.SU.518, (Figure 4). A description of the vernal pools within 250 feet of the Action Area is provided in Table 1.

New Complex Site

There are Five (5) vernal pools within 250 feet of the Action Area: VP.CA.184, VP.GA.350, VP.CA.358, VP.CA.364, and VP.CA.030 (Figure 3). A description of the vernal pools within 250 feet of the Action Area is provided in Table 1.

Seasonal Wetlands and Swales

Seasonal wetlands are typically inundated or saturated during the wet season and dry during the summer. Rainfall, high groundwater tables, and runoff contribute to wetland hydrology during the winter and the spring periods. Seasonal wetlands share a similar hydrologic regime with vernal pool wetlands, but they lack some of the distinctive floristic components that are characteristic of a vernal pool system. Seasonal wetlands on Travis AFB are associated with low gradient swales, shallow depressions, and drainage features that capture surface runoff and remain saturated or inundated for several months of the year. Plant species typical of seasonal wetlands on Travis AFB include curly dock (*Rumex crispus*), Italian ryegrass, meadow barley (*Hordeum brachyantherum*), broadleaf peppergrass (*Lepidium latifolium*), and narrow-leaved plantain (*Plantago lanceolata*) (Travis AFB 2018).

Existing Complex Site

There is one wetland swale (WS.FL.593) within 250 feet of the Action Area. See Table 1 for a description of this wetland.

New Complex Site

There is one wetland swale (WS.CA.723) within 250 feet of the Action Area. See Table 1 for a description of this wetland.

Project staging and storage area

Three (3) wetland swales (USACE 2016) are within 250 feet of the designated staging area: SW.CA.845, WS.CA.867, and WS.CA.719. See Table 1 for a description of these wetlands.

Table 1. Wetlands Within 250 Feet of the Action Area

Feature ID	Area (ac.)	Distance (ft.)	Impact	Vernal Pool Species Habitat
New Complex				
WS.CA.723	0.05	Within Action Area	Direct (permanent removal)	No
VP.CA.184	0.04	0	Indirect	Potential
VP.CA.030	0.04	52	Indirect	Potential
VP.CA.358	0.86	75	Indirect	Potential
VP.CA.364	0.06	105	Indirect	Potential
VP.CA.350	0.01	185	Indirect	Potential
VP.CA.345	0.03	255	None	Potential
Staging Area				
WS.CA.719	0.02	115	None	Potential
SW.CA.845	0.02	120	None	Potential
WS.CA.867	0.02	130	None	Potential
Existing Complex				
VP.FL.798	0.01	15	None	Potential
VP.FL.797	0.05	30	None	Potential
VP.FL.796	0.21	60	None	Potential
VP.FL.597	0.01	75	None	Potential
VP.FL.504	0.01	200	None	Potential
VP.FL.505	0.02	170	None	Potential
VP.FL.803	0.01	220	None	Potential
VP.FL.594	0.01	95	None	Potential
VP.SU.518	0.01	245	None	Potential
WS.FL.593	0.26	55	None	Potential

4.1.3 Terrestrial Wildlife

Wildlife includes all animal species (i.e. insects and other invertebrates, freshwater fish, amphibians, reptiles, birds, and mammals), focusing on the species and habitat features of greatest importance or interest. A diversity of wildlife species occur on Travis AFB, including mammals, birds, reptiles, fish, amphibians, and aquatic invertebrates. A base-wide survey conducted by Weston in 1995 found 28 mammal species, 61 bird species including 16 species confirmed as nesting on the base, 7 species of reptiles, 1 amphibian species, and 9 fish species (60 CE/CEIE 2016). All fish species identified on the base are confined to the North Gate Pond and Union Creek, which are outside the Action Area. Subsequent surveys have increased the numbers of birds and amphibians found on the base.

Threatened and Endangered Wildlife

Existing Complex Site

To date, Vernal pool fairy shrimp (VPFS), Vernal pool tadpole shrimp (VPTS), and California tiger salamander (CTS) have not been found within this Action Area, however, potentially suitable habitat for these species is present. Vernal pool species habitat within this area is listed in Table 1.

Grassland habitat including small mammal burrows, which provide refugia and aestivation sites for CTS, are present within this site. This area of the base is considered high risk for CTS as described in Appendix A of the Final PBA for six federally threatened and endangered species (Travis AFB 2018). The nearest CTS record is a sighting of an adult CTS approximately 0.35 miles east and an off base CTS breeding pond is 0.5 miles east of the project site.

Vernal pools in this area of the base are consider to be of low value as described in the Final PBA for six federally threatened and endangered species (Travis AFB 2018). Vernal pools in this area of the base meet the criteria:

Low Value Conservation Areas:

- Small, infill parcels surrounded by existing development;
- Little or no connectivity to medium or high value conservation areas;
- Areas with extensive soil disturbance that has impacted underlying claypan; and
- Areas that have been surveyed using appropriate protocols with no known records of listed species.

This area is within 1 mile of an off-base location for Delta green ground beetle (DGGB). Travis AFB is believed to lack suitable habitat for DGGB; however, the Final PBA specifies that informal consultation will be conducted for projects within a 1-mile buffer around known locations of DGGB (Travis AFB 2018).

New Complex Site

To date, Vernal pool fairy shrimp (VPFS), Vernal pool tadpole shrimp (VPTS), and California tiger salamander (CTS) have not been found within this Action Area, however, potentially suitable habitat for these species is present.

An off-base active CTS breeding pond is located approximately 0.5 miles away (Wilcox West Pond). The nearest CTS record to the proposed Complex is a sighting of a juvenile CTS approximately 0.18-miles northeast on Collins Drive.

Vernal pools in this area of the base are consider to be of medium value as described in the Final PBA for six federally threatened and endangered species (Travis AFB 2018). Vernal pools in this area of the base meet the criteria:

Medium Value Conservation Areas:

- Watershed and buffer lands to High Value Conservation Areas;
- Areas that support (or may support) populations of more common and widespread listed species (e.g. VPFS);
- Sites of limited size that are isolated and/or subject to significant anthropogenic pressures, and the potential for restoration is limited.

4.2 Conservation Measures

The Proposed Action includes implementation of the following conservation measures as prescribed in Section 1.5 and Tabs A-F of the Final PBA (Travis AFB 2018). The following format will be used for Conservation Measures that are modified to fit this project: added text is in **bold**; omitted text is ~~crossed out~~.

4.2.1 Monitoring

MM-01. A USFWS-approved biologist will conduct preconstruction surveys of all ground disturbance areas within sensitive habitats to determine if any federally listed species may be present prior to the start of construction. These surveys will be conducted prior to the start of construction activities in and around any sensitive habitat. If any federally listed species are found during the preconstruction surveys, the USFWS-approved biologist will contact the USFWS to determine how to proceed. At least 10 business days prior to the onset of activities, Travis AFB will submit the name(s) and credentials of biologists who will conduct these preconstruction surveys if they have not previously received USFWS approval for similar surveys. No project activities will begin until proponents have received written approval from the USFWS that the biologist(s) is qualified to conduct the work.

MM-02. A USFWS-approved biologist will monitor construction activities in or adjacent to sensitive habitats as required. The biologist will ensure compliance with all applicable avoidance and minimization measures required to protect federally listed species and their habitats. If federally listed species are found that are likely to be affected by work activities, the USFWS-approved biologist will have the authority to stop any aspect of the project that could result in unauthorized take of a federally listed species. If the biologist exercises this authority, he/she must coordinate this with 60 CES/CEIE who will notify the USFWS ~~and the California Department of Fish and Wildlife (CDFW)~~ by telephone within one working day and in writing within five working days.

MM-03. A USFWS-approved biologist will conduct environmental awareness training for all construction personnel working within and near sensitive habitat on Travis AFB. Training will be provided at the start of work and within 15 days of any new worker arrival. The program will consist of a briefing on environmental issues relative to the proposed project. The training program will include an overview of the legal status, biology, distribution, habitat needs, and compliance requirements for each federally listed species that may occur in the project area. The presentation will also include a discussion of the legal protection for endangered species under the Endangered Species Act, including penalties for violations. A fact sheet conveying this information will be distributed to all personnel who enter the project site. Upon completion of the orientation, employees will sign a form stating that they attended the program and understand

all avoidance and minimization measures. These forms will be maintained at Travis AFB and will be accessible to the appropriate resource agencies.

4.2.2 Buffers and Site Restoration

MM-05. Wetlands/drainages/vernal pools, if present, will have erosion control measures (straw wattles, silt fencing) installed where hydrological continuity exists between the construction activities and the wetland. A USFWS-approved biologist will determine whether erosion control measures should be utilized, weighing the potential for impacts to other species including CTS. Construction boundaries within the buffer will be designated with fencing or other suitable means to ensure no equipment and/or construction workers access protected wetland resources.

MM-06. All areas of upland ground disturbance or exposed soil will be reseeded with a native “weed-free” seed mix approved by the 60 CES/CEIE. Note: direct impacts to wetlands require a Clean Water Act Section 404 permit issued by the US Army Corps of Engineers and Section 401 permit from the State Regional Water Quality Control Board.

4.2.3 Additional Measures

MM-07. Off-road travel outside of the demarcated construction boundaries will be prohibited.

MM-08. Prior to initiation of construction activities, sensitive areas, such as vernal pools, wetlands, riparian areas, and potential habitat for federally listed species (i.e., VPFS/VPTS, CCG, CTS), will be staked and flagged as exclusion zones where construction activities cannot take place. Orange construction barrier fencing (or an appropriate alternative method) will designate exclusion zones where construction activities cannot occur. The flagging and fencing will be clearly marked as an *environmentally sensitive area* (ESA). The contractor will remove all fencing, stakes and flagging within 60 days of construction completion.

MM-09. Any worker that inadvertently kills or injures a federally listed species, or finds one injured or trapped, will immediately report the incident to the on-site biologist. The biologist will inform the Travis AFB Natural Resource Manager (NRM) immediately (60 CES/CEIE). The Travis AFB NRM will verbally notify the Sacramento Office of the USFWS within one day and will provide written notification of the incident within five days.

MM-10. Motor vehicles and equipment will only be fueled and serviced in designated service areas. All fueling and maintenance of vehicles and other equipment and staging areas will occur in a designated area with appropriate spill containment. Any newly established, project specific fueling and maintenance areas will be located at least 250 feet from any wetland/drainage habitat or water body. Prior to the onset of work, Travis AFB will ensure a plan to allow a prompt and effective response to any accidental spills is in place. All workers will be informed of the importance of preventing spills and of the appropriate measures to take should a spill occur.

MM-11. During construction activities, all trash ~~that may attract predators~~ will be properly contained, removed from the work site daily, and disposed of properly. Following construction, all refuse and construction debris will be removed from work areas. All garbage and

construction-related materials in construction areas will be removed immediately following project completion.

MM-12. Unless otherwise designated as part of a habitat restoration plan, all excess soil excavated during construction occurring near vernal pools and other wetlands will be removed and disposed of outside the project area. Coordination with the Travis AFB Environmental Office and appropriate regulatory agencies is required prior to disposal of the excavated soil.

MM-13. The number of access routes, number and size of staging areas, and the total area of the activity will be limited to the minimum necessary to achieve the project goal. Routes and boundaries will be clearly demarcated, and these areas will avoid wetlands/drainage areas whenever feasible.

MM-14. All vehicle operators will follow the posted speed limit on paved roads and a 10-mile per hour speed limit on unpaved roads.

MM-17. No trenches will be left open at the end of the day; trenched areas will be compacted and restored to normal grade once the project is completed.

4.2.4 California Tiger Salamander

CTS-01. Within 14 days of the start of construction activities, a USFWS-approved biologist will perform a pre-construction survey and identify potential refuge habitats (burrows) suitable for CTS. In the unlikely event that a CTS is encountered, the biologist ~~will contact the USFWS for instructions.~~ **will relocate the individual outside of the project area following the procedure provided in Section 4.4.5 of the Final PBA, and the Sacramento Fish and Wildlife Office will be contacted.**

CTS-02. A USFWS-approved biologist will be on-site during all activities that could result in the take of listed species. As outlined in Final PBA Section 1.4.3, the qualifications of the biologist(s) will be presented to the USFWS for review and approval at least 10 working days prior to any groundbreaking activity at the project site. If any of the requirements associated with these measures are not being fulfilled, the biologist will have the authority to stop project activities, through communication with the project manager.

CTS-03. Construction personnel will be instructed to exercise caution when commuting within the area to be disturbed.

CTS-05. At the end of every work day, trenches, pits, and excavations shall be provided with escape ramps constructed of earth fill or wooden planks at a 3:1 slope. Before such trenches, pits, and excavations are filled, they will be thoroughly inspected for trapped wildlife.

CTS-6. If CTS exclusion barriers or fencing are used, a USFWS-approved biologist will be on-site to conduct morning inspections of the barrier fencing before construction activities begin each day of work activity on work days and within 30 minutes of dawn on non-work days (includes weekends and holidays). If a CTS is observed within or near the barrier fencing, the

individual will be relocated outside of the project area following the procedure provided in Section 4.4.5 of the Final PBA, and the Sacramento Fish and Wildlife Office will be contacted.

CTS-07. Seasonal Avoidance/Wet Season Procedures (Oct 16 – Apr 30): Work will not be conducted in the rain. ~~The USFWS-approved biologist will monitor the weather forecast and authorize work when the forecast indicates a period of dry days (5—10 days of no rain) before starting the project. The Travis Environmental Office will document through email notification to the USFWS when work will commence.~~ The weather forecast and hourly weather data for Travis AFB will be monitored and can be found by entering the zip code 94535 (Travis AFB) at <http://www.weather.gov/srh/>. A USFWS-approved biologist will be on-site for morning inspections before the start of work. Morning inspections consist of examination of all trenches, pits, excavations, equipment, CTS exclusionary barriers (if present), all suitable upland habitat including refugia habitat such as small woody debris, refuse, burrow entries, etc. will be properly inspected and all other areas within the project site. In addition, the project work crew will be notified to maintain vigilance regarding CTS activity. If feasible, the work crew will participate in the morning inspection(s). Modifications to this timing may be approved on a case-by-case basis by the USFWS.

CTS-08. Seasonal Avoidance Dry Season Rain/High Humidity Procedures (May 1 to October 15): Work will not be conducted if raining. The USFWS-approved biologist will check the National Weather Service by 6:00 AM on the day prior to a scheduled work day to see if there is a 50 percent or greater probability of rain forecast overnight. If there is, then before work begins the next morning, the USFWS-approved biologist will conduct an even more extensive morning inspection. The inspection will include searching the work area and a wider perimeter of the area for presence of CTS. In addition, the work crew will be notified to maintain vigilance regarding CTS activity. If feasible, the work crew will participate in the morning inspection(s). Modifications to this timing may be approved on a case-by-case basis by the USFWS. The weather forecast and hourly weather data for Travis AFB should be monitored and can be found by entering the zip code 94535 (Travis AFB) at <http://www.weather.gov/srh/>

CTS-09. ~~If dry season (May 1—October 15)~~ night time work is necessary, the following additional conservation measures shall be implemented:

- Work would only occur within paved areas (greater than 20 feet from uplands)
- A 6-inch-high CTS exclusionary barrier will surround the work area during work, with ingress/egress access being the only break in the barrier.
- A USFWS-approved biologist will be onsite during all night time work and will routinely monitor the CTS exclusionary barrier and the project site.
- Work will not be conducted at night time if there is a 50 percent or more chance of rain predicted overnight.

CTS-10. Water shall not be pumped, sprayed, or allowed to flow over undisturbed uplands that can support CTS as part of planned project activities outside of pre-approved requirements (i.e. dust control). Water applied for pre-approved requirements shall be applied in the minimum quantities necessary only to disturbed soils. If excess water accumulates as the result of construction activity, water may be pumped through a screened pump and removed from the

construction area as deemed necessary by the onsite biologist in coordination with Travis AFB Natural Resources Management (NRM) staff. If water inadvertently or purposefully enters construction trenches, pits, or excavations, a USFWS-approved biologist will remain on site until water is pumped from the trench, pit, or excavation. Following pumping, the biologist shall inspect the trench, pit, or excavation area and the surrounding uplands to determine if disturbance to CTS has occurred and implement any other measures necessary (e.g. placement of cover boards, exclusionary fencing or barriers) to protect CTS that may emerge due to the wet soil. **If rain water or ground water accumulates in trenches or excavated areas and is not pumped out, the Service approved biologist will conduct a thorough inspection of these trenches or excavated areas prior to the start of work each day.**

CTS-11. Pipes laid underground or stored on the ground shall be capped, covered, or taped in a manner that exclude CTS from entering the pipe prior to the completion of the construction project. Long-term storage of pipes and other construction material should be placed on asphalt and raised above the ground by no less than 1.5 inches (on top of 2 by 4 inch supports).

CTS-12. Trenches, pits, and excavations shall be covered in a manner that excludes CTS from entering during weekends, holidays, humid days, rain events, etc. Specifically, gaps no greater than one inch shall be allowed within cover materials if biologists will not be present the following day or if rain events or high humidity days are expected to occur. Before such trenches, pits, and excavations are filled, they will be thoroughly inspected for trapped wildlife.

CTS-13. Salamander exclusionary barriers or fencing may be erected in uplands between aquatic breeding sites and excavation areas if deemed necessary by USFWS personnel, NRM staff biologists or USFWS-approved biologist to protect CTS. Fencing will follow the upland CTS sampling methodology approved by the USFWS (USFWS 2003) with the following modifications: fencing will be erected perpendicular to the straight pathway that CTS would be expected to travel from the aquatic breeding area, toward the construction site, and will extend 100 feet in either direction, beyond the scope of the work area. Pit fall traps will be installed at the ends of the fencing sections and checked daily before sunrise or covered securely when work is not scheduled. Even if traps are covered, the Service-approved Biologist will check exclusionary barriers on the worksite on work days and non-work days (including weekends and holidays). Alternately, the fence may be constructed to direct CTS away from the project site. In all cases, fencing will be constructed to protect migrating CTS from project impacts. Note that the location of the fencing may change during the construction season since CTS will largely be moving away from breeding ponds in the late spring/early summer but toward breeding ponds in the late fall/early winter.

CTS-15. If CTS are expected to be moving at the ground surface during construction activity, thermally stable cover boards may be placed at a frequency and in a configuration that will allow CTS to encounter them prior to reaching construction area. If cover boards are placed, they will be checked daily by a USFWS-approved biologist and CTS collected will be moved to the designated CTS relocation area. Refer to the CTS Relocation Plan (Section 4.4.5) in the Final PBA for the designated upland habitat nearest the project site.

CTS-16. Erosion control Best Management Practices (BMP) implemented in accordance with the Travis AFB Storm Water Pollution Prevention Plan will be placed so as not to create a hazard to CTS.

CTS-17. A USFWS-approved biologist or natural resource monitor (depending on effect level of project) shall perform construction site inspections to ensure the contractor completes the Proposed Action as described and complies with all proposed minimization measures.

CTS-18. Concrete waste and water from curing operations will be collected in washouts and will be disposed of properly and not allowed into watercourses or CTS upland habitat.

CTS-19. In the event that CTS are encountered on the project site, the USFWS-approved biologist or natural resource monitor will contact the Travis AFB Natural Resource Manager who will then contact the USFWS. If CTS are captured, they should be released as near as possible to the point of capture, in a manner that maximizes their survival, per guidance provided by the Sacramento Office of the USFWS. Refer to the CTS Relocation Plan described in Section 4.4.5 of the Final PBA.

4.2.5 Vernal Pool Fairy Shrimp and Vernal Pool Tadpole Shrimp and Delta Green Ground Beetle

VP-01. No work will be conducted in the vicinity of vernal pool species' habitat between 16 Oct and 30 Apr, unless specifically approved by the Travis AFB NRM, who will field verify soil saturation, visual ponding, and expected surface disturbance. The USFWS will be notified of any off-pavement work within 250 feet approved between 16 Oct and 30 Apr.

VP-03. Projects that occur on road surfaces and along road shoulders will avoid direct impacts to wetland habitats.

VP-04. A USFWS-approved biologist will mark vernal pool species' habitat and a reasonable buffer to be avoided with flagging material. The area will be protected by placing construction fencing or other appropriate protective fencing around the pools including a buffer. Fencing will be used in locations where project equipment and/or personnel will be situated adjacent to or in the near vicinity of suitable vernal pool species habitat. If in a High or Medium Risk CTS area, small mammal burrows will be avoided when placing stakes or posts.

DGGB-6. If feasible, equipment used in projects requiring access to sites within vernal pool species' habitat will be situated outside of the habitat. To further minimize adverse effects, the following measures will be implemented at these sites:

- No work shall occur within vernal pool habitat when water is present.
- Ground disturbances such as trenching, and permanent disturbances such as pole installation will avoid hydrologically connected areas where feasible.
- As necessary, a Service-approved Biologist will be present during access and project work within vernal pool habitat.

- For projects adjacent to vernal pool species' habitat or hydrologically connected to the habitat, silt fencing, or other appropriate Best Management Practices (BMPs) to prevent siltation shall be implemented prior to work within that area. A Service-approved Biologist will flag areas where silt fencing or BMPs shall be implemented. BMPs may include sand bags and weed-free straw bales or straw wattles. The biologist will consider potential impacts to CTS in Medium and High Risk areas when recommending erosion control measures.
- Spill containment kits will be present at all sites where petroleum-fueled equipment is used.

DGGB-7. If project activities encroach within the perimeter of a pool, the following measures will be implemented:

- Construction equipment with pneumatic tires rather than tracked equipment will be used.
- Non-sensitive vegetation present within adjacent habitat will be used as an equipment-parking platform. Alternately, boards or plates will be used to distribute the weight of construction equipment for access.

4.2.6 Birds

Travis AFB is not consulting with USFWS on threatened or endangered bird species, however, the below Conservation Measures will be implemented for the project for the protection of birds.

GM-01. To protect birds under the Migratory Bird Treaty Act, a pre-construction survey must be performed by a qualified biologist at least 14 calendar days before construction to determine whether any protected species are present on or near the site. If protected birds are present or nesting on or near the site, construction may be temporarily postponed until the nesting season is over. Contact 60 CES/CEIE at least 30 calendar days in advance to arrange the pre-construction site survey.

GM-02. Other measures which may be necessary if protected species are found on or near the site during the pre-construction survey include: (1) the work crew may be prohibited from disturbing areas within a specified distance of owl burrows or bird nests; (2) the work crew may be required to shut down or restrict activities during breeding and nesting seasons; (3) construction may be temporarily delayed while birds are encouraged to relocate away from the construction area. The work crew should be advised of these possibilities in contract documents.

GM-03. If the project includes removal of any trees, the work crew is advised to remove the trees or tree limbs between the months of September and January, outside of the bird nesting season. Trees may not be removed or limbed during nesting season unless a qualified biologist determines there are no active bird nests present.

5 Status of the Species and Critical Habitat in the Action Area

5.1 Vernal pool fairy shrimp

5.1.1 Listing Status and Description

The vernal pool fairy shrimp was listed as threatened by the USFWS in 1994 (FR 59:80 and updated in FR 68:151). Critical habitat was designated on August 6, 2003 (68 CFR 46683) and was subsequently revised with critical habitat unit designations on February 10, 2006 (71 CFR 7117). The USFWS published a recovery plan that included this species entitled Recovery Plan for Vernal Pool Ecosystems of California and Southern Oregon (USFWS 2005).

VPFS co-occurs with a large number of other vernal pool branchiopod species throughout its range, including conservancy fairy shrimp (*Branchinecta conservatio*), mid-valley fairy shrimp (*B. mesovallensis*), versatile fairy shrimp (*B. lindahli*), California fairy shrimp (*Linderiella occidentalis*), Santa Rosa Plateau fairy shrimp (*L. santarosae*), Riverside fairy shrimp (*Streptocephalus woottoni*), and vernal pool tadpole shrimp (*Lepidurus packardii*). Male VPFS are readily distinguishable from co-occurring fairy shrimps by antennae; female VPFS are distinguishable by the shape of the brood pouch (Eriksen and Belk 1999).

5.1.2 Life History and Ecology

This species is widely distributed throughout the grasslands of California, from Shasta County south to Riverside County, but is rarely abundant. Vernal pool fairy shrimp are restricted to vernal pools and vernal pool-like habitats; the species has never been found in riverine, marine, or other permanent water bodies (USFWS 2007). VPFS occurs in a variety of vernal pool types ranging from small rock pools to large, turbid grassland pools. Other kinds of depressions that hold sufficient water volume, depth and area for sufficient duration and seasonality may also constitute potential habitat. These other depressions are often artificial habitats such as roadside ditches, ruts left by heavy construction vehicles and depressions in fire breaks (Eng et al. 1990, Rogers and Fugate 2001). Characteristics of typical VPFS habitat include water temperatures between 40 and 73 degrees Fahrenheit, low to moderate salinity, elevations between 33 and 4,000 feet (rarely up to 5,600 feet), and area less than 2,200 square feet ($\pm 2,100$ square feet; rarely up to several acres). Vernal pools are usually nutrient-poor and experience dramatic daily fluctuations in pH, dissolved oxygen, and carbon dioxide (Keeley and Zedler 1998). VPFS feed primarily on detritus and microscopic algae (USFWS 2007).

VPFS occupy a variety of different vernal pool habitats or vernal pool-like habitats, from small, clear, sandstone rock pools to large, turbid, alkaline, grassland valley floor pools. Although the species has been collected from large vernal pools, it tends to occur in small swales, or vernal pools in unplowed grasslands (Eriksen and Belk 1999).

VPFS require cold winter water temperatures to hatch and grow and typically appear after the first frosts. Hatching begins shortly after temporary pools have been inundated by runoff from

fall and winter rains. Helm (1998) determined that VPFS reach sexual maturity in an average of 41 days but mature in as few as 18 days in optimal conditions. After males and females mate, the eggs mature into cysts in the female's brood pouch. Cysts are released to settle in the soil at the bottom of the pool, where they remain as the pool dries. Pools must dry completely during the summer months to prevent fungus from destroying cysts.

5.1.3 Status in the Action Area

The VPFS is known to occur on Travis AFB, and much of the seasonal wetland habitat on the Base and Geographically Separated Unit (GSU) provides suitable habitat for the species (Figure 2). The presence of suitable habitat for the species and documented occurrences suggests that the species is likely to persist on Travis AFB given current conditions. On Travis AFB there are 45 documented occurrences of VPFS, and these are concentrated within the northern portion of the Base though a number of other occurrences are scattered throughout the center of the Base in natural vernal pools as well as manmade seasonal wetland features (Marty 2016). VPFS are widely distributed on Travis AFB north of the flight line, occurring in natural vernal pools and artificial seasonal wetland features (Travis AFB 2018).

Critical Habitat is designated for VPFS on the Travis AFB main base at the South Gate, a triangular parcel south of Runway 03R/21L (not within the fenced boundary of the Base), the western railroad right-of-way, and the Potrero Hills Landfill GSU (Travis AFB 2018).

There is no Designated Critical Habitat for VPFS within the Action Area. The closest Designated Critical Habitat for VPFS occurs on 13 acres near the South Gate.

Existing Complex Site

There are no historically documented occurrences of VPFS in the vernal pools or seasonal wetland habitats within the site, however, they are assumed to be present. Vernal pools located within this area are classified within the Low Value Conservation Area (Travis AFB).

New Complex Site

During a 2017 survey a cluster of vernal pools between E Street and Vandenberg Dr., approximately 0.10-mile east of the site, contained VPFS (Figure 3). There are no historically documented occurrences of VPFS in the vernal pools or seasonal wetland habitats within the site, however, VPFS are assumed to be present. The vernal pool habitat affected by the project is located with the Medium Value Conservation Area (Travis AFB).

5.2 Vernal pool tadpole shrimp

5.2.1 Listing Status and Description

The vernal pool tadpole shrimp was listed as endangered by the USFWS in 1994 (FR 59 No. 180). Critical habitat was designated in 2003 (FR 68 No. 151) and revised in 2006 (FR 71 No. 28). The USFWS published a recovery plan that included this species entitled Recovery Plan for Vernal Pool Ecosystems of California and Southern Oregon (USFWS 2005).

VPTS are distinguished from other listed vernal pool branchiopods by a large shield-like carapace that covers the anterior side of the body. Adults are 0.6 to 3.3 inches long.

5.2.2 Life History and Ecology

The species occurs in a wide variety of vernal pool habitats but is relatively long-lived compared to other vernal pool crustaceans (USFWS 2005). VPTS generally take between 3 and 4 weeks to mature (Ahl 1991, Helm 1998) and reproduce repeatedly during the season, as long as pools remain inundated (Ahl 1991, Simovich *et al.* 1992). VPTS can be found in pools that are likely too small to remain inundated for the entire life cycle of the species and may be able to tolerate temporary drying (Helm 1998).

5.2.3 Status in the Action Area

Despite numerous protocol-level and non-protocol-level sampling efforts over the past two decades, the VPTS has not been found to occur on the main base of Travis AFB. It has been found on the Northern Railroad Right-of-Way GSU, and just off-base in a pool 40 feet from the perimeter fence near the Meridian Gate on the eastern base boundary (Travis AFB 2018). This location is approximately 0.43-miles east of the Existing Complex.

Critical Habitat is designated for VPTS on the Travis AFB main base at the South Gate, a triangular parcel south of Runway 03R/21L (not within the fenced boundary of the Base), the western railroad right-of-way, and the Potrero Hills Landfill GSU (Travis AFB 2018). There is no Designated Critical Habitat for VPTS within the Action Area. The closest Designated Critical Habitat for VPFS occurs on 13 acres near the South Gate.

5.3 California Tiger Salamander

5.3.1 Listing Status and Description

The Central Valley Population of the Central California Distinct Population Segment of CTS, which includes CTS populations in Solano County, was listed as threatened under the Endangered Species Act on August 4, 2004 (69 CFR 47212). A final designation of critical habitat for CTS was published by USFWS on August 23, 2005 (70 CFR 49380). The California Fish and Game Commission listed CTS as threatened under the California Endangered Species Act on August 19, 2010.

The CTS is an amphibian in the family Ambystomatidae, endemic to California and native to Solano County. It is a large terrestrial salamander with a broad, rounded snout. Coloration consists of white or pale-yellow spots or bars on a black background on the back and sides. The belly varies from almost uniform white or pale yellow to a variegated pattern of white or pale yellow and black. The salamander's small eyes protrude from their heads, and the eyes have black irises (Jennings and Hayes 1994). Males can be distinguished from females, especially during the breeding season, by their swollen cloacae, a common chamber into which the intestinal, urinary, and reproductive canals discharge. They also have more developed tail fins and larger overall size. Adult males are slightly larger than females (8 inches and less than 7

inches, respectively) (Stebbins 2003). Juvenile salamanders are 1.7 to 2.8 inches from the tip of the snout to the rear of the vent and have the same coloration patterns as adults (as cited in Jennings 2005). Larval salamanders range in size from 0.4 to 6.6 inches in total length with a pale-yellow, tan, or dark colored belly (Andersen 1968). After 2 weeks from emergence, a larval salamander will have prominent external gills and legs (Storer 1925). Egg sizes are reported by Storer (1925) to measure 0.13 to 0.21 inches.

The CTS is endemic to California and historically inhabited the low-elevation grassland and oak savanna plant communities of the Central Valley, adjacent foothills, and Inner Coast Ranges (Jennings and Hayes 1994, Shaffer et al. 1993). Along the Coast Ranges, the species occurred from the Santa Rosa area of Sonoma County, south to the vicinity of Buellton in Santa Barbara County. The historic distribution in the Central Valley and surrounding foothills included northern Yolo County southward to northwestern Kern County and northern Tulare County.

5.3.2 Life History and Ecology

California tiger salamander larvae develop in vernal pools and ponds in which they hatch; however, the species is otherwise terrestrial and spends most of its post-metamorphic life in widely dispersed underground retreats. Metamorphosis occurs in May through July. Individuals can accelerate development in early-drying ponds, or delay metamorphosis in ponds that hold water longer; however, the USFWS minimum requirement for critical habitat is 12 weeks in a typical rainfall year (USFWS 2005). Subadult and adult CTS typically spend the dry summer and fall months in the burrows of small mammals, such as California ground squirrel and Botta's pocket gopher (*Thomomys bottae*) (Loredo and Van Vuren 1996). Adults emerge from underground retreats to breed during the November – February rainy season (Loredo and Van Vuren 1996). Adults may travel more than 2 km between upland aestivation sites and aquatic breeding sites (Orloff 2011); however, the typical distance traveled is less than 1 km (Searcy and Shaffer 2008).

CTS are also known to use several successive burrows at increasing distances from an associated breeding pond. Although previously cited studies provide information regarding linear movement from breeding ponds, upland habitat features appear to have some influence on movement. Trenham (2001) found that radio-tracked adults were more abundant in grasslands with scattered large oaks (*Quercus* spp.), than in more densely wooded areas. In addition, captures of arriving adults and dispersing new metamorphs were evenly distributed around two ponds completely encircled by drift fences and pitfall traps. Thus, it appears that dispersal into the terrestrial habitat occurs randomly with respect to direction and habitat types.

Population declines for this species have been attributed to agricultural and urban development, grazing practices, and predation by introduced nonnative fish and bullfrogs. Several introduced predators of CTS pose a threat to their populations and survival. These include bullfrogs, African clawed frogs, red swamp crayfish, bass, catfish, sunfish, and mosquito fish (Federal Register, 50 CFR Part 17, Volume 69, No. 149, August 4, 2004).

5.3.3 Status in the Action Area

California tiger salamander is known to breed in ponds on the main base of Travis AFB, and much of the grassland habitat on the base provides suitable upland aestivation habitat. Active breeding ponds for CTS on the main base are located in the Castle Terrace Preserve. Most of the northern, southern, and eastern portions of Travis AFB are within 1.5 km of on- or off-base active CTS breeding ponds, and the undeveloped lands in those areas are considered high-risk areas for CTS based on proximity to breeding ponds, habitat suitability, and accessibility of the landscape to CTS (landscape resistance; Travis AFB 2018). The easternmost 4 km of the Northern Railroad Right-of-Way GSU is designated critical habitat for CTS (Travis AFB 2018). During runway surveys and relocation efforts begun on 31 May 2017 at Travis AFB, a total of 154 juvenile CTS were relocated off the runway and placed in suitable burrow sites along the eastern boundary of the base. During pitfall trapping begun on 22 June 2017, an additional 656 juvenile CTS were trapped and relocated. The runway survey and pitfall trapping area was approximately 0.75-mile northeast of the Existing Complex and approximately 0.67-mile southeast of the proposed New Complex. Total CTS numbers detected in the 2017 season included 820 live individuals and 52 dead (Marty 2017b).

Existing Complex Site

This site is within 0.5 miles of an active CTS breeding pond off-base near the Meridian Gate and is considered a high-risk area for CTS due to proximity, habitat suitability, and low landscape resistance (Travis AFB 2018). The vernal pools and wetland swale in the existing Complex are not suitable for CTS breeding, as they do not hold water long enough to allow CTS larvae to mature. The existing Complex site is within close proximity (0.5 miles) to the location where 2 dead CTS were found in 2015; the individuals likely became desiccated after moving during the early morning hours. They were most likely responding to either ponded water as a result of a break in a water main near their upland habitat, humid weather conditions, or both (Travis AFB 2018).

New Complex Site

The proposed Complex is within 0.5 miles of an active CTS breeding pond (Wilcox West Pond) immediately east of the Travis AFB perimeter fence, has low landscape resistance, and includes grassland habitat suitable for CTS aestivation. Consequently, the entire proposed Complex is considered a high-risk area for CTS (Travis AFB 2018). The vernal pool and wetland swale habitat in the proposed Complex are not suitable for CTS breeding, as they do not hold water long enough to allow CTS larvae to mature.

5.4 Delta Green Ground Beetle

5.4.1 Listing Status and Description

The Delta green ground beetle was listed as threatened and a final designation of critical habitat made under the Endangered Species Act on August 8, 1980 (45 CFR 62807). A recovery plan

was published in 1985; however, DGGB was included in a recovery plan for vernal pool ecosystems in California and southern Oregon in 2005.

5.4.2 Life History and Ecology

The DGGB is a beetle in the Carabidae (ground beetles) and is associated with large playa lakes in the Jepson Prairie region east of Travis AFB. Adults are active February through April in areas of sparse cover of low-growing vernal pool plant species (Travis AFB 2018). In a study of habitat features associated with DGGB presence, the species was least likely to be found in areas of annual grass cover (Arnold 1989).

5.4.3 Status in the Action Area

Habitat assessments of Travis AFB in 2012 and 2016 found no suitable habitat for DGGB on the main base (Travis AFB 2018). Because the ecology and dispersal of DGGB is poorly understood, Travis AFB has established a 1-mile buffer around known and potential locations off-base within which DGGB will be considered in project consultation (Travis AFB 2018). The Action Area does not include suitable habitat for DGGB; however, the existing Complex is inside a 1-mile buffer around off-base habitat for DGGB.

6 Effects of the Action

The Proposed Action would result in permanent removal of approximately 8.37 acres of high risk upland habitat suitable for the threatened CTS, 1.48 acres of temporary upland habitat disturbance, and indirect impacts to 1.01 acres of vernal pool species habitat suitable for the VPFS and VPTS. A wetland swale will be permanently removed as part of the project, however, it is not habitat for VPFS/VPTS.

Table 2. Project Habitat Impact Summary

Resource	Area (ac.)	Impact
High Risk CTS Upland Habitat	8.37	Permanent
High Risk CTS Upland Habitat	1.48	Temporary
Vernal pool fairy shrimp/Vernal pool tadpole shrimp habitat	1.01	Indirect
Wetland swale	0.05	Permanent (not threatened and endangered species habitat)

Total acreage Hardscape (staging area) 1.00

Total acreage Building and Pavement demolition 0.74

Total acreage removal of wetlands (requires CWA permit); not vernal pool species habitat: 0.05

6.1 California Tiger Salamander

The Proposed Action would permanently remove 8.37 acres and temporarily disturb 1.48 acres of High Risk CTS upland habitat.

The proposed Complex and existing Complex are designated as high-risk areas for CTS, and the Proposed Action is a CTS Level 3 category project as defined in Table 2 of the Final PBA (Travis AFB 2018). Level 3 projects are considered *may affect, and likely to adversely affect*, CTS. Development of the proposed Complex will result in loss and disturbance of upland habitat used for dispersal, refugia, and foraging.

CTS that may be using small mammal burrows or cracks in the soil within the construction footprint of the Proposed Action are likely to be destroyed during grading and ground compaction activities as burrows are crushed or as inhabitants of burrows are entombed. CTS may be killed or injured from inadvertent trampling by workers from foot traffic and operation of construction equipment during construction activities. Construction activities may result in harassment from noise, vibration, and night-lighting and may disturb CTS causing them to leave their upland refugia and increase their exposure to desiccation and predation. CTS may also become trapped in open excavations or construction trenches, making them vulnerable to desiccation, starvation, and predation. However, with full implementation of conservation measures described in Section 4.2, these incidences would be avoided.

Impacts to Species and Habitat

Existing Complex Site

Equipment utilized to conduct the work could crush burrows entombing any CTS that could be present on the site. Demolition of structures and return of the site to grassland in the existing Complex site would create approximately 0.74 acre of grassland habitat suitable for CTS. Any CTS found on the project site would be relocated by a Service approved biologist as per the Travis Relocation Plan found in the Travis PBA (Travis AFB).

New Complex Site

CTS individuals could potentially be negatively impacted by equipment and project activities during CTS migration periods and by earthmoving activities of the project because burrow entrances will be collapsed and entomb any individual that could be present. The proposed project would result in the permanent loss of 8.37 acres of grassland habitat suitable for CTS dispersal, foraging, and refugia in the proposed Complex site. Any CTS found on the project site would be relocated by a Service approved biologist as per the Travis Relocation Plan found in the Travis PBA (Travis AFB).

Project staging and storage area

With implementation of Conservation Measures, no impacts to CTS are expected from the use of the hardscape designated for the staging/storage area for the project as no ground disturbance will occur at this location.

Cumulative Impacts

Cumulative effects include the effects of future State, tribal, local or private actions that are reasonably certain to occur in the action area. Future Federal actions unrelated to the Proposed Action would require separate consultation under Section 7 of the ESA.

Following demolition of structures at the existing Complex site, that area would revert to Air Force management, and activities in that portion of the action area would be consistent with the routine operational activities described in the Final PBA (Travis AFB 2018). Activities in the proposed new Complex site would consist of routine VQ-3 Det Travis operations consistent with the overall mission of Travis AFB and would also be consistent with the routine operational activities described in the Final PBA (Travis AFB 2018). Each activity described in the Final PBA would be analyzed for the level of effect it may have to listed species according to the Effects Analysis Framework described in Section 1.4.2 of the Final PBA (Travis AFB 2018).

6.2 Vernal Pool Fairy Shrimp and Vernal Pool Tadpole Shrimp

The Proposed Action would indirectly affect 1.01 acre of vernal pool species habitat. The vernal pool habitat affected by the project is located within a low quality Vernal Pool Conservation Area (Travis AFB).

Impacts to Species and Habitat

Existing Complex Site

The majority of the demolition work at this site is not within close proximity of vernal pool species habitat, with the exception of VP.FL.797 (30 feet) and VP.FL.798 (10 feet). The infrastructure located near these vernal pools consists of 2 large steel cargo containers and the work to remove them from the site is not expected to involve ground disturbing work. The access route to remove the containers would be coordinated with the Service approved biologist to ensure the pools are avoided. Avoidance and minimization measures such as a Service Approved Biologist marking vernal pool habitat as an area to avoid prior to the start of work as well as environmental awareness training is expected to prevent any adverse effects to these features.

The demolition work at the site is expected to be conducted from paved surfaces when possible. Removal of pavement, buildings, and utility infrastructure does not occur within close proximity of vernal pool species habitat (closest is VP.FL.796 at 60 feet), however the work at this site is the removal of a carport and driveway which is not expected to involve deep ground disturbing work, therefore this vernal pool should not be affected by the work. The project will include measures to avoid vernal pool species habitat within this Action Area.

New Complex Site

The site for the proposed New Complex is immediately adjacent to one 0.04 acre vernal pool VP.CA.184 (USACE 2016) and four additional vernal pools are within 185 feet of the Action Area. These vernal pools would be avoided during construction, however grading of the site to remove the existing berm for the New Complex is expected to result in hydrological changes to the surrounding area. These changes, such as altered surface water runoff patterns, can result in more or less input to nearby vernal pools which is considered an indirect impact to these vernal pools.

Project staging and storage area

The area proposed for the project staging/storage is a paved area and no vernal pool species habitat is within 115 feet, therefore, with implementation of Conservation Measures no impacts area expected at this site.

Cumulative Effects

Cumulative effects include the effects of future State, tribal, local or private actions that are reasonably certain to occur in the action Area. Future Federal actions unrelated to the Proposed Action would require separate consultation under section 7 of the Endangered Species Act.

Following demolition of the existing Complex, that area would revert to Air Force management, and activities in that portion of the action area would be consistent with the routine operational activities described in the Final PBA (Travis AFB 2018). Activities in the proposed Complex would consist of routine VQ-3 Det Travis operations consistent with the overall mission of Travis AFB and would also be consistent with the routine operational activities described in the PBA (Travis AFB 2018). Each activity described in the Final PBA would be analyzed for the level of effect it may have to listed species according to the Effects Analysis Framework described in Section 1.4.2 of the Final PBA (Travis AFB 2018).

6.3 Delta Green Ground Beetle

The Proposed Action would not affect suitable habitat for DGGB and the species is considered absent from most of the main base; however, projects within the 1-mile buffer for off-base habitat may have potential to affect the species. The existing Complex is within a 1-mile buffer for off-base habitat. The Final PBA specifies that informal consultation will be conducted for projects proposed within the 1-mile buffer for DGGB habitat (Travis AFB 2018).

Impacts to Species and Habitat

Primary biological factors of critical habitat for DGGB that may be affected by project activities in the existing Complex include vernal pools. Proposed demolition of buildings and removal of structures are not expected to have impacts on vernal pool habitat, as most of the work occurs on paved surfaces and implementation of conservation measures in Section 4.2 would reduce the potential for adverse effects. The Proposed Action *may affect and is not likely to adversely affect* Delta green ground beetle.

Cumulative Effects

Cumulative effects include the effects of future State, tribal, local or private actions that are reasonably certain to occur in the action Area. Future Federal actions unrelated to the Proposed Action would require separate consultation under section 7 of the Endangered Species Act.

Following demolition of the existing Complex, that area would revert to Air Force management, and activities in that portion of the action area would be consistent with the routine operational activities described in the Final PBA (Travis AFB 2018). The proposed Complex is not within the 1-mile buffer for DGGB habitat and projects on Travis AFB outside of the 1-mile buffer are considered to have *no effect* on DGGB (Travis AFB 2018).

7 Conclusion

No threatened or endangered species have been recorded within the Action Area (Travis AFB 2018, 60 CES/CEIE 2016); however, suitable habitat exists within the Action Area for California tiger salamander (upland habitat) and vernal pool fairy shrimp. Although implementation of the conservation measures listed in Section 4.2 would reduce the potential for the Proposed Action to adversely affect CTS, VPTS, VPFS, and DGGB.

The Proposed Action would result in permanent and temporary loss of suitable habitat for CTS and indirect effects to suitable habitat for VPFS/VPTS.

Construction of the proposed Complex would result in permanent removal of 8.37 acres of annual grassland upland habitat suitable for CTS. Travis proposes to offset the loss of high risk California tiger salamander upland habitat at a ratio of 2:1 for permanent impacts. 16.74 acres will be purchased from a Service approved conservation bank.

Temporary high risk CTS upland habitat disturbance is expected to be 1.48 acres from the maneuvering of heavy equipment in the uplands surrounding the demolition projects. Since the demolition of buildings and concrete pavement in the existing Complex will be permanently removed (total approximately 0.74 acres), these areas will be returned to their natural, or pre-construction condition and small mammal activities are expected to resume. Travis proposes the temporary disturbance of 1.48 acres of CTS high risk upland habitat be offset with the 0.74 acres that will be returned to upland grassland for a total of 0.74 ($1.48 - 0.74 = 0.74$) acres of temporary disturbance to be purchase from a Service approved conservation bank at a ratio of 0.5:1.

Construction of the proposed New Complex will result in indirect effects to 1.01 acres of VPFS/VPTS species habitat from the hydrological modification of the surrounding grasslands. To compensate for the indirect effects to 1.01 acres of vernal pool branchiopod habitat, Travis AFB shall preserve vernal pool branchiopod habitat within a USFWS-approved conservation area/mitigation bank at a ratio of 1:1.

0.05 acre of wetlands that are not suitable habitat for vernal pool species would be removed within the proposed New Complex site, however, a Clean Water Act permit would be obtained prior to the start of the project.

Table 3. Summary of Impacts and Compensatory Mitigation

Location	Habitat	Type	Impact (ac)	Ratio	Mitigation (ac)
Proposed Complex	Annual Grassland	Permanent	8.37	2:1	16.74
Existing Complex	Annual Grassland	Temporary	0.74	0.5:1	0.37
Proposed Complex	Wetland	Indirect	1.01	1:1	1.01

The Proposed Action has been determined *may affect and is likely to adversely affect* CTS, VPTS, and VPFS, and *may affect but is not likely to adversely affect* DGGB.

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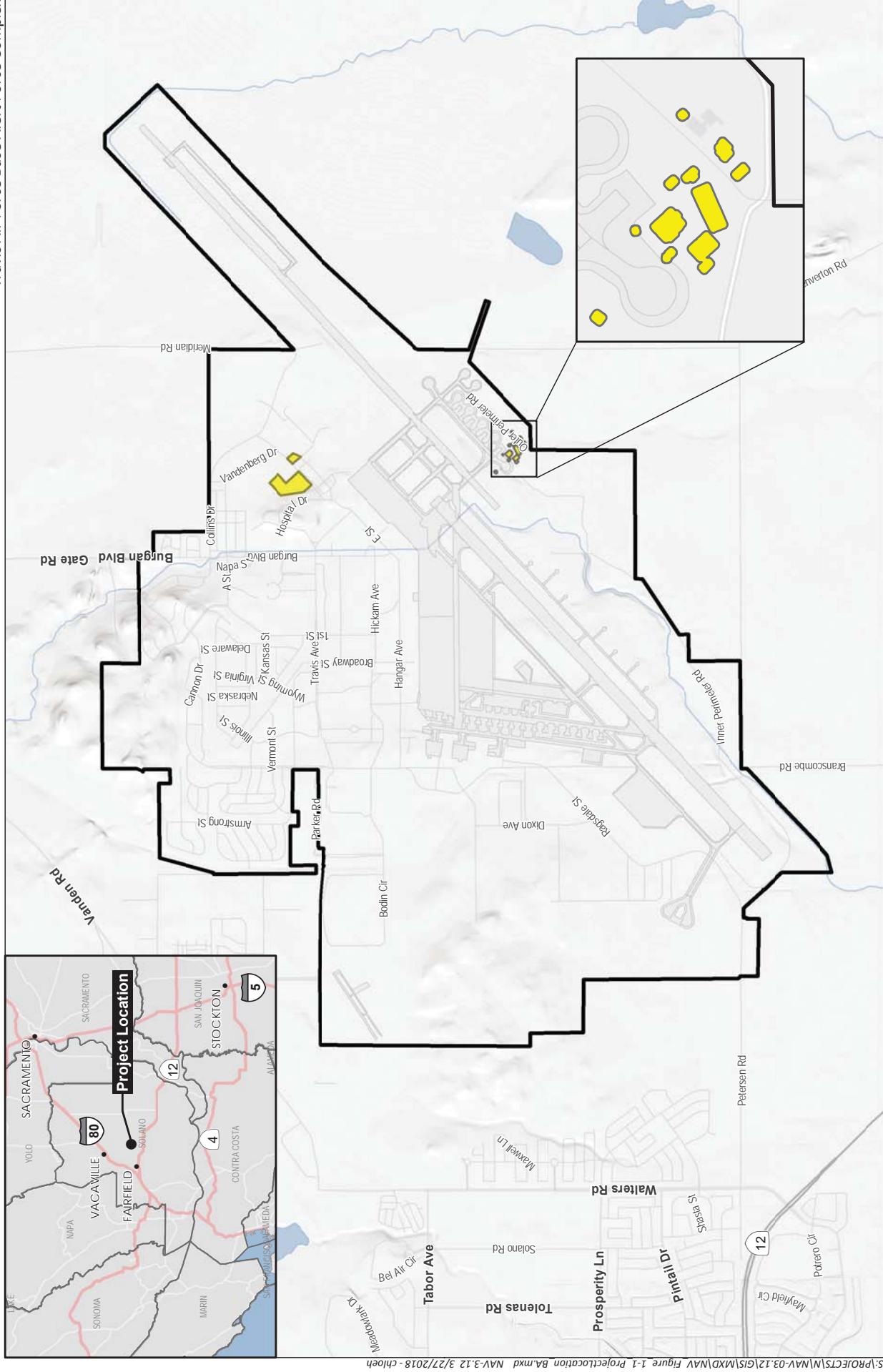
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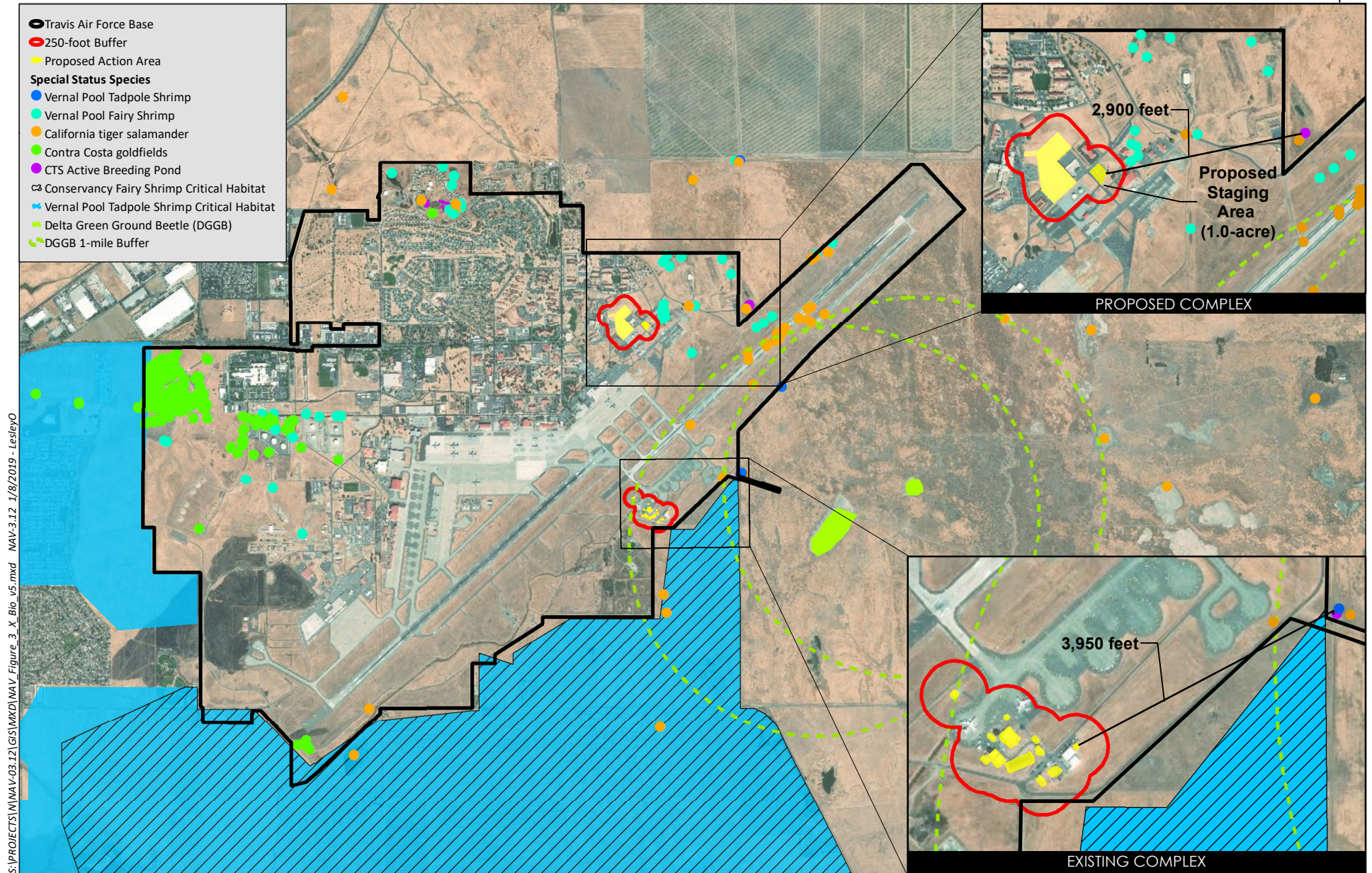


Source: ESRI 2017, USGS

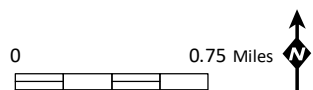


Regional Location Map

Figure 1



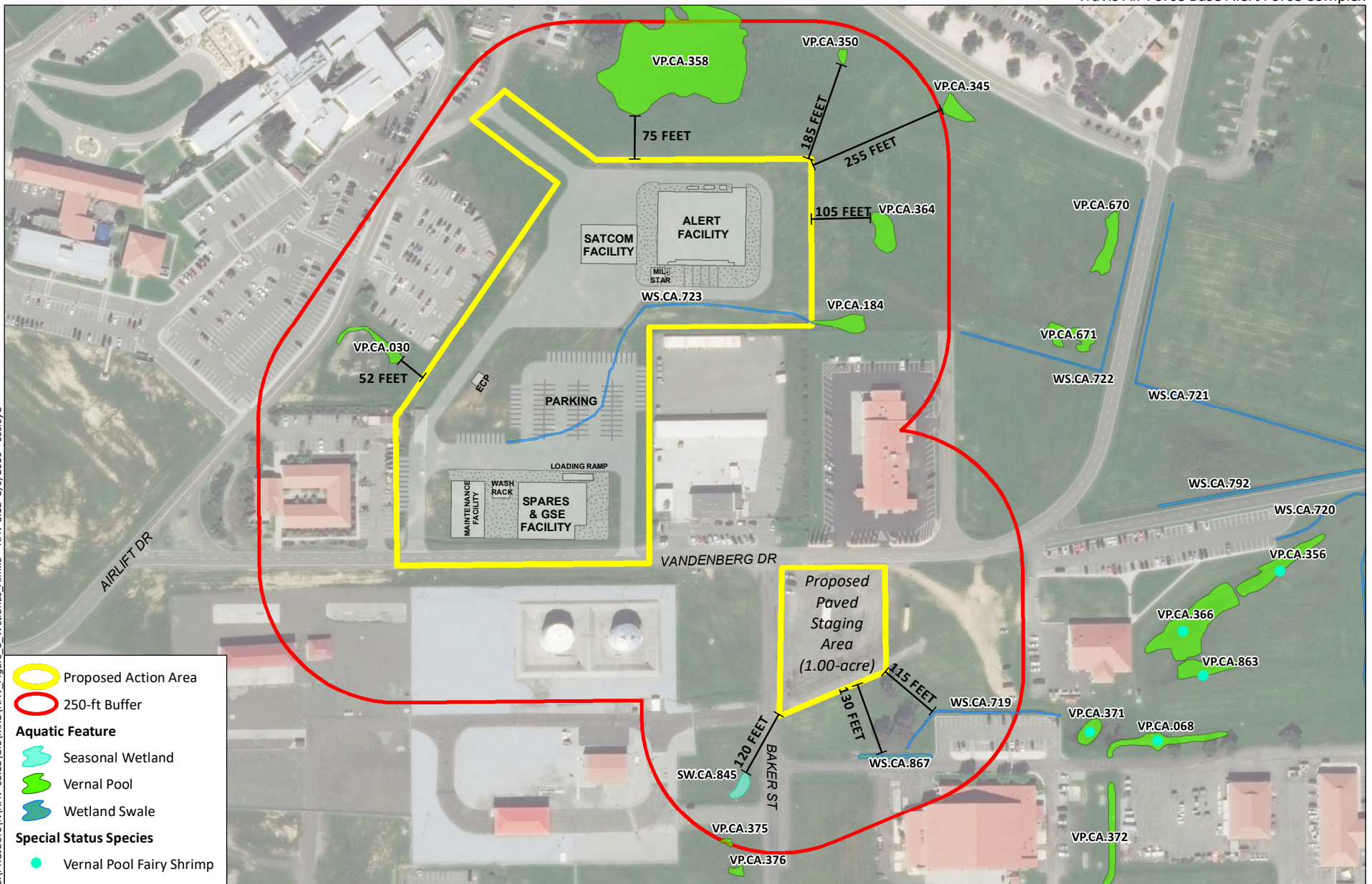
Source: ESRI 2018, USGS



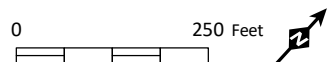
Special Status Species Map

Figure 2

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Source: Travis AFB, Esri 2017



Aquatic Features within 250-ft of the Proposed Action Area

Figure 3

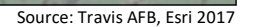


Figure 4

Photo taken January 15, 2019 from on top of berm that will be removed and graded for the construction of the New Complex. Well defined small mammal burrows present throughout the sloped sides of the berm. WS.CA.723 is shown.



Photo taken January 15, 2019 from on top of berm that will be removed and graded for the construction of the New Complex. Vernal pool VP.CA.184 in the distance would be indirectly impacted by the project.



Photo taken January 15, 2019 from on top of berm that will be removed and graded for the construction of the New Complex. Vernal pool VP.CA.358 is in the distance would be indirectly impacted by the project.



Photo taken December 17, 2018 of carport and concrete driveway that will be removed from the Existing Complex site. Vernal pool VP.FL.796 in the distance would be avoided.



Photo taken December 17, 2018 of steel containers that will be removed from the Existing Complex site. Vernal pool (VP.FL.798) in the distance would be avoided.





United States Department of the Interior



In Reply Refer to:
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2019-F-1159-1

FISH AND WILDLIFE SERVICE
Sacramento Fish and Wildlife Office
2800 Cottage Way, Suite W-2605
Sacramento, California 95825-1846

APR 08 2019

Merlin J. Miller
Deputy Commander, 60th Civil Engineer Squadron
411 Airman Drive, Bldg 570
Travis Air Force Base, California 94535-2001

Subject: Formal Consultation on P205 Alert Force Complex Project at Travis Air Force Base, Solano County, California

Dear Mr. Miller:

This letter is in response to the Travis Air Force Base (Travis AFB) February 25, 2019, electronic mail (email) request for initiation of formal consultation with the U.S. Fish and Wildlife Service (Service) on the P205 Alert Force Complex Project (proposed project), Travis AFB in Solano County, California. Your February 25, 2019, email and attachment include the required and complete Covered Project Analysis Template (consultation template) as outlined in the Programmatic Formal and Informal Consultation on the Proposed Effects of Activities Conducted at Travis Air Force Base on Six Federally Threatened and Endangered Species, Solano County, California (Service file 08ESMF00-2017-F-2294-3; Programmatic Biological Opinion). At issue are effects of the proposed project on the federally listed as threatened Central California Distinct Population Segment of the California tiger salamander (*Ambystoma californiense*; tiger salamander or CTS) and vernal pool fairy shrimp (*Branchinecta lynchi*; fairy shrimp); as well as the federally listed as endangered vernal pool tadpole shrimp (*Lepidurus packardii*; tadpole shrimp). Collectively, the fairy shrimp and the tadpole shrimp are referred to herein as the 'vernal pool shrimp species.' Travis AFB has also determined that the proposed project may affect, but is not likely to adversely affect, the delta green ground beetle (*Elaphrus viridis*; ground beetle). Our response is provided under the authority of the Endangered Species Act of 1973, as amended (16 U.S.C. 1531 et seq.) (Act), and in accordance with the implementing regulations pertaining to interagency cooperation (50 CFR 402).

The federal action on which we are consulting is the development of the P205 Alert Force Complex for the Fleet Air Reconnaissance Squadron Three Detachment Travis Operations Command. The proposed project involves the construction of a new compound north of the flight line, and the demolition or removal of most facilities at the existing complex site. Our response is based on the following information: (1) the consultation request letter dated February 25, 2019; (2) a Revised Draft Biological Assessment, dated January 2019; and (3) other information available to the Service.

Delta Green Ground Beetle

The delta green ground beetle occurs in grassland areas interspersed with surrounding vernal pools, although microhabitat conditions are not well understood (Service 2005). Nevertheless, moist soil conditions with low-growing vegetation and within 1.5 meters of water may indicate suitable microhabitat for the ground beetle (Arnold 1989). Surveys in 2012 and 2016 on Travis AFB did not

find any ground beetles, and determined that suitable microhabitat on the main Base property is unlikely.

The closest known population of the delta green ground beetle to Travis AFB is located about 458 meters (1,500 feet) off-Base in playa pools on the Wilcox Ranch, owned by the City of Fairfield and Solano County (CNDDDB 2019). The delta green ground beetle has been recorded 18 playas on the eastern portion of the Wilcox Ranch, yet not all playas on the western Wilcox parcel have been surveyed for the ground beetle. In addition, additional suitable habitat exists closer to Travis AFB. Suitable ground beetle habitat may exist around other playa pools on private lands adjacent to Travis AFB, but surveys have not been conducted or publicly reported.

Although little is known about ground beetle dispersal patterns, in the California Natural Diversity Data Base a buffer of 1 mile is established around designated ground beetle critical habitat at Olcott Lake (CNDDDB 2019). Due to the uncertainty associated with dispersal, as well as the lack of complete survey information throughout potentially suitable lands within 1 mile of the proposed project action area, the possibility exists for ground beetles to be affected by the proposed project. Furthermore, primary biological factors considered essential to the conservation and survival of this species; (1) vernal pools with their surrounding vegetation, and (2) land areas that surround and drain into these pools; occur within the action area on Travis AFB (Service 2005).

After reviewing all the available information, we concur with your determination that the proposed project may affect, but is not likely to adversely affect the delta green ground beetle. The proposed project reached the 'may affect' level, and the subsequent requirement for a biological assessment, due to the fact that the proposed project occurs where potentially suitable lands for the ground beetle exist. However, due to the fact that the ground beetle to date has not been identified on Travis AFB, the Service believes that adverse effects to the ground beetle are unlikely to occur, and are therefore discountable for the purposes of this consultation.

The remainder of this document provides our biological opinion on the effects of the proposed project on the salamander, fairy shrimp, and tadpole shrimp.

Consultation History

February 25, 2019:	Travis AFB sent a letter to the Service via email attachment requesting initiation of formal consultation regarding the P205 Alert Force Complex demolition and reconstruction.
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BIOLOGICAL OPINION

Description of the Action

The purpose of the proposed project is to construct adequate and efficiently configured facilities to provide a secure Alert Force Complex (Complex) for the Fleet Air Reconnaissance Squadron Three Detachment Travis (VQ-3 Det Travis) Operations Command. The existing Complex has not been improved to accommodate the operational requirements for VQ-3 Det Travis and larger personnel requirements. In addition, the existing Complex site poses multiple constraints including violation of the runway safety clear zone, flooding, and danger of wildfire. Constructing a new Complex north of the flight line and outside of the runway clear zone corrects critical capacity, condition, and configuration issues that degrade mission capability and threaten the ability to maintain continuity of communication capabilities. Under the proposed project, a new Alert Force Complex will be

constructed on an 8-acre site outside of the runway safety clear zone, and the facilities within the existing Complex will be demolished.

Existing Complex Site

Most of the buildings at the existing Complex site will be demolished, with the exception of a few storage and maintenance facilities. Demolition includes removal of the buildings and structures, along with their associated concrete pads, foundations, and below-ground utilities. Buildings to be demolished include: Buildings 1165, 1171, 1174, 1175, 1176, 1178, booths (1167 and 1168), a carport (1162), a hazardous waste storage locker (1180), a table and pavilion (1191), and tennis courts (1193 and 1893). Five steel shipping containers (1181 and unnumbered) will be moved to other locations, and associated concrete pads will be demolished.

New Complex Site

The new Complex includes the construction of a 17,500-square foot, two-story Alert Force facility that will include a controlled access operations control center and communication center, crew sleeping quarters, galley, recreational areas, administrative spaces and security spaces. Site preparation would include site clearing, excavation, and preparation for construction. Paving and site improvements include grading, parking, roadways, curbs, sidewalks, landscaping and pedestrian features. Also, an aircraft maintenance repair facility will be completed to accommodate ground support and repairs, aircraft spare parts warehouse, open storage, a ground storage equipment washrack, and hazardous material (HAZMAT) storage. An entry control facility will be built along the western boundary of the new Complex site and would include a single-story physical inspection building. Other features of the new Complex include security fencing, vehicle barriers, security gates, intrusion detection system, closed-circuit television, and pedestrian turnstiles.

Necessary electrical system upgrades will involve primary and secondary distribution systems, emergency generators and uninterrupted power suppliers, lighting, and transformers. Other utilities to be installed include telecommunications infrastructure, water lines, gas lines, sanitary sewer lines, and fire protection systems and supply lines. In all, digging to a depth of about 3 feet will be necessary for installing new utilities and for capping disused lines.

Other Logistical Information

A 1-acre construction staging area would be located on an existing hardscaped pad south of Vandenberg Drive. Access to the existing complex will be along Perimeter Road and existing tarmac, while the new complex will be accessed via Vandenberg Drive. Demolition and construction will need to be occurring simultaneously, and all work is scheduled between June 2020 and June 2022. Equipment likely to be used includes: an excavator; tractor, loader, or backhoe; trucks; concrete breaking equipment; cement and mortar mixer; paving equipment; boring equipment; a roller; a grader; a rubber-tired dozer; and a water truck. The total ground disturbance for the proposed project is about 9.85 acres, which will include a buffer of 20 feet around buildings and other structures proposed for demolition and removal at the existing Complex site.

Conservation Measures

To avoid or minimize effects on the tiger salamander, fairy shrimp, tadpole shrimp, and ground beetle, Travis AFB will fully implement the following conservation measures listed in Table 1, including all of the relevant conservation measures outlined in the *Programmatic Formal and Informal Consultation on the Proposed Effects of Activities Conducted at Travis Air Force Base on Six Federally Threatened and Endangered Species, Solano County, California* (Service 2018).

Additionally, to offset the permanent loss of tiger salamander upland habitat, Travis AFB has proposed to purchase 16.74 tiger salamander credits from a Service-approved conservation bank. To offset temporary losses of tiger salamander upland habitat, Travis AFB has proposed to reestablish 0.74 acre of suitable tiger salamander upland habitat and purchase an additional 0.37 tiger salamander credits at a Service-approved conservation bank. In all, Travis AFB proposes to purchase 17.11 tiger salamander credits at a Service-approved conservation bank.

Table 1. Conservation measures described in the programmatic biological assessment (Travis 2017) that will be included as part of the proposed project.

General Minimization Measures	MM-1, MM-2, MM-3, MM-5, MM-6, MM-7, MM-8, MM-9, MM-10, MM-11, MM-12, MM-13, MM-14, MM-17
California Tiger Salamander Measures	CTS-1, CTS-2, CTS-3, CTS-5, CTS-6, CTS-7, CTS-8, CTS-9, CTS-10, CTS-11, CTS-12, CTS-13, CTS-15, CTS-16, CTS-17, CTS-18, CTS-19
Vernal Pool Measures	VP-1, VP-3, VP-4
Delta Green Ground Beetle Measures	DGGB-6, DGGB-7
Migratory Bird Measures	GM-01, GM-02, GM-03

Because proposed project activities are expected to result in hydrological modifications to vernal pools within 250 feet of all parts of the proposed project action area, Travis AFB has proposed to offset the loss due to the hydrological effects by purchasing 1.01 vernal pool conservation credits at a Service-approved conservation bank.

Of the conservation measures listed in Table 1, ~~five~~ measures will be modified from the text of the programmatic biological assessment (Travis 2017) when applied to the proposed project. In the following descriptions of these four measures, ~~striketrough~~ text indicates language that will be omitted upon implementation from the text as written in the programmatic biological assessment, and **bold** text indicates language that will be added upon project implementation to the text as written in the programmatic biological assessment:

- From MM -2, remove the ~~striketrough~~ text: A Service-approved Biologist will monitor construction activities in or adjacent to sensitive habitats as required. The Biologist will ensure compliance with all applicable avoidance and minimization measures required to protect federally-listed species and their habitats. If federally-listed species are found that are likely to be affected by work activities, the Service-approved Biologist will have the authority to stop any aspect of the project that could result in unauthorized take of a federally-listed species. If the Biologist exercises this authority, he/she must coordinate this with 60 CES/CEIE who will notify the Service ~~and the California Department of Fish and Wildlife (CDFW)~~ by telephone within 1 working day and in writing within 5 working days.
- To CTS-01, remove the following ~~striketrough~~ text and add the **bold** text: Within 14 days of the start of construction activities, a Service-approved biologist will perform a pre-construction survey and identify potential refuge habitats (burrows) suitable for CTS. In the unlikely event that a CTS is encountered, the biologist will ~~contact the SERVICE for instructions.~~ **will relocate the individual outside of the project area following the procedure in Section 4.4.5 of the Final PBA, and the Sacramento Fish and Wildlife Office will be contacted.**

- From CTS-07, remove the following ~~strikethrough~~ text: Seasonal Avoidance/Wet Season Procedures (Oct 16 – Apr 30): Work will not be conducted in the rain. ~~The USFWS-approved biologist will monitor the weather forecast and authorize work when the forecast indicates a period of dry days (5 – 10 days of no rain) before starting the project. The Travis Environmental Office will document through email notification to the USFWS when work will commence.~~ The weather forecast and hourly weather data for Travis AFB will be monitored and can be found by entering the zip code 94535 (Travis AFB) at <http://www.weather.gov/srh/>. A Service-approved biologist will be on-site for morning inspections before the start of work. Morning inspections consist of examination of all trenches, pits, excavations, equipment, CTS exclusionary barriers (if present), all suitable upland habitat including refugia habitat such as small woody debris, refuse, burrow entries, etc. will be properly inspected and all other areas within the project site. In addition, the project work crew will be notified to maintain vigilance regarding CTS activity. If feasible, the work crew will participate in the morning inspection(s). Modifications to this timing may be approved on a case-by-case basis by the Service.
- From CTS-09, remove the following ~~strikethrough~~ text: If ~~dry season (May 1 – October 15)~~ night time work is necessary, the following additional conservation measures shall be implemented:
 - Work would only occur within paved areas (greater than 20 feet from uplands)
 - A 6-inch-high CTS exclusionary barrier will surround the work area during work, with ingress/egress access being the only break in the barrier.
 - A Service-approved biologist will be onsite during all night time work and will routinely monitor the CTS exclusionary barrier and the project site.
 - Work will not be conducted at night time if there is a 50 percent or more chance of rain predicted overnight.
- To CTS-10, add the following **bold** text: Water shall not be pumped, sprayed, or allowed to flow over undisturbed uplands that can support CTS as part of planned project activities outside of pre-approved requirements (i.e. dust control). Water applied for pre-approved requirements shall be applied in the minimum quantities necessary only to disturbed soils. If excess water accumulates as the result of construction activity, water may be pumped through a screened pump and removed from the construction area as deemed necessary by the onsite biologist in coordination with Travis AFB Natural Resources Management (NRM) staff. If water inadvertently or purposefully enters construction trenches, pits, or excavations, a Service-approved biologist will remain on site until water is pumped from the trench, pit, or excavation. Following pumping, the biologist shall inspect the trench, pit, or excavation area and the surrounding uplands to determine if disturbance to CTS has occurred and implement any other measures necessary (e.g. placement of cover boards, exclusionary fencing or barriers) to protect CTS that may emerge due to the wet soil. **If rain water or ground water accumulates in trenches or excavated areas and is not pumped out, the Service-approved biologist will conduct a thorough inspection of these trenches or excavated areas prior to the start of work each day.**

Action Area

The action area is defined in 50 CFR § 402.02, as “all areas to be affected directly or indirectly by the federal action and not merely the immediate area involved in the action.” For the proposed project, the action area encompasses the footprints required for construction and demolition; including all

work areas, staging areas, and access routes, as well as a buffer of 20 feet around buildings and other structures proposed for demolition and removal. The action area is estimated to be about 11.64 acres.

Analytical Framework for the Jeopardy Determination

Section 7(a)(2) of the Endangered Species Act requires that federal agencies ensure that any action they authorize, fund, or carry out is not likely to jeopardize the continued existence of listed species. “Jeopardize the continued existence of” means to engage in an action that reasonably would be expected, directly or indirectly, to reduce appreciably the likelihood of both the survival and recovery of a listed species in the wild by reducing the reproduction, numbers, or distribution of that species (50 CFR § 402.02).

The jeopardy analysis in this biological opinion considers the effects of the proposed federal action, and any cumulative effects, on the rangewide survival and recovery of the listed species. It relies on four components: (1) the *Status of the Species*, which describes the rangewide condition of the species, the factors responsible for that condition, and its survival and recovery needs; (2) the *Environmental Baseline*, which analyzes the condition of the species in the action area, the factors responsible for that condition, and the relationship of the action area to the survival and recovery of the species; (3) the *Effects of the Action*, which determines the direct and indirect impacts of the proposed federal action and the effects of any interrelated or interdependent activities on the species; and (4) the *Cumulative Effects*, which evaluates the effects of future, non-federal activities in the action area on the species.

Status of the Species

California Tiger Salamander

For the most recent comprehensive assessment of the range-wide status of the tiger salamander, please refer to *Recovery Plan for the Central California Distinct Population Segment of the California Tiger Salamander* (*Ambystoma californiense*) (Service 2017). Threats evaluated during that review and discussed in the final document have continued to act on the species since the 2017 Recovery Plan review was finalized, with loss of habitat being the most significant effect. While there continue to be losses of tiger salamander habitat throughout its range, to date no project has proposed a level of effects for which the Service has issued a biological opinion of jeopardy for the species. The Service is in the process of finalizing its most current 5-year review for the species.

Vernal Pool Shrimp Species

The status of the tadpole shrimp and the fairy shrimp has been assessed in the *Recovery Plan for Vernal Pool Ecosystems of California and Southern Oregon* (Service 2005; Recovery Plan) and 5-year reviews. For the most recent comprehensive assessment of the range-wide status of the tadpole shrimp, please refer to the *Vernal Pool Tadpole Shrimp* (*Lepidurus packardii*) *5-Year Review: Summary and Evaluation* (Service 2007a). For the most recent comprehensive assessment of the range-wide status of the fairy shrimp, please refer to the *Vernal Pool Fairy Shrimp* (*Branchinecta lynchi*) *5-Year Review: Summary and Evaluation* (Service 2007b).

No change in either species' listing status was recommended in the 5-year reviews. Threats such as the loss of vernal pool habitat primarily due to widespread urbanization were evaluated during the reviews and discussed in the final documents and have continued to act on the tadpole shrimp and the fairy shrimp since the 2007 5-year reviews were finalized. The construction of infrastructure associated with urbanization also has contributed greatly to the loss and fragmentation of vernal

pool species including the construction of roads. Habitat loss exacerbates the highly fragmented distribution of these species. Direct losses of habitat generally represent an irreversible damage to vernal pools. The alteration and destruction of habitat disrupts the physical processes conducive to functional vernal pool ecosystems. Vernal pool hydrology may be altered by further changes to the patterns of surface and subsurface flow due to the increase in the runoff associated with infrastructure.

Environmental Baseline

Travis AFB is located in the Solano-Colusa Vernal Pool Region (Service 2005), which covers the majority of Solano County. Agricultural practices, water diversion and impounding for waterfowl enhancement, development, and road building have affected vernal pools in the region. The Solano Land Trust and the California Department of Fish and Wildlife manage adjacent reserves to protect portions of the northern claypan type (totaling about 2,300 acres). In addition, the Wilcox Ranch, adjacent to the base on the east, is a preservation area under restricted land use. Many vernal pool areas in the region have been converted to agriculture or developed for residential, commercial, or industrial uses. Restored agricultural lands are targets for land acquisitions through direct purchases, conservation easements, or other cooperative agreements.

Most of the proposed project demolition will occur in areas that are currently paved. However, the natural vegetation community found in the project area is a disturbed annual grassland/vernal pool complex. Some construction will occur in an area that is currently grassland, and is intensively managed by regular mowing. Throughout Travis AFB, the grassland/vernal pool complex is highly disturbed due to alterations of surface and subsurface hydrology for the construction of road and runway features, the dominance of introduced grasses in upland areas, and the effects from current land management activities. Past land use practices and grading activities within the project area included construction of the original airfield that leveled much of the wetland habitat.

California Tiger Salamander

A breeding habitat assessment for the tiger salamander was conducted on Travis AFB during the wet season of 2005 (CH2M Hill 2006). The assessment concluded that tiger salamanders are not likely to breed within wetlands within 250 of the proposed project action area because they do not provide the hydrology necessary to support breeding habitat. Although the proposed project action area does not contain suitable breeding ponds for the tiger salamander, the species has been observed in breeding ponds to the east, north, south, and west of the proposed project action area, within the dispersal range of tiger salamanders (TNC 2002, LSA 2004, CH2M Hill 2006, CNDDB 2019).

The proposed project primarily involves work on landscaped and hardscape areas in High Risk areas for tiger salamanders, but also involves some digging in habitat with small mammal burrows that can support tiger salamander populations during the non-breeding season (Johnson and Shaffer 2010). Dispersing tiger salamanders have been known to occur on roadways, runways, and surrounding grassland areas of the base (Marty 2017). For examples, on January 29, 2014, Travis AFB informed the Service of a live adult tiger salamander on a runway about 1.2 miles north of the proposed project action area. On July 5 and 8, 2015, two dead individuals were found on and near Runway 03R/21L about 0.68 mile from the proposed project action area (Service file #08ESMF00-2014-F-0633-R001). These two individuals were likely responding to ponded water from a break in a water main, which probably triggered dispersal behavior. More recently, runway surveys and relocation efforts between May 31 and July 20, 2017, relocated 154 juvenile tiger salamanders to suitable burrow sites, while 39 dead tiger salamanders also were found (Marty 2017). In addition, pitfall

trapping efforts between June 22, 2017, and July 14, 2017, captured and relocated 658 juvenile tiger salamanders and found 7 dead tiger salamanders (Marty 2017). More recently from November 21, 2018 through March 4, 2019, Travis AFB has reported a total of 68 tiger salamanders found during road surveys and trap checks throughout Travis AFB.

Vernal Pool Shrimp Species

The proposed project existing complex site is located in a low value vernal pool conservation area, while the proposed new complex site is located in a medium value vernal pool conservation area (Travis 2017). There are no known vernal pool shrimp species occurrences within 250 feet of the proposed project boundary; the closest proximity to the proposed project site for vernal pool fairy shrimp is 400 feet to the southeast of the proposed staging area for the new complex construction site (vp.ca.371). Several other vernal pools within 750 feet of the construction site are also known to contain fairy shrimp (vp.ca.366, vp.ca.863, vp.ca.068 and vp.ca.356). No vernal pool tadpole shrimp have been found in the vernal pools. However, presence of tadpole shrimp in all suitable habitat in the proposed project areas is assumed for this project.

Like the vernal pool fairy shrimp, vernal pool tadpole shrimp also occur throughout the Solano-Colusa Vernal Pool Region, including the greater Jepson Prairie area. There are 26 listed known extant occurrences of tadpole shrimp in Solano County (CNDDDB 2019), yet the general distribution of tadpole shrimp is sparser than fairy shrimp. Previous surveys on Travis AFB, identified fairy shrimp in 16 vernal pools, but no tadpole shrimp were observed (CH2M Hill 2006; Marty 2016). However, tadpole shrimp have been detected along the eastern boundary of Travis AFB near Runway 3R/21L, and to the south of the Base. The closest known occurrence of tadpole shrimp is about 0.43-mile east of the proposed New Complex site.

Effects of the Action

California Tiger Salamander

The proposed project will result in the permanent loss of 8.37 acres of suitable tiger salamander upland habitat. Also, temporary disturbance to tiger salamander upland habitat is estimated to be 1.48 acres. Both the New Complex site and the Existing Complex site are located in areas of High Risk for tiger salamander effects (Travis 2017). The implementation of the listed conservation measures will minimize proposed project affects to tiger salamanders. In addition to the listed conservation measures, Travis AFB has proposed to purchase 17.11 tiger salamander credits at a Service-approved conservation bank, as well as to reestablish onsite 0.74 acre of suitable tiger salamander upland habitat, to offset both permanent and temporary proposed project effects to tiger salamander upland habitat.

Juvenile and adult tiger salamanders have been known to use the hardscape of runways, roadways, and parking areas as dispersal habitat. Proposed project actions will reduce the amount of upland dispersal habitat, both temporarily and permanently for the tiger salamander during the proposed construction period at Travis AFB. Any tiger salamanders attempting to move into or through the proposed project area will be restricted in their movements. Mortality, injury, or harassment of tiger salamanders could occur due to crushing, entombment, relocating, or disruption of their movements as a result of demolition and construction activities related to the proposed project.

Vernal Pool Shrimp Species

The New Complex will be completed in a medium value conservation area for vernal pool species, while the Existing Complex site is in a low value conservation area for vernal pool species (Travis 2017). The proposed project will result in permanent, indirect effects to hydrology within 250 feet of

the New Complex site. Although neither the fairy shrimp nor the tadpole shrimp have been found in vernal pools within 250 feet of the New Complex site, fairy shrimp have been found in vernal pools within 500 feet to the east of the proposed New Complex action area. It is conceivable for vernal pools within 250 feet of the New Complex to provide suitable habitat for the fairy shrimp, as well as the tadpole shrimp. Travis AFB has proposed to compensate for the indirect effects to the vernal pool habitat through the purchase of 1.01 acres of vernal pool conservation credits at a Service-approved conservation bank.

The existence of suitable habitat for the fairy shrimp within 250 feet of the New Complex site, along with the fact the fairy shrimp occur throughout northern areas of Travis AFB, suggests that fairy shrimp can persist within the suitable vernal pools. Also, although the vernal pools within 250 of the proposed New Complex site action area may not remain inundated for a period long enough to sustain the tadpole shrimp throughout a complete life cycle, the species can tolerate dry periods while completing the cycle (Helm 1998).

Cumulative Effects

Cumulative effects include the effects of future state, Tribal, local, or private actions that are reasonably certain to occur in the action area considered in this biological opinion. Future federal actions that are unrelated to the proposed action are not considered in this section because they require separate consultation pursuant to section 7 of the Act. During this consultation, the Service did not identify any future non-federal actions that are reasonably certain to occur in the action area of the proposed project.

Conclusion

After reviewing the current status of the tiger salamander, vernal pool fairy shrimp, and vernal pool tadpole shrimp; the environmental baseline for the action area, the effects of the proposed project and the cumulative effects on each listed species; it is the Service's biological opinion that the P205 Alert Force Complex Project, as proposed, is not likely to jeopardize the continued existence of the California tiger salamander, vernal pool fairy shrimp, or the vernal pool tadpole shrimp. The Service reached this conclusion because the project-related effects to the species, when added to the environmental baseline and analyzed in consideration of all potential cumulative effects, will not rise to the level of precluding recovery or reducing the likelihood of survival of the species based on the following: (1) the potential of lethal take of individual California tiger salamanders, vernal pool fairy shrimp, and vernal pool tadpole shrimp, will be **minimized** by the implementation of the proposed conservation measures; (2) the project fits within the scope of the actions described in the Programmatic Biological Opinion; (3) the effects analyzed are similar to those that were analyzed in the Programmatic Biological Opinion; (4) sensitive time periods for listed species will be avoided to the extent practicable; and (5) all **minimization** measures will be implemented.

INCIDENTAL TAKE STATEMENT

Section 9 of the Act and federal regulation pursuant to section 4(d) of the Act prohibit the take of endangered and threatened species, respectively, without special exemption. Take is defined as to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture or collect, or to attempt to engage in any such conduct. Harass is defined by Service regulations at 50 CFR 17.3 as an intentional or negligent act or omission which creates the likelihood of injury to wildlife by annoying it to such an extent as to significantly disrupt normal behavior patterns which include, but are not limited to, breeding, feeding, or sheltering. Harm is defined by the same regulations as an act which actually kills or

injures wildlife. Harm is further defined to include significant habitat modification or degradation that results in death or injury to listed species by significantly impairing essential behavior patterns, including breeding, feeding, or sheltering. Incidental take is defined as take that is incidental to, and not the purpose of, the carrying out of an otherwise lawful activity. Under the terms of section 7(b)(4) and section 7(o)(2), taking that is incidental to and not intended as part of the agency action is not considered to be prohibited taking under the Act provided that such taking is in compliance with the terms and conditions of this Incidental Take Statement.

The measures described below are non-discretionary, and must be undertaken by Travis AFB so that they become binding conditions of any grant or permit issued as part of the proposed project, as appropriate, for the exemption in section 7(o)(2) to apply. Travis AFB has a continuing duty to regulate the activity covered by this incidental take statement. If Travis AFB (1) fails to assume and implement the terms and conditions or (2) fails to adhere to the terms and conditions of the incidental take statement, the protective coverage of section 7(o)(2) may lapse. In order to monitor the impact of incidental take, Travis AFB must report the progress of the action and its impact on the species to the Service as specified in the incidental take statement [50 CFR §402.14(i)(3)].

Amount or Extent of Take

California Tiger Salamander

The Service anticipates that incidental take of California tiger salamander will be difficult to detect due to its life history and ecology. Specifically, California tiger salamander can be difficult to locate due to their cryptic appearance, their use of underground burrows as habitat, their multiplicity of life forms, and the fact that finding a dead or injured individual is unlikely due to their relatively small size. Losses of salamanders may also be difficult to quantify due to seasonal fluctuations in their numbers, random environmental events, or the likelihood that the remains will be removed by a scavenger or indistinguishable amongst the disturbed soil and debris. There is a risk of harm, harassment, injury and mortality as a result of the proposed demolition and removal activities; therefore, the Service is authorizing take incidental to the proposed action as: (1) the harassment and capture of all salamanders within the 11.64-acre action area; and (2) the injury or mortality of one juvenile or adult salamander as observed by biological monitors.

Vernal Pool Shrimp Species

It is impossible to predict weather for the proposed project construction period, resultant hydrological patterns, and the presence of fairy shrimp and tadpole shrimp in the action area with absolute certainty. No fairy shrimp or tadpole shrimp are known to occur within 250 feet of the proposed project action areas, yet the vernal pools within 250 feet of the action areas are assumed to provide suitable habitat for the vernal pool shrimp species.

In instances in which the total number of individuals anticipated to be taken cannot be determined, the Service may use the amount of habitat impacted as a surrogate; since the take of individuals anticipated will result from the loss of vernal pool habitat, the quantification of suitable habitat serves as a direct surrogate for the individuals that will be lost. Therefore, the Service is authorizing take incidental to the proposed project as the 1.01 acres of potentially suitable vernal pool habitat for the fairy shrimp and the tadpole shrimp that could be affected by hydrological changes resulting from proposed project activities.

Upon implementation of the following Reasonable and Prudent Measures, incidental take of the tiger salamander, fairy shrimp, and tadpole shrimp associated with the proposed project will become

exempt from the prohibitions described in section 9 of the Act. No other forms of take are exempted under this opinion.

Effect of the Take

In the accompanying biological opinion, the Service determined that this level of anticipated take is not likely to result in jeopardy to the tiger salamander, fairy shrimp, or tadpole shrimp.

Reasonable and Prudent Measures

All necessary and appropriate measures to avoid or minimize effects on the tiger salamander, fairy shrimp, and tadpole shrimp resulting from implementation of this project have been incorporated into the project's proposed conservation measures. Therefore, the Service believes the following reasonable and prudent measure is necessary and appropriate to minimize incidental take of the tiger salamander, fairy shrimp, and tadpole shrimp:

1. All conservation measures, as described in the biological assessment and restated here in the Project Description section of this biological opinion, shall be fully implemented and adhered to. Further, this reasonable and prudent measure shall be supplemented by the terms and conditions below.

Terms and Conditions

In order to be exempt from the prohibitions of section 9 of the Act, Travis AFB must ensure compliance with the following terms and conditions, which implement the reasonable and prudent measure described above. These terms and conditions are nondiscretionary.

1. Travis AFB shall include full implementation and adherence to the conservation measures as a condition of any permit or contract issued for the project.
2. To monitor whether the amount or extent of incidental take anticipated from implementation of the proposed project is approached or exceeded, Travis AFB will adhere to the following reporting requirement. Should the anticipated amount or extent of incidental take be exceeded, Travis AFB must immediately reinitiate formal consultation, as per 50 CFR §402.16.
 - a. For those components of the action that will result in habitat degradation or modification whereby incidental take in the form of harm is anticipated, Travis AFB will provide quarterly updates to the Service with a precise accounting of the total acreage of habitat impacted. Updates shall also include any information about changes in project implementation that result in habitat disturbance not described in the Project Description and not analyzed in this Biological Opinion.
 - b. For those components of the action that result in direct encounters between listed species and project workers and their equipment whereby incidental take in the form of harassment, harm, injury, or death is anticipated, Travis AFB shall immediately contact the Service's Sacramento Fish and Wildlife Office (SFWO) at (916) 414-6563 to report the encounter. If the encounter occurs after normal working hours, Travis AFB shall contact the SFWO at the earliest possible opportunity the next working day.

- c. For those components of the action that will require the capture and relocation of any listed species, Travis AFB shall immediately contact the Service's SFWO at (916) 414-6563 to report the action. If capture and relocation need to occur after normal working hours, Travis AFB shall contact the SFWO at the earliest possible opportunity the next working day.

Salvage and Disposition of Individuals:

Injured listed species must be cared for by a licensed veterinarian or other qualified person(s), such as the Service-approved biologist. Dead individuals must be sealed in a resealable plastic bag containing a paper with the date and time when the animal was found, the location where it was found, and the name of the person who found it, and the bag containing the specimen frozen in a freezer located in a secure site, until instructions are received from the Service regarding the disposition of the dead specimen. The Service contact person can be reached at (916) 414-6563.

CONSERVATION RECOMMENDATIONS

Section 7(a)(1) of the Act directs federal agencies to utilize their authorities to further the purposes of the Act by carrying out conservation programs for the benefit of endangered and threatened species. Conservation recommendations are discretionary agency activities to minimize or avoid adverse effects of a proposed action on listed species or critical habitat, to help implement recovery plans, or to develop information. The Service recommends the following actions:

1. Travis AFB should continue to work with the Service to implement recovery actions for species associated with vernal pool habitats.

In order for the Service to be kept informed of actions minimizing or avoiding adverse effects or benefiting listed species or their habitats, the Service requests notification of the implementation of any conservation recommendations.

REINITIATION—CLOSING STATEMENT

This concludes formal consultation on the P205 Alert Force Complex Project. As provided in 50 CFR §402.16, reinitiation of formal consultation is required and shall be requested by the federal agency or by the Service where discretionary federal agency involvement or control over the action has been retained or is authorized by law and:

- (a) If the amount or extent of taking specified in the incidental take statement is exceeded;
- (b) If new information reveals effects of the action that may affect listed species or critical habitat in a manner or to an extent not previously considered;
- (c) If the identified action is subsequently modified in a manner that causes an effect to the listed species or critical habitat that was not considered in the biological opinion; or
- (d) If a new species is listed or critical habitat designated that may be affected by the identified action.

If you have any questions regarding this biological opinion, please contact Harry Kahler, Fish and Wildlife Biologist, (harry_kahler@fws.gov) or at (916) 414-6577 or Doug Weinrich, Assistant Field Supervisor, at (916) 414-6563 or the letterhead address.

Sincerely,



Jennifer M. Norris, Ph.D.
Field Supervisor

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RE: 08ESMF00-2019-F-1159-1 Formal Consultation on P205 Alert Force Complex Project at Travis Air Force Base, Solano County California

This Amendment to the Biological Assessment (BA) submitted to USFWS Sacramento Office on 25 February 2019 for the P205 Alert Force Complex Project (Proposed Action) at Travis Air Force Base, located in Solano County, California is being submitted due to recent new information obtained at the proposed New Complex Site. Below is a summary of changes to Section 4 Description of the Action Area, Section 6 Effects of the Action, and Section 7 Conclusion. Changes to the original Biological Assessment are shown in **red font**.

4 Description of the Action Area

Seasonal Wetlands and Swales

New Complex Site

There is one ~~wetland swale (WS.CA.723)~~ seasonal wetland (SW.CA.1040) within 250 feet of the Action Area. See Table 1 for a description of this wetland.

Table 1. Wetlands Within 250 Feet of the Action Area

Feature ID	Area (ac.)	Distance (ft.)	Impact	Vernal Pool Species Habitat
New Complex				
WS.CA.723	0.05	Within Action Area	Direct (permanent removal)	No
VP.CA.184	0.04	0	Indirect	Potential
VP.CA.030	0.04	52	Indirect	Potential
VP.CA.358	0.86	75	Indirect	Potential
VP.CA.364	0.06	105	Indirect	Potential
VP.CA.350	0.01	185	Indirect	Potential
VP.CA.345	0.03	255	Indirect	Potential
SW.CA.1040	0.0046	Within Action Area	Direct	Potential
Staging Area				
WS.CA.719	0.02	115	None	Potential
SW.CA.845	0.02	120	None	Potential
WS.CA.867	0.02	130	None	Potential
Existing Complex				
VP.FL.798	0.01	15	None	Potential
VP.FL.797	0.05	30	None	Potential
VP.FL.796	0.21	60	None	Potential
VP.FL.597	0.01	75	None	Potential
VP.FL.504	0.01	200	None	Potential
VP.FL.505	0.02	170	None	Potential
VP.FL.803	0.01	220	None	Potential
VP.FL.594	0.01	95	None	Potential
VP.SU.518	0.01	245	None	Potential
WS.FL.593	0.26	55	None	Potential

6 Effects of the Action

The Proposed Action would result in permanent removal of approximately 8.37 acres of high risk upland habitat suitable for the threatened CTS, 1.48 acres of temporary upland habitat disturbance, **0.0046 acres**

of direct impacts to vernal pool species habitat suitable for VPFS and VPTS, and indirect impacts to 1.01 acres of vernal pool species habitat suitable for the VPFS and VPTS. ~~A wetland swale will be permanently removed as part of the project, however, it is not habitat for VPFS/VPTS.~~

Table 2. Project Habitat Impact Summary

Resource	Area (ac.)	Impact
High Risk CTS Upland Habitat	8.37	Permanent
High Risk CTS Upland Habitat	1.48	Temporary
Vernal pool fairy shrimp/Vernal pool tadpole shrimp habitat	1.01	Indirect
Wetland swale	0.05	Permanent (not threatened and endangered species habitat)
Vernal pool fairy shrimp/Vernal pool tadpole shrimp habitat	0.0046	Direct

Total acreage Hardscape (staging area) 1.00

Total acreage Building and Pavement demolition 0.74

Total acreage removal of wetlands (requires CWA permit); ~~not~~ vernal pool species habitat: 0.0046 ~~0.05~~

6.2 Vernal Pool Fairy Shrimp and Vernal Pool Tadpole Shrimp

The Proposed Action would indirectly affect 1.01 acre of vernal pool species habitat and directly impact 0.0046 acres of vernal pool species habitat. The vernal pool habitat affected by the project is located within a low quality (Existing Complex Site) and medium quality (New Complex Site) Vernal Pool Conservation Area (Travis AFB).

Impacts to Species and Habitat

New Complex Site

The site for the proposed New Complex is immediately adjacent to one 0.04 acre vernal pool VP.CA.184 (USACE 2016) and four additional vernal pools are within 185 feet of the Action Area. These vernal pools would be avoided during construction, however grading of the site to remove the existing berm for the New Complex is expected to result in hydrological changes to the surrounding area. These changes, such as altered surface water runoff patterns, can result in more or less input to nearby vernal pools which is considered an indirect impact to these vernal pools. A newly delineated wetland feature SW.CA.1040 is within the footprint of the New Complex Site and cannot be avoided. Vernal pools and wetlands within the New Complex Site project area are classified as medium value according to the Vernal Pool Conservation Area map in the Travis AFB Programmatic Biological Assessment. SW.CA.1040 is 0.0046 acres and will be directly impacted as part of the project (Figure 1). Refer to Figure 2 for the Action Area of the New Complex Site.

7 Conclusion

The Proposed Action would result in permanent and temporary loss of suitable habitat for CTS and indirect and direct effects to suitable habitat for VPFS/VPTS.

Construction of the proposed New Complex will result in indirect effects to 1.01 acres of VPFS/VPTS species habitat from the hydrological modification of the surrounding grasslands. To compensate for the indirect effects to 1.01 acres of vernal pool branchiopod habitat, Travis AFB shall preserve vernal pool branchiopod habitat within a USFWS-approved conservation area/mitigation bank at a ratio of 1:1. A newly discovered wetland feature, SW.CA.1040, will be

permanently removed at the New Complex site. SW.CA.1040 is 0.0046 acres and is assumed to support habitat for VPFS/VPTS. Travis AFB shall preserve vernal pool branchiopod habitat within a USFWS-approved conservation area/mitigation bank at a ratio of 3:1. (Figure 1)

0.05 acre of wetlands that are not suitable habitat for vernal pool species would be removed within the proposed New Complex site, however, a Clean Water Act permit would be obtained prior to the start of the project. A recent wetland delineation has determined that WS.CA.723 is in fact not a wetland. The location of this feature as originally mapped is a convex ridge top that does not pond water (Figure 1).

Table 3. Summary of Impacts and Compensatory Mitigation

Location	Habitat	Type	Impact (ac)	Ratio	Mitigation (ac)
Proposed Complex	CTS Upland	Permanent	8.37	2:1	16.74
Existing Complex	CTS Upland	Temporary	0.74	0.5:1	0.37
Proposed Complex	VPFS/VPTS	Indirect	1.01	1:1	1.01
Proposed Complex	VPFS/VPTS	Direct	0.0046	3:1	0.0138



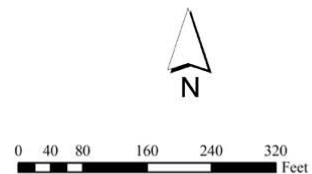
Figure 1

NEW TACAMO SITE

WETLAND DELINEATION

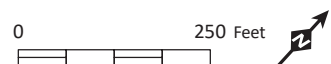
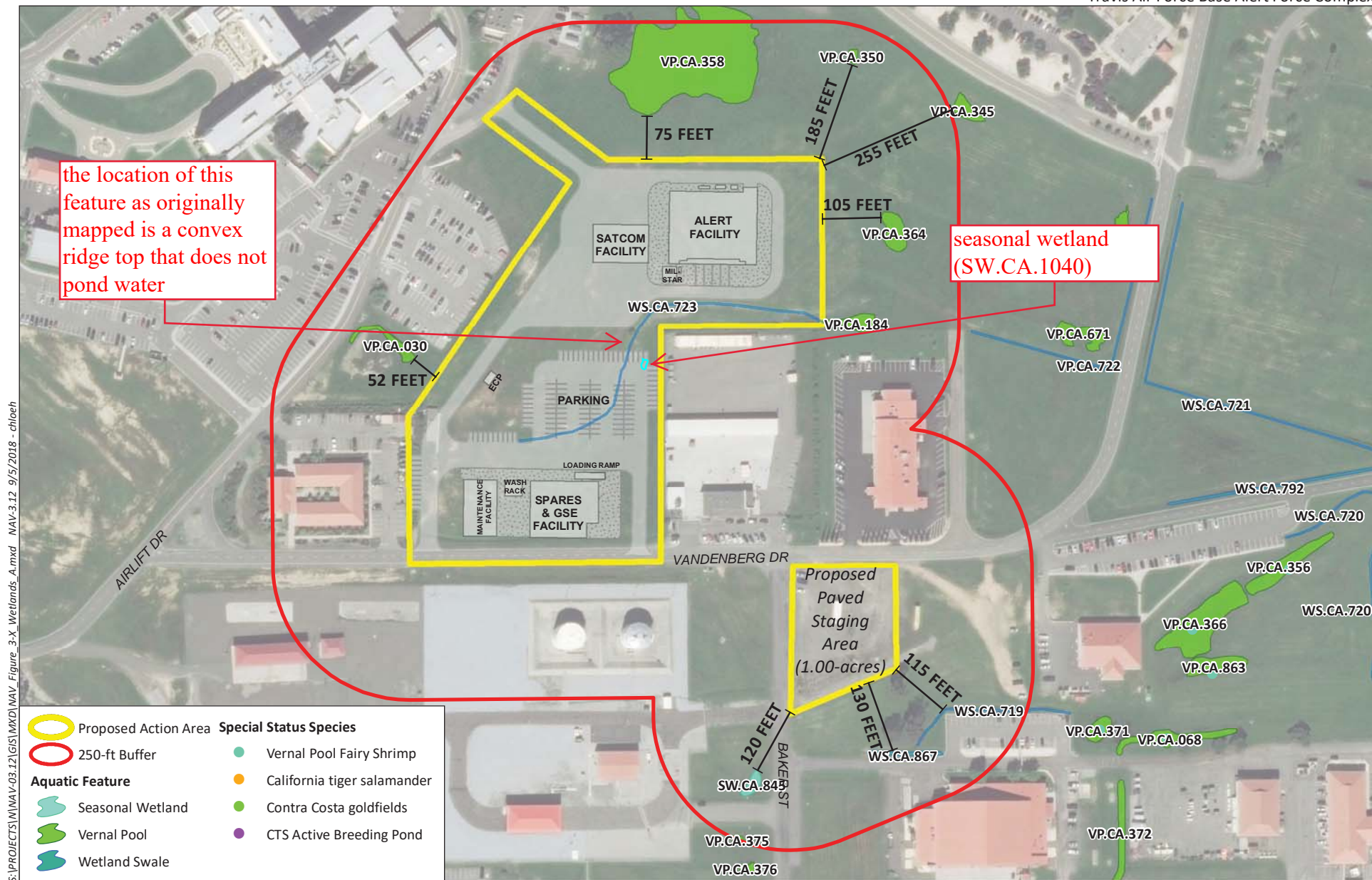
Travis AFB, CA

- Existing Wetlands
- New wetlands 5/20/2019
- Wetlands removed



Credits: ESRI 2019; TAFB 2019

Document Path: \\vmware-host\Shared Folders\Desktop\GIS\TAFB\2019 Wetland mapping.mxd



Aquatic Features within 250-ft of the Proposed Action Area

Figure 2



United States Department of the Interior



FISH AND WILDLIFE SERVICE
Sacramento Fish and Wildlife Office
2800 Cottage Way, Suite W-2605
Sacramento, California 95825-1846

In Reply Refer to:
08ESMF00-
2019-F-1159-R001

JUN 05 2019

Merlin J. Miller
Deputy Commander, 60th Civil Engineer Squadron
411 Airman Drive, Bldg 570
Travis Air Force Base, California 94535-2001

Subject: Reinitiation of Formal Consultation on P205 Alert Force Complex Project at Travis Air Force Base, Solano County, California

Dear Mr. Miller:

This letter is in response to the Travis Air Force Base (Travis AFB) May 29, 2019, electronic mail (email) request for reinitiation of formal consultation with the U.S. Fish and Wildlife Service (Service) on the P205 Alert Force Complex Project (proposed project), Travis AFB in Solano County, California. Your May 29, 2019, email and attachment include the required and complete Covered Project Analysis Template (consultation template) as outlined in the Programmatic Formal and Informal Consultation on the Proposed Effects of Activities Conducted at Travis Air Force Base on Six Federally Threatened and Endangered Species, Solano County, California (Service file 08ESMF00-2017-F-2294-3; Programmatic Biological Opinion). At issue are effects of the proposed project on the federally listed as threatened Central California Distinct Population Segment of the California tiger salamander (*Ambystoma californiense*; tiger salamander or CTS) and vernal pool fairy shrimp (*Branchinecta lynchi*; fairy shrimp); as well as the federally listed as endangered vernal pool tadpole shrimp (*Lepidurus packardii*; tadpole shrimp). Collectively, the fairy shrimp and the tadpole shrimp are referred to herein as the 'vernal pool shrimp species.' Travis AFB has also determined that the proposed project may affect, but is not likely to adversely affect, the delta green ground beetle (*Elaphrus viridis*; ground beetle). Our response is provided under the authority of the Endangered Species Act of 1973, as amended (16 U.S.C. 1531 et seq.) (Act), and in accordance with the implementing regulations pertaining to interagency cooperation (50 CFR 402).

In electronic mail (email) correspondence received May 29, 2019, you described modifications to the to proposed project as analyzed. As stated in the Reinitiation – Closing Statement section of the February 25, 2019 opinion, a reinitiation is required and shall be requested, among other conditions, when “the identified action is subsequently modified in a manner that causes an effect to the listed species or critical habitat that was not considered in the biological opinion.” According to the attachment included with the May 29, 2019 email, the proposed project described in the opinion will be modified in the following manners, with ~~strike through text~~ indicating text that will be omitted and **bold** text indicating text that will be added to the February 29, 2019, opinion:

Alterations to the Opinion

Under the heading “Effects of the Action”, within the “*Vernal Pool Shrimp Species*” section (Page 8), the following sentence:

- “The proposed project will result in permanent, indirect effects to hydrology within 250 feet of the New Complex site.”
- “The proposed project will result in permanent, **direct and** indirect effects to hydrology within 250 feet of the New Complex site.”

Under the heading “Effects of the Action”, within the “*Vernal Pool Shrimp Species*” section (Page 8), the following sentence:

- “Travis AFB has proposed to compensate for the indirect effects to the vernal pool habitat through the purchase of 1.01 acres of vernal pool conservation credits at a Service-approved conservation bank.”
- “Travis AFB has proposed to compensate for the indirect effects to the vernal pool habitat through the purchase of 1.01 acres **and direct effects to the vernal pool habitat through 0.0138 acres** of vernal pool conservation credits at a Service-approved conservation bank.”

Under the heading “Effects of the Action”, within the “*Vernal Pool Shrimp Species*” section (Page 8), added the following sentence:

- **“The proposed project will directly impact through the permanent removal of 0.0046 acres of vernal pool species habitat.”**

The federal action on which we are consulting is the development of the P205 Alert Force Complex for the Fleet Air Reconnaissance Squadron Three Detachment Travis Operations Command. The proposed project involves the construction of a new compound north of the flight line, and the demolition or removal of most facilities at the existing complex site. Our response is based on the following information: (1) the consultation request letter dated February 25, 2019; (2) a Revised Draft Biological Assessment, dated January 2019; and (3) a Revised Draft Biological Assessment, dated May 2019; and (4) other information available to the Service.

Conclusion

After reviewing the current status of the tiger salamander, vernal pool fairy shrimp, and vernal pool tadpole shrimp; the environmental baseline for the action area, the effects of the proposed project and the cumulative effects on each listed species; it is the Service’s biological opinion that the P205 Alert Force Complex Project, as proposed, is not likely to jeopardize the continued existence of the California tiger salamander, vernal pool fairy shrimp, or the vernal pool tadpole shrimp. The Service reached this conclusion because the project-related effects to the species, when added to the environmental baseline and analyzed in consideration of all potential cumulative effects, will not rise to the level of precluding recovery or reducing the likelihood of survival of the species based on the following: (1) the potential of lethal take of individual California tiger salamanders, vernal pool fairy shrimp, and vernal pool tadpole shrimp, will be minimized by the implementation of the proposed conservation measures; (2) vernal pool branchiopod habitat will be preserved at a 3:1 ratio within a conservation bank with credits purchased by Travis AFB in return for directly impacting suitable vernal pool species habitat; (3) the project fits within the scope of the actions described in the Programmatic Biological Opinion; (4) the effects analyzed are similar to those that were analyzed in the Programmatic Biological Opinion; (5) sensitive time periods for listed species will be avoided to the extent practicable; and (6) all minimization measures will be implemented.


In instances in which the total number of individuals anticipated to be taken cannot be determined, the Service may use the amount of habitat impacted as a surrogate; since the take of individuals

anticipated will result from the loss of vernal pool habitat, the quantification of suitable habitat serves as a direct surrogate for the individuals that will be lost. Therefore, the Service is authorizing take incidental to the proposed project as the **1.0146** acres of potentially suitable vernal pool habitat for the fairy shrimp and the tadpole shrimp that could be affected by hydrological changes **and permanent removal of suitable habitat** resulting from proposed project activities.

If you have any questions regarding this biological opinion, please contact Harry Kahler, Fish and Wildlife Biologist, (harry_kahler@fws.gov) or at (916) 414-6577 or Doug Weinrich, Assistant Field Supervisor, at (916) 414-6563 or the letterhead address.

Sincerely,



 Jennifer M. Norris, Ph.D.
Field Supervisor