Final Draft

Environmental Assessment

13th Street Bridge Replacement at the Santa Ynez River Crossing

Vandenberg Air Force Base, California

20 March 2015

30th Space Wing, Installation Management Flight
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Acronyms and Abbreviations

30 CES/CENPL	30th Space Wing, Engineering Flight, Comprehensive Planning
30 CES/CEIEA	30th Space Wing, Installation Management Flight, Environmental Conservation
30 CES/CEIEC	30th Space Wing, Installation Management Flight, Environmental Compliance
30 CES/CEOIU	30th Space Wing, Operations Management Flight, Utilities
30 MDG/SGOJ	30th Space Wing, Medical Group, Bioenvironmental Engineering
30 SW/CC	Commander, 30th Space Wing
30 SWP	30th Space Wing Plan
AADT	Annual Average Daily Traffic
AB	Assembly Bill
ADT	Average Daily Traffic
AFOSH	Air Force Occupational Safety and Health
AICUZ	Air Installation Compatible Use Zone
AIRFA	American Indian Religious Freedom Act
AOC	Area of Concern
AOI	Area of Interest
APE	Area of Potential Effects
APZ	Accident Potential Zone
Base	Vandenberg Air Force Base
BASH	Bird Air Strike Hazard
BCC	USFWS Bird Species of Conservation Concern
Bldg	building
BMC	Burton Mesa chaparral
BMC/CCS	mixed Burton Mesa chaparral and central coast scrub
BMPs	Best Management Practices
CAA	Clean Air Act
CAAA	Clean Air Act Amendments
CAAQS	California Ambient Air Quality Standards
CADC	California Avian Data Center
Cal EPA	California Environmental Protection Agency
CAP	Consolidated Accumulation Point
CARB	California Air Resources Board
CCA	California Coastal Act
CCC	California Coastal Commission
CCR	California Code of Regulations
CCS	central coast scrub
CCS/NNG	mixed central coast scrub/non-native grassland
C&D	construction and demolition
CDFW	California Department of Fish and Wildlife

CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CEQ	Council on Environmental Quality
cfs	cubic feet per second
CFR	Code of Federal Regulations
CH_4	methane
CIDH	cast-in-drilled-hole
CIWMB	California Integrated Waste Management Board
CNDDB	California Natural Diversity Database
CNG	compressed natural gas
CO	carbon monoxide
CO_2	carbon dioxide
CSC	California Species of Special Concern
CSM	coastal salt marsh
CMU	concrete masonry unit
CRLF	California red-legged frog
CSB	County of Santa Barbara
CWA	Clean Water Act
CY	cubic yards
CZMA	Coastal Zone Management Act
dB	decibel
dBA	A-weighted decibel
dbh	diameter at breast height
DO	dissolved oxygen
DOD	Department of Defense
DOT	Department of Transportation
EMS	Environmental Management System
EO	Executive Order
EOD	Explosive Ordnance Disposal
EPA	Environmental Protection Agency
EPMs	Environmental Protection Measures
EPP	Environmental Protection Plan
ESA	Endangered Species Act
FE	federally endangered
FOC	fiber optic cable
FONSI	Finding of No Significant Impact
FONPA	Finding of No Practicable Alternative
FPCON	Force Protection Conditions
FR	Federal Register
ft	foot or feet
FT	federally threatened
FWM	fresh water marsh
GHG	greenhouse gas
GIS	Geographic Information System

GPS	global positioning system
GWP	global warming potential
HazMart	Hazardous Materials Pharmacy
HFC	hydroflourocarbon
HMMP	Hazardous Materials Management Plan
HS	hydrogen sulfide
IES	Illuminating Engineering Society
IICEP	Interagency and Intergovernmental Coordination for Environmental Planning
ICRMP	Integrated Cultural Resources Management Plan
INRMP	Integrated Natural Resources Management Plan
IRP	Installation Restoration Program
km	kilometer
L	liter
LCZ	Lateral Clear Zone
LED	light emitting diode
LEED	Leadership in Energy & Environmental Design
LNG	liquefied natural gas
LOS	Level of Service
m	meter
m^2	square meters
MBTA	Migratory Bird Treaty Act
mg	milligram
MH	maintenance hole
MRC	Midway Research Center
MS4	Small Municipal Separate Stormwater Sewer System
MSRS	ManTech SRS Technologies, Inc.
N_2O	nitrous oxide
NAAQS	National Ambient Air Quality Standards
NAGPRA	Native American Graves Protection and Repatriation Act
NCA	Noise Control Act
NEPA	National Environmental Policy Act
NG	native grassland
NHPA	National Historic Preservation Act
NMFS	National Oceanic and Atmospheric Administration, National Marine Fisheries Service
NOI	Notice of Intent
NNB	non-native broadleaf
NNG	non-native grassland
NO_2	nitrogen dioxide
NO_x	oxides of nitrogen
NPDES	National Pollutant Discharge Elimination System
NRHP	National Register of Historic Places
NSF	National Sanitation Foundation, International

NSR	New Source Review
O_3	ozone
OAK	oak woodland
OAK/BMC	mixed oak woodland and Burton Mesa chaparral
OSHA	Occupational Safety and Health Administration
Pb	lead
PERP	Portable Equipment Registration Program
PFC	perflourocarbon
PHV	peak-hour volume
$PM_{2.5}$	particulate matter less than 2.5 microns
PM_{10}	particulate matter less than 10 microns
POLs	petroleum, oil, and lubricants
PPA	Pollution Prevention Act
ppmv	parts per million by volume
ppt	parts per thousand
PPV	Peak Particle Velocity
RCRA	Resource Conservation and Recovery Act
ROG	reactive organic gases
ROI	region of influence
ROW	right-of-way
RP	Recommended Practice
RUD	ruderal
RWD	Report of Waste Discharge
RWQCB	Regional Water Quality Control Board
SAIC	Science Applications International Corporation
SAP	Satellite Accumulation Point
SB	Senate Bill
SBCAPCD	Santa Barbara County Air Pollution Control District
SBCPD	Santa Barbara County Planning and Development Department
SBCWA	Santa Barbara County Water Agency
SE	California State Endangered
SIP	State Implementation Plan
SF_6	sulfur hexaflouride
SM	single mode
SNPL	western snowy plover
SO_2	sulfur dioxide
SR	State Route
SCCAB	South Central Coast Air Basin
SSPP	Strategic Sustainability and Performance Plan
SWFL	southwestern willow flycatcher
SWMP	Solid Waste Management Plan
SWPPP	Storm Water Pollution Prevention Plan
SWRCB	State Water Resources Control Board
TI	traffic index

TSCA	Toxic Substance Control Act
TSS	total suspended solids
TWG	tidewater goby
U.S.	United States
US 1	U.S. Highway 1
US 101	U.S. Highway 101
USACHPPM	U.S. Army Center for Health Promotion and Preventative Medicine
USACE	U.S. Army Corps of Engineers
U.S.C.	United States Code
USGS	U.S. Geological Survey
UPS	uninterruptible power system
USAF	United States Air Force
USFWS	United States Fish and Wildlife Service
UXO	unexploded ordnance
VAFB	Vandenberg Air Force Base
V/C	volume-to-capacity
WIS	Wetland Indicator Status
WY	water year

1 Purpose of and Need for the Proposed Action

The United States Air Force (USAF or Air Force) proposes to construct a replacement bridge for the 13th Street crossing of the Santa Ynez River and to install fiber optic cable under the Santa Ynez River on Vandenberg Air Force Base (VAFB or Base), California. This Environmental Assessment (EA) has been prepared to evaluate the potential environmental effects of implementing the Proposed Action and identified alternatives per the National Environmental Policy Act of 1969 (NEPA), the Council on Environmental Quality (CEQ) regulations implementing NEPA (40 CFR 1500-1508), and the U.S. Air Force's Environmental Impact Analysis Process (EIAP) regulations (32 CFR 989).

1.1 Project Location

VAFB is headquarters for the 30th Space Wing (30 SW). The 30 SW at VAFB is the Air Force Space Command organization responsible for Department of Defense (DOD) space and missile launch activities on the west coast of the United States (U.S.). Satellites destined for polar or near-polar orbit are launched from VAFB, and ballistic missiles are tested. The 30 SW supports West Coast launch activities for the USAF, DOD, Missile Defense Agency, National Aeronautics and Space Administration, foreign nations, and various private industry contractors. To accommodate space and missile launches, roadways are required to access all portions of base.

VAFB is located on the south-central coast of California, approximately halfway between San Diego and San Francisco (Figure 1-1). The Base covers 99,099 acres in western Santa Barbara County (USAF 2004) and occurs in a transitional ecological region that includes the northern and southern distributional limits for many plant and animal species.

The Santa Ynez River divides north and south VAFB, along the four miles of the river that runs through VAFB. The river is contained in the Lompoc Valley, which comprises the Santa Ynez River floodplain. The Santa Ynez River is the largest drainage basin on VAFB, draining approximately 900 square miles over a 90 mile (144.8 km) long channel.

The main proposed project site (13th Street Bridge Project Area) is located approximately three miles inland from the Pacific Ocean. The bridge is located on 13th Street within the Base boundaries and is limited to Air Force use only. Figure 1-2 illustrates the regional location of 13th Street and the Santa Ynez River. Figure 1-1 is a regional map, showing the roads in the area.

1.2 Purpose and Need

The existing 13th Street Bridge was constructed in 1970. It serves as the only on-base transport route and vehicle link between the north and south portions of VAFB and is a critical transportation link to support several VAFB programs. At present, it is the only available route for transporting Delta IV and Atlas V payloads and rocket components between processing facilities and the airfield on North VAFB and space launch complexes on South VAFB. It is an essential single-point failure node affecting numerous space programs, including satellite reconnaissance, vital to national security. The bridge is also the only route for fuel deliveries to

South VAFB and the transport of hazardous materials, and carries essential communications and utility distribution lines between North and South VAFB.

In 1981, due to structural deficiencies and inadequacy of the foundation to accommodate standard highway loading the bridge was retrofitted. In 2002, Penfield & Smith & Bengal Engineering evaluated the structural integrity of the bridge and found that the bridge was still unsafe for normal highway loads and at significant risk of collapse during a 5-year storm event (Penfield & Smith & Bengal 2002). During the summer of 2003, an emergency action was initiated to add micro-piles to support the existing steel pilings that were exposed due to continued degradation of the structure (USAF 2003). Additional rock riprap was placed along both the north and south channel banks in September 2005. These temporary repairs were designed to protect the existing bridge from imminent collapse during a 5-year storm event.

The purpose of the Proposed Action is to maintain a critical transportation link between South and North VAFB, along with the associated utilities and communication lines that are carried across the Santa Ynez River along the 13th Street Bridge. In addition, a new communication line will be installed under the Santa Ynez River adjacent to the new bridge to augment the communications capability between North and South VAFB. The need for the Proposed Action is to sustain vital infrastructure for mission support by replacing the 13th Street Bridge and upgrading existing fiber optics lines in the vicinity of the Bridge. The existing 13th Street Bridge is unsafe and at risk of failure and eventual collapse of the existing structure is unavoidable (Metcalf & Eddy, Inc., 2007). If the bridge is not replaced, space launch missions would continue to operate under the risk of potential bridge failure, which would result in: severance of physical access to South VAFB; severance of communications infrastructure; cessation of space launch missions where access and communications support is needed; and inability for VAFB to provide safety and security support to South VAFB due to lack of access and/or communication.

The implementation of a Wetland Mitigation Area will allow the Air Force to offset potential impacts to wetlands during construction and demolition by restoring degraded habitat.

Figure 1-1. Regional location of VAFB.

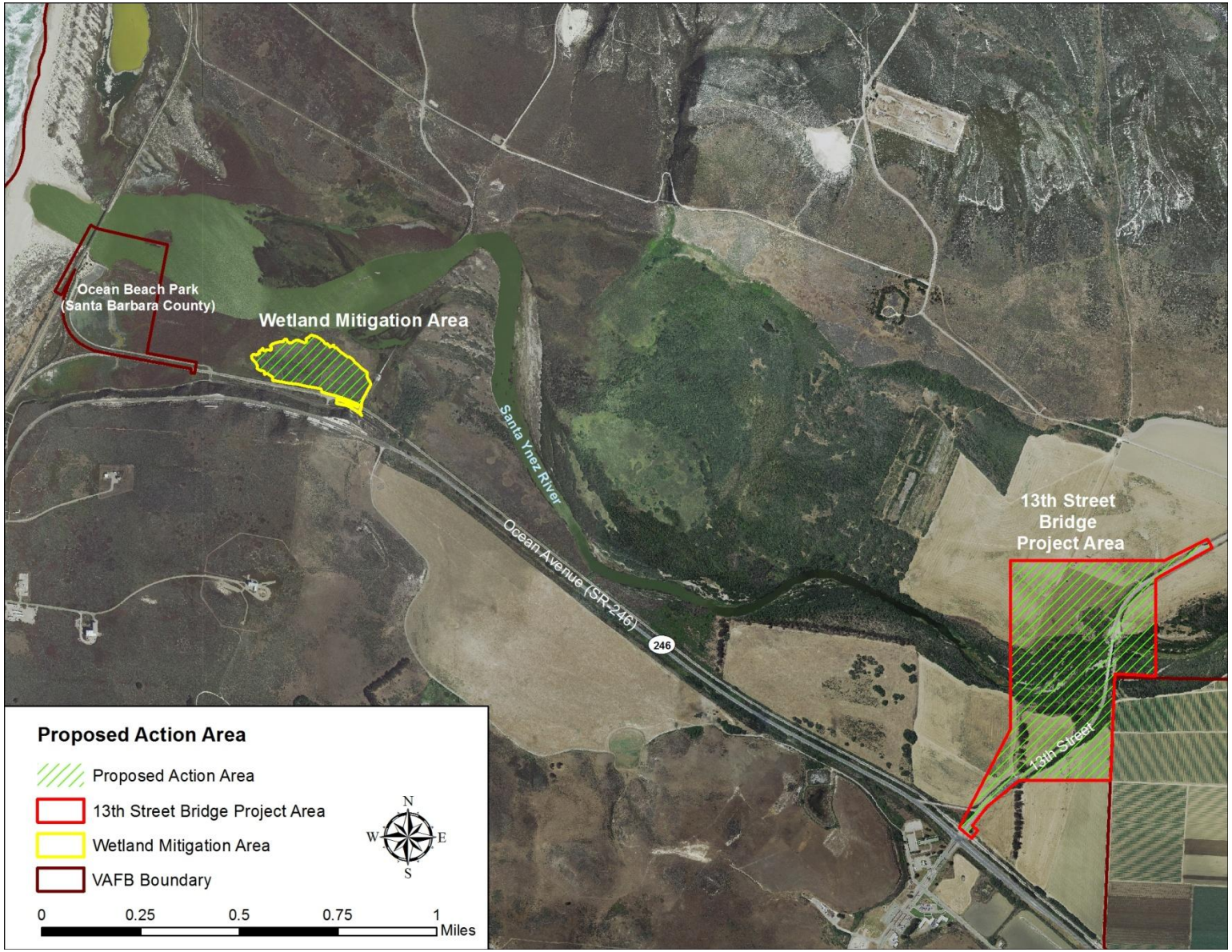

Figure 1-2. Proposed Action Area and vicinity.

1.3 Scope of the Environmental Assessment

This EA identifies, describes and evaluates the potential environmental impacts that could result from the Proposed Action, reasonable alternatives to the Proposed Action, and the No-Action Alternative for each Proposed Action, as well as possible cumulative impacts from other past, present and planned actions on VAFB. In, addition, the EA identifies environmental permits relevant to the Proposed Action. As appropriate, the EA describes, in terms of a regional overview or a site-specific description, the affected environment and environmental consequences of the action. Finally, the EA identifies management measures to avoid, prevent or minimize environmental impacts.

1.4 Interagency and Intergovernmental Coordination and Consultation

Air Force Instruction (AFI) 32-7060 requires the USAF to implement a process known as Interagency and Intergovernmental Coordination for Environmental Planning (IICEP), which is used for the purpose of agency coordination and implements scoping requirements. Through the IICEP process, VAFB notified relevant federal, state, and local agencies; and the surrounding communities of the Proposed Action and provided them sufficient time to make known their environmental concerns specific to the action (Appendix A).

The Proposed Action is a federal undertaking subject to compliance with Section 106 of the NHPA. VAFB initiated consultation with the State Historic Preservation Officer (SHPO) under 36 CFR Part 800. VAFB determined that the Proposed Action would have no adverse effect to any properties listed in or potentially listed in the National Register of Historic Places. The SHPO has concurred with VAFB's determination of no adverse effect to historic properties and (see Appendix B).

Executive Order (EO) 13175, *Consultation and Coordination with Indian Tribal Governments*, directs Federal agencies to coordinate and consult with Native American tribal governments whose interests might be directly and substantially affected by activities on federally administered lands. The Santa Ynez Band of the Chumash Indians was consulted on the Proposed Action and determined that no impacts to cultural sites would occur and a Native American monitor would be unnecessary (Appendix C).

VAFB determined that the Proposed Action may affect threatened or endangered species and consultation with the USFWS and NMFS was completed under Section 7 of the ESA (see Appendices D and E).

2 Description of the Proposed Action and Alternatives

This chapter provides detailed descriptions of equipment needs, construction requirements, and operational parameters for the Proposed Action.

2.1 Selection Standards

Four primary selection standards were identified for the bridge replacement including:

1. Hydrology and hydraulics. This standard is informed and influenced by:
   - flow volume conveyed under the bridge;
   - water surface elevations;
   - spatial extent of design floods of various frequencies (return periods); and,
   - scour potential.
2. Cost. This standard is informed and influenced by:
   - bridge size;
   - bridge type (both superstructure and substructure);
   - roadway length (with consideration of which sections will be strengthened, and which will be new/replaced); and,
   - cost of on-going bridge maintenance and maintenance of the river channel.
3. Schedule risks (environmental, constructability, demolition). This standard is informed and influenced by:
   - environmental/permitting difficulties, uncertainties, and risk;
   - constructability, including bridge type and location, access, seasonal concerns; and,
   - facilitating demolition.
4. Performance, including the final project's service performance to all anticipated service challenges. Performance is informed and influenced by:
   - hydraulic capacity; deciding this involves a combination of calculation, judgment, and cost benefit; analysis;
   - vertical Loads (this is a firm limit – the bridge must carry the specified vertical loads with performance prescribed by code allowables);
   - seismic (as with hydraulic performance, this involves a combination of calculation, judgment; and cost-benefit analysis); at the VAFB site, this decision driver is heavily influenced by liquefaction potential and how to mitigate for it;
   - scour for bridge; and,
   - scour for roadways.

2.2 Alternative A: Proposed Action

The Proposed Action consists of the following main components: construction of a new bridge on 13th Street over the Santa Ynez River and corresponding approach roads; demolition and removal of the existing 13th Street Bridge and existing approach roads; installation of a fiber optic communication cable under the Santa Ynez River, approximately 1,100 feet (ft) west of

the existing bridge; restoration of areas temporarily disturbed by construction and demolition activities; and, establishment of a Wetland Mitigation Area at the Santa Ynez River Estuary to offset any potential permanent impacts to wetlands that cannot be restored within the main project area.

The Proposed Action would occur in two project areas within the lower Santa Ynez River area; the 13th Street Bridge Project Area and the Wetland Mitigation Area. The 13th Street Bridge Project Area is defined as the area of anticipated impacts and vicinity, which includes the site of the new bridge construction and demolition of the existing bridge, relocation of utilities from the existing bridge to the new bridge, and installation of the fiber optic cable under the Santa Ynez River as depicted on Figure 1-2. The Wetland Mitigation Area is the offsite area depicted on Figure 1-2. It is anticipated that within this area, there would be as many as five acres of restored wetlands. Construction of the new bridge and demolition of the existing bridge is anticipated to begin in late spring or early summer 2015 and last approximately twelve to twenty months.

The Proposed Action Area encompasses approximately 141.5 acres, which encompasses 122.5 acres at the 13th Street Bridge Project Area and 19.1 acres at the Wetland Mitigation Area (Figures 1-2). Within these areas the estimated area of impacts from the Proposed Action is 31.1 acres at the 13th Street Bridge Project Area (Figure 2-1) and 6.9 acres at the Wetland Mitigation Area (Figure 2-10).

Demolition and removal of the existing approach roads are estimated to begin in April 2016 and last between five and six months. Installation of the fiber optic cable under the Santa Ynez River is estimated to begin in April 2015 and last approximately four months. Restoration of areas temporarily disturbed during construction and demolition activities would begin prior to the onset of first rainy season following construction. Wetland restoration at the Wetland Mitigation Area in the Santa Ynez River Estuary would begin after construction and demolition activities for the bridge and fiber optic cable had been completed and final project impacts assessed.

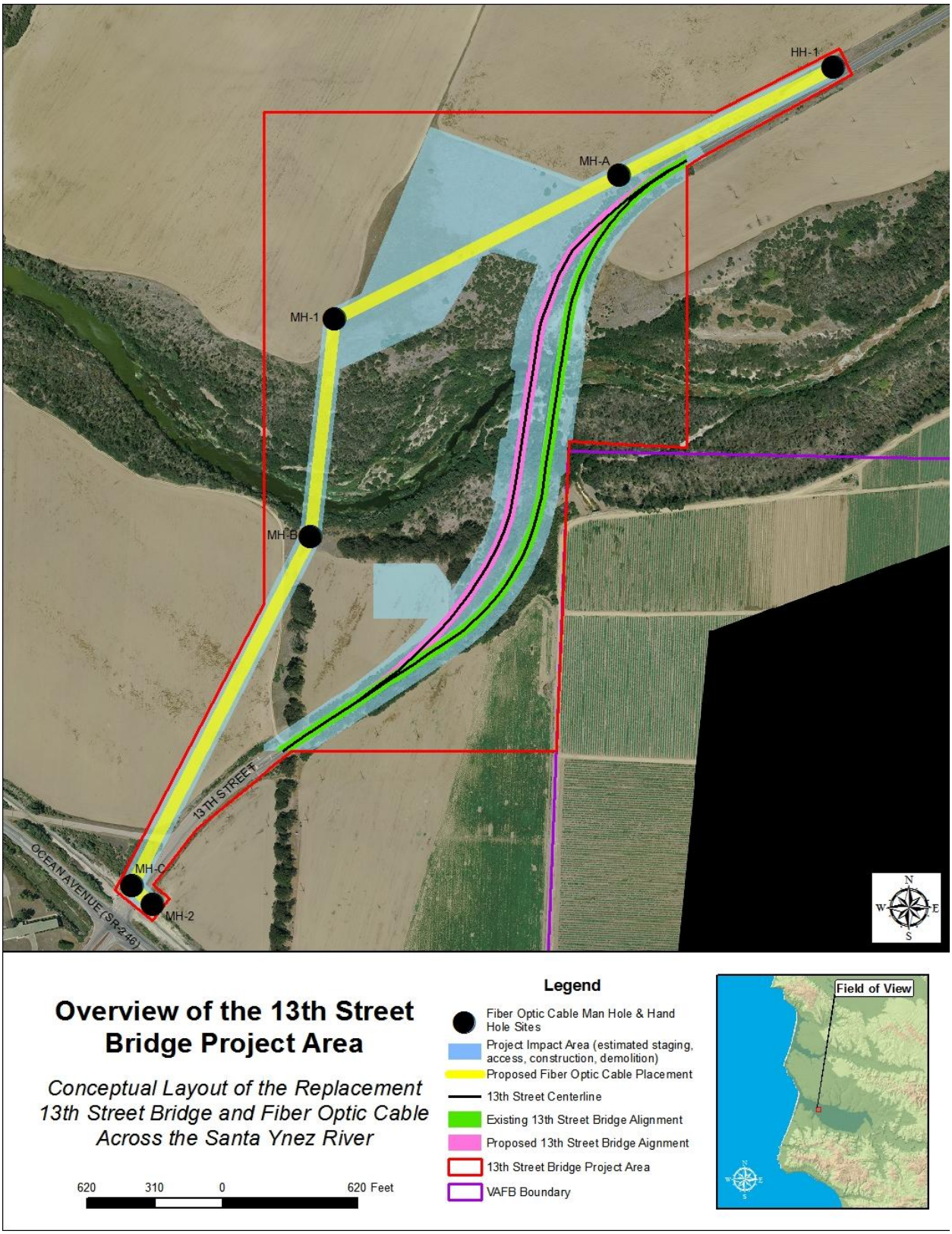

Figure 2-1. Proposed layout of the new 13th Street Bridge and fiber optic cable installation.

2.2.1 Construction of New 13th Street Bridge

2.2.1.1 Design Overview & Superstructure

The replacement bridge would be approximately 650 ft in length and 43.5 ft wide, located between 50 and 80 ft west of the existing bridge crossing the Santa Ynez River and associated riparian corridor (Figure 2-1). The new bridge would consist of two travel lanes at 12 ft each and 8 ft shoulders and bridge rails. The new location of the bridge would require realignment of the existing approach roads to provide smooth curves leading into the north and south sides of the bridge (Figure 2-1). The existing approach roads would be removed after the new bridge and new approach roads are in service. The new bridge would be built to Leadership in Energy & Environmental Design (LEED) "silver" specifications, meet current seismic loading standards, and carry the vehicle loadings from specialized missile/spacecraft transporters that will be utilizing the bridge in addition to normal highway loading. The new bridge would be completed and placed into service prior to the demolition of the existing bridge. Traffic on 13th Street would continue to use the existing bridge until the new bridge is completed.

The new bridge would also support utility and communication infrastructure required to support South VAFB. The elevation of the new bridge would be approximately 7 ft above the elevation of the existing bridge. There would be no increase in the water surface elevation. Approach roads would also be raised to match the finish grade of the bridge.

The locations of the new bridge, approach roads, access and staging areas depicted in Figure 2-1 are approximate and may change slightly with the final design; however all project activities will occur within the designated 13th Street Bridge Project Area and will have approximately the same anticipated footprint of impacted area, currently depicted as "access routes, staging areas, and direct impact areas" in Figure 2-1.

2.2.1.2 Project Area Dewatering and River Diversion

Prior to commencing bridge construction or demolition, the project site would be dewatered by installing up and down stream dams and pumping the water within the project area out of the channel to the adjacent agricultural field. Integrated into the process of dewatering would be the diversion of the active river channel through culverts passing through the project site to keep soil and debris out of the river as well as preventing flowing water from flooding the column excavations. The culverts would be maintained throughout the new bridge construction period. Once dewatering is complete, the project site would be filled with clean soil and rock from an on-base borrow pit to construct temporary roads to access the construction and demolition sites (Figure 2-1). Once the temporary access roads have been completed, additional dewatering may need to occur during the installation of the bridge foundations. This water will also be pumped to the adjacent agricultural field within the project area.

2.2.1.3 Bridge Foundation, Girder, and Piers

The bridge superstructure would be haunched cast-in-place, prestressed concrete box girder (Figure 2-2). The bridge cross section shall have 40 ft clearance between the bases of the traffic

sides and crowned with two percent slopes (Figure 2-2). The new bridge will be supported by two intermediate piers in the river bed, each consisting of 10 ft diameter drilled/cast-in-place concrete, approximately 200 ft deep, and an abutment at each end of the bridge, near the edges of the river bed, each supported on three 5 ft diameter drilled/cast-in-place concrete piles, approximately 100 ft deep. There will be two foundation piers total, both within the river bed, between 200 and 270 ft apart (Figure 2-3) as opposed to the current bridge, that has eight piers spaced 60 ft apart. The native material at the project site will require 210 ft deep foundations for both the piers in the river bed. These foundations will be 10 ft diameter columns, cast-in-drilled-hole shafts, likely installed with the use of temporary casings. The two piers will be non-equilaterally hexagonal, with the narrowest sides facing upstream and downstream. The piers will be tapered from the bottom to the top of the bridge (Figures 2-2 and 2-3). There will be no scour protection needed at the piers since fewer piers will reduce the scour potential and velocity of flows under the bridge. This will differ from the current piers on the existing bridge that have riprap scour protection which impacts the natural flow of the river.

Construction will include the erection of falsework in the dewatered river bed to form and cast the new bridge deck. Falsework support posts will likely consist of steel pipes that are vibrated into the ground. Falsework would remain in place during the rainy season if bridge deck construction has not been completed and will be designed to withstand a 5 year flood.

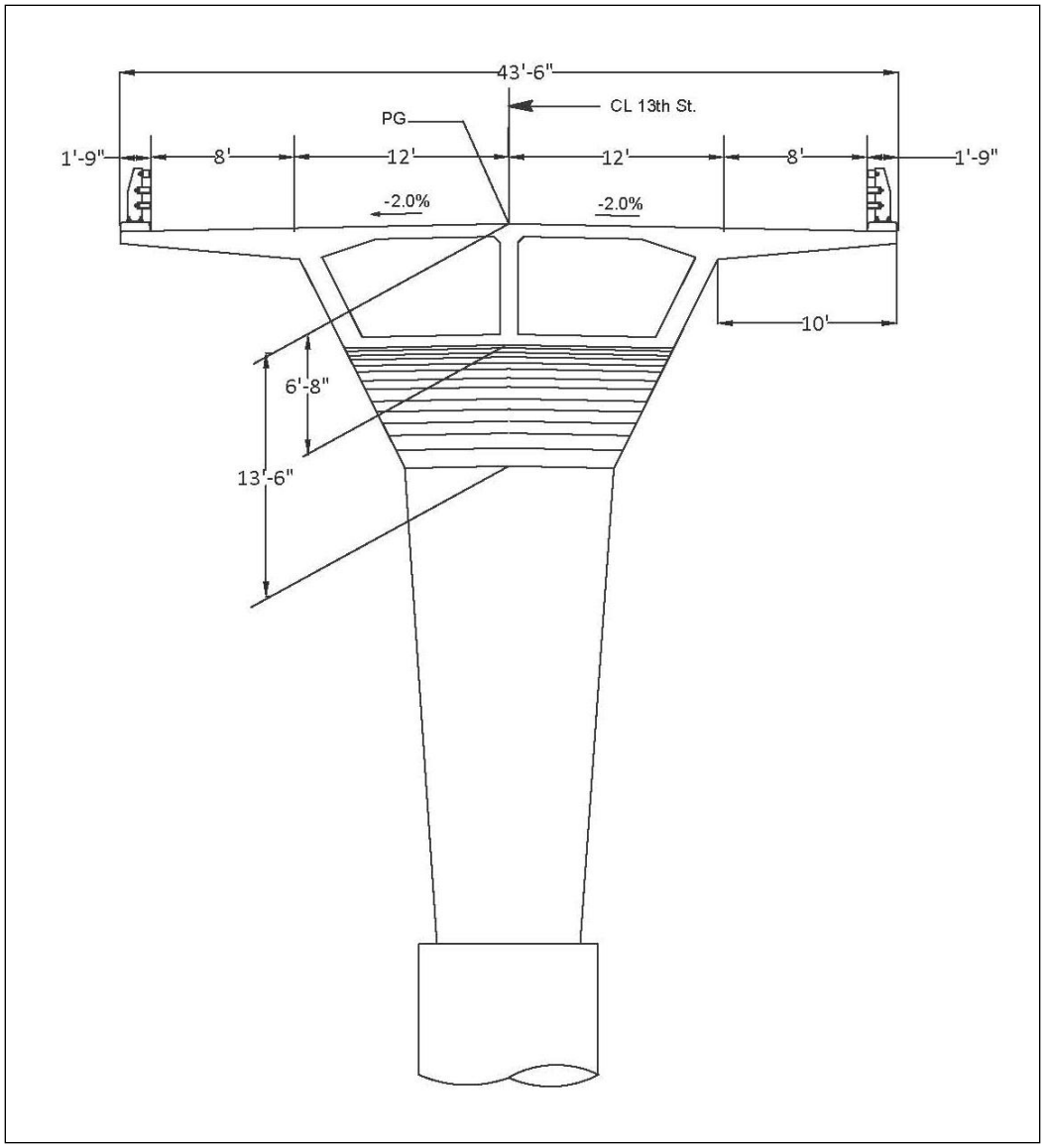

Figure 2-2. Typical representation of the prestressed concrete box girder and pier (for conceptual purposes).

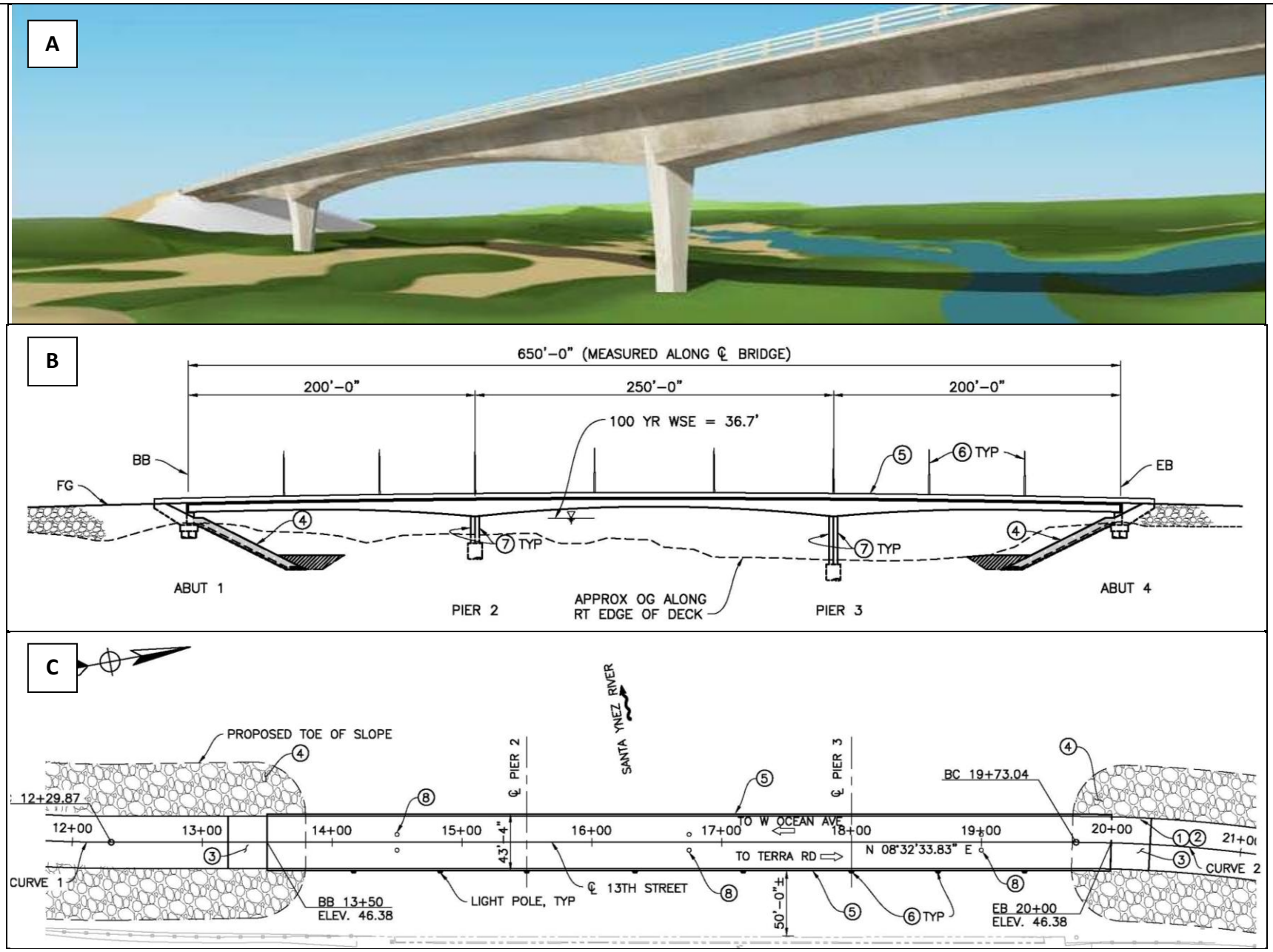

Figure 2-3. New bridge design overview: A) bridge rendering; B) refined design – profile view; C) refined design – top view.

2.2.1.4 Protection of Banks and Abutments

The abutments will be anchored at the top of the slopes on the north and south banks and located as such to create a superstructure with balanced end spans. The existing banks and the new approach fills would be protected from erosion and scour. The new north abutment would be protected by adding approximately 12.5 linear ft of rock riprap, as well as leaving the existing rock riprap, gabion baskets, concrete, and steel wall associated with the existing north abutment in place. The south abutment would be protected by installing approximately 12.5 ft of new ungrouted rock riprap at the base of the abutment. The embankments for the new approach roadways would also receive rock slope protection. The rock slope protection for the new approach roadways would be soil capped and planted with interspaced native vegetative, including willow cuttings, installed during construction. The rock riprap would be embedded below the toe of the bank and soil would be excavated and removed from the embankments to place the rock riprap. A layer of excavated soil, mixed with native plant material, would be placed on top of the excavated embankments to promote native plant growth. Excess material would be transported to a designated waste or fill site. Filter fabric would be placed below the rock to prevent it from settling and becoming ineffective in protecting the banks. The layout, composition, and thickness of the filter fabric would allow tree root growth. Native willow trees would emerge among the rock riprap to create cover for habitat. Root systems of the plants help to bind stream banks in place and provide additional bank stabilization.

2.2.1.5 Bridge Lighting

Lighting fixtures may be installed on the new bridge. If so, eight 30 ft tall light poles would be located along the edge of the east side of the bridge at 83.3 ft apart. The poles would be fitted with light-emitting diode (LED) fixtures that would provide an average of 0.4 foot candles (fc) over the entire bridge to satisfy the Illuminating Engineering Society (IES) Recommended Practice (RP) 8-00 (RP-8-00; American National Standards Institute, Inc., and IES North America 2005). The design of the light fixtures would cut-off backlight to minimize light spill behind the fixture and would not exceed 0.2 fc at the bridge edge nor exceed 0.1 fc within 10 ft north or south of the bridge edge. The maximum illumination at the ground level below the bridge would not exceed 0.1 fc. Deck-mounted lights were considered during the design process, however pole mounted lights were justified as a more efficient and effective option due to lower cost and the creation of more uniform light levels across the bridge surface.

2.2.1.6 Associated Infrastructure

The existing bridge supports communication lines, an electrical line, a water line, and a natural gas line servicing South VAFB. These lines would remain in service until they are replaced on the new bridge. The new bridge will accommodate a 10 inch water main, four-inch natural gas conduit, communication conduits, and a low voltage electrical line to power bridge lighting. Full size access maintenance ports will be required at both ends of the bridge as well as at intermediate locations on the bridge. In addition to the communication line that will be replaced on the new 13th Street Bridge, an alternate, underground communications link will be installed under the Santa Ynez River (Section 2.1.3) to ensure continued reliable

communications support during bridge construction and to provide a redundant communications link to South VAFB to support mission critical programs.

2.2.1.7 Temporary Construction Access Roads, and Staging Areas

Staging areas would be established on the terrace above the riparian corridor for storage of equipment, materials, and temporary personnel facilities and office trailers, as well as establishing a dewatering area with berms and a percolation reservoir (Figure 2-1). A vehicle wash area with containment would also be put in the staging area. Temporary access roads would be constructed into the riparian corridor and riverbed to enable construction equipment, materials, and temporary supports to be moved into position for utilization during construction. The temporary access roads would be installed across the riverbed on both sides of the proposed new bridge location and be approximately 50 ft wide to accommodate cranes and other construction equipment (Figure 2-1). Clean soil, gravel, and shale would be used for the access roads to construct a firm surface capable of supporting travel by heavy construction equipment. A partial trestle might also be constructed to provide additional access and support during bridge construction. The trestle will be designed to withstand a five to ten year flood event and may be left in place over the rainy season if construction has not been completed prior to the onset of a significant rainfall event (0.5 inches during a 24 hour period) and if acceptable to the Regional Water Quality Control Board and US Army Corps of Engineers. Prior to the construction of access roads and staging areas, vegetation within the Project Area would be cleared. To the extent feasible, vegetation would be removed mechanically; however hand clearing would be required in sensitive areas, as determined by the VAFB biologists or on-site qualified biological monitors.

All temporary fill, water diversion, and materials placed in the river channel would be removed prior to the onset of a rainfall event greater than 0.5 inch, with the possible exception of the falsework and the trestle. If necessary, in-channel construction would recommence in spring 2016 with the re-installation of access roads into the channel.

2.2.1.8 Approach Roadways

New approach roadways would be constructed on the north (approximately 950 ft) and south (approximately 880 ft) ends of the new bridge (Figure 2-1). Compacted backfill materials (sand, native fill, and roadbase) would be used to raise the approach roads from existing elevation to approximately 45 ft above sea level, or 10 ft above existing grade on the north and south banks, to meet the elevation of the new bridge. The finished two lane roadways would be between 45 and 48 ft wide, six inches of asphalt over 11 inches of aggregate base, with rock slope protection, or equivalent armorflex type protection, over non-woven filter fabric installed on 2:1 slopes on either side of the raised approach roadways (see example cross sections in Figure 2-4).

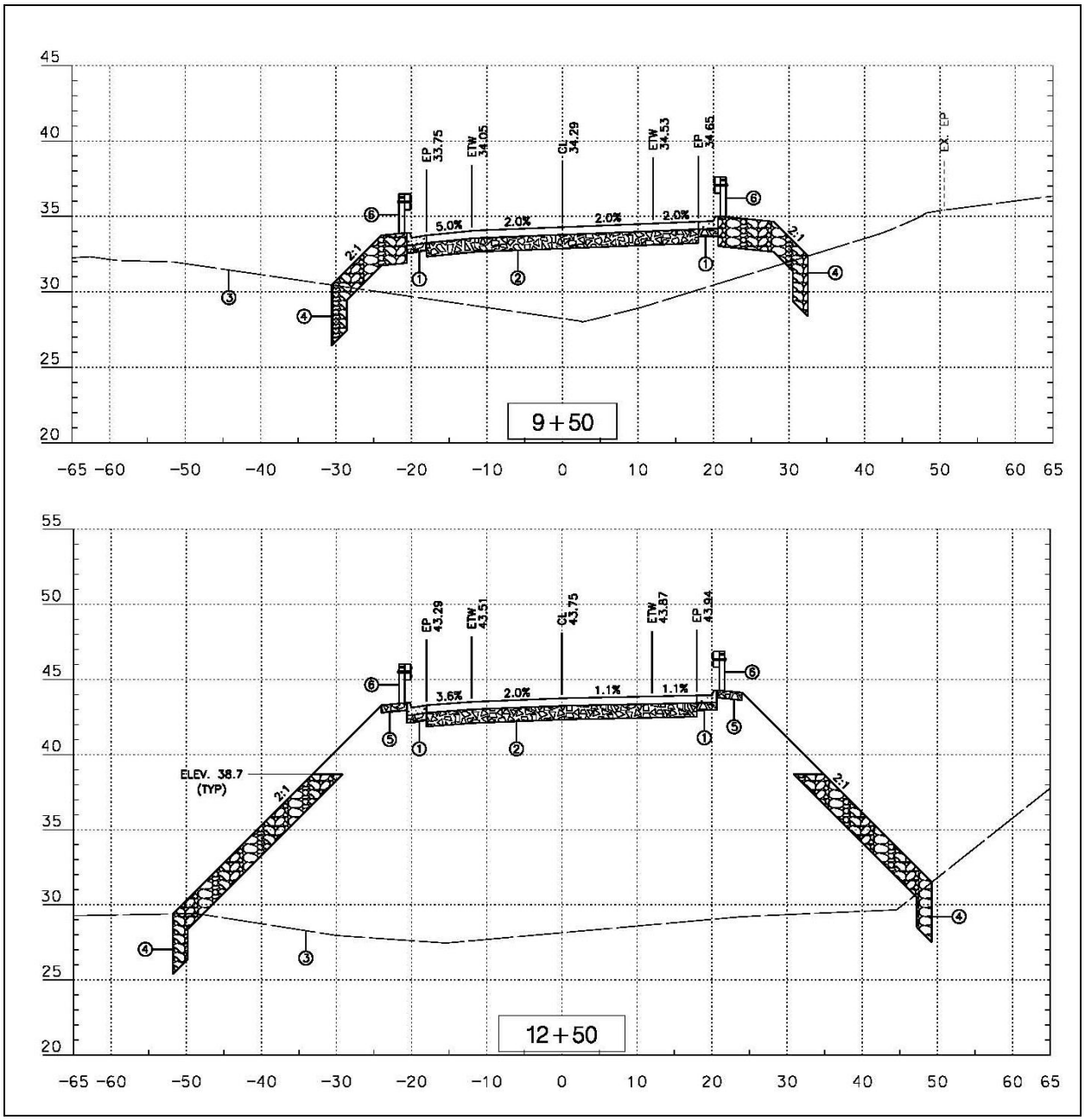

Figure 2-4. Sample cross sections of approach roadways.

2.2.2 Demolition & Removal of Existing 13th Street Bridge

2.2.2.1 Overview

The existing 13th Street Bridge over the Santa Ynez River was constructed in 1970 to replace the bridge that washed out in the 1968-1969 winter flood. The existing bridge is 500 ft long and the superstructure consists of 9 spans of reinforced concrete "T" beams (Figures 2-5 and 2-6). The bridge is supported by 8 reinforced concrete pier walls. Each of the piers is supported by a single row of approximately 59 ft long steel piles. The abutments are reinforced concrete and

are also supported by steel piles. The existing bridge is 36 ft wide between barriers and has a 4 ft wide, 2 inch thick sidewalk. A sidewalk replacement is not included in the new bridge design because the new bridge is not located within a developed area of the Base and is not a walking route. The total bridge width from outside of the bridge railing is approximately 42.5 ft.

2.2.2.2 Demolition & Removal Process

After completion of the new bridge, the existing bridge and approach roadways would be demolished and removed. Demolition would occur during the dry season (spring 2016 to the onset of significant rainfall). Prior to commencing demolition, the project site would again be dewatered, in the same manner as described in Section 2.1.1.2, by installing up and down stream dams and pumping the water within the project area out of the channel to the adjacent agricultural field. Integrated into the process of dewatering would be the diversion of the river through culverts passing through the project site spanning approximately 100 ft upstream and downstream of the project site. Once dewatering is complete, the project site would be filled with clean soil, gravel, and shale to construct temporary roads to access the demolition sites (Figure 2-1).

The existing approach roads, including the subbase, base, and bituminous surfacing, would be removed to a depth of at least 6 inches below the grade of the existing surfacing. Where no longer needed, the associated metal beam guard railing would be removed, along with any concrete anchors and steel foundation tubes. Holes and depressions left as a result of removal of the approach roads and railings would be backfilled with clean fill and graded to blend with the surrounding terrain. Demolition of the existing bridge would be accomplished utilizing an impact hammer mounted to a hydraulic excavator, a 90 pound jackhammer, and concrete saw. Explosives will not be used during the demolition process. Temporary support shoring, temporary bracing, and protective covers would be installed to support portions of the bridge as the existing support structures are removed during the demolition process. Protective shields would be used to contain debris during demolition and prevent it from falling into the river channel. Protective shields would be at least equal to 2 inch Douglas fir planking on posts at 5 ft centers. Piling, piers, abutments, and pedestals would be removed to 3 ft below the ground line or 3 ft below finished grade, whichever is lower. The concrete bridge abutments and piers would be removed in their entirety. The riprap at the base of the pilings, within the river channel, and at the piers at the south abutment will be removed in their entirety. The north abutment and associated riprap, gabion baskets, and concrete wall at the base of this abutment would be removed in their entirety (Figure 2-7).

Existing north abutment riprap, gabion baskets, concrete abutment, and steel wall will be removed and re-used for the new bridge construction (see Figure 2-7). Remaining debris would be segregated and diverted for reclamation and disposal at an offsite landfill.

Figure 2-5. Existing 13th Street Bridge piers; view from north-east bank.

Figure 2-6. Three of the eight existing 13th Street Bridge piers; view from south-west bank.

Figure 2-7. Existing north abutment: riprap, gabion baskets, concrete abutment, and steel wall.

2.2.3 Installation of Fiber Optic Cable

Fiber optic cables attached to the existing 13th Street Bridge are an essential communications link between launch platforms on South VAFB and launch control centers on North VAFB. Interruption of the main communication supply could cause a delay or other mission impact to space launches. A redundant, secure communications link is needed to ensure reliable communications support to mission essential facilities on South VAFB.

The Combat Information Transport System (CITS) upgrade along 13th Street completed in 2008 improved reliability via dual connectivity and eliminated existing network maintenance issues. An existing CITS fiber optic cable runs across the existing bridge and would be reinstalled on the new bridge. A Biological Opinion was issued for the CITS project in 2006 (USFWS 2006). A second existing overhead fiber optic cable, approximately 1,100 ft downstream of the existing 13th Street Bridge, has been found to be vulnerable. A new underground fiber optic cable would be installed near the same location as the existing overhead cable to maintain reliability of communications and address security concerns. Activities associated with the installation of the new fiber optic cable could occur at any time of the year, but would begin in spring 2015.

2.2.3.1 Maintenance Holes

Three new maintenance holes (MH-A, MH-B, and MH-C; Figure 2-1) will be installed at each bore hole site (approximate locations shown on Figure 2-1). Maintenance holes would be

precast and have a minimum interior dimension of 3 ft by 5 ft by 4 ft (width, length, depth) and be equipped with a sump, pulling irons and cable racks and torsion assisted rectangular diamond plate covers with self-latching stainless steel slam locks.

2.2.3.2 Underground Conduit Installation

Four separate 2 inch diameter high density polyethylene SIDR 11 conduits would be installed via one directional drilling/boring (approximate locations shown on Figure 2-1). The bore diameter would be 12 inches. All ducts would have a sleeve or bell end type coupling and would be watertight when assembled. With the exception of the Santa Ynez River crossing, all conduits would be installed at a minimum of 60 inches below grade. The new conduit would be installed starting at handhold (HH)-1 along 13th Street north of the bridge and paralleling the road until it intercepts the newly installed MH-A. The conduit route would then cross VAFB agriculture fields to intercept existing MH-1 approximately 700 ft north of the river. From MH-1, conduit will be bored under Santa Ynez River, between MH-1 and new MH-B, at a minimum of 25 ft below grade (as shown in Figure 2-8) and an approximate distance of 1,100 ft. From MH-B, conduit will be bored southwest under agricultural fields to intercept new MH-C, northwest of the intersection of Highway 246 and 13th Street and then finally bored to intercept existing MH-2 on the east side of 13th Street. The total length of conduit to be installed is approximately 5,500 ft.

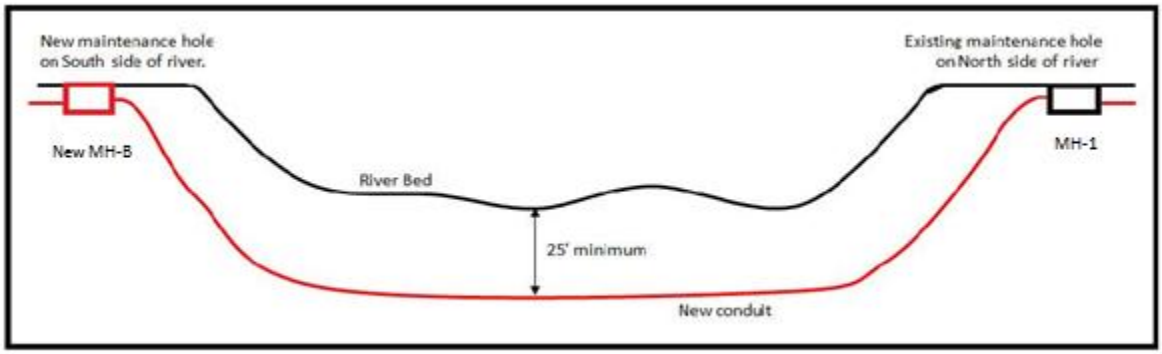

Figure 2-8. Conduit to be installed at a minimum of 25 ft below the riverbed under the Santa Ynez River.

2.2.3.3 Fiber Optic Cable Installation

Two separate Single Mode (SM), outside plant fiber optic cables (FOC) would be installed into the new conduit system. Each cable would be run through the same conduit but separate innerducts.

2.2.4 Restoration of the 13th Street Bridge Project Area

After construction and demolition is completed within the 13th Street Bridge Project Area, restoration efforts would be implemented within areas temporarily disturbed by construction activities. The proposed restoration areas are shown on Figure 2-9.

Disturbed areas would be restored to an ecologically functional state that supports the same local plant and animal species found in adjacent natural areas. Native plant species were selected on the basis of providing conditions that facilitate soil deposition, nutrient cycling, plant succession, natural regeneration, wildlife movement and erosion control. Long-term maintenance (e.g., weeding and plant replacement) and monitoring would ensure the successful restoration of native plant communities and wetland habitats to the maximum extent possible. More detailed information on the work and/or Environmental Protection Measures associated with these efforts is discussed in Sections 2.1.7.5, 2.1.7.8, and 2.1.7.9.

A Comprehensive Mitigation and Monitoring Plan would be implemented following construction and demolition activities and be implemented at both the 13th Street Bridge Project Area and the Wetland Mitigation Area. The plan will include post-construction monitoring to assess the effectiveness of the initial native plant revegetation efforts and provide guidance for follow-up maintenance, based on performance criteria described in the plan. The post-construction monitoring would focus on the extent of native species cover and the diversity and presence of non-native, invasive plant species. Eradication of invasive plants, through hand removal, mechanical removal (e.g. weed wacker), and herbicide application, is anticipated to be necessary throughout the monitoring period. The project area would be assessed on a monthly basis for watering needs and for the presence of nonnative, invasive plant species. Native plantings would be irrigated as necessary with water from the VAFB water supply, thus lightly chlorinated, or from the Santa Ynez River. Water from the Santa Ynez River would be pumped into containers for hand-watering or into a drip irrigation system. The irrigation pump intake would be placed in a 30 gallon barrel with fine mesh (1/16th inch) screened holes by a qualified biologist to protect listed species from entering the pump intake.

2.2.4.1 Construction Site Restoration

Restoration of the area impacted during the installation of the new bridge would begin during the final stages of all construction activities as access roads are removed and construction machinery and materials are removed. All access roads, surplus and waste materials, and temporary facilities would be removed from the Project Area, unless they are also required for the demolition of the existing bridge. To the extent feasible and practicable, the site contours, river channel, and habitat types would be restored to pre-construction conditions. Prior to removal of access roads, a backhoe would be used to assist in the installation of willow cuttings at or near the water table along both banks of the channel. A water stinger would be used to install pole cuttings at 5 to 8 ft deep on the banks of the channel, near riprap, and in other locations where a backhoe cannot access. The water stinger will utilize water pumped from the Santa Ynez River to operate. The water pump intake would be placed in a 30 gallon barrel with fine mesh (1/16th inch) screened holes by a qualified biologist to protect fish and wildlife from entering the pump intake. All access roads that are not needed for the demolition of the existing bridge would be removed. All exposed soil areas, including upland staging and access areas, would be stabilized with vegetation. An upland seed mix that is approved by the base botanist would be applied. Weed-free mulch would be used to protect the seed and provide temporary stabilization. Irrigation would be used in upland areas as needed to achieve the establishment of 70 percent surface vegetation coverage.

2.2.4.2 Demolition Site Restoration

Site restoration would begin at the completion of the demolition and removal of the existing bridge. Any remaining access roads, surplus and waste materials, and temporary facilities would be removed from the Project Area. To the extent feasible, the site contours, river channel, and habitat types would be restored to mimic the surrounding natural conditions. As access roads would be removed, construction equipment (e.g. backhoe) would be used to install willow cuttings at or near the water table along the banks of the channel. A water stinger would be used to install willow pole cuttings at 5 to 8 ft deep on the banks of the channel, near riprap, and in other locations where a backhoe cannot access. The water stinger will utilize water pumped from the Santa Ynez River to operate. The water pump intake would be placed in a 30 gallon barrel with fine mesh (1/16th inch) screened holes by a qualified biologist to protect fish and wildlife from entering the pump intake. Any remaining disturbed areas would be restored to native vegetation under direction of VAFB biologists or on-site qualified biological monitors. If feasible, the biologists would ensure that all disturbed areas are restored, at a minimum, to the original condition, and, if feasible, enhance the wetlands and riparian corridor within the project footprint to compensate for the net loss of wetlands or other sensitive plant communities that may occur due to the construction and demolition associated with the bridge replacement and fiber optic cable installation. All exposed soil areas, including upland staging and access areas, would be stabilized with vegetation. An upland seed mix would be approved by VAFB 30 CES/CEIEA. Weed-free mulch would be used to protect the seed and provide temporary stabilization. Irrigation would be used in upland areas as needed to achieve the establishment of 70 percent surface vegetation coverage.

2.2.4.3 Fiber Optic Cable Site Restoration

All grounds disturbed during installation of the maintenance holes, conduit, and/or FOC would be restored to pre-activity conditions. Any bare soils at the completion of the project would be seeded with a seed mix representing an appropriate palette of native species, to be determined by a qualified biologist.

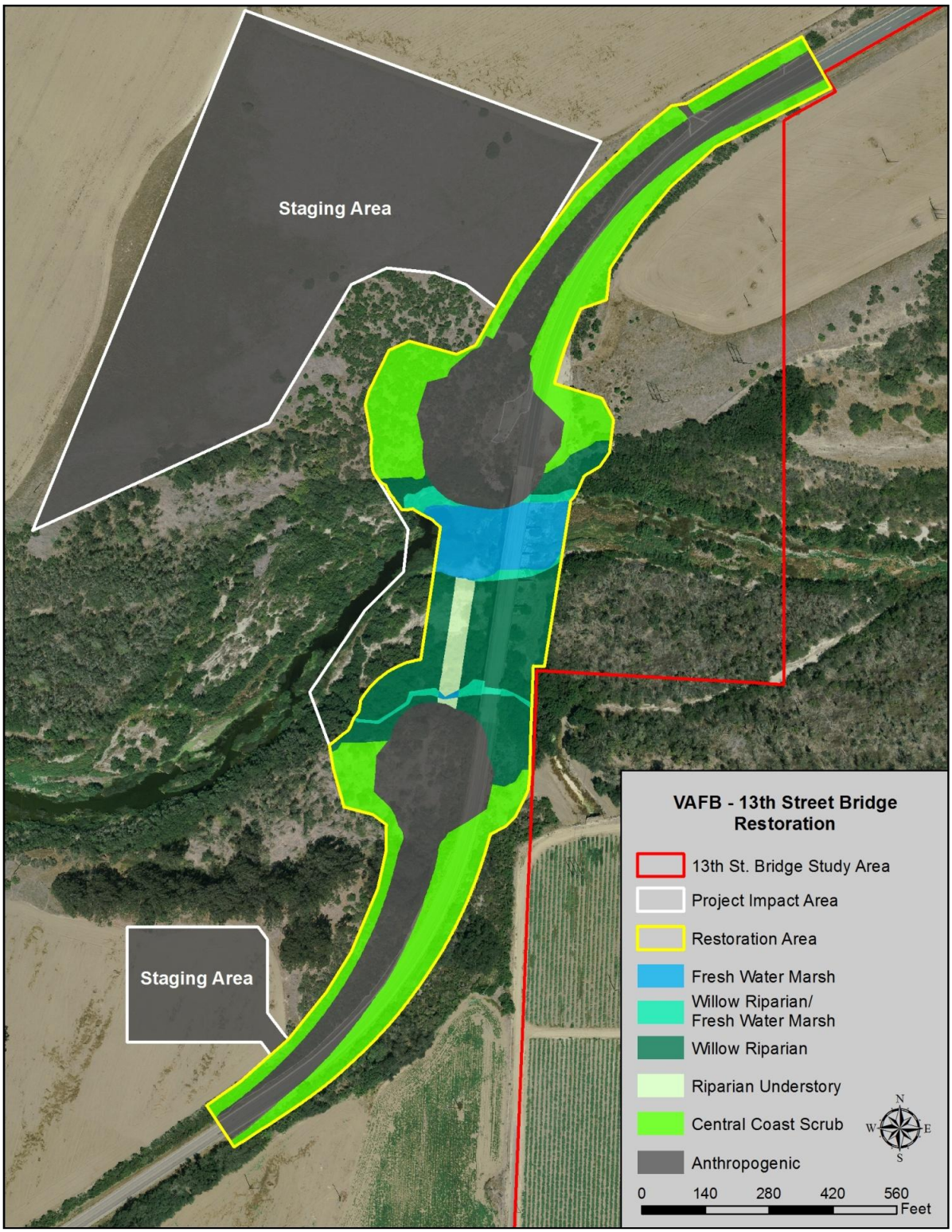

Figure 2-9. Proposed restoration areas within the 13th Street Bridge Project Area.

2.2.5 Wetland Mitigation Area

2.2.5.1 Background

The U.S. Army Corps of Engineers and Regional Water Quality Control Board strive to maintain a "no net loss" of value and physical size of wetlands and other water bodies. The requirements of the Clean Water Act Section 401 and 404 permits that will be issued for the Proposed Action will include mitigation measures for temporary and permanent impacts to wetlands. Temporary impacts to wetlands would be mitigated at a 1:1 ratio (area mitigated: area impacted) by restoring disturbed areas within the 13th Street Bridge Project Area to pre-construction conditions. Permanent impacts to wetlands are required to be mitigated at a 2:1 (area mitigated: area impacted) for restored or enhanced wetlands. The design of the new bridge and demolition of the existing bridge will improve wetland and aquatic habitat by reducing the obstruction of flow and allowing the river more area to meander. However, it is possible that the required mitigation for permanent impacts to wetlands cannot be achieved within the 13th Street Bridge Project Area. Therefore, an area adjacent to the Santa Ynez River estuary was identified for wetland mitigation, if necessary, to meet the 401 and 404 permit criteria. No net loss of wetlands is anticipated based on the bridge design; however, impacts to wetlands could vary during bridge construction. Therefore, off-site wetland mitigation would be implemented only if a net loss of wetlands occurs as a result of bridge construction and is included as a potential component of the Proposed Action. The proposed wetland mitigation would include re-establishment of up to 4.02 acres of currently impaired estuarine habitat along the southeast portion of the Santa Ynez River estuary (Figure 2-10). The final acreage of re-establishment of wetland and/or other aquatic characteristics and functions within the designated mitigation area will be dependent on the acreage of net loss of wetlands during bridge construction.

2.2.5.2 Wetland Mitigation Area Description

The portion of the Santa Ynez River estuary near the proposed Wetland Mitigation Area is currently from 1.5 to 4 ft higher than the requisite elevation to create the habitat conditions to support a broad spectrum of native salt marsh plant and animal species (Ball & Robinette 2012). The current ground elevations within the Wetland Mitigation Area are the result of more than 70-years of sediment accretion caused by river flow conditions influenced by old 35th Street Bridge abutments. Though that bridge was demolished in 1970, the structural abutments on either bank still remain in place. Decades of high flow events have caused a gradual buildup of sediment immediately downstream of these barriers. This has caused the southwest portion of the estuary to transition from estuarine habitat to upland habitat, dominated by a mix of invasive broadleaf plants and native central coast scrub species. As a result, this area no longer functions as wetland habitat and does not support obligate estuary species. Grading this area to an average elevation of approximately 10 ft would cause the habitat to transition from an invasive species dominated upland, currently habitat for species such as red-winged blackbird (*Agelaius phoeniceus*) which pose a BASH risk, to an irregularly flooded middle salt marsh wetland habitat dominated by pickleweed (*Salicornia virginica*), alkali heath (*Frankenia salina*), saltgrass (*Distichlis spicata*), and fleshy jaumea (*Jaumea carnosa*). At

this elevation, the area would not be regularly inundated with water, therefore would not create waterfowl habitat. Instead, the mitigation area would serve as refuge habitat for tidewater goby (TWG; *Eucyclogobius newberryi*) during irregular high flow events and would support small passerine bird species, such as savannah sparrow (*Passerculus sandwichensis*),

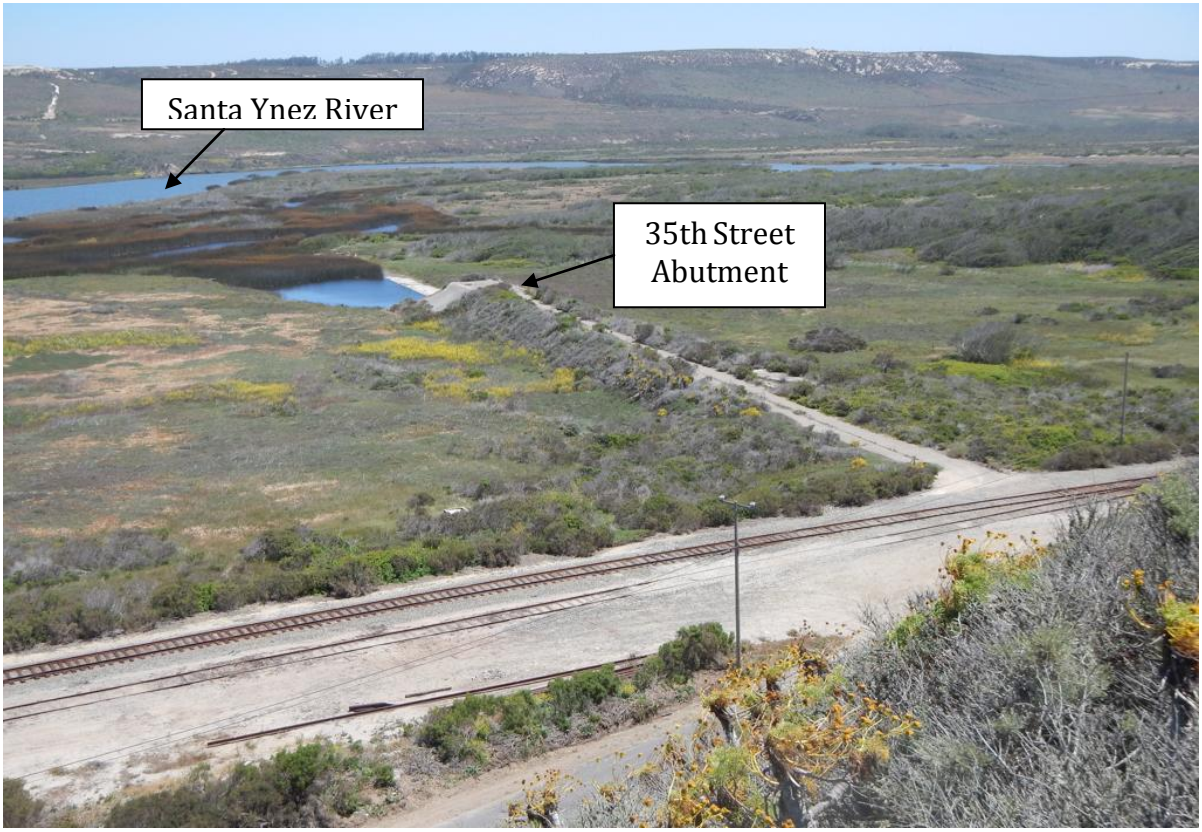

Figure 2-10. Remnant 35th Street Bridge abutment and causeway on the south bank of the Santa Ynez River.

that do not present a BASH concern. In addition, coastal estuarine wetland is one of the most imperiled habitats in California.

The proposed wetland mitigation would require grading and relocation of between 10,000 and 11,000 cubic yards (CY) of accumulated sediment at the south eastern edge of the estuary (Figure 2-11). Prior to grading activities, the vegetation within the site, which is predominately non-native (see Section 3.2), would be grubbed with a masticator. The restoration area will then be graded to an average elevation of approximately 10 ft. Application of herbicides would be used as discussed in Section 2.1.7.7, 2.1.7.9.

Grading would occur between 15 August and 28 February to avoid impacts to nesting birds and prior to the onset of the rainy season. Grading would be postponed if the restoration area is inundated (due to elevated estuary water levels) until water levels subside. All excavated soil would be transferred 800 to 1,100 ft for deposition at a 2.1 acre site at the southwestern edge of the remnant 35th Street Bridge causeway and abutments (Figure 2-11) or used as soil

amendment on the agricultural field immediately south of the site on Ocean Ave. If the soil is placed at the southwestern edge of the causeway, the soil would be deposited in a gradually sloped lens along the embankment and restored as native upland habitat. Since removal of the 35th Street Bridge abutments are not part of the Proposed Action, they will remain in place and sediment may build up in the Wetland Mitigation Area during future high flow events.

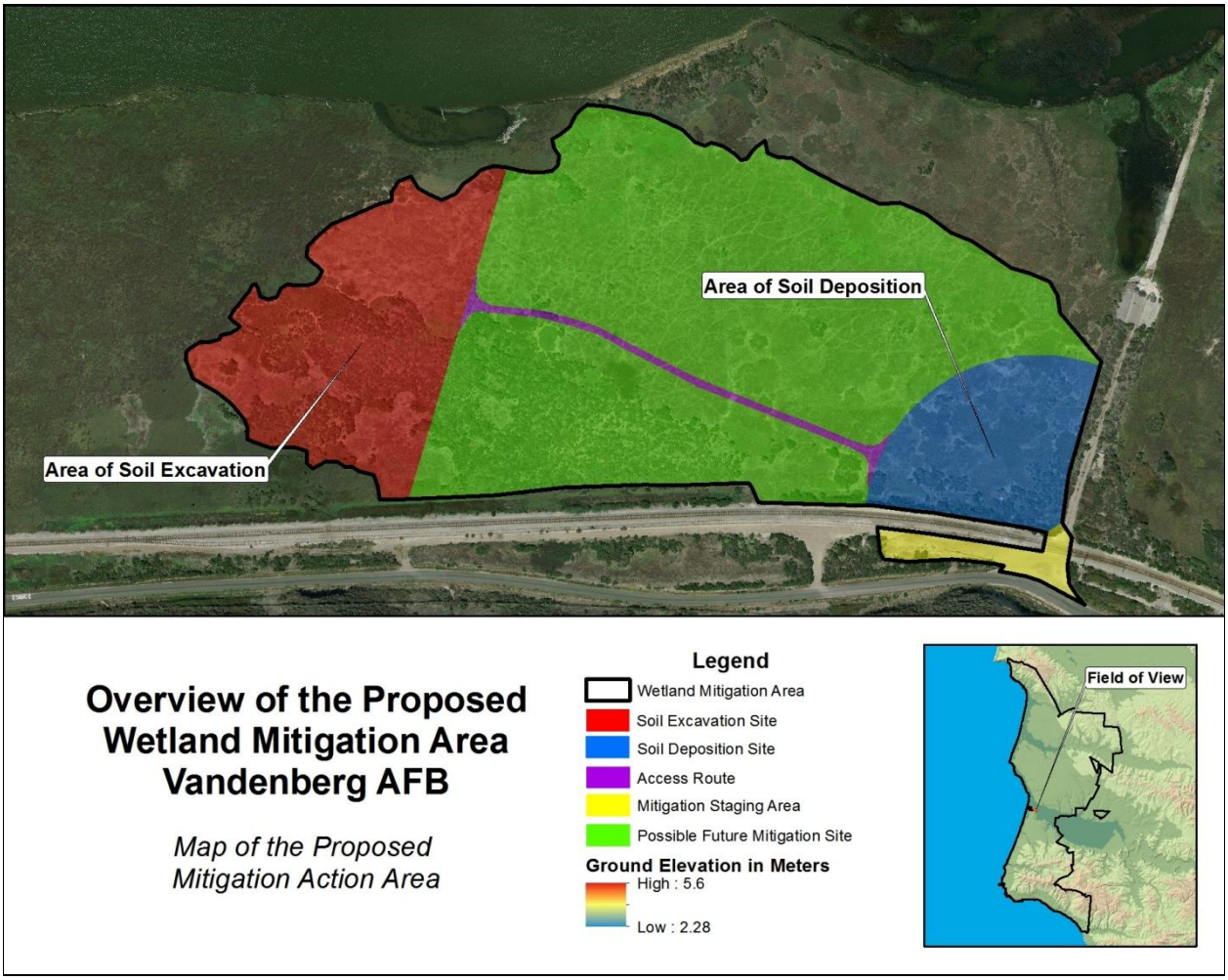

Figure 2-11. Proposed Wetland Mitigation Area and underlying topography. *Note: the area in green would not be affected by the Proposed Action; it was a result of prior planning discussions. The area in red is the proposed Wetland Mitigation Area.*

At the completion of grading activities, all disturbed soil would be sown with one of two native seed mixes. The portion of the site that was excavated to a lower elevation would be seeded with a salt marsh seed mix of pickleweed, alkali heath, saltgrass, and fleshy jaumea, applied at a recommended rate of 10 pounds per acre (pers. comm., S&S Seeds, Inc.). The sediment deposition area and access roads would be seeded with a native grass seed mix at a rate of a 35 pound per acre (pers. comm., S&S Seeds, Inc.). This native grass mix would include saltgrass, alkali rye (*Elymus triticoides*), meadow barley (*Hordeum brachyantherum*), and giant wild rye (*Elymus condensatus*). During the second winter following excavation, grading and seeding,

native broadleaf container plantings would be installed in the areas seeded with native grasses. Establishing native grasses within the site prior to broadleaf container plantings allows for one to two years of aggressive broadleaf invasive species control to exhaust the weed seed bank at the site prior to container planting. Invasive control and site maintenance will include manual, mechanical (e.g. weed wacker), and herbicide treatments.

Native broadleaf plantings in four-inch containers would be installed at a spacing of six feet on center. For protection of the plantings, each planting would be protected by a gopher basket and a wire herbivore exclosure cage. Container plantings would be installed during the last week of October and the first week of November, unless directed otherwise in consideration of weather forecasts. Plantings would receive an initial watering of approximately 0.5 to 0.75 gallon per plant using the VAFB water supply (lightly chlorinated) at the time of planting (approximately 0.5 to 0.75 gallon per plant). Additional watering would occur once every two week period that receives less that than 0.25 inches of rainfall until 15 April. At that point, watering would be discontinued to allow the plants to acclimate to the natural central California climate. In addition to container plantings, a native upland broadleaf seed mix (palette to be determined) would be applied to the upland portion (soil deposition area) of the site at a rate of 25 pounds per acre (pers. comm., S&S Seeds, Inc.).

Post-construction monitoring would be conducted to assess the effectiveness of the initial revegetation efforts and provide guidance for follow-up maintenance, based on performance criteria that will be described in the Maintenance and Monitoring Plan. The post-construction monitoring would focus on the extent of native species cover and the diversity and presence of non-native, invasive plant species. Eradication of invasive plants, through hand removal, mechanical removal (e.g. weed wacker), and herbicide application, is anticipated to be necessary throughout the monitoring period.

2.2.6 Project Equipment Needs

The exact type of equipment that would be used during construction may vary slightly from the projections below, depending on contractor capabilities. However, these estimates provide a basis for analyzing related issue areas such as air quality, noise, and traffic.

The two bridge foundations, which will be used to support the piers, would be drilled with a 100 ton crane w/ auger drill attachment to a depth of approximately 200 ft. The Proposed Action would require imported asphalt and concrete, which would be obtained from batch plants in Lompoc or Santa Maria in Santa Barbara County. Truck access to the 13th Street Bridge project area would be through the Lompoc Gate. The haul route from the Lompoc Gate to the proposed project area would be: travel north on Pine Canyon Road, turn south on California Boulevard and south on 13th Street. Dust control would be provided during grading operations by spraying water from a water truck. Equipment that would be used during the construction of the new bridge and during the demolition of the existing bridge and approach roadways is listed in Table 2-1.

Table 2-1. Estimated equipment usage under the Proposed Action.

Expected Equipment	Estimated Duration*
1-100 Ton Crane w/ Drill Attachment (230 hp)	1 month
1-10,000 Gallon Storage Tank	1 month
1-Slurry Recirculation Pump (30 hp)	1 month
1-Cat 336 Track Excavator or similar (300 hp)	4 months
20-Bottom Dump Trucks (400 hp)	2 months
2-Cat 623 Scraper (400 hp)	2 months
1-Cat 824 Dozer (350 hp)	2 months
1-Cat 966 Loader or Similar (260 hp)	18 months
1-100 Ton Crane (230 hp)	7 months
10-Concrete Mixer Trucks (250 hp)	40 days
1-Concrete Pump (350 hp)	40 days
1-Cat 450 or similar Backhoe (140 hp)	18 months
20-Various Project Pickup Trucks (150 hp)	18 months
1-Forklift (170 hp)	18 months
1-Cat 140M or similar Grader (200 hp)	18 months
1-Roller (150 hp)	6 months
1-Cat 613 Scraper or similar (175 hp)	6 months
1-Asphalt Paver (220 hp Typ)	2 weeks
1-4,000 gal Water Truck (250 hp)	18 months
Delivery Trucks	**Estimated Trips**
Concrete Delivery Trucks (250 hp)	720 round trips
Other Delivery Trucks (Rebar, Form Material, Etc.) (400 hp)	600 round trips
Bottom Dump Trucks for Dirt Import (40,000 cy; 400 hp)	3,000 round trips
Base and Asphalt Concrete Delivery Trucks (400 hp)	500 round trips

* Estimated usage is based on five working days per week at eight hours per day.

2.2.7 Environmental Protection Measures

Implementation of the environmental protection measures (EPMs), outlined below, should avoid or minimize potential adverse effects to various environmental resources during implementation of the Proposed Action. Mandatory EPMs (denoted by “shall” or “would”) are part of the project design and will be implemented as part of the Proposed Action so as to avoid, minimize, reduce and/or compensate for the anticipated environmental impacts. Discretionary measures (denoted by “may” or “could”) may or may not be implemented to further reduce environmental impacts.

2.2.7.1 Air Quality

The Santa Barbara County Air Pollution Control District (SBCAPCD) applies the following dust control measures to decrease fugitive dust emissions from ground disturbing activities:

- Water – preferably reclaimed – shall be applied at least twice daily to dirt roads, graded areas, and dirt stockpiles to prevent excessive dust at the staging areas. Watering frequency would be increased whenever wind speed exceeds 15 miles per hour.
- After completion of construction activities, disturbed soil shall be treated by watering, revegetating, or spreading soil binders to prevent wind erosion of the soil.
- All fine material transported off-site shall be either sufficiently watered or securely covered to prevent excessive dust.
- All haul trucks would be required to exit the site via an access point where a gravel pad or grizzly has been installed.
- Stockpiles of soil or other fine loose material shall be stabilized by watering or other appropriate method to prevent wind-blown fugitive dust.
- On-site vehicle speeds shall be limited to 15 miles per hour.
- Ground disturbance shall be limited to the smallest practical area and to the least amount of time.
- Designate personnel shall monitor project activities to ensure that excessive dust is not generated at demolition sites.
- The Proposed Action shall comply with storm water management plans, including Best Management Practices (BMPs) to reduce dust emissions.
- Any portable equipment powered by an internal combustion engine with a rated horsepower of 50 bhp or greater used for this project shall be registered in the California State-wide PERP or have a valid Santa Barbara County Air Pollution Control District (SBCAPCD) Permit to Operate. Examples of such equipment are portable generators, compressors and light-carts. Copies of each registration or permit along with fuel usage and hours of operation must be submitted to the 30 CES/CEIEC Air Quality section at the end of the project or by 15 January, whichever occurs first.
- Asphalt paving activities shall comply with APCD Rule 329, Cutback and Emulsified Asphalt Paving Materials.
- Construction and demolition activities shall comply with SBCAPCD Rule 345, Control of Fugitive Dust from Construction and Demolition Activities. Under Rule 345, construction, demolition, and/or earthmoving activities are prohibited from causing discharge of visible dust outside the property line, and must utilize standard BMPs to minimize dust from truck hauling, track-out/carry-out from active construction sites, and demolition activities.
- Off-road construction equipment shall be compliant with all Federal, State and local regulations. A description of each piece of equipment to include make, model, serial number and rated brake-horsepower, along with fuel usage and hours of operation

must be provided to the 30 CES/CEIEC Air Quality section at the end of the project or by 15 January, whichever occurs first.

The following control measures may be implemented to decrease diesel emissions, if feasible:

- When feasible, the contractor may use equipment powered with federally mandated "clean" diesel engines.
- The size of the engine in equipment and number of pieces of equipment operating simultaneously for the project should be minimized.
- Engines should be maintained in tune per manufacturer or operator's specification.
- Ultra low sulfur diesel fuel (15 parts per million by volume [ppmv]) may be used for all diesel equipment.
- Environmental Protection Agency (EPA) or California Air Resources Board (CARB) certified diesel catalytic converters, diesel oxidation catalysts, and diesel particulate filters may be installed on all diesel equipment.
- CARB developed idling regulations may be followed for trucks during loading and unloading.
- When practicable, diesel equipment should be replaced with electrical equipment.
- The construction period should be lengthened during smog season (May through October), to minimize the number of vehicles and equipment operating at the same time.
- Alternatively fueled construction equipment, such as compressed natural gas (CNG), liquefied natural gas (LNG), or electric, should be used if feasible (e.g., for the well logging unit, Phase 2 crane and forklift, etc.).

2.2.7.2 Biological Resources

The Biological Opinions received from the USFWS and the NMFS are attached as Appendices D and E. Although anticipated/proposed measures are listed below, the final regulatory documents are the binding documents as they may have more specific requirements as they represent the end of the consultation process. This is also the case with the permits to be obtained under the CWA (i.e., Sections 401, 402, and 404).

2.2.7.2.1 General Protection and Monitoring Measures

The following protection and monitoring measures would apply to all aspects of the Proposed Action to protect and minimize effects on biological resources.

- Qualified biological monitors, approved by NMFS, USFWS, and 30 CES/CEIEA, including personnel who are familiar with and possess necessary permits to capture, handle, and release TWG, southern steelhead, and California red-legged frog (CRLF; *Rana draytonii*), shall be present at all times during construction and monitor activities throughout the length of the project to minimize impacts to all special-status plant and wildlife species, jurisdictional wetland resources, and other native plant communities found in the project area. The biological monitors shall be responsible for delineating areas where

special-status species are located or concentrated, relocating special-status species in jeopardy of being killed or injured by construction and dewatering activities, and inspecting equipment and equipment staging areas for gas and oil leaks.

- Qualified biologists shall brief all project personnel prior to participating in project implementation activities. At a minimum, the training would include a description of the listed species and sensitive biological resources occurring in the area, the general and specific measures and restrictions to protect these resources during project implementation, the provisions of the ESA and the necessity of adhering to the provisions of the ESA, and the penalties associated with violations of the ESA.
- Disturbances in the riverbed shall be the minimum extent necessary to accomplish project objectives, and limited to placement of the temporary access road and culverts, and excavation of the foundation supports.
- All excess materials excavated shall be removed from the riverbed and transported to a designated waste or fill site.
- All material used (i.e. gravel, sand, fill material, wattles etc.) would be from weed-free sources. Only 100 percent bio-degradable erosion control materials (e.g. fabrics, wattles, etc.) would be left in place following project completion.
- Portable toilets would only be placed over paved surfaces or within staging areas; portable toilets will not be placed within the river channel or riparian corridor.
- The construction contractor would provide the biological monitors with a schedule of planned construction activities at least 48 hours in advance.
- All human generated trash at the project site shall be disposed of in proper containers and removed from the work site and disposed of properly at the end of each workday. All construction debris and trash shall be removed from the work area upon completion of the project.
- Prior to using equipment at the project site, all vehicles shall be cleaned of weed seeds and foreign soil. During on-site entry and exit periods, all equipment vehicles shall be inspected for and cleaned of weed seeds to prevent the introduction and spread of exotic invasive plant seeds. At a minimum, both manual removal of soil and debris followed by a wash system with containment will be accomplished. The vehicle wash system may be within the staging area. Vehicles will be high pressure spray-washed for a duration of at least 6 minutes, especially on the undercarriage, wheel wells, wheels, and bumper areas by a well-trained wash crew. Any skid plates shall be removed and cleaned prior to transport to the project site. Foreign soils and weed seeds shall be collected and properly disposed during cleaning. All equipment intended to be used on site would be inspected by a biological monitor prior to entering the Proposed Action Area to verify proper cleaning has been conducted. Any equipment found to contain weed seeds or foreign soils will not be allowed entry to the project site.
- A qualified biologist shall inspect any equipment left overnight within the exclusion area and staging areas prior to the start of work, equipment would be checked for presence of special status species in the vicinity and for fluid leaks. All materials and equipment would be removed from the Santa Ynez River channel to the staging areas at the end of

each day to the greatest extent feasible. If materials are to be staged within the bounds of the river channel overnight, they would be ringed with additional exclusionary fencing.

2.2.7.2.2 Vegetation Resources

- To the greatest extent possible, removal of native vegetation and plant communities, particularly riparian woodland and wetland vegetation, would be minimized. All small willows would be coppiced and tall willows would be limbed to a height of five ft, when practicable to enable them to regrow after project completion.
- Vegetation removal shall be monitored by a biologist capable of identifying federally endangered La Graciosa thistle (*Cirsium loncholepis*).
- When and where practicable, non-native vegetation within the project areas may be removed during project related activities under the direction of the biological monitor.

2.2.7.2.3 Fish and Wildlife Resources

- Prior to the onset of construction activities, the name(s) and credentials of the biologist(s) who would conduct the monitoring, surveying, species relocation, and other biological field activities shall be submitted to the USFWS and NMFS for their approval.
- To avoid transferring disease or pathogens between aquatic habitats during the course of surveys and handling of amphibians, the biologist(s) shall follow decontamination procedures described in the Declining Amphibian Population Task Force's Code of Practice.
- Wildlife and special status species, including TWG, southern steelhead, and CRLF, shall be removed and relocated from an **exclusion area** within the 13th Street Bridge Project Site by utilizing the following procedures and timeline. These activities would be accomplished prior to the start of construction and only under the direct supervision of a qualified biologist. If the project area is separated into multiple exclusion areas, the procedures outlined below would be followed for each exclusion area.

  Note: to ensure impacts to the endangered steelhead are avoided and/or minimized, the coffer dam diversion shall be installed no earlier than 1 June of each project year. If evaluation of flow conditions in the watershed, weather forecast, and steelhead migrant trapping information indicate that the upstream migration period for adult steelhead in the Santa Ynez River is likely complete for the given year, diversions can be installed as early as 15 April, following coordination, review, and agreement from NMFS.

  a. An **exclusion area** would be identified where all terrestrial and aquatic areas that will be directly impacted by construction related activities (i.e. areas requiring the removal of vegetation, placement of fill, and removal/exclusion of sensitive species). This exclusion area would encompass, at a minimum, the span of river to be diverted through culvert pipes and any areas to be cleared and/or temporarily filled.

b. Within the exclusion area, all aquatic vegetation within and along the river would be removed by hand or with hand tools under supervision of a qualified biologist.

c. All low growing terrestrial vines, shrubs and herbaceous plants, within the exclusion area would be cut at the ground level and removed with hand tools under supervision of biological monitor; all cleared vegetation would be transported off-site daily, or stocked piled in an area inaccessible to terrestrial wildlife.

d. Within the exclusion area, all small willows would be coppiced and tall willows would be limbed to a height of five ft, when practicable, under the supervision of a qualified biologist. In order to minimize the loss of riparian habitat, the removal of willows would only occur when necessary (if impeding construction or demolition activities and/or causing a safety concern) and be determined on a case by case basis through consultation between the site supervisor and biological monitor, as construction progresses.

e. Except where it spans the river, the exclusion area would be encircled with 5 ft high silt fencing, anchored with metal T-posts, and buried along the bottom edge to exclude terrestrial wildlife, including CRLF, from entering the site (note: 3 ft silt fencing has been found to be inadequate in excluding CRLF during prior projects on VAFB).

Figure 2-12. Installation of concreted collared culvert.

f. Day 1; following completion of a-e. All following activities will be conducted under the supervision of a qualified biologist.

i. At the site of the upstream river diversion point, a dam would be constructed by hand. Prior to dam construction, blocknets with mesh not wider than 1/16th of an inch would be set up immediately up and down stream of the location of the dam and all special status species would be removed via seine and dip-netting by qualified biologists (this process is hereafter referred to as "de-fishing"). Note: blocknets require continuous monitoring and maintenance to prevent them from becoming clogged and water scour underneath or around; it is <u>not feasible</u> to leave nets in place overnight without their effectiveness being compromised.

ii. The following applies to sand bag dams: Following de-fishing the base of the dam would be installed, upon which a concrete collared culvert would be lowered into place (Figure 2-12). The dam base will provide a level surface

on which to install the culvert. Minimally, the dam base would be 12 ft wide and consist of 4 or more tiers of cross stacked sand bags, with the goal of having the culvert half-submerged when lowered into place. The sand bags must be filled with coarse grained sand, as gravel will not effectively block flow. Previous attempts on VAFB projects to employ a combination of gravel bags and plastic wrap to block flow have been ineffective due to continual scouring.

iii. The following applies to sand bag dams: If the site is accessible from the bridge and a crane is available, the concrete collared culvert would be lowered into place by the crane. If this is not feasible, on the day prior to the anticipated installation of the dam, the concrete collared culvert would be constructed on-site and manually carried into place. If necessary, this procedure would be adapted to accommodate multiple collared culvert pipes. For on-site fabrication, quick-set concrete would be poured into a wood form constructed in-situ around the culvert on the bank adjacent to the installation location (note: the concrete collar is essential for preventing issues caused by water scouring around the pipe and infiltrating the dam and project area.

iv. The following applies to sand bag dams: Following the placement of the concrete collared culvert, cross stacked sand bags would be built up around the culvert, sealing it in place such that all flow is directed through the culvert.

v. Once flow has been successfully diverted through the culvert in the upstream dam, the blocknets upstream and downstream of the upstream dam would be removed.

g. Day 2; All following activities will be conducted under the supervision of a qualified biologist.

i. Working from the upstream culvert in a downstream direction, additional sections of culvert would be installed by hand to a distance of one or two spans short of the downstream dam location. Once the number and spacing of culverts required to span the project area has been determined, the placement location of the concrete collar on the last culvert would be determined and the collared culvert would be fabricated or lowered into place in the same manner described above.

ii. Concurrent with culvert installation, blocknets with mesh not wider than 1/16th of an inch would be set up immediately up and downstream of the downstream dam location and the area would be de-fished by qualified biologists.

iii. The following applies to sand bag dams: Following de-fishing, the base of a sandbag dam would be constructed in the same manner used to construct the upstream dam, described above. The dam base would be constructed to provide a level base on which to install the culvert. Minimally, the dam base

would be 12 ft wide and consist of 4 or more tiers of cross stacked sand bags with the goal of having the culvert half submerged when lowered into place.

iv. Once the dam base is completed, blocknets would be removed.

h. Day 3 (Ideally these actions would be accomplished within one day; to facilitate this goal, the following activities would commence at first light); all following activities will be conducted under the supervision of a qualified biologist.

i. The downstream culvert would be hand carried into position, connected to the existing culvert pipes, and locked into place by building up cross stacked sand bags. At this point, all river flow would be occurring through the pipe and the exclusion area would be completely cut off from the active river channel. A velocity dissipater or other form of erosion control would be installed at the outflow of the culvert to avoid significant scour.

ii. Once flow has been successfully diverted, four high pressure pumps with screened intakes would be positioned at the four lowest points along the river bottom between the up and downstream dams (within the exclusion area). The mesh size of the screens would not be more than 1/16th of an inch. The screened pump heads would be placed into larger screened containers, such as 30 gallon barrels, with 1/16th of an inch mesh screened holes to protect listed species from entering the pump intake. Dewatering of the exclusion area would commence immediately following completion of the downstream dam.

iii. Effluent water would be discharged to grade in the agricultural field within the project area north of the 13th Street Bridge. If necessary, an earthen barrier or silt fence would be installed at the discharge point to allow percolation and prevent surface backflow into the river.

iv. The rate of dewatering would be monitored by the biologist so that it does not result in anoxic conditions or cause stranding of animals.

v. Once the water level drops to manageable levels, de-fishing would begin. De-fishing would be conducted by systematically positioning upstream and downstream blocknets within subsections of the exclusion area. Once a subsection is determined to be cleared of fish by a qualified biologist, it would be cut-off from “un-fished” areas using hand installed earthen dams. This would prevent fish from re-entering areas previously cleared in the event of a net failure.

vi. If any un-fished areas remain at the end of the day, perforated air hoses, powered by 5 horse power air pumps, would be placed across the un-fished areas to ensure adequate aeration overnight. These areas would then be de-fished immediately the following morning.

vii. Following downstream dam completion and concurrent with the de-fishing activities, wind fencing, anchored by sand bags, would be installed over the upstream and downstream sand bag dams and tied into existing wind fencing

on the north and south banks to complete the fence around the exclusion area.

viii. After sunset, following completion of the installation of exclusion fencing, the first of three CRLF removal surveys of the exclusion area would be conducted by qualified biologists. All CRLF captured would be transported to the nearest suitable habitat outside of the exclusion area and released.

i. Day 4: any remaining pools would be de-fished and dewatered and a second CRLF removal survey will be conducted after sunset by qualified biologists.

j. Day 5: a final CRLF removal survey will be conducted after sunset by qualified biologists.

- The number and disposition of all special status species encountered and/or relocated would be recorded. Native wildlife species, including special status and listed species, would be removed to the nearest suitable habitat within the Santa Ynez River, chosen at the discretion of the biologist. All animals would be held in 5 gallon buckets until release. All animals held would be segregated by size and species such that predation would be unlikely. The holding time would be minimized to the greatest extent feasible and the health of all held animals would be continuously monitored to evaluate the need for additional measures to protect the animals, such as aeration of water in holding buckets.
- Qualified biologist(s) would permanently remove any non-native species, such as bullfrogs, crayfish, and Cyprinidae and Centrarchidae fishes, encountered within the Proposed Action Area to the maximum extent possible.
- Any areas of standing water within the exclusion area would be subject to weekly night surveys by a qualified biologist for the duration of construction in order to detect and remove any special status species, including CRLF, which may have potentially entered the site, or were missed during removal surveys.
- The wind fencing would be inspected twice daily by qualified biologists. Prior to the start of work, fencing would be inspected for any breaches that may have been created overnight and allowed terrestrial wildlife to enter the exclusion area. At the end of the work day, the wind fencing would be inspected again to identify any areas that may need repair prior to nightfall. Compromised fence would be repaired immediately. If breaks are discovered during the morning inspection, a survey would be conducted that night to detect and remove any CRLF that may have entered the site.
- Water quality parameters would be monitored (e.g., salinity, temperature, dissolved oxygen, turbidity) prior to and throughout implementation of the Proposed Action. Sampling would be conducted weekly, starting one week prior to commencement of work within the river channel. Measurements would be recorded 20 to 50 m upstream of the anticipated exclusion area and 20 to 50 m downstream of the anticipated exclusion area. Measurements would be taken in a manner that would avoid harassment or mortality to TWG or southern steelhead.
- Restoring flow through the site would be accomplished in the following manner to avoid impacts to sensitive and listed species. These activities would be initiated at the start of

the work day to allow completion of all activities within a single day. All activities below would be supervised by a qualified biologist.

a. A foam pig, attached to a rope, would be inserted into the upstream end of the pipe. Immediately following pig insertion, a net with mesh no wider than 1/16th of an inch would be secured to the upstream end of the pipe to prevent any further entrance of animals into the pipe.
b. The pig would be pulled through to the outflow of the pipe, followed immediately by affixing a net with mesh no wider than 1/16th of an inch to the downstream end of the pipe. The pipe would be considered free of animals at this point.
c. Blocknets would be set up immediately upstream and downstream of the dams and these areas would be de-fished.
d. The downstream sand bag dam would be removed prior to removal of the upstream dam. The dam would be removed such that the pipe would be completely exposed and all accessible sand bags cleared. Removal shall be accomplished in tiers, from top to bottom of the dam. There may be backflow of water into the site at this point, but the blocknets would prevent animals from entering the exclusion area.
e. The upstream dam would then be removed in the same manner as the downstream dam.
f. Pipes, culverts, and any remaining sand bags would be then removed. Upstream and downstream blocknets would be continuously maintained throughout this process until all materials have been removed from the creek.
g. Upstream and downstream blocknets would be removed allowing animals to re-enter the site.

- Instream construction activities would be completed or paused and all temporary fill, water diversion, and materials placed in the river channel would be removed prior to the onset of significant rainfall (0.5 inches within a 24 hour period). If agreed to by the Regional Water Quality Control Board and USACE, temporary falsework and trestles may be left in place over the rainy season, but will be designed to withstand a five to ten year flood event. Some construction activities may continue above the river bed on the upper bank during the rainy season (installation of decking, conduit, and approach roads, etc.).
- A contingency plan would be developed by qualified biologists familiar with the species for the recovery and salvage of special status species, including TWG, southern steelhead, and CRLF, in the event of a local toxic spill or accidental dewatering of their habitat.
- To avoid potential project-related impacts to nesting migratory birds, If vegetation clearing is initiated during avian nesting season (March through April), a qualified biologist would conduct nesting bird surveys within 1,000 ft of the project area prior to project initiation and vegetation clearing activities. If nesting migratory birds are found within the project area, a buffer of adequate size to prevent disturbance from project-

related activities (to be determined by the biological monitor) would be marked with flagging tape to avoid disturbance. The nest would be monitored to determine impacts, if any, from project-related disturbance. All nests present underneath the existing bridge would be inspected for the presence of unfledged swallows or unattended juvenile bats prior to the start of construction activities. If any are found, they would be monitored and disturbance minimized as much as possible.

- At least two months prior to demolition of the existing bridge, exclusionary techniques would be implemented to avoid accidental injury to roosting bats. In addition, the structure of the new bridge will have gaps between the bridge soffit and the abutment seat. These areas are usually filled with polystyrene, however the polystyrene will be removed. These gaps will be the height of the bearing pads, which should be about four inches, and will provide access to the one inch wide vertical gap between the bridge and the abutment backwall.

2.2.7.3 Installation of Fiber Optic Cable

- Boring would be used to avert encroaching into the Santa Ynez River corridor.
- Entry and exit bore locations would be situated outside of Jurisdictional Waters of the U.S. and riparian habitat.
- Any excavations left open overnight would be surrounded with 5 ft high wind silt fencing to prevent the potential entrapment of listed species.
- During normal boring operations, excess drilling fluid, which is injected into the borehole, flows back out through the borehole into a collection pit; however, excessive pressure in the borehole can cause the ground to fracture and drilling fluid to be released at the surface above the borehole. This is known as a “frac-out”. To mitigate this risk, 30 CES would prepare a Frac-Out Contingency Plan in coordination with the construction contractor to prevent discharge of drilling fluid.
- BMPs and the Frac-Out Contingency Plan would be in place and implemented at any location where boring would occur near or beneath Jurisdictional Waters of the U.S. The construction crew would be responsible for the implementation of the Frac-Out Contingency Plan.

2.2.7.4 Revegetation and Weed Control Minimization Measures

- Site revegetation with native plant species and weed control activities would be overseen by a qualified biological monitor. Any activity that could potentially impact listed species would be monitored by a qualified biologist.
- When pumping water from the Santa Ynez River for irrigation or use of the water stinger, the pump intake would be placed in a 30 gallon barrel with fine mesh (1/16th inch) screened holes to protect listed species from entering the pump intake.
- All herbicides will be used in accordance with the pesticide label and DoD and Air Force Pest Management Regulations. Herbicide application will comply with California Department of Pesticide Regulations, and the U.S. District Court for the Northern

District of California (20 October 2006) injunction on pesticide use in CRLF habitat. Glyphosate herbicide will not be applied within 15 ft of aquatic features, and herbicides that leave residue will not be applied within the Ordinary High Water Mark (Waters of the U.S.).

- Treatment within or adjacent to aquatic resources will use appropriately labeled products only.
- If herbicide application occurs during the CRLF breeding season and within riparian habitat, qualified biologists will conduct egg mass and/or tadpole surveys within 100 ft downstream or downslope of the application area prior to chemical application. If CRLF eggs or larvae are found, no pesticide application will be conducted within the riparian habitat.
- Equipment maintenance and fueling will occur at least 250 ft away from riparian habitat and wetlands.
- Herbicides will not be sprayed when wind velocities at the site exceed five miles per hour, or in foggy or rainy conditions when ground moisture becomes excessive. Non-target species, especially native species, will be avoided during spraying. A biological monitor familiar with the site will be present to supervise herbicide spraying activities.

2.2.7.5 Wetland Mitigation Area

- All soil removal and deposition, and any other activities involving vegetation clearing or the use of heavy machinery would not occur after the onset of significant rainfall (0.5 inches within 24 hours).
- Silt fence and/or biodegradable straw wattles would be placed along the edge of the Wetland Mitigation Area adjacent to the estuary prior to construction activities in order to capture sediments during any potential run-off event from the Wetland Mitigation Area during construction. These would be removed at the end of construction once exposed soil on the site has been revegetated and/or stabilized with erosion control measures.
- Any equipment or materials staged at the Wetland Mitigation Area would be ringed by 5 ft wind fencing, buried along the bottom edge, and checked by a qualified biological monitor prior to the initiation of work to ensure CRLF and other special status species are not present.

2.2.7.6 Cultural Resources

- In the event that previously undocumented cultural resources are discovered during construction activities, work will stop and the procedures established in 36 CFR 800.13 and the VAFB Integrated Cultural Resources Management Plan shall be followed.

2.2.7.7 Earth Resources

- The contractor would prepare a Storm Water Pollution Prevention Plan (SWPPP) as part of the National Pollutant Discharge Elimination System (NPDES) permit. Both plans

would be implemented in accordance with applicable local, state, and Air Force guidelines to minimize storm water runoff and erosion.

2.2.7.8 Hazardous Materials and Waste Management

- Hazardous materials would be procured through or approved for use by VAFB Hazardous Materials Pharmacy (HazMart). The contractor will report monthly usage of hazardous materials to the HazMart to meet legal reporting requirements.
- Hazardous materials would be properly stored and managed in secured areas located outside the riparian corridor.
- Chemical stockpile spill containment, if necessary, would be accomplished to minimize or preclude hazardous releases.
- Standard procedures would be used to ensure that all equipment is maintained properly and free of leaks during operation, and all necessary repairs are carried out with proper spill containment. All equipment operating within the project areas would be inspected regularly for fluid leaks. The construction contractor would submit a Spill Prevention Plan for 30 CES/CEIEA approval.
- All equipment would be staged, repaired, and maintained at least 150 ft from the Santa Ynez River. Fueling and addition of oil/fluids to equipment would be done in pre-designated areas over secondary containment to minimize risks from accidental spillage or release. Spill containment material would be placed around the equipment before fuel, or other hazardous substances such as oil or brake fluid, are brought in.
- To the greatest extent practicably, all construction equipment and machinery would be restricted to operating on existing paved surfaces, access roads, and staging areas. In the event that any equipment must be operated outside of these areas, a biological monitor would supervise these activities.
- Stationary equipment operating within the riverbed would be placed on protective mats to prevent contamination of the riverbed. Non-stationary equipment would be operated on the established temporary access road whenever possible, and the time it is operated outside of these roads would be minimized to the greatest extent possible.
- All hazardous materials would be properly identified and used in accordance with manufacturer specifications to avoid accidental exposure to or release of hazardous materials required to operate and maintain construction equipment.
- If refueling of equipment within the riverbed is required (i.e., oversize cranes), safety measures such as temporary catch pans or basins to place under the fill areas to catch accidental overflow would be implemented. A riverbed refueling spill prevention and containment plan would be prepared by the Contractor and submitted to 30 CES/CEIEA for approval.
- If any equipment repairs are necessary within the riverbed or the riparian corridor, repair would not begin without implementation of a Spill Prevention Plan, and the presence of a qualified biological monitor on the project site.

- Hazardous waste shall be managed in accordance with the HWMP, 30 SW Plan 32-7043-A. The contractor is required to complete and submit a CAER form to 30 CES/CEIEC within 24 hrs of a Haz-Mat spill or release.

2.2.7.9 Land Use and Aesthetics

- The Air Force shall coordinate the Proposed Action with the California Coastal Commission in compliance with the Coastal Zone Management Act (CZMA).

2.2.7.10 Solid Waste

- The construction and demolition (C&D) waste shall be segregated and managed separately and reused or recycled to the greatest extent practicable.
- Debris shall be segregated to facilitate subsequent P2 options. P2 options would be exercised in the following order: reuse of materials, recycling of materials, and then regulatory compliant disposal.
- The contractor shall to track and report all solid waste disposal and C&D debris recycling tonnages to 30 CES/CEIEC on a quarterly basis during the demolition portion of the project.

2.2.7.11 Transportation

- Employees may be encouraged to carpool and eat lunch on-site.
- Truck trips should be scheduled during non-peak traffic hours to the greatest extent practicable.

2.2.7.12 Water Resources

- Construction activities associated with approach roadways, which involve minor earthwork and grading may occur during the wet season (typically 1 November to 1 April) provided erosion control BMPs are implemented to prevent discharge of sediments and polluted runoff to the river. Standard BMPs during the wet season shall include silt fencing and vegetative buffers. Additional BMPs would be required as described below.
- Temporary soil cover for erosion control will be required for work sites remaining exposed between the completion of the new bridge and demolition of the old bridge and implementation of the Compensatory Mitigation and Monitoring Plan. The sites must be secured from catastrophic erosion resulting from rain events. Erosion control measures such as silt fences, temporary grass cover, interceptor ditches, coconut or jute fiber rolls, erosion control mats, temporary downstream catchment basins, and other appropriate measures.
- BMPs to prevent discharge of construction materials, contaminants, washings, concrete, fuels, and oils shall include the following measures:

a. Ensure all equipment is properly maintained (off-site) and free of leaks during operation, and all necessary repairs shall be carried out with proper spill containment.
b. Repair and maintenance of all equipment shall be a minimum of 150 feet outside of the riverbed and riparian corridor.
c. Fueling and addition of oil/fluids to equipment shall be done in pre-designated areas over secondary containment to minimize risks from accidental spillage or release.
d. If refueling of equipment within the riverbed is required (i.e., oversize cranes), adequate secondary containment shall be placed under the fill areas to catch accidental overflow. A riverbed refueling spill prevention and containment plan would be developed by the contractor and approved by 30 CES/CEIE Water Resources and the wildlife biologist.
e. Adequate spill response supplies shall be maintained at the construction staging area for immediate response and clean-up of any fuel spills.
f. Stationary equipment operating within the riverbed would be placed on protective mats to prevent contamination of the riverbed.
g. Hazardous materials shall be stored in proper containers to include secondary containment, within the staging areas outside the riverbed.
h. Vehicle and equipment washing shall be prohibited except within staging areas. High pressure washing of undercarriages and wheel wells shall be prohibited at the project site.
i. Cover waste disposal containers at the end of every business day and during a rain event. Pick up any trash that escapes from containers at the end of each day.
j. Contain and protect loose construction materials and stockpiled waste material from wind and rain at all times unless actively being used.
k. Porta-potties shall have secondary containment and be secured to the ground to prevent falling.
l. Ensure the containment of concrete washout areas and other washout areas that may have pollutants so there is no discharge into soil.
m. Spilling of concrete will be prevented by a plywood deck under the entire elevated bridge deck extending out beyond the edges of the bridge by several feet. All concrete will be contained within formwork which is away from the edge of the falsework.
n. No concrete curing of the bridge deck shall occur within 24 hours of a forecasted rain event.
o. Wastewater from high pressure spray washing of vehicles for weed control shall be contained and properly disposed of off-site. Alternatively, this activity may be performed off-site at a location where the wastewater can be disposed of in the sanitary sewer system or at a treatment site.

- Permanent erosion control requires stabilization of exposed soil areas with 70 percent of the original vegetation's surface coverage per the General Permit. The Compensatory Mitigation and Monitoring Plan described in Section 2.1.7.8 shall include measures to achieve this.
- The diversion of the active channel is described in Section 2.1.7.2.3. Dewatering water from between the dams and during foundation pier drilling would be discharged to grade in the agricultural field in a manner that would not cause erosion or surface backflow into the river.

2.2.7.13 Human Health and Safety

- The replacement of the water main would follow California Health & Safety Code (Title 22), Sections 64551 – 64604, California Waterworks Standards, as applicable.
- All chemicals, materials, and products used in drinking water construction or treatment that will come in contact with the drinking water shall be listed as such per National Sanitation Foundation International (NSF) Standards 60 & 61, as applicable.
- All plumbing materials and products used in construction that will come in contact with drinking water for fixtures intended to provide drinking water to the user shall conform to California's lead-free law as stated in Title 22, Sections 116875 - 116880. Additional information as referenced can be located in recent California legislation, as contained in Senate Bill (SB) 1334, SB 195, and AB 1953.
- Any activity requiring the connection to and the drawing of bulk water from the drinking water distribution system to support construction and repair projects shall require the approval and coordination of the Vandenberg Cross Connection Control and Backflow Prevention Program Manager, Mr. Robert Coward, 30 CES/CEOIU, 805-606-8158.
- Disinfection practices of water mains shall adhere to American Water Works Association Standard C651-05. All chemicals used that will come in contact with drinking water shall be listed in NSF-60 as approved for disinfection. In addition, results from bacteriological testing shall be shared with 30 CES/CEIEC and 30 MDG/SGOJ prior to placing the main in service.
- Personnel making decisions affecting the construction, installation, disinfection, testing, flushing, cleaning of water distribution and well system components as part of any project involving the installation of water mains, laterals, hydrants, and wells shall be certified by the California Department of Public Health as a Water Distribution System Operator D2. Refer to Title 22, Section 63770.
- In regards to the filling, cleaning, flushing, and dewatering of the new water main, only uncontaminated water may be released to grade.
- Conditions for discharge of chlorinated water from waterline disinfection include:
    a. The total chlorine residuals of the discharge shall not exceed 1.5 mg/L. Water may need to be captured and contained until the chlorine residual is reduced.
    b. The discharge shall have a pH between 6.5 and 8.3. Water may need to be captured and contained until the pH is reduced.

c. The discharge shall not flow to a surface water, wetlands, storm drain, or storm water conveyance system.
d. The discharge shall not be within 100 ft of a surface water or wetland, or at a point where the discharge can flow into a surface water or wetland.

2.3 Alternative B: No-Action Alternative

Under the No-Action Alternative a new bridge would not be constructed and the existing bridge and roadway would remain in place. The overhead fiber optic cable downstream of the bridge would not be replaced and the Wetland Mitigation Area at the estuary would not be used.

Implementing the No-Action Alternative has the potential to result in a severe detrimental impact to the VAFB mission if the bridge were to collapse. In addition, bridge collapse and/or emergency repairs would have the potential for significant impacts to special status species, and Waters of the U.S., including Jurisdictional Wetlands. VAFB would continue maintenance and emergency repairs to the structure, as necessary. As in the past, future emergency repairs to the bridge may require reinforcing the existing piers and abutments with additional rip rap; however, eventual collapse of the bridge has been determined to be unavoidable (Metcalf & Eddy, Inc., 2007). In addition, the existing overhead fiber optic cable downstream of the bridge is vulnerable. The existing overhead cable was installed in 1995. At its original installation, it was given a life-expectancy of twenty years given the 1000 ft span cable tension across the Santa Ynez River. Without the new diversely protected underground cable route, the end-of-life aerial cable will continue to be exposed and vulnerable and mission critical communications would continue to be at risk.

2.4 Other Alternatives Considered and Eliminated from Further Analysis

2.4.1 13th Street Bridge Replacement

During the bridge Type Selection phase of the project design, seven different alignments (Figure 2-13), four bridge lengths, and three bridge types were considered in regards to hydraulics, constructability, topography, roadway feasibility, right-of-way (ROW) and cost (MFDB/KASL & Moffat & Nichols 2014). Selection and elimination of the proposed alignments was based on engineering factors and minimizing impacts to Waters of the U.S. (Jurisdictional Wetlands and Other Waters [i.e., Santa Ynez River]). Alignments 1a and 2 through 6 were eliminated for a variety of reasons (Table 2-2). The three bridge types considered included: Type 1) 4-Span, 3-Pier, Constant Depth Concrete Box Girder; Type 2) 3-Span, 2-Pier, Haunched Concrete Box Girder; and Type 3) 6-Span, 5-Pier, Precast Bulb Tee. Type 2 uses larger and deeper shaft foundations at only two piers in order to carry vertical loads. This concentration of shaft size and depth was determined to be the most economical design when performance criteria for liquefaction and scour potential are considered (MFDB/KASL & Moffat & Nichols 2014). The haunched girders in the Type 2 design also work better for passing storm flood debris beneath the bridge without hanging up on the girders (girder soffits act as debris-catchers), and have better seismic performance (MFDB/KASL & Moffat & Nichols 2014). Type 2 also has the deepest bentcaps (13.5 ft) so column top moments can be easily carried and still remain elastic

(MFDB/KASL & Moffat & Nichols 2014). Type 1 and Type 3 were therefore eliminated from further consideration.

The analysis process showed that a range of lengths for the bridge between 600 to 750 ft were defensible. Shorter bridges had lower projected costs, but when hydraulics and performance in response to high flow storm events were considered during the cost-benefit analysis, the optimal bridge length was determined to be between 650 and 750 ft (MFDB/KASL & Moffat & Nichols 2014). Therefore the proposed bridge length is 650 ft.

Table 2-1. Alignment selection considerations from type selection of bridge design.

Alignment	Reasons to Select or Reject
1	Does not observe curve radii; not optimized to topography; vertical alignment based on incorrect hydraulics (Selection Standard 1)
1a	Optimized to topography; only requires one access road for construction and demolition; may be able to use portions of north abutment rip-rap; neutral (compared to other alignments) on habitat impacts.
2	No significant hydraulics advantage; abutment placement requires 800 ft bridge; larger new roadway costs. Requires two construction access roads (Selection Standard 1).
3	No advantage on hydraulics; abutment placement requires 700-800 ft bridge; larger new-roadway costs; roadway knuckle by guardhouse (Selection Standard 2).
4	Uncertainties about ROW acquisition; potentially significant cost and schedule impacts (Selection Standard 2).
5	1,050 ft roadway radius requirement forces this alignment to cross the river channel at a highly skewed angle; may require additional access road (Selection Standard 2).
6	Crosses river channel at better angle than #5, but roadway requirement pulls north abutment away from northern outcrop – so no advantage (Selection Standard 3).

2.4.2 Installation of Fiber Optic Cable

A protected underground cable route is needed to ensure security of the line from human and environmental impacts, including weather elements and potential fire hazards. Therefore, no alternatives to directional drilling/boring under the Santa Ynez River are possible. Other alternatives considered include downstream locations. These alternatives were eliminated from further consideration due to additional environmental impacts associated with installation of maintenance holes. The new underground fiber optic cable would be installed near the same location as the existing overhead cable and would use existing maintenance holes.

2.4.3 Wetland Mitigation Area

Several alternative wetland mitigation sites were eliminated from further consideration:

- ***Adjacent to the Project Area.*** Wetland mitigation adjacent to the project site, which would not occur in the riparian corridor, would require wetland creation on the upland benches on either the north or south banks of the river. These sites are perched approximately 20 ft above the water table. Wetland creation along the banks would require excavating enormous volumes of soil to reach the water table. These potential mitigation sites were eliminated from further consideration because of construction costs associated with removal of these volumes of soil.
- ***Waterfowl Management Ponds.*** The Waterfowl Management Ponds, also referred to as the Wildlife Natural Resources Area, are located approximately 3,280 ft northwest of the 13th Street Bridge Project Area, to the south of Terra Road. Six former percolation

ponds, totaling about 15 acres, served an old wastewater treatment plant that used to be in operation at the site. If the depressions could be converted into sustainable ponds, the area could be transformed into willow riparian habitat that could support CRLF and waterfowl. However, the site is perched several feet above the water table; this has created significant challenges in restoring these ponds to a functioning state during past efforts. Key factors in these past failures have been securing reliable electricity to the site to serve groundwater pumps, maintenance and repair cost requirements for groundwater pumps that must operate constantly and consistently for the site to be self-sustaining, poor prior design of lock between the pools, and lack of a clay layer lining at the base of the pools. This site would have no restoration benefits for TWG. For these reasons, the Waterfowl Management Ponds were eliminated from further consideration as a wetland mitigation site for the 13th Street Bridge replacement project.

- ***Surf Pasture Wetland.*** An unnamed wetland adjacent in Surf Pasture, approximately 9,000 ft west of the 13th Street Bridge Project Area and south of Ocean Avenue, was considered for wetland restoration opportunities. In prior years, a depression at this location has had standing water which could support CRLF and a freshwater marsh. A relatively small patch of willow forest is currently found at the site; however much of the wetland consists of non-native weeds and the site has not been observed to hold water for many years. Several gaps in knowledge of the site were barriers to developing it into a feasible Wetland Mitigation Area. The largest gap in information was the unknown reason why the site has not held water in many years. This could potentially be due to a number of different factors, including natural fluctuations in groundwater levels, groundwater pumping, upgradient sources of artificial water input (e.g. water supply leak), etc. A hydrological study of the wetlands would have been required to understand the site's constraints and develop a restoration strategy based on the framework of these constraints. The site would have no restoration benefits for TWG or southern steelhead and would increase waterfowl habitat near the flight path of the VAFB runway increasing BASH concerns. For these reasons, restoration of this unnamed wetland was eliminated from further consideration for the 13th Street Bridge replacement project.
- ***East of 35th Street Abutment.*** A site located east of the 35th Street abutment was considered for potential mitigation on the north side of Ocean Avenue, approximately 9,000 ft west of the 13th St Bridge project area. Similar to sites considered adjacent to the project area, removal of a larger quantity of soil and vegetation would be required, increasing costs. Additionally, a serious concern was raised, that the resulting catchment, with no direct connection to the estuary, would result in ponding that would likely attract ducks, geese and other large waterfowl. The primary objective of the selected site is to make the restoration site less attractive to waterfowl while improving habitat for TWG. For these reasons, restoration of this site was eliminated from consideration for the 13th Street Bridge replacement project.

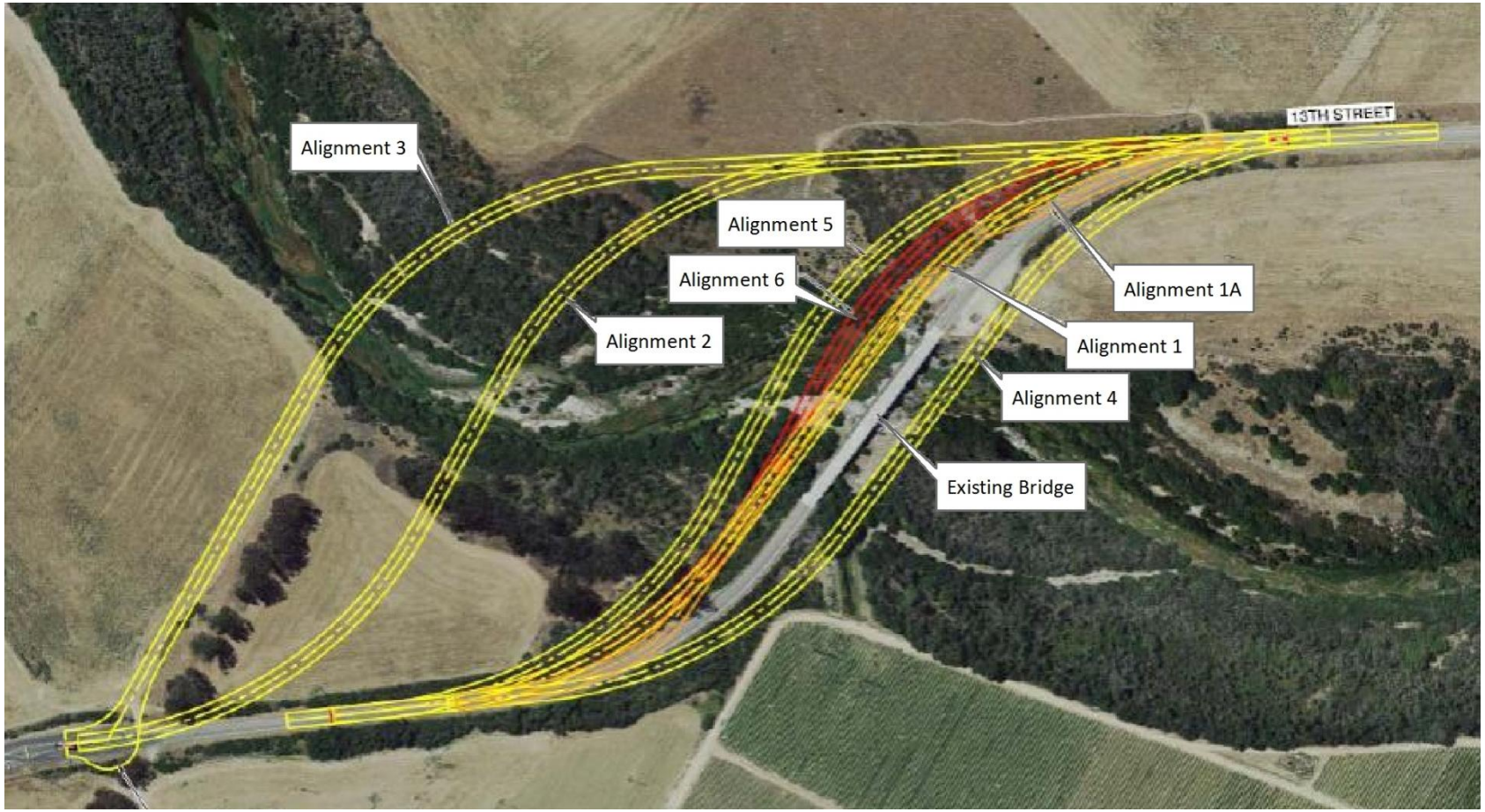

Figure 2-9. Alternative alignments considered during bridge design type selection. Alignment 1 is the Proposed Action.

3 Affected Environment

This chapter describes the existing environment near and within the project area for the Proposed Action and No-Action Alternative. The area considered for most resources was confined to the immediate area of the proposed project areas. For some environmental resources, a wider regional area was used, as appropriate.

The resources identified for analysis in this EA include: air quality, biological resources, cultural resources, earth resources, hazardous materials and hazardous waste management, human health and safety, land use and aesthetics, solid waste management, transportation, and water resources. The following resources were considered but not analyzed in this EA:

- Environmental Justice. Per EO 12898, *Environmental Justice*, the potential effects of the Proposed Action on minority communities and low-income communities were considered. The project would neither affect nor disproportionately affect low-income or minority populations. The proposed action would occur within an unpopulated area of VAFB and potential environmental impacts would not extend into populated areas.

- Socioeconomics. Implementing the Proposed Action could result in the creation of some temporary new jobs. However, these potential new jobs would have no effect on the socioeconomic environment of the region (i.e., Lompoc Valley and Santa Maria Valley). Implementing the No-Action Alternative would neither create nor eliminate jobs from the regional area.

VAFB is located in northwestern Santa Barbara County, where agriculture is the main economic and land use influencer. The base encompasses approximately 99,099 acres and is physically divided into North VAFB and South VAFB by the Santa Ynez River. Much of VAFB is open space set aside as security or safety buffer zones for space launch activities. The project area is located within the Lompoc Valley geomorphic region at the point where 13th Street on VAFB crosses the lower reach of the Santa Ynez River, approximately three miles east of the Pacific Ocean. The Santa Ynez River floodplain comprises the Lompoc Valley. This area lies within the Santa Maria Basin-San Luis Range domain of central California, a geologic transition zone between the Transverse Ranges Geomorphic Province to the south and the Coast Ranges Geomorphic Province to the north. The associated riparian and wetland habitats of the Santa Ynez River are closely related to the adjacent transitional and upland habitats along the drainage. A coastal marsh habitat occurs near the mouth of the river, where it drains into the Pacific Ocean.

3.1 Air Quality

3.1.1 Definition of Resource

Air quality is defined by ambient air concentrations of specific pollutants determined by the USEPA to be of concern with respect to the health and welfare of the general public. Six major pollutants of concern, called “criteria pollutants,” are carbon monoxide (CO), sulfur dioxide (SO_2), nitrogen dioxide (NO_2), ozone (O_3), suspended and fine particulate matter (PM_{10} and

$PM_{2.5}$), and lead (Pb). The USEPA has established National Ambient Air Quality Standards (NAAQS) for these pollutants. Areas that violate a federal air quality standard are designated as non-attainment areas.

Ambient air quality refers to the atmospheric concentration of a specific compound (amount of pollutants in a specified volume of air) that occurs at a particular geographic location. The ambient air quality levels measured at a particular location are determined by the interactions of emissions, meteorology, and chemistry. Emission considerations include the types, amounts, and locations of pollutants emitted into the atmosphere. Meteorological considerations include wind and precipitation patterns affecting the distribution, dilution, and removal of pollutant emissions. Chemical reactions can transform pollutant emissions into other chemical substances. Ambient air quality data are generally reported as a mass per unit volume (e.g., micrograms per cubic meter of air) or as a volume fraction (e.g., parts per million [ppm] by volume).

Pollutant emissions typically refer to the amount of pollutants or pollutant precursors introduced into the atmosphere by a source or group of sources. Pollutant emissions contribute to the ambient air concentrations of criteria pollutants, either by directly affecting the pollutant concentrations measured in the ambient air or by interacting in the atmosphere to form criteria pollutants. Primary pollutants, such as CO, SO_2, lead, and some particulates, are emitted directly into the atmosphere from emission sources. Secondary pollutants, such as O_3, NO_2, and some particulates, are formed through atmospheric chemical reactions that are influenced by meteorology, ultraviolet light, and other atmospheric processes. PM_{10} and $PM_{2.5}$ are generated as primary pollutants by various mechanical processes (for example, abrasion, erosion, mixing, or atomization) or combustion processes. However, PM_{10} and $PM_{2.5}$ can also be formed as secondary pollutants through chemical reactions or by gaseous pollutants condensing into fine aerosols. In general, emissions that are considered "precursors" to secondary pollutants in the atmosphere (such as reactive organic gases (ROG) and oxides of nitrogen (NO_x), which are considered precursors for O_3), are the pollutants for which emissions are evaluated to control the level of O_3 in the ambient air.

The State of California has identified four additional pollutants for ambient air quality standards: visibility reducing particles, sulfates, hydrogen sulfide, and vinyl chloride. The CARB has also established the more stringent California Ambient Air Quality Standards (CAAQS). Areas within California in which ambient air concentrations of a pollutant are higher than the state and/or federal standard are considered to be non-attainment for that pollutant. Table 3-1 shows both the federal and state ambient air quality standards. Toxic air pollutants, also called hazardous air pollutants, are a class of pollutants that do not have ambient air quality standards but are examined on an individual basis when there is a source of these pollutants. The State of California has identified particulate emissions from diesel engines as a toxic air pollutant.

Global temperatures are moderated by naturally occurring atmospheric gases, including water vapor, carbon dioxide (CO_2), methane (CH_4) and nitrous oxide (N_2O), which are known as greenhouse gases (GHGs). These gases allow solar radiation (sunlight) into the Earth's atmosphere, but prevent radiative heat from escaping, thus warming the Earth's atmosphere. Gases that trap heat in the atmosphere are often called greenhouse gases, analogous to a

greenhouse. GHGs are emitted by both natural processes and human activities. State law defines greenhouse gases as any of the following compounds: CO_2, CH_4, N_2O, hydrofluorocarbons (HFCs), perfluorocarbons (PFCs) and sulfur hexafluoride (SF_6) (California Health and Safety Code Section 38505(g)). GHGs have varying global warming potential (GWP). The GWP is the potential of a gas or aerosol to trap heat in the atmosphere; it is the "cumulative radiative forcing effect of a gas over a specified time horizon resulting from the emission of a unit mass of gas relative to a reference gas" (USEPA 2006). The reference gas for GWP is CO_2; therefore, CO_2 has a GWP of 1. The other main greenhouse gases that have been attributed to human activity include CH_4, which has a GWP of 21, and N_2O, which has a GWP of 310. CO_2, followed by CH_4 and N_2O, are the most common GHGs that result from human activity. CO_2, and to a lesser extent, CH_4 and N_2O, are products of combustion and are generated from stationary combustion sources as well as vehicles. High global warming potential gases include GHGs that are used in refrigeration/cooling systems such as chlorofluorocarbons and hydrofluorocarbons.

Table 3-1. Ambient air quality standards.

Pollutant	Averaging Time	NAAQS[1]		CAAQS[2]
		Primary[3]	Secondary[4]	Concentration[5]
Ozone (O_3)	1-Hour	-	Same as Primary Standard	0.09 ppm (180 µg/m^3)
	8-Hour	0.08 ppm		0.070 ppm (137 µg/m^3)[note 7]
Respirable Particulate Matter (PM_{10})	24-Hour	150 µg/m^3	Same as Primary Standard	50 µg/m^3
	Annual Arithmetic Mean	-		20 µg/m^3
Fine Particulate Matter ($PM_{2.5}$)	24-Hour	35 µg/m^3	Same as Primary Standard	-
	Annual Arithmetic Mean	12.0 µg/m^3	15 µg/m^3	12 µg/m^3
Carbon Monoxide (CO)	8-Hour	9 ppm (10 µg/m^3)	None	9.0 ppm (10 µg/m^3)
	1-Hour	35 ppm (40 µg/m^3)		20 ppm (23 µg/m^3)
Nitrogen Dioxide (NO_2)	Annual Average	0.053 ppm (100 µg/m^3)	Same as Primary Standard	0.030 ppm (56 µg/m^3)
	1-Hour	0.100 ppm (188 µg/m^3)		0.18 ppm (338 µg/m^3)
Sulfur Dioxide (SO_2)	Annual Arithmetic Mean	0.030 ppm	-	-
	24-Hour	0.14 ppm	-	0.04 ppm (105 µg/m^3)
	3-Hour	-	1300 µg/m^3 (0.5 ppm)	-
	1-Hour	75 ppb (196 µg/m^3)	-	0.25 ppm (655 µg/m^3)
Lead (Pb)[6]	30-Day Average	-	-	1.5 µg/m^3
	Calendar Quarter	1.5 µg/m^3	Same as Primary Standard	-
	3-Month Rolling Average	0.15 µg/m^3	Same as Primary Standard	-
Hydrogen Sulfide (HS)	1-Hour	No Federal Standards		0.03 ppm (42 µg/m^3)
Sulfates (SO_4)	24-Hour			25 µg/m^3
Visibility Reducing Particles	8-Hour (10 am to 6 pm, Pacific Standard Time)			In sufficient amount to produce an extinction coefficient of 0.23 per kilometer due to particles when the relative humidity is less than 70 percent.
Vinyl chloride[6]	24 Hour			0.01 ppm (26 µg/m^3)

[1] NAAQS (other than O_3, particulate matter, and those based on annual averages or annual arithmetic mean) are not to be exceeded more than once a year. The O_3 standard is attained when the fourth highest 8-hour concentration in a year, averaged over 3 years, is equal to or less than the standard. For PM_{10}, the 24-hour standard is attained when 99 percent of the daily concentrations, averaged over 3 years, are equal to or less than the standard. For $PM_{2.5}$, the 24-hour standard is attained when 98 percent of the daily concentrations, averaged over 3 years, are equal to or less than the standard. Contact the USEPA for further clarification and current federal policies.

[2] California Ambient Air Quality Standards for O_3, CO (except Lake Tahoe), SO_2 (1- and 24-hour), NO_2, PM_{10}, and visibility reducing particles, are values that are not to be exceeded. All others are not to be equaled or exceeded.

[3] National Primary Standards: The levels of air quality necessary, with an adequate margin of safety, to protect the public health.

[4] National Secondary Standards: The levels of air quality necessary to protect the public welfare from any known or anticipated adverse effects of a pollutant.

µg/m^3 = milligrams per cubic meter

Source: CARB 2014

[5] Concentration expressed first in units in which it was promulgated. Ppm in this table refers to ppm by volume or micromoles of pollutant per mole of gas.

[9] The CARB has identified lead and vinyl chloride as 'toxic air contaminants' with no threshold level of exposure for adverse health effects determined. These actions allow for the implementation of control measures at levels below the ambient concentrations specified for these pollutants.

3.1.1.1 Regional Setting

VAFB is within Santa Barbara County and under the jurisdiction of the SBCAPCD. The SBCAPCD is the agency responsible for the administration of federal and state air quality laws, regulations, and policies in Santa Barbara County, which is within the South Central Coast Air Basin (SCCAB). The SCCAB includes San Luis Obispo, Santa Barbara, and Ventura Counties.

The SCCAB, and all of Southern California, lies in a semi-permanent high-pressure zone of Eastern Pacific Region. The coastal island is characterized by sparse rainfall, most of which occurs in the winter season and hot, dry summers, tempered by cooling sea breezes. In Santa Barbara County, the months of heaviest precipitation are November through April, averaging 14.66 inches annually. The mean temperature in the VAFB area, as reported by monitors in Lompoc, is 58.3°F and the mean maximum and mean minimum temperatures are 69.6°F and 47.0°F, respectively (WRCC 2014).

Santa Barbara County is classified as an attainment/unclassified area for the NAAQS for all criteria pollutants. Santa Barbara County is considered a nonattainment area for the CAAQS for ozone and PM_{10}. Santa Barbara County is classified as an attainment/unclassified area for the CAAQS for all other criteria pollutants.

The ARB and SBCAPCD operate a network of ambient air monitoring stations throughout Santa Barbara County. The purpose of the monitoring stations is to measure ambient concentrations of the pollutants and determine whether the ambient air quality meets the CAAQS and the NAAQS. The nearest ambient monitoring stations to the project site are the Vandenberg AFB STS Power site and the Lompoc South H Street monitoring station. The Vandenberg monitoring station measures O_3, PM_{10}, CO, NO_2, and SO_2, but does not measure $PM_{2.5}$. The station ceased monitoring CO in 2012, as CO levels have been well below the state and federal standards. The Lompoc S. H Street monitoring station measures all criteria pollutants.

Table 3-2 presents a summary of ambient air quality measurements for the period from 2011 to 2013. The 1-hour CAAQS for ozone was not exceeded at the VAFB monitoring station during the period from 2011 through 2013. The federal 8-hour ozone standard was not exceeded at the VAFB monitoring station during the period from 2011 through 2013. The 8-hour CAAQS for ozone was exceeded once in 2013. The Vandenberg station measured one exceedance of the 1-hour NO_2 standard in 2013; however, the standard is not based on a single exceedance and the region remains unclassified/attainment. The 24-hour PM_{10} CAAQS was exceeded in 2011 and 2013. The data from the monitoring stations indicate that air quality is in attainment of all other state and federal standards.

Table 3-2. Ambient air quality measurements.

Pollutant	Averaging Time	2011	2012	2013	CAAQS (ppm)	NAAQS (ppm)	Monitoring Station
Ozone	8 hour	0.067	0.062	0.071	0.070	0.075	Vandenberg
	1 hour	0.079	0.069	0.074	0.09	-	Vandenberg
PM_{10}	Annual Arithmetic Mean	17.9 µg/m^3	15.9 µg/m^3	19.9 µg/m^3	20 µg/m^3	-	Vandenberg
	24 hour	54.0 µg/m^3	47.0 µg/m^3	57.6 µg/m^3	50 µg/m^3	150 µg/m^3	Vandenberg
$PM_{2.5}$	Annual Arithmetic Mean	7.5 µg/m^3	NA	NA	12 µg/m^3	12.0 µg/m^3	Lompoc
	24 hour	18.8 µg/m^3	18.1 µg/m^3	15.9 µg/m^3	-	35 µg/m^3	Lompoc
NO_2	Annual	0.001	0.000	0.000	0.030	0.053	Vandenberg
	1 hour	0.012	0.013	0.130	0.18	0.100	Vandenberg
CO	8 hour	0.30	0.41	NA	9.0	9	Vandenberg
SO_2	Annual	0.000	0.000	0.000	-	0.030	Vandenberg
	24 hour	0.002	0.003	0.001	0.04	0.14	Vandenberg

California averages reported for PM_{10}
N/A = not available from current website data
Source: www.arb.ca.gov

3.1.1.2 Region of Influence

Specifically identifying the ROI for air quality requires knowledge of the type of pollutant, emission rates of the pollutant source, proximity to other emission sources, and local and regional meteorology. For inert pollutants (all pollutants other than ozone and its precursors), the ROI is generally limited to a few miles downwind from the source. However, for photochemical pollutant such as ozone, the ROI may extend much farther downwind. Ozone is a secondary pollutant that is formed in the atmosphere by photochemical reactions of previously emitted pollutants, or precursors (ROG, NOx, and PM_{10}). The maximum effect of precursors on ozone levels tends to occur several hours after the time of emission during periods of high solar load and may occur many miles from the source. Ozone and ozone precursors transported from other regions can also combine with local emissions to produce high local ozone concentrations. The ROI for the 13th Street Bridge includes the SSCAB.

3.1.2 Federal Requirements

3.1.2.1 Clean Air Act, General Conformity, and NEPA

The USEPA is the agency responsible for enforcing the CAA of 1970 and its 1977 and 1990 amendments. The purpose of the CAA is to establish NAAQS, to classify areas as to their attainment status relative to the NAAQS, to develop schedules and strategies to meet the NAAQS, and to regulate emissions of criteria pollutants and air toxics to protect public health and welfare. Under the CAA, individual states are allowed to adopt ambient air quality standards and other regulations, provided they are at least as stringent as federal standards. The Clean Air Act Amendments (CAAA) (1990) established new deadlines for achievement of the NAAQS, dependent upon the severity of non-attainment.

The USEPA requires each state to prepare a State Implementation Plan (SIP), which describes how that state will achieve compliance with the NAAQS. A SIP is a compilation of goals, strategies, schedules, and enforcement actions that will lead the state into compliance with all federal air quality standards.

The CAAA also requires that states develop an operating permit program that would require permits for all major sources of pollutants. The program would be designed to reduce mobile source emissions and control emissions of hazardous air pollutants through establishing control technology guidelines for various classes of emission sources.

New Source Review: A New Source Review (NSR) is required when a source has the potential to emit any pollutant regulated under the Clean Air Act in amounts equal to or exceeding specified major source thresholds (100 or 250 tons per year) which are predicated on a source's industrial category. Through the SBCAPCD's permitting processes, all stationary sources are reviewed and are subject to an NSR process.

EO 13432: This EO was issued to ensure that all necessary actions are taken to integrate environmental accountability in agency day-to-day decision making and long-term planning processes, across all agency missions, activities, and functions. Pollution prevention is highlighted as a key aspect to the environmental management system process.

***EO 13514*:** This EO, *Federal Leadership in Environmental, Energy, and Economic Performance*, was signed by President Obama on October 5, 2009. EO 13514 defines three scopes of emissions, which include the following: (a) scope 1: direct greenhouse gas emissions from sources that are owned or controlled by the Federal agency; (ii) scope 2: direct greenhouse gas emissions resulting from the generation of electricity, heat, or steam purchased by a Federal agency; and (iii) scope 3: greenhouse gas emissions from sources not owned or directly controlled by a Federal agency but related to agency activities such as vendor supply chains, delivery services, and employee travel and commuting.

***General Conformity*:** Under 40 CFR Part 93 and the provisions of Part 51, Subchapter C., Chapter I, Title 40, Appendix W of the Code of Federal Regulations (CFR), of the CAA as Amended, federal agencies are required to demonstrate that federal actions conform with the applicable SIP.

The USEPA general conformity rule applies to federal actions occurring in non-attainment or maintenance areas. Because Santa Barbara County is an unclassified/attainment area for all NAAQS, the General Conformity Rule does not apply to the Proposed Action at VAFB.

3.1.3 Local Requirements

As indicated previously, in Santa Barbara County, the SBCAPCD is the agency responsible for the administration of federal and state air quality laws, regulations, and policies. Included in the local air districts' tasks are monitoring of air pollution, maintenance of air quality standards through programs to control air pollutant emissions, and the promulgation of Rules and Regulations. SBCAPCD regulations require that facilities building, altering, or replacing stationary equipment that may emit air pollutants obtain an Authority to Construct permit. Further, SBCAPCD regulations require stationary sources of air pollutants to obtain a Permit to

Operate. The local air districts are responsible for the review of applications and for the approval and issuance of these permits. It is not anticipated that the 13th Street Bridge project would require any stationary sources. In addition, the SBCAPCD regulations require stationary source that would emit 25 tons per year or more of any pollutant except CO in any calendar year during construction to obtain emission offsets.

3.2 Biological Resources

3.2.1 Region of Influence

The ROI considered in this EA for biological resources encompasses the Santa Ynez River and associated riparian corridor 0.25 mile upstream of the existing 13th Street Bridge to the estuary. The project area (or construction limits) is defined as the Santa Ynez River, associated riparian corridor, and terrace surrounding the existing and proposed bridges and fiber optic cable installation (Figure 2-1), as well as the edge of the estuary at the Wetland Mitigation Area (Figure 2-10). The existing biological setting includes the regional setting of VAFB, the specific project area setting, and past and present disturbances in and near the Santa Ynez River. Biological resources on VAFB are abundant and diverse compared to other areas of California because VAFB is within an ecological transition zone where the northern and southern ranges of many species overlap, and because the majority of the land within the base boundaries has remained undeveloped. The Santa Ynez River is the largest drainage basin of any stream on VAFB (Coulombe & Mahrdt 1976). This river originates in the San Rafael Mountains and flows along 90 miles (144.8 km) through the communities of Solvang, Buellton and Lompoc before draining into a lagoon east of Ocean Beach. The Santa Ynez River has a drainage basin of 900 square miles (2,300 km^2). This river had perennial flow prior to the completion of Bradbury Dam in 1953. At the present, this is an intermittent river with highly fluctuating flow. Summer flow in the Santa Ynez River often drops to zero. Approximately four miles (6.4 km) of the river runs through VAFB. This segment generally has some water flowing as a result of discharge of irrigation water from agricultural fields and treated effluent from the Lompoc Regional Wastewater Treatment Plant, located east of the VAFB boundary (Coulombe & Mahrdt 1976).

3.2.2 Methodology

Biological resources in the vicinity of the proposed project area were characterized during biological assessments completed in 2014 for the Proposed Action (ManTech SRS Technologies, Inc. [MSRS] 2014a, MSRS 2014b). Wetland surveys were conducted within the 13th Street Bridge Study Area and Wetland Mitigation Area in spring 2014 (MSRS 2014e). The delineation of the active flood plain was made through interpretation of 2005, 2009 and 2013 aerial photographs and field verified (

A, MSRS 2014c, MSRS 2014e). Plant and wildlife species surveys of the project areas, including special status species surveys were conducted from October 2012 through June 2014. Complete lists of plant and wildlife species documented within the project area can be found in Appendix F. Potential occurrence of special status and sensitive species not detected during the biological surveys was determined based on the presence of suitable habitat and/or past records of occurrence of the species. Sources accessed and reviewed to determine potential

for occurrence included the California Natural Diversity Data Base (CNDDB; California Department of Fish and Wildlife [CDFW] 2014) and existing local and regional references (Christopher 1996, 2002; Coulombe & Mahrdt 1976; Holmgren & Collins 1999; Keil & Holland 1998; Lehman 2014).

Waters of the U.S. encompass the jurisdictional limits of the authority of the USACE and include streams and their tributaries that have defined bed and banks and/or that have an OHWM, which is a line on the shore established by the fluctuations of ordinary water flows, as well as adjacent jurisdictional wetlands (FR 33 CFR 320-330). Wetlands were delineated in accordance with the USACE methodology, *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West Region* (USACE 2008), which requires an area to meet specific criteria for each of three wetland parameters (vegetation, hydrology, and soils) in order to be considered a wetland. The Wetland Delineation Report is provided in Appendix G and provides further information on the delineation methods (MSRS 2014c). In addition to wetlands, the limits of jurisdictional waters of the U.S. were determined using the ordinary high water mark (OHWM) as indicated by drift lines and shelving present on the bank. According to section 33 CFR 328.4 the limits of jurisdiction of the USACE are bound by the OHWM of the Santa Ynez River and the tributary channel and any adjacent wetlands. Field identification of the OHWM was complicated within the 13th Street Bridge Project Area. Three years of drought have resulted in reduced winter flows preventing the maintenance of a well-defined OHWM. Additionally, drift deposits originating from above average flows in 2005 (SRS Technologies, Inc. 2006) have persisted complicating field identification of the OHWM. To determine OHWM, physical features were used to determine the bounds of the active floodplain. Features used included benches, breaks in slope, presence of drift deposits, and the presence of sand or other sediments deposited during flows. Vegetation features were also used; particularly the presence of pioneer tree saplings and the absence of mature pioneer trees. The absence of mature trees is indicative that the area in question receives scouring flows at frequent intervals. In addition to onsite evaluations, the previous wetland delineation (SRS 2006), EA for the 13th Street Bridge Emergency Repair and Retrofit (USAF 2003b), aerial photographs, photo documentation from previous flow events, and the county soil survey were consulted.

3.2.3 Vegetation Resources

Areas devoted to agricultural fields and currently developed by the existing bridge and approach roads are present within the 13th Street Bridge Project Area. Vegetation types identified within the 13th Street Bridge Project Area and Wetland Mitigation are included in Figures 3-1 and 3-2. Table 3-3 provides acreages of each vegetation type anticipated to be impacted by project activities within the 13th Street Bridge Project Area. Table 3-4 provides acreages of each vegetation type in the Wetland Mitigation Area. Vegetation types present in the project areas are described in more detail below. Also, Appendix F lists plant species observed during the 2002-2003 and 2013-2014 surveys, supplemented with species observed during the wetlands delineation for the Proposed Action (see also Appendix G for the Wetland Report).

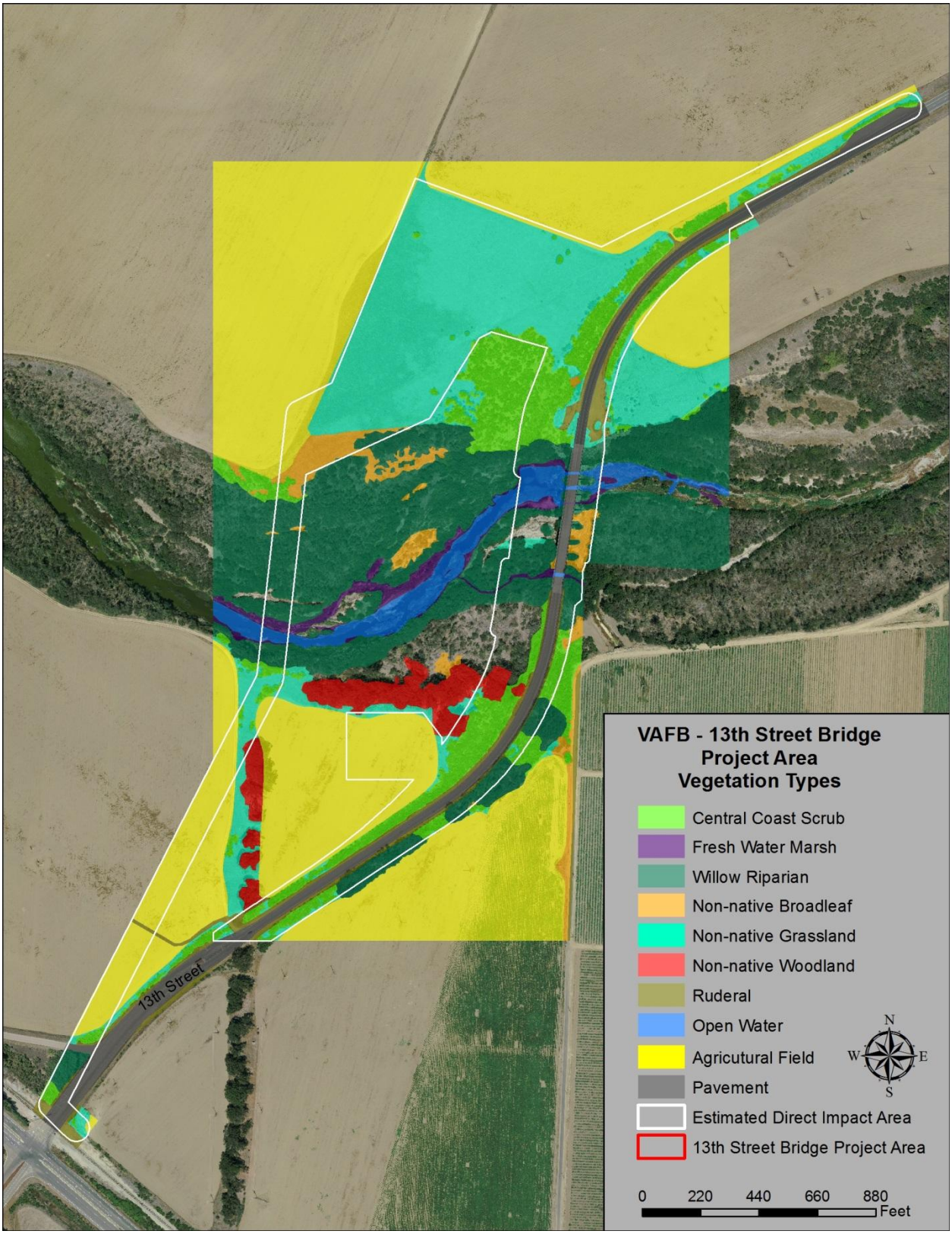

Figure 3-1. Overview of vegetation types and Waters of the U.S. within the 13th Street Bridge Project Area.

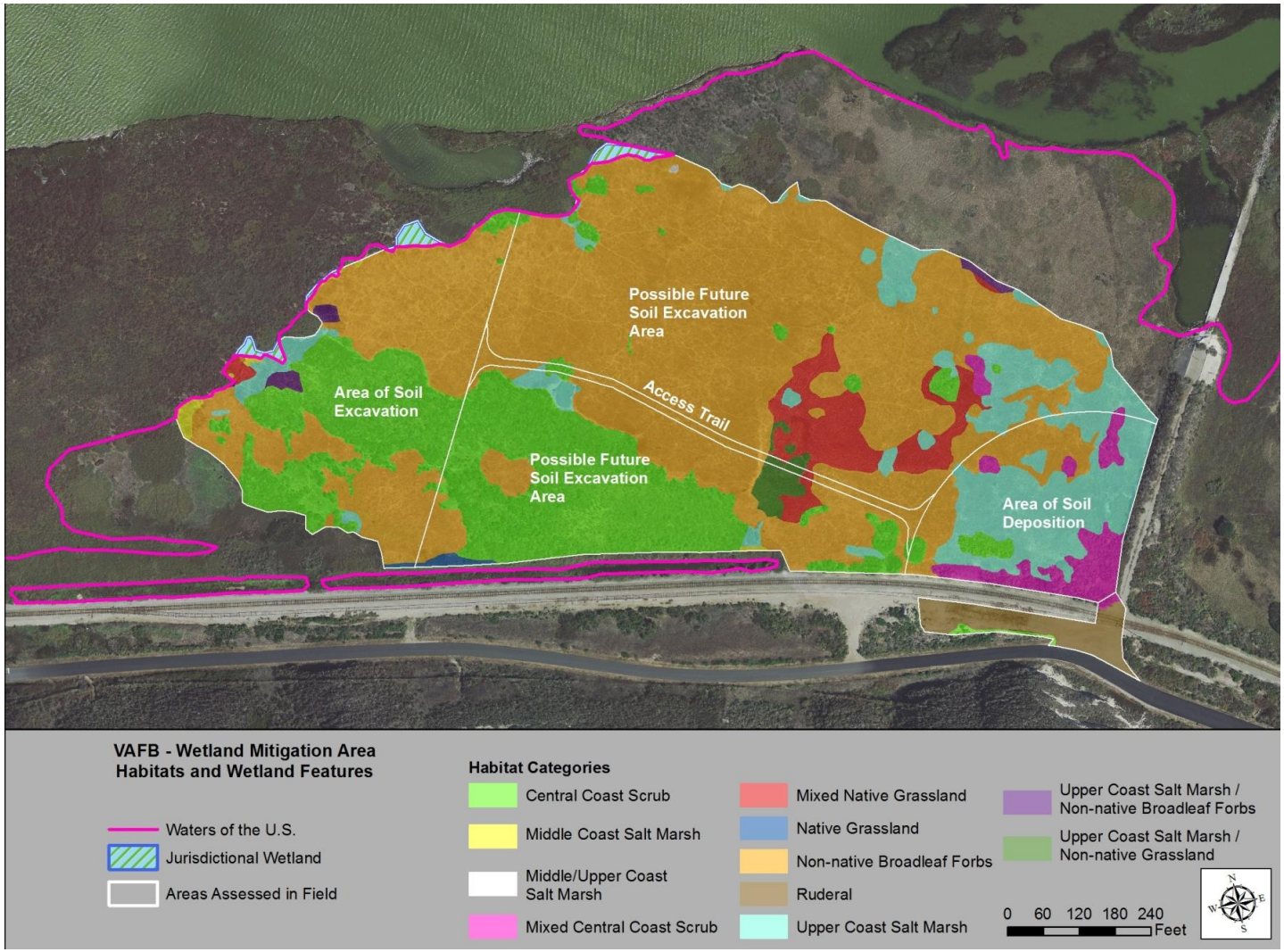

Figure 3-2. Vegetation types and Waters of the U.S. within the Wetland Mitigation Area.

Table 3-3. Vegetation types potentially affected by project activities within the 13th Street Bridge Project Area.

Vegetation Type	Acreage
Willow Riparian	5.3681
Fresh Water Marsh	0.9071
Willow Riparian-Fresh Water Marsh	0.1209
Central Coast Scrub	4.0632
Non-native Grassland	13.3008
Non-native Broadleaf	1.0318
Non-native Woodland	0.1888
Agricultural	2.0770
Ruderal	1.3355
Total	**28.3932**

Source: MSRS 2014e.

Table 3-4. Vegetation types present within the Wetland Mitigation Area (Note: totals are for the overall "Project Area").

Vegetation Type	Acreage
Coastal Salt Marsh	2.59
Central Coast Scrub	4.70
Native Grassland	0.85
Non-native Broadleaf	10.54
Ruderal	0.40
Total	19.08

Source: MSRS 2014e.

3.2.3.1 Willow Riparian Forest

This is the dominant community found in the Santa Ynez River riparian corridor in the vicinity of 13th Street. It is composed of a variety of willow species including arroyo willow (*Salix lasiolepis*), red willow (*Salix laevigata*), and pacific willow (*Salix lasiandra*) of varying age classes. Sandbar willow (*Salix exigua*) is also present at scattered locations on dryer sandy areas of the site. Herbaceous species in the understory include stinging nettle (*Urtica dioica*), California blackberry (*Rubus ursinus*), nightshade (*Solanum* sp.), California figwort (*Scrophularia californica*), and mugwort (*Artemisia douglasiana*). Coyote brush (*Baccharis pilularis*), box elder (*Acer negundo*), and poison oak (*Toxicodendron diversilobum*) are present on the upper banks and are interspersed among the willows or are found in open areas where the willow canopy is lacking. Portions of this habitat also support dense infestations of cape ivy (*Delairea odorata*).Most of the willows on the lower benches within the 13th Street Bridge Project Area appear to be young trees. These areas experience scouring flows on a regular basis preventing the establishment of large trees. Older trees dominate the upper benches where flows are

more infrequent. Outside of the channel, on the upper of the terraces, many of the willows appear to be succumbing to drought conditions. These areas feature many dead and severely stressed trees with a mixed understory of poison hemlock (*Conium maculatum*) and cape ivy.

3.2.3.2 Freshwater Marsh

The dominant plant species in inundated areas within the 13th Street Bridge Project Area include California bulrush (*Schoenoplectus californicus*) and broadleaf cattail (*Typha latifolia*), which are generally found in monotypic stands. Adjacent to flowing water, common species included chairmaker's bulrush (*Schoenoplectus americanus*), tall flatsedge (*Cyperus eragrostis*), floating water primrose (*Ludwigia peploides*), and common monkeyflower (*Mimulus guttatus*). In areas with saturated soils, but withour surface water, species present include brass buttons (*Cotula coronopifolia*), willow herb (*Epilobium ciliatum*), rabbitsfoot grass (*Polypogon monspeliensis*), weedy cudweed (*Pseudognaphalium luteoalbum*), and sneezeweed (*Helenium puberulum*).

3.2.3.3 Central Coastal Scrub

Central coast scrub is an upland plant community found outside the Santa Ynez River riparian corridor within the proposed project area. It is often referred to as soft chaparral, but unlike chaparral, it contains species that are mesophyllous and shallow-rooted, and often are drought-deciduous and summer-dormant. Plant growth occurs in winter and spring, when soil moisture is readily available. Central coast scrub is a diverse vegetation type dominated by the shrub California sagebrush (*Artemisia californica*). In disturbed or more mesic areas, the dominant species may be coyote brush. Within the 13th Street Bridge Project Area coyote brush is overwhelmingly dominant as a result of previous disturbances. Other species found in this community include poison oak, and straggly gooseberry (*Ribes divaricatum*). Central coast scrub stands bordering roads and agricultural fields have a significant invasive understory, predominately consisting of black mustard (*Brassica nigra*) (MSRS 2014e). Within the Wetland Mitigation Area, this vegetation type exhibits low diversity and is composed almost exclusively of coyote brush (*Baccharis pilularis*). Where it borders areas with enhanced moisture, portions of CCS may support hydric herbaceous species (*Frankenia salina, Jaumea carnosa*, and *Conium maculatum*) as an understory component (MSRS 2014e).

3.2.3.4 Coastal Salt Marsh

"Middle" coastal salt marsh occurs in areas of the Wetland Mitigation Area that are inundated during maximal water levels within the estuary. Pickleweed (*Salicornia pacifica*), an obligate-wetland species, that forms a near monoculture throughout much of this habitat type. On the fringes, however, it may occur in conjunction with other species such as alkali heath and fleshy jaumea ranked facultative-wetland and obligate-wetland respectively. "Upper" coastal salt marsh occurs at elevations above the maximum level of inundation, and rarely has surface water present. However, it is influenced by enhanced subsurface moisture and is dominated by native species ranked as facultative or facultative-wetland. In large tracts it is dominated by a mix of salt grass, alkali rye, pacific aster (*Symphyotrichum chilense*), alkali heath and marsh

baccharis (*Baccharis glutinosa*). This habitat type may also occur as small patches composed of a single species.

3.2.3.5 Native Grassland

Within the Wetland Mitigation Area this vegetation type is dominated by grass species tolerant of salinity; salt grass and alkali rye. It is mostly found in areas with enhanced moisture regimes. Most of this vegetation type is highly degraded within the area with native grass species sharing dominance with non-native broadleaf weeds.

3.2.3.6 Non-native Grassland

This vegetation type occurs most commonly in areas that have been subjected to prior disturbance allowing weedy non-native species adapted to frequent disturbance to invade and dominate a site. Non-native annual grasses (*Bromus* spp. and *Avena* spp.) dominate most of the non-native grassland within the 13th Street Bridge Project Area.

3.2.3.7 Non-native Broadleaf

This vegetation type occurs most commonly in areas that have been subjected to prior disturbance allowing weedy non-native species adapted to frequent disturbance to invade and dominate a site. Within the 13th Street Bridge Project Area, non-native herbaceous broadleaf species such as black mustard (*Brassica nigra*) and poison hemlock (*Conium maculatum*) dominate most of the non-native broadleaf vegetation. Within the Wetland Mitigation Area, this habitat type was extensive, to the exclusion of native species, within elevated areas that do not receive regular inundation.

3.2.3.8 Non-native Woodland

Within the 13th Street Bridge Project Area, this vegetation type is dominated by Tasmanian blue-gum eucalyptus (*Eucalyptus globulus*). Many of these trees were planted as wind breaks around agricultural fields. In some areas these groves have expanded beyond the original planted area as trees have reproduced successfully. Some stands have a substantial poison oak (*Toxicodendron diversilobum*) understory.

3.2.3.9 Ruderal

Ruderal vegetation types are found growing adjacent to roads or within areas subjected to frequent disturbance. Ruderal vegetation within the 13th Street Bridge Project Area is composed primarily mowed road margins and pullouts on the northeast and northwest end of the 13th Street Bridge. Mixed non-native annual forbs and grasses (primarily *Bromus* spp.) dominate this vegetation type within the project area. Ruderal vegetation within the Wetland Mitigation Area occurs along road margin and in areas adjacent to the railroad tracks. These areas are subjected to regular disturbance and are dominated by non-native annual forbs and grasses.

3.2.3.10 Anthropogenic

Anthropogenic habitat consists of developed paved areas and active agricultural fields. Agricultural fields are sparsely vegetated due to regular intense disturbances such as mechanical disking. Due to an intense maintenance regime, perennial species are absent from these areas. Active agricultural areas are adjacent to the Santa Ynez River within the 13th Street Bridge Project Area. Non-native annual grasses and forbes constitute the majority of vegetation present in these areas.

3.2.3.11 Special-Status Plant Species and Sensitive Plant Communities

Sensitive plant communities recorded in the CNDDB (CDFW 2014) for the Surf 7.5 minute U.S. Geological Survey (USGS) quadrangles and which occur within the proposed project area include southern willow riparian forest, coastal freshwater marsh, and southern California steelhead stream. No federal special-status plant species were observed during the field surveys conducted in 2013 and 2014 (MSRS 2014a, MSRS 2014d) or during the wetlands delineation for the proposed new bridge (Appendix G, MSRS 2014c). Although potential habitat exists within the project area for La Graciosa thistle (Cirsium loncholepis, federal endangered species/state endangered species) and Gambel's watercress (Nasturtium gambelii, federal endangered species/state endangered species), the last confirmed observation of La Graciosa thistle along the Santa Ynez River, immediately south of the 13th Street Bridge Project Area occurred in 1958 (Smith 1983) and there are no records of Gambel's watercress from the Santa Ynez River.

3.2.3.12 Wildlife Resources

The Santa Ynez River is valuable to wildlife by providing habitat and serving as a travel and migration corridor. The riparian corridor of the river allows wildlife from upland areas to avoid predators and escape human disturbance and also provides food and water sources for these species. Appendix F lists wildlife species documented within the Proposed Action Area. This table also includes wildlife species not encountered during surveys but potentially present based on prior records in the vicinity.

Common amphibian and reptile species found within and around the project area include bullfrog (*Lithobates catesbeiana*), CRLF , Baja chorus frog (*Pseudacris hypochondriaca*), ensatina (*Ensatina eschscholtzii*), western fence lizard (*Sceloporus occidentalis*), southern alligator lizard (*Elgaria multicarinata*), side-blotched lizard (*Uta stansburiana*), western skink (*Eumeces skiltonianus*), Pacific rattlesnake (*Crotalus helleri*), kingsnake (*Lampropeltis getula*), common gartersnake (*Thamnophis sirtalis*), and gopher snake (*Pituophis catenifer*). The CRLF is a federally threatened species.

Fish species known to occur within the Santa Ynez River include TWG, mosquito fish (*Gambusia affinis*), arroyo chub (*Gila orcutti*), armored three-spine stickleback (*Gasterosteus aculaetus*), and southern steelhead (*Oncorhynchus mykiss*) (Coulombe & Mahrdt 1976; Swift 2002; Swift et al. 1997; MSRS 2014d). The TWG and southern steelhead are federally endangered species.

More birds are found in riparian forests than in any other habitat type on VAFB. Coulombe and Mahrdt (1976) observed 46 species of birds in this habitat. Common inhabitants include song sparrow (*Melospiza melodia*), Bewick's wren (*Thryomanes bewickii*), yellow warbler (*Setophaga*

petechia), spotted towhee (*Pipilo maculatus*), and downy woodpecker (*Picoides pubescens*). The federally endangered southwestern willow flycatcher (*Empidonax traillii extimus*) historically bred in riparian willow forest of the Santa Ynez River near 13th Street. Cliff swallows (*Petrochelidon pyrrhonota*) nest underneath the deck structure of the existing 13th Street Bridge.

Large and medium sized mammal species commonly found in willow riparian forests include Virginia opossum (*Didelphis virginiana*), desert cottontail (*Sylvilagus audubonii*), brush rabbit (*Sylvilagus bachmani*), long-tailed weasel (*Mustela frenata*), coyote (*Canis latrans*), raccoon (*Procyon lotor*), striped skunk (*Mephitis mephitis*), and bobcat (*Felis rufus*). Small mammals include various species of mice (*Peromyscus* spp.), dusky-footed woodrat (*Neotoma fuscipes*), and Trowbridge's shrew (*Sorex trowbridgii*). Several bat species are known to roost underneath the existing 13th Street Bridge or utilize habitat nearby (Pierson et al. 2002).

3.2.3.13 Special Status Wildlife Species

Table 3-5 lists federal and state listed wildlife species and other special status species that occur or have the potential to occur within the project area and its vicinity. Potential occurrence was determined based on past documentation of special status species within the vicinity of the Proposed Action Area and on suitability of habitat and occurrence within the region of a particular species. Several species were excluded from potential occurrence because they either do not occur at the site during the time construction activities would occur, they do not breed within the project area and their special status affords them protection during their breeding period, or they do not occur in a manner that affords them special status protection (i.e., rookeries or nesting colonies).

Although potential habitat exists within the project area for the least Bell's vireo (*Vireo bellii pusillus*, federal endangered species/state endangered species) and southwestern willow flycatcher (*Empidonax traillii extimus*, federal endangered species/state endangered species), these species have not been documented within the proposed project area in the last 10 years (Seavy et al. 2012). Therefore, it is unlikely that these species would be encountered and would be affected by the Proposed Action.

Golden eagles (*Aquila chrysaetos*, Federal Bird Species of Conservation Concern, California Fully Protected Species) and bald eagles (*Haliaeetus leucocephalus* [Federal Bird Species of Conservation Concern, California Endangered Species, California Fully Protected Species]) are occasionally seen throughout VAFB and may forage in open scrub, grassland, and estuarine habitats. However, these would be expected to be occasional rare sightings and these species are not anticipated to be affected by project activities.

Table 3-5. Federal and state special status wildlife species with potential to occur within the Proposed Action Area.

Species	Status		Occurrence within Proposed Action Area	Notes
	USFWS	CDFW		
Amphibians				
California Red-legged Frog (*Rana draytonii*)	FT	CSC	Common	Resident within Proposed Action Area
Reptiles				
Southwestern Pond Turtle (*Actinemys pallida*)	-	CSC	Common	Resident within Proposed Action Area
Fishes				
Tidewater Goby (*Eucyclogobius newberryi*)	FE	CSC	Abundant	Resident within Proposed Action Area
Southern Steelhead (*Oncorhynchus mykiss*)	FE	CSC	Absent to Rare	Numbers dependent on environmental conditions
Arroyo chub (*Gilia orcuttii*)	-	CSC	Absent to Abundant	Numbers dependent on environmental conditions
Birds				
Belding's Savannah sparrow (*Posserculucs sandwhichensis beldingi*)		SE	Common	Resident breeder within the Wetland Mitigation Area
Ferruginous Hawk (*Buteo regalis*)	BCC	-	Rare	Wintering birds hunt in fallow fields within the Proposed Action Area
Northern harrier (*Circus cyaneus*)	-	CSC	Common	Nesting records near the Proposed Action Area
White-tailed Kite (*Elanus leucurus*)	-	CSC	Rare - Common	Nesting records near the project area; numbers vary annually
Allen's Hummingbird (*Selasphorus sasin*)	BCC	-	Common	Resident riparian breeder within the Proposed Action Area
Nuttall's Woodpecker (*Picoides nuttallii*)	BCC	-	Common	Resident riparian breeder within the Proposed Action Area
Olive-sided Flycatcher (*Contopus cooperi*)	-	CSC	Rare	Summer resident, potential breeder in Non-native Woodland within the Proposed Action Area
Loggerhead Shrike (*Lanius ludovicianus*)	BCC	-	Common	Resident central coast scrub breeder within the Proposed Action Area
Purple Martin (*Progne subis*)	-	CSC	Very Rare	Fall/Spring transient at the Santa Ynez River mouth
Oak Titmouse (*Baeolophus inornatus*)	BCC	-	Common	Resident riparian breeder within the Proposed Action Area
Yellow Warbler (*Dendroica petechia brewsteri*)	BCC	CSC	Common	Summer resident riparian breeder within the Proposed Action Area
Yellow-breasted Chat (*Icteria virens*)	-	CSC	Common	Summer resident riparian breeder within the Proposed Action Area
Tricolored Blackbird (*Agelaius tricolor*)	BCC	CSC	Rare	Resident with historic breeding records on VAFB
Lawrence's Goldfinch (*Spinus lawrencei*)	BCC	-	Common	Summer resident riparian breeder within the Proposed Action Area
Mammals				
Pallid Bat (*Antrozous pallidus*)	-	CSC	Common	Resident forager within the Proposed Action Area
Western Red Bat (*Lasiurus blossevillii*)	-	CSC	Common	Resident breeder within the Proposed Action Area

Notes: FE = Federal Endangered Species; FT = Federal Threatened Species; FC = Federal Candidate Species; BCC = Federal Bird Species of Conservation Concern; SE = State Endangered Species; CSC = California Species of Special Concern; SC = State Candidate Species; FP = California Fully Protected Species. Abundant = 15+ individuals per day of survey; Common = Over 15 per year of survey; Rare = 1-15 per year of survey; Very Rare = Less than 1 individual per year of survey; Absent = No records of occurrence

California Red-legged Frog (*Rana draytonii* [Federal Threatened Species])

This highly aquatic amphibian inhabits quiet pools of streams, marshes, and occasionally ponds, where it prefers shorelines with extensive vegetation. It is active year-round in coastal areas, and can be found in upland areas during the winter and early spring. CRLF occur in nearly all permanent streams and ponds on VAFB (Christopher 1996). CRLF are known to occur in the Santa Ynez River at the 13th Street crossing (Christopher 1996 and 2004, MSRS 2009 and 2014d). CRLF have been documented in low densities throughout this area, ranging from zero to 11 individuals in October 2012 and 2013 (MSRS 2014d).

Evidence of CRLF breeding (calling males, pairs in amplexus and egg masses) were recorded within the 13th Street Bridge Project Area from February 2013 to May 2013 (MSRS 2014d). However, CRLF tadpoles were not captured or observed during the TWG surveys in July and October 2013 and CRLF metamorphs were not observed during 2012-2013 monthly frog surveys (MSRS 2014d). The 13th Street Bridge Project Area is likely marginal habitat for CRLF, due to high competitive pressure and potential predation from bullfrogs and the presence of non-native predatory fish.

MSRS did not observe CRLF during a night survey on 18 December 2013 of the lagoon along the edge of the proposed Wetland Mitigation Area. Nor are there records of CRLF in the lagoon adjacent to the Wetland Mitigation Area or further west from surveys performed in the lower Santa Ynez River by S. Christopher (2004). This portion of the lagoon may not be suitable for long term occupancy by CRLF or successful breeding due to high salinity during most years. Salinities of 6.5 ppt have been documented at the former 35th Street bridge abutment (Swift et al. 1997), which is the level at CRLF are observed to vacate areas (Jennings & Hayes 1990). However, during run-off events that breach the sand berm, the lagoon would be flushed with fresh water and this would temporarily decrease salinity in this area.

The nearest CRLF locality to the Wetland Mitigation Area is approximately 1,000 ft upstream (Christopher 2004). CRLF have also been documented within the Miguelito Wetland, approximately 700 ft east of the proposed Wetland Mitigation Area (Christopher 2004). The Miguelito Wetland is associated with a freshwater tributary draining into the Santa Ynez River, so salinities within the tributary would likely be lower than those in the main channel.

CRLF were listed as federally threatened by the USFWS on 23 May 1996 (61 FR 25813-25833). In 2002, the USFWS issued a Recovery Plan to stabilize and restore CRLF populations (USFWS 2002). Critical habitat was designated on 17 March 2010 (50 FR 12816-12959); however does not include VAFB, since it was excluded under section 4(b)(2) of the ESA, for reasons including impacts on national security.

Tidewater Goby (*Eucyclogobius newberryi* [Federal Threatened Species])

The TWG is a small bottom dweller of California's coastal estuaries, wetlands, and lagoons, and lower reaches of coastal streams and rivers. It has been reported in all the major drainages on VAFB, including Shuman Creek, San Antonio Creek, Santa Ynez River,

Canada Honda, and Jalama Creek (Swift et al. 1997). TWG typically favor areas within the fresh-saltwater interface and salinities of less than 12 parts per thousand (Swift et al. 1989). However, this species will range into fresh water and has been recorded up to 7.5 miles upstream from the ocean in the Santa Ynez River (Swift et al. 1997). The TWG population in the Santa Ynez River is the largest on VAFB but can experience dramatic seasonal and annual fluctuations (Swift et al. 1997).

Breeding occurs late April to early may, followed by dispersal and migration to upstream locations. Surveys conducted within the vicinity of the 13th Street Bridge in July 2013 documented young of the year and female gobies in spawning condition, indicating breeding was occurring within the project area (MSRS 2014d).

The TWG was listed as endangered in 1994 (59 FR 5494) with a recovery plan published in 2005 (USFWS 2005). Critical habitat was designated in 2013 (78 FR 8745-8819), but does not include VAFB, since it is controlled by the Department of Defense (DoD) and has adopted an Integrated Natural Resources Management Plan (INRMP; Air Force 2011), prepared under section 101 of the Sikes Act (16 U.S.C. 670a). In January 2014, USFWS proposed to reclassify the TWG from endangered to threatened (79 FR 14340-14362); a decision on this proposal is expected later in 2014.

Southern Steelhead Southern California ESU (*Oncorhynchus mykiss* [Federal Endangered])

This anadromous fish species returns to freshwater streams to spawn. Unlike salmon, juvenile steelhead may reside in coastal streams from one to three years, and as adults may make the spawning journey more than once. The Santa Ynez River was historically a major spawning ground and nursery for steelhead and supported the largest steelhead run in southern California (Romero 1993). Although runs have decreased drastically since the completion of Gibraltar Dam in 1920 and Bradbury Dam in 1953, the Santa Ynez River still supports steelhead. The section of the river that occurs within the boundaries of VAFB, including the project area, is presently used by steelhead for migration to and from spawning sites further upstream. Steelhead migrate upstream December through April. Downstream migration by smolts can occur any time of year.

Although the portion of the Santa Ynez River within VAFB does not provide potential breeding habitat for steelhead (i.e., deep pools, overhanging banks, spawning gravel) the waterway functions as a migratory corridor for this species. In general, steelhead migrate upstream December through April, and downstream migration by smolts typically occurs between late January and early May. Juvenile fish immigrating to the ocean are transients in the Santa Ynez River lagoon, although adults may become trapped as flows diminish, as evident by two resident adult steelhead documented in the lagoon in 1998 (Titus, pers. comm., cited in U.S. Bureau of Reclamation 1999). Smolts may also be trapped and over summer in the estuary if the lagoon mouth is closed during spring emigration (T. Robinson, pers. comm.). Therefore, steelhead may be present within the Proposed Action Area at any time of year, either as transitory or trapped adults and/or smolts.

Critical habitat for the southern steelhead was designated on September 2, 2005 (70 FR 52488), however Vandenberg AFB was excluded from this designation.

Belding's Savannah sparrow (*Passerculus sandwichensis beldingi* [California Endangered Species)

The Belding's Savannah sparrow resides year-round in the coastal salt marshes of southern California. This subspecies of Savannah sparrow is ecologically associated with dense pickleweed (*Salicornia virginica*), within which most nests are found. The breeding season for this species extends from mid-March to mid-August, with a peak in May and June. Salt marsh habitat within the Wetland Mitigation Area comprises breeding and foraging habitat for resident coastal savannah sparrows (Holmgren & Collins 1999; Ball & Robinette 2012). Critical habitat for this species has not been designated.

3.3 Waters of the United States and Wetlands

Delineation of wetlands within the Proposed Action Area was completed in June 2014 (MSRS 2014c). A report summarizing the results of this delineation is included in Appendix G. The present location and alignment of the main Santa Ynez River channel is the result of recent events. It is likely that the riverbed was substantially higher in elevation historically, and possibly as high as the sandbar terrace observed along the southern bank (ESA PWA 2010). However, the main channel of the river appears to be the result of downcutting, scour and soil deposition that have restricted the flow to its present alignment and location (ESA PWA 2010).

3.3.1 13th Street Bridge Project Area

Within the project area, saturation within the upper 12 inches was the most common primary indicator of wetland hydrology. A positive FAC-Neutral Test was the most common secondary indicator. The appearance of drift and sediment deposits was very limited with most deposits appearing multiple years old. These deposits were most commonly encountered away from the hydrated channel within the riparian corridor where they were deposited during high flow events (5 year flood events) that occurred during prior years. Within the riparian corridor, these deposits are protected from degradation and continue to persist. A hydric soil is defined as "…a soil that is saturated, flooded, or ponded long enough during the growing season to develop anaerobic conditions that favor the growth and regeneration of hydrophytic vegetation" (USACE 1987). Along the main channel of the Santa Ynez River, within the proposed project area, the soils are primarily sandy, with some areas of gravelly soils. Loamy soils predominate in established riparian areas, and silty surface layers were present in areas where sediments were deposited in drying backwater channels. Hydric soil characteristics were the most conserved wetland indicator. The appearance of a Depleted Matrix was the most common indicator of hydric soil conditions. Areas exhibiting his indicator present had soils with a value of 4 and a chroma of 2 accompanied by the appearance of mottles.

Field identification of the OHWM was complicated within the 13th Street Bridge Project Area. Three years of drought have resulted in reduced winter flows preventing the maintenance of a

well-defined OHWM. Additionally, drift deposits originating from above average flows in 2005 (SRS Technologies, Inc. 2006) have persisted complicating field identification of the OHWM. To determine OHWM, physical features were used to determine the bounds of the active floodplain. Features used included benches, breaks in slope, presence of drift deposits, and the presence of sand or other sediments deposited during flows. Vegetation features were also used; particularly the presence of pioneer tree saplings and the absence of mature pioneer trees. The absence of mature trees is indicative that the area in question receives scouring flows at frequent intervals.

Waters of the U.S. encompass Jurisdictional Wetlands as well as areas of open water and areas bound by the OHWM (Non-wetland Waters). A total of 2.89 acres are classified as Waters of the U.S. within the 13th Street Bridge Impact Area and are subject to the jurisdiction of the USACE under Section 404 of the CWA.

Approximately 1.26 acres of Jurisdictional Wetlands were identified within the Project Impact Area. These jurisdictional wetlands were located in and along the active channel of the Santa Ynez River and the Secondary Channel to the south (see Figure 3-1). Additional areas of Jurisdictional Wetlands were present within the Project Area in a high flow channel on the north side of the river west of the Project Impact Area (MSRS 2014e). This high flow channel connects to a hydrated backwater pond that also met the criteria for Jurisdictional Wetlands (see Figure 3-1). As discussed in Section 3.2.3, the wetland plant communities found in this area includes willow riparian forest and freshwater marsh. A list of the plant species observed during the surveys and their Wetland Indicator Status (WIS) is provided in Appendix G.

Non-wetland Waters of the U.S. were determined to be those areas within the OHWM of the Santa Ynez River to the north and the wetlands associated with the agricultural stream to the south that did not clearly meet all three wetland criteria (Figure 3-1). These areas include unvegetated portions of flowing channels, and areas within the active flood plain of these waters (Figure 3-1). Approximately 1.63 acres of non-wetland Waters of the U.S. are within the Project Impact Area. These areas include un-vegetated portions of flowing channels, and areas within the active flood plain of these waters (see Figure 3-1).

3.3.2 Wetland Mitigation Area

Areas that currently meet the criteria for Jurisdictional Wetlands occur along the western edge of the Wetland Mitigation Area (Figure 3-2). The wetland plant community found in this area is coastal salt marsh (Figure 3-2). A list of the plant species observed during the surveys and their WIS is provided in Appendix G.

Saturation within the upper 12 inches was the only primary indicator of wetland hydrology documented and a positive FAC-Neutral Tests the only secondary indicator. Throughout the winter spring period, when surveys were conducted, water levels in the estuary were actively rising. These rising water levels led to documentation of saturation within the upper 12 inches in June 2014 portions of the project area with ground elevations of 11 ft or less. Soils within the Wetland Mitigation Area were naturally problematic. Due to recent inundation, hydric soil characteristics had not had sufficient time to develop at the time of sampling. Therefore, in

areas exhibiting both hydric vegetation and wetland hydrology, soils were classified as Problematic Hydric.

Waters of the U.S. within the Wetland Mitigation Area include areas encompassed by the OHWM of the Santa Ynez River and adjacent wetlands (Figure 3-2). The proposed Wetland Mitigation Area is above the OHWM but does contain contiguous wetlands. These wetlands were considered to be the bounds of jurisdiction.

The Wetland Mitigation Area is an approximate 19.1 acre area within which various habitat types are present, as discussed in Section 3.2.3. A small area of jurisdictional wetlands, 0.09 acres of Coastal Salt Marsh, is present within the area and overlaps with the acreage estimates provided in Section 3.2.3.

3.4 Cultural Resources

This section begins with a summary of the regional cultural setting and then describes known cultural resources and previously completed cultural resources studies in vicinity of the 13th Street Bridge Replacement Project.

3.4.1 Region of Influence

The prehistory of California's central coast spans the entire Holocene and may extend back to late Pleistocene times. Excavations on VAFB reveal occupations dating back 11,000 years (Lebow et al. 2014). These early occupants are thought to have lived in small groups that had a relatively egalitarian social organization and a forager-type land-use strategy (Erlandson 1994; Glassow 1996; Greenwood 1972; Moratto 1984). Human population density was low throughout the early and middle Holocene (Lebow et al. 2007). Cultural complexity appears to have increased around 3,000–2,500 years ago (King 1981, 1990). At VAFB, that interval also marks the beginning of increasing human population densities and appears to mark the shift from a foraging to a collecting land-use strategy (Lebow et al. 2006, 2007). Population densities reached their peak around 600–800 years ago, corresponding to the full emergence of Chumash cultural complexity (Arnold 1992).

People living in the VAFB area prior to historic contact are grouped with the Purisima Chumash (Greenwood 1978; King 1984; Landberg 1965), one of several linguistically related members of the Chumash culture. In the Santa Barbara Channel area, the Chumash people lived in large, densely populated villages and had a culture that "was as elaborate as that of any hunter-gatherer society on earth" (Moratto 1984). Relatively little is known about the Chumash in the Vandenberg region. Explorers noted that villages were smaller and lacked the formal structure found in the channel area (Greenwood 1978). About five ethnohistoric villages are identified by King (1984) on VAFB, along with another five villages in the general vicinity. Diseases introduced by early Euroamerican explorers, beginning with the maritime voyages of Cabrillo in A.D. 1542–1543, substantially impacted Chumash populations more than 200 years before Spanish occupation began (Erlandson & Bartoy 1995, 1996; Preston 1996). Drastic changes to Chumash lifeways resulted from the Spanish occupation that began with the Portolá expedition in A.D. 1769.

VAFB history is divided into the Mission, Rancho, Anglo-Mexican, Americanization, Regional Culture, and Suburban periods. The Mission Period began with the early Spanish explorers and continued until 1820. Mission La Purísima encompassed the Vandenberg area. Farming and ranching were the primary economic activities at the Mission. The Rancho Period began in 1820 and continued until 1845. Following secularization in 1834, the Alta California government granted former mission lands to Mexican citizens as ranchos. Cattle ranching was the primary economic activity during this period. The Bear Flag Revolt and the Mexican War marked the beginning of the Anglo-Mexican Period (1845–1880). Cattle ranching continued to flourish during the early part of this period, but severe droughts during the 1860s decimated cattle herds. The combination of drought and change in government from Mexican to the United States caused substantial changes in land ownership. Sheep ranching and grain farming replaced the old rancho system. Increased population densities characterize the Americanization Period (1880–1915). Beginning in the late 1890s, the railroad provided a more efficient means of shipping and receiving goods and supplies, which in turn increased economic activity. Ranching and farming continued during the early part of the period of Regional Culture (1915–1945), until property was condemned for Camp Cooke (Palmer 1999).

The Suburban Period (1945–1965) began with the end of World War II. In 1956, the army transferred 64,000 acres of North Camp Cooke to the Air Force, and it was renamed the Cooke Air Force Base. Construction of missile launch complexes began in 1957 and in 1958 the base had its first missile launch, the Thor, and was renamed VAFB (Palmer 1999). The base played a very important role in the Cold War, with every ballistic missile in the United States arsenal ground- and flight-tested at VAFB and thousands of military personnel receiving training under operational conditions. In addition, the base was the only place where military satellites could be safely launched into polar orbit and thus proved critical to the military space program during the Cold War (Nowlan et al. 1996).

3.4.2 Known Cultural Resources

An archaeological site record and literature search for the 13th Street Bridge Project was completed at the 30th CES/CEIEA at VAFB and at the Central Coast Information Center, University of California, Santa Barbara. Background research included a review of archaeological literature, archaeological base maps, and cultural resource records. Data sources examined at 30 CES/CEIEA included the VAFB Comprehensive Plan geographic information system (GIS). Information was collected for previous archaeological and for archaeological sites within 0.25 mile of the Project Area.

3.4.3 Archaeological Sites

No archaeological sites are recorded within or immediately adjacent to the proposed bridge replacement project. Three archaeological sites are recorded within 0.25 mile: CA-SBA-923, CA-SBA-2126, and CA-SBA-3744. CA-SBA-932 was recorded as a low- to moderate-density lithic scatter covering 414,518 square feet (ft^2) overlooking the valley floor. It also contains a historical component. Recent excavations revealed that the site contains a relatively high density of lithic debris (Enright et al. 2012). CA-SBA-2126 lies on the valley floor well north of the proposed bridge replacement project. It is a deposit of marine shell and lithic debris

associated with a buried soil about 6.5 ft deep. It encompasses about 304,188 ft^2 and was subject to excavations associated with an oil pipeline (Woodman et al. 1991). CA-SBA-3744 is a buried, low-density deposit of marine shell and lithic debris. It is about 5 ft deep and associated with a buried soil. It was found in July 2002 during monitoring for power pole installation (Munns 2004), about 197 ft outside the bridge replacement project. The site size is unknown.

3.4.4 Cultural Resources Studies

Research indicates that 23 cultural resource studies have been completed within 0.25 mile of the proposed project (Table 3-6). Four previously completed studies were specifically associated with replacing the 13th Street Bridge. The first of these was monitoring during emergency bridge stabilization in late 2002 and early 2003 (Davis et al. 2003), an effort that identified no cultural resources. In February 2003, a pedestrian survey of the proposed bridge replacement project was conducted (SRS Technologies 2003). The northern riverbank was examined for about 900 ft upstream and 200 ft downstream from the existing bridge. Exposures along the riverbank were examined for evidence of buried archaeological sites. Beyond the previously excavated and recontoured area that was cleared during the emergency stabilization, ground visibility was excellent along downstream portion. Visibility was poor (less than 20 percent) along the upstream portion, and physical access to the riverbank was difficult. No prehistoric or historical cultural materials were observed during the survey.

Munns (2005) documented monitoring of geotechnical boring in the bridge vicinity. She further described exploratory trenching along 13th Street at the southern bridge approach to "assess the potential for encountering subsurface cultural deposits during bridge construction, and to gain a better understanding of which areas might be most likely to harbor such deposits" (Munns 2005). The exploratory trenching was prompted by the presence of nearby buried archaeological deposit CA-SBA-3744 (described above). Five exploratory trenches roughly adjacent to and paralleling 13th Street were excavated to depths ranging up to 11 ft. No archaeological materials were identified during monitoring or during exploratory trenching.

Haslouer and Lebow (2006) report additional surface and subsurface survey for the bridge replacement. A pedestrian survey was completed of a previously unsurveyed area north of the river. No archaeological materials were observed. Subsurface exploration to look for potential buried archaeological deposits was expanded with excavation of five additional backhoe trenches. Three of these were along the southern river banks and one on the northern river bank in the proposed footprint of the replacement bridge. None of these trenches yielded any evidence of an archaeological deposit. The fifth trench was excavated between the project area and CA-SBA-3744 to determine whether it extended toward the project. A very sparse scatter of marine shell was identified at a depth of 5 ft and the site boundary was expanded. However, it was not expanded to the current project area. Multiple existing utilities in the project area closest the site precluded further sampling but those same utilities would have destroyed the site if it had extended into the current project area.

Most recently, a pedestrian survey was completed and 15 backhoe trenches were excavated along the proposed route for the second set of fiber-optic cables downstream from the new

bridge. No archaeological resources were identified during either the survey or the backhoe excavations (Lebow & Haslouer 2014).

Built in 1970, the current bridge across the Santa Ynez River is too young to meet the 50-year minimum to qualify as a cultural resource.

Table 3-6. Previous archaeological studies within 0.25 mile of the Project Area.

Author	VAFB Report No.	Report Title
Glassow (1977)	1977-01	*An Intensive Archaeological Survey of Five Areas on Vandenberg Air Force Base, Santa Barbara County, California*
Spanne (1980)	1980-07	*An Archaeological Evaluation of the Space Transportation System 69KV Transmission Line (V-86), VAFB, Santa Barbara County, CA*
WESTEC Services, Inc. (1981)	1981-04	*Geophysical Evaluation, VAFB, Santa Barbara County, CA For Union Oil Company of California*
Neff (1982)	1982-05	*VAFB, CA 1982 Fuels Management Program, Cultural Resources Survey/Evaluation*
WESTEC Services, Inc. (1984)	1984-02	*Final Report, VAFB, CA 1983 Fuels Management Project, Phase II Cultural Resource Survey - Evaluation*
Erlandson (1984)	1984-11	*A Summary of Phase I Cultural Resource Investigations Conducted in Support of the Proposed Union Oil Santa Maria Basin Pipeline, Santa Barbara County, CA*
Gibson (1984)	1984-21	*Results of Archaeological Surface Survey on Three Parcels of Land Totaling 234 Acres on VAFB, Santa Barbara County, CA*
Peterson et al. (1984)	1984-31	*Phase I Archaeological Survey of a Proposed Powerline Right-of-Way and Two Alternate Pipeline Routes, Lompoc, CA.*
Schliz (1985)	1985-03	*Archaeological Survey, Testing and Evaluation, STS Power Plant No. 6, VAFB, Santa Barbara County, CA*
King et al. (1985)	1985-25	*Union Oil Project/Exxon Project Shamrock and Central Santa Maria Basin Area Study EIS/EIR,* Technical Appendix G, Cultural Resources
Berry (1988)	1988-11	*Santa Ynez Raw Waterline Surface Survey*
Bergin and King (1989)	1989-12	*The Survey and Inventory of Archaeological Properties for the Backbone Fiber-Optic Transmission System Project, VAFB, Santa Barbara County, CA*
Gard et al. (1990)	1990-10	*Cultural Resources Monitoring Report: Phase I and II, Backbone Fiber Optics Transmission System Construction, Vandenberg Air Force Base, California.*
Woodman et al. (1991)	1991-06	*Western Chumash Prehistory: Resource Use and Settlement in the Santa Ynez River Valley.*
Peter and Dondero (1991)	1991-07	Site Summaries and Technical Appendices. In *Western Chumash Prehistory: Resource Use and Settlement in the Santa Ynez River Valley.*
Carbone and Mason (1998)	1998-03	*Phase I, II, and III Archaeological Surveys for Cultural Resources Inventory, Vandenberg Air Force Base, Santa Barbara County, California.*
Davis et al. (2003)	VAFBM-2003-01	*Site Visit/Monitoring Summary, December 21, 2002–January 3, 2003, 13th Street Bridge Emergency Stabilization.*
Parreira (2003)	VAFBM-2003-04	*Monitoring for 13th Street Cable Repair.*
SRS Technologies (2003)	—	*Final Environmental Assessment, 13th Street Bridge Emergency Repair and Retrofit.*

Table 3-6. Continued		
Lebow (2004)	2004-01	*Archaeological Studies for the Encapsulated Payload Transfer Route, Vandenberg Air Force Base, Santa Barbara County, California.*
Munns (2004)	VAFBM-2004-12	*Archaeological and Native American Monitoring for the EELV Transport Power Line Project.*
Munns (2005)	—	*Archaeological and Native American Monitoring of Geotechnical Testing and Exploratory Trenching for the Proposed 13th Street Bridge Redesign.*
Haslouer and Lebow (2006)	2006-06	*Archaeological Survey and Exploratory Backhoe Trenching for New 13 St Bridge, Vandenberg Air Force Base.*
Enright et al. (2012)	—	*Archaeological Studies in Support of Section 106 Compliance for Replacement of K1, K4, K6, K7, and K8 Power Lines, Vandenberg Air Force Base, Santa Barbara County, California.*

3.5 Earth Resources

3.5.1 Geology and Soils

VAFB is a geologically complex area that includes the transition zone between the Southern Coast Range and Western Transverse Range geomorphic provinces of California. The geologic features of VAFB have been an important factor in the development of the diverse natural habitats found in this primarily undeveloped stretch of California coastline. VAFB is underlain predominantly by marine sedimentary rocks of Late Mesozoic age (140 to 70 million years before the present) and Cenozoic age (70 million years to the present). The basal unit underlying the entire base is the Franciscan Formation of upper Jurassic age (Dibblee 1950). The Franciscan Formation consists of a series of sedimentary and volcanic rocks with numerous serpentine intrusions. Extensive folding and faulting throughout the VAFB area has created four structural regions: the Santa Ynez range, the Lompoc lowland, the Los Alamos syncline, and the San Rafael Mountain uplift (Reynolds, Smith, & Hill, Inc. 1985). The Santa Ynez range consists of a very thick Cretaceous-Tertiary sedimentary section uplifted along the Santa Ynez fault; it was then subsequently folded. The Lompoc lowland is an area of low relief that is structurally synclinal but has Franciscan basement relatively close to the surface. The Los Alamos syncline is a deep structural down warp traversing the Los Alamos and upper Santa Ynez valleys. Faulting along the southwestern margin of the mountain range uplifted the San Rafael Mountains. The majority of the folds in these structural regions are oriented to the northwest.

The two major riparian environments in the east/west trending valleys of VAFB are the San Antonio Creek and the Santa Ynez River. The area encompassing the Santa Ynez River is referred to as the Lompoc Valley geomorphic area. The Lompoc valley is a broad synclinal valley occupied in part by the floodplain of the Santa Ynez River. A Sorrento-Mocho-Camarillo soil association, as are all river and creek areas on VAFB, characterizes the river area. This soil type is found in nearly level to moderately sloping terrain such as floodplains and alluvial fans. The soil is well drained to somewhat poorly drained, and it ranges from sandy loams to silty clay loams (Shipman 1981). This soil type is composed of 40 percent Sorrento soils, 30 percent Mocho soils, 10 percent Camarillo soils, and 20 percent other soil series. The Sorrento series

consists of well-drained sandy loams to clay loams, which are recent fluvial or alluvial deposits and have a high to very high fertility. The erosion hazard is none to slight for Sorrento sandy loams and slight to moderate for Sorrento loams. The Sorrento series has a low to moderate shrink-swell potential. The Mocho series consists of well-drained alluvial and silty loams with a moderate to high fertility. It has a low to moderate shrink-swell potential and its erosion factor is none to slight. The Camarillo series consists of poorly drained, very fine-grained sandy loams to silty clay loams, which are alluvial in origin and have eroded from sandstone and shale bedrock. The fertility for the Camarillo series is moderate to high, there is no erosion hazard, and it has a low to moderate shrink-swell potential (Shipman 1972).

3.5.2 Seismology

The Santa Barbara County region is seismically active with a major earthquake occurring in the region about every 15 to 20 years (USAF 1987; Alterman et al. 1994). The Santa Ynez-Pacifico Fault Zone, the Lompoc-Solvang (Santa Ynez River)-Honda Fault Zone, the Lions Head-Los Alamos-Baseline Fault Zones, and their potential offshore extensions, are three of the primary fault zones that project through VAFB (Alterman et al. 1994).

These fault systems within the Transverse Ranges are considered active (Jennings 1994) and capable of generating damaging earthquakes. Moderate or major earthquakes along these systems could generate strong or intense ground motions in the area, and possibly result in surface ruptures of unmapped faults along the northern and southern boundaries, as well as the central part of VAFB.

3.5.3 Geological Hazards

The ROI considered for purposes of this EA is Santa Barbara County. The proposed project area at the Santa Ynez River crossing at 13th Street is located in a seismically active portion of Central California. Potential hazards that could affect the site and result in structural damage include faulting, ground shaking, liquefaction, lateral spreading and flooding. The hazards consist of seismically induced settlement, collapse (hydroconsolidation), and tsunami potential.

The potential for surface fault rupture on VAFB is generally considered to be low (USAF 1987). At the present, there are no known areas where liquefaction has occurred. Areas most prone to liquefaction are those in which there is sandy to silty soil, the water table is within 50 ft of the surface, and earthquake loading exceeds 20 percent of gravity. The areas that are most prone to liquefaction on VAFB are near San Antonio Creek and the Santa Ynez River. The potential for liquefaction on VAFB, despite these areas, is still considered low (USAF 1987).

Tsunamis, sea waves associated with offshore earthquakes, along the Central and Southern California coast have not been well recorded and documented until recently. Since 1946, only five significant tsunamis have been recorded, and each was associated with distant earthquakes. Tsunami flooding of the VAFB coastline could occur in low-lying areas such as the mouth of the Santa Ynez River. The recurrence intervals for tsunamis have not been predicted for the VAFB coastline (USAF 1987).

3.6 Hazardous Materials and Waste Management

Hazardous materials and wastes are those substances defined as hazardous by the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) (42 U.S.C. 9675), the Toxic Substances Control Act (TSCA) (15 USC 2601-2671), the Solid Waste Disposal Act as amended by the Resource Conservation and Recovery Act (RCRA; 42 USC 6901-6992), and Title 22 of the California Code of Regulations (CCR). In addition, federal and state Occupational Safety and Health Administration (OSHA) regulations govern protection of personnel in the workplace. In general, the definitions within these citations include substances that, because of their quantity, concentration, or physical, chemical, or infectious characteristics, may present substantial danger to public health (to workers), welfare, or the environment, when released into the environment. The ROI for hazardous materials and waste management for the Proposed Action is VAFB.

3.6.1 Hazardous Materials Management

Hazardous material use on VAFB is regulated by a Hazardous Materials Management Plan (USAF 2006), and emergency response procedures for hazardous materials spills are established in Vandenberg AFB's Hazardous Materials Emergency Response Plan (USAF 2014). In accordance with the Hazardous Materials Management Plan, Vandenberg AFB requires that all hazardous materials be obtained through the HAZMART, a base function that centrally manages the procurement of hazardous materials. Specifically, the HAZMART approves the use of hazardous materials only after it reviews the composition of the commodity and how it is to be used to ensure compliance with environmental, safety, and occupational health regulations and policies. Hazardous materials potentially used during construction and demolition projects are petroleum, oils and lubricants in demolition equipment and vehicles, solvents for paint abatement or equipment cleaning, and compressed gases for welding or cutting equipment.

3.6.2 Hazardous Waste Management

Management of hazardous waste at VAFB complies with the RCRA Subtitle C (40 CFR Part 240-299) and with California Hazardous Waste Control Laws as administered by the California Environmental Protection Agency (Cal EPA) Department of Toxic Substances Control, under CCR Title 22, Division 4.5. These regulations require that hazardous wastes be handled, stored, transported, disposed of, or recycled according to defined procedures. The VAFB *Hazardous Waste Management Plan* (HWMP; USAF 2002) outlines the procedures to be followed for hazardous waste management on VAFB.

3.6.3 Installation Restoration Program

The federal Installation Restoration Program (IRP) was implemented at DOD facilities to identify, characterize, and restore hazardous substance release sites. There are currently 136 IRP sites throughout VAFB grouped into six Operable Units based on similarity of their characteristics. The IRP sites are remediated through the Federal Facilities Site Remediation Agreement, a working agreement between the Air Force, the Regional Water Quality Control Board – Central Region, and the Department of Toxic Substances Control. In addition to IRP

sites, there are identified Areas of Concern (AOC), where potential hazardous material releases are suspected; and Areas of Interest (AOI), defined as areas with the potential for use and/or presence of a hazardous substance.

The following criteria were used to determine the sites included in this discussion:

- IRP sites, AOCs, and AOIs within 2,000 ft of the project site;
- Sites containing surface water drainage or groundwater flow within the Santa Ynez River watershed; and
- Sites upstream of the project site.

No IRP sites, AOCs or AOIs have been identified within 2,000 ft of the Santa Ynez River crossing at 13th Street.

3.6.4 Hazardous Materials and Waste Transport

The Department of Transportation (DOT) regulates the transport of hazardous materials and waste. Anyone transporting hazardous materials or waste must obtain EPA identification numbers as transporters. The EPA has incorporated DOT statutes (49 U.S.C.) into its regulatory scheme, and has added other requirements such as record keeping and cleanup of spills. Transporters of hazardous materials and waste at VAFB are regulated by the aforementioned laws and are DOT certified transporters. VAFB follows the Caltrans requirements for traveling with hazardous materials on SR 1, which runs through part of the eastern edge of VAFB, and SR 246, which physically divides the base into North and South VAFB.

3.7 Human Health and Safety

Hazards associated with some past and present mission activities and operations on VAFB can constrain locations where projects can be sited in order to ensure the health and safety of workers. The following hazard zones have been established on VAFB to protect workers from various hazards:

- **Toxic hazard zones** are areas established downwind of launch site operations to protect workers from exposure to toxic vapors emitted during the transfer or loading of liquid propellants or maintenance of launch systems. These zones can extend 20,000 or more ft from a launch site.
- **Missile/Space Launch Vehicle Flight Hazard Zones and Explosive Safety Zones** are established under the flight path of missile or space launch vehicle launches to protect personnel from debris fall-out under the launch trajectory. Explosive safety zones are established from 75 to 5,000 ft around launch sites and buildings where rocket propellants are stored to protect personnel from potential explosive hazards. Both of these hazard zones must be evacuated before any launch.
- **Radiofrequency Radiation Hazard Areas** are established around transmitters on VAFB that can present radiation hazards to people and potentially detonate electroexplosive

devices. The size of the hazard areas vary, depending on the transmitter power and antenna reception.

- **Airfield Clear Zones, Lateral Clear Zones (LCZs), and Accident Potential Zones (APZs)** are established around the VAFB airfield runway and contain restrictions on certain land uses. Clear zones and LCZs are areas where the accident potential is so high that land use restrictions prohibit reasonable use of the land. Clear zones occur at both ends of the runway, and LCZs extend 1,000 ft from both sides of the centerline along the length of the runway. The ground surface within the LCZ must be graded to certain requirements and kept clear of fixed or mobile objects, except for necessary navigational aids and meteorological equipment. There are two APZs, APZs I and II, which are less critical than clear zones but still possess significant potential for accidents. Acceptable uses within APZ I areas include industrial or manufacturing, communication and utilities transportation, wholesale trade, open space, recreation, and agriculture, but not uses that concentrate people in small areas. Acceptable uses within APZ II areas include low business services and commercial retail trade uses of low intensity or scale of operation, but not high density operations.
- **Air Installation Compatible Use Zones (AICUZs)** are areas where certain land uses are restricted due to the combination of the potential for accidents and noise and the need for clearance of obstacles.
- **Unexploded Ordnance Closure Areas** are areas on VAFB that were used as ordnance training ranges and have the potential to contain unexploded ordnance (UXO). On 27 September 2010, all areas known or suspected to contain UXO on VAFB were closed to non-mission/recreational activities. Any proposed work in these areas must be coordinated with the Weapons Safety and Explosive Ordnance Disposal (EOD) offices. Depending on the area, escorts may or may not be required.

The affected environment for Health and Safety is the regulatory environment for health and safety issues established to minimize or eliminate potential risk to the general public and personnel involved in the proposed project. The Proposed Action would involve construction and demolition activities where workers would potentially be exposed to conditions that could adversely impact their health and safety. The ROI of these potential impacts is the Proposed Action area and surrounding vicinity.

- Hazardous materials, primarily petroleum, oil, and lubricants (POLs), would be used for operating heavy equipment under the Proposed Action. The potential exists for unexpected releases of these POLs, which would generate hazardous waste.
- The construction contractor would transport hazardous material used in or resulting from the Proposed Action. A permitted hazardous waste hauler would transport hazardous waste. The transportation of these materials is discussed in Section 3.10 of this EA.
- Construction and demolition activities create noise, discussed below.

Because of the above conditions, the potential exists for persons participating in the construction and demolition activities to become exposed to hazardous materials and hazardous waste. In addition to these more obvious risks to human health and safety, the following, more mundane, physical features, which have the potential to be present in the vicinity of the proposed project, also have the potential to adversely impact the health and safety of the site workers:

- Physical hazards including traffic in the roads, holes and ditches, uneven terrain, sharp or protruding objects, slippery soils or mud, and unstable ground.
- Biological hazards such as animals (insects, spiders, and snakes), and disease vectors (ticks and rodents).

3.7.1 Noise

The Noise Control Act (NCA; 42 U.S.C. 4901 *et seq.*) sought to limit the exposure and disturbance that individuals and communities experience from noise. It focuses on surface transportation and construction sources, particularly near airport environments. The NCA also specifies that performance standards for transportation equipment be established with the assistance of the Department of Transportation. Section 7 of the NCA regulates sonic booms and gave the Federal Aviation Administration regulatory authority after consultation with the U.S. EPA. In addition, the 1987 Quiet Community amendment gave state and local authorities greater involvement in controlling noise.

Noise is often defined as unwanted sound that can interfere with normal activities or otherwise diminish the quality of the environment. Depending on the noise level, it has the potential to disrupt sleep, interfere with speech communication, or cause temporary or permanent changes in hearing sensitivity in humans and wildlife. Noise sources can be continuous (e.g., constant noise from traffic or air conditioning units) or transient (e.g., a jet overflight or an explosion) in nature. Noise sources also have a broad range of frequency content (pitch) and can be nondescript, such as noise from traffic or be specific and readily definable such as a whistle or a horn. The way the acoustic environment is perceived by a receptor (animal or person) is dependent on the hearing capabilities of the receptor at the frequency of the noise, and their perception of the noise.

The amplitude of sound is described in a unit called the decibel (dB). Because the human ear covers a broad range of encountered sound pressures, decibels are measured on a quasi-logarithmic scale. The dB scale simplifies this range of sound pressures to a scale of zero to 140 dB and allows the measurement of sound to be more easily understood.

There are many methods for quantifying noise, depending on the potential impacts in question and on the type of noise. One useful noise measurement in determining the effects of noise is the one-hour average sound level, abbreviated L_{eq1H}. The L_{eq1H} can be thought of in terms of *equivalent* sound; that is, if a L_{eq1H} is 45.3 dB, this is what would be measured if a sound measurement device were placed in a sound field of 45.3 dB for one hour. The L_{eq1H} is usually A-weighted unless specified otherwise (dBA). A-weighting is a standard filter used in acoustics that approximates human hearing and in some cases is the most appropriate weighting filter

when investigating the impacts of noise on wildlife as well as humans. Examples of A-weighted noise levels for various common noise sources are shown in Table 3-7.

Existing noise levels on VAFB are generally quite low due to the large areas of undeveloped landscape and relatively sparse noise sources. Background noise levels are primarily driven by wind noise; however, louder noise levels can be found near industrial facilities and transportation routes. Rocket launches and aircraft overflights create louder intermittent noise levels. On VAFB, general ambient L_{eq1H} measurements have been found to range from around 35 to 57 dB (Berg et al. 2002). Most activities associated with the Proposed Action would generate relatively continuous noise throughout the implementation period.

Table 3-7. Comparative A-weighted sound levels.

Noise Level (dBA)	Common Noise Levels	
	Indoor	Outdoor
100 – 110	Rock band inside New York subway	Jet flyover at 304 m
90 – 100	Food blender at one meter	Gas lawnmower at one meter
80 – 90	Garbage disposal at one meter	Diesel truck at 15 m; noisy urban daytime
70 – 80	Shouting at one meter; vacuum cleaner at three m	Gas lawnmower at 30 m
60 – 70	Normal speech at one meter	Commercial area heavy traffic at 100 m
50 – 60	Large business office; dishwasher next room	
40 – 50	Small theater or large conference room (background)	Quiet urban nighttime
30 - 40	Library (background)	Quiet suburban nighttime
20 - 30	Bedroom at night	Quiet rural nighttime
10 - 20	Broadcast and recording studio (background)	
0 – 10	Threshold of hearing	

3.8 Land Use and Aesthetics

3.8.1 Regional Setting

VAFB covers approximately 99,099 acres in western Santa Barbara County and is divided into North VAFB and South VAFB by the Santa Ynez River and Highway 246, a public thoroughfare. Much of VAFB is open space set aside for security and safety buffer zones. VAFB accommodates agricultural outleasing as a major land use on base. At present, 23,500 acres of rangeland are permitted for grazing activities, supporting a maximum of 800 head of cattle, and 1,104 acres are dryland farmed. All grazing land and farmland at VAFB is used by the U.S. Department of Justice, Bureau of Prisons, and U.S. Penitentiary in Lompoc for livestock grazing and 1,104 acres for dryland farming (USAF 2004).

Facilities used for space launches, missile tests, and telemetry and tracking are scattered throughout the base. The urbanized cantonment area is on North VAFB, which includes various administrative, training, industrial, commercial, and residential land uses. North VAFB also has missile test launch sites, space launch sites, and tracking facilities. South VAFB supports space launch sites, telemetry, and tracking facilities. All of these facilities support the primary mission of VAFB. The 30th Civil Engineer Squadron, Comprehensive Planning (30 CES/CENPL) manages development and land use at VAFB. The primary document that outlines development goals and constraints is the VAFB General Plan (USAF 2007). Land use areas on both North and South

VAFB include recreational use of beaches by the public and/or military. Immediately east of these recreational beach areas is open land set aside for security and safety buffer zones.

A Union Pacific railroad line passes through VAFB near the coast. It serves as the main line for Los Angeles to San Francisco coastal rail transportation, providing freight service to most cities along the coast. A number of spur lines operate off the main line in the VAFB area to provide local freight delivery. Amtrak passenger service from Seattle to San Diego, share these Union Pacific Railroad lines (USAF 1988). The Surf Amtrak Station is located adjacent to Surf Beach, at the west end of State Route 246.

13th Street is the main access route between North and South VAFB. Therefore, a bridge over the Santa Ynez River would serve as an important thoroughfare for employees on base and is essential to accomplish mission related activities.

3.8.2 Project Area Setting

The ROI for land use purposes in this EA encompasses the immediate project area, and the temporary staging areas within the Proposed Action Area (Figure 2-1). The area surrounding the Proposed Action Area is characterized by open space. Dryland farming and cattle grazing occurs to the north, east and west of 13th Street and south of Terra Road, and dryland farming to the south of the 13th Street Bridge Project Area, east and west of 13th Street and north of West Ocean Avenue (State Route 246). Wildlife viewing areas are located at the Waterfowl Natural Resources Area south of Terra Road and west of 13th Street. The County of Santa Barbara Ocean Beach Park is located immediately west of the Wetland Mitigation Area where there is wildlife viewing, beach access, and a picnic area.

3.8.3 Coastal Zone Management

Federal activity in, or affecting a coastal zone requires preparation of a Coastal Zone Consistency Determination or a Negative Determination, in accordance with the CZMA of 1972. The California Coastal Zone Management Program was formed through the CCA of 1972. The Air Force is responsible for making final coastal zone consistency determinations or negative determinations for its activities occurring within the state coastal zone or having effects on it. The California Coastal Commission (CCC) reviews federally authorized projects for consistency with the California Coastal Zone Management Program.

The AF has determined that the Proposed Action would not affect any coastal resources within the state coastal zone. As defined in Section 304 of the CZMA, the term “coastal zone” does not include “lands the use of which is by law subject solely to the discretion of or which is held in trust by the Federal government.” The Proposed Action will occur within VAFB, which is wholly owned and operated by the Department of Defense, and therefore is excluded from the coastal zone. However, the Air Force recognizes that actions outside the state coastal zone may affect land or water uses or natural resources within the state coastal zone and therefore are subject to the provisions of the Act. Consequently, an analysis of the impacts of the Proposed Action on the coastal zone was conducted.

3.9 Solid Waste Management

In 1989, the California Integrated Waste Management Act (AB 939) mandated a 50 percent reduction of the quantity of solid waste disposed of in California landfills from a 1990 baseline. The 50 percent reduction was to be accomplished by 1 January 2000. The most recent Air Force mandate regarding solid waste diversion came from Headquarters Air Force Space Command in 2008, requiring a 50 percent diversion rate goal for all solid waste generated at AFSC installations (USAF 2009).

The Pollution Prevention Act (PPA) of 1990 focused the national approach to environmental protection toward pollution prevention (P2). Implementation of the Air Force Environmental Management System (EMS) carries P2 a step further toward mission sustainability principles. The P2 program is defined in detail in the VAFB Pollution Prevention Management Plan, 30 SW Plan 32-7001 and is aimed at achieving 30 SW EMS objectives and targets, through documented practices, procedures, and operational requirements. VAFB implements EMS and its associated P2 program elements by following the P2 hierarchy:

- Reduce (source reduction to prevent the creation of wastes);
- Reuse (keep item or material for its intended purpose);
- Recycle (use item or material for some other beneficial purpose);
- Disposal (in an environmentally compliant manner, only as a last resort).

The State of California passed Senate Bill 1374, amending the PRC, Section 42912, which addresses the issue of C&D debris, diversion requirements, and the development of a model ordinance to be implemented by local jurisdictions (i.e., Santa Barbara County). EO 13514, *Federal Leadership in Environmental, Energy, and Economic Performance*, was signed on 5 October 2009. With respect to solid waste diversion, EO 13514 requires federal agencies to have as a goal to achieve 50 percent or higher diversion rate for Non-hazardous solid waste and construction and demolition materials and debris by fiscal year 2015. In August 2010, the DoD issued its updated Strategic Sustainability and Performance Plan (SSPP), which was followed up by Headquarters Air Force releasing its SSPP Implementation Plan in October 2011. The established diversion goals of the SSPP are 60 percent diversion, by weight, for construction and demolition debris by 2015. AFI 32-7042 requires installations to strive to divert as much solid waste as economically feasible and the VAFB Integrated Solid Waste Management Guide (USAF 2012) requires source segregation of recyclable materials to the greatest extent possible. The ROI of potential impacts to solid waste management as a result of the Proposed Action is VAFB.

3.10 Transportation

For the purpose of this EA, the ROI for transportation would be the combination of highway, arterial, and local roads that provide service to VAFB and the project area. Existing roadway conditions are evaluated based on roadway capacity and traffic volume. The capacity, which reflects the ability of the network to serve the traffic demand of a roadway, depends on the roadway width, number of lanes, intersection control, and other physical factors. Traffic

volumes can be reported as the number of vehicles averaged over a daily period (Average Daily Traffic or ADT) or an annual period (Annual Average Daily Traffic or AADT). Peak-hour volume (PHV) is defined as the highest volume of traffic in a 24-hour period that is recorded on a roadway or intersection during a one-hour period.

The performance of a roadway is generally expressed in terms of Level of Service (LOS). As shown in Table 3-8, the LOS scale ranges from A to F, with each level defined by a range of volume-to-capacity (V/C) ratios. LOS A, B, and C are considered good operating conditions with minor to tolerable delays experienced by motorists. LOS D represents below-average conditions. LOS E reflects a roadway at maximum capacity, and LOS F represents traffic congestion.

3.10.1 Region of Influence

As shown in Figure 1-1, the main access route to VAFB is U.S. Highway 101 (US 101). US 101 is the coastal four-lane divided freeway connecting Northern California to Southern California. The VAFB connections to US 101 are US 1, SR 135, and SR 246. US 1 is mostly a two lane rural highway with the portion bordering VAFB a four-lane rural expressway. SR 135 and SR 246 are mostly two-lane undivided highways with four-lane rural expressway portions.

North VAFB is accessible from three gates: Santa Maria Gate, Solvang Gate, and Lompoc Gate (Figure 3-3). US 1 services the Santa Maria Gate, while SR 246 (also referred to as West Ocean Avenue) services the Solvang Gate. Directly across SR 246 from the Solvang Gate is the South Base Gate, the primary access for South VAFB. Further west, at the terminus of SR 246, is the Coast Gate, which is normally closed, but is occasionally opened for oversized shipments to South VAFB. Santa Lucia Canyon Road, a two-lane highway, services the Lompoc Gate. The northern end of Santa Lucia Canyon Road starts at US 1 becomes Floradale Avenue and connects to Central Avenue. The southern end of Floradale Avenue/Santa Lucia Canyon Road terminates at SR 246. SR 246 services the Solvang Gate. Currently truck access to North VAFB and the base cantonment area is through the Lompoc Gate.

Informal traffic studies of the intersections of San Lucia Canyon Road and US 1 and Floradale Avenue and Central and Ocean Avenues indicate the intersections operate in the LOS A to C range. Force Protection Conditions (FPCON) widely varies the LOS at base gates. The FPCONs start at “Normal” and go to Alpha, Bravo, Charlie, and Delta as the potential threat levels increase. With each step up from normal, the number of protective measures implemented increases. The protective measures range from 100% identification check, to searches of random vehicles, to searches of all vehicles, to controlled access where only mission critical personal are allowed entry to the base. As the FPCON level increases, the traffic delays at the gates increase. All commercial vehicles must stop and be checked prior to access to the base regardless of the FPCON level. Informal traffic studies indicate the gates operate at LOS A to C range.

3.10.2 Project Traffic and Haul Routes

The haul route to an off base landfill from the 13th Street Bridge Project Area would be: travel south on 13th Street, turn east on SR 246. The haul route from the Wetland Mitigation Area is

to exit the area via the remnants of 35th Street to the south, merge onto Ocean Park Road to the South and turn east on SR 246. If waste will be transported to the Santa Maria Landfill, trucks would then travel North on Floradale Avenue (through VAFB) to proceed to US 1 North to Santa Maria (total trip, approximately 30 miles, one way). If waste is taken to the Lompoc City Landfill, trucks would travel south on South Bailey Avenue from SR 246 to West Olive Avenue and then south on Avalon St (total trip, approximately 10 miles, one way).

Main roads on North VAFB include California Boulevard, Washington Avenue/Pine Canyon Road, 13th Street, and El Rancho Road. Main roads on South VAFB include Arguello Boulevard, Bear Creek Road and Coast Road.

There are several routes available to traffic leaving the local area:

- Exit VAFB through the Solvang Gate, turn east on West Ocean Avenue/SR 246 and continue on SR 246 until reaching US 101
- Exit VAFB through the Solvang Gate, turn east on West Ocean Avenue/SR 246, turn north on "H" Street, which is also US 1, and continue north until reaching SR 135 to Santa Maria and connecting with US 101.
- Exit VAFB through the Lompoc Gate, turn east onto Santa Lucia Canyon Road to US 1, proceed south to SR 246 and connect to US 101.
- Exit VAFB through the Lompoc Gate, turn east onto Santa Lucia Canyon Road to US 1, proceed north to SR 135 and connect to US 101.
- Exit VAFB through the Main Gate (Santa Maria Gate), continue straight to connect to US 1/US 101.

Table 3-8. Level of Service scale.

LOS	Description	Criteria (V/C)		
		Multi-Lane Arterial	Two-Lane Highway	Delays[(a)]
A	Free flow with users unaffected by presence of other roadway users	0 – 0.30	0 – 0.15	<10.0
B	Stable flow, but presence of the users in traffic stream becomes noticeable	0.31 – 0.50	0.16 – 0.27	10.0 – 20.0
C	Stable flow, but operations of single users becomes affected by interaction with others in traffic stream	0.51 – 0.70	0.28 – 0.43	20.0 – 35.0
D	High density, but stable flow, speed and freedom of movement are severely restricted; poor level of comfort and convenience	0.71 – 0.84	0.44 – 0.64	35.0 – 55.0
E	Unstable flow; operating conditions at capacity with reduced speeds; maneuvering difficult and extremely poor levels of comfort and convenience	0.85 – 1.00	0.65 – 1.00	55.0 – 80.0
F	Forced breakdown flow with traffic demand exceeding capacity; unstable stop-and-go traffic	>1.00	>1.00	>80.0

NOTES:
V = Volume C = Capacity (a) Average stop delay at intersections.

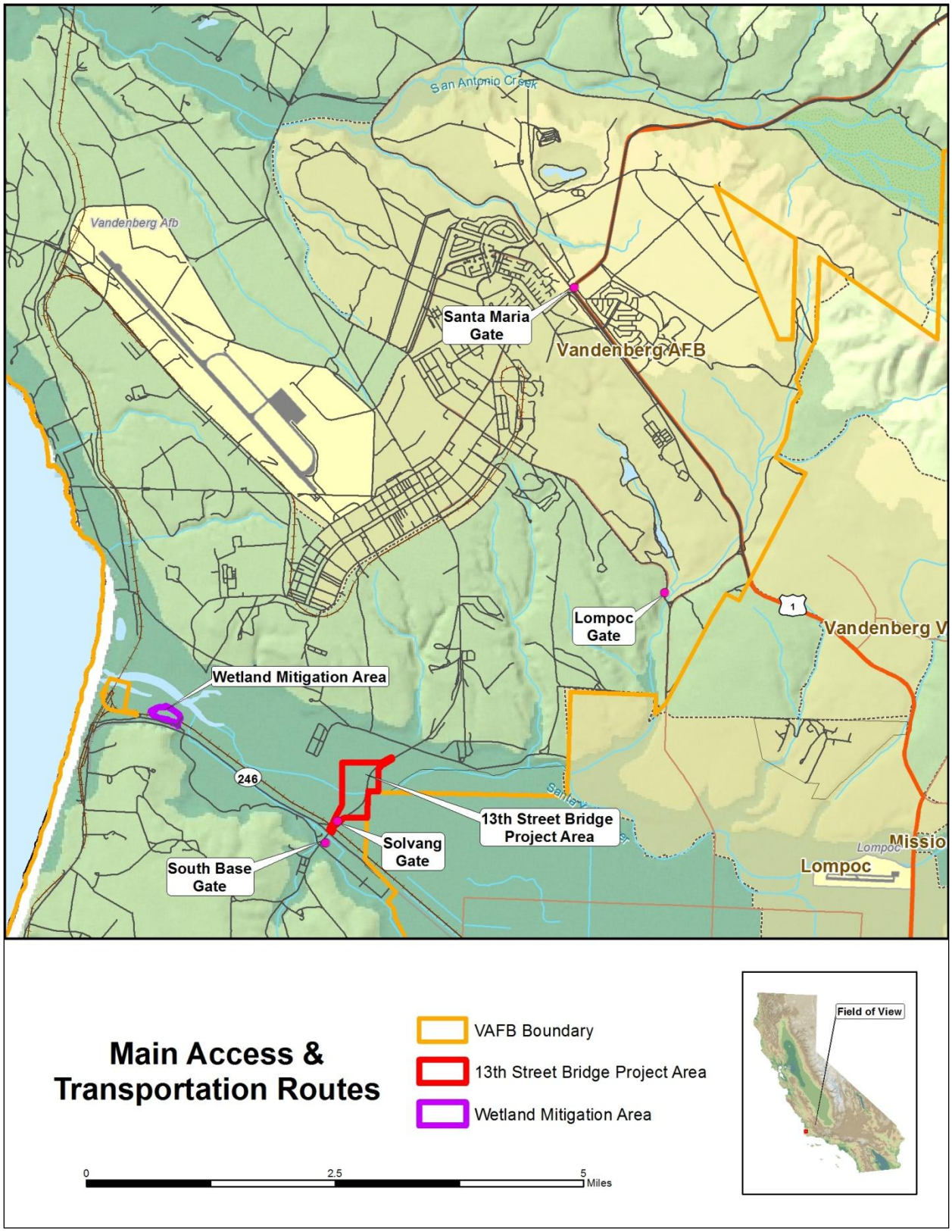

Figure 3-3. Main access and transportation routes associated with the Proposed Action.

3.11 Water Resources

In California, the State Water Resources Control Board (SWRCB) and the Regional Water Quality Control Board (RWQCB) administer the CWA and state water regulations. The CWA mandates that point source discharges to surface water or to the ocean are subject to the NPDES permit program (See Table 1-1 and http://water.epa.gov/lawsregs/lawsguidance/index.cfm). The RWQCB is responsible for management of the NPDES Construction General Permit process for California. The Central CCRWQCB is the local agency responsible for the VAFB area. The NPDES Construction General Permit for construction activities ensures that water discharged from a site meets water quality standards at the point of discharge. The NPDES Construction General Permit also reduces and eliminates storm water and non-storm water discharges associated with construction activities through BMP controls, site inspections, and monitoring to evaluate the effectiveness of the permit implementation actions.

The California Porter-Cologne Water Quality Act provides a framework for establishing beneficial uses of water resources and the development of local water quality objectives to protect these beneficial uses. State regulations require a WDR for permitting discharge. The California Porter-Cologne Water Quality Act implements the NPDES program for the state.

The RWQCB is responsible for enforcing the CWA at VAFB and issues NPDES Construction General Permits to protect stormwater quality.

NPDES General Permit coverage for Construction Activities is required for all construction projects equal to or greater than one acre in size and requires the development of a SWPPP, which describes BMPs to prevent pollutant and sediment discharges from the construction site. In addition, EO 11988 directs all federal agencies to avoid, to the extent possible, the long- and short-term adverse impacts associated with the occupancy and modification of floodplains and to avoid direct or indirect support of floodplain development wherever there is a practicable alternative. Therefore, preparation of a FONPA would be required for Air Force projects having the potential to impact floodplains, in accordance with this EO.

Under Section 401 of the CWA, a federal agency cannot issue a permit or license for an activity that may result in a discharge to waters of the U.S. until the state where the discharge would originate has granted or waived Section 401 Water Quality Certification. Section 404 of the CWA regulates the discharge of dredged or fill material into waters of the U.S., including wetlands. Section 404 permits are reviewed and issued by the USACE. A CWA Section 401 Water Quality Certification from the Central Coast RWQCB and CWA Section 404 Permit from the USACE are required under the Proposed Action because direct impacts to water bodies or wetlands would occur.

3.11.1 Region of Influence

VAFB encompasses portions of two major drainage basins – San Antonio Creek and the Santa Ynez River. Aquifers capable of yielding large quantities of water usable for water supply are generally restricted to the deeper portions of these two waterways (USAF 1998). The Santa Ynez River drains a total area of approximately 900 square miles, and the river flows westward discharging into the Pacific Ocean. Dams on the Santa Ynez River control its flow, and the

volume of flow is also affected by irrigation withdrawals. Groundwater from the Santa Ynez River basin supplies water for irrigation, domestic, industrial, and municipal purposes through pumping. The Proposed Action area is located in the lower Santa Ynez River (Figure 1-1) and the ROI on water resources is the Santa Ynez River basin from the site of the 13th Street Bridge, downstream to the Pacific Ocean.

3.11.2 Surface Water and Floodplains

The Santa Ynez River watershed consists of mostly undeveloped riparian, scrublands, rangelands, and agricultural fields. Flow in the Santa Ynez River is seasonal because of generally very little precipitation from June to November. Higher discharges generally occur during the rainy season, from November to May. The long-term average precipitation in the area is 14.7 inches per year (Santa Barbara County Flood Control District 2014). The portion of the Santa Ynez River that flows through VAFB has year-round flow due to the discharge of treated effluent from the Lompoc Regional Wastewater Treatment Plant, which discharges a maximum of 3.5 million gallons per day to the river about five miles upstream from 13th Street.

Section 303(d) of the federal CWA requires states to identify surface water bodies that are polluted (water quality limited segments). These surface water bodies do not meet water quality standards even after discharges of wastes from point sources have been treated by the minimum required levels of pollution control technology. The project is located within the Santa Ynez River watershed, which is included in the 303(d) list of impaired water bodies for several pollutants. Refer to the *2010 California Integrated Report* (http://www.waterboards.ca.gov/water_issues/programs/tmdl/integrated2010.shtml) for a current list of water quality impairments and their sources.

The 13th Street Bridge replacement project is subject to EOs 11988, *Floodplain Management*, and 13690, *Federal Flood Risk Management Standard*, requirements and objectives because its intended location is in a floodplain. The Air Force requested advance public comment in compliance with EOs 11988 and 13960 to determine if there were any public concerns regarding the project's potential impacts or comments on potential project alternatives. The 100-year floodplain for the Santa Ynez River basin is depicted in Figure 3-4. Because the Proposed Action would occur within the 100-year floodplain of the Santa Ynez River, no practicable alternative to implementing the Proposed Action in a floodplain is possible.

Agricultural runoff and high flows increase the sediment load of the Santa Ynez River in the vicinity of 13th Street. Peak sediment loads occur during the wet season due to the increased flow at that time.

3.11.3 Hydraulics

Data for the hydraulic analysis of the Santa Ynez River was obtained from the USGS Water Resources Data Report for California Water Year 2013. The closest Santa Ynez River monitoring location to 13th Street is located approximately six miles upstream of the proposed project area, 1,000 ft downstream of the H Street Bridge in Lompoc, California (USGS Station 11134000). There were no flows recorded at this station in Water Year 2013 (USGS 2014). The maximum discharge prior to regulation by Lake Cachuma was 37,900 cfs in January 1952 (USGS

2014). The maximum discharge after regulation by Lake Cachuma was 41,600 cfs in March 2001 (USGS 2014). The annual mean discharge after regulation by Lake Cachuma is 71.0 cfs (USGS 2014). A flood frequency analysis prepared during the design phase of the Proposed Action estimated the 100 year return flow at the "Narrows" (approximately 7.8 miles [12.7 km] east of the 13th Street Bridge; USGS Station 11133000) at 141,700 cfs (Moffatt & Nichols 2014).

3.11.4 Groundwater

VAFB includes parts of two major groundwater basins, and at least two subbasins. Most of the northern third of the base is within the San Antonio Creek Basin, while most of the southern two-thirds of the base are within the Santa Ynez River Basin and associated Lompoc Terrace and Cañada Honda Subbasins.

The Santa Ynez River Basin is approximately 90 miles (144.8 km) long, and a maximum of 15 miles (24 km) wide. It extends west from about half a mile east of the Santa Barbara County line to the coast. The Santa Ynez Mountains and Lompoc Terrace bound the basin to the south and the San Raphael Mountains, the lower Purisima Hills, and Burton Mesa bound it to the north. The Lompoc Plain represents the westernmost reach of the Santa Ynez River Basin. The most productive water-bearing zones of the entire Santa Ynez River Basin underlie this alluvial plain. VAFB lies along the coast and traverses the westernmost three to four miles of the Lompoc Plain, where it is bounded to the south by the Lompoc Terrace and to the north by Burton Mesa (Science Applications International Corporation [SAIC] 1990).

Groundwater in the Lompoc Plain area is divided into two main bodies: a shallow, unconfined body, and a deep, confined body. These two groundwater bodies are generally not hydrologically connected, but do appear to be connected in a few restricted areas. Where the comparison can be made, the hydraulic head of the shallow body is generally one to 10 ft higher than that of the deep body. Groundwater flow direction in the shallow body is irregular and poorly defined, and changes over time in response to seasonal changes (Upson & Thomasson 1951). The 13th Street crossing of the Santa Ynez River reach is within the lower region of the Lompoc Groundwater Basin, identified as the Lompoc Plain area. The Basin has a net overdraft of 991 acre-feet per year (County of Santa Barbara [CSB] 2000).

The groundwater supplies water for irrigation, domestic, industrial and municipal purposes through pumping. Recharge to the aquifers beneath the Lompoc Plain includes infiltration from precipitation, seepage from streams, underflow from the aquifers in the Lompoc Terrace and Uplands, irrigation overflow, and by the Santa Ynez River through natural seepage (Stentson Engineering, Inc. 2002). Near the coast of the Lompoc Plain, the aquifer has a shallow water-bearing zone of groundwater, with total dissolved solids (TDS) concentrations up to 8,000 milligrams per liter (mg/L), as measured in the late 1980s. The middle zones had measures of

TDS concentrations from 700 to as high as 4,500 mg/L (SBCWA 2000). The depth of the groundwater varies from zero near the ocean to over 400 ft in the upland areas of this basin.

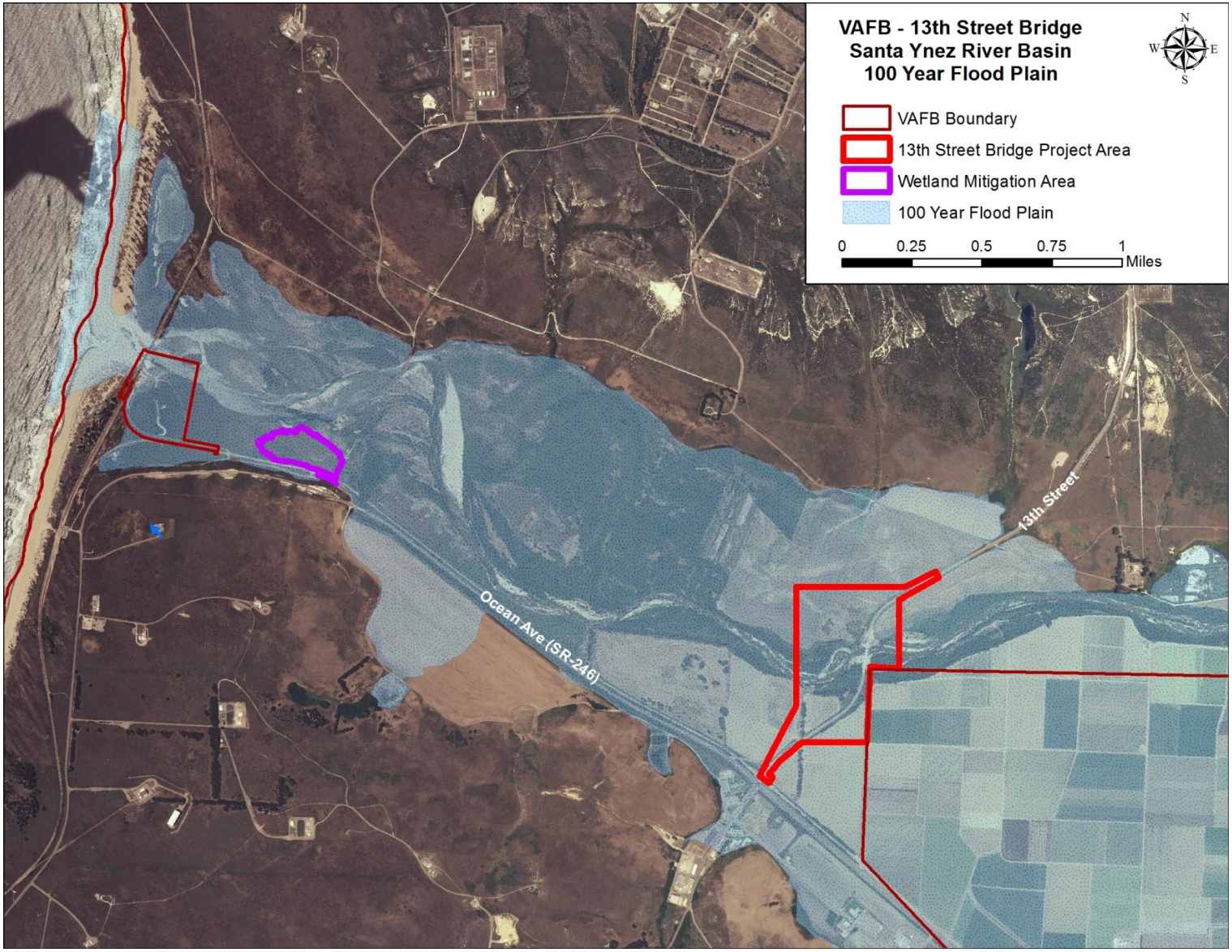

Figure 3-4. Santa Ynez River basin 100-year floodplain.

For much of the Lompoc Plain area, the groundwater depth ranges from 15 to 50 ft (CSB 2002).

Groundwater quality in the region meets all National Primary Drinking Water Regulation standards (California Department of Water Resources [CDWR] 2004). Continued overdraft of the groundwater basins could lead to degradation in the water table levels and a compaction of the basins. Groundwater monitoring is conducted for basins that are used for drinking water.

4 Environmental Consequences

The following analysis of environmental consequences is based on the potential direct, indirect, short-term and long-term, and cumulative effects of the Proposed Action and the No Action Alternative as described in Chapter 2. A list of factors to be considered in determining whether impacts are significant, for purposes of NEPA, are provided in each subsection. Both beneficial and adverse effects are considered. Whether beneficial impacts may occur will be discussed in the analysis of each subsection since the listing of factors to be considered in each subsection is normally focused on the potential for adverse impacts. The decision as to whether to prepare an Environmental Impact Statement (EIS) is based on the impacts of the action as a whole considering context and intensity of the potential impacts.

4.1 Air Quality

Factors considered in determining whether implementing an alternative may result in significant impacts to air quality include the extent or degree to which implementation of an alternative would:

- Expose people to localized (as opposed to regional) air pollutant concentrations that potentially violate federal or state ambient air quality standards; and/or
- Exceed caps (limits) as imposed by federal and state GHG regulations.

To determine the significance of operational impacts, emissions from the project were compared with the federal major source thresholds. The federal major source threshold for criteria pollutants is 100 tons per year, which is the major source threshold under 40 CFR 70, the Federal Operating Permit Program, for all pollutants.

Standard dust control measures (see Section 2.1.7.1) must be implemented for any discretionary project involving earth-moving activities. Some projects have the potential for construction-related dust to cause a nuisance. Since Santa Barbara County violates the state standard for PM_{10}, dust mitigation measures are required for all discretionary construction activities regardless of the significance of the fugitive dust impacts based on the policies in the 1979 Air Quality Attainment Plan.

On 18 February 2010, the CEQ released draft guidance on addressing climate change in NEPA documents. This draft document was revised on 18 December 2014, and CEQ is soliciting public comments until 23 Feb 2015. The 2010 draft guidance, which has been issued for public review and comment, recommends quantification of GHG emissions, and proposes a threshold of 25,000 metric tons of CO_2e emissions. The 2010 guidance indicates that use of 25,000 metric tons of CO_2e emissions as a reference point would provide federal agencies with a useful

indicator, rather than an absolute standard of significance, to provide action-specific evaluation of GHG emissions and disclosure of potential impacts. This analysis complies with the recommendations of both the 2010 and 2014 versions of the draft guidance.

For purposes of this air quality analysis, project emissions within the VAFB region would be potentially significant if they exceed these thresholds. This is a conservative approach, as the analysis compares emissions from both project-related stationary and mobile sources to these thresholds.

4.1.1 Proposed Action

4.1.1.1 Criteria Pollutant Emissions

Potential impacts to air quality from the 13th Street Bridge project would be mainly associated with construction of the bridge. The analysis therefore involves estimating emissions generated from the proposed construction activities and assessing potential impacts on air quality. No increase in emissions is associated with operation of the 13th Street Bridge, as the bridge will replace the existing bridge.

The Proposed Action would occur over a period of approximately 20 months. Construction emissions that would be associated with the Proposed Action include fugitive dust emissions from demolition of the existing bridge, fugitive dust from grading activities and import of dirt, exhaust emissions from heavy construction equipment, and emissions from worker vehicles and trucks. The assumptions of construction equipment, vehicles, and workforce required to implement the Proposed Action that were used for the analysis are shown in Table 2-1.

To calculate emissions associated with construction, the CalEEMod Model, Version 2013.2.2 (ENVIRON 2013) was used. The CalEEMod Model is the latest version of the land use model in California, and takes into account emission factors for construction equipment from the ARB's OFFROAD model and emission factors for on-road vehicles from the ARB's EMFAC2011 model. As shown in Table 4-1, emissions produced during implementation of the Proposed Action would not exceed the significance thresholds for any criteria pollutant. Moreover, the implementation of EPMs, including fugitive dust control measures and measures designed to decrease diesel emissions, described in detail in Section 2.1.7.1, would reduce potential emissions. The increase in construction related PM10 emissions will not have a substantial effect on the 24-hour CAAQS and will not exacerbate the annual standard. Therefore, the Proposed Action will not have a significant effect on air quality.

Table 4-1. Proposed Action construction emissions (tons/year).

Emissions, tons/year						
Construction Phase	**ROG**	**NOx**	**CO**	**SOx**	**PM10**	**PM2.5**
CIDH Installation						
Heavy Construction Equipment	0.05	0.63	0.29	0.0006	0.03	0.03
Construction Worker Travel	0.003	0.005	0.05	0.0001	0.006	0.002
Subtotal	**0.053**	**0.635**	**0.34**	**0.0007**	**0.036**	**0.032**
Significance threshold	25	25	25	25	25	25
Exceeds threshold?	No	No	No	No	No	No
Drainage and RSP Work						
Fugitive Dust	-	-	-	-	0.001	0.0001
Heavy Construction Equipment	0.15	2.01	0.90	0.002	0.08	0.07
Construction Worker Travel	0.006	0.01	0.09	0.0001	0.01	0.0003
Subtotal	**0.156**	**2.02**	**0.99**	**0.0021**	**0.091**	**0.0704**
Significance threshold	25	25	25	25	25	25
Exceeds threshold?	No	No	No	No	No	No
Temporary Access Road						
Fugitive Dust	-	-	-	-	0.005	0.0006
Heavy Construction Equipment	0.15	1.97	1.08	0.002	0.08	0.07
Vendor Trucks	0.01	0.08	0.16	0.0002	0.005	0.002
Construction Worker Travel	0.006	0.01	0.09	0.0001	0.01	0.003
Subtotal	**0.166**	**2.06**	**1.33**	**0.0023**	**0.1**	**0.0756**
Significance threshold	25	25	25	25	25	25
Exceeds threshold?	No	No	No	No	No	No
Dirt Import						
Fugitive Dust	-	-	-	-	0.002	0.0003
Heavy Construction Equipment	0.27	3.23	1.45	0.004	0.12	0.11
Haul Trucks	0.04	0.55	0.54	0.001	0.03	0.01
Construction Worker Travel	0.009	0.01	0.12	0.0002	0.02	0.004
Subtotal	**0.319**	**3.79**	**2.11**	**0.0052**	**0.172**	**0.1243**
Significance threshold	25	25	25	25	25	25
Exceeds threshold?	No	No	No	No	No	No
Roadway Embankment						
Fugitive Dust	-	-	-	-	0.07	0.03
Heavy Construction Equipment	0.11	1.37	0.78	0.001	0.06	0.05
Construction Worker Travel	0.005	0.008	0.07	0.0001	0.01	0.002
Subtotal	**0.115**	**1.378**	**0.85**	**0.0011**	**0.14**	**0.082**
Significance threshold	25	25	25	25	25	25
Exceeds threshold?	No	No	No	No	No	No
Bridge Construction						
Heavy Construction Equipment	0.13	1.65	0.71	0.002	0.07	0.06
Haul Trucks	0.003	0.04	0.04	0.0001	0.005	0.002
Construction Worker Travel	0.006	0.01	0.09	0.0001	0.01	0.003
Subtotal	**0.139**	**1.7**	**0.84**	**0.0022**	**0.085**	**0.065**
Significance threshold	25	25	25	25	25	25
Exceeds threshold?	No	No	No	No	No	No
CIDH Piles and Bridge						
Heavy Construction Equipment	0.10	1.18	0.42	0.001	0.05	0.04
Haul Trucks	0.01	0.13	0.13	0.0003	0.008	0.003
Construction Worker Travel	0.004	0.007	0.06	0.0001	0.008	0.002
Subtotal	**0.114**	**1.317**	**0.61**	**0.0014**	**0.066**	**0.045**
Significance threshold	25	25	25	25	25	25
Exceeds threshold?	No	No	No	No	No	No
Construct New Road						
Heavy Construction Equipment	0.11	1.19	0.67	0.001	0.06	0.06

Table 4-2 Continued						
Haul Trucks	0.005	0.07	0.07	0.0002	0.005	0.002
Construction Worker Travel	0.005	0.009	0.07	0.0001	0.01	0.003
Subtotal	**0.12**	**1.269**	**0.81**	**0.0013**	**0.075**	**0.065**
Significance threshold	25	25	25	25	25	25
Exceeds threshold?	No	No	No	No	No	No
Pave New Road						
Heavy Construction Equipment	0.02	0.28	0.11	0.0003	0.01	0.009
Haul Trucks	0.001	0.02	0.02	0.0000	0.001	0.0004
Construction Worker Travel	0.0007	0.001	0.01	0.0000	0.002	0.0004
Subtotal	**0.0217**	**0.301**	**0.14**	**0.0003**	**0.013**	**0.0098**
Significance threshold	25	25	25	25	25	25
Exceeds threshold?	No	No	No	No	No	No
Total Annual Emissions						
Total Annual Emissions, Year 1	1.09	12.93	7.08	0.01	0.68	0.52
Total Annual Emissions, Year 2	0.31	3.67	2.03	0.004	0.19	0.15
Significance threshold	25	25	25	25	25	25
Exceeds threshold?	No	No	No	No	No	No

4.1.1.2 Greenhouse Gas Emissions

Emissions of GHGs are considered to have a potential cumulative impact on global climate. The emissions associated with construction of the 13th Street Bridge would incrementally increase regional emissions of CO_2 and other GHGs. Scientists are in general agreement that the Earth's climate is gradually changing, and that change is due, at least in part, to emissions of CO_2 and other GHG from manmade sources. The anticipated magnitude of global climate change is such that a significant cumulative impact on global climate exists.

On the issue of global climate change, however, there are no adopted federal plans, policies, regulations, or laws mandating reductions in the GHG emissions that cause global climate change. The climate change research community has not yet developed tools specifically intended to evaluate or quantify end-point impacts attributable to the emissions of GHGs from a single source. In particular, because of the uncertainties involving the assessment of such emissions regionally and locally, the very minor incremental contribution of the Proposed Action to climate change cannot be determined given the current state of the science and assessment methodology.

To calculate GHG emissions associated with the Proposed Action, emissions attributable to Scopes 1, 2, and 3 as defined in EO 13514 have been estimated. Scope 1 emissions include those emissions attributable to sources that are owned and operated by the Federal government. Scope 2 emissions include those emissions that are direct greenhouse gas emissions resulting from the generation of electricity, heat, or steam purchased by a Federal agency. Scope 3 emissions include greenhouse gas emissions from sources not owned or directly controlled by a Federal agency but related to agency activities such as vendor supply chains, delivery services, and employee travel and commuting. For the Proposed Action, these GHG emissions include emissions associated with construction of the 13th Street Bridge.

On February 18, 2010, the CEQ released draft guidance on addressing climate change in NEPA documents. The draft guidance, which has been issued for public review and comment,

recommends quantification of GHG emissions, and proposes a threshold of 25,000 metric tons of CO_2e emissions. The CEQ indicates that use of 25,000 metric tons of CO_2e emissions as a reference point would provide federal agencies with a useful indicator, rather than an absolute standard of significance, for agencies to provide action-specific evaluation of GHG emissions and disclosure of potential impacts. In the absence of formally-adopted thresholds of significance, this EA compares GHG emissions that would occur from the Proposed Action with the 25,000 metric ton level.

The Proposed Action's emissions have been compared with the proposed federal threshold of 25,000 metric tons of CO_2e emissions. Table 4-3 summarizes the annual GHG emissions associated with construction of the 13th Street Bridge. These data show that the annual CO_{2e} emissions estimated for the Preferred Alternative would be less than the proposed significance threshold of 25,000 metric tons of CO2e. Cumulative impacts to global climate change would not be significant.

Table 4-2. Proposed Action GHG emissions.

Scenario/Activity	Metric Tons per Year[1]			
	CO_2	CH_4	N_2O	CO_2e
Construction				
Total GHG Emissions – Year 1	1,369.13	0.3380	0.0000	1,376
Total GHG Emissions – Year 1	364.91	0.0960	0.0000	367
Total Emissions	**1,734.04**	**0.4341**	**0.0000**	**1,743**
Amortized Emissions	58	0.0145	0.0000	58

Notes:

1 CO_2e = (CO_2 * 1) + (CH4* 21) + (N2O * 296).

In sum, net emissions change would not significantly affect regional air quality; less than significant impact. Cumulative GHG impacts are anticipated.

4.1.2 No Action Alternative

Under the No Action Alternative, the 13th Street Bridge would not be replaced, the fiber optic cable would not be installed, and the Wetland Mitigation Area would not be implemented. There would be no change to baseline air emissions and no additional impacts associated with the No Action Alternative. Therefore, the No Action will not have a significant effect on air quality.

4.2 Biological Resources

Factors considered in determining whether implementing an alternative may result in significant impacts on biological resources include the extent or degree to which implementation of an alternative would result in:

- Unmitigable loss of important quantities of declining vegetation communities (including wetlands) that are considered rare;
- Impacts to endangered, threatened, or protected species; and/or
- Alteration of regionally- and locally important wildlife corridors that would severely and permanently limit their use.

Under Section 7 of the ESA of 1973, as amended (16 U.S.C. 1531 et seq.), federal agencies are required to assess the effect of any project on federally listed threatened and endangered species. Section 7 consultations with the USFWS and NMFS are required for federal projects if such actions have the potential to directly or indirectly affect listed species or destroy or adversely modify critical habitat. It is also Air Force policy to consider species listed by state agencies, and other federal special status species when evaluating the impacts of a project. Impacts to biological resources would occur if special status species (endangered, threatened, rare, candidate, or species of concern) or their habitats, as designated by federal and state agencies, would be affected directly or indirectly by project-related activities. These impacts can be short- or long-term impacts, for example, short-term or temporary impacts from noise and dust during construction and demolition, and long-term impacts from the loss of habitat to support wildlife populations. VAFB initiated formal Section 7 consultation with the USFWS and NMFS to address potential adverse impacts to federally protected wildlife species, associated with the construction of a new bridge at 13th Street over the Santa Ynez River and the demolition of the existing bridge. Completed consultation was in the form of a Biological Opinion issued by USFWS and NMFS (see Appendices D and E) and the requirements will be fully implemented.

4.2.1 Proposed Action

Potential impacts to biological resources as a result of the Proposed Action include:

- short-term (temporary) and long-term (permanent) loss of habitat from construction related activities such as access, excavation and construction;
- loss of individuals within the work area due to excavation, crushing or burial;
- loss of individuals in habitats adjacent to work areas due to soil erosion;
- abandonment of breeding and/or roosting sites due to project related noise and associated disturbance;
- disruption of foraging or roosting activities due to project related noise and associated disturbance;
- soil erosion into wetlands or open water adjacent to the project site; and
- degradation of water quality due to turbidity.

4.2.1.1 Vegetation Resources

As discussed in Section 3.2.3, native vegetation types identified in the 13th Street Bridge Project Area (see Figure 3-1; Table 4-4) and Wetland Mitigation Area (see Figure 3-2; Table 4-6) include central coastal scrub, willow riparian forest and freshwater marsh. Disturbances to native plant communities within the footprint of the project area would be unavoidable. Temporary disturbances would occur as a result of the containment of the river channel, installation of silt fencing, access road and staging area construction, and potential increased turbidity immediately downstream of the project area. Permanent losses within the project footprint would occur as a result of installation of the new bridge foundations, abutments, rock slope protection, rip rap, new approach roadways, and maintenance hole installation.

Removal of native plant communities, and temporary disturbances to these communities would be necessary during project implementation and considered a significant impact without restoration and mitigation. However, the removal of native vegetation would be minimized to the extent practicable and native vegetation would be replanted to restore all temporarily disturbed areas. As much as feasible, vegetation removal would be restricted to the minimum areas possible and restricted to the level of the bottom substrate, with root systems of native plants and trees will be left in place wherever possible to enable vegetation to re-sprout quickly after completion of project activities. In addition, BMPs would be implemented to control erosion and reduce turbidity during construction.

A Comprehensive Mitigation and Monitoring Plan (Appendix H) would be implemented prior to the first rainy season following construction. As part of this plan, site restoration and implementation of the Wetland Mitigation Area are designed to restore and replace native plant communities temporarily or permanently affected during construction. Long-term maintenance (e.g., weeding and plant replacement) and monitoring would ensure the successful restoration of native plant communities and wetland habitats to the maximum extent possible. The plan includes maintenance, monitoring, success criteria, and contingency measures to ensure restoration success. Restoration of areas temporarily disturbed during construction and implementation of the Wetland Mitigation Area will result in overall estimated gains of 2.62 acres of wetland habitats and 4.77 acres of native habitats (Table 4-7). With implementation of the environmental protection and monitoring measures and Comprehensive Mitigation and Monitoring, impacts to native plant communities would be less than significant.

No special-status plant species were documented within the footprint of the Proposed Action Area during the biological surveys. La Graciosa thistle was last documented immediately south of the project area in 1958 (Smith 1983). Surveys were conducted in 2013 and it was not observed. In addition, a biological monitor capable of identifying La Graciosa thistle will monitor vegetation removal. Therefore, there would be no effects to special-status plant species as a result of implementing the Proposed Action.

Table 4-4**.** Estimated acreage of each vegetation type affected by the Proposed Action in the 13th Street Bridge Project Area.

Habitat Type	Pre-Project	Post-Restoration	Change
Fresh Water Marsh	0.9071	1.2045	+0.2974
Willow Riparian-Fresh Water Marsh	0.1209	0.3159	+0.1950
Willow Riparian	5.3681	3.3469	-2.0212
Central Coast Scrub	4.0632	5.1675	1.1043
Understory	0	0.2669	+0.2669
Non-Native	14.5214	13.1861	-1.3353
Agricultural	2.0770	2.0539	-0.0231
Ruderal	1.3355	0	-1.3355

Table 4-5. Estimated acres of Willow Riparian habitat outside of Jurisdictional Waters impacted within the 13th Street Bridge Project Area.

Category	Impact Type		Total Impacted
	Temporary	Permanent	
Non-Jurisdictional Willow Riparian	1.5259	2.4362	3.9621
Willow Riparian - Mature	*1.2653*	*0.8763*	*2.1416*
Willow Riparian - on Riprap	*0.2048*	*0.1801*	*0.3848*
Willow Riparian - on Sandbar	*0.0558*	*0.1399*	*0.1957*
Willow Riparian - Senescing[1]	*0*	*1.2399*	*1.2399*

1. Source: MSRS 2014c/Appendix G.
2. The 0.2609 acres impacted during vegetation clearing and soil excavation constitutes a permanent impact for this category because restoration will not be possible due to distance of this area from the water table.

Table 4-6. Estimated acreage of each habitat type affected by the Proposed Action in the Wetland Mitigation Area.

Habitat Type	Existing	Impacted	Restoration Gains	Post-Action	Net Gain/Loss
Coastal Salt Marsh	**2.34**	**1.40**	**4.02**	**4.94**	**2.60**
CSM-middle	0.10	0.09*	4.02	4.02	3.92
CSM-upper	2.21	1.32	0	0.89	-1.32
CSM-middle/upper	0.03	0	0	0.03	0
Central Coast Scrub	**4.21**	**1.67**	**2.80**	**5.34**	**1.13**
Native Grassland	**0.01**	**0.01**	**0**	**0**	**-0.01**
Degraded Habitats	**1.58**	**0.57**	**0**	**1.03**	**-0.55**
CSM-upper / NNBl	0.09	0.06	0	0.03	-0.06
CSM-upper / NNG	0.16	0.02	0	0.15	-0.01

Table 4-6 Continued					
CCS / NNBl	0.49	0.45	0	0.04	-0.45
NG / NNBl	0.84	0.04	0	0.81	-0.03
Non-native Habitats	**10.94**	**3.21**	**0**	**7.73**	**-3.21**
Non-native broadleaf	10.54	2.81	0	7.73	-2.81
Ruderal	0.40	0.40	0	0.00	-0.40
Total	**19.08**	**6.86**	**6.82**	**19.04**	**-0.04****
Other Categories (inclusive of above categories)					
Jurisdictional Wetlands and Waters of the U.S.	0.09	0.09	4.02	4.02	3.93

Source: MSRS 2014c/Appendix G.

Note: (1) Existing means the Project Area; (2) the total acreage of "Impacted" is the Project Impact Area (excavation, deposition, and road access areas); (3) Post-Action includes existing habitat that was not affected by the Proposed Action; (4) Net Gain/Loss is the difference between the existing and post-action totals; (5) * indicates jurisdictional wetlands; (6) ** is the total of gains/losses of all habitats not a net loss of wetlands.

4.2.1.2 Wildlife Resources

Native plant communities within the 13th Street Bridge Project Area are highly productive wildlife habitats. Removal of these habitat types or the temporary loss of these communities during project implementation has the potential to represent an adverse impact on wildlife species. Construction and demolition activities also generate noise that could result in temporary disturbances to wildlife resources. The level of impact associated with construction and demolition noise is discussed in more detail below.

Turbidity and sediment build-up in the vicinity of the project area should be reduced through the use of silt fencing, the temporary containment of the active river channels, and the placement of block nets downstream of the construction zone.

4.2.1.2.1 Noise Related Effects

Wildlife, including mammals, amphibians, reptiles, fish and birds, present in the area could be affected by construction and demolition noise. For airborne sound, one of the most useful measurements to assess the effects of noise is the one-hour average sound level, abbreviated L_{eq1H}. The L_{eq1H} can be thought of in terms of *equivalent* sound. For example a L_{eq1H} of 45.3 dB is what would be measured if a sound measurement device were placed in a sound field of 45.3 dB for one hour. However, this is not what happens during real sound measurements. When a L_{eq1H} level of 45.3 dB is measured, the sound level has fluctuated above and below 45.3dB, but the *average* during that hour is 45.3 dB. The L_{eq1H} is usually A-weighted unless specified otherwise. A-weighting is a standard filter used in acoustics that approximates human hearing and in many cases is the most appropriate weighting filter when investigating sound effects on wildlife as well as humans. L_{eq} measurements can also be specified for other time periods such as eight or 24-hour periods. Predictions of non-transient noise levels associated with activities such as those that would occur during the construction and demolition of a bridge for distances up to 1000 ft are depicted in Table 4-7, with the assumption that equipment is located in one area and operating simultaneously.

Table 4-7. L_{eq1h} noise levels as a result of continuous construction and demolition activities.

Distance from Project Area (ft)	L_{eq} (dB)
50	99.9
100	95.4
300	88.2
500	84.9
1000	80.4

On VAFB, L_{eq1H} measurements have been found to range from 35 to 60 dB, with the higher level representative of areas with higher traffic (SRS Technologies 2001). To place noise levels in perspective, a food blender at a distance of three feet generates 90 dBA. Riding an automobile at 40 miles per hour produces approximately 75 dBA. Normal speech is approximately 60 dBA. Measurements of noise levels in riparian habitat approximately 300 ft west of the existing 13th Street Bridge indicate ambient L_{eq1H} ranging between 33.8 and 47.9 dB, with an average of 39.7 dB (J. Francine, SRS Technologies, pers. comm.). Consequently, short-term disturbance of noise-sensitive wildlife species due to airborne noise near the project area could occur.

The Proposed Action will create noise related effects on wildlife species. Noise and vibration may cause wildlife to temporarily abandon habitat adjacent to work areas. This disturbance may increase the potential for predation and desiccation when amphibians leave shelter sites. The Air Force proposes to relocate wildlife species out of the project area to ample habitat in the surrounding areas, thus minimizing the threat of noise disturbances that would adversely affect these species.

Wildlife responses to noise can be physiological or behavioral. Physiological responses can range from mild, such as an increase in heart rate, to more damaging effects on metabolism and hormone balance. Behavioral responses to man-made noise include attraction, tolerance, and aversion. Each has the potential for negative and positive effects, which vary among species and among individuals of a particular species due to temperament, sex, age, and prior experience with noise. Responses to noise are species-specific; therefore, it is not possible to make exact predictions about hearing thresholds of a particular species based on data from another species, even those with similar hearing patterns. Since construction activities will occur during daylight hours, construction sound is unlikely to disturb calling frogs, because frogs typically call during the night. Exceptionally little sound is transmitted between the air-water interface (Godin 2008), thus in-air sound will not have a significant effect on submerged animals.

Ground-borne vibrations, which would be caused by using a jackhammer to break apart the existing bridge, tend to be highly localized and decay much quicker over distance than in-air sound, except in very unique ground circumstances. Hence, vibration zones of influence tend to be much smaller than their in-air sound counterparts. As reported by ATS Consulting (2013), the referenced vibration emission level for a typical 90 lb jackhammer at 100 ft was 0.003 Peak Particle Velocity (PPV) inches per second. Lewis & Narins (1985) indicate that frogs can detect noise and vibrations, albeit at close range and at approximate levels of 0.04 PPV. Using the fundamental equation for vibration propagation for average soil and distance:

$$PPV_{equipment} = PPV_{ref} (100/D_{rec})^n$$

Where:

PPV_{ref} = reference PPV at 100 ft.

D_{rec} = distance from equipment to the receiver in ft.

n = 1.1 (the value related to the attenuation rate through ground)

The approximate distance from a jackhammer to levels similar to those reported in Lewis & Narins (1985) would be 10 ft. Given the distance of jackhammer activities from the locations where frogs could be located during demolition activities (minimum of approximately 50 ft to edge of exclusion area), it is unlikely that ground-borne vibration would propagate to their locations and cause behavioral responses and therefore would have less than significant impacts.

4.2.1.2.2 Construction Disturbances

Implementation of measures in Section 2.1.7.2 specifically designed to minimize adverse effects on wildlife species should minimize or avoid the potential adverse effects of project-related noise. The noise generated by construction and demolition would represent a change in ambient conditions in the river and surrounding habitats. The Air Force proposes to relocate terrestrial native wildlife out of the project area to the extent practicable to suitable habitat in the surrounding areas, thus minimizing the threat of noise and vibration disturbances that would adversely affect these species. Potential impacts to birds resulting from project related activities, human generated noise, and habitat removal include nest failure and disruption in foraging, roosting, and courtship activities. Birds would be expected to move away from the area of disturbance during construction and demolition activities. Therefore, impacts from noise on wildlife species are expected to be less than significant.

4.2.1.3 Special Status Wildlife Species

Several special status wildlife species occur or have the potential to occur within or near the proposed project area. Table 4-8 presents a summary of potential project related impacts on special status wildlife species. Construction and demolition activities have the potential to result in take of some special status wildlife species from activities. Activities associated with the Proposed Action have the potential to result in temporary adverse effects to populations of CRLF, TWG, southern steelhead, migratory birds, and other special status wildlife in the immediate area of disturbance. The activities that could directly or indirectly adversely affect these species include construction of access roads and staging areas, excavation, placement of rock riprap, movement of workers and vehicles, and relocation of individuals out of the project area. The specific potential effects and the potentially affected species or types of animals are discussed in detail below.

Biological monitors will be present throughout the project duration to document the presence of special status species and minimize impacts to these species within the project area. Measures to be implemented for minimizing or preventing adverse effects to special status wildlife species are described in Section 2.1.7.2.

The Proposed Action Area is not located within designated or proposed critical habitat for any wildlife species. Therefore, the Proposed Action would not affect critical habitat.

Table 4-8. Potential impacts to special status wildlife observed within the Proposed Action area.

Species	Status		Potential Impacts
	USFWS	CDFW	
Amphibians			
California Red-legged Frog (*Rana draytonii*)	FT	CSC	Disturbance from noise, vibration, & light, decreased water quality, increased predation, direct physical impacts, temporary loss of habitat.
Reptiles			
Western Pond Turtle (*Antinemys pallida*)	-	CSC	Disturbance from noise, vibration, & light, decreased water quality, increased predation, direct physical impacts, temporary loss of habitat.
Fishes			
Tidewater Goby (*Eucyclogobius newberryi*)	FE	CSC	Disturbance from noise, vibration, & light, decreased water quality, increased predation, direct physical impacts, temporary loss of habitat.
Southern Steelhead (*Oncorhynchus mykiss*)	FE	CSC	Disturbance from noise, vibration, & light, decreased water quality, increased predation, direct physical impacts, temporary loss of habitat.
Arroyo Chub (*Gilia orcuttii*)	-	CSC	Disturbance from noise, vibration, & light, decreased water quality, increased predation, direct physical impacts, temporary loss of habitat.
Birds			
Golden Eagle (*Aquila chrysaetos)*	BCC	FP	Disturbance from noise, nest loss, temporary loss of foraging and nesting habitat
Ferruginous Hawk (*Buteo regalis*)	BCC	-	Disturbance from noise, nest loss, temporary loss of foraging and nesting habitat
Northern Harrier (*Circus cyaneus*)	-	CSC	Disturbance from noise, nest loss, temporary loss of foraging and nesting habitat
White-tailed Kite (*Elanus leucurus*)	-	CSC	Disturbance from noise, nest loss, temporary loss of foraging and nesting habitat
Allen's Hummingbird (*Selasphorus sasin*)	BCC	-	Disturbance from noise, nest loss, temporary loss of foraging and nesting habitat
Nuttall's Woodpecker (*Picoides nuttallii*)	BCC	-	Disturbance from noise, nest loss, temporary loss of foraging and nesting habitat
Olive-sided Flycatcher (*Contopus cooperi*)	-	CSC	Disturbance from noise, nest loss, temporary loss of foraging and nesting habitat
Loggerhead Shrike (*Lanius ludovicianus*)	BCC	-	Disturbance from noise, nest loss, temporary loss of foraging and nesting habitat
Oak Titmouse (*Baeolophus inornatus*)	BCC	-	Disturbance from noise, nest loss, temporary loss of foraging and nesting habitat
Yellow Warbler (*Dendroica petechia brewsteri*)	BCC	CSC	Disturbance from noise, nest loss, temporary loss of foraging and nesting habitat
Yellow-breasted Chat (*Icteria virens*)	-	CSC	Disturbance from noise, nest loss, temporary loss of foraging and nesting habitat
Savannah Sparrow (*Passerculus sandwichensis* possible *beldingi*)	-	Possible SE	Disturbance from noise, nest loss, temporary loss of foraging and nesting habitat

Table 4-8 Continued			
Species	**Status**		**Potential Impacts**
Tricolored Blackbird (*Agelaius tricolor*)	BCC	CSC	Disturbance from noise, nest loss, temporary loss of foraging and nesting habitat
Lawrence's Goldfinch (*Spinus lawrencei*)	BCC	-	Disturbance from noise, nest loss, temporary loss of foraging and nesting habitat
Mammals			
Pallid Bat (*Antrozous pallidus*)	-	CSC	Disturbance from noise, temporary loss of habitat.
Western Red Bat (*Lasiurus blossevillii*)	-	CSC	Disturbance from noise, temporary loss of habitat.

NOTES:

FE=Federal Endangered Species; FT=Federal Threatened Species; BCC=Federal Bird of Conservation Concern; SE= State Endangered Species; CSC=California Species of Concern

4.2.1.3.1 Physical Effects

Potential direct impacts to all life stages of special status wildlife within the project footprint include injury or mortality from inadvertent crushing by workers as they walk and operate construction equipment, by vehicles hauling or placing materials, and smothering by increased sedimentation. Individuals may also be crushed during the placement of impermeable barriers, rock riprap, and fill material, and desiccated or suffocated in a dewatered section of the creek bed.

Potential direct impacts to special status species will be minimized since the Air Force proposes to establish an exclusion area around the active project site, from which native wildlife would be removed during pre-construction surveys. Adult birds would likely move to adjacent suitable habitat due to project related disturbances and not be likely to experience direct physical effects. In addition, qualified biologists will be present during all construction and demolition activities and additional minimization measures designed to protect nesting birds and native wildlife will be implemented (see Section 2.1.7.2). As a result, potential effects to special status species from direct physical effects will be less than significant.

4.2.1.3.2 Effects of Increased Sedimentation

Excavation and backfilling associated with the removal of vegetation, construction of access roads and staging areas, and placement of rock riprap may cause erosion which can lead to sedimentation and smother special status aquatic herpetofauna and fish species and their nests or reduce the availability of plants and insects that serve as their habitat and food sources. Installing silt fencing, implementing BMPs, and diverting the active river channel around the work areas for the duration of work within the riparian corridor to ensure unimpeded flow would minimize this effect. In addition, no construction or demolition activities would be conducted within the active channel and downstream water quality will be monitored throughout the project. The effects of sedimentation should therefore be temporary (only during installation and removal of the diversion culverts and exclusion area) and have less than a significant effect on special status wildlife species.

The existing 13th Street Bridge has contributed to increased scour at the site of the bridge (Penfield & Smith 2012). By fixing an otherwise meandering channel between narrow

abutments and narrow bays, the existing bridge has concentrated flows into fixed paths and intensified scour downstream (ESA PWA 2010). The new bridge will span 650 ft of channel, compared to 500 ft spanned by the existing bridge, and replace the existing eight pier walls with two hexagonal piers. As a result, the river flow will be allowed to meander through a broader, less constricted channel and the new bridge is expected to decrease downstream scour and sedimentation (Mofatt & Nichols, Inc. 2014). This decrease in sedimentation would be a beneficial effect to special status herpetofauna and fish species. In other words, the sedimentation impacts will be less than significant.

4.2.1.3.3 Contamination Effects

Accidental spills of hazardous materials, careless fueling or oiling of vehicles or equipment, or a frac-out within the river during horizontal directional drilling could degrade aquatic habitat or dispersal habitat to a degree where special status wildlife species are adversely affected or killed. This effect would be greatly reduced because the Air Force will implement a frac-out contingency and spill prevention plan; store hazardous materials and stage, repair, and maintain project equipment outside of the riparian corridor in designated areas; and use catch pans or protective mats to prevent the contamination of the river bed. Therefore, impacts from contamination would be less than significant.

4.2.1.3.4 Effects of Relocation

During establishment of the exclusion area and subsequent biological monitoring, native wildlife will be relocated to suitable adjacent habitat (Section 2.1.7.2.3). Mortality, injury, and reduced fitness may occur to special status wildlife species that are captured and relocated due to improper handling, containment, a lack of familiarity with the site, increased competition, or from releasing them into unsuitable habitat. Only qualified biologists would handle special status wildlife species to minimize this risk. Relocation sites would be selected within the Santa Ynez River watershed, which appear to support the necessary environmental conditions for these species to maximize the likelihood of survival. Therefore, the impacts to relocated species should be less than significant.

Chytrid fungus could be spread if infected amphibians are relocated to areas that have not been previously infected with this fungus. Chytrid fungus is a water-borne fungus that can be spread through direct contact between aquatic animals and spores that can move short distances through the water. The fungus only attacks the parts of an amphibian's skin that have keratin (thickened skin), such as the mouthparts of tadpoles, and the tougher parts of adults' skin, such as the toes. The fungus can decimate amphibian populations, causing fungal dermatitis which usually results in death in 1 to 2 weeks, but not before infected animals may have spread the fungal spores to other ponds and streams. Once a pond has become infected with chytrid fungus, the fungus stays in the water for an undetermined amount of time. The Air Force would reduce the risk of spreading chytrid fungus to less than significant by using qualified biologists that would implement the Declining Amphibian Population Task Force’s Code of Practice (see Section 2.1.7.2.3).

4.2.1.3.5 Effects of Herbicide Use

Use of herbicides to control exotic plant species during restoration efforts may adversely affect water quality at, and downstream of, the project site. If herbicide drifts into aquatic areas at the project site, it may harm all life stages of special status herpetofauna and fish species, or their respective prey species. However, the Air Force would use herbicides approved for use in aquatic environments. Herbicide use would not occur during wet or windy weather conditions, to reduce potential adverse drift. In addition, all herbicides will be used in accordance with the pesticide label and DoD and Air Force Pest Management Regulations. Herbicide application will comply with California Department of Pesticide Regulations and not be used in CRLF habitat per a recent U.S. District Court for the Northern District of California injunction (20 October 2006). Glyphosate herbicide will not be applied within 15 ft of aquatic features, and herbicides that leave residue will not be applied within the Ordinary High Water Mark (Waters of the U.S.). Given these protection measures, it is not likely that the use of herbicides will result in mortality or significant impacts to special status herpetofauna and fish species.

4.2.1.3.6 Effects of Increased Predator Presence

A potential indirect effect of the proposed project is an increase in the number of predators, such as raccoons (*Procyon lotor*) and opossums (*Didelphis virginiana*), at the project site. Increased human presence and the potential for human-generated and discarded trash or food to be left at the site may result in an increase in the number of predators that may disturb, injure or kill adult special status wildlife species. Disposal of all food and trash in closed containers and removal of it daily from the project site would likely minimize the number of predators attracted to the site and result in a less than significant effect from increased predator presence.

4.2.1.3.7 Effects of Light

Light pollution, defined in this context as artificial light that spills into natural habitats, caused by artificial lighting on the new bridge can potentially impact special status wildlife species. Since construction activities will occur during daylight hours, no project lighting would be required. Fish respond differently to artificial light depending on species, life stages, wavelength, and intensities (Gehrke 2005; Marchesan et al. 2005; Nightingale et al. 2006; Becker et al. 2012). In teleosts (ray-finned fish), artificial light at night has been shown to affect foraging behavior, shoaling, predation risk, migration, and reproduction (Nightingale et al., 2006). In a controlled experiment in South Africa, both large and small species of fish were found to congregate in higher densities near artificial light provided in an estuary (Becker et al. 2012).

Although studies of the effects of light pollution have not been conducted with CRLF specifically, and the effects of light pollution on frogs have not been researched extensively, several studies have been conducted on frog and toad species. Anurans have extremely sensitive night vision and can see in very low light levels (Govardovkii & Zueva 1974; Sustare 1977); however activity patterns and some behaviors (e.g. calling and foraging) appear to be limited to very narrow ranges of illumination in many species (Jaeger et al. 1976; Jaeger & Hailman 1981; Hailman 1982, 1984). Increases in both natural and artificial light levels have

been shown to inhibit foraging and movement behavior, increase predator detection, and increase calling behaviors (Tuttle & Ryan 1982; Tuttle et al. 1982; Rand et al. 1997; Buchanan 1998; Baker & Richardson 2006; Buchanan 2006), as well as alter aspects of physiology (Buchanan 2006) in many species.

The light pollution produced by the bridge lights will not exceed 0.1 fc (1.1 lux) within 10 ft north or south of the bridge deck (see Section 2.1.1.5). For comparison, a moonless night on a clear sky produces 0.002 lux (Schlyter 2009), a full moon on a clear night produces between 0.27 and 1.0 lux (Bunning & Moser 1969; Schlyter 2009) and civil twilight is 3.4 lux (Photonis 2012). The light levels reaching the water will be less than 1.1 lux since the water level at typical, non-runoff levels will be 20 to 30 ft below the new bridge deck; however the light levels reaching the water would still be within the range of the brightness of a full moon. Thus, the addition of artificial light at the new bridge may influence foraging behavior, shoaling, predation risk, migration, and reproduction in fish and potentially suppress anuran activity and foraging behaviors in the area surrounding the bridge, resulting in behavioral modification, predation, loss of suitable habitat and decreased fitness of individuals for both species. As shown in other frogs (*Smilisca sila*, Tuttle & Ryan 1982; *Rana clamitans*, Baker & Richardson 2006), artificial light can correspond to an increase in predator detection and calling behaviors by CRLF at the bridge, which may have beneficial effects on survival and fitness. Since the light source would be constant during hours of darkness, CRLF would be expected to acclimate to the new conditions and experience little overall impacts, i.e., less than significant.

The overall effect of artificial bridge lighting on special status fish is difficult to predict since there are no studies examining the effects of low intensity, artificial light on this species or closely related species. Some fish species may benefit if prey species congregate at the site with the artificial light; however, larger fish predators would be likely to congregate as well, potentially resulting in net negative impacts to special status fish densities at the site of the bridge. However, since the affected area would be relatively small, bridge lighting will not have a significant effect on special status fish populations in the lower Santa Ynez River.

4.2.1.3.8 Special Status Avian Species

The removal of vegetation from the Proposed Action Area prior to construction and demolition activities (see Tables 4-4 and 4-6) and would result in the loss of existing breeding and roosting habitat for special status avian species. However, given the abundance of suitable habitat in the vicinity, this adverse impact would be less than significant. In addition, the removal of vegetation during the non-breeding season for avian species (September through February) would prevent adverse effects on these species. If not feasible, pre-construction surveys immediately preceding vegetation removal during the breeding season (March through August) would identify the presence of any nesting special status bird species and provide the opportunity to implement measures to prevent adverse effects.

Other potential adverse impacts of disturbance to breeding birds in the vicinity of but outside the project area include abandonment of breeding sites, egg breakage by “panicked” adults, physical damage to the eggs due to noise, heating and cooling from exposure during periods of nest abandonment, and increased vulnerability to predation. Increased levels of human activity

and associated noise could potentially displace special status species from adjacent nesting habitat. The severity of the impact would depend in a large part on the timing of the activity related disturbance. If disturbance occurs after nesting has already been initiated, project related noise could adversely impact reproductive success.

The measures outlined in Section 2.1.7.2 should serve to avoid or minimize potential adverse effects to special status avian species, including special status wildlife species, during implementation of the Proposed Action. In addition, restoration of areas temporarily disturbed during project activities and restoration of the existing bridge site, once removed, should restore native habitats to the maximum extent feasible. Thus, implementing these measures should result in less than significant adverse effects to avian species.

4.2.1.3.9 Special Status Mammals

Pallid bats and western red bats have been documented using the existing 13th Street Bridge Project Area. Pallid bats likely use this area for foraging and may use the existing bridge as a night roost (Pierson et al. 2002). Western red bats likely utilize the riparian vegetation and litter within the 13th Street Bridge Project Area for roosting, breeding, and hibernation.

Project activities, including noise, vibration, and demolition of the bridge may disturb roosting bats and cause them to abandon the roost site. Direct physical effects are unlikely since the bats would flush due to vibration and noise prior to risk of injury; however, bats may be exposed to greater risk of predation when flushed during daylight. Although predation of individuals may increase when flushed, the number of individuals potentially affected would be relatively small and the Proposed Action will not have a significant effect on bat populations on VAFB. In addition, the new bridge will accommodate bat roosting, therefore there will be no permanent loss of roosting habitat for pallid bats at the site. Removal of mature riparian habitat will result in the short-term loss of potential roosting and breeding habitat for western red bats within the 13th Street Bridge Project Area; however, willow riparian will be restored upon maturation of restoration plantings (Table 4-6).

4.2.1.3.10 Effects to Habitat

The Proposed Action would result in the temporary loss of habitat for special status species. Changes in water flow, temporary increases in turbidity, and removal of riparian vegetation associated with implementing the Proposed Action have the potential to temporarily adversely impact habitat for special status fish and aquatic herpetofauna. Specifically, the water quality and quantity, substrate, and vegetative overstory could be affected in, and possibly downstream, of the Proposed Action Area; however, the potentially affected area would be small. Southern steelhead primarily use the Proposed Action Area and adjacent habitat as a migration and dispersal corridor, with no breeding documented in the Proposed Action Area.

A total of 3.19 acres of aquatic habitat are expected to be subject to temporary disturbance during the proposed action as a result of proposed activities at the 13th Street Bridge Project Area (Table 4-9) (MFDB/KASL 2014a). There would be no temporary disturbance or removal of aquatic habitat at the Wetland Mitigation Area. At the 13th Street Bridge Project Area, creek flow would be diverted through culvert pipes and activities such as grading and use of imported

fill may occur to allow vehicular access. Temporary removal of, or disturbance to, 3.19 acres of foraging and breeding areas at the 13th Street Bridge Project Area would occur. In addition, up to 61.11 acres of upland habitat, potentially used for dispersal, foraging, nesting, and refugia, will be temporarily removed or disturbed at the 13th Street Bridge Project Area. Within the Wetland Mitigation Area, up to 19.19 acres of upland habitat will be temporarily removed or disturbed. These temporary losses of habitat may cause injury or death of individuals if they are forced into adjacent, less suitable habitat. After the construction and demolition activities have been completed and restoration of the site has been fully completed, the Proposed Action will result in an estimated net gain of 0.18 acres of aquatic habitat, a net loss of 0.24 acres of high quality upland habitat, and net gain of 0.33 acres of low quality upland habitat (Table 4-9) (MFDB/KASL 2014a).

Impacts to special status species habitat are expected to be largely restricted to the duration of construction and demolition. In the short term, the area of the channel temporarily diverted for construction and demolition activities would not be available for breeding or foraging habitat for the duration of construction and demolition of the bridge, approximately 12 to 20 months over a two year period. Permanent loss of special status species habitat within the Proposed Action Area is expected to be restricted to the area physically occupied by the construction associated with the new 13th Street bridge. However, this loss will be more than offset by the removal of the existing bridge and associated riprap and is therefore not expected to result in a permanent reduction of habitat within the Proposed Action Area. After bridge construction and demolition are complete, the area will once again receive creek flow and should again function as habitat for special status species. Disturbed areas would be restored with appropriate vegetation. Additionally, the Air Force would monitor and eradicate non-native invasive plant species in the Proposed Action Area following the completion of the project.

The project would also provide a long term benefit to fish species because the proposed Wetland Mitigation Area would increase lateral marsh habitat in the estuary during prolonged periods without breaching and high flow events. This increase in lateral marsh habitat would likely benefit fish species by increasing refugia and foraging habitat during these conditions. Therefore, impacts to habitat would be less than significant.

Table 4-9. Listed species habitats within the Proposed Action Area; there is no critical habitat designated within the Proposed Action Area (MFDB/KASL 2014a).

Habitat Type	Temporarily Removed or Disturbed		Post-Action[4]		Net Gain/Loss		
	13th Street Bridge Project Area	Wetland Mitigation Area	13th Street Bridge Project Area	Wetland Mitigation Area	13th Street Bridge Project Area	Wetland Mitigation Area	Overall Gain/Loss
CRLF							
Aquatic (Breeding) Habitat	3.19	0	3.49[3]	0	0.18	0	**0.18**
High Quality Upland Habitat[1]	27.67	0	28.52	0	-0.24	0	**-0.24**
Low Quality Upland Habitat[2]	33.44	19.19	35.51	19.09	0.23	0.10	**0.33**
TWG							
Aquatic (Breeding) Habitat	3.19	0	3.49[3]	0	0.18[3]	0	**0.18**

1. High quality upland CRLF habitat comprised of riparian and freshwater marsh habitats.
2. Low quality upland CRLF habitat comprised of upland habitats including central coast scrub and non-native habitat types. Ruderal and anthropogenic habitats are excluded; management of these habitats prevents the establishment of sufficient vegetative cover to support CRLF.
3. Estimated acres are based on the assumption that the channel location, depth, and width after the action is complete are similar to the morphology documented during 2014 surveys. Because the river is a dynamic system, the actual post-action acreage may differ from those predicted here as a result of significant rainfall and flow events.
4. Post-Action includes estimates of habitat that will be fully restored after construction and demolition.

4.2.1.3.11 Overall Effects on Special Status Wildlife Species

The potential impacts of the Proposed Action on special status wildlife species will be minimized to the greatest extent practicable. Most of the potential impacts will be avoided by the establishment of an exclusion area around the active project areas, from which qualified biologists would capture and relocate special status wildlife species to suitable adjacent habitat prior to the onset of construction activities. The implementation of additional minimization and monitoring measures, described in Section 2.1.7.2, will minimize the potential impact of project related activities on special status wildlife species. Therefore, the effects to special status wildlife species will be less than significant. In regards to federally listed wildlife species, pursuant to the ESA, the Proposed Action may affect, and is likely to adversely affect the CRLF, TWG, and southern steelhead. However, since the area of potential impacts is relatively small, the impacts are temporary, relatively few individuals will be potentially impacted, and the disturbed areas will be restored, the Proposed Action will not have significant effects on populations of federally listed wildlife species.

Formal section 7 consultation for federally listed species with potential to be affected was completed with USFWS and NMFS and Biological Opinions were issued (see Appendices D and E). VAFB will wholly adopt all mitigation measures stipulated within the Biological Opinion.

4.2.1.4 Waters of the United States and Wetlands

Impacts to jurisdictional waters of the U.S. and wetlands are considered significant if the project results in a net loss of wetland area or habitat value, either through direct or indirect impacts to wetland vegetation, loss of habitat for wildlife, degradation of water quality, or alterations in hydrological function.

Based on the wetlands delineation conducted in June 2014 (MSRS 2014c) and the footprint for disturbance for the proposed project, approximately 2.89 acres of Waters of the U.S. would be subject to temporary and permanent impacts, including 1.26 acres of Jurisdictional Wetlands. A CWA Section 401 Water Quality Certification from the Central Coast RWQCB and CWA Section 404 Permit from the USACE would be required because direct impacts to water bodies or wetlands would occur.

Temporary impacts would affect 0.57 acres and permanent impacts to Jurisdictional Wetlands would affect 0.68 acres. Upon completion of construction and demolition activities, contingent upon preservation of pre-construction channel width, depth, and water levels, 1.56 acres are expected to be capable of supporting Jurisdictional Wetland habitat. This would result in a net gain of 0.30 acres of potential Jurisdictional Wetlands. Upon removal of rip-rap from the northern three abutments of the old bridge these areas are expected to convert to a hydrated channel, which would become Jurisdictional Wetlands as hydric vegetation is established. The hydrated channel under the new bridge deck is also expected to become Jurisdictional Wetlands upon establishment of hydric vegetation. Post-project Jurisdiction Wetland acreage will be heavily dependent on natural processes. Changes in water level or channel width as a result of natural events, such as scouring during high flows and beaver dams, could result in significant changes in Jurisdictional Wetland acreage and cannot be predicted.

As to non-wetland Waters of the U.S., 1.63 acres will be directly impacted by project activities as listed below. Temporary impacts would affect 1.21 acres and permanent impacts to non-wetland waters would affect 0.42 acres. Construction activities are not expected to alter channel morphology significantly; therefore the post-project extent of Waters of the U.S. is not expected to change as a result of project activities (an approximate 0.30 acre loss of Non-Wetland waters would be offset by the anticipated 0.30 acre net gain of Jurisdictional Wetlands).

After construction and demolition activities are completed, temporary impacts at the 13th Street Bridge Project Area will be restored onsite in locations shown on Figure 2-11, above. Restoration estimates are presented in Table 4-10 below.

Table 4-10. Waters of the U.S. (acres) within the 13th Street Bridge Project Area.

Category	Action					Change
	Impacted	Created	Enhanced	Restored	Preserved	
Jurisdictional Wetlands	1.26	0	0	1.2746	0.2859	+0.2992
Jurisdictional Non-Wetland Waters	1.63	0.2669	0	0.5177	0.5507	-0.2992
Waters of the U.S.: Total	2.89	0.2669	0	1.7923	0.8365	0

Note: All restored Jurisdictional Wetlands are expected to occur within the bounds of the OHWM. Calculated acreages are predicated on channel morphology and flow regime following the proposed action corresponding to conditions observed in 2014. Changes in channel morphology and/or flow regime due to natural processes or as a result of the proposed action have the potential to significantly alter predicted values.

A net loss of approximately 1.83 acres of riparian habitat occur during project implementation, based on the overall restoration gains/losses of willow riparian and willow riparian-freshwater marsh (Table 4-11). Of this loss, 0.22 acre is in Waters of the US. Additionally, 1.24 acres of the loss is senescing willow riparian habitat due to hydrological conditions no longer being suitable. Approximately 0.38 acre of the senescing riparian habitat would be restored as central coast scrub and the 13th Street Bridge project site as a whole would gain approximately 1.1 acres of Central coast scrub. Approximately 0.27 acre of riparian understory would be established under the new bridge.

Table 4-11. Impacts to riparian habitat (acres) within the 13th Street Bridge Project Area.

Category	Impact Type		Total Impacted	Post-Restoration	Net Gain/Loss
	Temporary	Permanent			
Riparian All	2.5405	2.9846	5.4892	3.66	-1.8264
Jurisdictional Wetlands					
Willow Riparian-Fresh Water Marsh	0.0376	0.0833	0.1209	0.3159	0.1950
Willow Riparian	0.1287	0.1473	0.2760	0.0555	-0.2205
Jurisdictional Non-Wetland Waters					
Willow Riparian	0.8123	0.3179	1.1302	0.9032	-0.2270
Non-Jurisdictional Willow Riparian					
Willow Riparian - Mature	1.2653	0.8763	2.1416	2.3882	0.5785
Willow Riparian - on Riprap	0.2048	0.1801	0.3848	0	-0.6746
Willow Riparian - on Sandbar	0.0558	0.1399	0.1957		-0.2377
Willow Riparian - Senescing	0	1.2399	1.2399		-1.2399

As a condition of the CWA 401 Water Quality Certification, the Regional Water Quality Control Board requires permanent impacts to riparian habitat be mitigated at a 1:1 ratio of replacement of in-kind native vegetation. There is no feasible location to create or restore riparian habitat within the project area watershed. The gain in Central coast scrub and riparian understory may be used to offset a portion of the riparian habitat loss and the wetland mitigation area is proposed to be used to offset any remaining habitat loss.

Compliance with the conditions of the CWA 401 and 404 permits will ensure no net loss of wetlands or riparian habitat occurs. With these measures, impacts would be less than significant.

4.2.1.4.1 Wetland Mitigation Area

Within a 4.02 acre area to be restored, approximately 0.09 acres of Jurisdictional Wetland (Coastal Salt Marsh wetland habitat) would be impacted and ultimately restored following completion of grading. Completion of restoration of the Wetland Mitigation Area would result in a net gain of 3.93 acres of jurisdictional Coastal Salt Marsh wetland habitat (4.02 acre area offset by 0.09 acres being excavated). Of the 4.02 acre area, 0.26 acres would be enhanced while 3.75 would be restored.

After grading and grubbing, the habitat in the 4.02 acre area is anticipated to transition from primarily upland habitat to an irregularly to seasonally flooded Coastal Salt Marsh wetland habitat dominated by pickleweed, alkali heath, saltgrass, and fleshy jaumea. This habitat is expected to meet the criteria of Jurisdictional Wetland and Waters of the United States. Successful restoration of this habitat would lead to a net gain of 3.93 acres (4.02 acre area offset by 0.09 acres being excavated) of Jurisdictional Wetlands within the Wetland Mitigation Area.

Post-construction monitoring would be conducted per the Compensatory Mitigation and Monitoring Plan, which would likely be implemented over a 5-Year period.

4.2.2 No-Action Alternative

Under the No-Action Alternative, the 13th Street Bridge would not be replaced, the fiber optic cable would not be installed, and the Wetland Mitigation Area would not be implemented. While construction and demolition related disturbances to native plant communities and special status wildlife species would be avoided, erosion and scouring of the existing bridge structure would continue to occur as a result of high river flows, especially during storm events. Continuous repairs to the bridge would be routinely required, which could result in significant cumulative impacts to special status species and their habitats. In addition, the risk of bridge collapse could result in more serious adverse impacts to habitats of listed species and to the listed species themselves as a result of the bridge failure and the subsequent construction work that would be required to remove debris from the riverbed.

4.3 Cultural Resources

Factors considered in determining whether implementing an alternative may result in significant adverse impacts on cultural resources include the extent or degree to which implementation of an alternative would result in:

- The permanent loss of a significant cultural resource or the loss of a value or characteristic that qualify a historic resource for listing on the NRHP; and/or
- Substantially alter the natural environment or access to it in such a way that traditional cultural or religious activities were restricted.

Effects to cultural resources would be considered adverse if they resulted in disturbance or loss of value or data that qualify a site for listing in the National Register of Historic Places (NRHP); if there is substantial disturbance or loss of data from newly discovered properties or features prior to their recordation, evaluation and possible treatment; or if the project substantially changes the natural environment or access to it such that the practice of traditional cultural or religious activities would be restricted. For known cultural resource sites, rerouting or redesigning to avoid impacts is typically the recommended option. If rerouting or redesigning is not possible, subsurface testing is usually recommended to determine a site's value or data potentials relative to the NRHP, to assess possible adverse project effects, and to establish the physical relationship of site boundaries with the APE (Area of Potential Effects). In addition, 30 CES/CEIEA requires archaeological monitoring during construction through or adjacent to any known site, regardless of a site's NRHP eligibility. Archaeological monitoring is also typically required in areas where buried sites are possible (Integrated Cultural Resources Management Plan [ICRMP] 2005).

4.3.1 Proposed Action

Archival research indicates that no archaeological sites were previously recorded within the Proposed Action Area. Furthermore, surface surveys and subsurface trenching found no evidence of an archaeological site within the Proposed Action Area. One archaeological site,

CA-SBA-3744, is nearby but no evidence of the site was found within the Proposed Action Area. Therefore, the Proposed Action is not anticipated to impact archaeological resources and the Air Force determined that no historic properties are within the APE. In compliance with Section 106 of the NHPA of 1966 (16 U.S.C. 470f), as amended, and its implementing regulation at 36 CFR 800, VAFB requested SHPO concurrence that the Air Force has appropriately delineated the APE and conducted a reasonable and good faith effort to identify historic properties within the APE and SHPO concurrence was received for the bridge replacement on January 15, 2008 and fiber optic cable on July 3, 2014 (Appendix B).

Although no evidence of archaeological resources was identified, it is the policy of VAFB to monitor construction in archaeologically sensitive areas and will therefore provide an archeological monitor. The Santa Ynez Band of the Chumash Indians was consulted on the Proposed Action and determined that a Native American monitor would be unnecessary (Appendix C). In the event that previously undocumented cultural resources are discovered during monitoring of construction activities, procedures established in 36 CFR 800.13 would be followed. Therefore, the Proposed Action will not have a significant effect on cultural resources.

4.3.2 No-Action Alternative

Under this Alternative, the proposed replacement of the 13th Street Bridge would not occur, the fiber optic cable would not be installed, and the Wetland Mitigation Area would not be implemented. Thus, cultural resources would not be affected.

4.4 Earth Resources

Factors considered in determining whether implementing an alternative may have a significant adverse impact on geology and earth resources include the extent or degree to which implementation of an alternative would:

- Result in substantial soil erosion or the loss of topsoil; and/or
- Expose people or structures to potential substantial adverse effects, involving rupture of a known earthquake fault, strong seismic ground shaking, and/or liquefaction.

These hazards have the potential to cause significant damage to the bridge structure even after completion of the new bridge construction.

4.4.1 Proposed Action

Implementation of the Proposed Action would require the removal of vegetation and disturbance of soil during excavation, road construction, and installation of foundations. These activities typically loosen the soil and tend to promote erosion during periods of wind or rainfall. Because soils in the area are subject to high wind erosion, appropriate sediment and soil control techniques would be used to minimize soil loss. Soil erosion post-conclusion of the project would be prevented through the revegetation of the project area following the guidelines described in the Comprehensive Mitigation and Monitoring Plan for this project. In addition, the site restoration EPMs described in Section 2.1.7.8 would be implemented,

including implementation of BMPs and preparation of a SWPPP. Therefore, based on a review of the documentation available on the geological characteristics and seismic activity of the region, no significant impacts on geology and soils are anticipated from implementing the Proposed Action.

4.4.2 No-Action Alternative

Under this Alternative, the proposed replacement of the 13th Street Bridge would not occur, the fiber optic cable would not be installed, and the Wetland Mitigation Area would not be implemented. In the foreseeable future, there would be no additional impacts to earth resources beyond the status quo; however, if the existing bridge were to fail, there would likely be significant erosion at the bridge site and emergency repairs and/or replacement would be required.

4.5 Hazardous Materials and Waste Management

Factors considered in determining whether implementing an alternative may have a significant adverse impacts on hazardous materials and waste management include the extent or degree to which implementation of an alternative would result in:

- Non-compliance with applicable regulatory requirements; and/or
- Human exposure to hazardous materials and wastes, or environmental release above permitted limits.

Potential impacts as a result of hazardous materials and hazardous waste are evaluated using federal, state and local regulatory requirements, contract specifications, and base operating constraints, as outlined in Chapter 3. Hazardous materials management requirements are found in federal and state EPA and OSHA regulations, demolition contract specifications and the AFI 32-7086, Hazardous Materials Management. Hazardous waste management requirements are found in federal, state, and local regulations, demolition contract specifications, and the VAFB HWMP (30 SWP 32-7043A). Non-compliance with applicable regulatory requirements, human exposure to hazardous materials and wastes, or environmental release above permitted limits, would be considered adverse impacts.

4.5.1 Proposed Action

Implementing the Proposed Action would require the use of hazardous materials. As described in Chapter 3, these hazardous materials are commonly used for construction and demolition projects, and would be the same types as currently used and managed on VAFB. Because the Proposed Action would last only 18 months and the construction team would be relatively small (maximum of 50 workers), there would not be a significant increase in the amounts of hazardous materials present on VAFB. Thus no significant adverse impacts are anticipated.

Potential adverse effects at the project site could result from accidental releases of POLs from vehicle and equipment leaks and from hazardous wastes generated by abatement actions. The contractor would be subject to hazardous materials and waste management regulations as required by federal, state and local laws and regulations, and would follow procedures as

outlined in the AFI 32-7086, Hazardous Materials Management and VAFB HWMP (30 SWP 32-7043A). All hazardous wastes would be properly managed and disposed of in accordance with applicable federal, state and local hazardous waste regulations, and the VAFB HWMP (30 SWP 32-7043A). Prior to project implementation, the contractor would prepare a hazardous material Spill Prevention and Response Plan and obtain concurrence from 30 CES/CEI. All hazardous wastes would be managed either during release response and clean-up, or during abatement removal actions. In addition, the EPMs described in Section 2.1.7.12 would be implemented. As a result, the Proposed Action will not have a significant impact due to the use and generation of hazardous materials and hazardous wastes.

4.5.2 No-Action Alternative

Under the No-Action Alternative, the proposed replacement of the 13th Street Bridge would not occur, the fiber optic cable would not be installed, and the Wetland Mitigation Area would not be implemented. The No-Action Alternative would create no additional hazardous materials or waste on VAFB than baseline current baseline conditions. Therefore, no significant impacts to hazardous materials or waste management would occur in the foreseeable future. However, if the existing bridge were to fail, hazardous materials which are part of the existing structure may be released unabated into the Santa Ynez River, potentially causing a significant impact on biological resources and human health and safety.

4.6 Human Health and Safety (Noise)

Factors considered in determining whether implementing an alternative may have a significant adverse noise impacts include the extent or degree to which implementation of an alternative would:

- Expose people to noise levels in excess of applicable standards or at levels that may be harmful.

The construction contractor would comply with OSHA, AFOSH regulations, and other recognized standards and applicable Air Force regulations or instructions. Restricted public access to the proposed construction site would be provided through use of signs and fencing if feasible. The contractor must also provide for the health and safety of workers and all subcontractors who may be exposed to their operations or services. The contractor must submit a health and safety plan to the base and appoint a formally trained individual to act as safety officer. The appointed individual would be the point of contact on all problems involving job site safety. During performance of work, the contractor must comply with all provisions and procedures prescribed for the control and safety of demolition team personnel and visitors to the job site.

4.6.1 Proposed Action

Construction sites, in general, can be dangerous to workers and the public. For the activities associated with the Proposed Action, the contractor would comply with Federal-OSHA, and AFOSH regulations, as required and appropriate, to provide for the health and safety of

workers, subcontractors, and visitors who may be exposed to the operations, hazardous materials in use, and hazardous wastes generated and transported. Therefore, human health and safety would not be adversely impacted by general construction hazards.

Health and safety guidelines that would be followed in the handling and transportation of hazardous materials and waste are described in Section 4.5 of this EA.

Several known health and safety issues occur within the Proposed Action Area:

- The Proposed Action Area is in the floodplain and specifically within and adjacent to the riverbed of the Santa Ynez River which is prone to flooding during significant rain events.
- Physical hazards, including holes or ditches, uneven terrain, sharp or protruding objects, slippery soils or mud, quicksand, loose soil, steep grades, and unstable ground are or could be present throughout the Proposed Action Area.
- Biological hazards, including vegetation (i.e., poison oak and stinging nettle), animals (i.e., insects, spiders, and snakes), and disease vectors (i.e., ticks, rodents), exist at and in the vicinity of the Proposed Action Area, and have the potential to adversely impact the health and safety of construction personnel.

Adherence to federal OSHA and AFOSH regulations would minimize the exposure of workers to these hazards, and result in no significant effects as they relate to human health and safety from the Proposed Action.

4.6.1.1 Noise

The 13th Street Bridge Project Area is located at the crossing point of the Santa Ynez River by 13th Street. The Santa Ynez River basin at this location is at approximately the same elevation as the surrounding topographic features. The immediate vicinity is currently undeveloped, apart from single buildings or small groups of buildings (non-residential) at specific locations. Existing noise levels near this project site are low due to the large areas of undeveloped landscape and sparse noise sources. The Wetland Mitigation Area is immediately adjacent to the Santa Ynez River estuary and at a similar or lower elevation to the surrounding topographic features. There are no buildings in the immediate vicinity; however Ocean Beach Park is located immediately west of the Wetland Mitigation Area (Figure 1-2).

According to regulations of the federal OSHA, employees should not be subjected to sound exceeding an L_{eq} of 90 dB for an eight hour period. This sound level increases by five dB with each halving of time (e.g., four hour period at 95 dB). Exposure up to a L_{eq} of 115 dB is permitted for a maximum of only 15 minutes during an 8-hour workday and no exposure above 115 dB is permitted. For this analysis, OSHA standards are used as the “not to exceed” criteria as they are the most appropriate standards available. In addition, for purposes of this EA “employees” would refer to personnel working on or visiting VAFB that are not associated with Proposed Action activities.

The Proposed Action would temporarily increase the ambient noise levels within the Proposed Action Area and in neighboring areas during project implementation activities. Relatively

continuous noise would be generated during project activities. These continuous noise levels are generated from equipment that has source levels (at one meter) ranging from approximately 70 to 110 dB. As a sound source gets further away, the sound level decreases. This is called the attenuation rate. The rates are highly dependent on the terrain over which the sound is passing and the characteristics of the medium in which it is propagating. The rate used in these estimates was a decrease in level of 4.5 dB per doubling of distance. This average rate has been shown to be an accurate estimate from field data on grassy surfaces (Harris 1998). At 50 m these levels range from 50 to 95 dB. Typical noise levels of heavy construction equipment are presented in Table 4-12.

Since the project site is not located adjacent to inhabited areas, there are likely not many sensitive receptors in the vicinity of the Proposed Action site. Therefore, adverse impacts as a result of noise are expected to be less than significant.

Table 4-12. Noise levels of heavy construction equipment.

Equipment Item	Maximum Noise Level (dBA) at 15 m (50 ft)
Backhoe (48 HP)	78
Dumpster truck (40 ft)	84-87
Front end loader (1.5 CY)	77-82
Track loader (2.5 CY)	82-86
Dozer (demolition) (200 HP)	84
Dozer (grading) (300 HP)	86
Track hoe (3/4 cubic yard)	77
Water truck (3,000 gallons)	81-84
Dump truck (40 ton)	84-87
Scraper (14 CY)	83-86
Skid steer loader	81-82
Paver (130 HP)	82
Road grader (15 ton)	79-83
Asphalt truck (16 ton)	81-84
Cement truck	81-84
Trencher (12 HP)	72
Wheeled trencher (40 HP)	77

4.6.2 No-Action Alternative

Under the No-Action Alternative, the proposed replacement of the 13th Street Bridge would not occur, the fiber optic cable would not be installed, and the Wetland Mitigation Area would not be implemented. Therefore, there would be no health and safety impacts resulting from project activities. However, if the bridge were to collapse, access to North VAFB from SR 246 would be impeded. This would be an adverse impact to health and safety of personnel at VAFB, since emergency vehicle access would be limited to Pine Canyon Road and California Avenue.

4.7 Land Use and Aesthetics

Factors considered in determining whether implementing an alternative may have a significant adverse impacts on land use and aesthetics include the extent or degree to which implementation of an alternative would:

- Result in land uses on the project site that are incompatible with, or would have a substantial adverse impact on, the existing character of adjacent land uses;
- Conflict with substantive requirements of land use plans or the enforceable policies of the California Coastal Act;
- Substantially degrade the existing visual character or quality of important visual resources or
- designated scenic views; and/or
- Create a new source of substantial light or glare that would adversely affect day or night views in the area or that would substantially impact other people or properties.

Factors considered in the evaluation of the environmental consequences of implementing the Proposed Action and the No-Action Alternative for land use and aesthetics include:

4.7.1 Proposed Action

The construction of a new bridge at 13th Street over the Santa Ynez River, demolition of the existing 13th Street Bridge, and implementation of the Wetland Mitigation Area would not result in a conversion of prime agricultural land or cause a decrease in the utilization of land. In addition, the proposed project will not restrict access to recreation areas or impact aesthetics.

Traffic will continue on the existing bridge during the construction of the new bridge and new approach roads. Once the new bridge has been completed, traffic will be routed over the new bridge while the existing bridge and approach roads are demolished and removed. Additional brief restrictions to traffic may also occur occasionally throughout project duration. Alternate routes are available through Pine Canyon Road and the Lompoc Gate, and California Street and the Main Gate. Traffic restrictions are not expected to interfere with development of facilities on VAFB, public access to recreational areas, or Amtrak passenger service out of Surf Station. A small amount of open space would be used to construct the approach roadways to the new bridge. However, because the old approach roadways would be removed and the area revegetated, there would be no long-term net loss of open space area. Implementation of the Wetland Mitigation Area may briefly restrict traffic on Ocean Park Road, as trucks and equipment enter and leave the site; however the restrictions will not significantly interfere with access to Ocean Beach Park or access to Surf Station.

Therefore, no significant impacts would occur as a result of the Proposed Action.

4.7.1.1 Coastal Zone Management

The CZMA and CCA mandate that the scenic and visual qualities of coastal areas be considered and protected as a resource of public importance. The Proposed Action will not occur within the California Coastal Zone. However, the Proposed Action could have downstream or indirect effects on the coastal zone. The Air Force, therefore, conducted an analysis of the Proposed Action to determine whether there would be adverse impacts to the coastal zone, as defined by the CZMA and CCA. The Air Force determined that there would be no significant impacts to the coastal zone as a result of the Proposed Action and prepared a Negative Determination. The California Coastal Commission concurred with the Air Force determination (Appendix I) based

on the proposed EPMs, incorporated into the Proposed Action, and based on the long-term benefits of the new bridge design and proposed wetland restoration efforts.

4.7.2 No-Action Alternative

Under the No-Action Alternative, the proposed replacement of the 13th Street Bridge would not occur, the fiber optic cable would not be installed, and the Wetland Mitigation Area would not be implemented. Thus, no changes to land use and aesthetics would result. However, if the bridge were to collapse, traffic would be forcibly diverted to other roads, and result in an interruption of mission essential transportation between North and South VAFB. In addition, such a situation would result in a fast track reconstruction project involving intensive construction activities. Such an action could affect the agricultural lands near the approaches to the bridge, to accommodate construction staging areas and emergency activities.

4.8 Solid Waste Management

Factors considered in determining whether implementing an alternative may have a significant adverse impacts on solid waste management include the extent or degree to which implementation of an alternative would result in:

- Non-compliance with applicable regulatory requirements.

Solid waste impacts are evaluated using federal, state, and local regulatory requirements, permit conditions, contract specifications, VAFB Solid Waste Management Guide, and operating constraints as outlined in Chapter 3.

4.8.1 Proposed Action

Activities at the 13th Street Bridge Project Area will involve excavation and removal of existing rip-rap and the old bridge abutments to a depth of 3 ft below the current ground level. This excavation will entail the removal of 25,300 CY of a combination of soil, concrete and existing rip-rap. This material would be re-purposed for new construction. In addition to re-purposed material, new bridge construction will require an additional 400 CY of new material. 25,500 CY of temporary fill (combination of native and engineered soil) will be used in the channel to create an access road to support construction and demolition activities at the bridge replacement site. This fill would be removed in its entirety upon completion of construction and transported to an on-base borrow pit. Demolition of the existing bridge and removal of the existing approach roadways would generate 2,135 CY of concrete, 572 CY of asphalt, and 106 tons of metal. Debris would be segregated and diverted for reclamation. Between 10,000 and 11,000 CY of sediment would be removed from the Wetland Mitigation Area. All excavated soil would be transferred 800 to 1,100 ft for deposition at a 2.1 acre site at the southwestern edge of the remnant 35th Street Bridge causeway and abutments (Figure 2-9) or used as soil amendment on the agricultural field immediately south of the site on Ocean Ave. If the soil is placed at the southwestern edge of the causeway, the soil would be deposited in a gradually sloped lens along the embankment and restored as native upland habitat. The installation of

the fiber optic line and the implementation of the Wetland Mitigation Area will not generate any C&D debris.

The generation of C&D debris during implementation of the Proposed Action has the potential to adversely affect waste diversion rates on VAFB. Unrecyclable wastes generated during construction and demolition will be disposed of off-base by the contractor. However, to the greatest extent practicable, the contractor would segregate all waste generated during the Proposed Action and manage the wastes separately. To the extent practicable, C&D would be reused or transported to a recycler. In addition, all metals would be recycled at the VAFB Materials Diversion Center. Soils that are not reused at the 13th Street Bridge Project Area would be transported to an on-base borrow pit for storage and use on future VAFB projects. Asphalt and concrete debris would be reused onsite or transported off base for recycling or proper disposal. Wooden and metal falsework, used during construction of the new bridge, would be reused or recycled by the contractor.

The evaluation of potential P2 impacts includes solid waste diversion requirements, particularly as applied to demolition debris. Non-compliance with applicable regulatory requirements or disposal of quantities of solid waste that would cause the proposed project not to meet mandate diversion rates would be considered an adverse impact. Debris would be segregated to facilitate subsequent P2 options. P2 options would be exercised in the following order: reuse of materials, recycling of materials, and then regulatory compliant disposal.

Compliance with all applicable federal, state and local regulations, rules and requirements, and applicable VAFB plans would govern all actions associated with implementing the Proposed Action; therefore no significant effects to solid waste management are anticipated.

4.8.2 No-Action Alternative

Under the No-Action Alternative, the proposed replacement of the 13th Street Bridge would not occur, the fiber optic cable would not be installed, and the Wetland Mitigation Area would not be implemented. Because no solid wastes would be generated, there would be no significant impact to solid waste management in the foreseeable future. However, if the existing bridge were to fail, a large amount of concrete, metal, asphalt, and other materials would likely be released into the Santa Ynez River, requiring emergency retrieval and proper disposal and a large influx of waste onto VAFB infrastructure without the benefits of planning. Additionally, retrieval of all materials would be unlikely. Therefore, if the existing bridge were to collapse it would be likely to have a significant effect on solid waste management on VAFB.

4.9 Transportation

Factors considered in determining whether implementing an alternative may have a significant adverse impacts on transportation include the extent or degree to which implementation of an alternative would:

- Result in a primary roadway no longer being able to service existing traffic demands; and/or

- Result in traffic to shift to a roadway that was incompatible with those traffic increases (e.g., inadequate pavement structure or design capacity), or could cause potential safety problems.

The criteria for determining the significance of project-generated traffic were obtained from Santa Barbara County Planning and Development Department (SBCPD) guidelines (SBCPD 1992). Impacts would be considered adverse if:

- The addition of project trips at an intersection causes an increase in the V/C ratio by the value shown in Table 4-13 or the number of project trips using an intersection is greater than the values shown in Table 4-13. Project traffic would use a substantial portion of an intersection(s) capacity where the intersection is currently operating at acceptable levels of service (A-C) but with cumulative traffic would degrade to or approach LOS D (V/C 0.81) or lower. Substantial is defined as a minimum change of 0.03 for intersections that would operate from 0.80 to 0.85 and a change of 0.02 for intersections that would operate from 0.86 to 0.90, and 0.01 for intersections operating at anything lower.
- Project access to a major road or arterial road would require a driveway that would create an unsafe situation or a new traffic signal or major revisions to an existing traffic signal.
- Project adds traffic to a roadway that has limiting design features or receives use that would be incompatible with substantial increases in traffic, which would become potential safety problems with the addition of project or cumulative traffic. Limiting design features include, but are not limited to narrow width, roadside ditches, sharp curves, poor sight distance, and inadequate pavement structure. Some examples of a roadway receiving incompatible use are large number of heavy trucks on rural roads used by farm equipment, livestock, horseback riding, or residential roads with heavy pedestrian or recreational use.

Table 4-13. LOS significance thresholds.

LOS	Threshold
A	An increase of V/C > 0.20
B	An increase of V/C > 0.15
C	An increase of V/C > 0.10
D	Adding 15 Trips to baseline conditions
E	Adding 10 Trips to baseline conditions
F	Adding 5 Trips to baseline conditions

4.9.1 Proposed Action

Given the low ADT volumes and good levels of service currently experienced on the roadways that would be affected by project activities on VAFB and its vicinity, and the relatively small increase in daily truck traffic that would be generated by the Proposed Action, no adverse effects to capacity would occur in the study-area roadways. However, brief restrictions to traffic may occur occasionally throughout project duration. Alternate routes during this time are described as part of this EA in Sections 3.10 (Transportation). All roadway sections would continue to operate at an LOS in the range of A to B with project-added traffic. Increased truck

activity affects the integrity of roadway sections by increasing the flexures of the pavement. The design life for asphalt pavement, generally selected as either 10 or 20 years, drives engineering specifications for the road based upon the strength of the base soil and the Traffic Index (TI) for the design life. The TI is calculated based upon the number of truck trips that are expected during the design life of the pavement. The theory states that the pavement, during its lifetime, can tolerate a finite number of flexures due to loaded trucks. If the number of truck trips is increased, the life of the pavement is shortened. For example, if a 20 year design were based upon an AADT of 1,000 trucks for 20 years and the volume increases to 2,000 ADT, the structural life of the pavement would be reduced to 10 years. While the current condition of the pavement on all of the affected roads is fair to good, added truck traffic could cause faster than estimated deterioration of the pavement surface and require additional maintenance. Although an adverse effect, it would not be considered significant given that the number of truck trips per day anticipated from the Proposed Action, are not high. Therefore, the Proposed Action is not anticipated to create any significant impacts to transportation. In addition, the recommended EPMs, described in Section 2.1.7.15 would further reduce the potential for adverse effects on transportation.

4.9.2 No-Action Alternative

Under the No-Action Alternative, the proposed replacement of the 13th Street Bridge would not occur, the fiber optic cable would not be installed, and the Wetland Mitigation Area would not be implemented. Therefore, there would be no effect on existing transportation beyond baseline conditions. However, if the bridge were to collapse, traffic would be forcibly diverted to other roads, and result in an interruption of mission essential transportation between North and South VAFB. In addition, such a situation would result in a fast track reconstruction project involving intensive construction activities. Such an action could affect local traffic conditions and cause adverse effects on local transportation routes.

4.10 Water Resources

Factors considered in determining whether implementing an alternative may have a significant adverse impacts on water resources include the extent or degree to which implementation of an alternative would:

- Cause substantial flooding or erosion;
- Reduce surface water quality to creeks, rivers, streams, lakes, or the ocean; and/or
- Reduce surface or groundwater quality or quantity.

4.10.1 Proposed Action

The Proposed Action would require a NPDES Construction General Permit as required by Section 402 of the CWA because the total disturbed area of the Proposed Action would occur in or near a riverbed and be greater than one acre. NPDES Construction General Permit VAFB would follow the conditions of the Clean Water Act Section 404 Permit and 401 Water Quality Certification, the SWPPP prepared for the NPDES Construction General Permit and EISA Section 438. All permit conditions and BMPs would be implemented to minimize the potential for

adverse impacts to local water resources. In addition, the contractor would implement all NPDES Construction General Permit requirements until the RWQCB officially terminates the permit coverage.

A CWA Section 401 Water Quality Certification from the RWQCB and CWA Section 404 Permit from the USACE would also be required under the Proposed Action because it involves dredge or fill in water bodies or wetlands. The contractor would implement all permit conditions, contract EPP (which addresses the contractor's site processes for all compliance medias), and VAFB Management Plan requirements, and would incorporate these requirements to work practices and procedures to ensure compliance for all project related activities. In addition, the 401 and 404 permits include compensatory mitigation requirements and success criteria that must be met through restoration and site maintenance. With the implementation of Construction General Permit requirements, 401 Water Quality Certification conditions and Environmental Protection Measures defined in Section 2.1.7.16, adverse effects to water resources would be less than significant.

4.10.1.1 Surface Water

The Proposed Action would remove vegetation, expose soils, and has the potential for releases of hazardous materials and wastes because work with heavy machinery is being conducted within the floodplain/river channel; therefore, surface water may be potentially impacted without implementation of adequate EPMs. The proper management of materials and wastes (as described in Sections 4.5 and 4.8 of this EA) would reduce or eliminate the potential for contaminated runoff. EPMs that would be implemented per the NPDES Construction General Permit are described in detail the Section 2.1.7. These EPMs include BMPs designed to properly manage materials while on-site, especially during the rainy season, prevent and reduce the risk of spills, and minimize the potential for erosion. Therefore, there would be no significant impacts anticipated to surface water.

4.10.1.2 Floodplains and Wetlands

The existing 13th Street Bridge is located within the Santa Ynez River floodplain (Figure 3-4). The new bridge would be capable of withstanding a 100-year flood event while ensuring redundancy during construction.

EOs 11988 and 13690 require federal agencies to reduce the risk of flood loss, minimize the impact of flood on human safety, and to restore and preserve the natural and beneficial values served by floodplains. EO 13690 would modify EO 11988 by establishing a flood reduction standard (identifying the floodplain based on three approaches) by which federal agencies would ensure federally funded actions improve the resilience of communities and federal assets against the impacts of flooding. EO 11990, *Protection of Wetlands*, is similar in content but is focused minimizing the destruction, loss or degradation of wetlands, and to preserve and enhance the natural and beneficial values of wetlands. All three EOs require an evaluation of alternatives prior to proceeding with federal actions that may affect floodplains or wetlands. Since EO 11990 is similar in content, the discussion below would also apply because the wetlands associated with the Proposed Action are largely confined to the floodplain.

Alternative alignments for the new bridge and the reasoning supporting selection of the proposed alignment were considered; however, all alignments require working within the floodplain.

It is not possible to avoid construction in the floodplain for two main reasons. First, although it is possible to use Highway 1 to circumvent the 13th Street Bridge, this is not practical for the USAF when transporting payloads and rocket components to South VAFB as it would present a national security concern and potential public safety issue. Thus, retention of the 13th Street Bridge is required. Second, the Santa Ynez River bisects the base into North and South VAFB and therefore the 13th Street Bridge crosses the River and had to be constructed in its floodplain. Both construction of the new bridge and demolishing the old bridge would require working within the floodplain. It should be noted, however, that the Proposed Action seeks to replace the existing bridge; there is no expanded construction as compared to the status quo (No Action) in that there will still only be one bridge after construction is complete.

In addition, alternatives to the Wetland Mitigation Area were considered (restoration of other sites), but the selected mitigation alternative was determined to be the most feasible considering available knowledge and technology, risk to mission, and cost (see Section 2.4.1).

The Proposed Action (Alternative A) was selected based on considerations of hydraulics, constructability, topography, roadway feasibility, right-of-way (ROW), cost, minimizing impacts to Waters of the U.S., and ability to withstand a flood event (see Section 2.4). The proposed new bridge length of 650 feet is the minimum length required to withstand a 100-year flood event. A longer bridge would be more expensive and result in greater environmental impacts and provide the same benefits as the proposed bridge – capable of withstand a 100-year flood event. As discussed below, the new bridge design alone would actually result in beneficial impacts to the river and floodplain than compared to the existing bridge. As proposed, the floodplain limits in the vicinity of 13th Street would not be altered by activities associated with the replacement of the bridge. Aside from the design improvements, the USAF has incorporated additional environmental protection measures into the Proposed Action (see Section 2.2.7)) to ensure the natural and beneficial values served by floodplains are maintained.

Therefore, the USAF's Proposed Action is consistent with the requirements of EO 11988 and 13690 and there is no practicable alternative to construction within the floodplain or wetland areas.

The new EO 13690 requires federal agencies follow three approaches for establishing flood elevations and hazard areas to be used to, generally, inform planning for projects within floodplains. The USAF has designed the new bridge utilizing the best available science and data in regards to flood risk since the bridge is located within a floodplain.

Based on a review of the 100% design documents (USACE 2014), the proposed 13th Street Bridge would be constructed 2-feet above the 50-year flood level with the approach roads, lower elevation than the bridge, being constructed at the 20-year flood level. Despite this, the entire structure was constructed to withstand a 100-year flood even though it would be submerged during the 100-year flood event. This design was based on balancing the need to ensure bridge integrity during a 100-year flood event and to minimize environmental impacts

(i.e., not create a super-sized structure) while remaining within the authorized budget. It would be cost prohibitive and result in more adverse environmental effects to construct the 13th Street Bridge above the 100-year floodplain as more surface area would be required to elevate the bridge to above the 100-year mark (see Figure 3-4). The new bridge would result in adverse environmental effects, but overall it is designed to result in less long-term environmental impacts as compared to the existing bridge.

Construction and demolition activities within the floodplain of the Santa Ynez River have the potential for both short and long term effects on the hydrology of the river system, including potentially altering scour patterns, increasing downcutting, erosion, and sedimentation. To avoid potential short term impacts, the active river channel at the 13th Street Bridge Project Area would be temporarily contained in culverts during construction and demolition of the bridge, allowing for unimpeded flow underneath the surface of the construction zone. Water diversions and temporary access roads would be removed from the channel prior to the onset of significant rainfall. This would allow the river to maintain its seasonal hydraulic capacity at the bridge site during significant runoff events. The installation of the fiber optic line would occur underneath the river channel and the Wetland Mitigation Area is adjacent to the channel so these elements will not require diversion of the active channel.

Since the existing bridge constricts flow through a series of narrow bays, it has had a negative effect on hydraulics of the river, which has contributed to the deterioration of the lower Santa Ynez River and estuary through downcutting, scour, and erosional processes. The new bridge will be 650 ft long, compared to the existing 500 ft long bridge and replace the existing eight pier walls with two hexagonal piers. As a result, the river flow will be allowed to meander through a broader, less constricted channel and the new bridge is expected to decrease downstream scour and sedimentation and have a long term benefit to the Santa Ynez River floodplain. The Wetland Mitigation Area is outside of the channel; however will increase lateral marsh habitat during high flow events, which will help decrease flow rates and potential for erosion during runoff events. The installation of the fiber optic line will have no effect on the hydraulics of the river.

Therefore, the Proposed Action will not have any significant negative effects on the floodplain of the Santa Ynez River and may have beneficial effects since the new bridge will be substantially less restrictive to the river's flow than the existing bridge, therefore reducing erosion.

Based on a consideration of construction feasibility, cost, flood risk and potential environmental impacts, it was determined that replacement of the bridge with a similar design yet sturdier structure would be sufficient to facilitate the VAFB mission of ensuring a transportation and communication corridor is maintained between North and South VAFB.

The design of the new bridge took into account flood hazards (i.e., pressure of a 100-year flood on the bridge, the need to minimizing scouring and allow river meandering) while incorporating additional environmental protection measures into the Proposed Action (see Section 2.2.7) to ensure habitats (including wetlands) are restored and species can re-establish in areas disturbed by construction (area of demolition and area of new construction). The nearest community is about 1.5 miles away from the bridge and past flood events have not been

attributed to the existing of the bridge. No evidence exists to suggest that the presence of the bridge has or would exacerbate a flood event. However, as previously discussed, the new bridge is designed to conform to the natural systems and processes that occur within the Santa Ynez River floodplains (i.e., reduce restriction on river flow under the bridge by reducing quantity of piers). This would tend to minimize the potential of the bridge to exacerbate the effects of flooding in the area as well as not restrict natural processes. The largely un-developed area of the Santa Ynez River floodplain would remain in an undeveloped state after construction.

Therefore, the Proposed Action is consistent with EOs 11990, 11988 and 13690 because it seeks to replace an aging bridge, needed to connect North and South VAFB, to withstand a 100-year flood event and thereby ensuring federal funds are spent in consideration of the risk of flood hazards thereby minimizing impacts to adjacent communities while also ensuring that adverse effects to the floodplains and wetlands are minimized.

4.10.1.3 Groundwater

Groundwater is likely to be encountered during installation of the bridge foundation (up to 210 ft deep). Because the bridge foundations would be installed using temporary casings, dewatering of groundwater will only be required within the casings. As concrete is poured into the shafts, water would be pumped out into holding tanks where the sediment could settle. The water would then be filtered and discharged into a designated dewatering area on the agricultural field on the terrace above the riparian zone. As the concrete sets and cures, there would be no further interaction with the ground water. Therefore, installation of the new bridge will not have a significant effect on groundwater.

Groundwater will be encountered during the process of boring under the Santa Ynez River to install the fiber optic cable. During horizontal directional drilling the bore hole is stabilized by a bentonite slurry grout pumped under pressure. The grout is inert and would not act as a pollutant; however it could have minor effects on groundwater flow by filling voids adjacent to the borehole and reducing the overall permeability in the immediate vicinity. The magnitude of this potentially adverse effect is negligible due to the relatively small volume of space that would be affected within the alluvium (12 inch diameter borehole at 25 ft below grade). Therefore, the proposed method of installation of the fiber optic cable will have a negligible environmental impact.

Implementation of the Wetland Mitigation Area will not include any processes or activities that will interact with groundwater. Overall, the Proposed Action is not anticipated to have a significant effect on groundwater resources.

4.10.1.4 Water Quality

Water quality could be adversely affected by hazardous materials spills, sedimentation and erosion, and improper disposal of waste. Disturbances to the riverbanks and riverbed during project implementation may result in an increase in sediment load as a result of removing vegetation, loosening and exposing soils, installing fill for temporary access roads, and stockpiling materials. Increases in sediment load in the vicinity of the Proposed Action area

would be minimized by implementing the EPMs described in detail in Section 2.1.7, including diverting the active river channels within temporary culverts implementing erosion control devices where needed (i.e., silt fencing), implementing a SWPPP, working outside of the channel during significant rainfall and runoff, and restoring the site. In addition, all disturbed areas within the Proposed Action area would be revegetated upon conclusion of construction and demolition activities. Therefore the risk of potential sediment loading would be significantly reduced through the soil stabilization and revegetation of project affected areas.

The containment of the active channel in culverts through the exclusion area would minimize the exposure of stream water to any project related contaminants. Maintenance and refueling of equipment would occur outside of the channel; however, because large cranes may require refueling within the riverbed, the contractor would develop and 30 CES/CEI would approve a riverbed refueling spill prevention and containment plan, including appropriate safety precautions and personnel training. At a minimum, the plan would include measures that will prevent the contamination of the substrate in the event of an accidental spill and an emergency clean-up plan in the event of an accidental spill. The contractor would implement all CWA Section 401 Water Quality Certification and Section 404 Permit requirements. All refuse and construction debris will be properly handled, stored, and removed from the site as soon as possible. As a result, the Proposed Action is not anticipated to have a significant effect on water quality.

4.10.2 No-Action Alternative

Under the No-Action Alternative, the proposed replacement of the 13th Street Bridge would not occur, the fiber optic cable would not be installed, and the Wetland Mitigation Area would not be implemented. Therefore, no impacts to water resources would occur. However, if the existing bridge were to fail, the water quality of the Santa Ynez River, downstream of the location of the bridge, would be adversely affected.

4.11 Cumulative Impacts

The effects of the Proposed Action and No Action Alternative in combination with the effects of other relevant past, present, and reasonably foreseeable future projects have been evaluated in this cumulative effects analysis. A list of relevant past, present, and reasonably foreseeable projects that have been/would be constructed on VAFB is provided in Table 4-13. The foregoing analysis is based on the same resource thresholds as discussed in Sections 4.1 to 4.10.

4.11.1 Past, Present, and Reasonably Foreseeable Future Actions in the Region of Influence

The region of influence for the Proposed Action is defined as the area over which effects of the Proposed Action could contribute to cumulative impacts on the environment. Therefore, the region of influence includes both North and South VAFB. Future large projects on VAFB that are currently projected for the next several years have the greatest potential to result in cumulative impacts. VAFB projects contain environmental contract specifications and are individually evaluated for their environmental impacts. Based on the environmental impacts associated

with each specific project, environmental protection measures and requirements are included in the project activities to reduce adverse environmental effects. Thus, individually implemented measures provide cumulative protection reducing overall adverse effects on VAFB environmental resources. Table 4-14 lists the past, present, and reasonably foreseeable future federal actions that may contribute to cumulative effects of the Proposed Action and may be under construction at the same time as the Proposed Action.

Table 4-14. Federal and Non-Federal Projects.

Federal Projects	Status
Oak Ridge Tracking Facility upgrades	NEPA document approved. Construction underway.
Reactivation of SLC-4E	NEPA document approved. Construction complete.
Plover Habitat Restoration	NEPA document approved. Field work underway.
Honda Ridge Equipment upgrades	NEPA document approved.
Basewide Demolition	Programmatic Environmental Assessment underway.
Repairs and Replacement of Overhead Electrical Lines, Feeders K1, K7, and K8	NEPA document approved. Construction planned for 2015.
Repairs to Honda Ridge Road and the Command Transmit Access Road	NEPA underway.
Narlon Bridge Replacement on San Antonio Creek	NEPA underway.
Replacement of N5, N9, and N10 Powerlines on South VAFB	NEPA underway. Construction planned for 2015.
Replacement of N1, N3, N6 Powerlines on South VAFB	NEPA document approved. Construction complete.
East Housing Area Solar Energy Project	NEPA document approved. Construction planned for 2015.
Boost-back and Landing of the Falcon 9 First Stage at SLC-4 West, and the Dragon In-flight Abort Test	NEPA underway.
Non-Federal Projects	**Status**
City of Lompoc, North Avenue Bridge Preventative Maintenance Project	CEQA underway.
CalTrans District 5, Salispuedes Creek Bridge Scour Mitigation	CEQA underway.
Lower Santa Ynez River Fish Management Plan	CEQA/NEPA Completed.

4.11.2 Proposed Action

4.11.2.1 Air Quality

Vandenberg AFB has several other construction and/or demolition projects in the region of influence for the Proposed Action. Air emissions from other projects would be localized and short-term in nature, except for the Basewide Demolition project which is anticipated to continue over the course of 15 years, contingent on funding. Long-term emissions from the projects are not anticipated to increase. Cumulative emissions from Proposed Action combined with other concurrent construction projects and launch operations would not exceed the significance thresholds in Santa Barbara County and would not produce any significant cumulative air quality impacts. This determination was made by reviewing the total emission impact of this project with the cumulative emissions from all planned concurrent projects.

4.11.2.2 Biological Resources

The Proposed Action and other construction and launch projects that involve ground-disturbing activities and related noise and traffic impacts could have temporary and localized effects on biological resources. Cumulative adverse impacts could result if concurrent projects, along with the Proposed Action, cause disturbances to special-status species or their habitats.

Implementation of the Proposed Action would result in temporary loss of habitat, potential loss of individual special status species, and potential disruption of foraging and breeding activities. Although the Proposed Action and other concurrent projects may disturb wildlife, these disturbances would be temporary and wildlife would continue to use habitat in the periphery of the projects. Through habitat restoration, wetland mitigation, and the implementation of the EPMs, listed in Section 2.1.7.2, and the requirements stated in the Biological Opinions issued by the USFWS and NMFS for the Proposed Action, potential adverse effects would be less than significant and not affect special status species populations. Additionally, VAFB routinely implements projects and specific measures and procedures set forth in the Integrated Natural Resources Management Plan, which would tend to ensure project-specific and cumulative adverse effects to biological resources are avoided and minimized. As a result, the Proposed Action, in combination with other past and planned activities, should not result in significant adverse cumulative impacts on biological resources.

4.11.2.3 Cultural Resources

Implementing the Proposed Action and other construction activities on VAFB involving activities that disturb intact, native soils or demolish structures over 50 years of age could result in impacts to cultural resources. Cumulative impacts would result if construction activities cause major ground disturbances in areas of high paleontological sensitivity that may contain intact subsurface prehistoric or historic archaeological resources. Although one site is in the vicinity of the Proposed Action, there would be no environmental consequences at the sites and the Proposed Action would not affect historic archaeological resources.

EPMs would be implemented to minimize impacts on sensitive archaeological resources. An archaeologist and Native American would monitor all ground-disturbing activities. If cultural resources are discovered during project-related ground-disturbing activities, all excavation would be halted until the significance of the find is assessed. Significant cumulative impacts from other projects and the Proposed Action are not expected.

4.11.2.4 Earth Resources

Cumulative projects at VAFB involving grading, excavations, and construction and/or demolition could result in erosion-induced sedimentation of adjacent drainages and water bodies. Potential cumulative effects would include an increase in soil disturbance associated with construction, demolition, and road building activities, substantially increased erosion, landslides, soil creep, mudslides, and unstable slopes. These impacts would be minimized by the use of BMPs and site restoration to minimize soil erosion and reduce fugitive dust. Erosion-induced sedimentation of surface drainages could occur as a result of cumulative projects at VAFB.

All projects located in the region are subject to seismically induced ground shaking due to an earthquake on a local or regional fault. By incorporating modern construction engineering and safety standards, all adverse seismic-related impacts at the project site, as well as the projects in the region should be avoided. Therefore, the Proposed Action would not result in significant adverse cumulative impacts to geology and earth resources.

4.11.2.5 Hazardous Materials and Waste Management

Management of any hazardous materials would occur under compliance of VAFB Hazardous Materials Management Plan and emergency responses to spills would follow the Hazardous Materials Emergency Response Plan, for all projects. Projects must also follow the Integrated Solid Waste Management Plan. EPMs would be implemented to minimize hazardous materials or hazardous waste management impacts. The Proposed Action would not contribute to cumulative effects to hazardous materials and wastes in or around VAFB. The Proposed Action and other projects would not result in significant cumulative impacts.

4.11.2.6 Human Health and Safety

The Proposed Action and other concurrent projects on VAFB could result in increased risks to human health and safety. Implementation of the Proposed Action and other similar actions at VAFB would slightly increase the short-term risk associated with construction contractors performing work at project locations. Contractors would be required to establish and maintain safety programs that would provide protection to their workers and limit the exposure of Base personnel to construction hazards. Impacts would be minimal and confined to the immediate project site. The safety program would include coordination with the AFCEC/CZO MMRP manager and contact with the weapons safety specialist for 30 SW/SEW for information on VAFB policies on UXO safety for construction work at VAFB. With implementation of required safety measures, there would be no significant cumulative impacts resulting from the Proposed Action and other anticipated projects.

4.11.2.7 Noise

Construction and demolition activities within the Proposed Action Area and for other projects would result in temporary, intermittent impacts localized to each project site. Construction projects are typically temporary in duration and the noise impact from the Proposed Action would not be a major contributor to the noise setting on VAFB. In addition, the cumulative projects listed in Table 4-13 are not located in the immediate vicinity of the Proposed Action and would therefore not combine with it to produce a cumulative noise impact.

4.11.2.8 Land Use and Aesthetics and Coastal Zone Management

The Proposed Action would not adversely affect land use or CZMA and CCA policies. The cumulative projects identified in Table 4-13 are all on VAFB and would conform to Air Force regulations and planning principles and/or comply with County/State requirements. Cumulative projects would be modified during the project review process to ensure compatibility with existing land uses and consistency with management plans. These project have been and would be assessed separately under NEPA and the effects would be analyzed and disclosed. The Proposed Action and other cumulative projects are not expected to result in significant adverse cumulative effects on land use or coastal zone resources.

4.11.2.9 Solid Waste

The cumulative projects listed in Table 4-13, including the Proposed Action will result in an overall increase in solid waste generation resulting from construction, renovation, and

demolition. Solid waste would be minimized by compliance with VAFB's Integrated Solid Waste Management Plan and the implementation of EPMs, including segregating, reusing, and recycling waste to the greatest extent practicable, would reduce cumulative impacts of solid waste. Local landfills would be able to process the projected temporary increases in solid waste. No significant cumulative impacts on solid waste management are expected.

4.11.2.10 Transportation

Cumulative construction and demolition projects on VAFB would contribute to increased traffic volumes in the region. However, given the low ADT volumes and good levels of service currently experienced on the roadways that would be affected by project activities on VAFB and its vicinity, and the relatively small and temporary increase in daily truck traffic that would be generated by the Proposed Action, no cumulative adverse effects to capacity are expected to occur as a result of the Proposed Action.

4.11.2.11 Water Resources

Cumulative impacts to water resources could occur if concurrent projects were to inadequately address water resources at project locations. However, projects on VAFB, including the Proposed Action, are required to utilize site-specific BMPs to control runoff and conduct site restoration, as necessary, to minimize impacts to water quality. Impacts tend to be localized and temporary during the duration project duration. In addition, VAFB would follow the conditions of the Clean Water Act Section 404 Permit and 401 Water Quality Certification, the SWPPP prepared for the NPDES Construction General Permit and EISA Section 438.. The Proposed Action is expected to improve baseline conditions by utilizing an improved hydraulic design for the new bridge, which is expected to reduce scour, erosion, and sedimentation. Therefore, no significant cumulative effects on water resources are expected.

4.11.3 No Action Alternative

Under the No-Action Alternative, the proposed replacement of the 13th Street Bridge would not occur, the fiber optic cable would not be installed, and the Wetland Mitigation Area would not be implemented. Therefore, no impacts to cumulative impacts would be expected in the short-term. However, if the existing bridge were to fail, which has been determined to be inevitable, significant adverse impacts to the environment would be expected. Since failure would likely occur in an unplanned fashion, it would necessitate emergency repairs and/or demolition and replacement. Without the benefit of environmental planning and review, this scenario would likely result in significant impacts to biological resources, earth resources, hazardous materials and waste, human health and safety, land use and aesthetics, solid waste management, transportation, and water resources and therefore have a significant adverse contribution to cumulative effects on the environment.

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APPENDIX A: Interagency and Intergovernmental Coordination for Environmental Planning

KAISERSATT, SAMANTHA O CIV USAF AFSPC 30 CES/CEIEA

From: KAISERSATT, SAMANTHA O CIV USAF AFSPC 30 CES/CEIEA
Sent: Thursday, February 26, 2015 12:00 PM
To: 'Jorgenson, David A SPL'; 'Phillips, Jeff'; 'lsimon@coastal.ca.gov'; 'sheila.soderberg@waterboards.ca.gov'; 'pearsonm@sbcapcd.org'; 'FRomero@santaynezchumash.org'; 'SCohen@santaynezchumash.org'; 'dvillalo@co.santa-barbara.ca.us'; 'hallen@co.santa-barbara.ca.us'; 'president@cnpsci.org'; 'BTrautwein@EnvironmentalDefenseCenter.org'; 'lswetland@sbnature2.org'; 'gching@cox.net'; 'mary.hamilton@waterboards.ca.gov'; 'kurtfz63@yahoo.com'; 'bima55@msn.com'; 'martin.potter@wildlife.ca.gov'; 'mary.meyer@wildlife.ca.gov'; 'sachs.carol@epa.gov'; 'carol.roland-nawi@parks.ca.gov'
Subject: Notice of Preparation of Environmental Assessment

To whom it may concern,

The US Air Force is preparing a Draft Environmental Assessment (EA) for a project to replace the 13th Street Bridge at the Santa Ynez River Crossing on Vandenberg Air Force Base (VAFB). This project would replace the existing 13th Street bridge with a new one approximately 50-80 feet downstream. No viable alternatives have been identified at this time due to engineering factors and minimizing impacts to wetlands. The project is necessary because the existing bridge is structurally deficient and subject to collapse during a moderate earthquake event and it is structurally overstressed if standard HS 20 live loads (i.e., a standard 18-wheeler) go over it. The 13th Street Bridge is the only on-base transport route and vehicle link between North and South VAFB, and is critical to supporting several VAFB programs. The bridge also supports utilities, including essential communication lines between North and South VAFB.

The 13th Street Bridge replacement project is subject to Executive Order 11988 (Floodplain Management) requirements and objectives because its intended location is in a floodplain. The acreage of wetland affected is anticipated to be between 2-4 acres. The Air Force requests advance public comment to determine if there are any public concerns regarding the project's potential impacts. The Air Force would also like to solicit public input or comments on potential project alternatives. The proposed 13th Street Bridge replacement will be analyzed in a forthcoming EA and the public will have the opportunity to comment on the draft EA when it is released.

The public comment period is March 1, 2015 – March 30, 2015. Please submit comments or requests for more information to Samantha Kaisersatt, NEPA Project Manager via email (samantha.kaisersatt@us.af.mil) or by standard mail to: 30 CES/CEIEA, Attn: Samantha Kaisersatt, 1028 Iceland Avenue, Vandenberg Air Force Base, CA 93437.

//SIGNED//
Samantha Kaisersatt
Environmental Planner
30 CES/CEIEA
1028 Iceland Ave.
Vandenberg AFB, CA 93437
COMM: 805-605-0392
DSN: 275-0392
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*** Proof of Publication ***

PROOF OF PUBLICATION
(2015.5 C.C.P.)

STATE OF CALIFORNIA.

SANTA MARIA TIMES

SAMANTHA KAISERSATT
1028 ICELAND AVE.
VANDENBERG AFB, CA 93437

ORDER NUMBER 51102

I AM THE PRINCIPAL CLERK OF THE PRINTER OF THE SANTA MARIA TIMES, NEWSPAPER OF GENERAL CIRCULATION, PRINTED AND PUBLISHED IN THE CITY OF SANTA MARIA, COUNTY OF SANTA BARBARA, AND WHICH NEWSPAPER HAS BEEN ADJUDGED A NEWSPAPER OF GENERAL CIRCULATON BY THE SUPERIOR COURT OF THE COUNTY OF SANTA BARBARA, STATE OF CALIFORNIA, ADJUDICATION #463687.

THAT THE NOTICE OF WHICH THE ANNEXED IS A PRINTED COPY (SET IN TYPE NOT SMALLER THAT NONPAREIL), HAS BEEN PUBLISHED IN EACH REGULAR AND ENTIRE ISSUE OF SAID NEWSPAPER AND NOT IN ANY SUPPLEMENT THEREOF ON THE FOLLOWING DATES, TO-WIT:

I CERTIFY (OR DECLARE) UNDER PENALTY OF PERJURE THAT THE FOREGOING IS TRUE AND CORRECT.

PUBLISHED ON: 02/28/2015, 03/01/2015, 03/02/2015

TOTAL AD COST: 365.36

FILED ON: 3/2/2015

DATED AT SANTA MARIA, CA THIS 2nd DAY OF MAR, 2015

Teresa Ramirez

SIGNATURE

PUBLIC NOTICE
PREPARATION OF ENVIRONMENTAL ASSESSMENT
13TH STREET BRIDGE AT SANTA YNEZ RIVER CROSSING
VANDENBERG AIR FORCE BASE, CALIFORNIA

The US Air Force is preparing a Draft Environmental Assessment (EA) for a project to replace the 13th Street Bridge at the Santa Ynez River Crossing on Vandenberg Air Force Base (VAFB). This project would replace the existing 13th Street bridge with a new one approximately 50-80 feet downstream. No viable alternatives have been identified at this time due to engineering factors and minimizing impacts to wetlands. The project is necessary because the existing bridge is structurally deficient and subject to collapse during a moderate earthquake event and it is structurally overstressed if standard HS 20 live loads (i.e., a standard 18-wheeler) go over it. The 13th Street Bridge is the only on-base transport route and vehicle link between North and South VAFB, and is critical to supporting several VAFB programs. The bridge also supports utilities, including essential communication lines between North and South VAFB.

The 13th Street Bridge replacement project is subject to Executive Order 11988 (Floodplain Management) requirements and objectives because its intended location is in a floodplain. The acreage of wetland affected is anticipated to be between 2-4 acres. The Air Force requests advance public comment to determine if there are any public concerns regarding the project's potential impacts. The Air Force would also like to solicit public input or comments on potential project alternatives. The proposed 13th Street Bridge replacement will be analyzed in a forthcoming EA and the public will have the opportunity to comment on the draft EA when it is released.

The public comment period is March 1, 2015 - March 15, 2015. Please submit comments or requests for more information to Samantha Kaisersatt, NEPA Project Manager via email (samantha.kaisersatt@us.af.mil) or by standard mail to: 30 CES/CEIEA, Attn: Samantha Kaisersatt, 1028 Iceland Avenue, Vandenberg Air Force Base, CA 93437.

Legal #51102
Pub dates: Feb 28, Mar 1, 2, 2015

*** Proof of Publication ***

PROOF OF PUBLICATION
(2015.5 C.C.P.)

STATE OF CALIFORNIA.

LOMPOC RECORD

SAMANTHA KAISERSATT
1028 ICELAND AVE.
VANDENBERG AFB, CA 93437

ORDER NUMBER 51127

I AM THE PRINCIPAL CLERK OF THE PRINTER OF THE LOMPOC RECORD, NEWSPAPER OF GENERAL CIRCULATION, PRINTED AND PUBLISHED IN THE CITY OF LOMPOC, COUNTY OF SANTA BARBARA, AND WHICH NEWSPAPER HAS BEEN ADJUDGED A NEWSPAPER OF GENERAL CIRCULATON BY THE SUPERIOR COURT OF THE COUNTY OF SANTA BARBARA, STATE OF CALIFORNIA, ADJUDICATION #47065.

THAT THE NOTICE OF WHICH THE ANNEXED IS A PRINTED COPY (SET IN TYPE NOT SMALLER THAT NONPAREIL), HAS BEEN PUBLISHED IN EACH REGULAR AND ENTIRE ISSUE OF SAID NEWSPAPER AND NOT IN ANY SUPPLEMENT THEREOF ON THE FOLLOWING DATES, TO-WIT:

I CERTIFY (OR DECLARE) UNDER PENALTY OF PERJURE THAT THE FOREGOING IS TRUE AND CORRECT.

PUBLISHED ON: 03/01/2015

TOTAL AD COST: 105.62

FILED ON: 3/2/2015

DATED AT SANTA MARIA, CA THIS 2nd DAY OF MAR, 2015

Teresa Ramirez

SIGNATURE

PUBLIC NOTICE
PREPARATION OF ENVIRONMENTAL ASSESSMENT
13TH STREET BRIDGE AT SANTA YNEZ RIVER CROSSING
VANDENBERG AIR FORCE BASE, CALIFORNIA

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The public comment period is March 1, 2015 - March 15, 2015. Please submit comments or requests for more information to Samantha Kaisersatt, NEPA Project Manager via email (samantha.kaisersatt@us.af.mil) or by standard mail to: 30 CES/CEIEA, Attn: Samantha Kaisersatt, 1028 Iceland Avenue, Vandenberg Air Force Base, CA 93437.

Legal #51127
Pub dates: Mar 1, 2015

APPENDIX B: SHPO Consultation

DEPARTMENT OF THE AIR FORCE
30TH SPACE WING (AFSPC)

01 DEC 2007

Richard N. Cote
30 CES/CD
1172 Iceland Ave
Vandenberg AFB CA 93437-6012

Mr. Milford Wayne Donaldson, FAIA
State Historic Preservation Officer
ATTN: Mr. David Byrd
Department of Parks and Recreation
Office of Historic Preservation
P.O. Box 942896
Sacramento CA 94296-0001

Dear Mr. Byrd

The Department of the Air Force, Vandenberg Air Force Base (VAFB), proposes to construct a replacement bridge for the 13th Street crossing of the Santa Ynez River located on VAFB. These improvements constitute a federal undertaking subject to compliance with Section 106 of the National Historic Preservation Act of 1966, as amended. VAFB is initiating consultation with the State Historic Preservation Officer regarding the undertaking in accordance with the Section 106 implementing regulations [36 CFR Part 800].

Undertaking Description and Location

The proposed project site is located approximately three miles inland from the Pacific Ocean. The bridge is on 13th Street, approximately three miles south of New Mexico Avenue and one-half mile northeast of the access gate to South VAFB at Ocean Avenue. Attachment 1 illustrates the location of 13th Street and the Santa Ynez River and the area of potential effects (APE) is shown in Attachment 2. The APE would encompass approximately 15 acres, extending approximately 200 feet upstream and 300 feet downstream of the existing bridge, and 1,200 feet north and south of the bridge deck. An area approximately 100 feet wide and 885 feet long at the northerly and southerly approaches to the existing bridge would be required for new approach roadway construction.

The existing 13th Street Bridge over the Santa Ynez River was constructed in 1970 to replace the bridge that washed out in the 1968 winter flood. The existing bridge is 500 feet long with a superstructure consisting of 10 spans of reinforced concrete beams. During construction of this bridge in 1970, flooding damaged the pilings, requiring additional piles to be placed. In March 1978, the river shifted as a result of winter storms, washing out the southerly approach roadway, which was also subsequently replaced. In 1981, concrete buttresses and rock riprap were added to protect the foundations and to reduce debris loading. In 2003, due to continual river

degradation, an emergency repair and retrofit of the bridge was initiated to protect the bridge from collapse during annual storm events, but not during larger flooding events.

The proposed action includes replacing the existing 13th Street Bridge over the Santa Ynez River with a new structure and demolishing the existing bridge. The new bridge would be located between 50 and 75 feet downstream of the existing bridge (Attachment 2). Proposed bank protection measures include temporarily removing the existing rip rap, then replacing it after construction of the new bridge, and additional rip rap under the new bridge and 100 feet downstream on both the north and south banks.

The limits of the approach roadway work would be approximately 1,200 feet from each end of the new bridge. The lanes and shoulders of the new roadway approaches would have the same width as those of the bridge and would also have curbs. Fill material would be required to raise both the northern and southern approach roadways to the proposed bridge height. Soil would be compacted to a depth of 3 feet below the proposed finished grade. Soil may need to be removed to a depth of 3 feet below proposed finished grade in some areas so compacted sub-base and base course can be inserted. In areas where native soil is more than 3 feet below the proposed finished grade only vegetation would be removed. The northern and southern approach footprints would be 45 feet wide and 885 feet long. Concrete approach slabs would be installed at each end of the bridge for stability. A temporary construction access road would be constructed at grade level from the north approach of the new bridge, across the riverbed, to the southern approach using fill material.

All construction activities will occur during the dry season (April through November). Culverts will be placed 100 feet upstream from the existing bridge to redirect water flow from construction areas. The existing bridge will be demolished and removed in the following dry season.

Properties Identified

No archaeological sites are recorded within the APE. One archaeological site, CA-SBA-3744, is outside the APE but within 0.25 miles. CA-SBA-3744 is recorded as a buried, low-density deposit of marine shell and lithic debris. It was found in a single 3-foot-diameter auger boring during monitoring for installation of a power line in July 2002. Five marine shell fragments and one dark brown Monterey chert flake were observed within an intact very dark grey to black, sandy clay loam. Five to six feet of non-cultural alluvium overlay the deposit and the dark clay loam appeared to represent an intact buried surface. Two pieces of marine shell collected during monitoring and submitted for radiocarbon analysis yielded calibrated calendar ages of A.D. 680–900 and A.D. 660–850.

Previous archaeological studies for the 13th Street Bridge include surface survey and construction monitoring. An archaeological survey was completed in conjunction with an environmental assessment for emergency bridge repairs and retrofitting. Specifically, the survey covered an area along the northern river bank, 900 feet upstream and 200 feet downstream from the existing bridge. No archaeological resources were observed. In addition to the survey, archaeological and Native American monitoring was completed for the emergency bridge repairs

and retrofitting. Monitored activities were limited to the river bed and the northern riverbank as construction activities were restricted from the southern riverbank. No archaeological resources were observed during approximately two months of monitoring.

Efforts to Identify Historic Properties within APE

VAFB was concerned that CA-SBA-3744, or a similar buried site, might be present within the APE. Extremely dense brush prohibited a surface survey south of the river, and a surface survey would have had limited utility for locating buried sites. Therefore, VAFB conducted backhoe trenching as a means of completing an archaeological survey (Attachment 3). Applied EarthWorks, Inc. completed the survey in two phases. A rubber-tired backhoe was used during both phases. The first phase took place in December 2004 and was associated with geotechnical testing. Five backhoe trenches were excavated roughly parallel to 13th Street, on the south side of the Santa Ynez River. The southern most of the five trenches was within 300 feet of the location where CA-SBA-3744 was observed. However, no archaeological deposits were identified in any of the five trenches (Munns 2005). The final report is provided as Attachment 4.

The second phase of the subsurface survey was completed in July 2006 (Haslouer and Lebow 2006). A copy of the final report is provided as Attachment 5. Briefly, three parallel backhoe trenches were excavated within the APE near and perpendicular to the southern riverbank. A fourth trench was excavated near and perpendicular to the northern riverbank in the only part of the APE north of the river that appeared undisturbed. None of these four trenches revealed evidence of an archaeological deposit. The final trench was excavated east of 13th Street and outside the APE in an effort to determine whether CA-SBA-3744 extended toward the street. The trench revealed a sparse scatter of marine shell at a depth of five feet. An additional trench directly west of the positive trench and within the APE was contemplated but was determined not feasible due to multiple utilities buried as deep as six feet. If the site had at one time extended into this portion of the APE, it has since been destroyed by installation of these utilities. In sum, backhoe trenching found no evidence that archaeological sites (buried or otherwise) are present within the APE.

Since the existing bridge will be demolished, research into the significance of the existing bridge structure was conducted with the assistance of Andrew Hope from the California Department of Transportation via email communication. This bridge is not listed in the Statewide Historic Bridge Inventory because it is located on federal property and constructed after 1960. Only bridges constructed before 1960 were part of the historic bridge survey. Since the bridge is less than 50 years old, VAFB has determined that the existing bridge is not historic.

Public Participation and Consultation

Currently, a Draft Environmental Assessment is in public review. The Santa Ynez Band of Chumash Indians have been consulted with all past stabilization efforts and archaeological survey activities. Consultation is ongoing and will continue with the tribe as needed until the completion of the project.

Findings

No historic properties are within the APE of the proposed project. In compliance with 36 CFR 800. VAFB is requesting SHPO concurrence that the US Air Force has appropriately delineated the APE and conducted a reasonable and good faith effort to identify historic properties within the APE. Pending SHPO concurrence, VAFB's finding for the proposed 13th Street Bridge Replacement Project is No Historic Properties Affect. Barring any further objection to this finding by the SHPO, VAFB has fulfilled its Section 106 responsibilities and no further consultation is required.

If you have any questions, please contact Ms. Beth McWaters-Bjorkman, Staff Archaeologist and 30 SW Native American Liaison, at (805) 606-0533 or via email elizabeth.mcwaters-bjorkman@vandenberg.af.mil or Mr. Christopher Ryan, Cultural Resources Team Lead, at (805) 605-0748 or via email christopher.ryan@vandenberg.af.mil. Thank you for your assistance with this undertaking.

Sincerely

RICHARD N. COTE, P.E.
Deputy Base Civil Engineer

Attachments:
1. Project Location Map
2. Area of Potential Effects and Proposed Construction Activities
3. Locations of Archaeological Subsurface Trenching
4. Munns 2005 Geotechnical Testing and Exploratory Trenching for the 13th Street Bridge
5. Haslouer and Lebow 2006 Archaeological Survey and Exploratory Trenching for the 13th Street Replacement Bridge

STATE OF CALIFORNIA – THE RESOURCES AGENCY

ARNOLD SCHWARZENEGGER, *Governor*

OFFICE OF HISTORIC PRESERVATION
DEPARTMENT OF PARKS AND RECREATION
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January 15, 2008

In reply refer to: USAF071207A

Richard N. Cote, P.E.
Deputy Base Civil Engineer
US Department of the Air Force
30th Space Wing (AFSPC)
1172 Iceland Avenue
Vandenberg AFB, CA 93437-6012

Re: Replacement of Bridge for the 13th Street Crossing of the Santa Ynez River, Vandenberg Air Force Base, Santa Barbara County, California

Dear Mr. Cote:

Thank you for your letter dated 1 December 2007, received in my office on 13 December 2007, requesting my comments regarding the referenced undertaking. You are consulting with me in order to comply with Section 106 of the National Historic Preservation Act of 1966 (16 U.S.C. 470f), as amended, and its implementing regulation at 36 CFR Part 800.

The Air Force proposes to construct a new bridge to replace the current 13th Street crossing of the Santa Inez River on Vandenberg Air Force Base (VAFB). The Air Force has surveyed the project area and has determined that no historic properties are located within the area of potential effects (APE). Based upon a review of the materials you submitted with your letter, I agree that the Air Force has properly determined and documented the APE in accordance with 36 CFR § 800.4(a)(1) and has made a reasonable and good faith effort to identify historic properties. Per 36 CFR § 800.4(d)(1), the Air Force has determined that no historic properties will be affected by the undertaking and I agree that this is the appropriate finding.

Thank you for seeking my comments and considering historic properties as part of your project planning. Please be advised that in the event of an unanticipated discovery or a change in the project description, the Air Force may have further responsibilities under 36 CFR Part 800. If you have any questions or concerns, please contact David Byrd, Project Review Unit historian, at (916) 653-9019 or at dbyrd@parks.ca.gov or William Soule, at (916) 654-4614 or wsoule@parks.ca.gov.

Sincerely,

Susan K Stratton for

Milford Wayne Donaldson, FAIA
State Historic Preservation Officer
MWD:db

RECEIVED
JAN 22 2008
By

DEPARTMENT OF THE AIR FORCE
30TH SPACE WING (AFSPC)

JUN 17 2014

Lieutenant Colonel Deron L. Frailie
Commander, 30th Civil Engineer Squadron
1172 Iceland Ave
Vandenberg AFB CA 93437-6012

Dr. Carol Roland-Nawi
State Historic Preservation Officer
Department of Parks and Recreation
Office of Historic Preservation
P.O. Box 942896
Sacramento CA 94296-0001

Dear Dr. Roland-Nawi

The 30th Space Wing of the United States Air Force, Vandenberg Air Force Base (VAFB), proposes to install 5,500 feet (1,675 meters) of fiber optic cable within the Santa Ynez River Valley in Santa Barbara County, California (Figure 1 and 2). One existing fiber optic cable conduit runs underground just west of 13th Street where the road crosses the Santa Ynez River. However, where the conduit crosses the river, it is suspended overhead between two poles on opposite sides of the river. The proposed project would place the existing overhead portion of conduit beneath the Santa Ynez River, add additional conduits parallel to the existing conduit using directional boring, and install three additional maintenance holes. The proposed *Alternate Communications Pathway Near 13th Street Bridge* project is needed in order to maintain adequate, reliable, and efficient communications and data transmission between launch control centers on North VAFB and launch platforms on South VAFB.

VAFB determined that the proposed project is an undertaking subject to compliance with Section 106 of the National Historic Preservation Act of 1966, as amended, and the implementing regulations [36 CFR Part 800]. With this letter and attachments, VAFB is initiating consultation with the State Historic Preservation Officer (SHPO) in accordance with 36 CFR 800.3. VAFB also identified the Santa Ynez Band of Chumash Indians as a consulting party and initiated consultation with them. Additionally, VAFB is submitting the delineation of the area of potential effects (APE) for review in accordance with 36 CFR 800.4.

Three maintenance holes currently exist along the existing stretch of the fiber optic pathway and three new maintenance holes would be installed (locations shown on Figure 3). Maintenance holes would be precast concrete and have interior dimensions measuring 4' x 7.5' x 6' (W x L x H) with a 2' to 3' neck leading to the ground surface.

From the northernmost existing maintenance hole to the center maintenance hole, two separate 4" high density polyethylene conduits would be installed parallel to the existing conduit. From the central maintenance hole to the southernmost maintenance hole, three separate 4" conduits would be installed (locations shown on Figure 3). All conduits shall be installed via directional boring. With the exception of the Santa Ynez River crossing, all conduits shall be installed at a minimum of 60" below ground surface. Conduits under Santa Ynez River shall be installed a minimum of 25' below ground surface.

The footprint for all foreseeable project-related ground-disturbing activities for this project will be referred to as the Area of Direct Impacts (ADI) and encompasses the excavation area for three pits for new maintenance holes, directional boring and the excavation of the associated bore pit and receiving pit, and vehicular traffic on the ground surface. The APE was established to encompass the entirety of the ADI. If any cultural resources would have overlapped the ADI, the boundary of the APE would have been expanded to include the entirety of that resource. However, the records search and the preliminary results of the Extended-Phase-1 survey did not identify any cultural resources overlapping the ADI.

At this time, VAFB requests concurrence from the SHPO that the APE for constructing the *Alternate Communications Pathway Near 13th Street Bridge* is adequately delineated. If there is no objection to this delineation by the SHPO, VAFB shall assume that the APE is adequately delineated after 30 days of receipt by the SHPO and continue consultation.

If you have any questions or require additional information, please contact Christopher Ryan at (805) 605-0748 or via e-mail at christopher.ryan.7@us.af.mil. Thank you for your assistance with this undertaking.

Sincerely

DERON L. FRAILIE, Lt Col, USAF
Commander

3 Attachments:
1. Figure 1 Project Location
2. Figure 2 Project Vicinity
3. Figure 3 Area of Potential Effects

STATE OF CALIFORNIA – THE NATURAL RESOURCES AGENCY EDMUND G. BROWN, JR., *Governor*

OFFICE OF HISTORIC PRESERVATION
DEPARTMENT OF PARKS AND RECREATION
1725 23rd Street, Suite 100
SACRAMENTO, CA 95816-7100
(916) 445-7000 Fax: (916) 445-7053
calshpo@parks.ca.gov
www.ohp.parks.ca.gov

August 22, 2014

Reply in Reference To: USAF_2014_0623_002

Deron L. Frailie, Lt Col, USAF
Commander, 30th Civil Engineer Squadron
1172 Iceland Ave
Vandenberg AFB, California 93437-6012

Re: Continuing Section 106 Consultation on the Installation of 5500 Feet of Fiber Optic Cable Undertaking, Santa Ynez River Valley, Vandenberg, Air Force Base

Dear Lt Col Frailie:

Thank you for your July 16, 2014 letter continuing consultation with the State Historic Preservation Officer (SHPO) for the above undertaking. In our previous round of consultation, the United States Air Force, Vandenberg Air Force Base (VAFB) requested my review and comment on their determination and documentation of the area of potential affects (APE) for this undertaking. Via letter dated July 3, 2014, I responded that I found the APE sufficient. The VAFB is now requesting SHPO concurrence on a finding of no historic properties affected (36 CFR §800.4(d)(1)) as a result of this undertaking.

Supporting documentation (36 CFR §800.11(a)) submitted with your letter includes a report entitled *Archaeological Phase I and Extended Phase I Studies for the Alternative Communications Pathway near the 13th Street Bridge, Vandenberg Air Force Base, Santa Barbara County, California* (Lebow and Haslouer 2014).

The VAFB's efforts to identify historic properties within the APE (36 CFR §800.4(b)(1)) included a record search of the APE, including a 0.25 mile buffer around the APE. Results from the record search did not identify previously recorded cultural resources within the APE. However, three prehistoric sites (CA-SBA-923, a low-to moderate-density lithic scatter, -2126, a marine shell deposit and lithic scatter, and -3744, low-density marine shell deposit and lithic scatter) are recorded within the 0.25 mile record search buffer area. The record search also revealed that no previous cultural resource studies have been conducted within the APE and 23 have been completed within 0.25 miles of the APE. Additional identification efforts included a surface survey (Phase I) and subsurface survey (Extended Phase I) analysis of the APE conducted by archaeologists with Applied EarthWorks, Inc. Mr. Claudio Lopez of the Santa Ynez Band of Chumash Indians monitored the fieldwork. No archaeological resources were identified during the Phase I study. Fifteen small trenches were excavated using a small tracked excavator for the Extended Phase I study. The Extended Phase I methods and methodology is presented on page 11 through 19 of the report. Buried soils likely suitable for human occupation were identified; however, no archaeological remains were found.

VAFB have initiated consultation with the Santa Ynez Band of Chumash Indians (SYBCI) as part of their gathering of information pursuant to 36 CFR §800.3(f) to assist in identifying properties which may be of religious and cultural significance and may be eligible for listing in

the National Register of Historic Places (NRHP) (36 CFR §§800.4(a)(4) and 800.4(b)). In a phone call on August 22, 2014 with our office staff, Christopher Ryan, archaeologist with the VAFB, explained that the VAFB has a long standing consultation relationship with the SYBCI. Christopher also stated that Freddie Romero, Cultural Preservation Consultant with the SYBCI Elders Council, agrees with the VAFB's finding of no historic properties affected because of this undertaking.

Based on VAFB's level of effort, they have determined a finding of no historic properties affected because of this undertaking. I concur with your finding of no historic properties affected as a result of this undertaking.

Thank you for seeking my comments and considering historic properties as part of your undertaking. Please be advised that under certain circumstances, such as post-review discoveries or a change in the undertaking description, you may have future responsibilities for this undertaking under 36 CFR Part 800. If you require further information, please contact Alicia Perez of my staff at 916-445-7020 or at Alicia.Perez@parks.ca.gov.

Sincerely,

Carol Roland-Nawi, Ph.D.

Carol Roland-Nawi, Ph.D.
State Historic Preservation Officer

APPENDIX C: Native American Tribal Consultation

DEPARTMENT OF THE AIR FORCE
30TH SPACE WING (AFSPC)

30 November 2007

MEMORANDUM FOR SANTA YNEZ BAND OF CHUMASH INDIANS

FROM: 30 CES/CEVNC CULTURAL RESOURCES

SUBJECT: Initiation of Consultation for the New 13th Street Bridge, Vandenberg Air Force Base, CA

Dear Elders Council,

The Department of the Air Force, Vandenberg Air Force Base (VAFB), proposes to construct a replacement bridge for the 13th Street crossing of the Santa Ynez River located on VAFB. These improvements constitute a federal undertaking subject to compliance with Section 106 of the National Historic Preservation Act of 1966, as amended. VAFB is initiating consultation with the Santa Ynez Band of Chumash Indians regarding the undertaking in accordance with the Section 106 implementing regulations [36 CFR Part 800].

Undertaking Description and Location

The proposed project site is located approximately three miles inland from the Pacific Ocean. The bridge is on 13th Street, approximately three miles south of New Mexico Avenue and one-half mile northeast of the access gate to South VAFB at Ocean Avenue. Attachment 1 illustrates the location of 13th Street and the Santa Ynez River and the area of potential effects (APE) is shown in Attachment 2. The APE would encompass approximately 15 acres, extending approximately 200 feet upstream and 300 feet downstream of the existing bridge, and 1,200 feet north and south of the bridge deck. An area approximately 100 feet wide and 885 feet long at the northerly and southerly approaches to the existing bridge would be required for new approach roadway construction.

The existing 13th Street Bridge over the Santa Ynez River was constructed in 1970 to replace the bridge that washed out in the 1968 winter flood. The existing bridge is 500 feet long with a superstructure consisting of 10 spans of reinforced concrete beams. During construction of this bridge in 1970, flooding damaged the pilings, requiring additional piles to be placed. In March 1978, the river shifted as a result of winter storms, washing out the southerly approach roadway, which was also subsequently replaced. In 1981, concrete buttresses and rock riprap were added to protect the foundations and to reduce debris loading. In 2003, due to continual river degradation, an emergency repair and retrofit of the bridge was initiated to protect the bridge from collapse during annual storm events, but not during larger flooding events.

The proposed action includes replacing the existing 13th Street Bridge over the Santa Ynez River with a new structure and demolishing the existing bridge. The new bridge would be located between 50 and 75 feet downstream of the existing bridge (Attachment 2). Proposed

bank protection measures include temporarily removing the existing rip rap, then replacing it after construction of the new bridge, and additional rip rap under the new bridge and 100 feet downstream on both the north and south banks.

The limits of the approach roadway work would be approximately 1,200 feet from each end of the new bridge. The lanes and shoulders of the new roadway approaches would have the same width as those of the bridge and would also have curbs. Fill material would be required to raise both the northern and southern approach roadways to the proposed bridge height. Soil would be compacted to a depth of 3 feet below the proposed finished grade. Soil may need to be removed to a depth of 3 feet below proposed finished grade in some areas so compacted sub-base and base course can be inserted. In areas where native soil is more than 3 feet below the proposed finished grade only vegetation would be removed. The northern and southern approach footprints would be 45 feet wide and 885 feet long. Concrete approach slabs would be installed at each end of the bridge for stability. A temporary construction access road would be constructed at grade level from the north approach of the new bridge, across the riverbed, to the southern approach using fill material.

All construction activities will occur during the dry season (April through November). Culverts will be placed 100 feet upstream from the existing bridge to redirect water flow from construction areas. The existing bridge will be demolished and removed in the following dry season.

Prehistoric Properties Identified

No archaeological sites are recorded within the APE. One archaeological site, CA-SBA-3744, is outside the APE but within 0.25 miles. CA-SBA-3744 is recorded as a buried, low-density deposit of marine shell and lithic debris. It was found in a single 3-foot-diameter auger boring during monitoring for installation of a power line in July 2002. Five marine shell fragments and one dark brown Monterey chert flake were observed within an intact very dark grey to black, sandy clay loam. Five to six feet of non-cultural alluvium overlay the deposit and the dark clay loam appeared to represent an intact buried surface. Two pieces of marine shell collected during monitoring and submitted for radiocarbon analysis yielded calibrated calendar ages of A.D. 680–900 and A.D. 660–850.

Previous archaeological studies for the 13th Street Bridge include surface survey and construction monitoring. An archaeological survey was completed in conjunction with an environmental assessment for emergency bridge repairs and retrofitting. Specifically, the survey covered an area along the northern river bank, 900 feet upstream and 200 feet downstream from the existing bridge. No archaeological resources were observed. In addition to the survey, archaeological and Native American monitoring was completed for the emergency bridge repairs and retrofitting. Monitored activities were limited to the river bed and the northern riverbank as construction activities were restricted from the southern riverbank. No archaeological resources were observed during approximately two months of monitoring.

Efforts to Identify Historic Properties within APE

VAFB was concerned that CA-SBA-3744, or a similar buried site, might be present within the APE. Extremely dense brush prohibited a surface survey south of the river, and a surface survey would have had limited utility for locating buried sites. Therefore, VAFB conducted backhoe trenching as a means of completing an archaeological survey (Attachment 3). Applied EarthWorks, Inc. completed the survey in two phases. A rubber-tired backhoe was used during both phases. The first phase took place in December 2004 and was associated with geotechnical testing. Five backhoe trenches were excavated roughly parallel to 13th Street, on the south side of the Santa Ynez River. The southern most of the five trenches was within 300 feet of the location where CA-SBA-3744 was observed. However, no archaeological deposits were identified in any of the five trenches (Munns 2005). The final report is provided as Attachment 4.

The second phase of the subsurface survey was completed in July 2006 (Haslouer and Lebow 2006). A copy of the final report is provided as Attachment 5. Briefly, three parallel backhoe trenches were excavated within the APE near and perpendicular to the southern riverbank. A fourth trench was excavated near and perpendicular to the northern riverbank in the only part of the APE north of the river that appeared undisturbed. None of these four trenches revealed evidence of an archaeological deposit. The final trench was excavated east of 13th Street and outside the APE in an effort to determine whether CA-SBA-3744 extended toward the street. The trench revealed a sparse scatter of marine shell at a depth of five feet. An additional trench directly west of the positive trench and within the APE was contemplated but was determined not feasible due to multiple utilities buried as deep as six feet. If the site had at one time extended into this portion of the APE, it has since been destroyed by installation of these utilities. In sum, backhoe trenching found no evidence that archaeological sites (buried or otherwise) are present within the APE.

Findings

No historic properties are within the APE of the proposed project. In compliance with 36 CFR 800. VAFB is requesting that the Santa Ynez Band of Chumash Indians review the proposed project and give any comments and/or concerns regarding any aspect of the undertaking. VAFB has performed a good faith effort to detect any historic properties within the APE and proposes to move forward with the undertaking has designed with no archaeological and Native American monitoring requirements. 30 CES/CEVNC Cultural Resources Staff will meet with the contractors before the construction activities begin to give instructions regarding what they should be looking for in the event of an inadvertent discovery. They will be instructed to stop operations and notify 30 CES/CEVNC Cultural Resources Staff immediately. Discussions will also include compliance of the Native American Graves Protection and Repatriation Act and the protocol in the event possible human remains are discovered. This meeting will be documented and a SYBCI representative will be invited to attend. VAFB will continue consultation with the Santa Ynez Band of Chumash Indians as to the status of this project until the project is completed.

If you have any questions, please contact Ms. Beth McWaters-Bjorkman, Staff Archaeologist and 30 SW Native American Liaison, at (805) 606-0533 or via email elizabeth.mcwaters-bjorkman@vandenberg.af.mil.

BETH MCWATERS-BJORKMAN
Staff Archaeologist
30 SW Native American Liaison
30 CES/CEVNC Cultural Resources
Vandenberg AFB

Attachments:
1. Project Location Map
2. Area of Potential Effects and Proposed Construction Activities
3. Locations of Archaeological Subsurface Trenching
4. Munns 2005 Geotechnical Testing and Exploratory Trenching for the 13th Street Bridge
5. Haslouer and Lebow 2006 Archaeological Survey and Exploratory Trenching for the 13th Street Replacement Bridge

DEPARTMENT OF THE AIR FORCE
30TH SPACE WING (AFSPC)

12 March 2015

Christopher Ryan
1028 Iceland Ave
Vandenberg AFB CA 93437-6010

Mr. Freddie Romero
Santa Ynez Band of Chumash Indians
P.O. Box 517
Santa Ynez CA 93460

Dear Freddie

The proposed 13th Street Bridge Replacement project and the associated installation of a redundant communications line across the Santa Ynez River is in the final stages of production of an Environmental Assessment (EA) in accordance with the National Environmental Policy Act (NEPA). Review of the administrative draft EA by Air Force legal personnel requested written correspondence from the Santa Ynez Band of Chumash Indians (Tribe) regarding their views about the project.

As you recall, excavation and examination of exploratory backhoe trenches in 2004 and 2006 found nothing subsurface west of the bridge, and one low density lithic scatter east of the bridge and south of the river (see attachment 'Bridge Replacement Study Area). Because the new bridge will be constructed west of the existing bridge, no ground disturbance would take place in the vicinity of the site. Mr. Amado Romero served as the Tribal representative who monitored those investigations.

Exploratory backhoe trenches for the new communications cable under the Santa Ynez River took place in May 2014, and spanned a wider cross-section of the Santa Ynez River flood plain (see attachment 'New Comm Line Study Area'). No archaeological deposits were encountered. Analysis of the soil profiles indicated this portion of the Santa Ynez River valley is a high fluvial energy environment in a continuous cycle of washing away and depositing sediments. Mr. Claudio Lopez served as the Tribal representative who monitored those investigations.

Would you be so kind as to provide any comments or concerns you may have to me at your earliest convenience. An e-mail reply is acceptable. Thank you for your assistance with this undertaking.

Sincerely

Christopher Ryan

CHRISTOPHER RYAN, 30 CES/CEIEA

KAISERSATT, SAMANTHA O CIV USAF AFSPC 30 CES/CEIEA

From: Freddie Romero <FRomero@santaynezchumash.org>
Sent: Monday, March 16, 2015 2:24 PM
To: RYAN, CHRISTOPHER D GS-12 USAF AFSPC 30 CES/CEANC
Cc: YORK, DARRYL L GS-13 USAF AFSPC 30 CES/CEIEA; KAISERSATT, SAMANTHA O CIV USAF AFSPC 30 CES/CEIEA; Sam Cohen
Subject: Re: 13th Street Bridge Replacement - request for written comments

Chris,

The SYBCI Elders Council are ok with the project and based on previous studies, the Elders agree with the proposed project and placement of new bridge. The SYBCI Elders Council do not see any impact to cultural sites as a result of this project.

The SYBCI Elders Council would only ask that if a discovery be made during construction, that they be notified to evaluate the significance of find and to consult on any proposed archaeological plan for such discovery.

Freddie Romero

Cultural Resources Coordinator

SYBCI Elders Council

805-688-7997

805-403-2873

_____

From: RYAN, CHRISTOPHER D GS-12 USAF AFSPC 30 CES/CEANC <christopher.ryan.7@us.af.mil>
Sent: Thursday, March 12, 2015 3:15 PM
To: Freddie Romero
Cc: YORK, DARRYL L GS-13 USAF AFSPC 30 CES/CEIEA; KAISERSATT, SAMANTHA O CIV USAF AFSPC 30 CES/CEIEA; Sam Cohen
Subject: 13th Street Bridge Replacement - request for written comments

Hello Freddie:
We are in the process of finalizing the Draft EA for public circulation for the proposed 13th Street Bridge Replacement project. Although the Tribe monitored backhoe trenching in support of the project in 2004, 2006, and 2014, I can find no written correspondence in my files about that. Legal staff are requesting written comments from the Tribe for inclusion in the Draft EA. Would you be so kind as to provide me with the Tribe's views or comments about the project at your earliest convenience? An e-mail reply is acceptable. Thank you.
Respectfully, Chris

Christopher Ryan
Cultural Resources Mgmt
1028 Iceland Ave, Bldg 11146
VAFB, CA 93437-6010
805.605.0748

APPENDIX D: USFWS Consultation

DEPARTMENT OF THE AIR FORCE
30TH SPACE WING (AFSPC)

JUN 10 2014

Beatrice L. Kephart
30 CES/CEI
1028 Iceland Avenue
Vandenberg AFB CA 93437-6010

Stephen P. Henry
U.S. Fish and Wildlife Service
2493 Portola Road, Suite B
Ventura CA 93003

Dear Mr. Henry

In accordance with section 7 of the Endangered Species Act of 1973, Vandenberg Air Force Base (VAFB) requests formal consultation for a project to replace a mission-essential vehicle bridge over the Santa Ynez River at 13th Street. A new bridge will be built approximately 75 feet west of the existing bridge, and once the new bridge is complete, demolition of the existing bridge will commence. We are especially pleased to mention that, due to advances in bridge design, our new bridge will require only two pillars within the riverbed as compared to the current eight, and that the new bridge is expected to achieve Leadership in Energy and Environmental Design (LEED) "silver" status.

We request "take" as a result of our determination that this project "may affect, and is likely to adversely affect" Tidewater goby (*Eucyclogobius newberryi*) and California red-legged frog (*Rana draytonii*), although extensive avoidance and monitoring measures will minimize disturbance to these species. We also considered potential effects to six other threatened and endangered species.

We are also initiating a consultation on this mission-critical project with the National Marine Fisheries Service, with a separate Biological Assessment determining "may affect and is likely to adversely affect" the Southern California Evolutionarily Significant Unit of Southern Steelhead (*Oncorhynchus mykiss*).

Enclosed is our biological assessment with the project description and effects of project activities. As always, we would appreciate the opportunity to review the draft Biological Opinion for this project before your office finalizes it. Additionally, due to the critical timeline which we have developed for this project, we request formal notification that all necessary materials and information have been received in support of a 135-day consultation.

Thank you for your assistance. Please contact me at (805) 605-7924 or Samantha Kaisersatt at (805) 605-0392 if you have any questions.

Sincerely

BEATRICE L. KEPHART
Chief, Installation Management Flight

Attachment:
Biological Assessment

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Ventura Fish and Wildlife Office
2493 Portola Road, Suite B
Ventura, California 93003

IN REPLY REFER TO:
08EVEN00-2014-F-0327

September 18, 2014

Beatrice L. Kephart
30 CES/CEI
1028 Iceland Avenue
Vandenberg Air Force Base, California 93437-6010

Subject: Biological Opinion for the 13th Street Bridge Replacement Project, Vandenberg Air Force Base, Santa Barbara County, California (8-8-14-F-34)

Dear Ms. Kephart:

This document transmits the U.S. Fish and Wildlife Service's (Service) biological opinion regarding the U.S. Air Force's (Air Force) proposal to replace a bridge over the Santa Ynez River at 13th Street on Vandenberg Air Force Base, and its effects on the federally threatened tidewater goby (*Eucyclogobius newberryi*) and California red-legged frog (*Rana draytonii*). Your request, dated June 10, 2014, and received in our office on June 12, 2014, and our response are in accordance with section 7 of the Endangered Species Act of 1973 (Act), as amended (16 U.S.C. 1531 et seq.).

This biological opinion was prepared using information you provided in your letter requesting initiation of formal consultation (Air Force 2014a), the biological assessment (Air Force 2014b), correspondence and information in our files. A complete record for this biological opinion can be made available at the Ventura Fish and Wildlife Office.

CONSULTATION HISTORY

On June 12, 2014, we received the Air Force's request for formal consultation for the proposed 13th Street bridge replacement project. On August 25, 2014, the Service provided the base with a draft biological opinion. The Air Force (2014c) provided comments on the draft biological opinion on September 9, 2014; we have incorporated the Air Force's comments into this biological opinion, as appropriate.

BIOLOGICAL OPINION

DESCRIPTION OF THE PROPOSED ACTION

The Air Force proposes to replace a mission-essential vehicle bridge over the Santa Ynez River at 13th Street on Vandenberg Air Force Base. The existing bridge was constructed in 1970 and

serves as the only on-base transport route and vehicle link between the north and south portions of Vandenberg Air Force Base. The existing 13th Street bridge is unsafe and at risk of failure. Collapse of the existing structure is unavoidable and would sever communications and utility links between north and south Vandenberg Air Force Base, temporarily ceasing space launch operations and potentially causing loss of life and expensive mission assets.

The proposed bridge replacement project includes: (1) construction of a new bridge and corresponding approach roads; (2) demolition and removal of the existing 13th Street bridge and existing approach roads; (3) installation of fiber optic communications cable under the Santa Ynez River; and (4) establishment of a wetland modification area at the Santa Ynez River Estuary to offset any potential project related impacts to wetlands that cannot be restored within the project area. The area encompassing the bridge replacement and fiber optic line installation is approximately 122.4 acres. The area designated for wetland mitigation encompasses 19.1 acres approximately 2 miles downstream of the 13th Street bridge (see figure 1-2 in Air Force 2014b).

Construction of the new bridge and demolition of the existing bridge is anticipated to begin in late spring or early summer 2015 and last approximately 12 to 20 months. Demolition and removal of the existing approach roads are estimated to begin in April 2016 and last between 5 to 6 months. Installation of the fiber optic cable under the Santa Ynez River is estimated to begin in April 2015 and last approximately 4 months. The wetland mitigation activities site at the designated area within the Santa Ynez River Estuary would begin after completion of the aforementioned activities.

Construction activities in the river channel would be completed or paused prior to the forecast and onset of significant rainfall (0.5 inch within a 24 hour period). All temporary fill, water diversion, and materials placed in the river channel would be removed prior to the onset of a rainfall event greater than 0.5 inch. If necessary, in-channel construction would recommence in spring 2016 with the reinstallation of access roads into the channel.

Construction of the New 13th Street Bridge

The replacement bridge would be approximately 650 feet in length and be located between 50 to 80 feet west of the existing bridge. New approach roadways would be constructed on the north and south ends of the new bridge. The finished two lane roadways would be between 45 and 48 feet wide with rock slope protection, or equivalent protection, on either side of the approach ways. The existing communication lines, electrical line, water line, and natural gas line that the existing bridge supports would be replaced on the new bridge.

The new bridge would have two piers, both within the channel, spaced between 200 to 270 feet apart. The native material in the river bed would require the piers to be 10 feet in diameter and 210 feet deep. The abutments would be anchored at the top of the slopes on the north and south banks. The north abutment would be protected by adding approximately 12.5 feet of rock riprap as well as leaving the existing rock, gabion baskets, concrete, and steel wall associated with the

existing abutment in place. The south abutment would be protected by installing approximately 12.5 feet of new ungrouted rock riprap at the base of the abutment. Soil would be removed from the embankments to embed in the rock riprap. A layer of soil, mixed with native plant material, would be placed on top of the embankments to promote native plant growth. Native willow trees would emerge among the rock riprap to create cover habitat.

As part of the bridge design, eight 30 foot tall light poles would be located along the edge of the east side of the bridge spaced approximately 83 feet apart. The poles would be fitted with LED fixtures that provide light over the entire bridge to satisfy the Illuminating Engineering Society Recommended Practice. The design of the light fixtures would cut off backlight to minimize light spill behind the fixtures and would not exceed 2.15 lux at the bridge edge or 1.1 lux within 10 feet north or south of the bridge's edge; the maximum illumination at the ground level below the bridge would not exceed 1.1 lux.

Staging areas would be established on the terrace above the riparian corridor for storage of equipment, materials, and temporary personnel facilities, as well as establishing a dewatering area. Temporary access roads would be constructed into the riparian corridor and riverbed to enable construction equipment, materials, and temporary supports to be moved into position during construction. Prior to the construction of access roads and staging areas, vegetation within the project area would be cleared. The project site would be dewatered by installing up and down stream dams and pumping the water within the project area out of the channel to the adjacent agricultural field. Integrated into the process of dewatering would be the diversion of the active river channel through culverts passing through the project site to keep soil and debris out of the riverbed, prevent flowing water from flooding the column excavations, and allow species to travel around the project area by way of the diversion.

Demolition and Removal of the Existing 13th Street Bridge

The existing bridge is 500 feet long, 42.5 feet wide, and supported by 8 concrete pier walls. After completion of the new bridge, the existing bridge and approach roadways would be demolished and removed. Demolition would occur during the dry season and the project area would again be dewatered, as described above for the construction of the new bridge.

The existing approach roads would also be removed; holes and depressions left as a result of removal of the approach roads and railings would be backfilled with clean fill and graded to blend with the surrounding terrain. Temporary support shoring, temporary bracing, and protective covers would be installed to support portions of the bridge as the existing support structures are removed during the process. With the exception of the north abutment and its associated riprap and support structures, the concrete bridge abutments and piers would be removed below grade. The riprap at the base of the pilings, within the river channel, and at the piers at the south abutment would also be removed in their entirety.

Installation of the Fiber Optic Cables

Communication lines on the existing bridge would be relocated to the new bridge. An existing overhead fiber optic cable is located approximately 1,100 feet west of the existing bridge. In 2006, the Service issued a biological opinion for this line; however, the existing line has since been found to be insufficient and a new underground fiber optic cable would be installed in the same location.

The new cables would be installed via one directional drilling/boring; all ducts would be watertight when assembled. The entry and exit bore locations would be located outside of Jurisdictional waters of the U.S. and riparian habitat. Within the river channel, the conduit would be installed at a minimum of 25 feet below the surface over approximately 1,100 feet; outside the channel, the conduit would be installed at a minimum of 60 inches below the surface.

Measures to Offset Adverse Effects

Per the requirements of the Clean Water Act Section 401 and 404 permits that would be issued for the proposed project, measures to offset temporary and permanent impacts to wetlands will be implemented. Temporary impacts to wetlands would be offset at a 1:1 ratio by restoring disturbed areas within the project area to pre-construction conditions. Permanent impacts to wetlands would be offset at a 2:1 ratio for restored or enhanced wetlands. The design of the new bridge and demolition of the existing bridge will improve wetland and aquatic habitat by reducing the obstruction of flow. However, the Air Force anticipates that the mitigation area required to offset the permanent impacts cannot be achieved within the 13th Street bridge project area. Re-establishment of up to four acres of currently impaired estuarine habitat along the southeast portion of the Santa Ynez River estuary is therefore included as a component of the proposed action. The final acreage of re-establishment of wetland and/or other aquatic characteristics and functions within the designated mitigation area would depend on the acreage of the final permanent impacts during construction of the new bridge.

More than 70 years of sediment accretion caused by river flow influenced by the old 35th Street bridge abutments has resulted in ground elevations that are 1.5 to 4 feet higher than the elevation needed to create habitat that supports a broad spectrum of native salt marsh plant and animal species. Although the bridge was demolished in 1970, the structural abutments on either bank still remain in place. Decades of high flow events have caused a gradual buildup of sediment immediately downstream of these barriers. This has caused the southwest portion of the estuary to transition from estuarine habitat to upland habitat, dominated by a mix of invasive broadleaf plants and native central coast scrub species. As a result, this area no longer functions as wetland habitat and does not support obligate estuary species.

The Air Force proposes to grade the area encompassing the old 35th Street bridge abutments (referred to as the wetland mitigation site) to an elevation of approximately 3.15 meters to allow the habitat to transition from invasive upland species to intermittently flooded middle salt marsh wetland habitat. The proposed action would require grading and relocation of approximately

10,000 to 11,000 cubic yards of accumulated sediment at the south eastern edge of the estuary (see figure 1-2 in Air Force 2014b).

In addition to the wetland mitigation site, restoration of temporarily disturbed areas and areas impacted during installation of the new bridge and demolition of the existing bridge would be implemented. A Habitat Restoration and Monitoring Plan would be implemented to restore all disturbed areas, at a minimum, to the original condition, and, if feasible, enhance the wetlands and riparian corridor within the project footprint to compensate for the net loss of wetlands or other sensitive plant communities that may occur due to the proposed action. The plan would include post-construction monitoring to assess the effectiveness of revegetation efforts and provide guidance for follow-up maintenance.

Avoidance and Minimization Measures

To minimize adverse effects to the tidewater goby and the California red-legged frog, the Air Force proposes to implement the following protective measures. To some degree, we have collated protective measures from throughout the biological assessment (Air Force 2014b) and the programmatic biological opinion (Service 2011), and changed the wording of some measures to improve clarity, but we have not changed the substance of the measures the Air Force has proposed. The biological assessment (Air Force 2014b), programmatic biological opinion (Service 2011), and additional correspondence with the Air Force staff (Kaisersatt 2014) contain additional details of the following proposed protective measures.

1. At least 15 days prior to ground-disturbing activities, the applicant will submit to the Service the names and credentials of biologists for approval to conduct the minimization measures outlined below. No project activities will begin until the applicant has received approval from the Service that the biologists are qualified to do the work.

2. Prior to the commencement and throughout the period of construction, a qualified biologist will conduct an environmental sensitivity training for all project personnel to provide an overview on the listed species that may be encountered during the project, applicable regulatory policies and provisions regarding their protection, and the avoidance and minimization measures to protect these species. Furthermore, crew members will be briefed on the reporting process in the event that an inadvertent injury should occur to a listed species during construction.

3. Prior to commencing project activities, including excavation in upland areas, a pre-construction survey of the project site will be conducted by a Service-approved biologist immediately preceding the activity. The Service-approved biologist will search all potential hiding spots for California red-legged frogs. If any life stage of the California red-legged frog is found and these individuals are likely to be killed or injured by work activities, the approved biologist will be allowed sufficient time to move them from the site before work begins. Only approved biologists will participate in activities associated with the capture, handling and monitoring of California red-legged frogs. The Service-

approved biologist will follow the Declining Amphibian Population Task Force's Code of Practice.

4. If a California red-legged frog is found in the work area, any work that may kill or injure that animal will stop until it is relocated by a Service-approved biologist. The Service-approved biologist will relocate any California red-legged frogs that are found the shortest distance possible to a location that contains suitable habitat and that will not be affected by activities associated with the proposed project; to the extent practicable, the relocation site will be in the same drainage.

5. Two days prior to beginning project activities, the Air Force will install nets with mesh no larger than 0.0625 inch to exclude tidewater gobies from the project area. These nets will be set up within the main channel of the creek 50 feet upstream and 50 feet downstream of the project area. These nets will be removed immediately following the completion of project activities. Surface water pump intakes will be completely screened with 0.0625 inch mesh to prevent entrainment of tidewater gobies.

6. The dewatering intake will be screened with 0.0625 inch mesh to prevent tidewater gobies from entering the system. Water will be released downstream of the project area at an appropriate rate to maintain downstream flows.

7. The active river channel will be diverted through culverts passing through the project site to keep soil and debris out of the riverbed, prevent flowing water from flooding the column excavations, and allow species to travel through the pipes and around the project area.

8. Block netting will be used to exclude tidewater gobies and other fish from the work area. The netting will be continually monitored and maintained to prevent them from becoming clogged.

9. Prior to any construction activities, a Service-approved biologist will survey the project area for the presence of tidewater gobies of any life stage. A Service-approved biologist will relocate all tidewater gobies observed within the project site to suitable habitat immediately downstream of the project site.

10. A Service-approved biologist will be present during and after the dewatering to relocate tidewater gobies that enter the work area prior to construction. A Service-approved biologist will monitor the project area every work day, including the exclusion nets, until all tidewater gobies are removed from the work site. At that point, the Service-approved biologist may appoint project personnel to periodically monitor the exclusion nets for the duration of the project; however, the Service-approved biologist must be on-call for immediate assistance, if needed, until project completion.

11. No activities will take place below the top of bank until the diversion/dewatering system is in place. These systems will consist of culverts, nets, and screens, as detailed in the biological assessment (Air Force 2014b).

12. A qualified biologist would inspect all work areas including any equipment left overnight within the project area and staging areas prior to the start of work. All materials and equipment would be removed from the Santa Ynez River channel to the staging areas at the end of each day to the greatest extent feasible. If materials are to be staged within the bounds of the river channel overnight, they would be ringed with additional exclusionary fencing.

13. Covered pits and trenches will be inspected prior to or during the removal of coverings before work begins each day. Any excavations left open overnight would be covered or surrounded with 5 feet high silt fencing to prevent the potential entrapment of listed species.

14. The limits of the project area will be staked, flagged, or otherwise marked in the field to prevent impacts outside of the designated work areas. All project work and access will occur within the designated limits of the project area.

15. The fencing would be inspected twice daily by qualified biologists. Prior to the start of work, fencing would be inspected for any breaches that may have been created overnight and allowed species to enter the exclusion area. At the end of the work day, the wind fencing would be inspected again to identify any areas that may need repair prior to nightfall. Compromised fence would be repaired immediately. If breaks are discovered during the morning inspection, a survey would be conducted that night to detect and remove any special status species that may have entered the site.

16. The use of heavy equipment and vehicles will be limited to the proposed project area. To the extent feasible, all construction equipment and machinery would operate on existing paved surfaces, access roads, and staging areas. In the event that any equipment must be operated outside of these areas, a biological monitor would supervise these activities.

17. The construction contractor will submit a Spill Contingency Plan which contains measures to prevent the release of oil and/or other hazardous materials during operational activities in the project area. The Spill Contingency Plan will be implemented during project activities.

18. Equipment maintenance and fueling will occur at least 250 feet away from riparian habitat and wetlands. Fueling and addition of oil/fluids to equipment would be done in pre-designated areas over secondary containment to minimize risks from accidental spillage or release.

19. Construction activities in the river channel will be completed or paused prior to the forecast and onset of significant rainfall (0.5 inches within a 24 hour period) and all temporary fill, water diversion, and materials placed in the river channel would be removed, except for the trestle, which would remain in place for the winter.

20. To the maximum extent possible, non-native species and vegetation within the project areas would be removed during project related activities under the direction of the qualified biologist(s).

21. The amount of in-stream disturbance will be the minimum amount necessary to allow construction to take place. Temporary fencing will be used to delineate the work area, and no vegetation removal will be allowed outside of this area. All construction materials will be stored within the dewatered portion of the channel or at the top of bank in preapproved locations; no vegetation removal will occur for this purpose.
22. The Air Force will return stream contours to their original condition at the end of project activities, unless 30 CES/CEI determine that it is not feasible or beneficial to the species. All temporarily disturbed areas, including access roads, would be restored at a minimum to their original condition. This would include the removal of all imported fill material from the project areas.

23. All herbicides will be used in accordance with the pesticide label and DoD and Air Force Pest Management Regulations. Herbicide application will comply with California Department of Pesticide Regulations, and the U.S. District Court for the Northern District of California (20 October 2006) injunction on pesticide use in California red-legged frog habitat. Glyphosate herbicide will not be applied within 15 feet of aquatic features, and herbicides that leave residue will not be applied within the ordinary high water mark (waters of the U.S.).

24. Herbicide treatment within or adjacent to aquatic resources will use appropriately labeled products only.

25. Herbicides will not be sprayed when wind velocities at the site exceed five miles per hour or in foggy or rainy conditions when ground moisture becomes excessive. Non-target species, especially native species, will be avoided during spraying. A biological monitor familiar with the site will be present to supervise herbicide spraying activities.

26. Boring will be used to install the fiber optic cable to avert encroaching into the river corridor.

27. The 30 CES will prepare a Frac-Out Contingency Plan in coordination with the construction contractor that will be implemented by the construction crew. BMPs and the Frac-Out Plan will be in place and implemented at any location where boring would occur near or beneath Jurisdictional Waters of the U.S.

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 relies on four components: (1) the Status of the Species, which describes the range-wide condition of tidewater goby and California red-legged frog, the factors responsible for that condition, and the species' survival and recovery needs; (2) the Environmental Baseline, which analyzes the condition of tidewater goby and California red-legged frog in the action area, the factors responsible for that condition, and the relationship of the action area to the survival and recovery of these 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 tidewater goby and California red-legged frog; and (4) the Cumulative Effects, which evaluates the effects of future, non-Federal activities in the action area on tidewater goby and California red-legged frog.

In accordance with policy and regulation, the jeopardy determination is made by evaluating the effects of the proposed federal action in the context of the current status of tidewater goby and California red-legged frog, taking into account any cumulative effects, to determine if implementation of the proposed action is likely to cause an appreciable reduction in the likelihood of both the survival and recovery of these species in the wild.

STATUS OF THE SPECIES

Tidewater Goby

Tidewater gobies were listed as endangered on March 7, 1994 (59 Federal Register (FR) 5494). On June 24, 1999, the Service proposed to remove the populations occurring north of Orange County, California, from the endangered species list (64 FR 33816). In November 2002, the Service withdrew this proposed delisting rule and determined it appropriate to retain the tidewater goby's listing as endangered throughout its range (67 FR 67803). A recovery plan for tidewater gobies was completed on December 12, 2005 (Service 2005). A 5-Year Review for tidewater gobies was completed in September 2007 (Service 2007). Detailed information on the biology of tidewater gobies can be found in Wang (1982), Irwin and Soltz (1984), Swift et al. (1989), Worcester (1992), and Swenson (1995); much of the information from this account was taken from these sources.

Tidewater gobies are endemic to California and they typically inhabit coastal lagoons, estuaries, and marshes, preferring relatively low salinities of approximately 12 parts per thousand (ppt). Tidewater goby habitat is characterized by brackish estuaries, lagoons, and lower stream reaches

where the water is fairly still but not stagnant. They tend to be found in the upstream portions of lagoons. Tidewater gobies can withstand a range of habitat conditions and have been documented in waters with salinity levels that range from 0 to 41 ppt, temperatures from 46 to 77 degrees Fahrenheit, and depths from approximately 10 inches to 6.5 feet.

Tidewater gobies are primarily an annual species in central and southern California, although some variation in life history has been observed. If reproductive output during a single season fails, few (if any) tidewater gobies survive into the next year. Reproduction typically peaks from late April or May to July and can continue into November or December depending on the seasonal temperature and amount of rainfall. Males begin the breeding ritual by digging burrows (3 to 4 inches deep) in clean, coarse sand of open areas. Females then deposit eggs into the burrows, averaging 400 eggs per spawning effort. Males remain in the burrows to guard the eggs. They frequently forego feeding, which may contribute to the mid-summer mortality observed in some populations. Within 9 to 10 days, larvae emerge and are approximately 0.20 to 0.27 inch in length. Tidewater gobies live in vegetated areas in the lagoon until they are 0.60 to 0.70 inch long. When they reach this life stage, they become substrate-oriented, spending the majority of time on the bottom rather than in the water column. Both males and females can breed more than once in a season, with a lifetime reproductive potential of 3 to 12 spawning events. Vegetation is critical for over-wintering tidewater gobies because it provides refuge from high water flows.

Tidewater gobies feed on small invertebrates, including mysids, amphipods, ostracods, snails, aquatic insect larvae, and particularly chironomid larvae. Tidewater gobies of less than 0.30 inch in length probably feed on unicellular phytoplankton or zooplankton, similar to many other early stage larval fishes.

Historically, tidewater gobies occurred in at least 135 California coastal lagoons and estuaries from Tillas Slough near the Oregon border south to Agua Hedionda Lagoon in northern San Diego County. The southern extent of its distribution has been reduced by approximately 8 miles. The species is currently known to occur in about 112 locations, although the number of sites fluctuates with climatic conditions. Currently, the most stable populations are in lagoons and estuaries of intermediate size (5 to 124 acres) that are relatively unaffected by human activities. Six regional clades based on morphological differences (Ahnelt et. al. 2004) that are supported by genetic work done by Dawson et al. (2001) have been used to define recovery units for tidewater gobies (Service 2005). The recovery plan describes 26 recovery sub-units for tidewater gobies (Service 2005).

Tidewater gobies enter the marine environment when sandbars are breached during storm events. The species' tolerance of high salinities (up to 60 ppt) for short periods of time enables it to withstand marine environment conditions where salinities are approximately 35 ppt, thereby allowing the species to re-establish or colonize lagoons and estuaries following flood events. However, genetic studies indicate that individual populations rarely have contact with other populations so natural recolonization may be rare. In Santa Barbara County during the fall of 1994, tidewater gobies were reported as common in the Santa Ynez River 4 miles upstream from

the lagoon (Swift et al. 1997); however, by January 1995, they were absent at the upstream sites. Tidewater gobies that are found upstream of lagoons in summer and fall tend to be juveniles. The highest densities of tidewater gobies are typically present in the fall.

Recovery Plan for the Tidewater Goby

The goal of the tidewater goby recovery plan is to conserve and recover the species throughout its range by managing threats and perpetuating viable metapopulations within each recovery unit while maintaining morphological and genetic adaptations to regional and local environmental conditions. The decline of tidewater gobies is attributed primarily to habitat loss or degradation resulting from urban, agricultural, and industrial development in and around coastal wetlands. The recovery plan identifies 6 recovery units: North Coast Unit, Greater Bay Unit, Central Coast Unit, Conception Unit, Los Angeles/Ventura Unit, and South Coast Unit.

The recovery plan specifies that tidewater gobies may be considered for downlisting when:

1. Specific threats to each metapopulation (e.g., coastal development, upstream diversion, channelization of rivers and streams, etc.) have been addressed through the development and implementation of individual management plans that cumulatively cover the full range of the species.

2. A metapopulation viability analysis based on scientifically credible monitoring over a 10-year period indicates that each recovery unit is viable. The target for downlisting is for individual sub-units within each recovery unit to have a 75 percent or better chance of persistence for a minimum of 100 years.

Tidewater gobies may be considered for delisting when downlisting criteria have been met and a metapopulation viability analysis projects that all recovery units are viable and have a 95 percent probability of persistence for 100 years.

5-Year Review for the Tidewater Goby

The 5-year review for the tidewater goby, completed in 2007, stated that the recovery plan reflects up-to-date information; however, the 5-year review reconsidered the downlisting and delisting criteria in the recovery plan. The 5-year review stated that other, currently available information on the species may also be used to determine the appropriate listing status of the species under the Act. These include the current number of occupied localities, current laws and regulations that act to protect the species, and our current understanding of threats and their impact on tidewater gobies. The 5-year review recommended that we reclassify tidewater gobies from endangered to threatened because we concluded that the species was not in imminent danger of extinction. The main reason for this recommendation was that the number of localities known to be occupied had more than doubled since listing. The 5-year review also concluded that the tidewater goby may be more resilient in the face of severe drought events than believed at the time of listing. The 5-year review also stated that threats identified at the time of listing

had been reduced or were not as serious as thought. Although numerous threats to tidewater gobies have been identified (e.g., non-native predation and competition, pollution, cattle grazing), information on the degree of impact these threats may have on tidewater gobies is generally lacking. According to the 5-year review, the increase in occupied localities indicated that these threats appeared to not be having a major impact on tidewater gobies.

On May 18, 2010, we received a petition dated May 13, 2010, from The Pacific Legal Foundation, requesting that tidewater gobies be reclassified as threatened under the Act. Included in the petition was reference to the 5-year review of the tidewater goby's status published by the Service in 2007. We published a 90-day finding on January 19, 2011 (76 FR 3069), that stated our conclusion that the petition presented substantial scientific or commercial information indicating that the petitioned action (reclassification of tidewater gobies) may be warranted. We published a rule on March 13, 2014, proposing to downlist the tidewater goby and soliciting comments from the public (79 FR 14340).

California Red-legged Frog

The California red-legged frog was federally listed as threatened on May 23, 1996 (Service 1996). The Service completed a recovery plan for the species in 2002 (Service 2002). A 5-year review for the California red-legged frog has not been completed. The historical range of the California red-legged frog extended coastally from southern Mendocino County and inland from the vicinity of Redding, California, southward to northwestern Baja California, Mexico (Jennings and Hayes 1985, Storer 1925). The California red-legged frog has been extirpated or nearly extirpated from 70 percent of its former range. Historically, this subspecies was found throughout the Central Valley and Sierra Nevada foothills. Four additional occurrences have been recorded in the Sierra Nevada foothills since listing, bringing the total to five extant populations in that area compared to approximately 26 historical records (61 FR 25813). Currently, California red-legged frogs are known from three disjunct regions in 26 California counties and one region in Baja California, Mexico (Grismer 2002; Fidenci 2004; and Smith and Krofta, 2005).

The diet of California red-legged frogs is highly variable. Hayes and Tennant (1985) found invertebrates to be the most common food item of adults. Vertebrates, such as Pacific chorus frogs (*Pseudacris regilla*) and California mice (*Peromyscus californicus*), represented over half of the prey mass eaten by larger frogs (Hayes and Tennant 1985). Hayes and Tennant (1985) found juveniles to be active diurnally and nocturnally, whereas adults were largely nocturnal.

California red-legged frogs breed from November through March; earlier breeding has been recorded in southern localities (Storer 1925). Males appear at breeding sites from 2 to 4 weeks before females (Storer 1925). Female California red-legged frogs deposit egg masses on emergent vegetation so that the masses float on the surface of the water (Hayes and Miyamoto 1984). Egg masses contain about 2,000 to 5,000 moderately-sized, dark reddish brown eggs (Storer 1925, Jennings and Hayes 1985). Eggs hatch in 6 to 14 days (Storer 1925). Larvae undergo metamorphosis for 3.5 to 7 months after hatching (Storer 1925, Wright and Wright

1949). Sexual maturity can be attained at 2 years of age by males and 3 years of age by females (Jennings and Hayes 1985); adults may live 8 to 10 years (Jennings et al. 1992) although the average life span is considered to be much lower. The California red-legged frog is a relatively large aquatic frog ranging from 1.5 to 5 inches from the tip of the snout to the vent (Stebbins 2003).

The California red-legged frog uses a variety of habitat types, including various aquatic systems, riparian, and upland habitats. Tadpoles, juveniles, and adults have been collected from streams, creeks, ponds, marshes, plunge pools and backwaters of streams, dune ponds, lagoons, and estuaries. California red-legged frogs frequently breed in artificial impoundments such as stock ponds, if conditions are appropriate. Although California red-legged frogs successfully breed in streams and riparian systems, high seasonal flows and cold temperatures in streams often make these sites risky environments for eggs and tadpoles. The importance of riparian vegetation for this species is not well understood. When riparian vegetation is present, California red-legged frogs spend considerable time resting and feeding in it; the moisture and camouflage provided by the riparian plant community provide good foraging habitat and may facilitate dispersal in addition to providing pools and backwater aquatic areas for breeding.

Juvenile and adult California red-legged frogs may disperse long distances from breeding sites throughout the year. They can be encountered living within streams at distances exceeding 1.8 miles from the nearest breeding site, and have been found up to 400 feet from water in adjacent dense riparian vegetation (Bulger et. al 2003). During periods of wet weather, starting with the first rains of fall, some individuals may make overland excursions through upland habitats. Most of these overland movements occur at night. Bulger et al. (2003) found marked California red-legged frogs in Santa Cruz County making overland movements of up to 2 miles over the course of a wet season. These individual frogs were observed to make long-distance movements that are straight-line, point to point migrations over variable upland terrain rather than using riparian corridors for movement between habitats. For the California red-legged frog, suitable habitat is considered to include all aquatic and riparian areas within the range of the species and includes any landscape features that provide cover and moisture (Service 1996).

Habitat loss and degradation, combined with over-exploitation and introduction of exotic predators, were important factors in the decline of the California red-legged frog in the early to mid-1900s. Continuing threats to the California red-legged frog include direct habitat loss due to stream alteration and loss of aquatic habitat, indirect effects of expanding urbanization, competition or predation from non-native species including the bullfrog, catfish (*Ictalurus* spp.), bass (*Micropterus* spp.), mosquito fish (*Gambusia affinis*), red swamp crayfish (*Procambarus clarkia*), and signal crayfish (*Pacifasticus leniusculus*).

An additional threat affecting amphibians worldwide is the chytrid fungus *Batrachochytrium dendrobatidis*. *Batrachochytrium dendrobatidis* causes chytridiomycosis, a skin disease that has been found to disrupt osmoregulatory function in the skin of amphibians, resulting in an imbalance of electrolytes and death (Voyles et al. 2009). Chytridiomycosis in amphibians may be marked by deformed mouthparts in tadpoles, wherein most infected tadpoles will die at

metamorphosis (Service 2002). Infected boreal toads (*Anaxyrus boreas boreas*) showed few clinical signs of the disease but many appeared weak or lethargic, exhibited excessive shedding of skin and were reluctant to flee at the approach of humans (U.S. Geological Service 2000, as cited in Service 2002). Chytrid fungi are widespread in the environment where they act as decomposers of keratin, chitin, cellulose, and other plant material, and are known parasites of fungi, algae, higher plants, protozoa, invertebrates, and most recently in vertebrates. Chytrid fungi reproduce asexually by means of minute, fragile, motile spores, and are probably spread directly from amphibian to amphibian in water. These fungi most likely move from one water source to another on migrating amphibians, waterbirds, or flying insects (Service 2002).

Since its discovery in 1998, chytrid fungus has likely been responsible for die-offs of a number of amphibian species, including remaining populations of the endangered boreal toad in the southern Rocky Mountains, and Chiricahua leopard frogs (*Rana chiricahuensis*) in Arizona (Colorado Herpetological Society 2000, as cited in Service 2002). Occurrences of infection have been observed in two amphibian species in the Sierra Nevada, the mountain yellow-legged frog (*Rana muscosa*) and the Yosemite toad (*Bufo canorus*). An infected California red-legged frog tadpole was collected in Calabasas Pond on the Ellicott Slough National Wildlife Refuge in Santa Cruz County (Service 2002).

The chytrid fungus is now recognized for its ability to spread quickly through amphibian populations and infect numerous species, causing high rates of mortality, and persisting at low host densities (Voyles et al. 2009). These recent findings validate the importance of taking precautions to prevent the spread of chytrid fungus or any disease agent into and/or between amphibian populations. It is considered a threat to California red-legged frog populations.

Recovery Plan for the California Red-Legged Frog

According to the recovery plan for the California red-legged frog, the strategy for the species' recovery involves: (1) protecting existing populations by reducing threats; (2) restoring and creating habitat that will be protected and managed in perpetuity; (3) surveying and monitoring populations and conducting research on the biology and threats to the species; and (4) reestablishing populations of the species within its historical range (Service 2002).

The recovery plan for the California red-legged frog identifies eight recovery units. These recovery units are based on the Recovery Team's determination that various regional areas of the species' range are essential to its survival and recovery. The recovery status of the animal is considered within the scale of Recovery Units as opposed to the overall range. Because of the varied status of this species and differing levels of threats throughout its range, recovery strategies differ per recovery unit to best meet the goal of delisting the species. For example, in areas where California red-legged frog populations appear to be stable, recovery strategies are intended to protect existing population numbers, whereas in areas where frogs have been extirpated or are declining, strategies are to stabilize, increase, augment, or reestablish populations.

The recovery units are delineated by major watershed boundaries as defined by U.S. Geological Survey hydrologic units and the limits of the range of the California red-legged frog. The goal of the recovery plan is to protect the long-term viability of all extant populations within each recovery unit. Within each recovery unit, core areas have been delineated and represent contiguous areas of moderate to high California red-legged frog densities that are relatively free of exotic species such as bullfrogs. The goal of designating core areas is to protect metapopulations that, combined with suitable dispersal habitat, will allow for the long term viability within existing populations. This management strategy allows for the recolonization of habitat within and adjacent to core areas that are naturally subjected to periodic localized extinctions, thus assuring the long-term survival and recovery of the California red-legged frog.

ENVIRONMENTAL BASELINE

The implementing regulations for section 7(a)(2) of the Act define the "action area" as all areas to be affected directly or indirectly by the Federal action and not merely the immediate area involved in the action (50 CFR 402.02). For the purposes of this biological opinion, we consider the action area to include the stretch of the Santa Ynez River and upland area within the 13th Street bridge project area and the downstream wetland mitigation site. Based upon the information provided to us in the biological assessment (Air Force 2014b), we identify the action area as the 122.4 acre project area which encompasses the proposed 13th Street bridge, the existing 13th Street bridge, the proposed fiber optic line, and 19.1 acres wetland mitigation site located approximately 2 miles downstream from the bridge.

The 122.4 acre action area encompassing the 13th Street bridge is characterized by five distinct vegetation types: central coast scrub, non-native habitats, freshwater marsh, willow riparian, and ruderal. The 19.1 acre wetland mitigation site consists of central coast scrub, non-native habitats, coastal salt marsh, and ruderal.

Tidewater Goby

Tidewater goby have been documented in all of the major drainages on Vandenberg Air Force Base including: Shuman Creek, San Antonio Creek, Santa Ynez River, Cañada Honda, and Jalama Creek. The tidewater goby population in the Santa Ynez River is the largest on Vandenberg Air Force Base, but can undergo dramatic seasonal and annual fluctuations.

ManTech SRS Technologies (ManTech) conducted tidewater goby surveys in the vicinity of the 13th Street bridge action area in July and October of 2013. During both survey periods, surface water was not present upstream of the survey area. ManTech conducted sampling at select locations within the action area to assess abundance of tidewater gobies within the hydrated area around the 13th Street bridge. The following table summarizes the survey efforts and results as presented in the biological assessment (Air Force 2014b). Tidewater goby densities in October 2013 were significantly lower than densities reported in July 2013 and reflect natural seasonal fluctuations in abundance that are well-documented in this species. Tidewater gobies were also

documented in pools approximately 850 feet upstream of the bridge during California red-legged frog night surveys during fall 2012.

Survey Period	Number of Locations Sampled	Area Surveyed (Acres)	Tidewater Gobies Captured (# of individuals)	Tidewater Goby Density (#/acre)	Tidewater Gobies estimated within the Project Area (# of individuals)
July 2013	11	3.84	9,831	29.2 per m^2	453,885
October 2013	13	3.27	2,514	7.46 m^2	98,793

During the July survey, young of the year and female gobies in spawning condition were captured, indicating breeding was occurring within the action area. Tidewater gobies were the most abundant fish documented during both survey efforts accounting for 92.8% and 81.3% in July and October, respectively.

ManTech did not conduct tidewater goby surveys within the Santa Ynez River estuary adjacent to the wetland mitigation site action area; however, tidewater goby occurrence in the estuary is well-documented.

Recovery of the Tidewater Goby

The final recovery plan for the tidewater goby subdivides the geographic distribution of the species into six recovery units, encompassing a total of 26 sub-units defined according to genetic differentiation and geomorphology. Santa Ynez River is included in the Conception Recovery Unit. The Conception Recovery Unit is divided into three sub-units; the Santa Ynez River is included in Sub-Unit CO 2, which extends from Point Sal to Point Arguello over a generally sandy coast. Sub-Unit CO 2 is located entirely within Santa Barbara County. Primary tasks for this recovery unit as recommended in the recovery plan include: (1) population monitoring; (2) substantiate Sub-Units based on genetic studies; (3) improve habitat and remove threats; and (4) consider recolonization if there is a 25 percent reduction in the number of inhabited locations. The 5-year review does not specify the recovery function of the Santa Ynez River for the tidewater goby.

The Air Force's Integrated Natural Resources Management Plan provides some protection for the Santa Ynez River population of the tidewater goby. The tidewater goby habitat along the Santa Ynez River is designated as "Water Quality Limited". Pollutants and stressors and their respective potential sources include: nutrients from nonpoint sources, salinity/chlorides from agricultural activities, and sedimentation/siltation from agriculture, runoff, and resource extraction (Service 2005). The introduction of predatory fish, especially centrarchids and channel catfish, crayfish, and mosquito fish may threaten populations through direct predation on

eggs, larvae, and adults (Air Force 2011). The Integrated Natural Resources Management Plan prohibits the introduction of nonnative fish species into Vandenberg Air Force Base streams. Impacts the tidewater goby and its habitat are avoided whenever possible in project planning. Where impacts to habitat cannot be avoided, work is scheduled to avoid peak breeding periods whenever possible (March through July) and management measures are implemented that minimize impacts to the tidewater goby and its habitat. Project-specific monitoring and protection measures are identified in section 7 consultations, and National Environmental Policy Act documents, and implemented as required.

California Red-legged Frog

Vandenberg Air Force Base is located in the relative middle of the current range of the California red-legged frog. Many of the healthiest populations of the species (in terms of numbers of individuals) area located along the central coast of California, and California red-legged frogs are likely to be present in nearly all permanent streams and ponds on the base. The proposed project area consists of marginal habitat for California red-legged frogs due to the presence of invasive species.

ManTech conducted monthly focused California red-legged frog surveys at the 13th Street bridge from October 2012 to October 2013. California red-legged frogs were documented at low densities throughout the area compared to other riverine areas on Vandenberg Air Force Base, ranging from 0 to 11 individuals during each survey. During the breeding season, evidence of breeding (calling males, pairs in amplexus and egg masses) was recorded within the project area from February 2013 to May 2013. Salinities in the 13th Street bridge project area are within acceptable range for California red-legged frog egg development.

No California red-legged frog tadpoles were captured during the tidewater goby surveys and no metamorphs were observed during the 2012-2013 monthly focused California red-legged frog surveys. In 1996, 2004, and 2008, California red-legged frogs were documented within the action area.

No California red-legged frogs were documented during the December 2013 focused night survey of the proposed wetland mitigation area. Salinities of 6.5 parts per thousand have been documented in this area and are likely too high to support California red-legged frogs.

Recovery of the California Red-legged Frog

The action area and Vandenberg Air Force Base in general, are within the Northern Transverse Ranges and Tehachapi Mountains Recovery Unit for the California red-legged frog. The action area is also within the Santa Maria River-Santa Ynez River Core Area defined in the recovery plan (Service 2002). The recovery unit was described in the recovery plan as having a "high recovery status," meaning the unit supports many populations of the species, has many areas of high habitat quality, and threat levels that ranged from low to high. Some protections are afforded to the California red-legged frog on Vandenberg Air Force Base due to implementation

of the Air Force's Integrated Natural Resources Management Plan. So far, the Air Force has implemented several actions that provide a positive conservation benefit: (1) public outreach and education; (2) working with researchers from U.C. Santa Barbara, the U.S. Geological Survey, and Department of the Navy, including chytridiomycosis studies; (3) surveys for new populations; (4) monitoring of known populations; and other actions. These efforts are consistent with the goals from the recovery plan of protecting known populations; protecting suitable habitat, corridors, and core areas; developing land use guidelines; gathering biological and ecological data necessary for conservation of the species; and monitoring existing populations and conducting surveys for new populations.

EFFECTS OF THE ACTION

Tidewater Goby

Tidewater goby adults, fry and eggs within the project area could be inadvertently crushed by workers, construction equipment, or during the placement of riprap, barriers, and fill material. Dewatering activities may result in the death of any tidewater gobies in the dewatered area due to stranding resulting in desiccation, suffocation, or opportunistic predation. The Air Force has proposed to relocate all tidewater gobies out of areas to be dewatered. Tidewater gobies may be injured or killed during capture and relocation activities, from improper handling, physiological stress, increased competition, or from being released into unsuitable habitat. To minimize these potential effects, the Air Force proposes to use a Service-approved biologist to capture and relocate all tidewater gobies from the project area. Relocation sites would be selected within the Santa Ynez River watershed, which supports the necessary environmental conditions for tidewater goby survival. We anticipate the measures proposed by the Air Force will minimize adverse effects from dewatering the project area and relocating tidewater gobies.

The potential exists that some tidewater gobies may not be located or may still be killed or injured during the capture and relocation procedures. Furthermore, tidewater gobies may be breeding during the proposed project, and any eggs located within the dewatering area would not be detectable. These eggs may be destroyed during the proposed project. Tidewater gobies may also be entrained by pump intakes. We anticipate the Air Force's proposal to cover the pump intakes with wire screens with no greater than 0.0625-inch mesh size will minimize the potential for tidewater gobies to be caught in the inflow.

Excavation and backfilling associated with the construction of access roads and staging areas, removal of vegetation, and placement of rock riprap may cause erosion that can lead to sedimentation and habitat alteration that may result in tidewater goby injury, death, and lowered breeding success. Sediment may affect tidewater gobies by impairing the efficiency of their gill filaments and exposing them to higher salinities and/or predation as they flee downstream. Direct effects of sedimentation include mortality, reduced physiological function, and burrow smothering. Indirect effects of sedimentation include potential alteration to the food web which could create cascading effects to higher trophic levels. A reduction in phytoplankton can result from increased turbidity, which can thereafter reduce zooplankton, in turn reducing benthic macroinvertebrates, and thus reduce prey available to tidewater gobies (Henley et al. 2000). The

effects of sedimentation resulting from the proposed project would be minimized by the Air Force's proposal to install silt fencing around the perimeter of the work area, implement best management practices during project activities, and divert the active river channel around the work area to ensure flow is not impeded. We anticipate these measures will control and minimize erosion and sedimentation.

Furthermore, the existing 13th Street bridge has contributed to increased scour at the site of the bridge. The existing bridge has concentrated flows into fixed paths between narrow abutments and intensified scour downstream. The new bridge will span 650 feet of channel, compared to 500 feet spanned by the existing bridge, and replace the existing eight piers with two hexagonal piers. As a result, the new bridge is expected to decrease downstream scour and sedimentation by allowing the river to meander through a broader, less constricted channel. We anticipate this decrease in sedimentation would be beneficial to the tidewater goby and its habitat.

The proposed bridge replacement project will temporarily disturb aquatic habitat within the project area; there would be no temporary disturbance or removal of aquatic habitat at the wetland mitigation site. The proposed activities would result in the temporary removal of or disturbance to 3.19 acres of tidewater goby feeding and breeding habitat within the action area. The loss of habitat has the potential to cause injury or death of tidewater goby if they are forced into adjacent, less suitable habitat.

Permanent loss of aquatic habitat would be restricted to the area physically occupied by the new 13th Street bridge. The design of the new 13th Street bridge includes two piers as opposed to the existing bridge that has eight piers. After completion of the proposed project and restoration of the project site, the project will result in an estimated net gain of 0.18 acres of tidewater goby breeding habitat. The permanent loss of habitat resulting from the bridge replacement will be more than offset by the removal of the existing bridge and associated riprap. Therefore, we do not anticipate the proposed project will result in permanent reduction of tidewater goby habitat at the project site.

Impacts to tidewater goby habitat are expected to be largely restricted to the duration of construction of the new bridge and demolition of the existing bridge. During construction and demolition activities, which are anticipated to be 12 to 20 months over a two-year period, the area of the channel temporarily diverted would not be available for breeding or foraging habitat. After construction and demolition activities are complete, the area will once again receive river flow and will again function as habitat for tidewater goby. The Air Force would also remove non-native plant and wildlife species in the action area during project related activities, and continue to monitor and eradicate non-native invasive plant species following completion of the project. Given that habitat loss will be short-term in nature and the proposed project will result in a net increase in habitat quality and availability, we anticipate the effects to the tidewater goby of habitat loss will be temporary and minimal.

The project would provide additional benefits to the tidewater goby because the proposed wetland mitigation site would increase lateral marsh habitat in the estuary during prolonged

periods without breaching and high flow events. The increase in lateral marsh habitat would likely benefit the tidewater goby by increasing refugia and foraging habitat during these conditions; however, because the current ground elevations within the wetland mitigation site are a result of sediment accretion caused by river flow conditions influenced by the 35th Street bridge abutments and the Air Force is not proposing to remove the abutments, sedimentation will likely build up in the area again during future high flow events. Therefore, we do not anticipate the wetland mitigation project will provide long-term benefits to the tidewater goby and its habitat.

Accidental spills of hazardous materials, careless fueling or oiling of vehicles or equipment, or a frac-out within the river channel during horizontal directional drilling could degrade aquatic habitat or dispersal habitat to a degree where tidewater gobies are injured or killed. The Air Force proposes to implement several measures to minimize the potential of releasing contaminants into the channel. First, the Air Force would implement a frac-out contingency and Spill Prevention Plan containing measures to prevent the release of hazardous materials during project-related activities. Second, the Air Force would store hazardous materials and stage, repair, and maintain project equipment outside of the riparian corridor in pre-designated areas. Lastly, the Air Force would use secondary containment such as catch pans or protective mats to prevent contamination of the river bed. Given the measures proposed by the Air Force to minimize the risk of releasing contaminants into the channel, we anticipate that the potential for adverse effects to tidewater gobies from spills of hazardous materials would be minimized.

The use of herbicides to control exotic plant species during restoration efforts may adversely affect water quality at, or downstream of, the project site. Herbicides that drift into aquatic areas have to potential to harm tidewater gobies, their eggs, and their prey. The Air Force proposes to use a glyphosate-based herbicide approved for use in aquatic environments (e.g., Rodeo, etc.). Glyphosate is a systemic herbicide that will kill broadleaf and grass species by inhibiting the production of aromatic amino acids in plants and some microorganisms that are necessary to build proteins (Devine et al. 1993). Because many animals lack the amino acid synthesis pathway that glyphosate disrupts, it has low potential to cause toxicity in animals (Devine et al. 1993). No information is available regarding the toxicity of glyphosate products specifically to tidewater goby. Toxicity studies on bluegill sunfish (*Lepomis macrochirus*) and rainbow trout (*Oncorhynchus mykiss*) indicate that Aquamaster herbicide is practically non-toxic to these species (Monsanto 2005). Studies compiled by the Pesticide Action Network indicate that glyphosate ranges from not acutely toxic to moderately toxic depending on the species of fish (Kegley et al., 2010). Because the toxicity of glyphosate-containing products can vary significantly between species, and between specific products and mixes, a conservative assumption would be that glyphosate-containing products are moderately toxic to tidewater gobies. The actual glyphosate concentration that tidewater gobies would be exposed to is anticipated to be much less than the application concentration, due to dilution by estuary/lagoon waters and distance. We anticipate this diluted concentration will not result in toxic effects to tidewater gobies. Additionally, the Air Force proposes to restrict herbicide application within 15 feet of aquatic features and would not apply herbicides during the wet season or windy conditions to reduce potential adverse effects to tidewater goby. Therefore, we expect tidewater gobies would only potentially be exposed to glyphosate through overspray. Given the protective

measure proposed by the Air Force, we anticipate adverse effects resulting from herbicide application will be minimized and controlled.

Noise and vibration generated during the removal of utility structures, barrier rock wall, and the excavation for electric line installation, and construction worker foot traffic would likely disturb tidewater gobies beyond the dewatered area to some degree; however, these effects are temporary, lasting only for the duration of the construction activities. If tidewater gobies are driven from the vicinity of the work activities, we expect that they would return upon the completion of construction.

Lighting on the new bridge could have an indirect effect on tidewater gobies. Responses to artificial lighting vary greatly between species and between age classes of fishes (Rich and Longcore 2006). In general, artificial night lighting influences fish foraging and schooling behavior, spatial distribution, predation risk, migration and reproduction. Effects in these areas collectively influence community ecology of fishes and both their prey and predators across the affected aquatic landscape. Artificial lighting may affect foraging and schooling behavior of diurnal, crepuscular, and nocturnal fishes. Fish display large manipulability in these behaviors; some normally diurnal fish forage at night, and nocturnal fish occasionally may be active during the day.

Becker et al conducted nighttime surveys to test the effects of artificial light on fish abundance and behavior and found a clear difference in the abundance of fish observed between fish exposed to light and those that were not (Rich and Longcore 2006). The occurrence of large-bodied predators increased when the artificial lights were on; the amount of small shoaling fish also increased. Conditions created by artificial lighting may benefit piscivores by concentrating prey and enhancing foraging capabilities. However, this has the potential to create an unnatural top-down regulation of fish populations within estuarine and coastal waters. Becker et al concluded that artificial light has the potential to alter fish communities by creating optimal conditions for predators.

Although studies have not been conducted with tidewater gobies specifically, these studies indicate that artificial night light produced from the bridge may have adverse effects on tidewater gobies in the action area. The light produced by the bridge lights will not exceed 1.1 lux within 10 feet north or south of the bridge deck, which is comparable to natural light produced at dawn or dusk. The light levels reaching the water will be less than 1.1 lux since the water level will typically be 20 to 30 feet below the new bridge deck; however, the light levels reaching the water would be within the range of the brightness of a full moon (0.27 to 1.0 lux). Thus, the addition of artificial night light at the new bridge may influence foraging behavior, shoaling, predation risk, migration, and reproduction of tidewater goby individuals. Because the effects of night lighting will be restricted to a small portion of the action area and the light levels reaching the water would be within the natural ranges that tidewater gobies experience during lunar cycles, we anticipate the adverse effect of night lighting would be minimal.

Recovery of the Tidewater Goby

The goal of the tidewater goby recovery plan is to conserve and recover the tidewater goby throughout its range by managing threats and perpetuating viable metapopulations within each recovery unit while maintaining morphological and genetic adaptations to regional and local environmental conditions. We do not expect the replacement of the 13th Street bridge to substantially affect the conservation of tidewater gobies within the Conception Recovery Unit, in terms of the recovery strategy described in the recovery plan because:

1. The tidewater goby recovery plan emphasizes the importance of the conservation of population units rather than individual fish, and the effects of the replacement of the 13th Street bridge are not expected to cause population-level declines in Santa Ynez River; and

2. The replacement of the 13th Street bridge would not adversely affect the metapopulation dynamics between individual populations within the Conception Recovery Unit.

The proposed action could adversely affect tidewater goby adults, juveniles, and/or eggs that occur within Santa Ynez River through direct injury or mortality, increased sedimentation, contamination, and exposure to artificial night light. These effects will be minimized by the Air Force's implementation of the minimization measures described above, and are not anticipated to substantially affect the survival of the species in Santa Ynez River. Replacement of the 13th Street bridge is not anticipated to compromise the recovery of tidewater gobies.

California Red-legged Frog

California red-legged frogs could be inadvertently injured or killed by workers, construction equipment, or during the placement of riprap, barriers, and fill material. California red-legged frogs dispersing from areas adjacent to the action area are subject to mortality or injury from vehicle strikes and construction activities associated with the proposed project. California red-legged frogs that are not able to disperse from the action area may be crushed by worker foot traffic or the use of heavy equipment. Effects could range from crushing the leg of a California red-legged frog resulting in injury to completely running over or stepping on an individual rendering unrecognizable among excavated soil and vegetation. To minimize effects to this species, the Air Force would have a qualified biologist conduct a pre-construction survey and capture and relocate all California red-legged frogs to the nearest suitable habitat outside of the project area prior to the onset of construction activities. The qualified biologist would monitor project-related activities to minimize adverse effects on California red-legged frogs and their habitat. The Air Force's proposal to restrict work prior to the forecast and onset of significant rainfall events (0.5 inches within a 24 hour period) would further reduce adverse effects to breeding California red-legged frogs, typically laying their eggs during or shortly after large rainfall events. Given the Air Force's proposed protective measures, we anticipate these effects to California red-legged frog would be minimized and controlled.

Relocating California red-legged frogs out of harm's way may reduce injury or mortality from equipment, foot traffic, or ground disturbing activities; however, injury or mortality of individuals may occur as a result of improper handling, containment, or transport of individuals or from releasing them into unsuitable habitat (e.g., where exotic predators are present). Observations of diseased and parasite-infected amphibians are frequently reported. This has given rise to concerns that releasing amphibians following a period of captivity, during which time they can pick up infections of disease agents, may cause an increased risk of mortality in wild populations. Amphibian pathogens and parasites can also be carried between habitats on the hands, footwear, or equipment of fieldworkers, which can spread them to localities containing species which have had little or no prior contact with such pathogens or parasites. We anticipate the Air Force's proposal to use a Service-approved biologist and conduct an educational briefing for all project personnel prior to the start of work activities would reduce or eliminate the risk of improper handling, containment, or transport of California red-legged frogs.

Recent observations suggest that California red-legged frog exhibit strong site fidelity (AECOM 2011). The Air Force's proposal to have a biological monitor present on site to detect any California red-legged frogs attempting to return to the site after relocation and install silt-fencing around the perimeter of the project could minimize the effect of translocated individuals returning to the site. Furthermore, the translocation of individuals from the project area would likely reduce the level of mortality that otherwise would occur if California red-legged frogs were not removed.

Excavation and backfilling associated with the removal of vegetation, construction of access roads and staging areas, and placement of rock riprap may cause erosion that can lead to sedimentation that could smother California red-legged frogs or reduce the availability of plants and insects that serve as their habitat and food sources. The effects of sedimentation resulting from the proposed project would be minimized by the Air Force's proposal to install silt fencing around the perimeter of the work area, implement best management practices during project activities, and divert the active river channel around the work area to ensure flow is not impeded. We anticipate these measures will control and minimize erosion and sedimentation and the effects on California red-legged frogs.

The existing 13th Street bridge has contributed to increased scour at the site of the bridge. The existing bridge has concentrated flows into fixed paths between narrow abutments and intensified scour downstream. The new bridge will span 650 feet of channel, compared to 500 feet spanned by the existing bridge, and replace the existing eight piers with two hexagonal piers. As a result, the new bridge is expected to decrease downstream scour and sedimentation by allowing the river to meander through a broader, less constricted channel. We anticipate this decrease in sedimentation would be beneficial to the California red-legged frog and its habitat.

The proposed bridge replacement project will temporarily disturb California red-legged frog aquatic and upland habitat within the project area. Habitat disturbance at the wetland mitigation site would be restricted to upland habitat adjacent to the channel; there would be no temporary disturbance or removal of aquatic habitat at the wetland mitigation site. Temporary removal of,

or disturbance to, 3.19 acres of California red-legged frog aquatic feeding and breeding habitat within the project area would occur. Up to 61.11 acres of upland California red-legged frog habitat, potentially used for dispersal, foraging, and summer refugia, will be temporarily disturbed within the 13th Street bridge project area. An additional 19.19 acres of upland California red-legged frog habitat will be temporarily disturbed at the wetland mitigation site. The temporary loss of habitat has the potential to cause injury or death of California red-legged frog if they are forced into adjacent, less suitable habitat. After construction and demolition activities are complete, the areas within the 13th Street bridge project area will continue to function as California red-legged frog aquatic and upland habitat.

Permanent loss of aquatic habitat would be restricted to the area physically occupied by the new 13th Street bridge. The design of the new 13th Street bridge includes two piers as opposed to the existing bridge that has eight piers. After completion of the proposed project and restoration of the project site, the project will result in an estimated net gain of 0.18 acres of California red-legged frog breeding habitat. The permanent loss of habitat resulting from the bridge replacement will be more than offset by the removal of the existing bridge and associated riprap. Therefore, we do not anticipate the proposed project will result in permanent reduction of California red-legged frog habitat in the action area.

During the 2012-2013 California red-legged frog surveys, densities within the 13th Street bridge project area were relatively low compared to other riverine areas on Vandenberg Air Force Base. The low densities may be due to the relatively high presence of bullfrogs within the area resulting in high competitive pressure and potential predation from bullfrogs. The Air Force's proposal to eradicate non-native species in the action area would further benefit California red-legged frogs in the area by reducing potential predators.

Impacts to California red-legged frog habitat are expected to be largely restricted to the duration of construction of the new bridge, demolition of the existing bridge, and activities associated with the wetland mitigation project. During construction and demolition activities, which are anticipated to be 12 to 20 months over a two year period, the area of the channel temporarily diverted would not be available for breeding or foraging habitat. The Air Force proposes to remove non-native plant and wildlife species in the action area during project-related activities, and continue to monitor and eradicate non-native invasive plant species following completion of the project. Given that habitat loss will be short-term in nature and the proposed project will result in a net increase in habitat quality and availability, we anticipate the effects of habitat loss to be temporary and minimal.

Accidental spills of hazardous materials, careless fueling or oiling of vehicles or equipment, or a frac-out within the river channel during horizontal directional drilling could degrade aquatic habitat or dispersal habitat to a degree where California red-legged frogs are injured or killed. The Air Force proposes to implement several measures to minimize the potential of releasing contaminants into the channel. First, the Air Force would implement a frac-out contingency and Spill Prevention Plan containing measures to prevent the release of hazardous materials during project-related activities. Second, the Air Force would store hazardous materials and stage,

repair, and maintain project equipment outside of the riparian corridor in pre-designated areas. Lastly, the Air Force would use secondary containment such as catch pans or protective mats to prevent contamination of the river bed. Given the measures proposed by the Air Force to minimize the risk of releasing contaminants into the channel, we anticipate adverse effects to California red-legged frog would be minimal.

Glyphosate is the active ingredient in a variety of herbicides including Roundup, Rodeo, Aquamaster, Buccaneer, Glyfos, Honcho, Touchdown, Vision, Duramax, Rattler, and others. Glyphosate is a systemic herbicide that will kill broadleaf and grass species by inhibiting the production of aromatic amino acids in plants and some microorganisms that are necessary to build proteins (Devine et al. 1993). Because many animals lack the amino acid synthesis pathway that glyphosate disrupts, it is considered to have low potential to cause toxicity in animals (Devine et al. 1993). Most glyphosate products are formulated to contain surfactants that allow the active ingredients to spread over and penetrate the plant cuticles. Surfactants can be the most toxic portion of a pesticide product. The surfactant associated with many glyphosate products is a polyethoxylated tallowamine (POEA) surfactant.

California red-legged frog eggs, tadpoles, juveniles and adults can be exposed to glyphosate products and POEA surfactants in aquatic habitats through direct overspray of wetlands, drift from treated areas, or contaminated runoff from treated areas. The half-life of glyphosate in pond water ranges between 12 days and 10 weeks (Extoxnet 1996). Additionally, juvenile and adult California red-legged frogs can be exposed in terrestrial habitats that have been treated. Glyphosate and POEA readily sorbs to soil particles and can be degraded by microbes in 7 to 70 days depending on soil conditions (Giesy et al. 2000).

No information is available regarding the toxicity of glyphosate products specifically to California red-legged frogs. Studies exploring the lethal and sublethal effects of glyphosate products on other amphibians, including ranids, are available but are largely focused on aquatic stages of the species and formulations of glyphosate that include surfactants. Roundup Original Max, a glyphosate product with POEA surfactant, was demonstrated to be moderately to highly toxic to nine species of frog and toad tadpoles including five Ranidae species: wood frog (*Rana sylvatica*), leopard frog (*Rana pipiens*), Cascades frog (*Rana cascadae*), green frog (*Rana clamitans*), and American bullfrog (*Rana catesbeiana*) (Relyea and Jones 2009). The mortality of tadpoles is hypothesized to be caused by the lysis (i.e. destruction) of gill cells from exposure to surfactants (Lajmanovich et al. 2003, Edington et al. 2004) indicating that the life stage during which frogs and toads have gills may be particularly vulnerable. Glyphosate products containing POEA surfactants have also been shown to have sub-lethal effects to amphibians including decreased size, increased time to metamorphosis, tail malformations, and gonadal abnormalities (Govindarajulu 2008, Howe et al. 2004).

Several studies suggest that the toxicity of glyphosate products is linked with the surfactant, and not the glyphosate. Howe et al. (2004) compared the toxicity of glyphosate alone, to glyphosate with POEA surfactant, and POEA alone, on green frogs. Results indicated that the toxicity of glyphosate with POEA surfactant was similar to the POEA surfactant alone, which was much

greater than glyphosate alone, indicating that the POEA was responsible for the toxic effects. In a comprehensive review of studies involving the effects of glyphosate on amphibians Govindarajulu (2008) concluded that the toxic effect of glyphosate products containing POEA are due to the POEA rather than the active glyphosate ingredient.

These studies indicate that glyphosate products formulated with POEA surfactants will likely kill or injure California red-legged frogs in aquatic habitats, with tadpoles being particularly vulnerable. Because glyphosate and POEA readily bind to soil and sediments, these chemicals may be less available to California red-legged frogs on land; however, research is needed to determine toxicity mechanisms and thresholds from terrestrial exposure. The Air Force proposes to use a glyphosate formulation that does not contain a surfactant. Herbicides would not be applied during the wet season or windy conditions to reduce potential adverse effects to California red-legged frogs. Given these protective measures, we anticipate the adverse effects of herbicide application would be minimized and controlled.

Noise and vibration generated during the removal of utility structures, the barrier rock wall, the excavation for electric line installation, and construction worker foot traffic may cause California red-legged frogs to temporarily abandon habitat adjacent to work areas. Such disturbance may increase the potential for predation and desiccation when California red-legged frogs leave shelter sites; however, these effects would be temporary, lasting only for the duration of the construction activities. If California red-legged frogs are driven from the vicinity of the work activities, we expect that they would return upon the completion of construction or find other suitable refuge nearby.

Because many amphibians are nocturnally active or have biological rhythms regulated by light, light pollution may have significant adverse effects on them. Frogs are nocturnally active, such that reproduction and activity primarily occur during dark periods. Wise (2007) reviewed studies examining the impacts of light pollution on frogs and found that artificial night lighting has the potential to affect foraging and breeding as well as growth and development of frogs. Light pollution increases ambient illumination, disrupts photoperiod, and changes spectral properties of night light that may affect the physiology, behavior, ecology, and evolution of frog populations.

Baker and Richardson (in Wise 2007) examined the reproductive behavior (calling) and movement activity of male green frogs (*Rana clamitans melanota*), that were exposed to artificial light on moonlit nights (higher natural ambient illumination) or darker nights (lower natural ambient illumination). Baker and Richardson found a reduction in number of calls and an increase in movements by males in the artificially lighted treatment compared to the control treatment, regardless of the natural ambient illumination (moonlight or no moonlight). A reduction in the number of calls by males may affect selection of mates by females (Wise 2007). If such an effect is long-term and widespread, exposing frogs to artificial night lighting may result in changes in population dynamics.

Baker (in Wise 2007) examined the impact of artificial night lighting on distributions of common European toads. During a mass emigration event, Baker counted the number of young toads

aggregating in lighted areas under street lamps and in darker control areas between these lamps. He found more toads under lighted areas than in unlit areas. Baker hypothesized that toads aggregated under street lamps because of the increased insect abundance (prey for toads) found there. While these animals may benefit from increased prey in the lit areas, aggregation may increase the risk of predation as increased illumination may allow predators to see frogs that may not normally be visible to them resulting in increased mortality.

In a recent study, a variety of nocturnal illuminations were used to measure the effect of light at night on growth and metamorphosis in tadpoles (Wise 2007). Tadpoles were exposed to varying nocturnal illuminations of 0.0001 lx (comparable to a very dark night), 0.01 lx (comparable to bright moonlight), 1 lx (comparable to dawn or dusk), and 100 lx (comparable to bright room lighting). Results showed that the tadpoles differed in amount of growth in the different nocturnal light treatments; at the end of the experiment, a greater proportion of frogs in the darkest lighting treatment metamorphosed than in the other lighting treatments. Even small amounts of light at night (comparable to bright moonlight, or artificial lights from anthropogenic sources) may delay metamorphosis.

Although studies have not been conducted with California red-legged frog specifically, these studies indicate that artificial night light produced from the bridge may have adverse effects on California red-legged frogs in the action area. The light produced by the bridge lights will not exceed 1.1 lux within 10 feet north or south of the bridge deck, which is comparable to natural light produced at dawn or dusk. The light levels reaching the water will be less than 1.1 lux since the water level will typically be 20 to 30 feet below the new bridge deck; however, the light levels reaching the water would be within the range of the brightness of a full moon (0.27 to 1.0 lux). Thus, the addition of artificial night light at the new bridge may result in behavioral modification, predation, loss of suitable habitat and decreased fitness of California red-legged frog individuals. Because the effects of night lighting will be restricted to a small portion of the action area and the light levels reaching the water would be within the natural ranges California red-legged frog experience during lunar cycles, we anticipate the adverse effects of night lighting would be minimized and controlled.

Recovery of the California Red-legged Frog

Because the action area is within a recovery unit with "high recovery status," the proposed bridge replacement is not likely to reduce the potential contribution of the action area to the conservation of the California red-legged frog. In other words, the populations of California red-legged frog in the recovery unit are considered plentiful and many of those are of high quality. Overall, the effects to the species and its habitat would be relatively minor and temporary. Additionally, the proposed bridge replacement project will increase the quality and quantity of available California red-legged frog habitat in the action area; therefore, we anticipate that the proposed project will not diminish the species' ability to recover.

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 consultation pursuant to section 7 of the Act. Because the entire Vandenberg Air Force Base is a Federal installation, we are not aware of any non-Federal actions that are reasonably certain to occur in the action area.

CONCLUSION

In determining whether a proposed action is likely to jeopardize the continued existence of a species, we consider the effects of the action with respect to the reproduction, numbers, and distribution of the species. In that context, the following paragraphs summarize the effects of the proposed bridge replacement project on the tidewater goby and the California red-legged frog.

Tidewater Goby

Reproduction

Replacement of the 13th Street bridge would temporarily reduce the amount of available tidewater goby breeding habitat. Such disruptions could potentially affect a proportion of breeding tidewater gobies at Vandenberg Air Force Base. The proposed activities would not cause permanent loss of breeding habitat, and the amount of habitat that would be temporarily affected is a small portion of the species breeding habitat rangewide. In addition, the Air Force would use a Service-approved biologist to survey for and relocate all tidewater gobies out of areas to be dewatered. The relocation sites would be selected within the Santa Ynez River watershed, which supports the necessary environmental conditions for tidewater goby survival. We expect these measures to greatly minimize disturbances to breeding activity. Therefore, we expect few breeding tidewater gobies would be affected by bridge replacement activities and these activities would not appreciably reduce tidewater goby reproduction in the action area or rangewide.

Number

We are unable to determine the precise number of tidewater gobies that could occur in the action area and may be affected by the bridge replacement activities because the numbers of individuals in the action area vary between breeding and non-breeding season, and from year to year. The proposed activities could directly and indirectly affect individual tidewater gobies to the point of injury or death, although we expect injury or mortality to be minimal. We expect all individuals within the action area during bridge replacement activities will be displaced. The Air Force will implement measures to avoid or minimize the likelihood of adverse effects to the species. The number of tidewater gobies we expect to be affected by the proposed activities is very small relative to those present in the Santa Ynez river estuary as a whole. The tidewater goby is an

annual species and thus has the capacity to produce many offspring, enough to replace entire populations each year. This strategy has evolved to compensate for high juvenile mortality due to predation, changing environmental conditions, and their short (typically 1-year) lifespan. This means that minor impacts, like those we anticipate for the subject project, will be masked within the next breeding cycle. Therefore, we do not expect the proposed bridge replacement project to appreciably reduce the number of tidewater gobies rangewide.

Distribution

The proposed bridge replacement project could temporarily displace tidewater gobies from portions of the action area and could cause injury or mortality; however, the Air Force would implement measures to minimize the risk of adverse effects on tidewater gobies. Effects of the project would be temporary as the channel would once again receive water and function as tidewater goby habitat following completion of the project. Furthermore, the project would result in an estimated net gain of 0.18 acres of available tidewater goby habitat. The proposed project would affect a small proportion of the habitat available on Vandenberg Air Force Base and to a lesser degree the geographic range of the tidewater goby. Therefore, we do not expect the effects of the 13th Street bridge replacement project to appreciably reduce the distribution of the tidewater goby.

After reviewing the current status of the tidewater goby, the environmental baseline for the action area, the effects of the proposed bridge replacement project at Vandenberg Air Force Base, and the cumulative effects, it is the Service's biological opinion that the Air Force's proposal to replace the 13th Street bridge at Vandenberg Air Force Base is not likely to jeopardize the continued existence of the tidewater goby. We have determined that the reproduction, numbers, and distribution of the species would not be diminished, and that the proposed project would not interfere with the recovery of the tidewater goby as envisioned in the recovery plan due to the size of the affected area and the measures the Air Force proposes to avoid and minimize the potential effects.

California Red-legged Frog

Reproduction

Replacement of the 13th Street bridge would temporarily reduce the amount of available California red-legged frog breeding habitat. Such disruptions could potentially affect a portion of breeding California red-legged frogs at Vandenberg Air Force Base. The proposed activities would not cause permanent loss of breeding habitat, and the amount of habitat that would be temporarily affected is a small percentage of California red-legged frog breeding habitat rangewide. The Air Force would use a Service-approved biologist to survey for and relocate all California red-legged frogs to the nearest suitable habitat outside of the project area prior to the onset of construction activities. In addition, the Air Force's proposal to restrict work within the river channel prior to the forecast and onset of significant rainfall events (0.5 inches within a 24 hour period) would further reduce adverse effects to breeding California red-legged frogs,

typically laying their eggs during or shortly after large rainfall events. We expect these measures to greatly minimize disturbances to breeding activity. Therefore, we expect few breeding California red-legged frogs would be affected by bridge replacement activities and these activities would not appreciably reduce California red-legged frog reproduction in the action area or rangewide.

Number

We are unable to determine the precise number of California red-legged frogs that could occur in the action area and may be affected by the bridge replacement activities because the numbers of individuals in the action area vary from year to year. The proposed activities could directly and indirectly affect individual California red-legged frogs to the point of injury or death, although we expect injury or mortality to be minimal. We expect all individuals left within the action area following capture and relocation efforts will be displaced during bridge replacement activities. The Air Force will implement other measures to avoid or minimize the likelihood of adverse effects to the species. The number of California red-legged frogs we expect to be affected by the proposed activities is very small relative to those in the entirety of the species' range. Therefore, we do not expect the proposed bridge replacement project to appreciably reduce the number of California red-legged frogs rangewide.

Distribution

The proposed bridge replacement project could temporarily displace California red-legged frogs from portions of the action area and could cause injury or mortality; however, the Air Force would implement measures to minimize the risk of adverse effects on California red-legged frogs. Effects of the project would be temporary as the channel and upland area would function as California red-legged frog habitat following completion of the project. The proposed project would affect a small proportion of the habitat available on Vandenberg Air Force Base and to a lesser degree the geographic range of the California red-legged frog. Therefore, we do not expect the effects of the 13th Street bridge replacement project to appreciably reduce the distribution of the California red-legged frog.

After reviewing the current status of the California red-legged frog, the environmental baseline for the action area, the effects of the proposed bridge replacement project at Vandenberg Air Force Base, the reinitiation request, and the cumulative effects, it is the Service's biological opinion that the Air Force's proposal to replace the 13th Street bridge at Vandenberg Air Force Base, is not likely to jeopardize the continued existence of the California red-legged frog. We have determined that the reproduction, numbers, and distribution of the species would not be diminished, and that the proposed project would not interfere with the recovery of the California red-legged frog as envisioned in the recovery plan due to the size of the affected area and the measures the Air Force proposes to avoid and minimize the potential effects.

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 wildlife 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. Harm is further defined by the Service to include significant habitat modification or degradation that results in death or injury to listed wildlife by significantly impairing essential behavioral patterns, including breeding, feeding, or sheltering. Harass is defined by the Service 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 behavioral patterns which include, but are not limited to, 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 the Air Force so that they become binding conditions for the exemption in section 7(o)(2) to apply. The Air Force has a continuing duty to regulate the activity covered by this incidental take statement. If the Air Force fails to assume and implement the terms and conditions, the protective coverage of section 7(o)(2) may lapse. In order to monitor the impact of incidental take, the Air Force 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)]

Tidewater Goby

We anticipate that tidewater gobies could be subject to take in the form of harm, wounding, killing, and capture. Dewatering and diverting the channel could significantly modify tidewater goby habitat. Such an alteration could cause harm by affecting individual gobies to the point of injury or mortality by significantly impairing behavioral patterns such as breeding, feeding, or sheltering. In addition, we expect that some tidewater gobies will be killed or injured by the proposed bridge replacement activities (i.e., crushed by heavy equipment, ground disturbance, etc.). We also conclude that tidewater gobies within the areas where ground disturbance will occur will be killed or injured by the bridge replacement activities because some are likely to not be captured during relocation efforts. Lastly, we anticipate that all tidewater gobies encountered in the project area will be taken when they are captured and relocated, and that a subset of the individuals captured may be killed or injured due to mishandling or stress.

We cannot quantify the precise numbers of tidewater gobies that may be captured, killed, or injured as a result of the actions that the Air Force has proposed because tidewater gobies move over time; for example, animals may have entered or departed the action area since the time of pre-construction surveys. Other individuals may not be detected due to their cryptic nature, small size, and low mobility. The protective measures proposed by Air Force are likely to

prevent mortality or injury of most individuals. In addition, finding every dead or injured tidewater goby is unlikely because of their small size and cryptic nature.

Consequently, we are unable to reasonably anticipate the actual number of tidewater gobies that would be taken by the proposed project. The quantification of take is difficult because of the species' small size and life history characteristics. The numbers and locations of tidewater gobies within suitable habitat in the action area may vary from day to day or month to month. Despite our inability to anticipate a precise number of tidewater gobies that would be killed or injured during project activities, we anticipate that few tidewater gobies are likely to be killed or injured during this project because the Air Force will implement measures to minimize adverse effects to the tidewater goby and its habitat. However, we must determine a reasonable number for the purpose of establishing a limit beyond which formal consultation must be reinitiated. We recognize that for every tidewater goby found dead or injured, other individuals of this species may have been injured or killed and not detected.

The considerations we used in arriving at the reinitiation trigger include: (1) tidewater goby populations fluctuate greatly in number of individuals; (2) dead or injured individuals are difficult to detect; (3) some tidewater gobies may be killed or injured by equipment, foot traffic, and dewatering activities; (4) because the number of tidewater gobies in a population may be high, many individuals could be taken without a substantial effect on the population; (5) minimization measures implemented by the Air Force will be effective at minimizing adverse effects to tidewater gobies; and (6) the level of take we anticipate must be consistent with a non-jeopardy determination, in that it cannot appreciably reduce the numbers, reproduction, or distribution of the species. Therefore, based upon the proposed project activities, and the number of tidewater gobies observed in the action area, and the uncertainty of how many tidewater gobies would be present and captured and relocated, we have determined that take in the form of injury or mortality by the relocation activities should be less than 10 percent of the total tidewater gobies captured at the project site (assuming a large number of tidewater gobies are captured). We assume that relocated individuals would normally survive, and injury or mortality is the result of unpredictable circumstances or mishandling. If less than 100 tidewater gobies are capture and 10 or more individuals are found dead, the Air Force must contact our office immediately to reinitiate formal consultation. If 100 or more tidewater gobies are captured and10 percent or more are found dead or injured as a result of capture, the Air Force must contact our office immediately to reinitiate formal consultation. In addition, the Air Force should cease conducting actions resulting in take until the formal consultation reinitiation process is concluded. These take levels are consistent with our analysis of the effects of the action and our non-jeopardy conclusion.

We anticipate that some take will occur as a result of dewatering. The actual number of tidewater gobies that may be taken cannot be accurately predicted because of their small size and varying abundance in a given location. Because we are unable to reasonably anticipate the actual number of tidewater gobies that would be taken by the dewatering activities, we are limiting take during dewatering activities to 40 dead or injured tidewater gobies. If 40 tidewater gobies are found dead or injured then the Air Force must contact our office immediately so we can review

the project activities to determine if additional protective measures are needed. Project activities may continue during this review period, provided that all protective measures proposed by the Air Force have been, and continue to be, implemented.

This biological opinion provides an exemption from the prohibition against the taking of listed species, contained in section 9 of the Act, only for the activities described in the Description of the Proposed Action section of this biological opinion. Tidewater gobies may be taken only within the boundaries of the action area as defined in the Environmental Baseline section of this biological opinion.

California Red-legged Frog

We expect that some California red-legged frogs will be killed or wounded by the bridge replacement activities (i.e., crushed by heavy equipment, ground disturbance, etc.). We also conclude that California red-legged frogs within the areas where ground disturbance will occur will be killed or wounded by the bridge replacement activities because they are not likely to be detected during surveys. Lastly, we anticipate that all California red-legged frogs detected will be taken when they are captured and relocated, and that a subset of the individuals captured may be killed or injured due to mishandling or stress.

We cannot quantify the precise numbers of California red-legged frogs that may be captured, killed, or wounded as a result of the actions that Air Force has proposed because California red-legged frogs move over time; for example, animals may have entered or departed the action area since the time of pre-construction surveys. Other individuals may not be detected due to their cryptic nature, small size, and low mobility. The protective measures proposed by Air Force are likely to prevent mortality or injury of most individuals. In addition, finding a dead or injured California red-legged frog is unlikely because of their small size and cryptic nature.

Consequently, we are unable to reasonably anticipate the actual number of California red-legged frogs that would be taken by the proposed project; however, we must provide a number at which formal consultation would have to be reinitiated. The Environmental Baseline and Effects Analysis sections of this biological opinion indicate that adverse effects to California red-legged frogs would likely be low given the nature of the proposed activities and the low number of California red-legged frogs found in the action area during surveys. We therefore anticipate that take of California red-legged frogs would also be low. We also recognize that for every California red-legged frog found dead or injured, other individuals may be killed or injured that are not detected, so when we determine an appropriate take limit we are anticipating that the actual take would be higher and we set the number at a low level.

Similarly, for estimating the number of California red-legged frogs that would be taken by capture, we cannot predict how many may be encountered for reasons stated earlier. Also, the population size fluctuates throughout the year between breeding and non-breading seasons. While the benefits of relocation (i.e., minimizing mortality) outweigh the risk of capture, we must provide a limit for take by capture at which consultation would be reinitiated.

Therefore, if 2 adult, subadult, or juvenile California red-legged frogs are found dead or injured or if 20 are captured and relocated, the Air Force must contact our office immediately to reinitiate formal consultation. Project activities that are likely to cause additional take should cease during this review period because the exemption provided under section 7(o)(2) would lapse and any additional take would not be exempt from the section 9 prohibitions.

REASONABLE AND PRUDENT MEASURES/TERMS AND CONDITIONS

The Service's evaluation of the effects of the proposed action includes consideration of the measures developed by the Air Force, and repeated in the Description of the Proposed Action portion of this biological opinion, to minimize the adverse effects of the proposed action on the tidewater goby and California red-legged frog. The Service believes these measures are adequate and appropriate to minimize the impacts of the incidental take of tidewater goby and California red-legged frog. Therefore, we are not including any reasonable and prudent measures and terms and conditions in this incidental take statement. Any subsequent changes in the minimization measures proposed by the Air Force may constitute a modification of the proposed action and may warrant reinitiation of formal consultation, as specified at 50 CFR 402.16.

REPORTING REQUIREMENTS

For each year this biological opinion is in effect, the Air Force must provide a written annual report describing project activities during the previous year to the Service by January 31st. The reports must contain information on: (1) the type of activities that occurred in the action area (e.g., construction activities, monitoring, etc.); (2) the location of these activities; (3) a description of the habitat in which these activities occurred; (4) the number of listed species affected and the manner in which they were affected; (5) steps taken to avoid or minimize effects; (6) the results of any surveys conducted for tidewater goby and California red-legged frog in the previous year; (7) a record of observations of any other listed species observed during project activities; and (8) any other pertinent information. The first report will be due January 31st following the first project activities conducted pursuant to this biological opinion.

DISPOSITION OF DEAD OR INJURED SPECIMENS

Within 3 working days of locating a dead or injured tidewater goby or California red-legged frog, the Air Force must make initial notification by telephone and writing to the Ventura Fish and Wildlife Office in Ventura, California, (2493 Portola Road, Suite B, Ventura, California 93003, (805) 644-1766). The report must include the time and date, location of the carcass, a photograph, cause of death if known, and any other pertinent information.

Care must be taken in handling dead specimens to preserve biological material in the best possible state for later analysis. If any injured tidewater gobies or California red-legged frogs survive, the Air Force should contact us regarding their final disposition.

Any remains of dead tidewater gobies or California red-legged frogs must be placed with educational or research institutions holding the appropriate State and Federal permits, such as the Santa Barbara Natural History Museum (Contact: Paul Collins, Santa Barbara Natural History Museum, Vertebrate Zoology Department, 2559 Puesta Del Sol, Santa Barbara, California 93460, (805) 682-4711, extension 321).

CONSERVATION RECOMMENDATIONS

Section 7(a)(1) of the Act directs Federal agencies to use 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 Air Force should remove all or part of the existing 35th Street bridge abutments to provide long-term benefits to the tidewater goby, the California red-legged frog, many other species, and their respective habitats. The remnants of the bridge have altered the natural hydrological conditions within the river floodplain such that it has led to severe erosion on the north river bank, restriction, channelization and incision of the mainstem channel, and overall degradation of native habitat in the floodplain. While grading the area to an elevation of approximately 3.15 meters would increase lateral marsh habitat in the estuary during prolonged periods without breaching and high flow events, the Air Force acknowledged in the biological assessment that sediment may build up in the wetland mitigation site during future high flow events because these abutments will remain in place. The Service understands the Air Force is concerned about increasing the bird/animal aircraft strike hazard (BASH) in the area because it is approximately 2.2 miles from the airfield; however, according to the BASH evaluation of the proposed mitigation project (Air Force 2012), the area currently attracts shorebirds, water birds, and other avian species that pose a risk to BASH. Enhancement of riparian habitat would attract passerines and other smaller avian species that tend to stay in the riparian zone, making short low elevation flights from tree to tree. Enhancing or expanding riparian habitat in the area would increase habitat for passerines which could be beneficial to the BASH program because it would reduce habitat for shorebirds. Overall, removal of all or portions of the 35th Street bridge abutments would be a large step towards restoring the habitats essential for the tidewater goby, California red-legged frog, and many other species.

REINITIATION NOTICE

This concludes formal consultation on the effects of the 13th Street bridge replacement project at Vandenberg Air Force Base. As provided in 50 CFR §402.16, reinitiation of formal consultation is required where discretionary Federal agency involvement or control over the action has been retained (or is authorized by law) and if: (1) the amount or extent of incidental take is exceeded; (2) new information reveals effects of the agency action that may affect listed species in a

manner or to an extent not considered in this opinion; (3) the agency action is subsequently modified in a manner that causes an effect to the listed species or critical habitat not considered in this opinion; or (4) a new species is listed or critical habitat designated that may be affected by the action. In instances where the amount or extent of incidental take is exceeded, the exemption issued pursuant to section 7(o)(2) will have lapsed and any further take would be a violation of section 4(d) or 9(a)(1)(B). Consequently, we recommend that any operations causing such take cease pending reinitiation.

If you have any questions regarding this consultation, please contact Rachel Henry of our staff at (805) 644-1766, extension 333.

Sincerely,

Stephen P. Henry
Field Supervisory

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APPENDIX E: NMFS Consultation

DEPARTMENT OF THE AIR FORCE
30TH SPACE WING (AFSPC)

JUN 20 2014

Beatrice L. Kephart
30 CES/CEI
1028 Iceland Avenue
Vandenberg AFB CA 93437-6010

Mr. Will Stelle
National Marine Fisheries Service – West Coast Region
510 West Ocean Blvd, Suite 4200
Long Beach CA 90802

Dear Mr. Stelle

In accordance with section 7 of the Endangered Species Act of 1973, Vandenberg Air Force Base (VAFB) requests formal consultation for a project to replace a mission-essential vehicle bridge over the Santa Ynez River at 13th Street. A new bridge will be built approximately 75 feet west of the existing bridge, and once the new bridge is complete, demolition of the existing bridge will commence. We are especially pleased to mention that, due to advances in bridge design, our new bridge will require only two piers within the riverbed as compared to the current eight. We request "take" as a result of our determination that this project "may affect and is likely to adversely affect" the Southern California Evolutionarily Significant Unit of Southern Steelhead (*Oncorhynchus mykiss*), although extensive avoidance and monitoring measures will minimize disturbance to these species.

Enclosed is our biological assessment with the project description and effects of project activities. We would appreciate the opportunity to review the draft Biological Opinion for this project before your office finalizes it. Additionally, due to the critical timeline which we have developed for this project, we request formal notification that all necessary materials and information have been received in support of a 135-day consultation.

We are also initiating a consultation on this mission-critical project with the United States Fish and Wildlife Service (USFWS), with a separate Biological Assessment determining "may affect, and likely to adversely affect" Tidewater goby (*Eucyclogobius newberryi*) and California red-legged frog (*Rana draytonii*). We also considered potential effects to six other threatened and endangered species managed by the USFWS.

Thank you for your assistance. Please contact me at (805) 605-7924 or Rhys Evans at (805) 606-4198 if you have any questions.

Sincerely

BEATRICE L. KEPHART
Chief, Installation Management Flight

Attachment:
Biological Assessment

UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
West Coast Region
1655 Heindon Road
Arcata, California 95521-4573

DEC 30 2014

Refer to NMFS No: ***WCR-2014-1093***

Ms. Beatrice Kephart
30 CES/CEI
1028 Iceland Ave.
Vandenberg AFB, California 93437-6010

Re: Endangered Species Act Section 7(a)(2) Biological Opinion for the 13th Street Bridge Replacement Project on Vandenberg Air Force Base near Lompoc, California (Santa Barbara County).

Dear Ms. Kephart:

Thank you for your June 20, 2014, letter requesting initiation of formal consultation with NOAA's National Marine Fisheries Service (NMFS) pursuant to Section 7 of the U.S. Endangered Species Act (ESA). This consultation concerns the demolition and replacement of the 13th Street Bridge and installation of a fiber-optic line where the bridge crosses the Santa Ynez River on Vandenberg Air Force Base (VAFB).

As requested by VAFB, NMFS issued a draft biological opinion for the subject proposed action for the base's review and comment on December 15, 2014. VAFB provided comments on the draft biological opinion to NMFS on December 18, 2014. NMFS worked with VAFB staff to address those comments and issue the final biological opinion which is enclosed with this letter.

This biological opinion addresses the effects of the proposed action on the federally endangered Southern California (SC) Distinct Population Segment (DPS) of steelhead (*Oncorhynchus mykiss*) in accordance with section (7)(a)(2) of the ESA. The action area is entirely on VAFB property where critical habitat for endangered steelhead is not currently designated.

The biological opinion concludes the proposed action is not likely to jeopardize the continued existence of the endangered SC DPS of steelhead. Because NMFS determined the proposed action is likely to result in incidental take of steelhead, an incidental take statement is included with the biological opinion. The incidental take statement includes the amount and extent of anticipated incidental take as well as reasonable and prudent measures and non-discretionary terms and conditions that NMFS has determined are necessary to minimize and monitor incidental take of steelhead.

Please contact Matt McGoogan at NMFS' Southern California Branch in Long Beach, 562-980-4026 or at matthew.mcgoogan@noaa.gov, if you have a question concerning this Section 7 consultation, or if you require additional information.

Sincerely,

for Jon Lagomarsino

William W. Stelle, Jr.
Regional Administrator

Enclosure

cc: Administrative File No. 151422WCR2014CC00158
Mary Larson, California Department of Fish and Wildlife, Los Alamitos
Roger Root, U.S. Fish and Wildlife Service, Ventura

Endangered Species Act (ESA) Section 7(a)(2) Biological Opinion

13th Street Bridge Replacement Project

NMFS Consultation Number: WCR-2014-1093

Action Agency: Department of the Air Force

Affected Species and NMFS' Determinations:

ESA-Listed Species	Status	Is Action Likely to Adversely Affect the Species?	Is Action Likely To Jeopardize the Species?
Southern California steelhead (*Oncorhynchus mykiss*)	Endangered	Yes	No

Consultation Conducted By: National Marine Fisheries Service, West Coast Region

Issued By:

William W. Stelle, Jr.
Regional Administrator

Date: DEC 30 2014

1. INTRODUCTION

This introductory section provides information relevant to the other sections of this document and is incorporated by reference into Sections 2 and 3 below.

1.1 Background

NOAA's National Marine Fisheries Service (NMFS) prepared the biological opinion (opinion) and incidental take statement portions of this document in accordance with section 7(b) of the Endangered Species Act (ESA) of 1973 (16 USC 1531 et seq.), and implementing regulations at 50 CFR 402.

A pre-dissemination review of this document was completed using standards for utility, integrity, and objectivity in compliance with applicable guidelines issued under the Data Quality Act (section 515 of the Treasury and General Government Appropriations Act for Fiscal Year 2001, Public Law 106-554). The document will be available through NMFS' Public Consultation Tracking System [https://pcts.nmfs.noaa.gov/pcts-web/homepage.pcts]. A complete record of this consultation is on file at NMFS' California Coastal Area Office, Southern California Branch in Long Beach, California.

1.2 Consultation History

The proposed action involves the demolition and replacement of the 13th Street Bridge and installation of a fiber-optic line where the bridge crosses the Santa Ynez River on Vandenberg Air Force Base (VAFB) near Lompoc, California (Santa Barbara County). During an annual review meeting for VAFB's Integrated Natural Resources Management Plan on December 17, 2012, VAFB staff first notified NMFS of their intent to initiate formal consultation for the proposed action. A field trip after the meeting included a brief visit to the proposed project site. On June 24, 2014, NMFS received a written request for formal consultation from VAFB for the proposed action. The proposed action is of concern because federally endangered Southern California (SC) Distinct Population Segment (DPS) of steelhead (*Oncorhynchus mykiss*) have the potential to be present in the Santa Ynez River within the action area. Because aspects of the proposed action may cause short-term adverse effects to steelhead, VAFB requested formal consultation with NMFS. The action area is entirely on VAFB property where critical habitat for endangered steelhead is not currently designated. The consultation package received by NMFS on June 24, 2014, met the requirements for initiating formal consultation as defined in 50 CFR §402.14; therefore, formal consultation was initiated on the same day. Modifications to the proposed action that resulted from incrementally developing the design plans were electronically submitted to NMFS on November 10, 2014, which NMFS considers in this biological opinion. As requested by VAFB, NMFS provided the base with a signed draft biological opinion on December 15, 2014, for comment and review. VAFB provided comments on the draft biological opinion to NMFS on December 18, 2014. NMFS worked with VAFB staff to address those comments and issue this final biological opinion.

1.3 Proposed Action

"Action" means all activities or programs of any kind authorized, funded, or carried out, in whole or in part, by Federal agencies (50 CFR §402.02).

The Federal action is VAFB's funding and carrying out the demolition and replacement of the 13th Street Bridge and installation of a fiber-optic line where the bridge crosses the Santa Ynez River on VAFB near Lompoc, California (Santa Barbara County).

1.3.1 Overview of Proposed Action

The existing 13th Street Bridge was constructed in 1970. The bridge provides the only on-base ground transportation route between the north and south portions of VAFB and is critical for several VAFB programs. The bridge and support pilings have degraded over the years and the bridge has been assessed as unsafe and at risk for failure. The main components of the proposed action involve: (1) construction of a new bridge and road approaches approximately 75-feet downstream of the existing bridge, (2) deconstruction of the existing bridge and road approaches, (3) installation of a fiber-optic line under the Santa Ynez River approximately 1100-feet downstream of the existing bridge, (4) potential restoration of a wetlands section in the Santa Ynez River estuary approximately 2.5-miles downstream of the existing bridge, (5) minimization measures related to each of these components, and (6) restoration of disturbed areas associated with proposed action. The proposed action is anticipated to begin in late spring or early summer and last up to 20 months.

1.3.2 Construction of the New Bridge

Construction of the new 13th Street Bridge will be completed prior to demolition of the existing bridge. Prior to engaging in construction activities in the river channel (*i.e.*, any grading, placement of streambank protection, piling construction, etc.), the instream work area for the new bridge will be dewatered. As result, dewatering of about 300-feet of the Santa Ynez River at the construction site of the new bridge will begin during late spring and summer and last through fall (about 6-months).

To construct the project in the dry, the proposed action involves isolating the work area by installing sandbag coffer dams at the upstream and downstream ends of the work area, installing one or more culverts (depending on flow) between the sandbag dams and through the work area, diverting the river flow through the culverts, and pumping the water within the isolated work area out of the channel to percolation ponds that will be created in the adjacent agricultural field. The proposed action includes having qualified fisheries biologists onsite for the purpose of relocating steelhead to appropriate wetted instream habitats downstream of the isolated work area. Greater details regarding installation of the diversion and dewatering of the work area are provided below in the section describing the minimization measures (Section 1.3.6.2). Once instream work activities associated with construction of the new bridge are complete in the fall, all the materials associated with the diversion (*i.e.,* sandbags, culverts) will be removed from the river. Temporary trestles may be left in place throughout the rainy season and will be designed to withstand a five to ten year flood event. Some construction activities may continue on the

upper bank outside of the river channel during the rainy season (*i.e.*, installation of decking, conduit, approach roads, etc.). Staging areas will be established on the terrace above the riparian corridor for storing equipment, materials, and temporary personnel facilities and office trailers.

The new bridge will be approximately 650-feet in length and will be located between 50 to 80-feet west of the existing bridge. The proposed bridge superstructure will be a cast-in-place, 'pre-stressed' concrete box girder. The new bridge will be supported by a total of two piers, located within the river channel, between 200 and 270-feet apart as opposed to the current bridge, which has eight piers spaced 60-feet apart. The native material at the site of the new bridge will require 210-feet deep foundations in the riverbed for each of the piers. These piers will be 10-feet diameter columns, cast-in-drilled-hole shafts, and likely installed with the use of temporary casings. The two piers will be non-equilaterally hexagonal, with the narrowest sides facing upstream and downstream. The piers will be tapered from the bottom toward the top of the bridge. There will be no scour protection needed at the piers because the depth, shape, and fewer numbers of piers is expected to reduce the scour potential of the piers as well as velocity of flows under the bridge. The potential for rising groundwater to influence the work area may require pumping to the percolation ponds in the adjacent agricultural field.

The new location of the bridge will require realigning the existing approach roads to provide smooth curves leading into the north and south sides of the bridge. The new bridge elevation will be approximately 7-feet above the elevation of the existing bridge. Approach roads will also be raised to match the finish grade of the bridge. The abutments of the new bridge will be anchored at the top of the slopes on the north and south bank. The existing streambanks and the new approach fills will be protected from erosion and scour. The north and south abutments will be protected by installing new ungrouted rock riprap to approximately 12.5-feet of streambank at the base of each abutment. The rock riprap will be embedded below the toe of the streambank and the rock slope protection will be soil capped and planted with interspaced native vegetation, including willow cuttings, installed during construction.

The existing bridge supports communication lines, an electrical line, a water line, and a natural gas line servicing South VAFB. These lines will remain in service until they are replaced on the new bridge. The new bridge will accommodate a 10-inch water main, 4-inch natural gas conduit, and communication conduits. Full size access maintenance ports will be required at both ends of the bridge as well as at intermediate locations on the bridge.

A temporary access road will be constructed into the riparian corridor and riverbed to enable construction equipment, materials, and temporary supports to be moved into position for use during construction. The temporary access road will be constructed across the riverbed between the site of the proposed new bridge and the existing bridge and have access points from both sides of the river. Clean soil, gravel, and shale will be used for the access roads to construct a firm surface capable of supporting travel by heavy construction equipment. A partial trestle might also be constructed to provide additional access and support during bridge construction. The construction of access roads and staging areas, will require the clearing or trimming of some vegetation at these locations either mechanically or by hand in sensitive areas, as determined by VAFB biologists or on-site biological monitors.

Overall, the length of streambank that is anticipated will be disturbed as part of the proposed action for both the construction of the new bridge and demolition of the existing bridge is 477-feet on the north bank of the river and 434-feet on the south bank. Of this disturbance, about 162-feet on each side is expected to be permanent in the form of the new bridge and supporting abutments that will remain once the proposed action is complete.

1.3.3 Demolition of the Existing Bridge

Demolition and removal of the existing approach roads and bridge will occur after the new bridge is complete. Instream demolition activities are proposed to begin in the spring following construction of the new bridge and last between five to six months. The instream work area (approximately 200-feet of the Santa Ynez River) associated with the demolition of the existing bridge will be dewatered prior to engaging in demolition activities. Dewatering will occur in the same manner as described for the installation of the new bridge. Once dewatering is complete, clean soil, gravel, and shale will be used to construct temporary roads to access the demolition work area.

The existing approach roads, including the sub-base, base, and bituminous surfacing, will be removed to a depth of at least 6-inches below the grade of the existing surfacing. Where no longer needed, the associated metal beam guard railing will be removed, along with any concrete anchors and steel foundation tubes. Holes and depressions left as a result of removing the approach roads and railings will be backfilled with clean fill and graded to blend with the surrounding terrain.

Bridge demolition will be completed through use of either an impact hammer mounted to a hydraulic excavator, a 90-pound jackhammer, or concrete saw. Explosives and free-falling mass will not be used as part of the demolition process. Temporary support shoring, bracing, and protective covers will be installed to support portions of the bridge as the existing support structures are removed during demolition. Protective shields, to contain debris during demolition, will be composed of material at least equal to 2-inch Douglas fir planking on posts at 5-foot centers. Pilings, piers, abutments, and pedestals of the existing bridge will be removed to 3-feet below the ground line or 3-feet below finished grade, whichever is lower. The riprap at the base of the piers, within the river channel as well as the riprap and gabion baskets associated with the bridge abutments will all also be entirely removed.

1.3.4 Installation of the Fiber-Optic Cable

Fiber-optic cables attached to the existing 13th Street Bridge are an essential communications link between launch platforms on South VAFB and launch control centers on North VAFB. Interruption of the main communication supply could cause a delay or other mission impact to space launches. As such, VAFB desires to install an additional, secure communications link to ensure that reliable communications support to mission-essential facilities on South VAFB are maintained. To accomplish this objective VAFB is proposing to install a fiber-optic cable under the Santa Ynez River approximately 1,100-feet downstream of the existing 13th Street Bridge via one directional drilling (or boring). The proposed bore path for this communication line will enter and exit from points in the agriculture fields adjacent to the river about 1,100-feet apart and

pass under the river at a depth of 25-feet. Installation activities are proposed to begin in July and last no longer than 4-months, although the activities related to boring the hole for the fiber-optic conduit are expected to be complete in 2 to 9-days.

1.3.5 Implementation of Wetland Restoration

Temporary impacts to wetlands are proposed to be mitigated at a 1:1 ratio (area mitigated to area impacted) by restoring disturbed areas within the action area to pre-construction conditions. Permanent impacts to wetlands will be mitigated at a 2:1 (area mitigated to area impacted) for restored or enhanced wetlands. The design of the new bridge and demolition of the existing bridge is expected to improve wetland and aquatic habitat by reducing the obstruction of flow and allowing the river more area to meander. However, it is anticipated that the observed mitigation for permanent impacts to wetlands cannot be achieved within the 13th Street Bridge work area. Therefore, an area adjacent to the Santa Ynez River estuary was identified for wetland mitigation, if necessary. Re-establishment of up to four acres of currently impaired estuarine habitat along the southeast portion of the Santa Ynez River estuary is therefore included as a component of the proposed action. The final acreage of wetland to be restored and/or other aquatic characteristics and functions within the designated mitigation area will depend on the acreage of permanent impacts that will be assessed once construction activities for the proposed action are complete.

The restoration of wetlands in the Santa Ynez River estuary will begin after bridge and fiber-optic cable construction and demolition activities have been completed and final impacts of the proposed action are assessed. The proposed wetland restoration will require grading and relocating between 10,000 and 11,000-cubic yards of accumulated sediment at the south eastern edge of the estuary. Prior to grading activities, the vegetation within the site, which is predominately non-native, will be grubbed with a masticator. The restoration area will then be graded to an average elevation of approximately 9.5-feet. This will cause the habitat to transition from an invasive species dominated upland habitat to an seasonally flooded middle salt marsh wetland habitat dominated by pickleweed (*Salicornia virginica*), alkali heath (*Frankenia salina*), saltgrass (*Distichlis spicata*), and fleshy jaumea (*Jaumea carnosa*). Grading will occur after August 15th to avoid impacts to nesting birds and prior to the onset of the rainy season. Grading will be postponed if the restoration area is inundated (due to elevated estuary water levels) until water levels subside. All excavated soil will be transferred 800 to 1,100-feet for deposition at a 2.1-acre site at the southwestern edge of the remnant 35th Street Bridge causeway and abutments. The soil will be deposited in a gradually sloped lens along the embankment and restored as native upland habitat.

1.3.6 Minimization and Monitoring Measures

As part of the proposed action, the following measures are intended to avoid or minimize any potential adverse effects to steelhead during implementation of the proposed action.

1.3.6.1 General Minimization and Monitoring Measures

1. Biologists will provide training to all personnel that will work at the site of the proposed action prior to the start of construction activities. At a minimum, the training will include a description of the listed species occurring in the area, and the general and specific measures and restrictions to protect these species during implementation of the proposed action.

2. All hazardous materials, equipment and holding tanks will be staged, repaired, and maintained at least 150-feet from the Santa Ynez River. Fueling and adding oil/fluids to equipment will be done in pre-designated areas over secondary containment to minimize risks from accidental spillage or release.

3. All equipment intended to be used on site will be cleaned and free of foreign soil and plant debris and inspected by a biological monitor before entering the action area to prevent introducing invasive weeds or other contaminants.

4. All material used (*i.e.,* gravel, sand, fill material, wattles etc.) will be clean and from weed-free sources. Only 100-percent bio-degradable erosion control materials (*e.g.*, fabrics, wattles, etc.) will be left in place following completion of the proposed action.

5. No portable toilets will be placed within the river channel or riparian corridor.

6. The construction contractor will develop and submit a Spill Prevention Plan for approval before commencing activities.

7. All equipment operating within the action areas will be inspected regularly for fluid leaks.

8. When and where practicable, non-native vegetation within the action area will be removed during implementation of the proposed action under the direction of the biological monitors.

9. All construction equipment and machinery will be restricted to operating on existing paved surfaces, access roads, and staging areas. If any equipment must be operated outside of these areas, a biological monitor will supervise these activities.

10. All food and trash will be disposed of in closed containers and removed daily from the action area.

11. All herbicides will only be used per their instructed use and Department of Defense recommendations and shall comply with California Department of Pesticide Regulations.

1.3.6.2 Minimization Measures Associated with Bridge Construction and Demolition

1. Under the proposed action, biologists (hereafter referred to as fisheries biologists) that have sufficient experience in steelhead ecology as well as capture and handling of the species will be present at all times during construction activities that have the potential to adversely affect steelhead and will monitor activities throughout implementation of these activities to minimize and avoid impacts to steelhead, jurisdictional wetland resources, and native plant communities found in the action area.

2. A biologist will be responsible for inspecting equipment and equipment staging areas for potential impacts to these resources, including identifying potential gas and oil leaks.

3. A fisheries biologist, VAFB biologist, and site supervisor will walk the site and jointly identify an exclusion area, which includes all terrestrial and aquatic areas that could be directly impacted by construction related activities (*i.e.,* areas requiring the removal of vegetation, dewatering, placement of fill, and removal/exclusion of listed species). This exclusion area will encompass, at a minimum, the span of river to be diverted through culvert pipes and any areas to be cleared and/or temporarily filled.

4. Within the exclusion area, all aquatic vegetation within and along the river will be removed by hand or with hand tools under the supervision of a fisheries biologist.

5. All low-growing terrestrial vines, shrubs and herbaceous plants, within the exclusion area will be cut at the ground level and removed with hand tools under supervision of a fisheries biologist.

6. Within the exclusion area, to minimize losing riparian habitat, willow removal will only occur when necessary (if impeding construction or demolition activities and/or causing a safety concern) and will be determined case by case through consulting between the site supervisor and fisheries biologist, as construction progresses.

7. The following are the measures that are proposed for minimizing effects to steelhead during the installation of the diversion structure and dewatering of the isolated work area. All of these measures will be directly supervised by the fisheries biologists.

    a. The sandbag coffer dam diversion shall be installed no earlier than June 1 of each project year. If evaluation of flow conditions in the watershed, weather forecast, and steelhead migrant trapping information indicate that the upstream migration period for adult steelhead in the Santa Ynez River is likely complete for the given year, diversions may be installed as early as April 15, following coordination, review, and agreement from NMFS.

    b. At the site of the upstream river diversion point, a dam will be constructed by hand. Light mechanized equipment (*e.g.,* a bobcat) may be used to transport materials for dam construction but will not enter flowing or standing water. Prior to dam construction, blocknets with mesh not wider than 1/16th of an inch will be set up immediately up and downstream of the location of the dam and all special

status species will be removed via seine and dip-netting by the fisheries biologists (this process is hereafter referred to as "de-fishing").

c. Following de-fishing, the base of the upstream sandbag dam will be installed and a concrete collared culvert (or culverts) will be lowered into place on top of the dam.

d. The number and diameter of temporary culverts to be installed for the water diversion will be determined based on the flow conditions at the time the channel is diverted.

e. After the culvert(s) are set into place, cross stacked sandbags will be built up around the culvert(s), sealing it in place so all flow will be directed through the culvert(s).

f. Once flow has been successfully diverted through the culvert(s), the blocknets upstream and downstream of the upstream dam will be removed.

g. Working in a downstream direction, additional sections of culvert will be attached to extend the diversion pipe to the point of the downstream dam location.

h. Similar to the upstream dam installation, blocknets with mesh not wider than 1/16th of an inch will be set up immediately up and downstream of the downstream dam location and the area will be de-fished by fisheries biologists.

i. Following de-fishing, the base of the sandbag dam will be constructed around the downstream end of the culvert(s) in the same manner as the upstream dam.

j. Once the dam base is complete, blocknets will be removed.

k. At this point, all river flow will be diverted through the culvert(s) between the diversion dam, and the work area will be isolated such that dewatering of the work area can begin.

l. Pumps with screened intakes will be used to extract water from the isolated work area between the dams. The screened pump heads will be placed into larger screened containers, such as 30-gallon barrels, with 1/16th of an inch mesh screened holes to protect listed species from entering the pump intake.

m. Water pumped out of the work area will be discharged into percolation ponds created in the agricultural field north of the 13th Street Bridge and/or pumped into water trucks that will take the water off-site for proper disposal.

n. The rate of dewatering will be monitored by a fisheries biologist to ensure that it does not result in anoxic conditions or cause stranding of steelhead.

o. During dewatering, the number and disposition of all listed species encountered and/or relocated will be recorded. Steelhead will be relocated to the nearest suitable habitat within the Santa Ynez River, chosen at the discretion of the fisheries biologist. Steelhead will be held in plastic bins with adequate aeration while transported to a release location. All animals held will be segregated by size and species to prevent predation. The holding time will be minimized to the greatest extent feasible and the health of all held animals will be continuously monitored to evaluate the need for additional measures to protect the animals, such as greater aeration of water in holding bins.

p. The biological monitors will permanently remove any non-native species, such as bullfrogs, crayfish, bass, carp, or catfish, encountered within the action area to the maximum extent feasible.

8. All materials and equipment will be removed from the Santa Ynez River channel to the staging areas at the end of each day to the greatest extent feasible. If materials are to be staged within the bounds of the river channel overnight, they will be ringed with additional exclusionary fencing.

9. Water quality parameters will be monitored (*e.g.*, salinity, temperature, dissolved oxygen, turbidity) prior to and throughout the proposed action. Sampling will be conducted weekly, starting one week prior to commencing work within the river channel. Measurements of these parameters will be recorded 60 to 150-feet upstream of the diversion dam and 60 to 150-feet downstream of the diversion dam.

10. All temporarily disturbed areas, including access roads, will be restored at a minimum to their original condition. This will include removing all imported fill material from the action area and planting the area with native riparian species.

11. The following are the measures that will be taken to minimize effects to steelhead during the removal of the diversion structure and restoring flow to the isolated work area once instream work is complete each of the two years of the proposed action. All of these measures will be directly supervised by the fisheries biologists.

    a. A foam cylinder slightly smaller than the diameter of the culvert(s) will be pulled through the culvert(s) from upstream to the outflow of each pipe to ensure the culvert is free of animals.

    b. After the culvert has been cleared of animals, blocknets will be set up immediately upstream and downstream of the dams and continuously maintained until all materials from the diversion have been removed from the river.

    c. All sandbags and other materials (*e.g.*, pipes, collared culverts) used to construct both dams will be completely removed from the stream channel. The removal of the sandbags will be completed in tiers to allow gradual re-entry of flow into the previously isolated work area. The downstream sandbag dam will be removed prior to removing the upstream dam.

d. Once all the diversion related materials have been removed from the river, the upstream and downstream blocknets will be removed, allowing animals to reenter into and migrate freely though the site.

12. Instream construction activities will be completed or paused and all temporary fill, water diversion, and materials placed in the river channel will be removed prior to the onset of significant rainfall (0.5-inches within a 24-hour period).

1.3.6.3 Minimization Measures Associated with Installation of the Fiber-Optic Cable

1. Directional boring will be used to avoid encroaching into the Santa Ynez River corridor.

2. Entry and exit bore locations will be situated in the adjacent agricultural fields outside of Waters of the U.S. and riparian habitat.

3. VAFB and the construction contractor will develop a contingency plan for the accidental release of drilling mud from the horizontal boring. This is a site specific plan that contains measures for reducing the likelihood of accidental release of drilling mud as well as the methods and materials used for containment and clean-up. The contingency plan will be submitted to NMFS for review prior to implementation of the proposed action.

4. BMPs such as straw bales, straw waddles, and silt fencing will be used to provide additional measures to protect water quality during bore operations.

1.3.6.4 Minimization Measures Associated with the Proposed Wetland Restoration Area

1. All soil removal and deposition, and any other activities involving vegetation clearing or using heavy machinery will conclude for the season prior to the onset of significant rainfall (0.5-inches within 24-hours).

2. Silt fence and/or biodegradable straw wattles will be placed along the edge of the wetland restoration area adjacent to the estuary prior to construction activities to capture sediments during any potential run-off event from the wetland restoration area during construction. These will be removed after construction once exposed soil on the site has been revegetated and/or stabilized with erosion control measures.

1.3.7 Site Restoration for Each Component of the Proposed Action

1.3.7.1 Construction Site Restoration

Restoration of the area impacted during the new bridge installation will begin during the final stages of all construction activities as access roads and construction machinery and materials are removed. All access roads, surplus and waste materials, and temporary facilities will be

removed from the action area, unless they are also required for demolition of the existing bridge. To the extent feasible and practicable, the site contours, river channel, and habitat types will be restored to pre-construction conditions. Prior to removing access roads, a backhoe will be used to assist in installing willow cuttings at or near the water table along both banks of the channel. A water stinger will be used to install pole cuttings at 5 to 8-ft deep on the banks of the channel, near riprap, and in other locations where a backhoe cannot access.

1.3.7.2 Demolition Site Restoration

Site restoration will begin when demolition and bridge removal are complete. At this time, any remaining access roads, surplus and waste materials, and temporary facilities will be removed from the action area. In a manner similar to that proposed for the restoration of the construction site, the demolition site contours and habitat types will be restored and willow cuttings will be planted at or near the water table along both banks of the channel at this location.

Under the direction of VAFB biologists or fisheries biologists monitoring the proposed action, any remaining disturbed areas within the action area will be restored with native vegetation. VAFB will implement a Habitat Restoration and Monitoring Plan to restore all disturbed areas, at a minimum, to the original condition. The post-construction monitoring will focus on the extent of native species cover and the diversity and presence of non-native, invasive plant species. The action area will be assessed monthly for watering needs and for the presence of nonnative, invasive plant species. VAFB anticipates eradicating invasive plants, through hand removal, mechanical removal (*e.g.*, weed-wacker), and herbicide application, will be necessary throughout the monitoring period.

1.3.7.3 Fiber-Optic Cable (FOC) Site Restoration

After installation, all grounds disturbed during installing the maintenance holes, conduit, and/or FOC will be restored to at least pre-activity conditions. Once the proposed action is complete, any bare soils will be seeded with a seed mix representing an appropriate palette of native species, to be determined by a qualified biologist.

1.3.7.4 Wetland Site Restoration

After the completion of grading activities, all disturbed soil will be sown with one of two native seed mixes. The portion of the site that was excavated to a lower elevation will be seeded with a salt marsh seed mix of pickleweed, alkali heath, saltgrass, and fleshy jaumea. The sediment deposition area and access roads will be seeded with a native grass seed mix. During the second winter following excavation, grading and seeding, native broadleaf container plantings will be installed in the areas seeded with native grasses. Container plantings will be installed during the last week of October and the first week of November, unless directed otherwise in consideration of weather forecasts. In addition to container plantings, a native upland broadleaf seed mix (palette to be determined) will be applied to the upland portion of the site.

Post-construction monitoring will be conducted to assess initial revegetation effectiveness and provide guidance for follow-up maintenance, based on performance criteria described in the Habitat Restoration and Monitoring Plan. The post-construction monitoring will focus on the extent of native species cover and the diversity and presence of non-native, invasive plant species. VAFB anticipates eradicating invasive plants, through hand removal, mechanical removal (*e.g.*, weed-wacker), and herbicide application, will be necessary throughout the monitoring period.

1.4 Action Area

"Action area" means all areas to be affected directly or indirectly by the Federal action and not merely the immediate area involved in the action (50 CFR 402.02). The 13th Street Bridge is located on VAFB and crosses the Santa Ynez River 3-miles upstream from where the river enters the Pacific Ocean. The action area for the proposed action includes instream habitat extending from approximately 100-feet upstream of the existing 13th Street Bridge centerline, downstream approximately 2.5-miles to the wetland restoration site. The action area includes the riparian corridor, specifically trees or streambank vegetation that contribute to shading the active channel of the Santa Ynez River.

2. ENDANGERED SPECIES ACT: BIOLOGICAL OPINION AND INCIDENTAL TAKE STATEMENT

The ESA establishes a national program for conserving threatened and endangered species of fish, wildlife, plants, and the habitat upon which they depend. As required by section 7(a)(2) of the ESA, Federal agencies must ensure that their actions are not likely to jeopardize the continued existence of endangered or threatened species. Per the requirements of the ESA, Federal action agencies consult with NMFS and section 7(b)(3) requires that, at the conclusion of consultation, NMFS provides an opinion stating how the agency's actions will affect listed species. If incidental take is expected, section 7(b)(4) requires NMFS to provide an incidental take statement (ITS) that specifies the impact of any incidental taking and includes non-discretionary reasonable and prudent measures and terms and conditions to minimize such impacts.

2.1 Analytical Approach

This biological opinion includes a jeopardy analysis. The jeopardy analysis relies upon the regulatory definition of "to jeopardize the continued existence of a listed species," which is "to engage in an action that 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). Therefore, the jeopardy analysis considers both survival and recovery of the species.

The following approach is used to determine whether a proposed action is likely to jeopardize listed species:

- Identify the rangewide status of the species likely to be adversely affected by the proposed action.
- Describe the environmental baseline in the action area.
- Analyze the effects of the proposed action on the species using an "exposure-response-risk" approach.
- Describe any cumulative effects in the action area.
- Integrate and synthesize the above factors to assess the risk that the proposed action poses to the species.
- Reach a jeopardy conclusion.
- If necessary, define a reasonable and prudent alternative to the proposed action.

This biological opinion is based on the best scientific and commercial data available, including (1) the biological assessment (ManTech SRS Technologies June 2014) for the proposed action; (2) observations of the action area noted during a September 19, 2014, site visit by a NMFS biologist; and (3) the ecological literature.

2.2 Rangewide Status of the Species

This opinion examines the status of each species that would be adversely affected by the proposed action. The status is determined by the level of extinction risk that the listed species face, based on parameters considered in documents such as recovery plans, status reviews, and listing decisions. This informs the description of the species' likelihood of both survival and recovery. The species status section informs the description of the species' current "reproduction, numbers, or distribution" as described in 50 CFR §402.02.

2.2.1 Status of the Species

Oncorhynchus mykiss is one of six Pacific salmon in the genus *Oncorhynchus* that are native to the North American coast. The natural history of this species dictates the terminology fisheries biologists and resource managers use when discussing *O. mykiss*, its habitat, and distribution. If the species remains in freshwater throughout their entire life cycle (and reside upstream of longstanding migration barriers), they are referred to as resident trout (non-anadromous), or rainbow trout. The anadromous or ocean-going form of *O. mykiss*, and its progeny, are listed under the ESA (NMFS 2006) and is typically referred to as "steelhead." Globally, steelhead are found in the western Pacific through the Kamchatka Peninsula in Asia, east to Alaska, south to southern California, and even reported in Baja California del Norte (Ruiz-Campos and Pister 1995).

The listed unit of anadromous *O. mykiss* is termed a "distinct population segment" or DPS (NMFS 2006), and the listed unit contains several individual or fish-bearing watersheds. The DPS recognizes only the anadromous *O. mykiss*, whereas the term "evolutionarily significant unit," or ESU, refers to both the non-anadromous (or resident) and anadromous (or residualized) *O. mykiss*. In accordance with the listing decision, this biological opinion solely uses the DPS terminology and provides NMFS' conclusion as to the likelihood of jeopardy to the species based only on effects to the listed DPS.

This biological opinion analyzes the effects of the proposed action on the following listed DPS, which occurs in the action area:

Endangered Southern California Coast Steelhead (*Oncorhynchus mykiss*), Southern Steelhead Distinct Population Segment (DPS)

Salmonid Species	ESU/DPS Name	Original Listing	Revised Listing(s)	Critical Habitat Designations
Steelhead (*O. mykiss*)	Southern California Coast Steelhead DPS	FR Notice: 62 FR 43937 Date Listed: 08/18/1997 Classification: Endangered	FR Notice: 67 FR 21586 Date: 05/01/2002 Classification: Southern Range Extension FR Notice: 71 FR 5248 Date: 01/05/2006 Re-classification: Endangered	FR Notice: 70 FR 52488 Date: 09/02/2005

The geographic range of this DPS extends from the Santa Maria River, near Santa Maria, to the California–Mexico border (NMFS 1997, 2002, 2006), which represents the known southern geographic extent of the anadromous form of *O. mykiss*. NMFS described historical and recent steelhead abundance and distribution for the southern California coast through a population characterization (Boughton *et al.* 2006). Surveys in Boughton *et al.* (2006) indicate between 58 percent and 65 percent of the historical steelhead basins currently harbor *O. mykiss* populations at sites with connectivity to the ocean. Most of the apparent losses of steelhead were noted in the south, including Orange and San Diego counties (Boughton *et al.* 2005). The majority of losses (68 percent) of steelhead were associated with anthropogenic barriers to steelhead migration (*e.g.*, dams, flood-control structures, culverts, etc.). Additionally, the investigators found the barrier exclusions were statistically associated with highly-developed watersheds.

Steelhead in southern California are categorized as "winter run" because they typically migrate into natal streams between December and April (*e.g.*, Fukushima and Lesh 1998), arriving in reproductive condition and spawning shortly thereafter. Adults may migrate several miles, hundreds of miles in some watersheds, to reach their spawning grounds. Steelhead have evolved to migrate deep into the extreme fringes of a watershed to exploit the environmental conditions that favor production of young (*e.g.*, Montgomery *et al.* 1999). Steelhead in southern California streams can be tolerant of warm water, remaining active and feeding at temperatures that are higher than the temperature preferences and heat tolerances reported for the species based on individuals from northern latitudes (Spina 2007). While 46 drainages support this DPS (Boughton *et al.* 2005), only 10 population units possess a high and biologically plausible likelihood of being viable and independent[1] (Boughton *et al.* 2006).

[1] Independent population: a collection of one or more local breeding units whose population dynamics or extinction risk over a 100-year time period is not substantially altered by exchanges of individuals with other populations (Boughton *et al.* 2006).

Although the geographic area of the DPS is broad, the individual population units are sparsely and unevenly distributed throughout the DPS with extensive spatial breadth often existing between nearest-neighbor populations (Boughton *et al.* 2005; NMFS 2005; Boughton *et al.* 2006). Extinction of some population units has been observed as well as contraction of the southern extent of the species' geographic range (Boughton *et al.* 2005; Gustafson *et al.* 2007). One reason for the extensive spatial gaps between neighboring population units and the range contraction involves man-made barriers to steelhead migration (Boughton *et al.* 2005).

This DPS experiences a high magnitude of threat to a small number of extant populations vulnerable to extirpation due to loss of accessibility to freshwater spawning and rearing habitat, low abundance, degraded estuarine habitats and watershed processes essential to maintain freshwater habitats (NMFS 2011). The recovery potential is low to moderate due to the lack of additional populations, lack of available/suitable freshwater habitat, steelhead passage barriers, and inadequate instream flow. There is a moderate magnitude of threat to smaller watersheds, and higher risk in larger watersheds with major water supply and flood control facilities. Conflict was determined to be present due to existing and anticipated future development, habitat degradation, and conflict with land development and associated flood control activities and water supplies. There is little new evidence to suggest that the status of the Southern California Coast DPS has changed appreciably in either direction since publication of the most recent collections of status reviews (Good *et al.* 2005; NMFS 2011; Williams *et al.* 2011). New information since the last review concerning the status of anadromous runs in the DPS is limited and does not suggest a change in extinction risk.

Population abundance trends can significantly vary based on yearly rainfall and storm events within the range of the SCC DPS. A relatively large number of adult steelhead were observed in 2008, two years after an extended wet spring that presumably gave smolts ample opportunity to migrate to the ocean. Some of the strength of the 2008 season may also be an artifact of conditions that year. Low rainfall appears to have caused many spawners to get trapped in freshwater, where they were observed during the summer; in addition, low rainfall probably improved conditions for viewing fish during snorkel surveys, and for trapping fish in weirs (Williams *et al.* 2011).

2.2.2 General Life History of Steelhead

O. mykiss is considered to have the most complexity and variation of all species in the genus in terms of the time and location spent at each life-history stage (Behnke 1992). Distinctly different than other Pacific salmon, steelhead adults can survive their first spawning and return to the ocean to reside until the next year to reproduce again. For returning adults, the specific timing of spawning can vary by a month or more among rivers or streams within a region, occurring in winter and early spring. The spawning time frames depend on physical factors such as the magnitude and duration of instream flows and sand bar breaching. Once they reach their spawning grounds, females will use their caudal fin to excavate a nest (redd) in streambed gravels where they deposit their eggs. Males will then fertilize the eggs and afterwards, the females cover the redd with a layer of gravel, where the embryos (alevins) incubate within the gravel. Hatching time can vary from approximately three weeks to two months depending on surrounding water temperature. The young fish (fry) emerge from the redd/gravel two to six

weeks after hatching. As steelhead begin to mature, juveniles or "parr," will rear in freshwater streams anywhere from 1-3 years. Juvenile steelhead can also rear in seasonal coastal lagoons or estuaries of their natal creek, providing over-summering habitat.

Juvenile steelhead emigrate to the ocean (as smolts) usually in late winter and spring and grow to reach maturity at age 2-4, but steelhead can reside in the ocean for an additional 2-3 years before returning to spawn. The timing of emigration is influenced by a variety of parameters such as photoperiod, temperature, breaching of sandbars at the river's mouth and streamflow. Research on juvenile residency has shown that residency can be greatly influenced by the hydrologic cycle in southern California. Extended droughts can cause juveniles to become landlocked, unable to reach the ocean (Boughton *et al.* 2006).

Through studying the otolith (small ear stone) microchemistry of *O. mykiss*, researchers further understand the complex and intricate life history of steelhead. Specifically, rainbow trout can have steelhead as progeny; likewise, steelhead can have rainbow trout as progeny (Zimmerman and Reeves 2000). Additionally, evidence indicates that sequestered populations of steelhead (*e.g.*, above introduced migration barriers) can exhibit traits that are the same or similar to anadromous specimens with access to the ocean. Examples include inland resident fish exhibiting smolting characteristics and river systems producing smolts with no regular access for adult steelhead. This evidence suggests the ecological importance of the resident form to the viability of steelhead and the need to reconnect populations upstream and downstream of introduced migration barriers. The loss or reduction in anadromy and migration of juvenile steelhead to the estuary or ocean is expected to reduce gene flow, which strongly influences population diversity (McElhany *et al.* 2000). Evidence indicates genetic diversity in populations of southern California steelhead is low (Girman and Garza 2006).

2.2.3 Steelhead Habitat Requirements

Habitat requirements of steelhead generally depend on the life history stage. Steelhead encounter several distinct habitats during their life cycle. Water discharge, water temperature, and water chemistry must be appropriate for adult and juvenile migration. Suitable water depth and velocity, and substrate composition are the primary requirements for spawning. Furthermore, dissolved oxygen concentration, pH, and water temperature are factors affecting survival of incubating embryos. The presence of interspatial spaces between large substrate particle types is important for maintaining water-flow through the nest as well as dissolved oxygen levels within the nest. These spaces can become filled with fine sediment, sand, and other small particles. Additionally, juveniles need abundant food sources, including insects, crustaceans, and other small fish. Habitat must also provide places to hide from predators, such as under logs, root wads and boulders in the stream, and beneath overhanging vegetation. Steelhead also need places to seek refuge from periodic high-flow events (side channels and off channel areas), and may occasionally benefit from the availability of cold-water springs or seeps and deep pools during summer. Estuarine habitats can be utilized during the seaward migration of steelhead, as these habitats have been shown to be nurseries for steelhead. Estuarine or lagoon habitats can vary significantly in their physical characteristics from one another, but remain an important habitat requirement as physiology begins to change while juvenile steelhead become acclimated to a saltwater environment.

2.2.4 Influence of a Changing Climate on the Species

One factor affecting the rangewide status of endangered steelhead, and aquatic habitat at large, is climate change. For the Southwest region (southern Rocky Mountains to the Pacific Coast), the average temperature has already increased roughly 1.5°F compared to a 1960-1979 baseline period. High temperatures will become more common, indicating that southern California steelhead may experience increased thermal stress even though this species has shown to endure higher than preferable body temperatures (Spina 2007).

Precipitation trends are also important to consider. The Southwest region, including California, showed a 16 percent increase in the number of days with very heavy precipitation from 1958 to 2007. Potential impacts to southern California steelhead in freshwater streams include damage to spawning redds and washing away of incubating eggs due to higher winter stream flow (USGCRP 2009), and poor freshwater survival due to longer and warmer periods of drought (Hanak *et al.* 2011; Mastrandrea and Luers 2012), which may lead to lower host resistance of steelhead to more virulent parasitic and bacterial diseases (McCullough 1999; Marcogliese 2001). Snyder and Sloan (2005) projected mean annual precipitation in southwestern California to decrease by 2.0 cm (four percent) by the end of the 21st century.

Wildfires periodically burn large areas of chaparral and adjacent woodlands in autumn and winter in southern California (Westerling *et al.* 2004). Increased wildfire activity over recent decades reflects sub-regional responses to changes in climate, specifically observations of warmer and earlier onset of spring along with longer summer-dry seasons (Westerling *et al.* 2006; Westerling and Bryant 2008).

Estuarine productivity is likely to change based on changes in freshwater flows, nutrient cycling, and sediment amounts (Scavia *et al.* 2002). Additionally, upper ocean temperature is the primary physical factor influencing the distribution of steelhead in the open ocean, and a warming climate may result in a north-ward shift in steelhead distribution, for example (Myers and Mantua 2013).

In summary, observed and predicted climate-change effects are generally detrimental to the species, given the unprecedented rate of change and uncertainty about the ability to adapt, so unless offset by improvements in other factors, status of the species is likely to decline over time. The climate change projections referenced above cover the time period between the present and approximately 2100. In general, climate change projections cannot be distinguished from annual and decadal climate variability for approximately the first 10 years of the projection period (see Cox and Stephenson 2007). While there is uncertainty associated with projections beyond 10 years, which increases over time, the direction of change is relatively certain (McClure *et al.* 2003).

2.2.6. Steelhead Abundance and Distribution within the Santa Ynez River Watershed

There has been extensive documentation and observation of steelhead in the mainstem of the Santa Ynez River and many of its tributaries (primarily Hilton, Quiota, Alisal, Salsipuedes, and

El Jaro creeks) below Bradbury dam (U.S. Bureau of Reclamation 2011). Various life stages of steelhead, including rearing juveniles, upstream migrating adults, and downstream migrating smolts, have been consistently observed at some of these sites, suggesting the occurrence of a persistent population of steelhead albeit greatly reduced from historical levels. The run size for steelhead in the Santa Ynez system was originally estimated between 20,000 and 30,000 adult steelhead, and was historically one of the largest runs in southern California (Busby *et al.* 1996). Current run sizes, while not fully known, are a small fraction of historical run sizes (less than 100 adults total).

During the winter of 2008, 15 adult steelhead were counted migrating upstream in the Santa Ynez River watershed during trapping and monitoring efforts by biologists employed by the Cachuma Conservation and Release Board (CCRB) (T. Robinson, Senior Scientist for CCRB, pers. comm. June 2014). This represents the highest total number of adult steelhead counted in a single year since the monitoring program has been in place (about 20 years). In most years, the numbers of adult steelhead counted by CCRB biologists are lower.

In annual summer snorkel surveys conducted by CCRB biologists between 2008 to 2011, the number of juvenile steelhead counted within habitats along about 6-miles of the mainstem Santa Ynez River ranged from about 50 to 500 (U.S. Bureau of Reclamation 2011, 2012, 2013, 2014). Counts from summer snorkel surveys for this same time period along about 4-miles of habitats in several different tributaries (*i.e.*, Hilton, Quiota, Salsipuedes, and El Jaro creeks) ranged from about 1000 to 3000 juveniles.

2.3 Environmental Baseline

The "environmental baseline" includes the past and present impacts of all Federal, state, or private actions and other human activities in the action area, the anticipated impacts of all proposed Federal projects in the action area that have already undergone formal or early section 7 consultation, and the impact of state or private actions which are contemporaneous with the consultation in process (50 CFR §402.02).

2.3.1 Status of Steelhead in the Action Area

Generally, the instream habitat within the action area provides a migration corridor for adult and juvenile steelhead. Based on habitat characteristics (*i.e.*, perennial flow, instream cover, large deep pools and runs) the action area may also potentially provide some rearing opportunities for juveniles and over-summering opportunities for adults. This section of the Santa Ynez River at the bridge is currently characterized mostly as a large pool or run habitat that begins at the existing 13th Street Bridge, ranges from 30 to 100-feet wide, over 6-feet deep in places, and extends downstream at least 1200-feet. Aerial photographs of the area from different years show this same reach as a series of riffles connecting long pools and runs at a much lower water level. The water elevation in the estuary and height of the sandbar at the mouth of the river may influence the water level through the upstream extent of the action area under certain conditions.

This section of stream is perennial, though flows are lowest during the summer. Releases of treated water from a wastewater treatment plant approximately 4-miles upstream of the existing

bridge are likely one of the main reasons this reach at the 13th Street Bridge maintains perennial flow as the streambed above the treatment plant generally goes dry during the late spring and summer. The substrate in the action area is composed largely of sand and finer sediment. The riparian vegetation along the edge of the stream in the action area is dominated by willow. The river ranges from 30 to 100-feet in width through the action area and is largely open with trees mainly providing shade along the immediate streambank. Within the streambed are clusters of reeds and cattails that provide instream cover.

There is limited information with regard to steelhead use of or abundance in the action area because there have been only a few recent surveys and no extensive long-term studies or monitoring completed for steelhead in the action area. The only steelhead recently documented in the action area was one 18 to 20-inch adult that was observed by a biologist conducting a red-legged frog survey in October 2013 (R. Evans, Biologist for VAFB, pers. comm. October 2014). No steelhead was observed during other recent surveys of the action area known to NMFS that included: (1) two different steelhead snorkel surveys of the action area in May 2014 (ManTech SRS Technologies June 2014), (2) a visual survey by CCRB biologists wading through the action area in January 2014 (S. Engblom, Fish Biologist for CCRB, pers. comm. October 2014), or (3) seine sampling conducted in the action area in July 2013 (R. Evans, Biologist for VAFB, pers. comm. October 2014). Overall, these surveys were conducted during a time of extended drought when steelhead access into and movement throughout the watershed was probably limited and overall productivity and population size within the watershed was relatively low. These watershed conditions may be a large factor contributing to the observation of only one steelhead in the action area during this time and not necessarily representative of steelhead occurrence and use of the action area during wetter years.

The opportunity and likelihood for steelhead migration through and presence in the action area would increase during years with higher flow and connectivity throughout the watershed when overall steelhead migration through and likelihood of increased productivity in all accessible reaches of the watershed is higher. Based on the size of the habitat and general observations of steelhead densities in other parts of the watershed, NMFS estimates it is possible that up to 50 juvenile and 1 anadromous adult steelhead may be present in the work area to be dewatered each summer (or 100 juvenile and 2 adult steelhead total over two summers) depending on flow conditions, migration opportunities, and overall production in the watershed during a given year.

2.3.2 Factors Affecting Steelhead in the Action Area

This section provides greater detail on the factors affecting steelhead in the action area. Based on a review of NMFS recovery plan for southern California Steelhead (NMFS 2012) and NMFS' familiarity with activities whose effects could extend into the action area, evidence indicates a number of past and present anthropogenic activities have reduced the quality and quantity of habitat and likely the number of steelhead within the action area. These activities involve construction and operation of water storage and diversion facilities, conversion of wildlands, wastewater release to the river, land-use activities, and groundwater pumping. The factors affecting steelhead are described as follows, beginning with the construction of dams.

The majority of the prime spawning and rearing habitat on the Santa Ynez River is inaccessible to steelhead as a result of dams, road crossings, grade-control structures, culverts, and other instream structures that block or impede migration of adult steelhead (NMFS 2012). Dams and diversions can have effects on fishery resources and quality of steelhead habitat (Blahm 1976, Mundie 1991, Smith *et al.* 2000). Three dams have been constructed on the Santa Ynez River (the largest and lowest in the system is Bradbury Dam at Lake Cachuma). All of these dams block steelhead from a substantial amount of historical spawning and rearing habitat because none of these reservoirs were constructed to allow passage of fish. Operations of dams and diversions may decrease water available for surface flows, reducing rearing opportunities for steelhead and adversely affecting the physicochemical and biological characteristics of streams (Poff *et al.* 1997). Dams on the Santa Ynez River reduce the amount of flow that would extend through the action area as well as reduce the overall productivity of steelhead in the watershed and therefore, the number of steelhead that would pass through or utilize the action area.

Surface and groundwater pumping in Santa Ynez River have the potential to adversely affect steelhead. In some cases, these operations have reduced available surface flows and even dried portions of streams, thereby stranding steelhead or reducing the available habitat quantity and quality for rearing steelhead (M. McGoogan, NMFS, pers. obs.). These pumping operations also reduce the amount and duration of flow that would extend through the action area.

Changes in land use through conversion of lands (*e.g.*, due to development of urban areas) can impact steelhead by increasing input rates of nitrogen and sediment (*i.e.*, sand and smaller particles) to receiving waters, leading to reductions in the quality of steelhead habitat and abundance of desirable aquatic species, and increased eutrophication of receiving waters such as estuaries and streams (Weaver and Garman 1994; Bowen and Valiela 2001; Quist *et al.* 2003). Past and present development of lands often results in an increase of impervious surfaces which can lead to increased potential for runoff of pollutants to surface water. Increased runoff may not necessarily be confined to the wet season, but may extend into the dry season as a result of people washing streets, parking lots, vehicles, and other elements of the urban environment. Once in surface water, pollutants of sufficient concentration may impair water quality and alter the characteristics of the channel bed. Long-term urbanization effects have been associated with lower fish species diversity and abundance (Weaver and Garman 1994). Consequently, the proliferation of urban areas within many of the coastal watersheds throughout the Santa Ynez River watershed is of concern. There are several urban areas upstream of the action area in the Santa Ynez River watershed (*e.g.*, Santa Ynez, Solvang, and Buellton) as well as urban areas directly adjacent to the action area (*i.e.*, VAFB and Lompoc).

Direct and indirect evidence of cattle in riparian areas and streams within the Santa Ynez River and many of its tributaries below Bradbury Dam have been observed (M. McGoogan, NMFS, pers. obs.). Cattle have been observed in and along parts of the Santa Ynez River and its tributaries, grazing on slopes above waterways, and exposing soil, thereby increasing the potential for water-quality alterations related to sedimentation and turbidity (Platts 1991). This can reduce opportunities for rearing and spawning steelhead.

Mining can contribute soil to streams, and cause sedimentation and turbidity, which can be harmful to fish (Cordone and Kelley 1961; Chapman 1988) and their habitat (Alexander and

Hansen 1986; Everest *et al.* 1984; Gregory *et al.* 1987). Mining can also cause changes to the stream channel (*i.e.*, head-cuts, channel widening, etc.) that have the potential of adversely affecting steelhead migration (B. Cluer, NMFS, pers. comm., October 2014). A few miles upstream of the action area there is a small sand mining operation on the Santa Ynez River near Lompoc.

Non-native warm water species (*e.g.*, carp, bass, sunfish, catfish, etc.) have spilled over Bradbury Dam and into the mainstem of the Santa Ynez River (U.S. Bureau of Reclamation 2011). These warm water species can compete with steelhead for space and resources or potentially prey directly on steelhead to cause harm or mortality to individuals. Under certain flows it is likely that some of these species pass through or into the action area.

NMFS' recovery plan for the SC DPS identifies Santa Ynez River as a Core 1 population within the larger SC DPS population of steelhead (NMFS 2012). Core 1 populations are considered the highest priority and importance for recovery of the larger DPS. The threats listed above affecting the action area are corroborated in the recovery plan, which identifies dams and surface water diversions, groundwater extraction, agricultural development, and non-native species as some of the highest threats to steelhead in the Santa Ynez River watershed. Urban development and instream mining are listed as medium threats.

2.4 Effects of the Action

Under the ESA, "effects of the action" means the direct and indirect effects of an action on the species, together with the effects of other activities that are interrelated or interdependent with that action, that will be added to the environmental baseline (50 CFR §402.02). Indirect effects are those that are caused by the proposed action and are later in time, but still are reasonably certain to occur. The expected effects of the action on endangered steelhead are described as follows.

2.4.1 Effects Related to the Wetland Restoration Site.

Wetland restoration is not expected to adversely affect or benefit steelhead. Grading activities will be conducted in the dry outside of active stream channel and flowing water. After grading is complete a portion of lower-elevation sites will be connected with the estuary such that higher flows or the tide can gradually inundate these areas. Although the wetland restoration may immediately increase the available estuary area for steelhead, the permanence of any increase is unclear because the original approach road and bridge abutment will remain and these structures are believed to have caused this area of the estuary to fill.

2.4.2 Effects Related to Installation of the Fiber-Optic Cable

Horizontal boring to make way for the fiber-optic cable has the potential to accidentally release drilling mud into the action area. We emphasize that although accidental release of drilling mud is speculative, NMFS' experience with other horizontal borings indicate that not only is an accidental release possible, but probable. For this reason NMFS expects the installation of the fiber-optic cable to temporarily increase turbidity and sedimentation within receiving waters of

the action area. The specific turbidity concentration and rate of sedimentation are unknown because these have not been estimated, however. Additional information regarding the potential effects of an accidental release of drilling mud is provided in the following sections.

2.4.3 Alteration of Aquatic Habitat

Installing the temporary water diversions is expected to cause a temporary loss of aquatic habitat and potentially expose steelhead at the diversion site to a greater risk of harm during the dewatering process. The dewatered work areas for the bridge construction and demolition are anticipated to be the primary cause for these type of effects as the diversions will be constructed for two consecutive years in the channel during the late spring, remain for up to 5 to 7-months each year, and result in the dewatering of about 300-feet of the river the first year as part of new bridge construction and 200-feet of river the second year as part of deconstruction of the existing bridge.

The accidental release of drilling mud would probably prompt dewatering of isolated areas for containment and remediation, potentially exposing steelhead to harm.

In either instance, the loss of habitat would be confined to a discrete section of the Santa Ynez River and would be temporary because the affected workspace would be re-watered after the proposed action is complete or drilling mud is successfully contained and cleaned. Steelhead require suitable living space for growth and survival; living space absent surface water is not suitable. Streamflow diversions or isolated containment areas could harm individual steelhead by concentrating or stranding them in residual wetted areas that are predisposed to dewatering or desiccation, increased water temperature, decreased dissolved oxygen concentration and predation (Cushman 1985) or by causing them to migrate to adjacent less suitable habitats (Kraft 1972; Campbell and Scott 1984). As part of the proposed action, an on-site biologist will monitor the area as it is dewatered and move any remaining steelhead to appropriate nearby stream habitats, so potential harm and mortality to steelhead from the water diversion is expected to be reduced if not avoided. However, such handling of steelhead in itself also carries some risk to these individuals. The potential impacts resulting from handling and relocating steelhead during dewatering will be addressed in the next section (2.4.4 Capture and Relocation of Steelhead).

The potential severity of these temporary adverse effects is expected to be greatly reduced owing to precautionary measures included in the proposed action. The diversions, while they are in place for several months, are temporary and will be removed at the end of the first year of instream construction and then permanently at the end of the second year of construction when the proposed action is complete. Further, there is an adequate amount of similar quality rearing habitat adjacent to the action area that can be used by steelhead during the time portions of the action area are dewatered. Observations made during a September 2014 site visit by NMFS' biologist (Matt McGoogan) of instream habitat in the action area adjacent to the work area that will be dewatered as well as number of steelhead currently occupying those habitats (mainly a large more than 1200-foot pooled area with only 1 steelhead observed in the area during several surveys over the past couple years) indicate that these adjacent habitats do not seem to be at

capacity and should be able to adequately provide the same level of rearing function to steelhead relocated to these habitats from the portion of the action area to be dewatered.

Over the short-term during the two years of construction, the installation of the coffer dam diversions is not expected to adversely affect (i.e., impede or delay) steelhead migration through the action area. VAFB has stated they will coordinate with NMFS to ensure that the diversion is not installed until after upstream migration of steelhead is complete for a given year (R. Evans, Biologist for VAFB, pers. comm. October 2014). This timing will likely ensure that downstream migration of smolts has also ended or will soon cease. Although, any potential downstream migrating steelhead would be able to pass through the dewatered work area via the diversion pipe.

2.4.4 Capture and Relocation of Steelhead

NMFS expects no more than 50 juvenile and 1 adult steelhead to be displaced or relocated from the instream work area to be dewatered during each construction season (*i.e.,*100 juvenile and 2 adult steelhead total over two construction season) the diversions will be in installed, or as a result of needing to contain and remediate an accidental release of drilling mud. If the general minimization measures, dewatering procedures, and fish capture and relocation methods are implemented correctly, mortality of steelhead due to the proposed action is expected to be no more than 2% (2 juveniles). This estimated mortality is based on NMFS' experience and knowledge with similar actions observed in southern and south-central California during the last five years. For example, during the implementation of a recent separate proposed action involving a similar dewatering and relocation plan, 105 steelhead were relocated successfully and only 1 mortality (~1%) was observed (San Luis Obispo County Public Works 2011). No adult steelhead mortality is expected because only a small number, if any, are anticipated to be encountered and, should an adult be captured, the minimization measures proposed are anticipated to reduce stress and likelihood of mortality for steelhead in general.

NMFS does not expect the loss of up to two juvenile steelhead would affect the survival of the steelhead population in the Santa Ynez River, even when combined with the effects of past and present activities. Overall, the area to be dewatered and the steelhead that are relocated from the action area represent a small fraction of steelhead and viable habitat within the Santa Ynez River watershed. This is evident in the fact that while up to 50 juvenile and 1 adult steelhead may occupy the reach within the action area in a given year, the annual population of steelhead in the Santa Ynez River watershed has ranged from at least 1000 to 3500 juveniles and up to 15 adults in recent years (U.S. Bureau of Reclamation 2011, 2012, 2013, 2014).

2.4.5 Alteration of Water Quality

Water quality is important for maintaining the functional value of freshwater rearing sites and freshwater spawning sites. Installing and then removing the temporary coffer dam stream diversion for two consecutive work seasons (late spring to fall) is expected to temporarily increase sedimentation (rapid settling of suspended sediment) and turbidity (suspended particulate matter affecting the amount of light that is scattered or absorbed by a fluid) both years. This is of concern because high turbidity concentrations can cause fish mortality, reduce

fish feeding efficiency and decrease food availability (Berg and Northcote 1985; McLeay *et al.* 1987; Gregory and Northcote 1993; Velagic 1995). Prolonged exposure to elevated concentrations of inorganic sediment can caused decreased growth in salmonids (Shaw and Richardson 2001). The magnitude and degree of the potential water-quality alteration is unknown because the specific sedimentation and turbidity rates have not been predicted. The actual sedimentation and turbidity rates would depend in part on the amount of time required to install the coffer dam diversions each year. Gross increases in sedimentation and turbidity owing to construction activities are not likely because the applicant proposes to implement and maintain erosion control measures, and construction activities will occur in the dewatered portion of the stream. Although NMFS expects that turbidity and sedimentation rates will increase during installation and deconstruction of the temporary diversion each year, these increases are not expected to be sufficient to diminish the functional value of habitat and as a result adversely affect steelhead because increases are localized, and of less magnitude than steelhead can experience as part of natural storm-flow events at other times of the year. Turbidity should quickly return to baseline levels after the diversion is installed or removed, and be negligible after 100-feet or less downstream of the point of disturbance based on observations of similar disturbances to stream sediments. Further, diversion installation and other work activities will be conducted during the dry season when stream flows are lowest allowing for greater ease in setting up diversion structures and less opportunity for sediment to be transported far downstream.

An accidental release of drilling mud has the potential to cause a temporary increase in sedimentation and turbidity within the receiving water of the action area. Similar to the analysis related to the installation and deconstruction of the diversion, the magnitude and degree of the potential water-quality alteration in the event of an accidental release of drilling mud is unknown because the specific sedimentation and turbidity rates have not been predicted. The actual sedimentation and turbidity rates would depend in part on the amount of streamflow and the volume of drilling mud released.

Based on NMFS' experience with other similar proposed actions, increased turbidity and sedimentation rates are not expected to be sufficient to permanently diminish the functional value of habitat. The turbidity and sedimentation in these events would be localized and of less magnitude than can occur as part of natural-flow events. Also, a contingency plan will be implemented to reduce the likelihood and extent of accidental releases of drilling mud. Work activities will be conducted during the dry season when stream flow is lowest, allowing for greater ease in setting up containment structures and less opportunity for sediment or drilling mud to be carried downstream. Finally, the pooled habitat in this area is extensive and steelhead would have the ability and space move away from such a disturbance and its associated impacts.

Operation of heavy equipment in the river channel is not expected to result in alterations to water quality that will impact steelhead. The work areas will be isolated and dewatered such that all equipment and vehicles will operate only outside of flowing water. In addition, vehicles will be monitored for leaks and repaired as necessary to prevent or stop leakage, spill-cleanup materials will be stored onsite, and all servicing and staging of vehicles will be conducted away from the stream channel.

2.4.6 Loss of Aquatic Insects

The benthic (bottom-dwelling) aquatic insect assemblage of most waterways typically comprises numerous species. Food resources are important in supporting rearing functions for juvenile steelhead. Aquatic insects provide a source of food for stream fish populations, and may represent a substantial portion of food items consumed by juvenile steelhead at various times of a year. The section of stream to be dewatered for the proposed action consists mainly of a large pool with a section of riffle feeding it from upstream. Some species of insects are found in swift-water habitats such as riffle and runs, whereas other species are found in slow-water habitats such as glides and pools. Riffles are generally accepted as the principal food-producing habitat in streams. Nevertheless, any activity that affects instream habitat could reasonably be expected to affect these food resources.

Individual benthic aquatic insects in the immediate instream work area are expected to be lost when this section of river is dewatered between the coffer dams during both years of construction. Similarly, in the event of an accidental release of drilling mud, aquatic insects could be lost if clean-up and containment of the drilling mud requires isolation and potential dewatering of a small portion of the stream. However, in either instance the flow will be reestablished and insects from upstream areas will re-colonize the affected area. Therefore, effects from the loss of aquatic insects from the dewatered stream channel in either instance will be temporary because instream removal activities will be relatively short-lived, and rapid (on the order of one to two months) re-colonization of these areas by macro-invertebrates is expected (Thomas 1985; Harvey 1986). Furthermore, the effect of insect loss on steelhead downstream of the diversion is likely to be negligible because food from upstream sources (via macroinvertebrate drift through the diversion pipe) would be available to steelhead immediately downstream of the affected area.

2.4.7 Disturbance to Streamside Vegetation

Streamside vegetation provides numerous functional values to the stream that may benefit migrating and rearing steelhead (Hall and Lantz 1969; Karr and Schlosser 1978; Lowrance *et al.* 1985; Wesche *et al.* 1987; Gregory *et al.* 1991; Platts 1991; Welsch 1991; Castelle *et al.* 1994; Lowrance *et al.* 1995; Wang *et al.* 1997). Disturbance or removal of streamside vegetation has the potential to adversely affect steelhead by reducing the capacity of the stream to provide these benefits (*i.e.*, shading, cover, allochthonous biological inputs to support instream productivity and food resources) to steelhead instream. Overall, the length of streambank that is anticipated will be disturbed or modified as part of the proposed action for both the construction of the new bridge and demolition of the existing bridge is 477-feet on the north bank of the river and 434-feet on the south bank. Currently, about 100-feet of bank on each side of the stream is void of much vegetation as a result of the existing bridge and associated riprap protection armoring the abutments and streambank. Therefore, there is potential for vegetation to be newly disturbed or removed from portions of about 375-feet of the north bank and 335-feet of the south bank as a result of construction of access roads and activities related to construction of the new bridge. Modifications to about 160-feet of bank on each side of the river is expected to be permanent in the form of the new bridge and supporting abutments that will remain once the proposed action is

complete. The permanently removed vegetation does not currently contribute to measurable shade or cover for steelhead within the action area.

Overall, the effects to steelhead resulting from the disturbance or removal of streamside vegetation as a result of the proposed action are expected to be insignificant for several of the following factors. Once the proposed action is complete the disturbed areas, including portions of the bridge abutment treated with ungrouted and backfilled riprap, will be replanted and expected to recover to pre-action levels within two years based on NMFS experience with similar proposed actions over the last ten years in southern California streams. While it may take a couple years for the vegetation to recover fully, this portion of the Santa Ynez River is lower in the watershed where the river is wider and vegetation currently grows mainly on the along margins and bank of the river. As a result, streamside vegetation that will be disturbed, currently only provides minimal direct overhead shade, cover, and biological inputs to the stream and therefore, its current benefit or temporary loss as it grows back after removal is expected to be minimal. This assessment of vegetation in the action area appears consistent with general observations of medium to larger-sized streams. In these streams moving downstream from the headwaters results in the stream channel becoming wider and biological inputs from overhanging riparian vegetation decreases in abundance and importance relative to primary production driven by sunlight (Vannote et. al 1980).

2.5 Cumulative Effects

"Cumulative effects" are those effects of future state or private activities, not involving Federal activities, that are reasonably certain to occur within the action area of the Federal action subject to consultation (50 CFR 402.02). 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 ESA.

Cumulative effects include the effects of future state, local or private actions that are reasonably certain to occur in the action area considered in this biological opinion. NMFS is generally familiar with activities occurring in the action area, and at this time is unaware of such actions that would be reasonably certain to occur. 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 Endangered Species Act. Consequently, NMFS believes no cumulative effect, beyond the continuing effects of present land uses as described in the Environmental Baseline (Section 2.3), is likely.

2.6 Integration and Synthesis

The Integration and Synthesis section is the final step in our assessment of the risk posed to the species as a result of implementing the proposed action. In this section, we add the effects of the action (Section 2.4) to the environmental baseline (Section 2.3) and the cumulative effects (Section 2.5), taking into account the status of the species (Section 2.2), to formulate the agency's biological opinion as to whether the proposed action is likely to: (1) reduce appreciably the likelihood of both the survival and recovery of a listed species in the wild by reducing its numbers, reproduction, or distribution.

Juvenile steelhead (as well as possibly an estimated two adults) have the potential to be present in the action area during the time the proposed action will be implemented and therefore, subject to direct and indirect effects associated with aspects of the proposed action. The main risks that these individuals will be exposed to are identified in the effects analysis as the temporary adverse effects (*i.e.*, reduction in rearing habitat, increased competition for food resources after being relocated to habitats already occupied by other rearing juvenile steelhead) due to loss of habitat from the portions of stream to be dewatered as well as potential harm or mortality during the process of capture and relocation during the dewatering activities. Dewatering activities for the proposed action are associated with the isolation of the work areas for the construction of the new bridge, demolition of the existing bridge, and potentially the containment and remediation of an accidental release of drilling mud. The severity of the temporary adverse effects from rearing habitat reduction are expected to be reduced by the temporary nature of the diversions (to be removed completely after each instream construction season is complete) and the ability of adjacent instream habitats to provide similar quality rearing function to steelhead relocated there from the work areas to be dewatered.

Overall, some long-term benefit to steelhead may occur as a result of implementation of the proposed action. By removing the existing bridge including its eight pilings and extensive riprap and replacing it with a bridge that will have only two pilings at depths great enough to alleviate the need for riprap to protect from scour, it is expected the proposed action will promote a more natural and unimpeded flow through this portion of the reach. As a result steelhead migration through the reach over the long-term should occur with slightly greater ease.

NMFS concludes non-lethal take of no more than 100 juvenile and 2 adult steelhead (*i.e.*, 50 juveniles and 1 adult for each of two years of construction) that may be captured and relocated as a result of dewatering within the action area, with a potential lethal take of no more than 2% (2 juveniles) out of the 100. No lethal take is anticipated for captured adults. These 100 individuals represent a small fraction of steelhead within the Santa Ynez River, evident in the fact that while up to 50 juvenile and 1 adult steelhead may occupy the reach within the action area in a given year, the annual population of steelhead in the Santa Ynez River watershed has ranged from at least 1000 to 3500 juveniles and up to 15 adults in recent years. As such a small fraction of steelhead affected by the proposed action, these effects are not expected to noticeably impact the overall population of the Santa Ynez River, and as such, the proposed action is thereby not expected to jeopardize the larger SC DPS as whole over the short or long-term or result in a lower potential for achieving recovery goals for the species.

2.7 Conclusion

After reviewing and analyzing the current status of the listed species, the environmental baseline within the action area, the effects of the proposed action, any effects of interrelated and interdependent activities, and cumulative effects, it is NMFS' biological opinion that the proposed action is not likely to jeopardize the continued existence of the endangered SC DPS of steelhead.

2.8 Incidental Take Statement

Section 9 of the ESA and Federal regulations pursuant to section 4(d) of the ESA prohibit the take of endangered and threatened species, respectively, without a 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. "Harm" is further defined by regulation to include significant habitat modification or degradation that actually kills or injures fish or wildlife by significantly impairing essential behavioral patterns, including breeding, spawning, rearing, migrating, feeding, or sheltering (50 CFR 222.102). "Incidental take" is defined by regulation as takings that result from, but are not the purpose of, carrying out an otherwise lawful activity conducted by the Federal agency or applicant (50 CFR 402.02). Section 7(b)(4) and section 7(o)(2) provide that taking that is incidental to an otherwise lawful agency action is not considered to be prohibited taking under the ESA if that action is performed in compliance with the terms and conditions of this incidental take statement.

2.8.1 Amount or Extent of Take

In the biological opinion, NMFS determined that incidental take would occur as follows:

For reasons discussed within this biological opinion, NMFS believes the proposed action on Santa Ynez River on VAFB property near Lompoc, California, will result in the incidental take (capture, injury, and mortality) of steelhead when portions of the action area are dewatered, and when juvenile steelhead are captured for relocation to suitable habitats outside the dewatered areas. NMFS anticipates no more than 100 juvenile and 2 adult steelhead will be captured relocated during implementation of the proposed action and that no more than 2 of the 100 juvenile steelhead captured, may be killed. Incidental take will have been exceeded if more than 100 juvenile or 2 adult steelhead are captured, or more than 2 juvenile or 1 adult steelhead are killed as a result of activities associated with the proposed action. The accompanying biological opinion does not anticipate any other form of take incidental to the proposed action.

2.8.2 Effect of the Take

In the biological opinion, NMFS determined that the amount or extent of anticipated take, coupled with other effects of the proposed action, is not likely to result in jeopardy to the species.

2.8.3 Reasonable and Prudent Measures

"Reasonable and prudent measures" are nondiscretionary measures that are necessary or appropriate to minimize the impact of the amount or extent of incidental take (50 CFR 402.02). NMFS believes following reasonable and prudent measures are necessary and appropriate to minimize and monitor incidental take of steelhead. The results of the effect analysis provide the basis for the following reasonable and prudent measures:

1. Employ a fisheries biologist for the purposes of monitoring the affected area, and for removing and relocating steelhead from the affected area.

2. Minimize effects of bridge construction, bridge demolition, and dewatering events on steelhead.

3. Monitor the stream channel in the action area in the vicinity of the fiber-optic line installation during active bore activities for the purpose of identifying, containing, and remediating the accidental release of drilling mud.

4. Report activities to NMFS associated with minimizing and monitoring the proposed action's effects on steelhead.

2.8.4 Terms and Conditions

The terms and conditions described below are non-discretionary, and VAFB or any applicant must comply with the terms and conditions, which implement the reasonable and prudent measures (50 CFR §402.14). VAFB or any applicant has a continuing duty to monitor the impacts of incidental take and must report the progress of the action and its impact on the species as specified in this incidental take statement (50 CFR §402.14). If the entity to whom a term and condition is directed does not comply with the following terms and conditions, protective coverage for the proposed action would likely lapse.

1. The following terms and conditions implement reasonable and prudent measure No. 1.

    A. At least 3 fisheries biologists shall continuously monitor the placement and removal of the two water diversions (sandbag dam and culvert) to ensure all steelhead are removed from the respective affected areas to be dewatered. The biologists shall capture steelhead stranded in residual wetted areas as a result of streamflow diversion and workspace dewatering, and relocate steelhead to a suitable instream location immediately downstream of the workspace. One or more of the following NMFS approved methods shall be used to capture steelhead: dip net, seine net, throw net, or by hand.

    B. The habitat(s) to be used for relocation of steelhead shall be identified and evaluated for suitability of steelhead occupancy by the fisheries biologists prior to dewatering and/or capture of any steelhead. The fisheries biologists shall evaluate potential relocation sites based on attributes such as adequate water quality (at a minimum dissolved oxygen and temperature shall be a measured), cover (instream and over-hanging vegetation or woody debris), and living space. Multiple relocation habitats may be necessary to prevent overcrowding of a single habitat depending on the number of steelhead captured, current number of steelhead already occupying the relocation habitat(s), and the size of the available habitat(s) to be relocated to.

    C. The fisheries biologists for the proposed action shall monitor construction activities, instream habitat, and performance of sediment control/detention devices for the purpose of identifying and reconciling any condition (*i.e.,* associated effects from increased sedimentation or turbidity noted in the effects section of this biological opinion) that could adversely affect steelhead or their

habitat. The biologist shall be empowered to halt work activity and to recommend measures for avoiding adverse effects to steelhead and their habitat.

D. A fisheries biologist shall contact NMFS (Matt McGoogan, 562-980-4026) immediately if one or more steelhead are found dead or injured. The purposes of the contact shall be to review the activities resulting in take, to determine if additional protective measures are required, and to discuss handling procedures for injured or dead steelhead.

E. If a steelhead mortality does occur, a fisheries biologist shall coordinate with NMFS (Matt McGoogan, 562-980-4026) to ship the carcass as soon as possible on dry ice through overnight, express mail to NMFS Southern California Office (Matt McGoogan, 501 W. Ocean Blvd., Suite 4200, Long Beach, California 90802).

2. The following terms and conditions implement reasonable and prudent measure No. 2.

A. The biologists shall check equipment daily for leaks prior to beginning any construction activities and throughout the day as necessary to ensure equipment is functioning properly and minimize release or threat of release of hazardous materials into the stream environment. If leaks are detected the biologists shall be empowered to halt work to have equipment repaired and/or any released hazardous fluid to be properly cleaned and removed from the action area.

B. A spill kit shall be stored near the river to have it readily available during construction in case of contaminant release such that term and condition No. 2 (A) above can be achieved in the most efficient manner.

C. VAFB shall ensure that the diversion culvert is installed in a manner that provides sufficient depth (at least 6-inches) for the passage of smolts through the diversion. If multiple culverts are used, the culverts shall be arranged with one culvert at a slightly lower elevation to ensure to maintain sufficient downstream passage depth and concentration of flow for the greatest amount of time possible as flows decrease.

D. VAFB shall monitor and report the re-vegetation of the action area. VAFB shall take a series of photos of the action area in a manner that will document the vegetation in the action area that will be disturbed, the level of disturbance to the vegetation as a result of implementing the proposed action, and the progression of vegetation recovery to the area after the proposed action is complete. To this end, VAFB shall take the first photo series directly before construction activities begin and prior to any disturbance of vegetation as a result of the proposed action. The second photo series will be taken directly after instream construction activities are complete, the diversions are removed, and water is flowing through the site again. The remaining two photo series shall be taken at intervals of one and five years after the completion of the proposed action and during the summer of each of those years. VAFB shall take each photo series from the same angles and

locations to ensure meaningful comparability between the series. From the photos and site observations VAFB shall develop an assessment as to the degree of vegetation recovery within the action area after the final photo series is complete (5-years after the completion of the proposed action).

3. The following terms and conditions implement reasonable and prudent measure No. 3.

   A. VAFB's shall submit a written request for NMFS agreement that the contingency plan for accidental releases of drilling mud developed by the contractor is sufficient for protecting steelhead and minimizing effects to steelhead. VAFB shall send this request to NMFS (Matt McGoogan, 501 W. Ocean Blvd., Suite 4200, Long Beach, California 90802) at least 60-days prior to the start of fiber optic line boring activities for the proposed action. Activities associated with the proposed action that have the potential to adversely affect steelhead may not commence without NMFS' written agreement with the contingency plan.

   B. At least 3 fisheries biologist shall continuously monitor the instream habitat and streambank at least 200-feet upstream and downstream of the centerline of the bore path during boring activities for evidence of accidental releases of drilling mud. There should be one biologist on the north bank, one on the south bank, and one in or with access to the wetted stream channel in a method that will not noticeably increase turbidity in the stream (*e.g.*, use of a kayak).

   C. During bore operations the biologists will maintain the ability to instantly communicate (*i.e.*, by cell phone, walkie-talkie, voice, etc.) with the bore operator or someone on site that can communicate to the bore operator to stop when an accidental release of drilling mud or other problem is observed as a result of the proposed action. If an accidental release of drilling mud is observed, the biologists will be empowered to immediately stop work activities and work with crews to assess the best mode of containment and clean-up.

   D. The biologists shall monitor placement and removal of drilling mud containment materials to remove steelhead that could be adversely affected. Prior to closing a containment area the biologists shall attempt to guide any visible remaining steelhead out of the area. The biologist shall capture steelhead in residual wetted areas if a contained instream space needs to be dewatered, and then relocate steelhead to a suitable instream location upstream or downstream of the containment area. The biologist shall note the number of steelhead observed in the affected area, the number of steelhead relocated, and the date and time of the collection and relocation. One or more of the following methods shall be used to capture steelhead: dip net, seine, throw net, or by hand.

   E. The fisheries biologists shall ensure that any containment area is cleared of steelhead prior to the use of vacuum collection of mud and/or water from the contained area.

F. If an accidental release of drilling mud occurs in the wetted stream channel, a fisheries biologist shall contact NMFS (Matt McGoogan, 562-980-4026) as soon as practicable after the accidental release of drilling mud is contained.. The purpose of the contact shall be to review the nature and magnitude of the release, discuss the most appropriate course for remediation of the discharge, and to determine if additional protective measures are required.

4. The following terms and conditions implement reasonable and prudent measure No. 4.

A. VAFB shall provide a written monitoring report to NMFS (Matt McGoogan, 501 W. Ocean Blvd., Suite 4200, Long Beach, California 90802) within 30 days following completion of the proposed action. The report shall include the number of steelhead killed or injured during the proposed action and biological monitoring; the number and size of steelhead removed and relocated; latitude and longitude coordinates of the action area; the length of the stream that was dewatered; the area of the creek reach that was dewatered; the habitat type(s) present in the area that was dewatered and estimated percent of each (*i.e.*, % pool, % riffle, % run, % glide, % side channel, etc); results of the water quality monitoring; any effect of the proposed action on steelhead that was not previously considered (re-initiation of consultation may be required, see section IX (2) of the biological opinion); and, photographs taken during, before and after work activity.

B. VAFB shall provide a written report to NMFS (Matt McGoogan, 501 W. Ocean Blvd., Suite 4200, Long Beach, California 90802) describing the results of the re-vegetation and wetland restoration monitoring to NMFS within 30-days following completion of the site inspections at one and five years following completion of the proposed action. These reports shall include color photographs taken of the action area during each inspection and before and after implementation of the proposed action, and estimated percent of exposed soil remaining within each area affected by the proposed action.

2.9 Conservation Recommendations

Section 7(a)(1) of the ESA directs Federal agencies to use their authorities to further the purposes of the ESA by carrying out conservation programs for the benefit of the threatened and endangered species. Specifically, conservation recommendations are suggestions regarding discretionary measures to minimize or avoid adverse effects of a proposed action on listed species or regarding the development of information (50 CFR §402.02).

NMFS recommends that VAFB remove all or part of the existing 35th Street bridge abutments. As stated previously the proposed wetland restoration will likely only provide a temporary and limited benefit to steelhead and other species as the hydrologic conditions caused by the 35th Street Bridge abutments will not change and will likely cause the restoration site to fill in again over time and return to current conditions. As such, the proposed wetland restoration is not expected to provide a meaningful long-term benefit. Removing the 35th Street Bridge abutments is expected to restore hydrologic function and provide long-term benefit to steelhead in the form of increased living space and a more properly functioning and dynamic estuary.

2.10 Reinitiation of Consultation

This concludes formal consultation for VAFB.

As 50 CFR §402.16 states, re-initiation of formal consultation is required where discretionary Federal agency involvement or control over the action has been retained or is authorized by law and if: (1) the amount or extent of incidental taking specified in the incidental take statement is exceeded, (2) new information reveals effects of the agency action that may affect listed species in a manner or to an extent not considered in this opinion, (3) the agency action is subsequently modified in a manner that causes an effect to the listed species that was not considered in this opinion, or (4) a new species is listed that may be affected by the action.

3. DATA QUALITY ACT DOCUMENTATION AND PRE-DISSEMINATION REVIEW

The Data Quality Act (DQA) specifies three components contributing to the quality of a document. They are utility, integrity, and objectivity. This section of the opinion addresses these DQA components, documents compliance with the DQA, and certifies that this opinion has undergone pre-dissemination review.

3.1 Utility

Utility principally refers to ensuring that the information contained in this consultation is helpful, serviceable, and beneficial to the intended users. The intended user of this opinion is VAFB. Other interested users could include the U.S. Fish and Wildlife Service, U.S. Army Corps of Engineers, and the California Department of Fish and Wildlife. Individual copies of this opinion were provided to VAFB. This opinion will be posted on the Public Consultation Tracking System web site (https://pcts.nmfs.noaa.gov/pcts-web/homepage.pcts). The format and naming adheres to conventional standards for style.

3.2 Integrity

This consultation was completed on a computer system managed by NMFS in accordance with relevant information technology security policies and standards set out in Appendix III, 'Security of Automated Information Resources,' Office of Management and Budget Circular A-130; the Computer Security Act; and the Government Information Security Reform Act.

3.3 Objectivity

Information Product Category: Natural Resource Plan

Standards: This consultation and supporting documents are clear, concise, complete, and unbiased; and were developed using commonly accepted scientific research methods. They adhere to published standards including the NMFS ESA Consultation Handbook, ESA regulations, 50 CFR 402.01 et seq., and the MSA implementing regulations regarding EFH, 50 CFR 600.

Best Available Information: This consultation and supporting documents use the best available information, as referenced in the References section. The analyses in this opinion contain more background on information sources and quality.

Referencing: All supporting materials, information, data and analyses are properly referenced, consistent with standard scientific referencing style.

Review Process: This consultation was drafted by NMFS staff with training in ESA, and reviewed in accordance with West Coast Region ESA quality control and assurance processes.

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APPENDIX F: Species Observed During Field Surveys

Table F-1. Plant species observed within the Proposed Action Area.

Species	Common Name	Status
Acer negundo	Box elder	Native
Ambrosia psilostachya	Western ragweed	Native
Amsinkia sp.	Fiddleneck	Native
Apium graveolens	Wild celery	Non-native
Artemisia californica	California sagebrush	Native
Artemisia douglasiana	Mugwort	Native
Arundo donax	Giant reed	Non-native
Astragalus nuttallii	Nuttall's milkvetch	Native
Atriplex lentiformis	Quail bush	Native
Avena barbata	Slender wild oat	Non-native
Baccharis glutinosa	Marsh baccharis	Native
Baccharis pilularis	Coyote brush	Native
Baccharis salicifolia	Seep willow	Native
Bolboschoenus maritimus	Bulrush	Native
Brassica nigra	Black mustard	Non-native
Bromus diandrus	Rip-gut brome	Non-native
Bromus madritensis	Red brome	Non-native
Carduus pycnocephalus	Italian thistle	Non-native
Carpobrotus sp.	Ice plant	Non-native
Centaurea melitensis	Tacolte	Non-native
Chenopodium murale	Nettle-leaf goosefoot	Non-native
Cirsium vulgare	Bull thistle	Non-native
Conium maculatum	Poison hemlock	Non-native
Cotula coronopifolia	Brass buttons	Non-native
Croton californicus	Croton	Native
Cuscuta salina	Salt marsh dodder	Native
Cynodon dactylon	Bermuda grass	Non-native
Cyperus eragrostis	Umbrella sedge	Native
Delairea odorata	German ivy	Non-native
Distichlis spicata	Salt grass	Native
Elymus condensatus	Giant wild rye	Native
Elymus triticoides	Alkali wild rye	Native
Epilobium ciliatum	Willow herb	Native
Ericameria ericoides	Mock heather	Native
Erigeron canadensis	Horseweed	Native
Erodium cicutarum	Red-stem filaree	Non-native
Euphorbia peplus	Petty spurge	Non-native
Foeniculum vulgare	Fennel	Non-native
Frankenia salina	Alkali heath	Native
Helenium puberulum	Sneeze weed	Native

Species	Common Name	Status
Heliotropium curassavicum	Salt heliotrope	Native
Heterotheca grandiflora	Telegraph weed	Native
Hirschfeldia incana	Perrenia mustard	Non-native
Hoita orbicularis	Creeping leather root	Native
Jaumea carnosa	Fleshy jaumea	Native
Juncus ensifolius	Swordleaf rush	Native
Juncus textilis	Basketry rush	Native
Lactuca serriola	Prickly lettuce	Non-native
Malva nicaeensis	Bull mallow	Non-native
Marah fabacea	Manroot	Native
Marrubium vulgare	Horehound	Non-native
Medicago polymorpha	Bur clover	Non-native
Melilotus albus	White sweet clover	Non-native
Melilotus indicus	Yellow sweet clover	Non-native
Mentha arvensis	Field mint	Non-native
Mimulus aurantiacus	Bush monkeyflower	Native
Mimulus guttatus	Common monkeyflower	Native
Nasturtium officinale	European watercress	Non-native
Nicotiana glauca	Tree tobacco	Non-native
Phacelia distans	Common phacelia	Native
Picris echioides	Bristly ox-tongue	Non-native
Plantago cornopus	Cutleaf plantain	Non-native
Polypogon interruptus	Ditch beard grass	Non-native
Polypogon monspeliensis	Rabbitfoot grass	Non-native
Populus fremontii	Cottonwood	Native
Pseudognaphalium stramineum	Annual everlasting	Native
Rhamnus californica	California coffeeberry	Native
Rhaphanus sativus	Wild radish	Non-native
Ribes divaricatum	Spreading gooseberry	Native
Rubus ursinus	Blackberry	Native
Rumex crispus	Curley dock	Non-native
Rumex salicifolius	Willow-leafed dock	Native
Sambucus nigra	Blue elderberry	Native
Salicornia pacifica	Pickleweed	Native
Salix exigua	Sandbar willow	Native
Salix laevigata	Red willow	Native
Salix lasiandra	Shining willow	Native
Salix lasiolepis	Arroyo willow	Native
Salsola tragus	Russian thistle	Non-native
Schoenoplectus americanus	American three-square	Native
Schoenoplectus californicus	California tule	Native
Scrophularia californica	California figwort	Native

Species	Common Name	Status
Silybum marianum	Milk thistle	Non-native
Sonchus asper	Prickly sow thistle	Non-native
Sonchus oleracues	Common sow-thistle	Non-native
Sparganium eurycarpum	Bur reed	Native
Stipa miliacea	Smilo grass	Non-native
Symphyotrichum chilense	Pacific aster	Native
Typha latifolia	Broadleaf cattail	Native
Toxicodendron diversilobum	Poison oak	Native
Urtica dioica	Stinging nettle	Native
Verbena lasiostachys	Vervain	Native
Vulpia myuros	Rattail fescue	Non-native

Table F-2. Animal species observed within the proposed project areas during surveys in 2013 through 2014 (MSRS 2014a, MSRS 2014b, MSRS 2014d). Special status species are shown in red.

Species name	Common name	Status	Occurrence*	Source
Fish				
Gasterosteus aculeatus	Armored threespine stickleback	Native	Observed	MSRS 2014d
Platichthys stellatus	Starry flounder	Native	Historic	Swift et al 1997
Ictalurus punctatus	Channel catfish	Non-native	Historic	SRS 2004
Ameiurus sp.	Catfish	Non-native	Observed	MSRS 2014d
Gambusia affinis	Western mosquito fish	Non-native	Observed	MSRS 2014d
Leptocottus armatus	Pacific staghorn sculpin	Native	Observed	MSRS 2014d
Cottus asper	Prickly sculpin	Native	Observed	MSRS 2014d
Eucyclogobius newberryi	Tidewater goby	Native; FE, CSC	Observed	MSRS 2014d
Oncorhynchus mykiss	Southern steelhead	Native, FE, CSC	Observed	MSRS 2014b
Micropterus salmoides	Largemouth bass	Non-native	Observed	MSRS 2014d
Lepomis cyanellus	Green sunfish	Non-native	Historic	Swift et al 1997
Cyprinus carpio	Common carp	Non-native	Observed	MSRS 2014d
Pimephales promelas	Fathead minnow	Non-native	Historic	SRS 2004
Gilia orcutti	Arroyo chub	Native	Historic	SRS 2004
Reptiles and Amphibians				
Anaxyrus boreas	Western toad	Native	Observed	SRS 2004
Rana draytonii	California red-legged frog	Native; FT, CSC	Observed	MSRS 2014d
Lithobates catesbeiana	American bullfrog	Non-native	Observed	MSRS 2014d
Pseudacris hypochondriaca	Baja chorus frog	Native	Observed	MSRS 2014d
Actinemys pallida	Southwestern pond turtle	Native, CSC	Observed	MSRS 2014d
Elgaria multicarinata	Southern alligator Lizard	Native	Potential	
Uta stansburiana	Side-blotched lizard	Native	Observed	MSRS 2014a
Sceloporus occidentalis	Western fence lizard	Native	Observed	MSRS 2014a
Pituophis catenifer	Gopher snake	Native	Observed	MSRS 2014c
Lampropeltis getula	California kingsnake	Native	Observed	MSRS 2014c
Thamnophis hammondii	Two-striped gartersnake	Native, CSC	Potential	
Thamnophis sirtalis	Common gartersnake	Native	Observed	MSRS 2014c
Crotalus oreganus	Southern pacific rattlesnake	Native	Observed	MSRS 2014c

Species name	Common name	Status	Occurrence*	Source
Birds				
Botarus lentiginosus	American bittern	Native	Historic	Holmgren & Collins 1999
Podiceps nigricollis	Eared grebe	Native, nesting on site	Observed	MSRS 2014a
Podilymbus podiceps	Pied-billed grebe	Native, likely to nest on site	Observed	MSRS 2014d
Ardea herodias	Great blue heron	Native	Observed	MSRS 2014a
Ardea alba	Great egret	Native	Observed	MSRS 2014a
Nycticorex nycticorax	Black-crowned night heron	Native, likely to nest on site	Historic	SRS 2004
Branta canadensis	Canada goose	Native	Historic	SRS 2004
Anas platyrhynchos	Mallard	Native, likely to nest on site	Observed	MSRS 2014a
Anas strepera	Gadwall	Native, likely to nest on site	Observed	MSRS 2014c
Anas americana	American wigeon	Native, wintering	Observed	MSRS 2014d
Anas crecca	Green-winged teal	Native, wintering	Observed	MSRS 2014d
Oxyura jamaicensis	Ruddy duck	Native, nesting on site	Observed	MSRS 2014d
Cathartes aura	Turkey vulture	Native	Observed	MSRS 2014a
Elanus leucurus	White-tailed kite	Native	Historic	SRS 2004
Circus cyaneus	Northern harrier	Native	Observed	MSRS 2014a
Accipiter striatus	Sharp-shinned hawk	Native, wintering	Historic	SRS 2004
Accipiter cooperii	Cooper's hawk	Native, likely to nest on site	Observed	MSRS 2014c
Buteo lineatus	Red-shouldered hawk	Native, likely to nest on site	Historic	SRS 2004
Buteo jamaicensis	Red-tailed hawk	Native, likely to nest on site	Observed	MSRS 2014a
Buteo regalis	Ferruginous hawk	Native, wintering, BCC	Historic	SRS 2004
Aquila chrysaetos	Golden eagle	Native, BCC	Historic	SRS 2004
Falco sparverius	American kestrel	Native, likely to nest on site	Observed	MSRS 2014a
Falco columbarius	Merlin	Native, wintering	Historic	SRS 2004
Falco peregrinus	Peregrine falcon	Native	Observed	MSRS 2014d
Callipepla californica	California quai;	Native, likely to nest on site	Historic	SRS 2004
Fulica americana	American coot	Native, likely to nest on site	Observed	MSRS 2014a
Rallus limicola	Virginia rail	Native, likely to nest on site	Observed	MSRS 2014a
Porzana carolina	Sora	Native, likely to nest on site	Observed	MSRS 2014a
Charadrius vociferus	Killdeer	Native, nesting on site	Observed	MSRS 2014a
Zenaida macroura	Mourning dove	Native, likely to nest on site	Historic	SRS 2004
Tyto alba	Barn owl	Native	Observed	MSRS 2014a
Bubo virginianus	Great horned owl	Native, nesting on site	Observed	MSRS 2014a

Species name	Common name	Status	Occurrence*	Source
Calypte anna	Anna's hummingbird	Native, likely to nest on site	Observed	MSRS 2014a
Selasphorus sasin	Allen's hummingbird	Native, likely to nest on site, BCC	Observed	MSRS 2014a
Ceryle alcyon	Belted kingfisher	Native	Observed	MSRS 2014d
Picoides nuttallii	Nuttall's woodpecker	Native, likely to nest on site, BCC	Observed	MSRS 2014d
Colaptes auratus	Northern flicker	Native, likely to nest on site	Observed	MSRS 2014a
Empidonax railii extimus	Southwestern willow flycatcher	Native, FE, SE	Historic	Ball et al. 2012
Empidonax difficilis	Pacific-slope flycatcher	Native, likely to nest on site	Observed	MSRS, unpubl. data*
Sayornis nigricans	Black phoebe	Native, likely to nest on site	Historic	SRS 2004
Sayornis saya	Say's phoebe	Native, wintering	Observed	MSRS 2014a
Lanius ludovicianus	Loggerhead shrike	Native, likely to nest on site, BCC	Historic	Holmgren & Collins 1999
Vireo belli pusillus	Least Bell's vireo	Native, FE, SE	Historic	Holmgren & Collins 1999
Vireo huttoni	Hutton's vireo	Native, likely to nest on site	Observed	MSRS 2014a
Vireo gilvus	Warbling vireo	Native, likely to nest on site	Observed	MSRS, unpubl. data*
Aphelocoma californica	Western scrub jay	Native, likely to nest on site	Observed	MSRS 2014a
Corvus brachyrhynchos	American crow	Native, likely to nest on site	Observed	MSRS 2014a
Eremophila alpestris	Horned lark	Native	Observed	MSRS 2014a
Tachycineta bicolor	Tree swallow	Native, likely to nest on site	Observed	MSRS, unpubl. data*
Stelgidopteryx serripennis	Northern rough-winged swallow	Native, likely to nest on site	Historic	Holmgren & Collins 1999
Petrochelidon pyrrhonota	Cliff swallow	Native, likely to nest on site	Observed	MSRS 2014a
Hirundo rustica	Barn swallow	Native, likely to nest on site	Expected	
Poecile rufescens	Chestnut-backed chickadee	Native, likely to nest on site	Observed	MSRS 2014a
Psaltriparus minimus	Bushtit	Native, likely to nest on site	Observed	MSRS 2014a
Thryomanes bewickii	Bewick's wren	Native, likely to nest on site	Observed	MSRS 2014a
Cistothorus palustris	Marsh wren	Native, likely to nest on site	Observed	MSRS 2014c
Chamaea fasciata	Wrentit	Native, likely to nest on site	Observed	MSRS 2014a
Regulus calendula	Ruby-crowned kinglet	Native, wintering	Observed	MSRS 2014a
Polioptila caerulea	Blue-gray gnatcatcher	Native, likely to nest on site	Observed	MSRS 2014a
Catharus ustulatus	Swainson's thrush	Native, likely to nest on site	Observed	MSRS 2014d
Mimus polyglottos	Northern mockingbird	Native, likely to nest on site	Observed	MSRS 2014a
Toxostoma redivivum	California thrasher	Native, likely to nest on site	Observed	MSRS 2014a
Sturnus vulgaris	European starling	Non-native	Historic	SRS 2004

Species name	Common name	Status	Occurrence*	Source
Vermivora celata	Orange-crowned warbler	Native, likely to nest on site	Observed	MSRS, unpubl. data*
Dendroica petechia	Yellow warbler	Native, likely to nest on site	Observed	MSRS 2014c
Dendroica coronata	Yellow-rumped warbler	Native, wintering	Observed	MSRS 2014a
Dendroica townsendii	Townsend's warbler	Native, wintering	Observed	MSRS 2014d
Geothypis trichas	Common yellowthroat	Native, likely to nest on site	Observed	MSRS 2014a
Wilsonia pusilla	Wilson's warbler	Native, likely to nest on site	Observed	MSRS 2014a
Icteria virens	Yellow-breasted chat	Native, likely to nest on site, CSC	Observed	MSRS 2014c
Pheucticus melanocephalus	Black-headed grosbeak	Native, likely to nest on site	Observed	MSRS 2014c
Pipilo maculatus	Spotted towhee	Native, likely to nest on site	Observed	MSRS 2014a
Pipilo crissalis	California towhee	Native, likely to nest on site	Observed	MSRS 2014a
Passerculus sandwichensi	Savannah sparrow	Native, likely to nest on site	Observed	MSRS 2014c
Melospiza melodia	Song sparrow	Native, likely to nest on site	Observed	MSRS 2014d
Zonotrichia leucophrys	White-crowned sparrow	Native, wintering	Observed	MSRS 2014a
Passerella iliaca	Fox sparrow	Native	Observed	MSRS 2014d
Sturnella neglecta	Western meadowlark	Native	Observed	MSRS 2014a
Agelaius phoeniceus	Red-winged blackbird	Native, likely to nest on site	Observed	MSRS 2014a
Agelaius tricolor	Tricolored blackbird	Native	Historic	Holmgren & Collins 1999
Euphagus cyanocephalus	Brewer's blackbird	Native, likely to nest on site	Historic	SRS 2004
Molothrus ater	Brown-headed cowbird	Non-native	Historic	Holmgren & Collins 1999
Icterus bullockii	Bullock's oriole	Native, likely to nest on site	Expected	
Carpodacus mexicanus	House finch	Native, likely to nest on site	Observed	MSRS 2014a
Carduelis psaltria	Lesser goldfinch	Native, likely to nest on site	Observed	MSRS, unpubl. data*
Carduelis lawrencei	Lawrence's goldfinch	Native	Expected	
Carduelis tristis	American goldfinch	Native, likely to nest on site	Observed	MSRS, unpubl. data*
Passer domesticus	House sparrow	Non-native	Expected	
Mammals				
Sorex trowbridgii	Trowbridge's shrew	Native	Historic	SRS 2004
Scapanus latimanus	Broad-footed mole	Native	Observed	MSRS 2014c
Eptesicus fuscus	Big brown bat	Native	Historic	SRS 2004
Lasiurus blossevillii	Western red bat	Native, CSC	Historic	Pierson et al. 2002
Lasiurus cinereus	Hoary bat	Native	Historic	Pierson et al. 2002
Lasionycteris noctovagans	Silver-haired bat	Native	Historic	Pierson et al. 2002

Species name	Common name	Status	Occurrence*	Source
Myotic californicus	California myotis	Native	Historic	Pierson et al. 2002
Myotis yumanensis	Yuma myotis	Native	Historic	Pierson et al. 2002
Tadarida brasiliensis	Mexican free-tailed bat	Native	Historic	Pierson et al. 2002
Sylvilagus audubonii	Desert cottontail	Native	Historic	SRS 2004
Sylvilagus bachmani	Brush rabbit	Native	Observed	MSRS 2014a
Thomomys bottae	Valley pocket gopher	Native	Observed	MSRS 2014a
Castor canadensis	American beaver	Non-native	Observed	MSRS 2014d
Microtus californicus	California vole	Native	Observed	MSRS 2014a
Neotoma fuscipes	Dusky-footed woodrat	Native	Observed	MSRS 2014a
Peromyscus californicus	California mouse	Native	Historic	USACHPPM 1995
Peromyscus maniculatus	Deer mouse	Native	Historic	USACHPPM 1995
Reithrodontomys megalotis	Western harvest mouse	Native	Historic	USACHPPM 1995
Canis latrans	Coyote	Native	Observed	MSRS 2014a
Taxidea taxus	American badger	Native	Observed	MSRS 2014a
Mustela frenata	Long-tailed weasel	Native	Historic	SRS 2004
Mephitis mephitis	Striped skunk	Native	Expected	
Felis concolor	Mountain lion	Native	Expected	
Felis rufus	Bobcat	Native	Historic	SRS 2004
Odocoileus hemionus	Mule tail deer	Native	Observed	MSRS 2014a

Observed = Documented occurrence within the project area in the last 10 years
Historic = Most recent documented occurrence within the project area 10 or more years ag.
Potential = Known to occur on VAFB, suitable habitat within the project area, no documented occurrence
BCC = USFWS Bird Species of Conservation Concern
CSC = California Species of Special Concern
FE = Federally Endangered
FT = Federally Threatened
SE = California State Endangered
* MSRS, unpublished results of in progress riparian bird point count study; records from May – July 2014

APPENDIX G: Assessment of Wetland Habitats at the 13th Street Bridge Demolition and Replacement Site and the Wetland Mitigation Area

Assessment of Wetland Habitats at the 13th Street Bridge Demolition and Replacement Site and Wetland Mitigation Area

Vandenberg Air Force Base, California

January 2015

Prepared for

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Acronyms and Abbreviations

AA	Assessment Area
AFB	Air Force Base
CCS	Central Coast Scrub
cm	centimeter
CRAM	California Rapid Assessment Method
CSM	Coastal Salt Marsh
H	Herb stratum
FAC	Facultative Plant
FACU	Facultative Upland Plant
FACW	Facultative Wetland Plant
ft	feet
FWM	Freshwater Marsh
km	kilometer
km^2	square kilometer
m	meters
MSRS	ManTech SRS Technologies, Inc.
NG	Native Grassland
NNB	Non-native Broadleaf
NNG	Non-native Grassland
NNW	Non-native Woodland
OBL	Obligate Wetland Plant
OHWM	Ordinary High Watermark
RIP	Willow Riparian
RSP	Rock Slope Protection
RUD	Ruderal
S	Sapling/Shrub stratum
T	Tree stratum
UPL	Obligate Upland Plant
USACE	United States Army Corps of Engineers
USFWS	United States Fish and Wildlife Service
USDA	United States Department of Agriculture
V	Woody vine stratum
VAFB	Vandenberg Air Force Base
WIS	Wetland Indicator Status

1.0 Introduction

The Santa Ynez River is the largest drainage basin on Vandenberg Air Force Base (VAFB) (Coulombe & Mahrdt 1976). This 900 square miles (2,300 square kilometers [km^2]) drainage originates in the San Rafael Mountains and flows 70 miles (112.5 kilometers [km]) to the west through the communities of Solvang, Buellton and Lompoc before draining into a lagoon near Ocean Beach County Park. The river then enters the Pacific Ocean during flow events that breach the estuary's berm. The Santa Ynez River had perennial flow prior to the completion of Bradbury Dam in 1953, approximately 33.3 air miles (54.6 km) upstream. Approximately four miles (6.4 km) of the river runs through VAFB. This segment generally has flow throughout the year as a result of discharge of irrigation water from agricultural fields and treated effluent from the Lompoc Regional Wastewater Treatment Plant, located east of the VAFB boundary (Coulombe & Mahrdt 1976).

At present, the Santa Ynez River is intermittent, with highly fluctuating flow dependent on storm events and releases from the Bradbury Dam, which controls 47 percent of the watershed's annual runoff. The dam has reduced the magnitude and frequency of flood events, as well as the frequency and duration of lagoon breaching. These events play important roles in sustaining and renewing a mosaic of wetland, estuarine, and floodplain habitats within the estuary and lowest portion of the river (ESA PWA 2010).

On VAFB the 13th Street Bridge serves as the only on-base transport route and vehicle link spanning the Santa Ynez River and is a critical transportation link to support several VAFB programs. The bridge also supports utilities, including essential communication lines between North and South VAFB. The existing 13th Street Bridge was constructed in 1970. In 1981, the bridge was retrofitted due to structural deficiencies and inadequacy of the foundation to accommodate standard highway loading. In 2002, Penfield & Smith & Bengal Engineering evaluated the structural integrity of the bridge and found that the bridge was still unsafe for normal highway loads and at significant risk of collapse during a 5-year storm event (Penfield & Smith & Bengal 2002). During the summer of 2003, an emergency action was initiated to add micro-piles to support the existing steel pilings that were exposed due to continued degradation of the structure (USAF 2003). Additional rock riprap was placed along both the north and south channel banks in September 2005. These temporary repairs were designed to protect the existing bridge from imminent collapse during a 5-year storm event. However, the repairs were not designed to protect the bridge from collapse during larger storm events. In addition, the bridge is susceptible to collapse during a magnitude 4.0 (Richter scale) or larger earthquake and is structurally overstressed when large trucks (i.e., a standard 18-wheel truck with load) are required to transit across the bridge (Metcalf & Eddy, Inc., 2007).

To remedy this, VAFB proposes to undertake the following Proposed Action, which has four components: 1) construction of a new bridge on 13th Street over the Santa Ynez River and corresponding approach roads; 2) demolition and removal of the existing 13th Street Bridge and existing approach roads; 3) installation of a fiber optic communication cable under the Santa Ynez River, approximately 1,100 feet (ft) (350 meters [m]) west of the existing bridge; and 4) establishment of a Wetland Mitigation Area at the Santa Ynez River Estuary to offset any potential

project related impacts to wetlands that cannot be restored within the main Project Impact Area. The Proposed Action would occur in two areas within the lower Santa Ynez River area (Figure 1).

In spring 2014, a wetland delineation and a habitat scoring using the California Rapid Assessment Method (CRAM) was performed within the Proposed Action Area at the site of the 13th Street Bridge replacement and demolition and the Wetland Mitigation Area (Figure 1). The delineations and CRAM assessments were conducted by ManTech SRS Technologies, Inc. (MSRS) biologists experienced with federal wetland delineation and CRAM methodology. This report details the methods and results of the 2014 wetland delineation and CRAM assessments and presents an analysis of impacts.

Figure 1. Regional Map.

2.0 Methods

2.1 Wetland Delineation

Wetland surveys were conducted within the 13th Street Bridge Study Area and Wetland Mitigation Area in spring 2014. In addition to field surveys, 2013 aerial imagery of the Study Area and Wetland Mitigation Area and the Soil Survey of Northern Santa Barbara Area, California (United States Department of Agriculture [USDA] 1972) were consulted. Wetlands were delineated in accordance with United States Army Corps of Engineers (USACE) Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West Region (USACE 2008). Potential wetlands were evaluated for the presence of hydric vegetation, wetland hydrology, and hydric soils.

2.1.1. Vegetation

Hydric vegetation is defined as having more than 50 percent of the dominant species able to grow, effectively compete, reproduce, and/or persist in anaerobic soil conditions. When classifying vegetation, plants are grouped into four strata depending on growth habit and morphology (Table 1; USACE 2008). In cases where "Tree" and/or "Woody" vine strata had less the five percent total plant cover, any trees and vines present were combined with the "Sapling/Shrub" stratum (USACE 2008).

Table 1. Vegetation Strata

Code	Stratum	Description
H	Herb	All non-woody plants regardless of height
S	Sapling/Shrub	Woody plants less than 3.0 inch diameter at breast height regardless of height
T	Tree	Woody plants greater than or equal to 3 inches at breast height, regardless of height
V	Woody vine	Woody climbing plants regardless of height

Dominant species were determined for each strata using the "50/20 rule". Plants were evaluated in order of descending abundance until species comprising at least 50 percent of the vegetation in a particular stratum, as determined by relative cover, had been considered. Any additional species occupying at least 20 percent of the stratum were also listed as dominants. Relative cover was determined by visual estimation.

To determine if the vegetation present was hydric, the wetland indicator status (WIS) for dominant species was defined based on assignments from the National Wetland Plant List: 2013 Wetland Ratings (Lichvar 2013). For species not listed in Lichvar (2013), the National List of Vascular Plant Species that Occur in Wetlands (United States Fish and Wildlife Service [USFWS] 1997), was consulted as well. Plants were ranked in one of five categories (Table 2); unranked plants were assumed obligate upland (UPL) unless supporting evidence was available to the contrary.

The threshold for hydrophytic vegetation is met when 50 percent or more of the dominant species are rated facultative plants (FAC) or wetter. In borderline cases, such as those where all of the dominants were rated FAC or drier, Prevalence indices and FAC-Neutral Test results were used to

clarify status of the vegetation. The Prevalence Index takes all plants and their indicator status into account; it is not restricted to dominant species. Calculation of the Prevalence Index followed methods outlined in the Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West Region (USACE 2008), with numbers less than or equal to 3 supporting findings of hydrophytic vegetation. For a FAC-Neutral test the ratio of dominants rated FACW or wetter and dominants rated FACU or drier is calculated. Ratios equaling one or greater constitute positive results and support the designation of vegetation as hydric.

Table 2. Wetland Indicator Status

Code	WIS	Description
OBL	Obligate Wetland	Plants that almost always occur (estimated probability 99%) in wetlands under natural conditions, but may also occur rarely (estimate probability 1%) in non-wetlands
FACW	Facultative Wetland	Plants that usually occur (estimated probability 67% to 99%) in wetlands, but also occur (estimated probability 1% to 33%) in non-wetlands.
FAC	Facultative	Plants with a similar likelihood (estimated probability 33% to 67%) of occurring in both wetlands and non-wetlands.
FACU	Facultative Upland	Plants that sometimes occur (estimated probability 1% to 33%) in wetlands, but occur more often (estimated probability 67% to 99%) in non-wetlands.
UPL	Obligate Upland	Those plants that rarely (estimated probability 1%) occur in wetlands, but occur almost always (estimated probability 99%) in non-wetlands under natural conditions.

* Plants not assigned a WIS are assumed UPL unless there is supporting documentation available to the contrary.

2.1.2. Hydrology

Areas with wetland hydrology are either permanently or periodically inundated at mean water depths less than or equal to 6.6 ft, or the soil is saturated to the surface for at least 14 days during the growing season of the prevalent vegetation. Positive findings for wetland hydrology require the finding of at least one primary indicator or two secondary indicators (USACE 2008).

Plots were subject to visual inspection for indicators of hydrology such as inundation, water marks, drift lines, sediment deposits, drainage patterns in wetlands, and water stained leaves. Pits were excavated with a 16 inch bladed drain spade to a depth of at least 12 inches wherever possible to characterize depth of free water, depth of saturated soil, and determine the presence of oxidized rhizospheres surrounding live roots. FAC-Neutral test results were also considered when making a determination of wetland hydrology.

2.1.3. Soils

Hydric soils possess characteristics that are associated with reducing soil conditions, indicative of saturation, flooding, or ponding, for sufficient duration during the growing season to develop anaerobic conditions in the upper part (WTI 1995). To determine if reducing conditions were present, soil profiles were examined.

Test pits were excavated and an intact soil core section, at least 12 inches in height spanning the vertical range of the pit, was removed from each hole where possible. Buried rip-rap, rocks, gravel and tree roots limited the depth of excavation at some locations. Soil color and texture were characterized from this sample. Soil color was determined by the comparison of moist samples to the color plates in the Munsell Soil Color Charts (2000). Texture was evaluated by touch, following procedures adapted from S. Thien (WTI 2003). In cases where soil was too dry for color and textural evaluations, water was added. The vertical span and distribution of various soil layers, as determined by color and textural differences, was measured and noted.

2.1.4. Waters of the United States

The limits of jurisdictional waters of the United States were determined using the Ordinary High Watermark (OHWM). Identification of the OHWM was accomplished by using the USACE manual: A Field Guide to the Identification of the Ordinary High Water Mark (OHWM) in the Arid West Region of the Western United States (Lichvar & McColley 2008) where the OHWM equates to the active flood plain.

The initial delineation of the active flood plain was made through interpretation of 2005, 2009 and 2013 aerial photographs. The results of aerial photo interpretation were then subjected to field proofing. During field proofing the boundaries of the active flood plain, as mapped, were walked. In cases, where the mapped boundary was not supported by field conditions, the boundary was re-mapped in the field using a Trimble Geo XT.

2.1.5. Field Surveys and Mapping

Eleven transects were established within the 13th Street Bridge Study Area. Transects were oriented perpendicular to the path of the aquatic feature targeted for investigation and were spaced throughout the Study Area with exact placement depending on site conditions. Representative plots were chosen along each transect within different vegetation types, growing conditions, and/or at wetland-upland interface areas. Due to the linear bands of vegetation paralleling aquatic features plot size was variable with limits demarcated by boundaries of vegetation types.

Within the Wetland Mitigation Area, representative plots were chosen within areas supporting hydric vegetation. Plots were located both within the Study Area and along the Study Area boundary. Plots were 30 meters in diameter.

USACE wetland delineation forms characterizing vegetation, hydrology and soils were completed for each plot. The locations of soil test pits were mapped with Global Positioning System units (Trimble Geo XT). Once indicators of wetland boundaries were determined, boundary lines were walked and mapped.

2.2 California Rapid Assessment Method (CRAM)

To further categorize wetland habitats, the Study Area was assessed using metrics and methods established for the CRAM. CRAM scores wetlands based on the ecological services provided. Value is dependent on the diversity of services provided, as opposed to the level of any one service.

CRAM operates from the premise that diversity of services increases with the size and structural complexity of the wetland. To determine wetland value, specific metrics are scored as A, B, C, or D. These letters correspond to numeric values: A=12, B=9, C=6 and D=3 that are used to calculate scores for each of four attributes: buffer and landscape context, hydrology, physical structure, and biotic structure. The overall score for the Assessment Area (AA) is calculated by averaging the four attribute scores. Metrics and scoring vary by wetland type (CWMW 2013a).

The maximum possible score represents the best condition that is likely to be achieved for the type of wetland being assessed. The overall score for a wetland indicates how the wetland compares relative to the best achievable conditions. CRAM also provides guidelines for identifying stressors that might account for low scores. Evident stressors are characterized as “present” or “present and having a significant negative effect on an attribute score” (CWMW 2013a).

In preparation for CRAM analysis, the 13th Street Bridge Study Area was divided into eight AAs according to criteria outlined in the CRAM Riverine Wetlands Field Book ver. 6.1 (CWMW 2013c). AAs were delineated to encompass as much of the Study Area as possible while adhering to CRAM criteria. One AA was established spanning the river upstream of the 13th Street bridge where surface water was shallow enough to allow foot crossing and six one-sided AAs were established downstream of the 13th Street bridge where water was too deep to permit crossing on foot. Both the current 13th Street Bridge and the agricultural channel input were determined to be hydrologic breaks and were not spanned by the AAs. An additional AA was established along the agricultural channel to characterize this portion of the Study Area.

The Wetland Mitigation Area is currently comprised of upland habitat and, therefore, CRAM is not a suitable method for assessment. However, a reference AA was established immediately downstream of proposed Wetland Mitigation Area. This AA was established for comparison purposes and possesses native habitat that the restoration seeks to re-establish in the first AA.

3.0 Results

3.1 13th Street Bridge Study Area

3.1.1. Wetland Delineation

Vegetation

The entire 122.5 acre 13th Street Bridge Study Area was surveyed to characterize current conditions and identify areas of potential wetlands. Seven distinct vegetation types were identified (Figure 3):

- Central Coast Scrub (CCS)
- Non-native Broadleaf (NNB)
- Non-native Grassland (NNG)
- Non-native Woodland (NNW)
- Freshwater Marsh (FWM)
- Willow Riparian (RIP)
- Anthropogenic

A complete list of species observed along wetland transects surveyed in 2014 is provided in Appendix B, see Figure 2 for transect locations. Plant species nomenclature follows the Jepson Manual, Second Edition (Baldwin et al. 2012). Vegetation types are described in detail below, see Figure 3 for distribution of vegetation types within the Study Area. Where suitable, nomenclature follows Holland (1986). Acreages are presented in Table 3.

Central Coast Scrub – This vegetation type is characterized by shallow-rooted, mesophylic plant species that are often drought-deciduous and summer-dormant. The dominant native species at this site is coyote brush (*Baccharis pilularis*). CCS stands bordering roads and agricultural fields have a significant invasive understory, predominately consisting of black mustard (*Brassica nigra*). Overall non-native cover in CCS was 13.3 percent.

Non-native Grassland – This vegetation type occurs most commonly in areas that have been subjected to prior disturbance allowing weedy non-native species adapted to frequent disturbance to invade and dominate a site. Non-native annual grasses (*Bromus* spp. and *Avena* spp.) dominate most of the non-native grassland within the Study Area.

Non-native Broadleaf – This vegetation type occurs most commonly in areas that have been subjected to prior disturbance allowing weedy non-native species adapted to frequent disturbance to invade and dominate a site. Non-native herbaceous broadleaf species such as black mustard (*Brassica nigra*) and poison hemlock (*Conium maculatum*) dominate most of the non-native broadleaf vegetation within the Study Area.

Non-native Woodland – Within the Study Area, this vegetation type is dominated by Tasmanian blue-gum eucalyptus (*Eucalyptus globulus*). Many of these trees were planted as wind breaks

around agricultural fields. In some areas these groves have expanded beyond the original planted area as trees have reproduced successfully. Some stands of NNW have a substantial poison oak (*Toxicodendron diversilobum*) understory.

Fresh Water Marsh – This vegetation type occurs in and along active channels as well as backwater channels and pools. Within the wetland sample plots, where standing water was not present (Fresh Water Marsh - Terrestrial), this vegetation type was dominated by native species such as mugwort (*Artemisia douglasiana*), stinging nettle (*Urtica dioica*), and umbrella sedge (*Cyperus eragrostis*) and non-native species such as rabbit-foot grass (*Polypogon monspeliensis*) and wild celery (*Apium graveolens*).

Within wetland sample areas where it occurred in conjunction with standing water (Fresh Water Marsh - Aquatic) dominant species were rushes (*Schoenoplectus* spp. and *Bolboschoenus maritimus*), broad-leafed cattail (*Typha latifolia*), and the non-native European watercress (*Nasturtium officinale*).

Almost all areas supporting FWM meet the requirements for Jurisdictional Wetland.

This vegetation type is subject to dramatic changes in extent seasonally and yearly. In years such as 2014, which experienced no scouring flows, this vegetation type proliferated within the active channels During 2014 surveys the channel was found to be over 80 percent vegetated with bank side habitats also supporting this vegetation type. In contrast, on years where high flow occurs, virtually all FWM habitats within the active floodplain are scoured out and do not reach peak extent until the end of the summer.

Willow Riparian Forest – Willow Riparian Forest is dense, low, closed-canopy, broad-leafed, winter-deciduous riparian forest that is dominated by a mix of arroyo willow (*Salix lasiolepis*) and red willow (*Salix laevigata*). Within the Study Area this vegetation type is associated with the banks and floodplain of the Santa Ynez River. Areas where this vegetation type overhang or are rooted in surface water, saturated soils, or freshwater marsh vegetation meet the requirements for Jurisdictional Wetland.

Areas supporting mature willow riparian are densely treed often with little herbaceous growth in the understory. Where this habitat type grows on sand bars; however, trees are typically small and may be widely spaced. Many of these areas are within the active flood plain and usually feature young trees which have recolonized the area following scour events. Interstitial spaces may feature open sand or stands of broadleaf weeds. Similarly where this habitat type is found growing through rip-rap abutments, trees are typically sparse, with open areas characterized by exposed rock.

RIP bordering the agricultural drainage on the southeast corner of the 13th Street Bridge Study Area had an understory dominated by cape ivy (*Delairea odorata*). Willow trees found within the RIP habitat on the upper terrace of the southwest bank have experienced significant mortality, likely due to the severe drought conditions, resulting in a reduction of willow canopy cover and a proliferation of poison hemlock.

Anthropogenic – Anthropogenic habitat consists of developed paved areas, active agricultural fields and ruderal vegetation. During surveys in 2014, the agricultural fields consisted of non-native barley (*Hordeum sativum*).

Ruderal vegetation is found adjacent to roads or within areas subjected to frequent disturbance. In the Study Area, it was primarily composed of mowed road margins and pullouts on the northeast and northwest end of the 13th Street Bridge. Mixed non-native annual forbs and grasses (primarily *Bromus* spp.) are dominant within these areas.

Table 3. Current habitat acreages within the 13th Street Bridge Project Impact and Study Areas.

Habitat Type	Project Impact Area	Study Area
Fresh Water Marsh (All)	0.9071	3.4242
Fresh Water Marsh-Aquatic	*0.6235*	*1.9745*
Fresh Water Marsh-Terrestrial	*0.2836*	*1.4497*
Willow Riparian-Fresh Water Marsh (All)	0.1209	0.1237
Willow Riparian-Fresh Water Marsh-Aquatic	*0.0847*	*0.0871*
Willow Riparian-Fresh Water Marsh-Terrestrial	*0.0361*	*0.0366*
Willow Riparian (All)	5.3681	27.3178
Willow Riparian	*3.1086*	*22.6350*
Willow Riparian-on Riprap	*0.6746*	*0.6940*
Willow Riparian-on Sandbar	*0.3451*	*0.7318*
Willow Riparian-Senescing	*1.2399*	*2.8445*
Willow Riparian-Sapling	*0*	*0.4125*
Central Coast Scrub	4.0632	10.1869
Non-Native (All)	14.5213	25.1869
Non-native Grassland	*13.3008*	*19.4845*
Non-native Broadleaf	*1.0318*	*2.7103*
Non-native Woodland	*0.1888*	*2.9922*
Open Water	0.1796	1.2118
Anthropogenic (All)	5.9085	55.0593
Agricultural Field	*2.0770*	*46.1735*
Ruderal	*1.3355*	*2.9875*
Developed	*2.4959*	*5.8983*

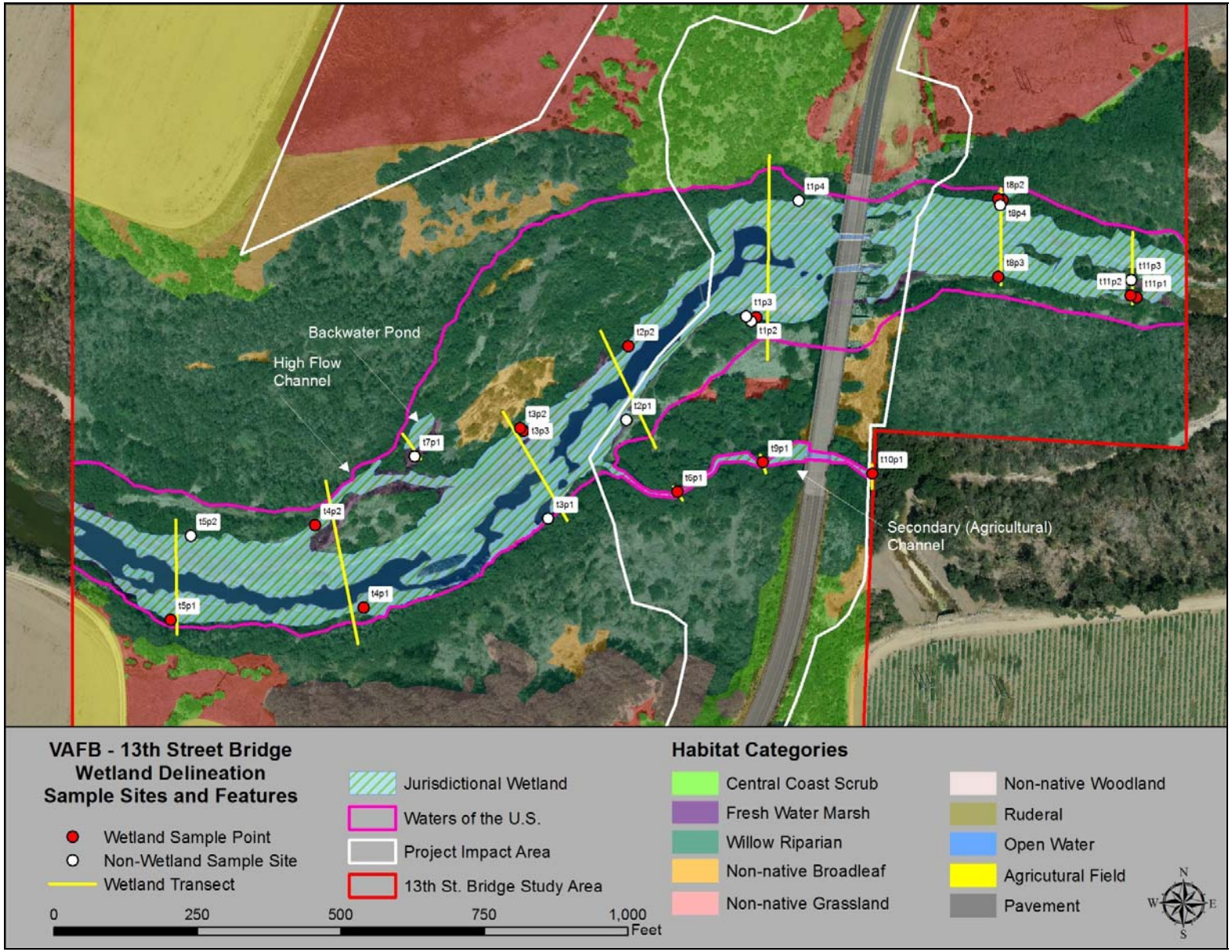

Figure 2. Wetland delineation sample sites and features.

Table 4. Sampling point locations and status. For Sampling Points: T# = Transect number, P# = Point number.

Sampling Point	Longitude	Latitude	Status			
			Vegetation	Soil	Hydrology	Determination
t01p1	-120.554843462	34.677279578	X	X	X	Wetland
t01p2	-120.554873530	34.677260002	X		X	
t01p3	-120.554903360	34.677283716	X		X	
t01p4	-120.554614590	34.677844528	X		X	
t02p1	-120.555583889	34.676771567	X		X	
t02p2	-120.555580755	34.677125159	X	X	X	Wetland
t03p1	-120.556021493	34.676291497	X		X	
t03p2	-120.556196939	34.676720859	X	X	X	Wetland
t03p3	-120.556177661	34.676708987	X	X	X	Wetland
t04p1	-120.557079899	34.675841813	X	X	X	Wetland
t04p2	-120.557372454	34.676230477	X	X	X	Wetland
t05p1	-120.558197111	34.675760178	X	X	X	Wetland
t05p2	-120.558090095	34.676165061	X		X	
t06p1	-120.555277338	34.676434346	X	X	X	Wetland
t07p1	-120.556805525	34.676571713	X		X	
t08p1	-120.553431211	34.677871346	X	X	X	Wetland
t08p2	-120.553458576	34.677875517	X	X	X	Wetland
t08p3	-120.553446069	34.677502743	X	X	X	Wetland
t08p4	-120.553444931	34.677845624	X		X	
t09p1	-120.554785967	34.676586689	X	X	X	Wetland
t10p1	-120.554147217	34.676546326	X	X	X	Wetland
t11p1	-120.552639993	34.677420641	X	X	X	Wetland
t11p3	-120.552677167	34.677429120	X	X	X	Wetland

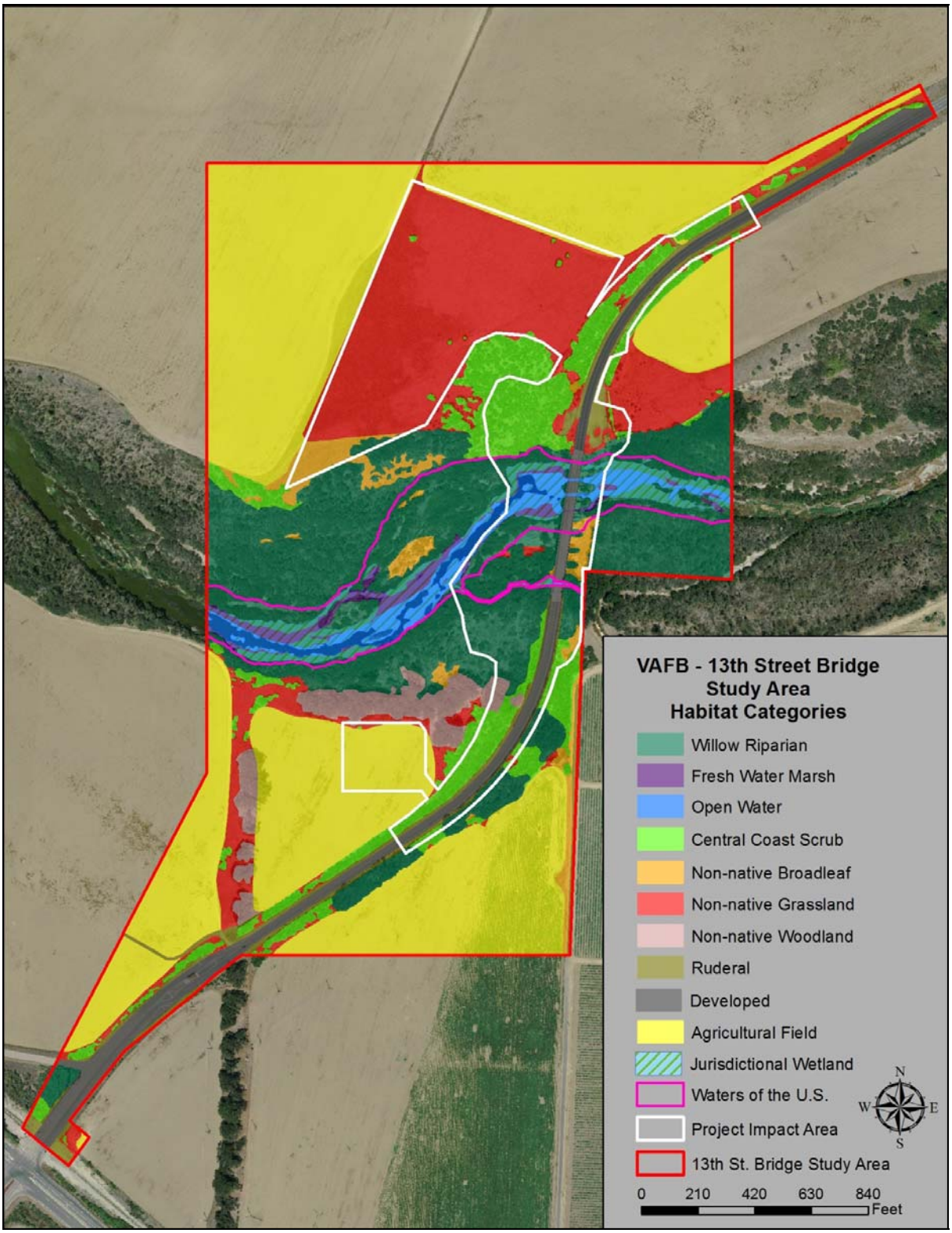

Figure 3. 13th Street Bridge Study Area habitat categories.

Hydrology

Within the Study Area, saturation within the upper 12 inches was the most common primary indicator of wetland hydrology. A positive FAC-Neutral Test was the most common secondary indicator. The appearance of drift and sediment deposits was very limited with most deposits appearing to be multiple years old. These deposits were most commonly encountered away from the hydrated channel within the riparian corridor where they were deposited during high flow events (5 year flood events) that occurred during prior years. Within the riparian corridor, these deposits are protected from degradation and continue to persist.

Soil

Within the Study Area, most of the soils within the active floodpain of the Santa Ynez River are classified as Riverwash (USDA 1972). This area, however, also includes areas mapped as Metz Loamy Sand and San Andreas Stony Soil (Figure 4). Due to the fact that these surveys were conducted in the early 1970s and that the river has migrated considerably since then, these areas cannot be differentiated in the field from those areas mapped as Riverwash.

During field examination, soils within the active floodplain were found to have high sand content. Some also showed weak evidence of stratified layers. Stratification is formed when successive layers of soil and organic debris are deposited during flow events. Areas within the riparian corridors, where flow events are more infrequent, had loamier soils. Less frequent flows in these areas likely allow smaller soil particles to persist in the profile.

Hydric soil characteristics were the most conserved wetland parameter. Areas with hydric soils were primarily located in and along the active channels. Highflow channels that incorporated depressions that retain water for extended periods following high flow events also had hydric soils.

The appearance of a Depleted Matrix was the most common indicator of hydric soil conditions. Plots with this indicator present had soils with a value of 4 and a chroma of 2 accompanied by the appearance of mottles. Mottles are spots of contrasting color that are formed in soils experiencing repeated cycles of reducing and aerobic conditions.

Gleyed soil colors were also observed. This indicator was restricted to areas within or immediately adjacent to hydrated channels or areas of ponding. These areas are saturated throughout the growing season. Continued saturation leads to extended periods of anoxia for the reduction of iron in the soil. This reduced iron is responsible for the gleyed and low chroma colors.

Gleyed and low chroma colors take time to develop and may not be present in recently inundated areas. These color changes may not be evident in sandy soils because there is insufficient clay to reflect the color change. In addition, color changes may not be evident in wetlands where there is net flow because iron is often carried out of the system (USACE 2008). This results in areas of naturally problematic soils within the Study Area. Problematic hydric soils were indicated where hydric vegetation and wetland hydrology characteristics were present and areas had evidence of recent inundation or were situated on vegetated sand bars within the flood plain.

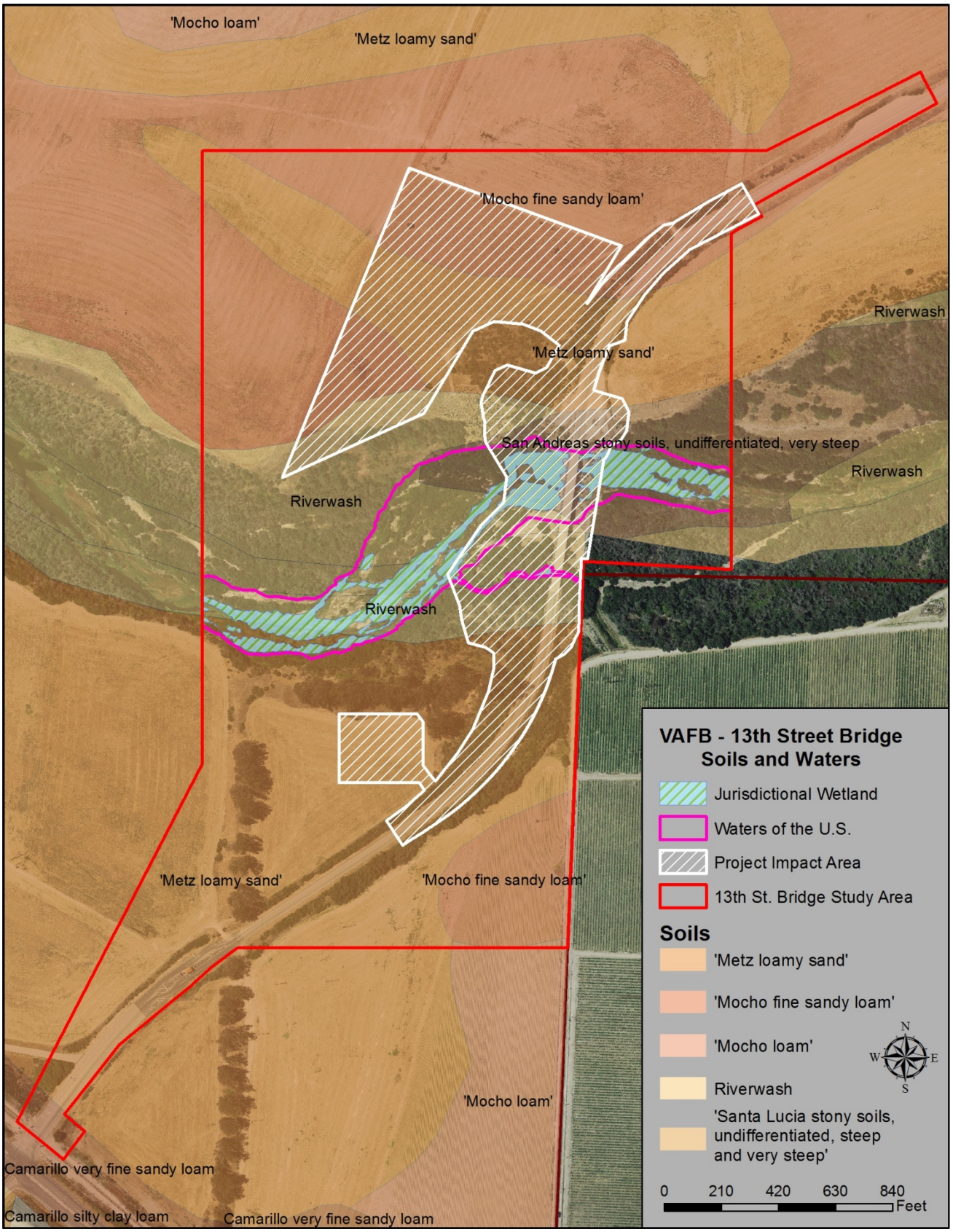

Figure 4. Soil types within the 13th Street Bridge Study Area.

Waters of the United States

The boundaries of Waters of the United States include areas encompassed by the OHWM of the Santa Ynez River (Figure 2). A total of 2.89 acres of Waters of the United States were identified within the Project Impact Area and 12.87 total acres identified within the 13th Street Bridge Study Area (Figure 2).

Field identification of the OHWM was complicated within the 13th Street Bridge Study Area. Three years of drought have resulted in reduced winter flows preventing the maintenance of a well defined OHWM. Additionally drift deposits on the banks, originating from above average flows in 2005 (SRS 2006), have persisted and complicated the field identification of the OHWM. To determine OHWM, MSRS biologists used physical features to determine the bounds of the active floodplain. Features used included benches, breaks in slope, presence of drift deposits, and the presence of sand or other sediments deposited during flows. Vegetation features were also used, particularly the presence of pioneer tree saplings and the absence of mature pioneer trees. The absence of mature trees was indicative that the Study Area receives scouring flows at relatively frequent intervals.

Field Surveys and Mapping

A total of 1.26 acres of Jurisdictional Wetlands were identified within the Project Impact Area and 5.03 total acres identified within the 13th Street Bridge Study Area. Within the Project Impact Area, Jurisdictional Wetlands were located in and along the active channel of the Santa Ynez River and the Secondary Channel to the south (Figure 2). Additional areas of Jurisdictional Wetlands were present within the Study Area in a high flow channel on the north side of the river west of the Project Impact Area. This high flow channel connects to a hydrated backwater pond that also met the criteria for Jurisdictional Wetlands (Figure 2).

Appendix A includes wetland delineation forms completed for each sample plot, and Appendix B includes a complete list of plant species observed during the wetland delineation. Figure 2 illustrates transect, and sample plot locations, vegetation types and Waters of the United States within the Study Area.

3.1.2. CRAM

Within the 13th Street Bridge Study Area, the Santa Ynez river was determined to correspond to the CRAM non-confined riverine subtype owing to the fact that the valley width across which the system can migrate is at least twice the average bankfull width of the channel. Completed CRAM score sheets from each AA are provided in Appendix C.

Table 5. AA attribute scores, overall scores and size.

AA	Buffer and Landscape Context	Hydrology	Physical Structure	Biotic Structure	Overall Score	Size (acres)
AA-01: East of Bridge	90.3	83.3	62.5	69.4	76.4	2.15
AA-02: Secondary Channel	93.3	83.3	50.0	69.4	74.0	0.35
AA-03: North Bank	93.3	75.0	62.5	72.2	75.8	3.21
AA-04: South Bank	86.4	75.0	62.5	52.7	69.2	1.50
AA-05: North Bank	90.3	75.0	75.0	86.1	81.6	2.27
AA-06: South Bank	90.3	58.3	37.5	69.4	63.0	1.06
AA-07: North Bank	90.3	75.0	87.5	77.8	82.6	1.53
AA-08: North Bank	80.6	58.3	37.5	55.6	55.6	0.81

Buffer and Landscape Context

Eight AAs were directly adjacent to one another; therefore the attributes relying on metrics assessed at the landscape level were similar among the AAs. All AAs were completely buffered with the buffer defined as the area adjoining the AA, at least five meters in width, existing in a natural or semi-natural state. The presence of buffer land also extended upstream from all AAs for at least 50 meters. All AAs scored an A for the Stream Continuity metric and for the Percent of AA with Buffer submetric. Under CRAM, buffer land stretches for a maximum of 250 meters after which point land is considered part of the landscape context of the AA. As shown in Figure 5, all land that was not occupied by roadways or agriculture was considered buffer. Taken as a whole, all buffer land associated with the AAs had at least 25 percent non-native vegetation scoring a B. Average buffer width, however, did vary by AA, with the one sided AAs southwest of the bridge having much less associated buffer land than those northwest of the bridge. Variation in scoring of average buffer width is what causes the variation in Buffer and Landscape scores in Table 4.

Hydrology

Under the Hydrology attribute, the Water Source Metric was also the same for all AAs. Water source is assessed by looking at two km upstream of the AA. Throughout most of the year, surface water in the lower Santa Ynez is a result of discharges from the Lompoc Regional Waste Water Reclamation Plant approximately 4 km upstream and from irrigated agricultural fields east of the AAs. These irrigated agricultural fields account for over 20 percent of the land within the direct drainage basin two km upstream of the AAs (Figure 6), resulting in a C score for this metric for all AAs.

The Riverine Channel Stability Metric varied by AA. AA-01 and AA-02 exhibited conditions predominantly indicative of channel equilibrium and scored an A. AA-03 and AA-04, both exhibited mild degradation and were scored a B. North bank AAs (AA-05 and AA-07) also scored a B with only mild degradation observed. South bank AAs (AA-06 and AA-08), however exhibited severe degradation and were scored as C. Downstream of the 13th Bridge where the Santa Ynez River bisects AA-05 and AA-06 and AA-07 and AA-08, the channel appears to be migrating southward and eroding away the southern bank. The south side of the channel is thus much more deeply incised that the north side as evidenced a steep, regularly scoured bank, and the presence of mature trees falling into the channel as their root holds are eroded away.

The Hydrologic Connectivity Metric is scored by calculating the average entrenchment ratio which consists of the average flood prone width divided by the average bankfull width, as calculated from the three transect measurements taken in each AA. Due to the fact that the six one-sided AAs downstream of the 13th Street Bridge were paired, values were measured separately along the same transect, directly across on opposite banks, and combined to calculate widths (opposed to estimating the widths of the side not assessed, as would be done in a non-paired one-sided AA). AAs 01, 02, 03, and 04 all scored an A with AAs 05, 06, 07, and 08, scoring a B. The lower score for AA-05 to 08 was due to the steep eroded south bank.

Physical Structure

The Physical Structure Attribute was assessed by scoring two metrics. The first metric is Structural Patch Richness. To assess this metric the entire AA was walked and evaluated for the presence of at least three square meters of 17 possible pre-determined patch types. All AAs were scored as C except for AA-07 which scored a B. The higher score for AA-07 was due to additional patches associated with the backwater channel and pool present within this AA.

Variation in the scores for the Physical Structure Attribute was due to variation in the second metric assessed: Topographic Complexity. The cross sectional topographic profile was assessed at three points along each AA. Scores for the AAs ranged from A to D. Both AA-05 and 07 scored an A due to the presence of multiple benches and abundant microtopography. AA-01, 03, and 04 scored a B due to the presence of a single bench with abundant microtopography. AA-02, which encompassed the agricultural channel, scored a C due to the presence of a single bench without microtopography. AA-06 and AA-08 scored a D; these AAs did not have a bench and a steep slope above the bankfull line marked the end of the immediate floodplain.

Biotic Structure

The Biotic Structure Attribute is assessed by the Plant Community Composition metric which is assessed through submetrics relating to diversity of plant layers, dominant plant species, and status of dominant plant species as native or invasive. It also incorporates metrics related to the degree of interspersion between plant associations present within the AA and the degree of overlap between plant layers within the AA. Scoring on individual sub-metrics and metrics was highly variable between AAs.

AA-04 and AA-08 scored the lowest in this attribute. Both low scores were due to a combination of low diversity of dominant plant species, low diversity in plant associations present with little intermixing of different plant associations, and little overlap between plant layers.

AA-01, 02, 03, and 06 all scored in the high 60s to low 70s. In the case of AA-01 the score was due to high percent of invasive species and low overlap between plant layers. In AA-02 it was due to low diversity of dominants, very high percent of invasive species and little horizontal dispersion. In AA-03 there was a moderate percent of invasive species and horizontal interspersion, but low vertical overlap. In AA-06 there is moderate diversity, percent invasive species, and vertical overlap, but low horizontal interspersion.

AA-05 and 07 scored the highest with both exhibiting identical scores in the Plant Community Composition submetrics. AA-05, however, scored an A, opposed to the B in AA-07, in the horizontal interspersion metric. In AA-05 the presence of the backwater channel and pond was associated with additional plant associations and a greater degree of intermixing than that present in other AAs.

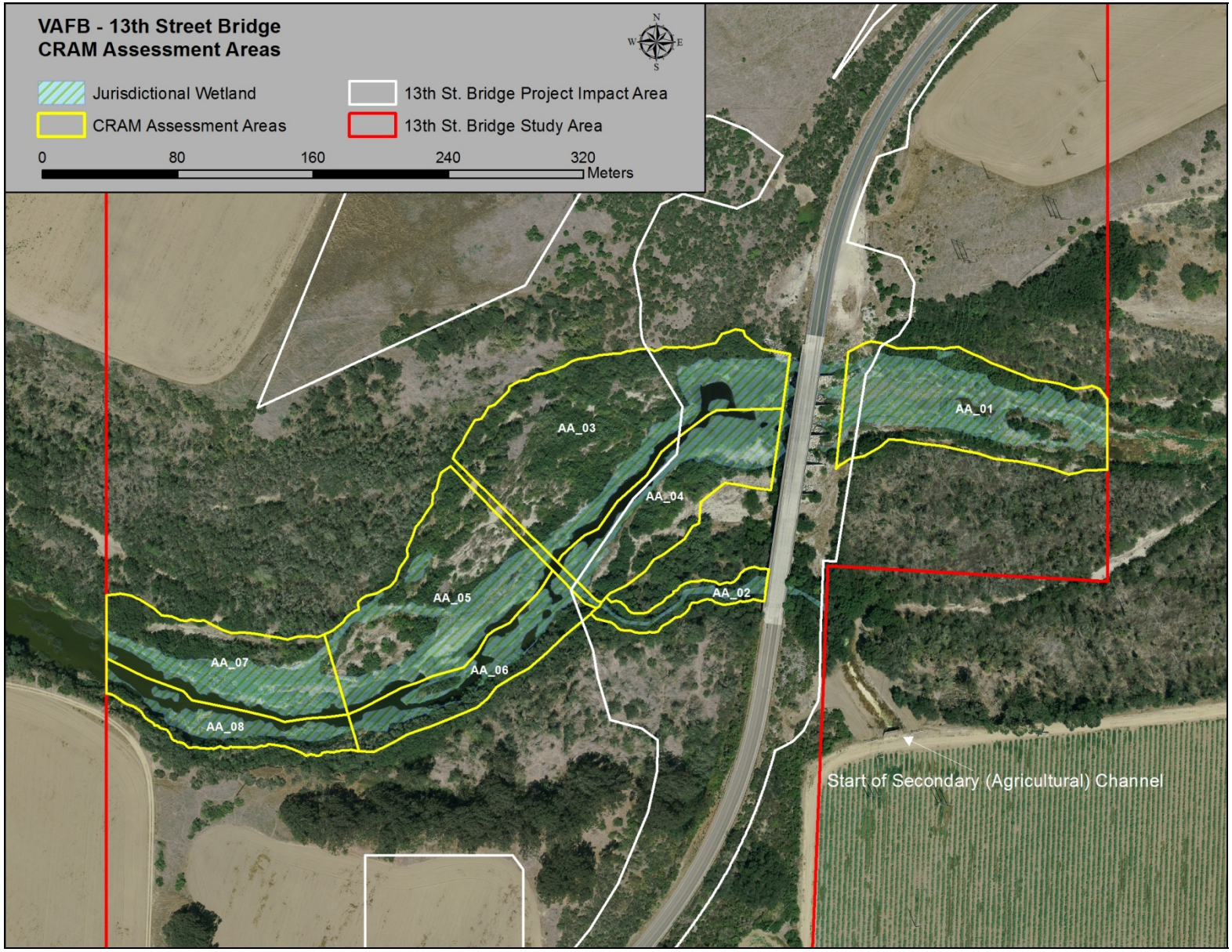

Figure 5. CRAM Assessment Areas.

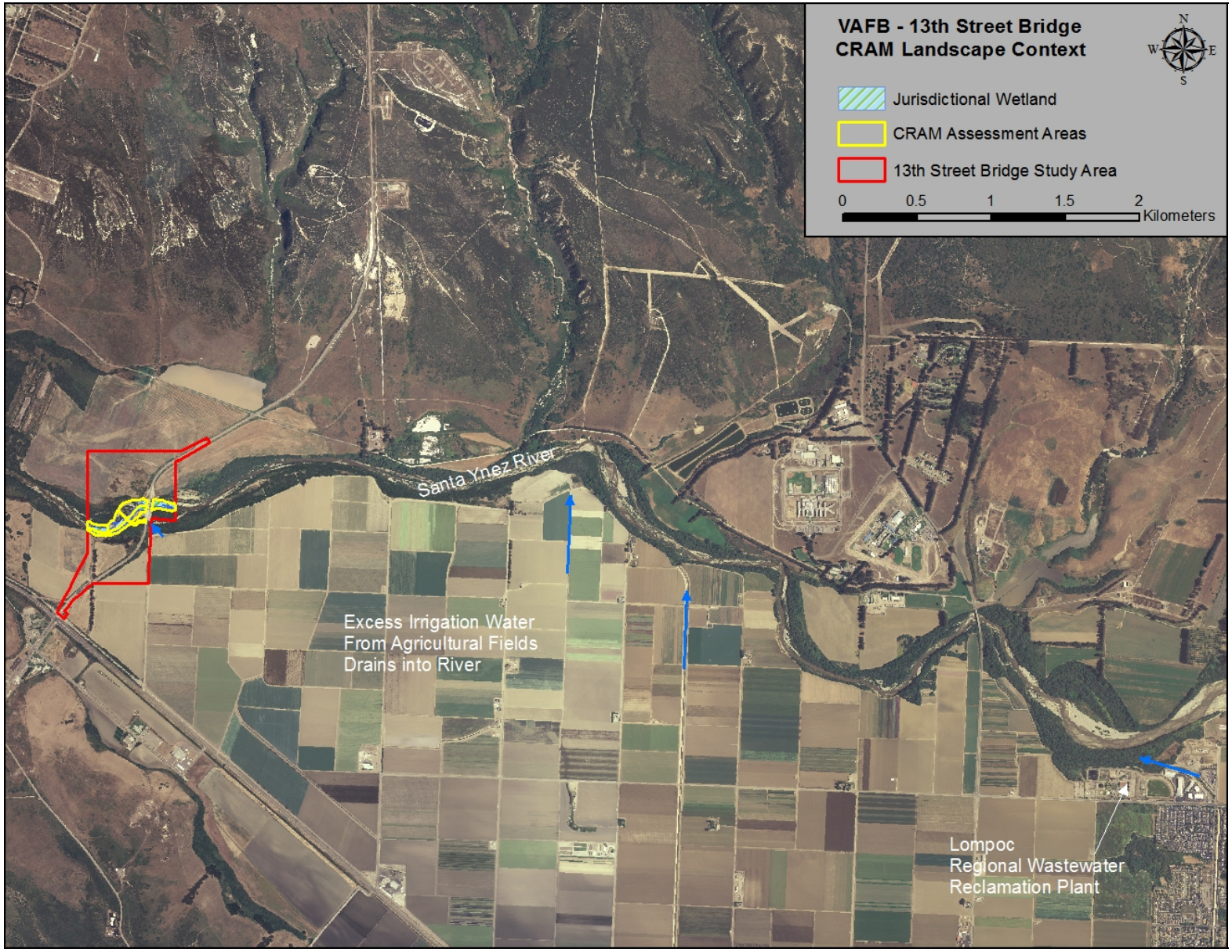

Figure 6. CRAM Assessment Areas and watershed overview.

3.1.3. Analysis of Impacts

Jurisdictional Wetlands

Waters of the United States encompass the active floodplain including those areas mapped as Jurisdictional Wetlands as well as areas of open water. A total of total of 2.89 acres within the Project Impact Area constitute Waters of the United States of which 1.26 acres of Jurisdictional Wetlands were identified in the 31.1 acre Project Impact Area during the spring 2014 field surveys. Vegetation in wetland habitats consists of Fresh Water Marsh both adjacent to and within the channel and Willow Riparian.

Project activities will involve excavation and removal of existing rip-rap and the old bridge abutments to a depth of 3 ft below the current ground level. This excavation will entail the removal of 25,300 cubic yards of a combination of soil, concrete and existing rip-rap. Salvaged rip-rap is expected to compromise 9,340 cubic yards. Soil and rip-rap would be re-purposed for new construction (see Figure 7). In addition to re-purposed material, new construction will require an additional 3,340 cubic yards of new material.

An additional estimated 25,500 cubic yards of temporary fill (combination of native and engineered soil) will be used in the channel to create an access road to support construction and demolition activities. This fill would be removed in its entirety upon completion of construction. (Note, the volume of material used to construct the temporary access road is based on the 35 percent design and actual design of the temporary access road will be accomplished by the construction contractor. The volume of material ultimately used may deviate substantially from the estimated figure of 25,500 cubic yards.)

Most of the salvaged material (estimated 25,300 cubic yards removed from the channel) and new permanent fill (3,340 cubic yards of rip-rap) will be used to construct the new north and south abutments which will require 5,535 and 7,155 cubic yards of rip-rap respectively. See Figure 7. The new abutments will extend into Waters of the U.S. Table 9 details estimated volumes and types of materials excavated and materials used as fill within Waters of the U.S. No dredging is anticipated within Waters of the U.S. and excavated areas will be filled to existing grade following completion of construction.

Of the area identified as Jurisdictional Wetlands, 1.26 acres will be directly impacted by project activities as follows (see also Table 6 and 7): 0.28 acres will be subjected to disturbance associated with temporary re-routing of the secondary channel and construction of downstream check dams in the main channel, 0.21 acres will be cleared of vegetation for access during construction, 0.08 acres will be excavated to depths of up to 18 feet below existing grade to allow placement of RSP (rock slope protection) and then refilled, 0.35 acres will have soil excavated to depths of up to 15 feet below existing grade and replaced with engineered fill to provide a stable support base for new bridge construction, 0.11 acres will be excavated to depths of up to 18 feet below existing grade with RSP placed 7 to 8 feet below the surface with surface soil replaced with engineered fill to provide a stable support base for new bridge construction, 0.09 acres will be excavated to depths of up to 18 feet below existing grade with rock slope protection (RSP) placed 7 to 8 feet below the surface and refilled, 0.13 acres will be excavated at depths of 11 to 13 feet with RSP

placed 1 to 3 feet below the surface and refilled, and 0.001 acres will be excavated to a depth of 5 feet below existing grade and filled with RSP to up to 7 feet above existing grade.

Upon completion of construction and demolition activities, contingent upon preservation of pre-construction channel width, depth, and water levels, 1.56 acres are expected to be capable of supporting Jurisdictional Wetland habitat. This would result in a net gain of 0.30 acres of potential Jurisdictional Wetlands (Table 11). Upon removal of rip-rap from the northern three abutments of the old bridge these areas are expected to convert to a hydrated channel, which would become Jurisdictional Wetlands as hydric vegetation is established. The hydrated channel under the new bridge deck is also expected to become Jurisdictional Wetlands upon establishment of hydric vegetation.

Post-project Jurisdiction Wetland acreage will be heavily dependent on natural processes. Changes in water level or channel width as a result of natural events, such as scouring during high flows and beaver dams, could result in significant changes in Jurisdictional Wetland acreage and cannot be predicted.

Willow Riparian (RIP)

Willow Riparian (RIP) and Willow Riparian – Fresh Water Marsh (RIP-FWM) habitats within the Project Impact Area occupy both Jurisdictional (Wetlands and Waters of the U.S.) and non-Jurisdictional areas (areas outside the bounds of Waters of the U.S.). For impacts to RIP and RIP-FWM habitats within Jurisdictional Waters see Tables 6 and 7, for impacts outside of Jurisdictional Waters see Table 8. Overall impacts to RIP and RIP-FWM habitats are detailed in Table 10 and discussed below.

During project activities, an estimated 4.56 acres of RIP and RIP-FWM habitat will be cleared of vegetation for the purposes of construction and access, an additional 0.93 acres may be subjected to disturbance related to construction of check dams and temporary re-routing of the agricultural channel. Disturbed areas are not expected to require active restoration.

Within cleared areas, 2.73 acres can be restored to RIP or RIP-FWM following construction and demolition. This will result in 3.66 acres of RIP and RIP-FWM within the Project Impact Area following the completion of restoration. There will be a net loss of 1.83 acres of RIP and RIP-FWM.

Of the RIP acreage lost, 1.24 acres of loss will occur on the upper terrace in senescent RIP in the vicinity of the southern abutment (Figure 7). Willow trees in this area are dying due to the divorce of this upper terrace from the active floodplain with RIP habitat being replaced by broadleaf weeds. Because hydrological conditions in this area are no longer suitable for maintaining RIP habitat, undeveloped portions of this area (0.38 acres) will be restored to CCS habitat following completion of construction and demolition activities (Figure 8).

An additional 0.67 acres of willows growing on rip-rap will be lost. Currently rip-rap subtending the northern four piers of the old 13th Street Bridge has sufficient elevation to support willows (Figure 7). Upon removal of rip-rap, undeveloped portions of this area (0.15 acres) are expected to become hydrated channel supporting FWM vegetation (Figure 8).

There will also be 0.34 acres of RIP lost under the new bridge deck. As is the case with the El Rancho Road bridge on VAFB, there will likely be too much shading by the bridge to support

willows underneath it. Undeveloped portion of these areas (0.24 acres) will therefore be restored using shade tolerant RIP understory species (Figure 8).

Remaining RIP losses (0.22 acres) will occur in upland habitat during construction associated with the southern approach and the north and south abutments and within the north staging area (Figure 7).

Waters of the U.S.

Of the area identified as Waters of the United States, 2.89 acres will be directly impacted by project activities as follows (see also Table 6 and 7): 0.84 acres will be subjected to disturbance associated with temporary re-routing of the secondary channel and construction of downstream check dams in the main channel, 0.44 acres will be cleared of vegetation for access during construction, 0.52 acres will be excavated to depths of up to 18 feet below existing grade to allow placement of RSP and then refilled, 0.51 acres will have soil excavated to depths of up to 15 feet below existing grade and replaced with engineered fill to provide a stable support base for new bridge construction, 0.11 acres will be excavated to depths of up to 18 feet below existing grade with RSP placed 7 to 8 feet below the surface with surface soil replaced with engineered fill to provide a stable support base for new bridge construction, 0.18 acres will be excavated to depths of up to 18 feet below existing grade with RSP placed 7 to 8 feet below the surface and refilled, 0.26 acres will be excavated at depths of 11 to 13 feet with RSP placed 1 to 3 feet below the surface and refilled, and 0.04 acres will be excavated to a depth of 5 feet below existing grade and filled with RSP to up to 7 feet above existing grade.

Construction activities are not expected to alter channel morphology significantly; therefore the post-project extent of Waters of the United States is not expected to change as a result of project activities. See Table 11 for estimated acreages of Jurisdictional Waters and habitat types present within Jurisdictional Waters following restoration.

Table 6. Estimated acres of Waters of the U.S. including Jurisdictional Wetlands impacted by project activities. All impacts are expected to be confined to the Project Impact Area.

Category	Impacts								Total Impacted
	Temporary			Permanent					
	Vegetation Disturbed	Vegetation Cleared	Soil Excavated and Replaced	Soil Excavated and Replaced with Engineered Fill	Surface Soil Excavated and Replaced with Engineered Fill, RSP placed below (7+ ft)	Soil Excavated and RSP placed below (7+ ft)	Soil Excavated and RSP placed below (1-3 ft)	Soil Excavated and replaced with pavement or exposed RSP	
Jurisdictional Wetlands	0.2859	0.2085	0.0849	0.3487	0.1063	0.0938	0.1320	0.0011	**1.2612**
Fresh Water Marsh	*0.2162*	*0.1657*	*0.0311*	*0.2943*	*0.0804*	*0.0203*	*0.0564*	*0.000005*	***0.8644***
Willow Riparian-Fresh Water Marsh	*0.0142*	*0.0186*	*0.0048*	*0.0274*	*0.0259*	*0.0300*	*0*	*0*	***0.1209***
Willow Riparian	*0.0555*	*0.0242*	*0.0490*	*0.0271*	*0*	*0.0435*	*0.0756*	*0.0011*	***0.2760***
Non-Wetland Waters	0.5507	0.2267	0.4387	0.1662	0.0038	0.0821	0.1262	0.0402	**1.6345**
Fresh Water Marsh	*0.0155*	*0.0253*	*0.0019*	*0*	*0*	*0*	*0*	*0*	***0.0427***
Willow Riparian	*0.4667*	*0.0972*	*0.2483*	*0.1395*	*0.0038*	*0.0408*	*0.0936*	*0.0402*	***1.1302***
Central Coast Scrub	*0.0001*	*0.0003*	*0.0009*	*0*	*0*	*0.0014*	*0*	*0*	***0.0028***
Non-Native	*0.0087*	*0.0355*	*0.0087*	*0*	*0*	*0*	*0*	*0*	***0.0530***
Open Water	*0.0596*	*0.0429*	*0.0382*	*0.0267*	*0*	*0.0121*	*0*	*0*	***0.1796***
Anthropogenic (Developed)	*0*	*0.0254*	*0.1406*	*0*	*0*	*0.0277*	*0.0326*	*0*	***0.2262***
Waters of the U.S.: Total	**0.8365**	**0.4352**	**0.5236**	**0.5149**	**0.1100**	**0.1759**	**0.2582**	**0.0413**	**2.8958**

Table 7. Temporary and permanent impacts to Waters of the U.S. (summary data from Table 6).

Category	Impact Type		Total Impacted
	Temporary	Permanent	
Jurisdictional Wetlands (acres)	0.5793	0.6819	1.2612
Fresh Water Marsh	*0.4130*	*0.4514*	*0.8644*
Willow Riparian-Fresh Water Marsh	*0.0376*	*0.0833*	*0.1209*
Willow Riparian	*0.1287*	*0.1472*	*0.2760*
Non-Wetland Waters (acres)	1.2160	0.4185	1.6345
Fresh Water Marsh	*0.0427*	*0*	*0.0427*
Willow Riparian	*0.8123*	*0.3179*	*1.1302*
Central Coast Scrub	*0.0014*	*0.0014*	*0.0028*
Non-Native	*0.0530*	*0*	*0.0530*
Open Water	*0.140*	*0.0389*	*0.1796*
Anthropogenic (Developed)	*0.1660*	*0.0603*	*0.2262*
Waters of the U.S.: Total (acres)	**1.7953**	**1.1004**	**2.8958**
Waters of the U.S. (linear feet)	**851.1**	**398.5**	**1,249.5**
Main Channel (linear feet)	*623.1*	*122.5*	*745.5*
Secondary Channel (linear feet)	*228.0*	*276.0*	*504.0*

Table 8. Estimated acres of Willow Riparian habitat outside of Jurisdictional Waters impacted by project activities.

Category	Impact Type		Total Impacted
	Temporary	Permanent	
Non-Jurisdictional Willow Riparian	1.5259	2.4362	3.9621
Willow Riparian - Mature	*1.2653*	*0.8763*	*2.1416*
Willow Riparian - on Riprap	*0.2048*	*0.1801*	*0.3848*
Willow Riparian - on Sandbar	*0.0558*	*0.1399*	*0.1957*
Willow Riparian - Senescing[1]	*0*	*1.2399*	*1.2399*

1. The 0.2609 acres impacted during vegetation clearing and soil excavation constitutes a permanent impact for this category because restoration will not be possible due to distance of this area from the water table.

Table 9. Cubic Yards of material placed and removed within Waters of the U.S.

Excavation & Fill	Cubic Yards	Acres
Material Excavated (soil and RSP)	**48,347.82**	**1.63**[3]
Permanent Fill	**36,269.95**[1]	
Soil (expected to consist of a mix of native soil and engineered fill soil)	*24,523.10*	
RSP (expected to consist of a mix of salvaged and new material)	*11,746.85*	
Temporary Fill	**5,355.30**[2]	

1. Assumes soil removal and replacement will be conducted per sheet C104 of the 95% Submittal (KASL 2014), this is expected to account for 11,691.19 cubic yards of material within Waters of the U.S.
2. From the 35% KASL design specifications, total temporary fill for the temporary access road is estimated at 25,500 cubic yards, 21 percent of the temporary access road is within Waters of the U.S.; the temporary access road may entail the use of 5,355.30 cubic yards of temporary fill within Waters of the U.S. Final values of temporary fill are to be developed by the contractor per G004 of the 95% Submittal (KASL 2014).
3. All excavated areas will be re-filled to or above existing grade with a soil, RSP or a combination of both.

Other Habitat Types

The estimated impacts to native vegetation types are outlined in Table 10, all direct impacts related to construction, demolition and restoration within the 13th Street Bridge Study Area are expected to be confined to the Project Impact Area. Portions of this area will be available for restoration upon completion of construction and demolition activities. Recommended restoration areas are depicted in Figure 8 and the presumed successful restoration of these areas was used to calculate post-project acreages in Table 10.

As long as suitable hydrological conditions exist, Fresh Water Marsh habitat should regenerate naturally, as seeds and propagules from intact vegetation upstream are washed into the site. If pre-project channel morphology, water levels, and flow rates remain similar to the current conditions, there will be a net increase of 0.37 acres capable of supporting this vegetation type.

A total of 2.55 acres of CCS habitat are expected to be lost during project activities. Areas within the Project Impact Area that are currently ruderal non-native vegetation, areas where the existing road will be demolished, and areas where upland RIP habitat will be removed can be restored to CCS. A net gain of 0.49 acres of CCS is expected.

Non-native plant dominated and Anthropogenic habitats utilized as staging areas will not be converted to native habitats. Reductions in Non-native habitat will occur through restoring non-native dominated areas currently intermixed with native habitats to native habitat types. Lost Anthropogenic areas will consist of those areas currently occupied by approach roads for the existing bridge. Upon demolition these areas will be restored to native habitat.

Table 10. Habitat restored within the 13th Street Bridge Restoration Area. See also Figure 8

Habitat Type	Pre-Project	Action				Post-Restoration	Change
		Created	Enhanced	Restored	Preserved		
Fresh Water Marsh (All)	0.9071	0	0	0.9729	0.2316	1.2045	+0.2974
Fresh Water Marsh-Aquatic	*0.6235*	*0*	*0*	*0.9729*	*0.1611*	*1.1340*	*+0.5105*
Fresh Water Marsh-Terrestrial	*0.2836*	*0*	*0*	*0*	*0.0705*	*0.0705*	*-0.2131*
Willow Riparian-Fresh Water Marsh (All)	0.1209	0	0	0.3017	0.0142	0.3159	+0.1950
Willow Riparian-Fresh Water Marsh-Aquatic	*0.0847*	*0*	*0*	*0*	*0.0088*	*0.0088*	*-0.0759*
Willow Riparian-Fresh Water Marsh-Terrestrial	*0.0361*	*0*	*0*	*0.3017*	*0.0054*	*0.3071*	*+0.2709*
Willow Riparian (All)	5.3681	0	0	2.4298	0.9172	3.3469	-2.0212
Willow Riparian	*3.1086*	*0*	*0*	*2.4298*	*0.8098*	*3.2395*	*+0.1310*
Willow Riparian-on Riprap	*0.6746*	*0*	*0*	*0*	*0*	*0*	*-0.6746*
Willow Riparian-on Sandbar	*0.3451*	*0*	*0*	*0*	*0.1074*	*0.1074*	*-0.2377*
Willow Riparian-Senescing	*1.2399*	*0*	*0*	*0*	*0*	*0*	*-1.2399*
Central Coast Scrub	4.0632	0	0	5.1372	0.0303	5.1675	+1.1043
Understory	0	0	0	0.2669	0	0.2669	+0.2669
Non-Native (All)	14.5213	0.8158	0	12.3400	0.0303	13.1861	-1.3353
Non-native Grassland	*13.3008*	*0.8158*	*0*	*12.3400*	*0.0303*	*13.1861*	*-0.1147*
Non-native Broadleaf	*1.0318*	*0*	*0*	*0*	*0*	*0*	*-1.0318*
Non-native Woodland	*0.1888*	*0*	*0*	*0*	*0*	*0*	*-0.1888*
Open Water	0.1796	0	0	0	0.0596	0.0596	-0.1200
Anthropogenic (All)	5.9085	5.0631	0	3.0681	0	8.1312	+2.2227
Agricultural Field	*2.0770*	*0*	*0*	*2.0539*	*0*	*2.0539*	*-0.0231*
Ruderal	*1.3355*	*0*	*0*	*0*	*0*	*0*	*-1.3355*
Developed	*2.4959*	*5.0631*	*0*	*1.0142*	*0*	*6.0773*	*+3.5814*

Table 11. Acres of habitat restored within Jurisdictional Waters. All restored Jurisdictional Wetlands are expected to occur within the bounds of the OHWM. Calculated acreages are predicated on channel morphology and flow regime following the proposed action corresponding to conditions observed in 2014. Changes in channel morphology and/or flow regime due to natural processes or as a result of the proposed action have the potential to significantly alter predicted values.

Category	Action				Change
	Created	Enhanced	Restored	Preserved	
Jurisdictional Wetlands	**0**	**0**	**1.2746**	**0.2859**	**+0.2992**
Fresh Water Marsh	*0*	*0*	*0.9729*	*0.2162*	*+0.3247*
Willow Riparian-Fresh Water Marsh	*0*	*0*	*0.3017*	*0.0142*	*+0.1950*
Willow Riparian	*0*	*0*	*0*	*0.0555*	*-0.2205*
Non-Wetland Waters	**0.2669**	**0**	**0.5177**	**0.5507**	**-0.2992**
Fresh Water Marsh	*0*	*0*	*0*	*0.0155*	*-0.0272*
Willow Riparian	*0*	*0*	*0.4364*	*0.4667*	*-0.2270*
Central Coast Scrub	*0*	*0*	*0.0027*	*0.0001*	*0*
Understory	*0*	*0*	*0.0460*	*0*	*+0.0460*
Non-native	*0*	*0*	*0*	*0.0087*	*-0.0443*
Open Water	*0*	*0*	*0*	*0.0596*	*-0.1200*
Anthropogenic (Developed)	*0*	*0*	*0.0326*	*0*	*+0.0733*
Waters of the U.S.: Total	**0.2669**	**0**	**1.7923**	**0.8365**	**0**

3.1.4. Restoration

Willow riparian habitat can be restored within undeveloped portions of the channel, as depicted in Figure 8. Due to the presence of buried rock left from previous bridge retrofits and repairs, successful restoration of these areas will be dependent on access of heavy equipment to aid in restoration. Restoration of RIP, therefore, will occur prior to removal of the temporary access roads. To successfully re-establish willows in these areas, a series of staggered trenches two feet wide will be excavated. Wherever possible, trenches will be excavated until the water table is reached. Willow poles will be placed in these trenches, at a spacing of six feet on center, and the trenches refilled to within two feet of the ground surface. Trenches should be spaced such that a willow pole density of eight feet on center throughout the riparian restoration areas is achieved. The shallow residual trenches will allow supplemental watering of pole plantings if winter rains are insufficient to allow establishment. Due to shading, RIP habitat is unlikely to successfully be re-established under the bridge. RIP habitat is also unlikely to be successfully restored in upland habitats or in areas covered by rip-rap.

Terrestrial habitat under the new bridge is likely to remain predominantly unvegetated due to reduced light. To prevent invasive species establishment in this area, native riparian understory species should be planted as depicted in the area designated “Riparian Understory” on Figure 8.

Recommended species include blackberry (*Rubus ursinus*), mugwort (*Aremisia douglasiana*) and creeping rye grass (*Leymus triticoides*). Creeping ryegrass should be seeded and the broad-leaf species installed as plantings at six feet on center.

CCS vegetation should be restored in upland areas as depicted in Figure 8. Areas targeted for CCS restoration with compacted soils should be ripped prior to the initiation of restoration activities. Restoration of these areas can be accomplished by hydroseeding of a native grass seed mix excluding giant wild rye (*Eleymus condensatus*) as this species is susceptible to broad-leaf specific herbicides. Post seed application, these areas would be chemically treated for broad-leaf weeds and physically managed for non-native grasses until weeds are controlled. Once broad-leafed weeds are controlled, giant wild rye should be seeded at a rate of 20 pounds per acre and central coast scrub species should be planted at six feet on center.

The southern staging areas will not be restored to native vegetation. Instead, the southern staging area will be returned to active agricultural use. The northern staging area will seeded with a species pallet designed to provide sufficient vegetative cover and soil stabilization to meet construction permit requirements. Formulation of the erosion control mix will be subject to approval of the VAFB botanist.

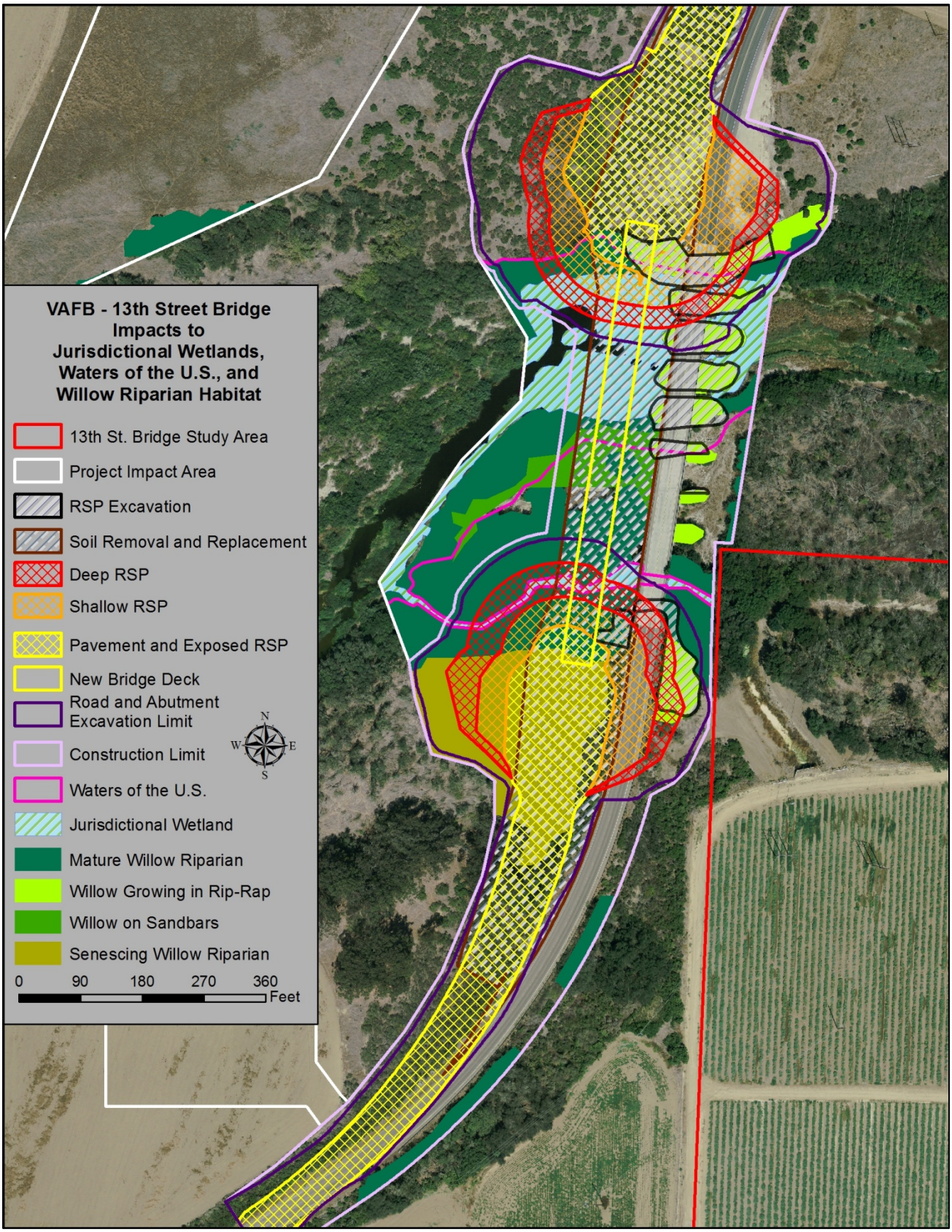

Figure 7. Construction impacts to Jurisdictional Wetlands, Waters of the United States, and Willow Riparian Habitats.

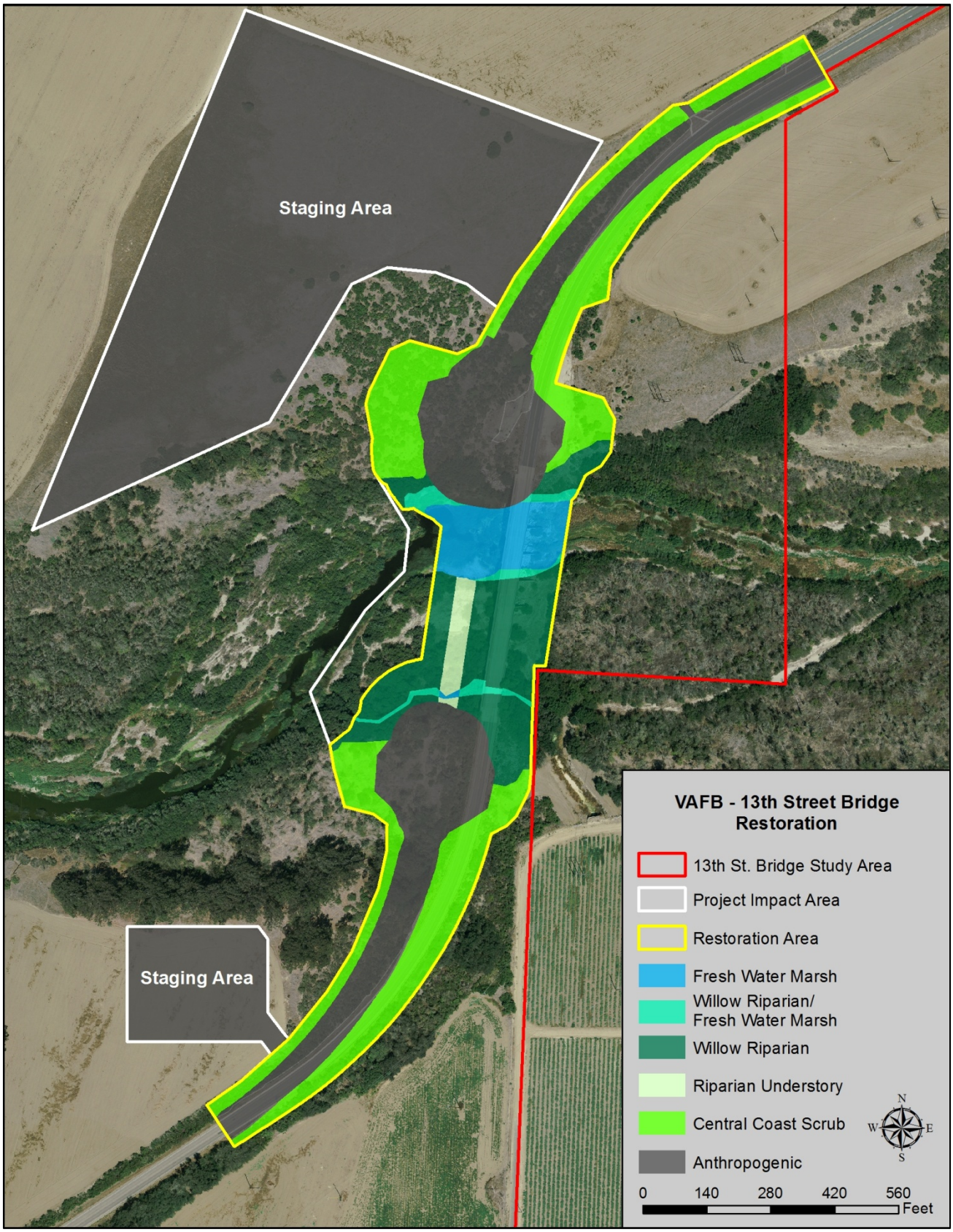

Figure 8. Proposed restoration areas.

3.2 Wetland Mitigation Area

3.2.1. Wetland Delineation

Vegetation

Six distinct vegetation types were identified in the 4.02 acre Wetland Mitigation Area where soil will be excavated. A total area of 19.1 acres was assessed (Figure 9):

- Central Coast Scrub (CCS)
- Native Grassland (NG)
- Non-native Broadleaf (NNB)
- Non-native Grassland (NNG)
- Coastal Salt Marsh (CSM) - middle
- Coastal Salt Marsh - upper
- Ruderal (RUD)

Vegetation types are described in detail below. Where suitable, nomenclature follows Holland (1986). A complete list of species observed during 2014 wetland surveys is provided in Appendix B. Plant species nomenclature follows the Jepson Manual, Second Edition (Baldwin et al. 2012). Acreages are presented in Table 12.

Central Coast Scrub – Within the area assessed, this habitat type exhibits low diversity and is composed almost exclusively of coyote brush (*Baccharis pilularis*). Where it borders areas with enhanced moisture, portions of CCS may support hydric herbaceous species (*Frankenia salina Jaumea carnosa*, *Conium maculatum*) as an understory component.

Non-native Broadleaf: This habitat type is extensive within the area assessed where it dominates, to the exclusion of native species, extensive tracts within elevated areas not receiving regular inundation. Non-native herbaceous broadleaf species, such as black mustard and poison hemlock, dominate.

Native Grassland : – Within the area assessed this vegetation type is dominated by grass species tolerant of salinity: salt grass (*Distichlis spicata*) and creeping wild rye (*Eleymus triticoides*). It appears to favor areas with enhanced moisture regimes. Most of this habitat is highly degraded within the Wetland Mitigation Area with native grass species sharing dominance with non-native broadleaf weeds.

Coastal Salt Marsh- middle: This vegetation type occurs in areas inundated during maximal water levels within the estuary. Pickleweed (*Salicornia pacifica*), an obligate-wetland species, that forms a near monoculture throughout much of this habitat type. On the fringes, however, it may occur in conjunction with other species such as alkali heath (*Frankenia salina*) and fleshy jaumea (*Jaumea carnosa*) ranked facultative-wetland and obligate-wetland respectively.

Coastal Salt Marsh - upper: This habitat type occurs at elevations above the maximum level of inundation, and rarely has surface water present. However, it is influenced by enhanced

subsurface moisture and is dominated by native species ranked as facultative or facultative-wetland. In large tracts it is dominated by a mix of salt grass, creeping wild rye, pacific aster (*Symphyotrichum chilense*), alkali heath and marsh baccharis (*Baccharis glutinosa*). This habitat type may also occur as small patches composed of a single species.

Ruderal: Ruderal habitat within the area assessed occurs along road margin and in areas adjacent to the railroad tracks. These areas are subjected to regular disturbance and are dominated by non-native annual forbs and grasses.

Table 12. Estimated acreage of each habitat type in the Wetland Assessment Area including the area that will be mitigated with soil excavation.

Habitat Type	Assessment Area	Excavation Area	Restoration Gains	Post-Action	Net Gain/Loss
Coastal Salt Marsh	**2.34**	**1.40**	**4.02**	**4.94**	**2.60**[1]
CSM-middle	0.10	0.09	4.02	4.02	3.92
CSM-upper	2.21	1.31	0	0.89	-1.32[1]
CSM-middle/upper	0.03	0	0	0.03	0
Central Coast Scrub	**4.21**	**1.67**	**2.80**	**5.34**	**1.13**
Native Grassland	**0.01**	**0.01**	**0**	**0**	**-0.01**
Degraded Habitats	**1.58**	**0.57**	**0**	**1.03**	**-0.55**
CSM-upper / NNB	0.09	0.06	0	0.03	-0.06
CSM-upper / NNG	0.16	0.02	0	0.15	-0.01
CCS / NNB	0.49	0.45	0	0.04	-0.45
NG / NNB	0.84	0.04	0	0.81	-0.03
Non-native Habitats	**10.94**	**3.21**	**0**	**7.73**	**-3.21**
NNB	10.54	2.81	0	7.73	-2.81
RUD	0.40	0.40	0	0.00	-0.40
Other Categories (inclusive of above categories)					
Jurisdictional Wetlands and Waters of the U.S.	0.09	0.09	4.02	4.02	3.93

1. VAFB is pursuing the use of agricultural fields southeast of the project area as an alternate area for soil deposition. Use of this area will reduce loss of CSM-upper to 0.16 acres and increase net gain of Coastal Salt Marsh to 2.76 acres.

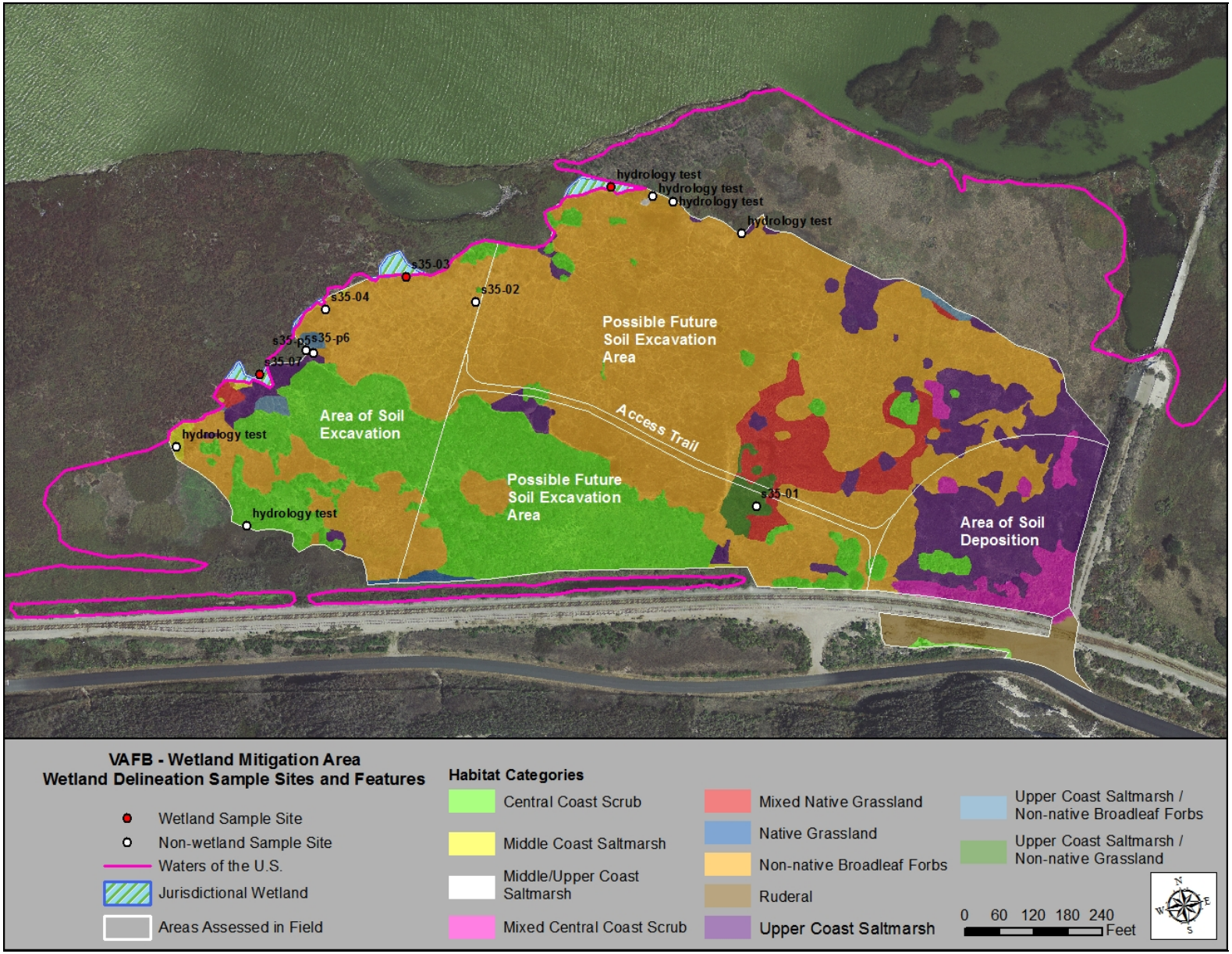

Figure 9. Wetland delineation sample sites and features.

Table 13. Sampling point locations and status.

Sampling Point	Longitude	Latitude	Status			
			Vegetation	Soil	Hydrology	Determination
s35-p1	-120.589625331	34.686707170	X			
s35-p2	-120.590983914	34.687934891	X			
s35-p3	-120.591347380	34.688117195	X	X	X	Wetland
s35-p4	-120.591843237	34.688044958	X			
s35-p5	-120.591964819	34.687850247	X			
s35-p6	-120.592004251	34.687870376	X			
s35-p7	-120.592296132	34.687802769	X	X	X	Wetland
hydrology test 1	-120.589390862	34.688004027	X	na		
hydrology test 2	-120.589742563	34.688216959	X	na		
hydrology test 3	-120.589855259	34.688261818	X	na		
hydrology test 4	-120.590078938	34.688346412	X	na	X	Wetland
hydrology test 5	-120.592853892	34.687542886	X	na		
hydrology test 6	-120.592542444	34.687105813	X	na		

Hydrology

Saturation within the upper 12 inches was the only primary indicator of wetland hydrology documented and a positive FAC-Neutral Tests the only secondary indicator.

Throughout the winter spring period, when surveys were conducted, water levels in the estuary were actively rising. These rising water levels led to documentation of saturation within the upper 12 inches in June 2014 portions of the assessed area with ground elevations of 11 ft or less (Figure 10).

Due to the fact that the development of wetland hydrology was a recent occurrence, there were no clear surface indicators present. Due to the lack of surface indicators, supplemental pits (hydrology test, Figure 9 and Table 13) were excavated to determine status of areas where hydric vegetation was present.

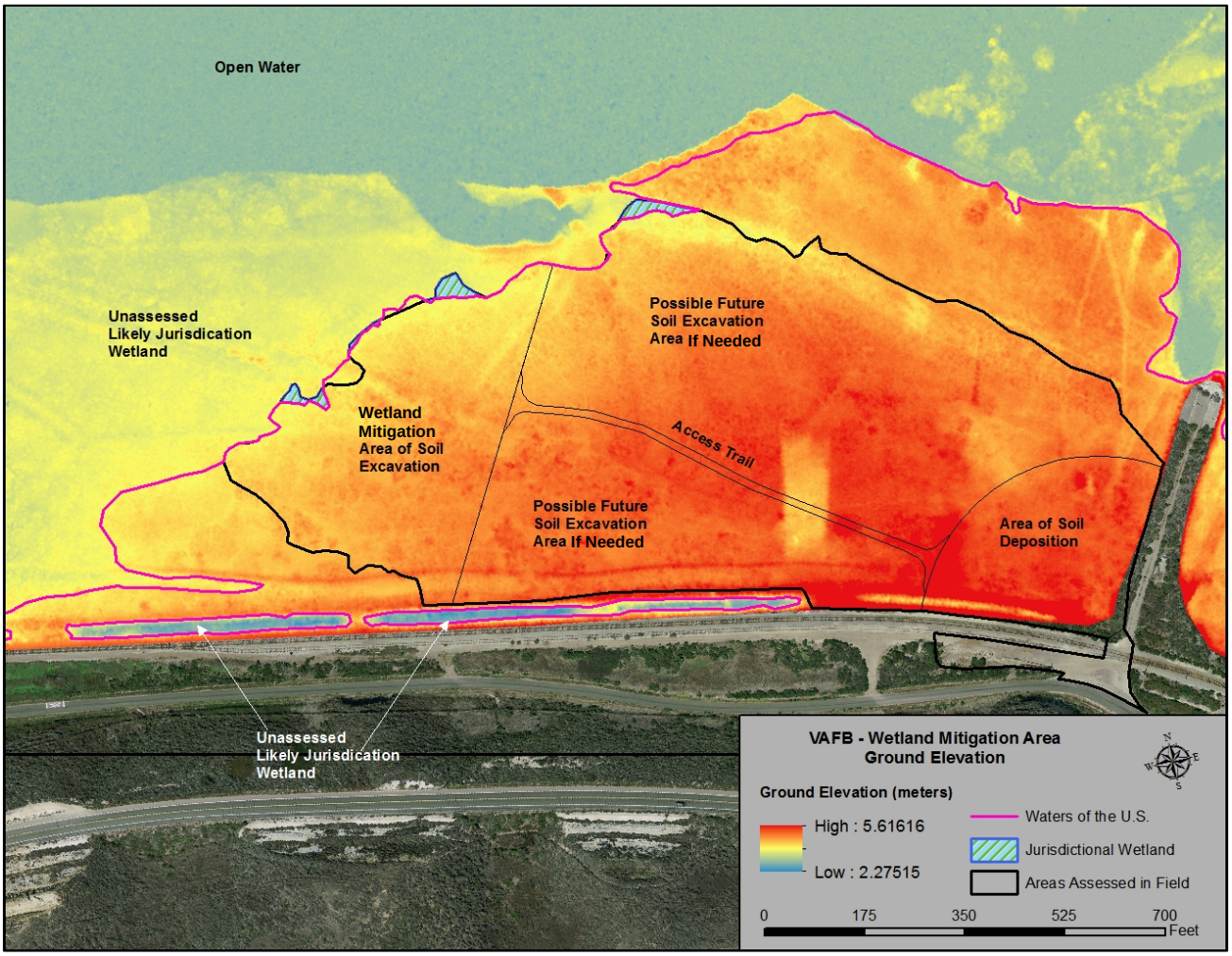

Figure 10. Current ground elevations within the Wetland Assessment Area.

Soils

Soils within the area assessed, were primarily classified as Marsh with a small area of Camarillo Sandy Loam present in the northernmost portion (SCS 1981; Figure 12).

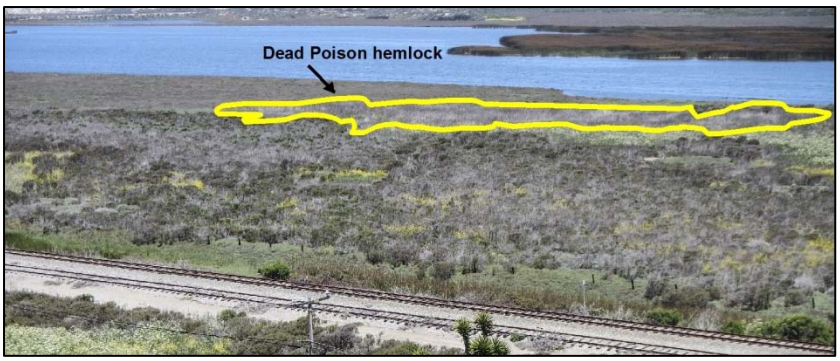

Figure 11. Poison hemlock failing to resprout due to rising levels of salt water

Water levels in the estuary fluctuate seasonally and between years. During general biological surveys conducted for the 13th Street bridge biological assessment and surveys conducted for the preparation of this document, a steady rise in water levels was observed. Likely in response to rising levels of salt water, large tracts of poison hemlock (NNB, Figure 11) failed to re-sprout and native salt marsh species were observed expanding into these areas in June 2014. These areas had positive indicators for vegetation and hydrology, but not soils. Due to recent inundation, hydric soil characteristics likely have not had sufficient time to develop. Therefore, in areas exhibiting both hydric vegetation and wetland hydrology, soils were classified as Problematic Hydric.

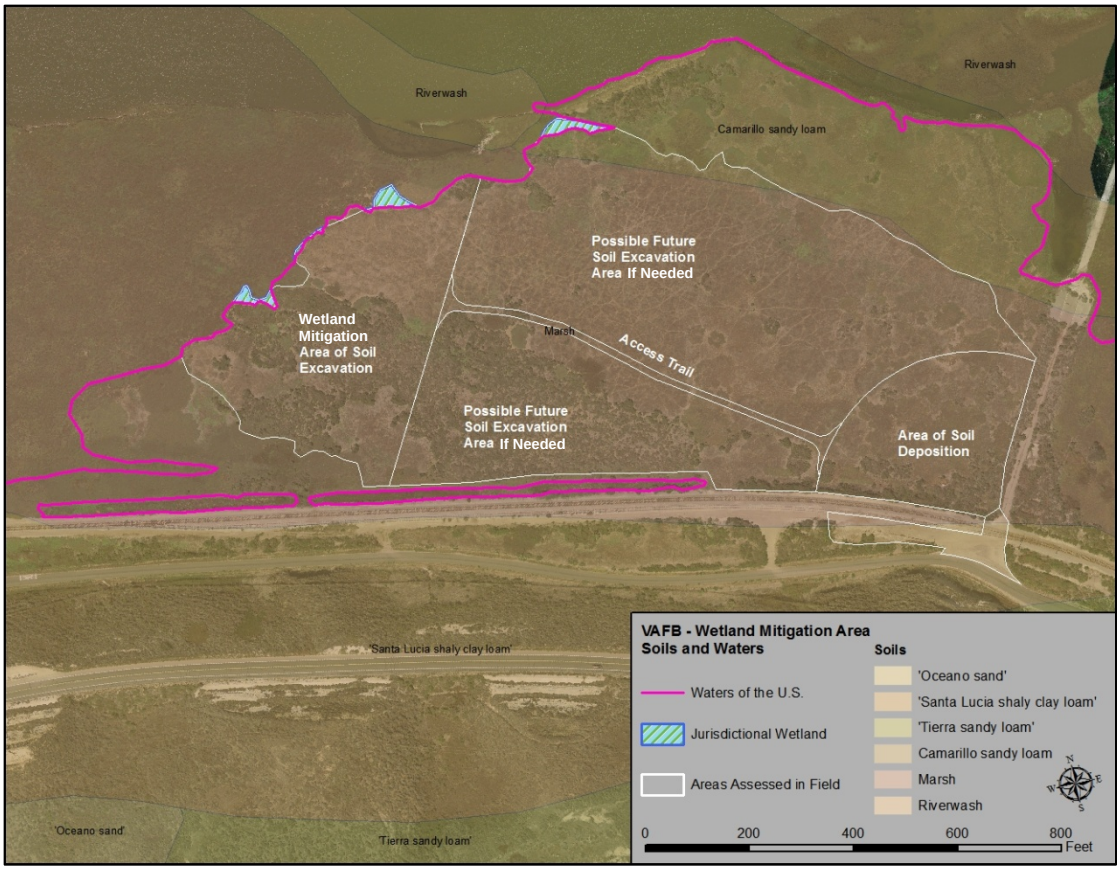

Figure 12. Soil types within the Wetland Assessment Area.

Waters of the United States

Waters of the United States within the area assessed include areas encompassed by the OHWM of the Santa Ynez River and adjacent wetlands. The Wetland Mitigation Area where soil will be excavated is above the OHWM but does contain contiguous wetlands. These wetlands were considered to be the bounds of jurisdiction. Outside of the Wetland Mitigation Area, approximate distributions of jurisdictional areas are detailed based on a combination of field observations, aerial photo interpretation and site elevation (Figures 9 and 10 and Table 13).

Field Surveys and Mapping

A total of 0.14 acres of Jurisdictional Wetlands were identified within the Wetland Mitigation Area. Jurisdictional wetlands are located in and along western margin of the entire area assessed (Figure 9 and Table 13).

Appendix A includes wetland delineation forms completed for each sample plot, and Appendix B includes a complete list of plant species observed during the wetland delineation. Figure 9 illustrates transect, and sample plot locations, vegetation types and Waters of the United States within the Wetland Mitigation Area.

3.2.2. CRAM

The proposed area of soil excavation falls outside of CRAM guidelines for establishment of a Bar-Built Estuarine AA because it is almost entirely upland habitat (CWMW 2013b). Under CRAM AA establishment guidelines, the AA cannot extend above the backshore which is defined in part by the transition from hydric saltmarsh vegetation to upland vegetation. To help inform restoration decisions, MSRS completed a CRAM assessment within saltmarsh wetland habitat immediately west of the Wetland Mitigation Area (Figure 13). This area contains habitat consistent with post restoration goals and the AA occupies the same general landscape context as the Wetland Mitigation Area. Upon completion of restoration, MSRS recommends the establishment of two additional AAs (Figure 13) to evaluate restoration success. Reference AA scores are present in Table 14 and the AA score sheet is provided in Appendix C.

Table 14. AA attribute scores and size

AA	Buffer and Landscape Context	Hydrology	Physical Structure	Biotic Structure	Overall Score	Size (acres)
Reference AA-	77.8	66.7	37.5	61.1	60.8	3.18

Buffer and Landscape Context

The attribute score for Buffer and Landscape Context is calculated from six submetrics assessed at that landscape level. Impacts that would affect the scoring of these metrics are beyond the scope of the proposed restoration. Given the similarity in context of the reference AA to the Wetland Mitigation Area, it is likely to have similar scores after project completion.

Three of the submetrics evaluated focus on landscape context. The first submetric assessed is stream corridor continuity. Because the stream corridor is intact 500 meters upstream of the AA, it scores an A. The second submetric, adjacent aquatic area, is assessed by drawing four 500 meter transect lines out from the AA, perpendicular to the direction of flow and measuring what proportion of the lines intercept aquatic areas. Transect lines extending 500 meters north of the AA were completely occupied by aquatic features (open water, or saltmarsh on the north bank) while those extended south of the AA had no overlap with aquatic features; the 50 percent overlap resulted in a B score. The third submetric evaluates marine connectivity. This metric is evaluated by drawing 500 meter lines along the coast north and south of the estuary mouth and looking for barriers between the marine and estuary environment. The railroad bridge and rip-rap re-enforced railroad tracks (Figure 13) represent a barrier to marine connectivity along most of the length of the transects leading to a C score.

The remaining three submetrics evaluate the buffer land surrounding the AA. In this case, the north side of the AA is bordered by open water at a width of over 30 meters which is considered neutral and therefore not buffer. Buffer south of the AA extends from upland habitat to Ocean Avenue. It includes the area occupied by the Celite railroad tracks as these do not receive in excess of two trains a day. The AA is completely surrounded by at least 5 meters of buffer and scores an A in terms of the submetric percent with buffer, but buffer is narrow on the south side of the AA scoring a B for the buffer width submetric. Buffer land on the south side of the AA is occupied by invasive weeds or disturbed ground associated with the railroad tracks while buffer land to the west is comprised of intact native habitat and buffer land to the east is dominated by invasive dominated habitat; this leads to a B score for buffer condition.

Hydrology

The Hydrology attribute is also assessed at the landscape level and will, thus be similar between the reference AA and the Wetland Mitigation Area and beyond the scope of restoration activities. This attribute is assessed through the scoring of three metrics.

The first metric evaluates water sources within a two km drainage basin upstream of the AA. Although dry season water sources supplying the AA are primarily due to inputs from the Lompoc Waste Water Reclamation Plant and from irrigated agricultural fields, these areas all occur over two km upstream of the AA. Inputs within two km are primarily natural causing the AA score a B for the water source metric.

For the metric evaluating hydroperiod, the AA is subject to natural tidal fluctuations (the estuary is not artificially breached). However, natural migration of the estuary mouth is prevented by the railroad bridge (Figure 13). This anthropogenic barrier to mouth migration lowers the AA to a B score for this metric.

The hydrologic connectivity metric is assessed by looking for barriers to lateral flow for the estuary as a whole. Ocean Park Access Road represents a barrier to lateral flow running the entire south bank of the estuary. Railroad tracks running parallel to the access road represent a second barrier to flow (Figure 13). The presence of these barriers, leads to a C score for this metric.

Physical Structure

Unlike the Buffer and Landscape Context and Hydrology attributes, the Physical Structure attribute is assessed within the AA. This attribute is assessed by scoring metrics for structural patch richness and topographic complexity. The CSM habitat within the AA is uniform in terms of cover, with low patch diversity, thus scoring a D. Topographic complexity is also limited to micro topography with no secondary channels within the AA leading to a C score.

Planned restoration activities, within the Wetland Mitigation Area, call for excavating the area to a depth similar to that of the reference AA. The goal of this excavation is to re-establishing environmental conditions that allow saltmarsh plant community establishment. Because this community is relatively uniform, successful restoration efforts will likely lead to similar scores.

However, low scores within the reference AA were due in part to the timing of the assessment. During the assessment water levels in the estuary were near maximum depths due to the back-up of water behind the closed estuary mouth. Additional patch types and topographic complexity may have been concealed beneath the water. This attribute may benefit from re-assessment when water levels are lower.

Biotic Structure

The Biotic Structure attribute is assessed through the scoring of three metrics the first of which, the plant community metric, is assessed through three submetrics. The first submetric is scored based on the number of plant layers. The AA had dominants in both the 0-30 centimeter (cm) range and the 30 cm to 1 m range, giving to two layers and a C score. The second submetric evaluates the number of co-dominant species within the AA. In this case there were three: alkali heath, pickleweed and fleshy jaumea; this scores a D. The final submetric evaluates invasive species presence in the AA; the reference AA was completely dominated by native species thereby scoring as A for this submetric.

The remaining two metrics evaluate horizontal interspersion and vertical biotic structure. The reference AA is entirely occupied by single plant association, thereby scoring a D for the horizontal interspersion metric. This vegetation does, however, form a dense canopy with substantial entrainment of dead material thereby scoring an A for the vertical biotic structure metric.

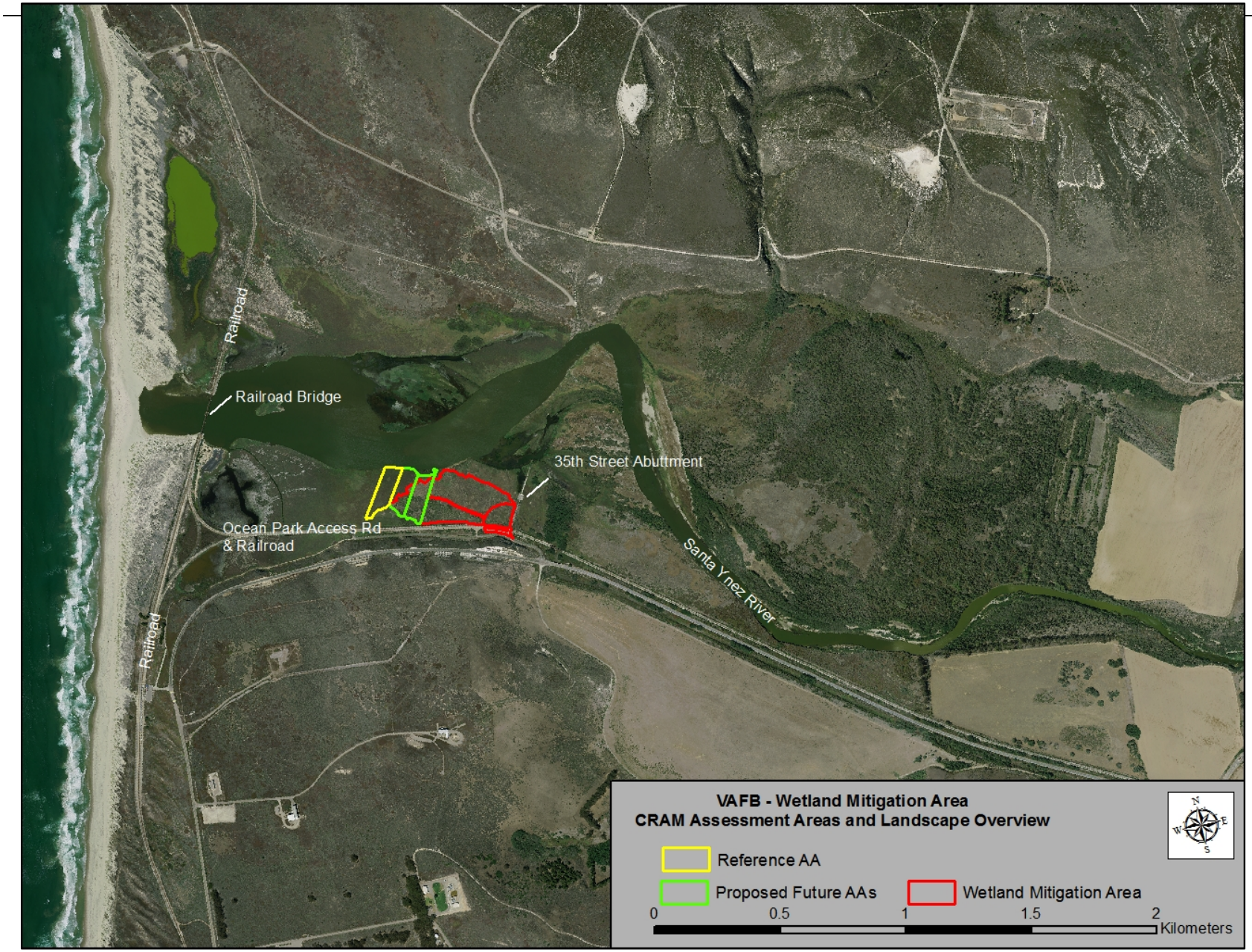

Figure 13. Wetland Assessment Area and CRAM Assessment Areas.

3.2.3. Analysis of Impacts

The proposed wetland restoration would require grading and relocation of between 10,000 and 11,000 cubic yards of accumulated sediment from a 4.02 acre area at the south eastern edge of the estuary (Figure 9). Approximately, 0.09 acres of Jurisdictional Wetland would be impacted and restored following completion of grading. This area of Jurisdictional Wetland is also qualifies as Waters of the United States.

Prior to grading activities, the vegetation within the site, which contains a substantial non-native component, would be grubbed with a masticator. The restoration area will then be graded to an average elevation of approximately 10 feet. This will cause the habitat in the 4.02 acre area to transition from primarily upland habitat to an irregularly to seasonally flooded Coastal Salt Marsh (CSM) wetland habitat dominated by pickleweed, alkali heath, saltgrass, and fleshy jaumea. This habitat is expected to meet the criteria of Jurisdictional Wetland and Waters of the United States. Successful restoration would lead to a net gain of 3.93 acres of Jurisdictional Wetlands and Waters of the United States within the Wetland Mitigation Area where soil will be excavated (Table 16).

The 0.09 acres of CSM that currently meet the definition of Jurisdictional Wetlands will be enhanced by decreasing the existing grade which will promote more frequent/regular hydration. The 0.17 acres of CSM currently present that does not meet the characteristics of Jurisdictional Wetlands will also be enhanced by decreasing the existing grade and promoting more frequent/regular hydration; post grading this area is expected to meet the criteria of Jurisdictional Wetlands and Waters of the United States. The remaining 3.75 acres of upland habitat will be restored to CSM (CSM likely existed in this area prior to the accumulation of sediment due to the old 35th Street Bridge abutment); post grading this area is also expected to meet the criteria of Jurisdictional Wetlands and Waters of the United States. See Table 15.

Hydration of the Wetland Mitigation Area will coincide with high water levels in the estuary. As such the proposed Wetland Mitigation Area may not possess hydrologic and soil characteristics of wetlands during all years. Even if wetland hydrology is present, soils within the Wetland Mitigation Area will likely continue to be problematic due to the seasonal and potentially irregular nature of inundation.

Table 15. Acres impacted by restoration actions within the Wetland Mitigation Area

Habitat Type	Restoration Actions			Total
	Created	Enhanced	Restored	
Coastal Salt Marsh	0	0.26	3.75	4.02[1]

1. Following restoration activities all CSM habitat is expected to meet the criteria of Jurisdictional Wetlands

Table 16. Jurisdictional Wetlands and Waters of the U.S. within the Wetland Mitigation Area

Category	Volume Excavated (Dredged), Cubic Yards	Acres/Linear Feet Excavated	Acres Restored	Net Gain (Acres)
Jurisdictional Wetlands and Waters of the U.S.[1]	**123.54**	**0.09/327**	**4.02[2]**	**+3.93**

1. Jurisdictional Wetlands and Waters of the U.S. overlap within the Wetland Mitigation Area
2. Jurisdictional Wetlands and Waters of the U.S. will consist of CSM habitat

A total of 1.32 acres of upper CSM habitat will potentially be lost in the soil deposition area and access road areas (Table 10). Depositing soil within the deposition area will increase the ground elevation altering hydrological conditions and prevent the persistence of this habitat type. VAFB is currently pursuing incorporating excavated soil into existing active agricultural fields south east of the Wetland Mitigation Area. Use of these areas will reduce loss of upper CSM-upper to 0.16 acres and increase net gain of Coastal Salt Marsh to 2.76 acres.

3.2.4. Restoration

At the completion of grading activities, all disturbed soil would be sown with one of two native seed mixes. The portion of the site that was excavated to a lower elevation would be seeded with a salt marsh seed mix of pickleweed, alkali heath, saltgrass, and fleshy jaumea, applied at a recommended rate of 10 pounds per acre (pers. comm., S&S Seeds, Inc.). The sediment deposition area and access roads would be seeded with a native grass seed mix at a rate of a 35 pound per acre (pers. comm., S&S Seeds, Inc.). This native grass mix would include saltgrass, alkali rye (*Elymus triticoides*), meadow barley (*Hordeum brachyantherum*), and giant wild rye (*Elymus condensatus*). During the second winter following excavation, grading and seeding, native broadleaf container plantings would be installed in the areas seeded with native grasses. Establishing native grasses within the site prior to broadleaf container plantings allows for one to two years of aggressive broadleaf invasive species control to exhaust the weed seed bank at the site prior to container planting. Invasive control and site maintenance will include manual, mechanical (e.g. weed wacker), and herbicide treatments.

Native broadleaf plantings in four-inch containers would be installed at a spacing of six feet on center. For protection of the plantings, each planting would be protected by a gopher basket and a wire herbivore exclosure cage. Container plantings would be installed during the last week of October and the first week of November, unless directed otherwise in consideration of weather forecasts. Plantings would receive an initial watering of approximately 0.5 to 0.75 gallon per plant using the VAFB water supply (lightly chlorinated) at the time of planting (.approximately 0.5 to 0.75 gallon per plant). Additional watering would occur once every two week period that receives less that than 0.25 inches of rainfall until 15 April. At that point, watering would be discontinued to allow the plants to acclimate to the natural central California climate. In addition to container plantings, a native upland broadleaf seed mix (palette to be determined) would be applied to the upland portion (soil deposition area) of the site at a rate of 25 pounds per acre (pers. comm., S&S Seeds, Inc.).

Post-construction monitoring would be conducted to assess the effectiveness of the initial revegetation efforts and provide guidance for follow-up maintenance, based on performance criteria that will be described in the 5-Year Habitat Restoration and Monitoring Plan. The post-construction monitoring would focus on the extent of native species cover and the diversity and presence of non-native, invasive plant species. Eradication of invasive plants, through hand removal, mechanical removal (e.g. weed wacker), and herbicide application, is anticipated to be necessary throughout the 5-year monitoring period.

To monitor functional status of the area post restoration, two AAs should be established to encompass the entire Wetland Mitigation Area and assessed using CRAM (Figure 13). These AAs

are expected to score similar to the reference AA in the Buffer and Landscape Context, Hydrology and Physical Structure attributes, but lower in the Biotic Structure attribute during the initial years following restoration. Lower scores are expected in the submetrics for number of plant layers, co-dominant species and vertical biotic structure as these will take time to develop as the site is colonized by wetland vegetation and the plants mature. Management actions may be necessary to prevent establishment of invasive species while natives are becoming established.

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APPENDIX H: Compensatory Mitigation and Monitoring Plan

Compensatory Mitigation and Monitoring Plan for the 13th Street Bridge Replacement at Vandenberg Air Force Base, California

2 January 2015

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Acronyms and Abbreviations

AA	Assessment Area
BCC	Bird of Conservation Concern
CCS	Central Coast Scrub
CDFW	California Department of Fish and Wildlife
cm	Centimeter
CMMP	Compensatory Mitigation and Monitoring Plan
CRAM	California Rapid Assessment Method
CRLF	California Red-legged Frog
CSC	California Species of Special Concern
CSM	Coastal Salt Marsh
CWA	Clean Water Act
CY	cubic yard
FE	Federally Endangered Species
FT	Federally Threatened Species
FWM	Freshwater Marsh
GPS	Global Positioning System
Hr	Hour
INRMP	Integrated Natural Resources Management Plan
m	meter
MSRS	ManTech SRS Technologies
NNB	Non-native Broadleaf
NNG	Non-native Grassland
NNW	Non-Native Woodland
NOAA Fisheries	National Oceanic and Atmospheric Administration, National Marine Fisheries Service
RIP	Willow Riparian
RUD	Ruderal
RWQCB	Central Coast Regional Water Quality Control Board
TWG	Tidewater Goby
U.S.	United States
USACE	U.S. Army Corps of Engineers
USFWS	U.S. Fish and Wildlife Service
VAFB	Vandenberg Air Force Base

1 Project Description

1.1 Responsible Parties

1.1.1 Applicant/Permittee:

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1.2 Location Project and Introduction

This Compensatory Mitigation and Monitoring Plan (CMMP) provides the concepts and direction for implementation and maintenance of the mitigation required to compensate for impacts to jurisdictional areas associated with the replacement of the 13th Street Bridge.

The 13th Street Bridge is located on Vandenberg Air Force Base (VAFB), Santa Barbara County, California (Figure 1-1), and is found on the United States Geological Survey *Surf, California* 7.5-minute topographic map. Due to the limited amount of on-site mitigation opportunities, mitigation will take place off site. The off-site mitigation area is located adjacent to the Santa Ynez River estuary on VAFB, Santa Barbara County, California (Figure 1-2), found on the United States Geological Survey *Surf, California* 7.5-minute topographic map.

This CMMP is required and directed by the United States Army Corps of Engineers (USACE) Clean Water Act (CWA) Section 404 Permit and the Central Coast Regional Water Quality Control Board (RWQCB) water quality certification pursuant to Section 401 of the CWA.

Approximately 0.68 acres of Jurisdictional Wetlands, 1.10 acres of Waters of the United States, and 2.98 acres of Willow Riparian habitat will be permanently impacted by project activities. In addition, 0.58 acres of Jurisdictional Wetland, 1.80 acres of Waters of the United States, and 2.50 acres of Willow Riparian habitat will be temporarily impacted by project activities. Temporary impacts to wetlands would be mitigated at a 1:1 ratio (area mitigated: area impacted) by restoring disturbed areas within the project area to mimic natural or pre-construction conditions. Permanent impacts to wetlands would be mitigated at a 2:1 (area mitigated: area impacted) for restored or enhanced wetlands. The final acreage of re-establishment of wetland and/or other aquatic characteristics and functions within the designated mitigation area will be dependent on the acreage of permanent impacts during bridge construction.

Mitigation success will be assessed through performance standards specific to the sites for the establishment of seeded and planted species and the exclusion of exotic and ruderal species. Total monitoring requirements will be for an anticipated five years or until performance standards are met. Annual and final monitoring reports will be provided.

To the extent feasible and practicable, the site contours, river channel, and habitat types would be restored within the project area to pre-construction conditions. The design of the new bridge and demolition of the existing bridge will improve wetland and aquatic habitat by reducing the obstruction of flow. However, it is anticipated that the required wetland restoration acreage may not be achieved within the 13th Street Bridge Project Impact Area. Therefore, a degraded upland area adjacent to the Santa Ynez River estuary was identified for additional wetland restoration, if necessary, to meet the 404 permit criteria. This area is designated as the Wetland Mitigation Area.

This portion of the estuary is currently 1.5 to 4 feet above elevations conducive to support a broad spectrum of native salt marsh plant and animal species (Ball & Robinette 2012). The current ground elevations within the Wetland Mitigation Area are the result of more than 70 years of sediment accretion caused by river flow conditions influenced by old 35th Street Bridge abutments. Though that bridge was demolished in 1970, the structural abutments on either bank still remain in place. Decades of high flow events have caused a gradual buildup of sediment immediately downstream of these

barriers. This has caused the southwest portion of the estuary to transition from estuarine habitat to upland habitat dominated by a mix of invasive broadleaf plants and native Central Coast Scrub species. As a result, this area no longer functions as wetland habitat and does not support obligate estuary species. Permanent impacts that cannot be mitigated within the 13th Street Project Impact Area will be mitigated through the grading and relocation of accumulated sediment in the Wetland Mitigation Area.

This CMMP describes the site preparation, seed and plant material, installation methods, and maintenance required until the performance standards are met.

Figure 1-1. Regional map of the 13th Street Project Area and Wetland Mitigation Area and the Santa Ynez River Watershed.

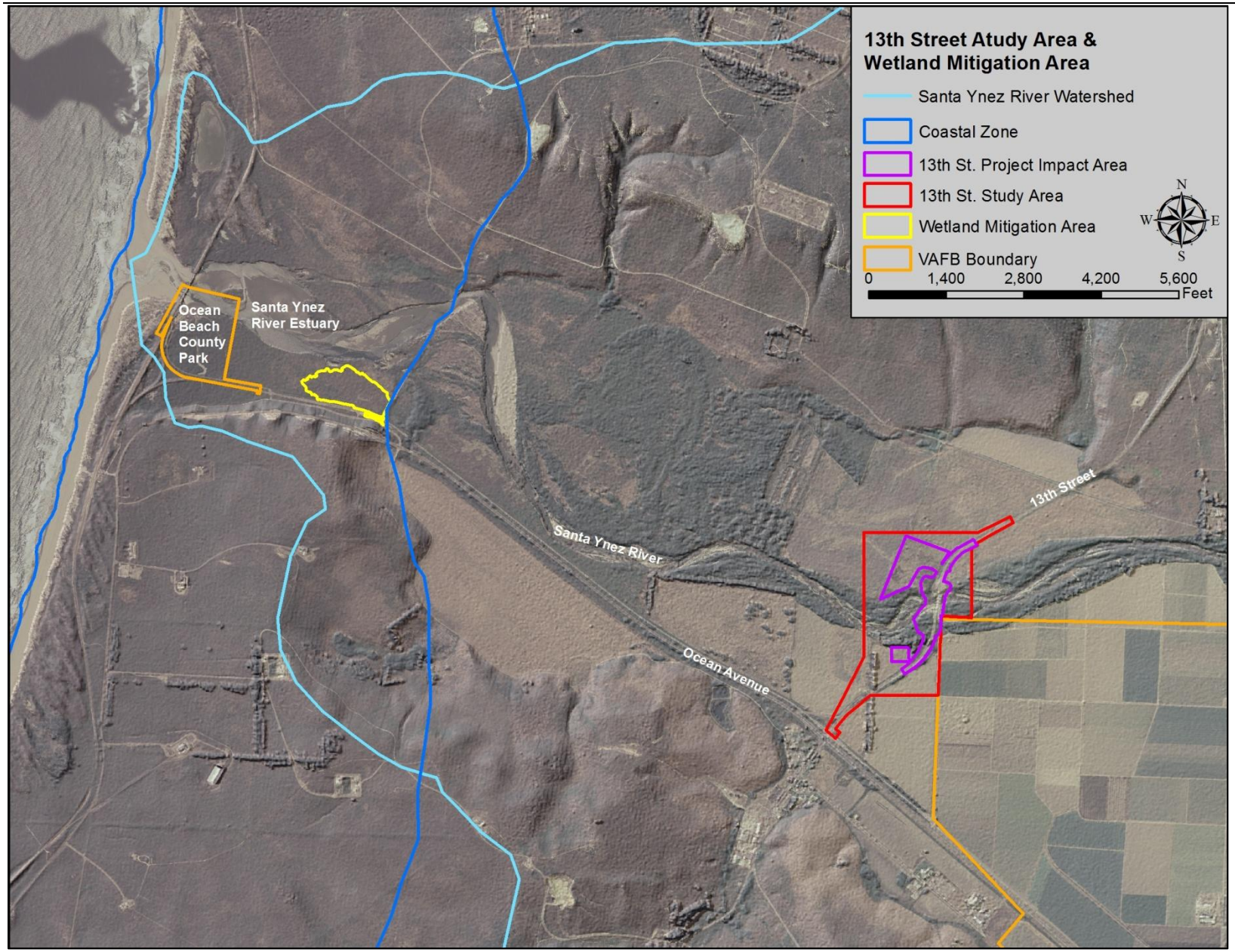

Figure 1-2. 13th Street Study and Wetland Mitigation Area.

1.3 Project Summary – 13th Street Bridge Replacement

The project includes construction of a new bridge on 13th Street over the Santa Ynez River and corresponding approach roads, and demolition and removal of the existing 13th Street Bridge and existing approach roads (Figure 1-3). Construction of the new bridge and demolition of the existing bridge is anticipated to begin in late spring or early summer 2015 and last approximately twelve to twenty months. Direct impacts related to bridge construction and demolition are expected to be confined to the 31.1 acre Project Impact Area.

Construction activities in the river channel would be completed or paused prior to the forecast and onset of significant rainfall (0.5 inches within a 24 hour period) and all temporary fill, water diversion, and materials placed in the river channel would be removed. Temporary trestles may be left in place throughout the rainy season, but will be designed to withstand a five to ten year flood event. Some construction activities may continue on the upper bank during the rainy season (installation of decking, conduit, and approach roads, etc.).

Demolition and removal of the existing approach roads is estimated to begin in April 2016 and last between five and six months.

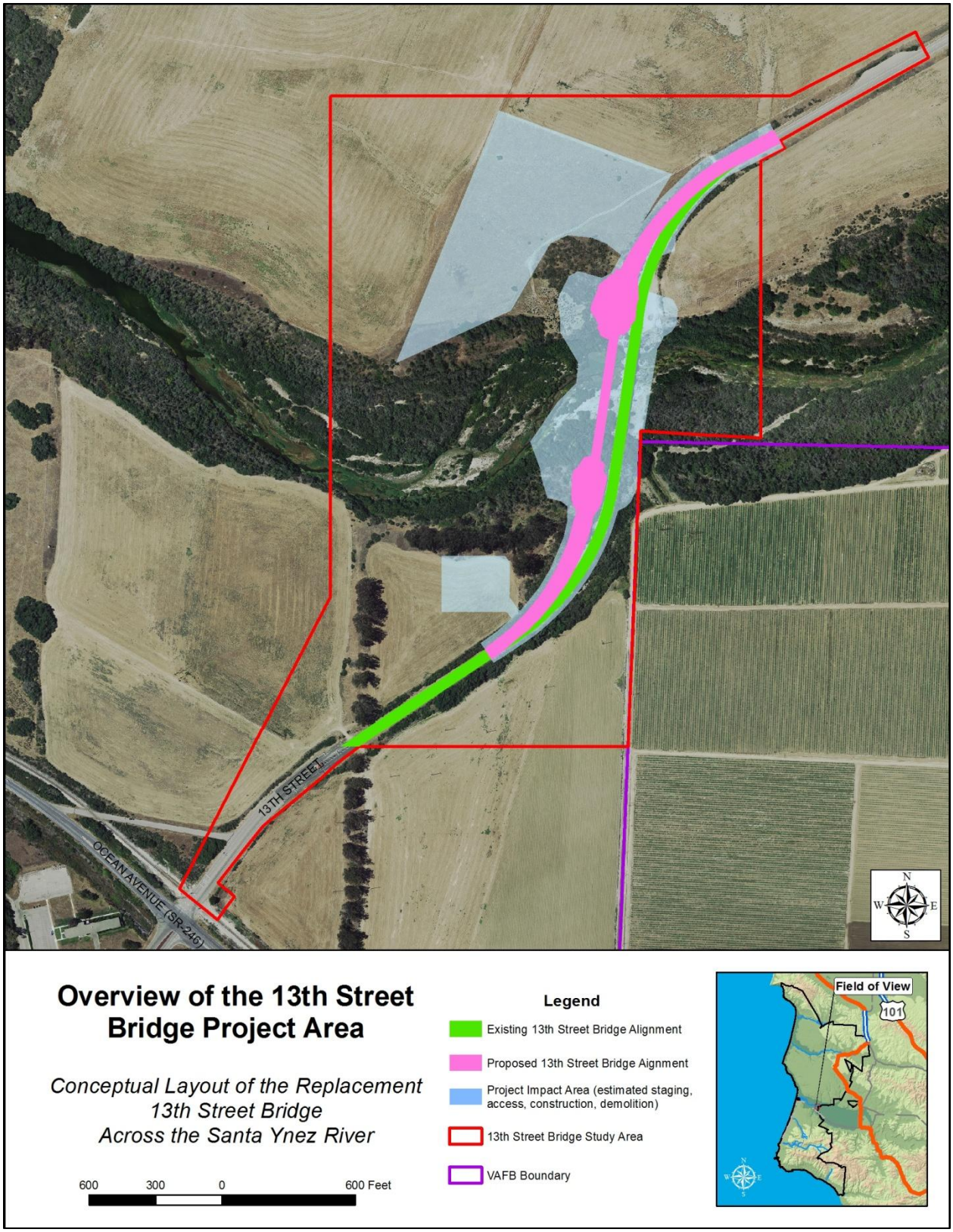

Figure 1-3. Overview of the 13th Street Bridge Project Impact and Study Areas.

1.4 Jurisdictional Areas and Special Aquatic Habitats within the 13th Street Bridge Project Area

Habitat and wetland surveys were conducted within the 13th Street Bridge Study Area in winter 2013 and spring 2014, respectively. Jurisdictional areas anticipated to be directly or indirectly affected by the project are shown in Figure 1-5. Table 1-1 details impacts to Jurisdictional Wetlands, Waters of the United States and Willow Riparian habitat within Jurisdictional Waters (MSRS 2014c). Table 1-2 details temporary and permanent impacts to Willow Riparian habitat outside of Jurisdictional Waters.

Table 1-1. Temporary and permanent impacts to Waters of the U.S. Within the 13th Street Bridge Study Area all Jurisdictional Wetlands were within Waters of the U.S.

Category	Impact Type		Total Impacted
	Temporary	Permanent	
Jurisdictional Wetland (acres)	0.5793	0.6819	1.2612
Fresh Water Marsh	*0.4130*	*0.4514*	*0.8644*
Willow Riparian-Fresh Water Marsh	*0.0376*	*0.0833*	*0.1209*
Willow Riparian	*0.1287*	*0.1472*	*0.2760*
Non-Wetland Waters (acres)	1.2160	0.4185	1.6345
Fresh Water Marsh	*0.0427*	*0*	*0.0427*
Willow Riparian	*0.8123*	*0.3179*	*1.1302*
Central Coast Scrub	*0.0014*	*0.0014*	*0.0028*
Non-Native	*0.0530*	*0*	*0.0530*
Open Water	*0.140*	*0.0389*	*0.1796*
Anthropogenic (Developed)	*0.1660*	*0.0603*	*0.2262*
Waters of the U.S.: Total (acres)	**1.7953**	**1.1004**	**2.8958**
Waters of the U.S. (linear feet)	**851.1**	**398.5**	**1,249.5**
Main Channel (linear feet)	*623.1*	*122.5*	*745.5*
Secondary Channel (linear feet)	*228.0*	*276.0*	*504.0*

Table 1-2. Estimated acres of Willow Riparian habitat outside of Jurisdictional Waters impacted by project activities. Jurisdictional Waters include Waters of the U.S. and Jurisdictional Wetlands.

Category	Impact Type		Total Impacted
	Temporary	Permanent	
Non-Jurisdictional Willow Riparian	1.5259	2.4362	3.9621
Willow Riparian - Mature	*1.2653*	*0.8763*	*2.1416*
Willow Riparian - on Riprap	*0.2048*	*0.1801*	*0.3848*
Willow Riparian - on Sandbar	*0.0558*	*0.1399*	*0.1957*
Willow Riparian - Senescing[1]	*0*	*1.2399*	*1.2399*

1.5 Types, Functions and Values of Jurisdictional and Special Aquatic Habitats to Be Impacted within the 13th Street Bridge Project Area

Habitat types, functions and values were assessed within the 13th Street Study Area by conducting multiple surveys, analyses, and literature searches. These included a California Rapid Assessment Method (CRAM) analysis, a Wetland Delineation, a general biological survey, targeted special status species surveys and reviews of literature and databases pertaining to past biological surveys. Results are detailed briefly below.

1.5.1 California Rapid Assessment Method

To determine the diversity of ecological services provided by wetland habitats, the 13th Street Bridge Study Area was assessed divided in eight assessment areas (AAs) using metrics and methods established for CRAM (Figure 1-4).

CRAM scores wetlands on four attributes based on the ecological services provided. Value is dependent on the diversity of services provided, as opposed to the level of any one service. The overall score for the AA is calculated by averaging the four attribute scores. The maximum possible score (100) for each attribute represents the best condition that is likely to be achieved for the type of wetland being assessed. The overall score for a wetland indicates how the wetland compares relative to the best achievable conditions (CWMW 2013a). Table 1-4 details scores for the each AA. A detailed discussion of methods and results pertaining to the CRAM analysis is available in MSRS 2014c. A brief overview of CRAM procedures is provided in section 3.1.2.1.

Table 1-3. AA attribute scores, overall scores and size.

AA	Buffer and Landscape Context	Hydrology	Physical Structure	Biotic Structure	Overall Score	Size (acres)
AA-01: East of Bridge	90.3	83.3	62.5	69.4	76.4	2.15
AA-02: Secondary Channel	93.3	83.3	50.0	69.4	74.0	0.35
AA-03: North Bank	93.3	75.0	62.5	72.2	75.8	3.21
AA-04: South Bank	86.4	75.0	62.5	52.7	69.2	1.50
AA-05: North Bank	90.3	75.0	75.0	86.1	81.6	2.27
AA-06: South Bank	90.3	58.3	37.5	69.4	63.0	1.06
AA-07: North Bank	90.3	75.0	87.5	77.8	82.6	1.53
AA-08: North Bank	80.6	58.3	37.5	55.6	55.6	0.81

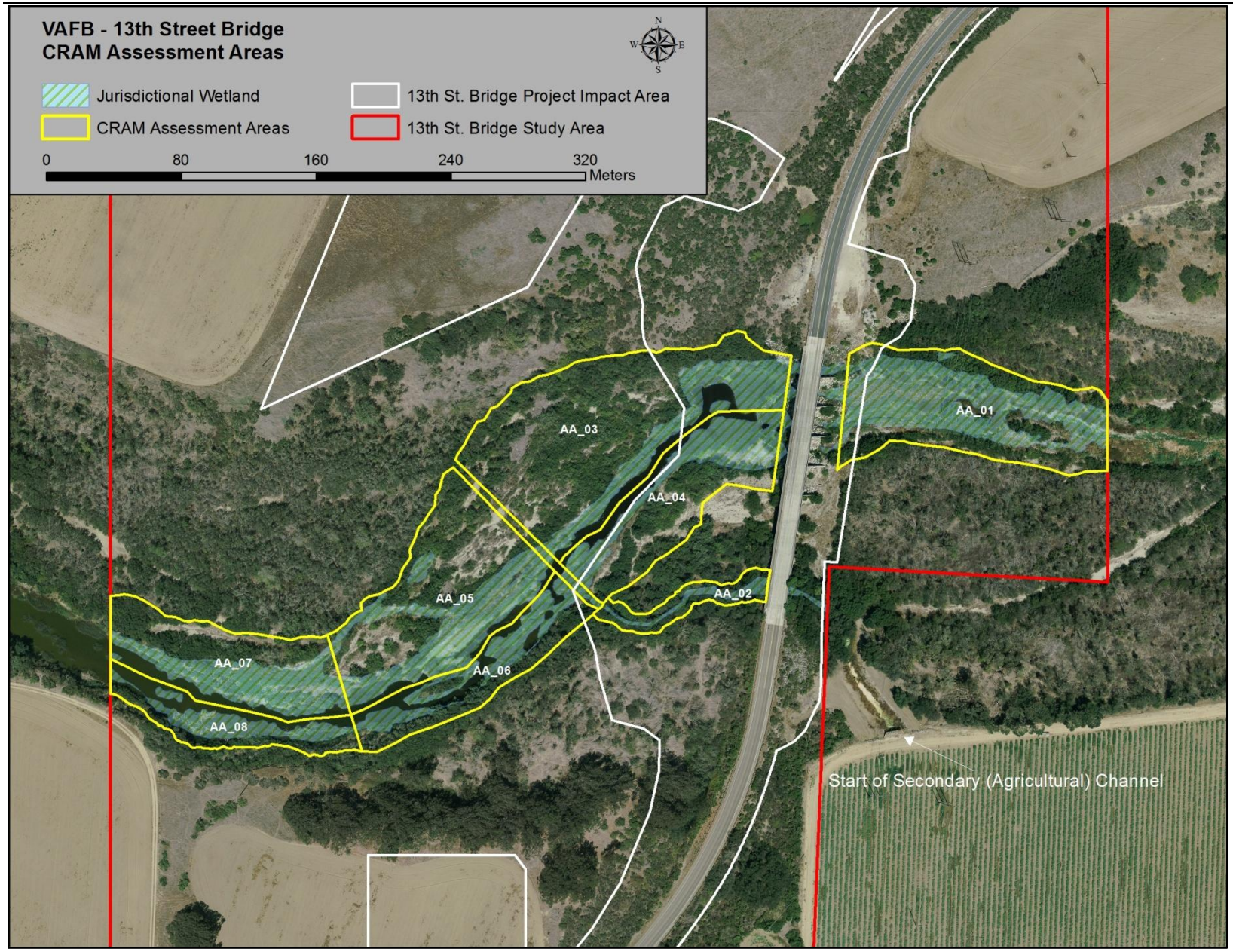

Figure 1-4. CRAM AAs within the 13th Street Bridge Project Impact and Study Areas.

1.5.2 Jurisdictional Delineation

Wetlands were delineated in accordance with USACE Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West Region (USACE 2008). Potential wetland areas were assessed for the presence of wetland hydrology, hydric soils, and hydric vegetation.

1.5.2.1 Hydrology

The Santa Ynez River is an intermittent river with highly fluctuating flow. Summer flow in the Santa Ynez River often drops to zero. Approximately four miles of the river run through VAFB. This segment, which includes the 13th Street Bridge Study Area generally has some water flowing as a result of discharge of irrigation water from agricultural fields and treated effluent from the Lompoc Regional Wastewater Treatment Plant, located east of the VAFB boundary (Coulombe & Mahrdt 1976).

Within the Study Area, saturation within the upper 12 inches was the most common primary indicator of wetland hydrology and was closely tied to proximity to the hydrated channel. The appearance of drift and sediment deposits was very limited with most deposits appearing to be multiple years old. These deposits were most commonly encountered away from the hydrated channel within the riparian corridor where they were deposited during high flow events (5 year flood events) that occurred during prior years. Within the riparian corridor, these deposits are protected from degradation and continue to persist.

1.5.2.2 Soils

Within the Study Area, most of the soils within the active floodpain of the Santa Ynez River are classified as Riverwash (USDA 1972). This area, however, also includes areas mapped as Metz Loamy Sand and San Andreas Stony Soil. Due to the fact that these surveys were conducted in the early 1970s and that the river has migrated considerably since then, these areas cannot be differentiated in the field from those areas mapped as Riverwash.

During field examination, soils within the active floodplain were found to have high sand content. Some also showed weak evidence of stratified layers. Stratification is formed when successive layers of soil and organic debris are deposited during flow events. Areas within the riparian corridors, where flow events are more infrequent, had loamier soils. Less frequent flows in these areas likely allow smaller soil particles to persist in the profile.

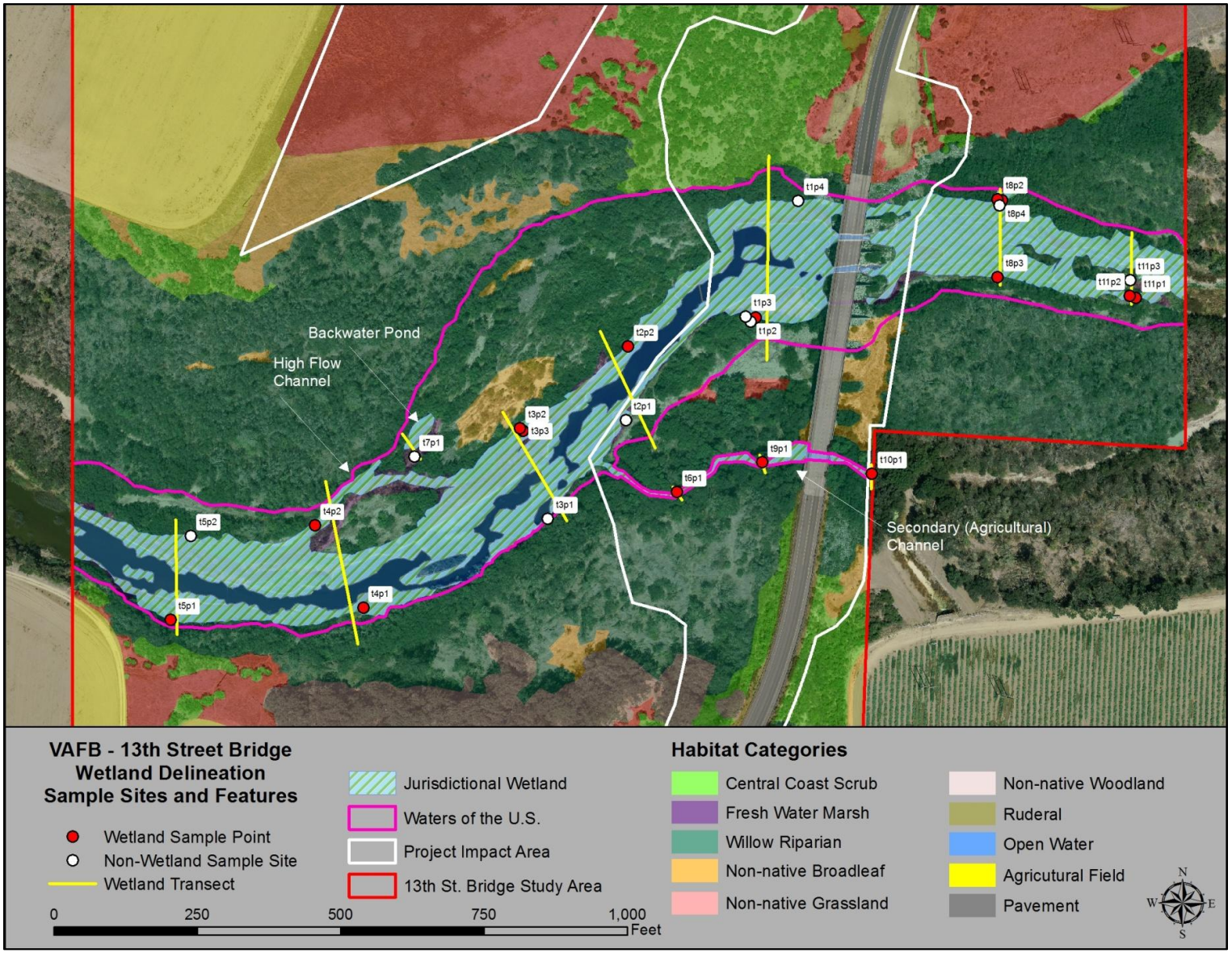

Figure 1-5. Wetland delineation sample sites and features within the 13th Street Bridge Project Impact and Study Areas.

1.5.2.3 Vegetation

The entire 122.5 acre 13th Street Bridge Study Area was surveyed to characterize current conditions and identify areas of potential wetlands (Figures 1-5 and 1-6). Three distinct native habitat types were identified: Central Coast Scrub (CCS), Freshwater Marsh (FWM), and Willow Riparian (RIP); see Table 1-6 and Figure 1-6.

Central Coast Scrub – This vegetation type is characterized by shallow-rooted, mesophylic plant species that are often drought-deciduous and summer-dormant. The dominant native species at this site is Coyote brush (*Baccharis pilularis*). CCS stands bordering roads and agricultural fields have a significant invasive understory, predominately consisting of black mustard (*Brassica nigra*). Overall non-native cover in CCS was 13.3 percent.

Freshwater Marsh – This vegetation type occurs in and along active channels as well as backwater channels and pools. Within the wetland sample plots, where standing water was not present (Terrestrial Freshwater Marsh), this vegetation type was dominated by native species such as mugwort (*Artemisia douglasiana*), stinging nettle (*Urtica dioica*), and umbrella sedge (*Cyperus eragrostis*) and non-native species such as rabbit-foot grass (*Polypogon monspeliensis*) and wild celery (*Apium graveolens*).

Within wetland sample areas where it occurred in conjunction with standing water (Channel) dominant species were rushes (*Schoenoplectus* spp. and *Bolboschoenus maritimus*), broad-leafed cattail (*Typha latifolia*), and the non-native European watercress (*Nasturtium officinale*).

Almost all areas supporting FWM meet the requirements for Jurisdictional Wetland.

This vegetation type is subject to dramatic changes in extent seasonally and yearly. In years such as 2014, which experienced no scouring flows, this vegetation type proliferated within the active channels During 2014 surveys the channel was found to be over 80 percent vegetated with bankside habitats also supporting this vegetation type. In contrast, on years where high flow occurs, virtually all FWM habitats within the active floodplain are scoured out and do not reach peak extent until the end of the summer.

Willow Riparian Forest – Willow Riparian Forest is dense, low, closed-canopy, broad-leafed, winter-deciduous riparian forest that is dominated by a mix of arroyo willow (*Salix lasiolepis*) and red willow (*Salix laevigata*). Within the Study Area this vegetation type is associated with the banks and floodplain of the Santa Ynez River. Areas where this vegetation type overhang or are rooted in surface water, saturated soils, or Freshwater Marsh vegetation meet the requirements for Jurisdictional Wetland.

Areas supporting mature Willow Riparian are densely treed often with little herbaceous growth in the understory. Where this habitat type grows on sand bars; however, trees are typically small and may be widely spaced. Many of these areas are within the active flood plain and usually feature young trees which have recolonized the area following scour events. Interstitial spaces may feature open sand or stands of broadleaf weeds. Similarly where this habitat type is found growing through rip-rap abutments, trees are typically sparse, with open areas characterized by exposed rock.

RIP bordering the agricultural drainage on the southeast corner of the 13th Street Bridge Study Area had an understory dominated by cape ivy (*Delairea odorata*). Willow trees found within the RIP habitat on

the upper terrace of the southwest bank have experienced significant mortality, likely due to the severe drought conditions, resulting in a reduction of willow canopy cover and a proliferation of poison hemlock (*Conium maculatum*).

Table 1-4. Current habitat acreages within the 13th Street Bridge Project Impact and Study Areas.

Habitat Type	Project Impact Area	Study Area
Fresh Water Marsh (All)	0.9071	3.4242
Fresh Water Marsh-Aquatic	*0.6235*	*1.9745*
Fresh Water Marsh-Terrestrial	*0.2836*	*1.4497*
Willow Riparian-Fresh Water Marsh (All)	0.1209	0.1237
Willow Riparian-Fresh Water Marsh-Aquatic	*0.0847*	*0.0871*
Willow Riparian-Fresh Water Marsh-Terrestrial	*0.0361*	*0.0366*
Willow Riparian (All)	5.3681	27.3178
Willow Riparian	*3.1086*	*22.6350*
Willow Riparian-on Riprap	*0.6746*	*0.6940*
Willow Riparian-on Sandbar	*0.3451*	*0.7318*
Willow Riparian-Senescing	*1.2399*	*2.8445*
Willow Riparian-Sapling	*0*	*0.4125*
Central Coast Scrub	4.0632	10.1869
Non-Native (All)	14.5213	25.1869
Non-native Grassland	*13.3008*	*19.4845*
Non-native Broadleaf	*1.0318*	*2.7103*
Non-native Woodland	*0.1888*	*2.9922*
Open Water	0.1796	1.2118
Anthropogenic (All)	5.9085	55.0593
Agricultural Field	*2.0770*	*46.1735*
Ruderal	*1.3355*	*2.9875*
Developed	*2.4959*	*5.8983*

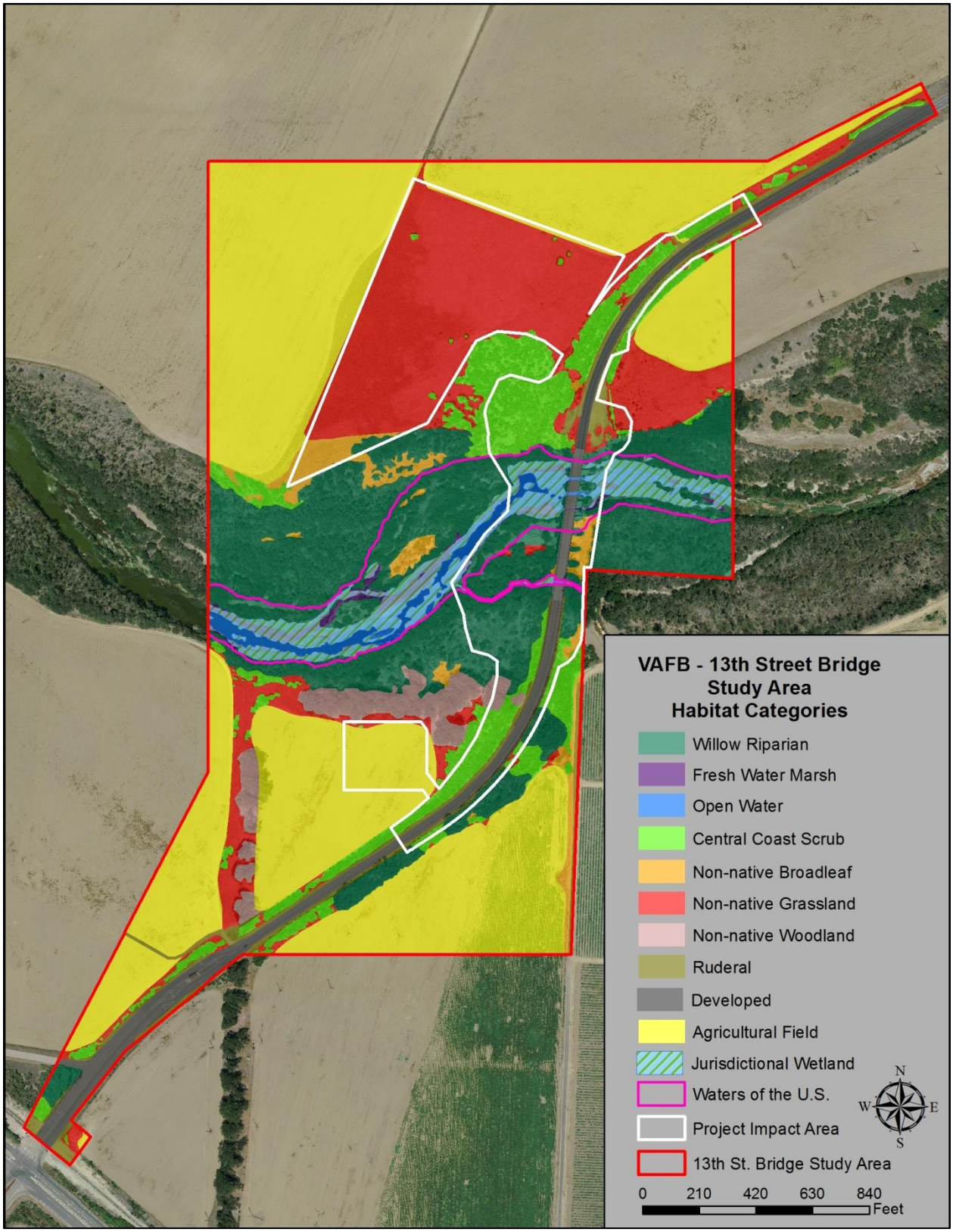

Figure 1-6. Habitat types, Jurisdictional Wetlands, and Waters of the United States within the 13th Street Bridge Project Impact and Study Areas.

1.5.3 Wildlife

The Santa Ynez River is valuable to wildlife by providing habitat and serving as a travel and migration corridor. The riparian corridor of the river allows wildlife from upland areas to avoid predators and escape human disturbance and also provides food and water sources for these species.

Common amphibian and reptile species found within and around the project area include non-native bullfrog (*Lithobates catesbeiana*), California red-legged frog (*Rana draytonii*, CRLF) , Baja chorus frog (*Pseudacris hypochondriaca*), ensatina (*Ensatina eschscholtzii*), western fence lizard (*Sceloporus occidentalis*), southern alligator lizard (*Elgaria multicarinata*), side-blotched lizard (*Uta stansburiana*), western skink (*Eumeces skiltonianus*), Pacific rattlesnake (*Crotalus helleri*), kingsnake (*Lampropeltis getula*), common gartersnake (*Thamnophis sirtalis*), and gopher snake (*Pituophis catenifer*). The CRLF is a federally threatened species.

Fish species known to occur within the Santa Ynez River include tidewater goby (*Eucyclogobius newberryi*, TWG), mosquito fish (*Gambusia affinis*), arroyo chub (*Gila orcutti*), armored three-spine stickleback (*Gasterosteus aculaetus*), and southern steelhead (*Oncorhynchus mykiss*) (Coulombe & Mahrdt 1976; Swift 2002; Swift et al. 1997; MSRS 2014d). The TWG and southern steelhead are federally endangered species.

More birds are found in riparian forests than in any other habitat type on VAFB. Coulombe and Mahrdt (1976) observed 46 species of birds in this habitat. Common inhabitants include song sparrow (*Melospiza melodia*), Bewick's wren (*Thryomanes bewickii*), yellow warbler (*Setophaga petechia*), spotted towhee (*Pipilo maculatus*), and downy woodpecker (*Picoides pubescens*). The federally endangered southwestern willow flycatcher (*Empidonax traillii extimus*) historically bred in riparian willow forest of the Santa Ynez River near 13th Street. Cliff swallows (*Petrochelidon pyrrhonota*) nest underneath the deck structure of the existing 13th Street Bridge.

Large and medium sized mammal species commonly found in Willow Riparian forests include Virginia opossum (*Didelphis virginiana*), desert cottontail (*Sylvilagus audubonii*), brush rabbit (*Sylvilagus bachmani*), long-tailed weasel (*Mustela frenata*), coyote (*Canis latrans*), raccoon (*Procyon lotor*), striped skunk (*Mephitis mephitis*), and bobcat (*Felis rufus*). Small mammals include various species of mice (*Peromyscus* spp.), dusky-footed woodrat (*Neotoma fuscipes*), and Trowbridge's shrew (*Sorex trowbridgii*). Several bat species are known to roost underneath the existing 13th Street Bridge or utilize habitat nearby (Pierson et al. 2002)

1.5.4 Special Status Species

Federally-listed species that occur or have the potential to occur within the project area and its vicinity include CRLF, TWG, and southern steelhead (*Oncorhynchus mykiss*). VAFB was excluded from final designation of Critical Habitat for the CRLF and TWG due to potential impacts on national security. Additionally, VAFB was partially exempted from Critical Habitat for southern steelhead because the base's draft Integrated Natural Resource Management Plan (INRMP) contained habitat protection measures for these species (and the INRMP was endorsed by NMFS in October 2009). Table 1-5 lists federal and state listed species and other special status species that occur or have the potential to occur within the 13th Street Bridge Project Area and its vicinity.

Table 1-5. Special status species observed or with potential to occur within the 13th Street Bridge Project Area.

Species	Status[1]		Habitat
	USFWS	CDFW	
Amphibians			
California Red-legged Frog (*Rana draytonii*)	FT	CSC	Still or slow water aquatic habitat.
Reptiles			
Southwestern Pond Turtle (*Actinemys marmorata pallida*)	-	CSC	Still or slow water aquatic habitat.
Fishes			
Tidewater Goby (*Eucyclogobius newberryi*)	FE	CSC	Tidal streams
Southern Steelhead (*Oncorhynchus mykiss*)	FE	CSC	Tidal streams
Arroyo chub (*Gila orcuttii*)	-	CSC	Streams
Birds			
Belding's Savannah sparrow (*Posserculus sandwichensis beldingi)*	SE		Estuary
Ferruginous Hawk (*Buteo regalis*)	BBC	-	Grasslands and shrub lands
Northern harrier (*Circus cyaneus*)	-	CSC	Grasslands and shrub lands
White-tailed Kite (*Elanus leucurus*)	-	CSC	Grasslands and shrub lands
Costa's Hummingbird (*Calypte costae*)	BCC	-	Shrub lands and woodlands
Allen's Hummingbird (*Selasphorus sasin*)	BCC	-	Shrub lands and woodlands
Nuttall's Woodpecker (*Picoides nuttallii*)	BCC	-	Woodlands
Olive-sided Flycatcher (*Contopus cooperi*)	-	CSC	Woodlands
Loggerhead Shrike (*Lanius ludovicianus*)	BCC	-	Grasslands and shrub lands
Oak Titmouse (*Baeolophus inornatus*)	BCC	-	Woodlands
Yellow Warbler (*Dendroica petechia brewsteri*)	BCC	CSC	Woodlands
Yellow-breasted Chat (*Icteria virens*)	-	CSC	Woodlands
Tricolored Blackbird (*Agelaius tricolor*)	BCC	CSC	Grasslands and marsh lands
Lawrence's Goldfinch (*Spinus lawrencei*)	BCC	-	Shrub land and woodlands

Species	Status[1]		Habitat
	USFWS	CDFW	
Mammals			
Pallid Bat (*Antrozous pallidus*)	-	CSC	Grassland, shrub land and woodlands
Western Red Bat (*Lasiurus blossevillii*)	-	CSC	Woodlands

1. FE=Federal Endangered Species; FT=Federal Threatened Species; FC=Federal Candidate Species; BCC=Federal Bird Species of Conservation Concern; SE=State Endangered Species; CSC=California Species of Special Concern; SC=State Candidate Species; FP=California Fully Protected Species

1.6 Mitigation Design

1.6.1 13th Street Bridge Project Area

The goals of restoration of the 13th Street Bridge Project Area are to reestablish the native habitats temporarily impacted by bridge construction and demolition. In the long term, these communities must be healthy, self-sustaining, regenerating, and result in effective soil stabilization that provides adequate erosion and sediment control. Additionally, these restored areas should be as weed-free as possible and comprised of local plant genotypes. Once these areas are restored, they should further function as habitat for special-status species and replace such habitat lost or adversely impacted by the bridge replacement project.

In order to assure maximum protection for the wetlands and other habitats impacted by project activities, restoration of the area impacted during project activities would begin during the final stages of construction and demolition activities as access roads and equipment are removed. Monitoring and maintenance will be undertaken until performance standards are met and will include weed control and replanting of areas where plants have died or have not been established.

1.6.2 Wetland Mitigation Area

1.6.2.1 Site Selection

The Wetland Mitigation Area is 19.1 acres. Actions in this area are contingent on not being able to meet restoration goals of no net loss of Jurisdictional or special aquatic habitats within the 13th Street Bridge Project Impact Area. The site was chosen after consideration and elimination of several alternative sites.

Wetland mitigation opportunities adjacent to the 13th Street Bridge Project Impact Area do not occur in the riparian corridor. Adjacent sites would require wetland creation on upland benches of the river, approximately 20 ft above the water table. This would require excavating enormous volumes of soil to reach the water table.

Other sites considered included an unnamed wetland in Surf Pasture, approximately 2.75 km west of the 13th Street Bridge Project Impact Area and south of Ocean Avenue. However this site has not been observed to hold water for many years and there are many unknowns associated with it. These unknowns present barriers to developing the Surf Pasture site into a wetland mitigation area. One such

unknown is the reason why this site is not holding water. A hydrological study would be required to understand the site's constraints and to determine if restoration is feasible and then an appropriate restoration strategy would need to be developed. In addition, Surf Pasture site would not improve habitat within the Santa Ynez River corridor or benefit wildlife species that occur there.

Since wetland restoration was not practicable adjacent to the 13th Street Bridge Project Impact Area, nor nearby within the watershed, opportunities were examined in different types of degraded wetland habitats elsewhere along the Santa Ynez River. This resulted in the selection of the "Wetland Mitigation Area". Restoration of this area would offset loss of wetland habitat functionality within the 13th Street Bridge Project Impact Area with increased functionality of estuarine wetland, thus providing an overall positive benefit to the Santa Ynez River watershed.

1.6.2.2 Project Summary

If use of this area is necessary to mitigate losses with the 13th Street Project Impact Area, approximately 4.02 acres at the western end would require grading and relocation of between 10,000 and 11,000 cubic yards (CY) of accumulated sediment at the south eastern edge of the estuary (Figure 2-3). Prior to grading activities, the vegetation within the site, which is predominately non-native, would be grubbed with a masticator. The Wetland Mitigation Area will then be graded to an average elevation of approximately 3.0 meters (10 feet). This will cause the habitat to transition from an invasive species dominated upland habitat to an irregularly to seasonally flooded middle salt marsh wetland habitat dominated by pickleweed (*Salicornia virginica*), alkali heath (*Frankenia salina*), saltgrass (*Distichlis spicata*), and fleshy jaumea (*Jaumea carnosa*).

Grading would occur after construction and demolition activities for the 13th Street bridge have been completed and final project impacts assessed. Additionally activities would occur after 15 August to avoid impacts to nesting birds and before the onset of the rainy season. Grading would be postponed if the restoration area is inundated (due to elevated estuary water levels) until water levels subside. All excavated soil would be transferred 800 to 1,100 feet for deposition at a 2.1 acre site at the southwestern edge of the remnant 35th Street Bridge causeway and abutments. The soil would be deposited in a gradually sloped lens along the embankment and restored as native upland habitat. Since removal of the 35th Street Bridge abutments are not part of the Proposed Action, they will remain in place and sediment may build up in the Wetland Mitigation Area during future high flow events.

1.6.2.3 Baseline Conditions

Habitat types, functions and values were assessed within the Wetland Area by conducting multiple surveys, analyses, and literature searches. These included a California Rapid Assessment Method (CRAM) analysis, a Wetland Delineation, a general biological survey, targeted special status species surveys and reviews of literature and databases pertaining to past biological surveys. Results are detailed briefly below.

1.6.2.3.1 California Rapid Assessment Method

The proposed area of soil excavation falls outside of CRAM guidelines for establishment of a Bar-Built Estuarine AA because it is almost entirely upland habitat (CWMW 2013b). Under CRAM AA establishment guidelines, the AA cannot extend above the backshore which is defined in part by the

transition from hydric salt marsh vegetation to upland vegetation. To help inform restoration decisions, MSRS completed a CRAM assessment within salt marsh wetland habitat immediately west of the Wetland Mitigation Area (Table 1-7 and Figure 1-7). This area contains habitat consistent with post restoration goals and the AA occupies the same general landscape context as the Wetland Mitigation Area. Upon completion of restoration, MSRS recommends the establishment of two additional AAs (Figure 1-7) to evaluate restoration success. A detailed discussion of methods and results pertaining to the CRAM analysis is available in MSRS 2014c.

Table 1-6. AA attribute scores, overall scores and size.

AA	Buffer and Landscape Context	Hydrology	Physical Structure	Biotic Structure	Overall Score	Size (acres)
Reference AA	67.2	66.7	37.5	61.1	58.3	3.18

Figure 1-7. Wetland Mitigation Area and CRAM Assessment Areas.

1.6.2.3.2 Jurisdictional Delineation

Habitat and wetland surveys were conducted within the Wetland Mitigation Area in winter 2013 and spring 2014, respectively. Wetlands were delineated in accordance with USACE Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West Region (USACE 2008). Jurisdictional areas anticipated to be directly or indirectly affected by the project are shown in Figure 1-5. Table 1-3 details impacts to Jurisdictional Wetlands, Waters of the United States and Coastal Salt Marsh habitat (MSRS 2014c).

Table 1-7. Impacts to Jurisdictional Wetlands, Waters of the United States and Coastal Salt Marsh habitat.

Habitat Type	Existing	Directly Affected	Restoration Gains	Post-Action Total Acres	Net Gain/Loss
Jurisdictional Wetland[1]	**0.09**	**0.09**	**4.02**	**4.02**	**3.93**
Waters of the U.S.[1]	**0.09**	**0.09**	**4.02**	**4.02**	**3.93**
Coastal Salt Marsh	**2.34**	**1.40**	**4.02**	**4.94**	**2.60[3]**
CSM-middle[2]	*0.10*	*0.09*	*4.02*	*4.02*	*3.92*
CSM-upper	*2.21*	*1.31*	*0*	*0.89*	*-1.32[3]*
CSM-middle/upper	*0.03*	*0*	*0*	*0.03*	*0*

1. Jurisdictional Wetlands and Waters of the U.S. completely overlap within the Wetland Mitigation Area
2. All Jurisdictional Wetlands occur within this habitat type and are included in acreages
3. VAFB is pursuing the use of agricultural fields southeast of the project area as an alternate area for soil deposition. Use of this area will reduce loss of CSM-upper to 0.16 acres and increase net gain of Coastal Salt Marsh to 2.76 acres.

1.6.2.3.2.1 Hydrology

Saturation within the upper 12 inches was the only primary indicator of wetland hydrology documented and a positive FAC-Neutral Tests the only secondary indicator. Throughout the winter spring period, when surveys were conducted, water levels in the estuary were actively rising. These rising water levels led to documentation of saturation within the upper 12 inches in June 2014 within portions of the Wetland Mitigation Area with ground elevations of 11 feet or less.

Due to the fact that the development of wetland hydrology was a recent occurrence, there were no clear surface indicators present. Because of the lack of surface indicators, supplemental pits (hydrology test, Figure 1-8) were excavated to determine status of areas where hydric vegetation was present.

1.6.2.3.2.2 Soils

Soils within the Wetland Mitigation Area, were primarily classified as Marsh with a small area of Camarillo Sandy Loam present in the northernmost portion (USDA 1972).

Water levels in the estuary fluctuate seasonally and between years. During general biological surveys conducted for the 13th Street bridge biological assessment and surveys conducted for the preparation of this document, a steady rise in water levels was observed. Likely in response to rising levels of salt water, large tracts of poison hemlock failed to re-sprout and native salt marsh species were observed expanding into these areas in June 2014. These areas had positive indicators for vegetation and hydrology, but not soils. Due to recent inundation, hydric soil characteristics likely have not had

sufficient time to develop. Therefore, in areas exhibiting both hydric vegetation and wetland hydrology, soils were classified as Problematic Hydric.

1.6.2.3.2.3 Vegetation

The entire 19.1 acre Wetland Mitigation Area was surveyed to characterize current conditions and identify areas of potential wetlands. Three distinct native habitat types were identified: Coastal Salt Marsh (CSM), Central Coast Scrub (CCS), and Native Grassland (NG); see Table 1-8 and Figure 1-8

Coastal Salt Marsh

Coastal Salt Marsh- middle: This vegetation type occurs in areas inundated during maximal water levels within the estuary. Pickleweed is an obligate-wetland species that forms a near monoculture throughout much of this habitat type. On the fringes, however, it may occur in conjunction with other species such as alkali heath and fleshy jaumea ranked facultative-wetland and obligate-wetland respectively. Areas occupied by this habitat type may meet the criteria for Jurisdictional Wetland.

Coastal Salt Marsh - upper: This habitat type occurs at elevations above the maximum level of inundation, and rarely has surface water present. However, it is influenced by enhanced subsurface moisture and is dominated by native species ranked as facultative or facultative-wetland. In large tracts it is dominated by a mix of salt grass, creeping wild rye, pacific aster (*Symphyotrichum chilense*), alkali heath and marsh baccharis (*Baccharis glutinosa*). This habitat type may also occur as small patches composed of a single species. This habitat type does not meet the criteria for Jurisdictional Wetland.

Central Coast Scrub – Within the Wetland Mitigation Area, this habitat type exhibits low diversity and is composed almost exclusively of coyote brush. Where it borders areas with enhanced moisture, portions of CCS may support hydric herbaceous species (*Frankenia salina Jaumea carnosa*, *Conium maculatum*) as an understory component.

Native Grassland – Within the Wetland Mitigation Area this vegetation type is dominated by grass species tolerant of salinity: salt grass (*Distichlis spicata*) and creeping wild rye (*Eleymus triticoides*). It appears to favor areas with enhanced moisture regimes. Most of this habitat is highly degraded within the Wetland Mitigation Area with native grass species sharing dominance with non-native broadleaf weeds.

Table 1-8. Estimated acreage of each habitat type in the Wetland Mitigation Area.

Habitat Type	Existing	Impacted	Restoration Gains	Post-Action	Net Gain/Loss
Coastal Salt Marsh	**2.34**	**1.40**	**4.02**	**4.94**	**2.60**[1]
CSM-middle	0.10	0.09	4.02	4.02	3.92
CSM-upper	2.21	1.31	0	0.89	-1.32[1]
CSM-middle/upper	0.03	0	0	0.03	0
Central Coast Scrub	**4.21**	**1.67**	**2.80**	**5.34**	**1.13**
Native Grassland	**0.01**	**0.01**	**0**	**0**	**-0.01**
Degraded Habitats	**1.58**	**0.57**	**0**	**1.03**	**-0.55**
CSM-upper / NNB	0.09	0.06	0	0.03	-0.06
CSM-upper / NNG	0.16	0.02	0	0.15	-0.01
CCS / NNB	0.49	0.45	0	0.04	-0.45
NG / NNB	0.84	0.04	0	0.81	-0.03
Non-native Habitats	**10.94**	**3.21**	**0**	**7.73**	**-3.21**
NNB	10.54	2.81	0	7.73	-2.81
RUD	0.40	0.40	0	0.00	-0.40

1. VAFB is pursuing the use of agricultural fields southeast of the project area as an alternate area for soil deposition. Use of this area will reduce loss of CSM-upper to 0.16 acres and increase net gain of Coastal Salt Marsh to 2.76 acres.

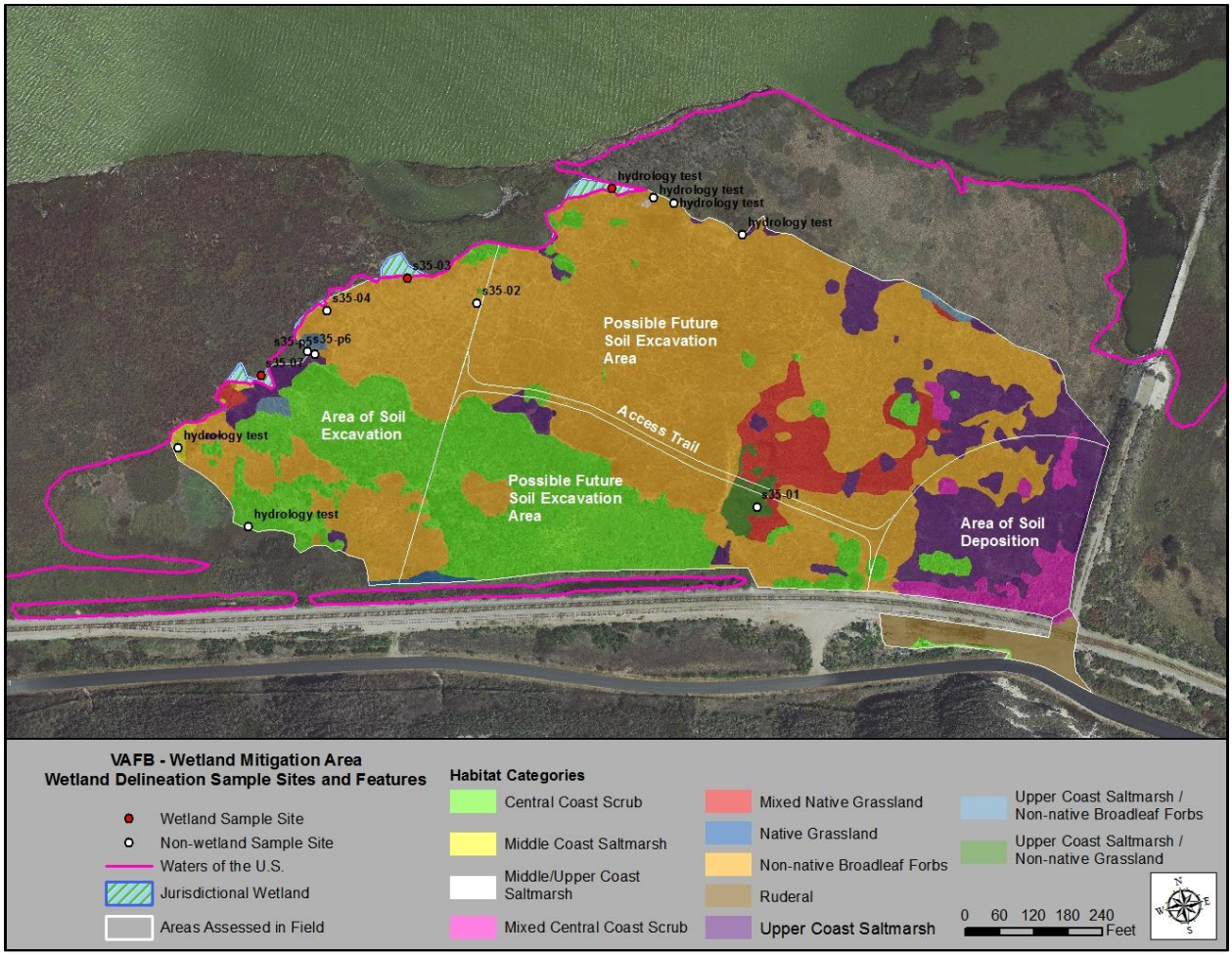

Figure 1-8. Wetland delineation sample sites and features within the Wetland Mitigation Area.

1.6.2.3.3 Wildlife

The functional CSM habitat within the Santa Ynez River Estuary provides valuable habitat for wildlife. The Wetland Mitigation Area is currently dominated by non-native and degraded native habitat which limit its function and value to wildlife species. Common wildlife species currently occupying the area include western fence lizard, common gartersnake, Belding's savannah sparrow (*Passerculus sandwichensis beldingi*), Bewick's wren, brush rabbit, coyote, raccoon, various species of mice, and dusky-footed woodrat

1.6.2.3.4 Special Status Species

Federally-listed species that occur or have the potential to occur within the wetland mitigation area and its vicinity include CRLF, TWG, and southern steelhead. VAFB was excluded from final designation of Critical Habitat for the CRLF and TWG due to potential impacts on national security. Additionally, VAFB was partially exempted from Critical Habitat for southern steelhead because the base's draft INRMP contained habitat protection measures for these species (and the INRMP was endorsed by NMFS in October 2009). Table 1-9 lists federal and state listed species and other special status species that occur or have the potential to occur within the Wetland Mitigation Area and its vicinity.

Table 1-9. Special status species observed or with potential to occur within the Wetland Mitigation Area.

Species	Status[1]		Habitat
	USFWS	CDFW	
Amphibians			
California Red-legged Frog[2] (*Rana draytonii*)	FT	CSC	Still or slow water aquatic habitat.
Reptiles			
Southwestern Pond Turtle[2] (*Actinemys marmorata pallida*)	-	CSC	Still or slow water aquatic habitat.
Fishes			
Tidewater Goby[2] (*Eucyclogobius newberryi*)	FE	CSC	Tidal streams
Southern Steelhead[2] (*Oncorhynchus mykiss*)	FE	CSC	Tidal streams
Birds			
Belding's Savannah Sparrow (*Posserculus sandwichensis beldingi*)	SE		Estuary
Ferruginous Hawk (*Buteo regalis*)	BBC	-	Grasslands and shrub lands
Northern harrier (*Circus cyaneus*)	-	CSC	Grasslands and shrub lands
White-tailed Kite (*Elanus leucurus*)	-	CSC	Grasslands and shrub lands
Costa's Hummingbird (*Calypte costae*)	BCC	-	Shrub lands and woodlands
Allen's Hummingbird (*Selasphorus sasin*)	BCC	-	Shrub lands and woodlands
Loggerhead Shrike (*Lanius ludovicianus*)	BCC	-	Grasslands and shrub lands
Tricolored Blackbird (*Agelaius tricolor*)	BCC	CSC	Grasslands and marsh lands
Lawrence's Goldfinch (*Spinus lawrencei*)	BCC	-	Shrub land and woodlands

1. FE=Federal Endangered Species; FT=Federal Threatened Species; FC=Federal Candidate Species; BCC=Federal Bird Species of Conservation Concern; SE=State Endangered Species; CSC=California Species of Special Concern; SC=State Candidate Species; FP=California Fully Protected Species
1. Potential to occur adjacent to the project area

Table 1-10. Habitat types to be created, restored, or enhanced within the 13th Street Bridge Project Impact Area.

Habitat Type	Pre-Project	Action				Post-Restoration	Change
		Created	Enhanced	Restored	Preserved		
Fresh Water Marsh (All)	0.9071	0	0	0.9729	0.2316	1.2045	+0.2974
Fresh Water Marsh-Aquatic	*0.6235*	*0*	*0*	*0.9729*	*0.1611*	*1.1340*	*+0.5105*
Fresh Water Marsh-Terrestrial	*0.2836*	*0*	*0*	*0*	*0.0705*	*0.0705*	*-0.2131*
Willow Riparian-Fresh Water Marsh (All)	0.1209	0	0	0.3017	0.0142	0.3159	+0.1950
Willow Riparian-Fresh Water Marsh-Aquatic	*0.0847*	*0*	*0*	*0*	*0.0088*	*0.0088*	*-0.0759*
Willow Riparian-Fresh Water Marsh-Terrestrial	*0.0361*	*0*	*0*	*0.3017*	*0.0054*	*0.3071*	*+0.2709*
Willow Riparian (All)	5.3681	0	0	2.4298	0.9172	3.3469	-2.0212
Willow Riparian	*3.1086*	*0*	*0*	*2.4298*	*0.8098*	*3.2395*	*+0.1310*
Willow Riparian-on Riprap	*0.6746*	*0*	*0*	*0*	*0*	*0*	*-0.6746*
Willow Riparian-on Sandbar	*0.3451*	*0*	*0*	*0*	*0.1074*	*0.1074*	*-0.2377*
Willow Riparian-Senescing	*1.2399*	*0*	*0*	*0*	*0*	*0*	*-1.2399*
Central Coast Scrub	4.0632	0	0	5.1372	0.0303	5.1675	+0.4943
Understory	0	0	0	0.2669	0	0.2669	+0.2669
Non-Native (All)	14.5213	0.8158	0	12.3400	0.0303	13.1861	-1.3353
Non-native Grassland	*13.3008*	*0.8158*	*0*	*12.3400*	*0.0303*	*13.1861*	*-0.1147*
Non-native Broadleaf	*1.0318*	*0*	*0*	*0*	*0*	*0*	*-1.0318*
Non-native Woodland	*0.1888*	*0*	*0*	*0*	*0*	*0*	*-0.1888*
Open Water	0.1796	0	0	0	0.0596	0.0596	-0.1200
Anthropogenic (All)	5.9085	5.0631	0	3.0681	0	8.1312	+2.2227
Agricultural Field	*2.0770*	*0*	*0*	*2.0539*	*0*	*2.0539*	*-0.0231*
Ruderal	*1.3355*	*0*	*0*	*0*	*0*	*0*	*-1.3355*
Developed	*2.4959*	*5.0631*	*0*	*1.0142*	*0*	*6.0773*	*+3.5814*

2 Goals of Mitigation

2.1 Types of Habitat to be Restored/Enhanced

2.1.1 13th Street Bridge Project Area

Acreage projections in Table 2-1 are based on a combination of 95 and 65 percent design drawings for the 13th Street Bridge replacement and demolition and environmental conditions present during the 2014 growing season. Projected acreages are subject to change pending the 100 percent design and natural processes.

2.1.2 Wetland Mitigation Area

Restoration actions within the Wetland Mitigation area are contingent on a net loss of Jurisdictional or special aquatic habitats within the 13th Street Bridge Project Impact Area. See Table 1-8 for a breakdown of impacts by habitat type within the Wetland Restoration Area.

Table 2-1. Jurisdictional habitat types to be created, restored, or enhanced within the Wetland Mitigation Area.

Habitat Type	Restoration Actions			Total
	Created	Enhanced	Restored	
Coastal Salt Marsh	0	0.26	3.75	4.02[1]

1. Following restoration activities all CSM habitat is expected to meet the criteria of Jurisdictional Wetland.

The 0.09 acres of CSM that currently meet the definition of Jurisdictional Wetland will be enhanced by decreasing the existing grade which will promote more frequent/regular hydration. The 0.17 acres of CSM currently present that does not meet the characteristics of Jurisdictional Wetland will also be enhanced by decreasing the existing grade and promoting more frequent/regular hydration; post grading this area is expected to meet the criteria of Jurisdictional Wetland and Waters of the United States. The remaining 3.75 acres of upland habitat will be restored to CSM (CSM likely existed in this area prior to the accumulation of sediment due to the old 35th Street Bridge abutment); post grading this area is also expected to meet the criteria of Jurisdictional Wetland and Waters of the United States (Table 2-2).

A total of 1.32 acres of upper CSM habitat will potentially be lost in the soil deposition area and access road areas (Table 1-8). Depositing soil within the deposition area will increase the ground elevation altering hydrological conditions and prevent the persistence of this habitat type. VAFB is currently pursuing incorporating excavated soil into existing active agricultural fields south east of the Wetland Mitigation Area. Use of these areas will reduce loss of upper CSM-upper to 0.16 acres and increase net gain of Coastal Salt Marsh habitat from 2.60 to 2.76 acres.

2.2 Functions and Values of Habitat to be Created/Enhanced

2.2.1 13th Street Bridge Project Area

The goals of restoration of the 13th Street Bridge Project Area are to reestablish the native habitats temporarily impacted by bridge construction and demolition. In the long term, these communities must be healthy, self-sustaining, regenerating, and result in effective soil stabilization that provides adequate erosion and sediment control. Additionally, these restored areas should be as weed-free as possible and comprised of local plant genotypes. Once these areas are restored, they should further function as habitat for special-status species and replace habitat lost or adversely impacted by the bridge replacement project.

2.2.2 Wetland Mitigation Area

An area adjacent to the Santa Ynez River estuary was identified for wetland mitigation, if necessary, to meet the 401 and 404 permit criteria. The goal of the mitigation is to fully compensate for permanent losses of Jurisdictional Wetlands and special aquatic habitat within the Santa Ynez River from implementation of the 13th Street Bridge Replacement Project. Mitigation will be accomplished by re-establishing up to four acres of currently impaired estuarine habitat along the southeast portion of the Santa Ynez River. Once these areas are restored, they should further function as high quality CSM habitat for native wildlife species.

2.3 Time Lapse

2.3.1 13th Street Bridge Project Area

To facilitate restoration success, restoration of the impacted areas would begin during the final stages of construction and demolition activities as access roads and equipment are removed. This will allow the use of heavy equipment to accomplish specific restoration actions (see Section 4). Monitoring and maintenance will be undertaken until performance standards are met and will include weed control and supplemental replanting of areas where outplantings have died or have failed to established.

2.3.2 Wetland Mitigation Area

The final acreage of wetland and/or other aquatic habitat within the designated mitigation area will be dependent on the amount of acreage that is necessary to restore, which will be determined by the acreage of permanent impacts during bridge construction. As such, actions within the Wetland Mitigation Area or a portion of it would be initiated following completion of project activities related to the 13th Street Bridge construction and demolition and final quantification of acres available for restoration within the 13th Street Bridge Project Impact Area. If there is insufficient acreage available for restoration within the 13th Street Bridge Project Area, the Wetland Mitigation Area would be used to meet restoration goals. Mitigation within the Wetland Mitigation Area is designed to comply with all agency approvals for the project. Monitoring and maintenance will be undertaken until performance standards are met and will include weed control and replanting of areas where plants have died or have not been established.

2.4 Special Aquatic Habitats

2.4.1 13th Street Bridge Project Area

2.4.1.1 Jurisdictional Wetlands

A total of 1.26 acres of Jurisdictional Wetlands were identified 31.1 acre 13th Street Bridge Project Impact Area during the spring 2014 field surveys. Vegetation in wetland habitats consists of FWM both adjacent to and within the channel and Willow Riparian. Waters of the United States encompass the active floodplain including those areas mapped as wetlands as well as areas of open water. A total of 2.89 acres within the Project Impact Area constitute Waters of the United States.

Upon completion of construction and demolition activities, contingent upon preservation of pre-construction channel width, depth, and water levels, 1.56 acres are expected to be capable of supporting Jurisdictional Wetland habitat. This would result in a net gain of 0.30 acres of potential Jurisdictional Wetland (Table 2-1). Gains would be achieved, in part through, removal of rip-rap from the northern three abutments of the old bridge these areas are expected to convert to a hydrated channel, which would become Jurisdictional Wetland as hydric vegetation is established. The hydrated channel under the new bridge deck is also expected to become Jurisdictional Wetland upon establishment of hydric vegetation.

Actual post-project Jurisdiction Wetland acreage will be heavily dependent on natural processes. Changes in water level or channel width as a result of natural events, such as scouring during high flows and beaver dams, could result in significant changes in Jurisdictional Wetland acreage and cannot be predicted.

2.4.1.2 Willow Riparian

Willow Riparian (RIP) and Willow Riparian – Fresh Water Marsh (RIP-FWM) habitats within the Project Impact Area occupy both Jurisdictional (Jurisdictional Wetland and Waters of the U.S.) and non-Jurisdictional areas (areas outside the bounds of Waters of the U.S.). For impacts to RIP and RIP-FWM habitats within Jurisdictional Waters see Table 1-1, for impacts outside of Jurisdictional Waters see Table 1-2. Overall impacts to RIP and RIP-FWM habitats are detailed in Table 2-1 and discussed below.

During project activities, an estimated 4.56 acres of RIP and RIP-FWM habitat will be cleared of vegetation for the purposes of construction and access, an additional 0.93 acres may be subjected to disturbance related to construction of check dams and temporary re-routing of the agricultural channel. Disturbed areas are not expected to require active restoration.

Within cleared areas, 2.73 acres can be restored to RIP or RIP-FWM following construction and demolition. This will result in 3.66 acres of RIP and RIP-FWM within the Project Impact Area following the completion of restoration. There will be a net loss of 1.83 acres of RIP and RIP-FWM.

Of the RIP acreage lost, 1.24 acres of loss will occur on the upper terrace in senescent RIP in the vicinity of the southern abutment (Figure 2-1). Willow trees in this area are dying due to the divorce of this upper terrace from the active floodplain with RIP habitat being replaced by broadleaf weeds. Because hydrological conditions in this area are no longer suitable for maintaining RIP habitat, undeveloped

portions of this area (0.38 acres) will be restored to CCS habitat following completion of construction and demolition activities (Figure 2-2).

An additional 0.67 acres of willows growing on rip-rap will be lost. Currently rip-rap subtending the northern four piers of the old 13th Street Bridge has sufficient elevation to support willows (Figure 2-1). Upon removal of rip-rap, undeveloped portions of this area (0.15 acres) are expected to become hydrated channel supporting FWM vegetation (Figure 2-2).

There will also be 0.34 acres of RIP lost under the new bridge deck. As is the case with the El Rancho Road bridge on VAFB, there will likely be too much shading by the bridge to support willows underneath it. Undeveloped portion of this area (0.24 acres) will therefore be restored using shade tolerant RIP understory species (Figure 2-2).

Remaining RIP losses (0.22 acres) will occur in upland habitat during construction associated with the southern approach and the north and south abutments and within the north staging area (Figure 2-1).

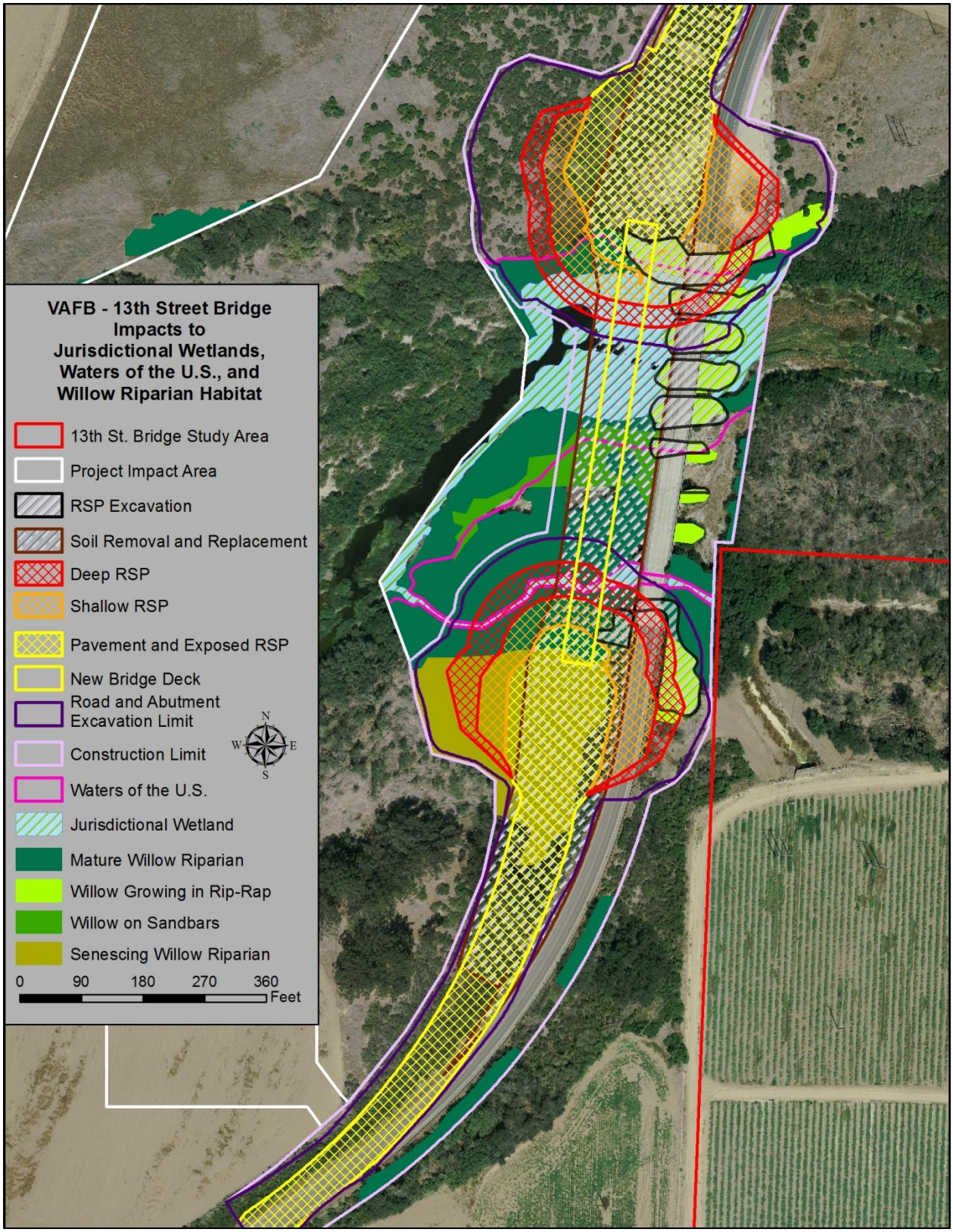

Figure 2-1. Construction impacts to Jurisdictional Wetlands, Waters of the United States, and Willow Riparian Habitats.

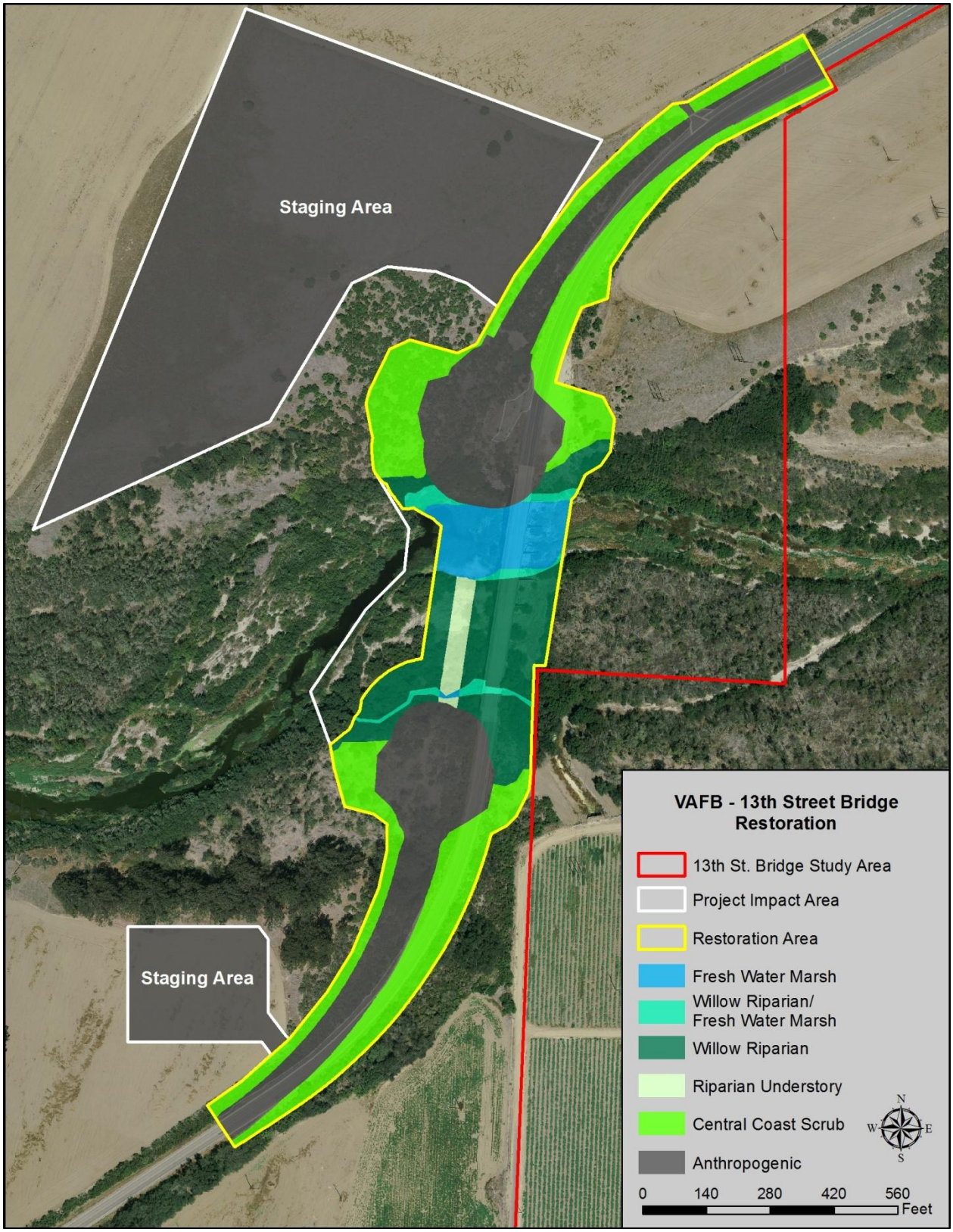

Figure 2-2. Proposed 13th Street Bridge Restoration Area.

2.4.2 Wetland Mitigation Area

The proposed wetland restoration would require grading and sediment removal from a 4.02 acre area at the south eastern edge of the estuary (Figure 2-3). Approximately, 0.09 acres of Jurisdictional Wetland would be impacted and restored following completion of grading. This area of Jurisdictional Wetland is also qualifies as Waters of the United States and consists of CSM habitat.

Following grading, the habitat in the 4.02 acre area is expected to transition from primarily upland habitat to an irregularly to seasonally flooded middle salt marsh wetland habitat dominated by pickleweed, alkali heath, saltgrass, and fleshy jaumea (CSM). This would lead to a net gain of 3.93 acres of Jurisdictional Wetland and Waters of the United States within the Wetland Mitigation Area.

Hydration of this area will coincide with high water levels in the estuary. As such the proposed Wetland Mitigation Area may not possess hydrologic and soil characteristics of wetlands during all years. Even if wetland hydrology is present, soils within the Wetland Mitigation Area will likely continue to be problematic due to the seasonal and potentially irregular nature of inundation.

Figure 2-3. Proposed restoration areas within the Wetland Mitigation Area.

3 13th Street Bridge Project Area and Wetland Mitigation Area

3.1 Existing Functions and Values: Baseline Information Collection and Results for the 13th Street Bridge Project Area and Wetland Mitigation Area

3.1.1 Wildlife

3.1.1.1 California Red-legged Frog

CRLF is a federally threatened species which has the potential to occur in virtually all known VAFB wetlands and bodies of water on VAFB. In prior studies, Christopher (1996, 2004) and MSRS (2009, 2014d) documented CRLF and the invasive bullfrog (*Lithobates catesbeianus*) within the 13th Street Bridge Project Area (Figure 3-1).

MSRS conducted monthly surveys on the new moon from October 2012 to October 2013 within the 13th Street Bridge Project Area. A two member team surveyed the area from approximately 275 meters downstream of the existing bridge to 130 meters upstream of the existing bridge. At the time of the biological survey contract award this area was the original project footprint and biological surveys for TWG, and southern steelhead also occurred within this footprint. After the contract award the 13th Street Bridge project footprint was extended an additional 325 meters downstream to encompass a fiber optic cable installation. Data from pre project and post-project surveys can be extrapolated to include this additional area.

All surveys commenced at least 20 minutes after sunset. Due to deep water in some sections, surveyors used float tubes to navigate the survey area. Surveyors visually scanned for frogs with high powered water-proof flash lights (Underwater Kinetics® C8 eLED plus or equivalent). The paired surveyors moved slowly along opposite banks as quietly as possible while attempting to create minimal water disturbance. The surveyors constantly alternated between scanning the water and banks ahead to spot frog “eye shine” and scanning to the sides for frogs either too close to create eye shine or hidden within vegetation. For areas with mid-channel vegetation, surveyors circled the vegetation to inspect all sides.

When ranids (CRLF or American bullfrogs) were located, a surveyor would move as close as required to positively identify it to species, estimate snout-vent length, identify sex (when possible), record habitat characteristics, and record the location using a handheld Garmin global positioning system (GPS) device. To minimize disturbance, frogs were not handled. Surveyors noted breeding behaviors such as amplexus or calling. Some calling frogs were not visually located and an approximate location was recorded for these individuals. When amphibian egg masses were encountered, the species, approximate number, location, and stage of development were recorded. Additionally, surveyors recorded the start and end time of the survey and air and water temperature, relative humidity, and wind speeds at the start and end of the survey.

MSRS also performed one night survey of the lagoon along the edge of the proposed Wetland Mitigation Area in December 2013 following the same protocol described above. CRLF were not detected. These survey results are detailed in MSRS 2014d.

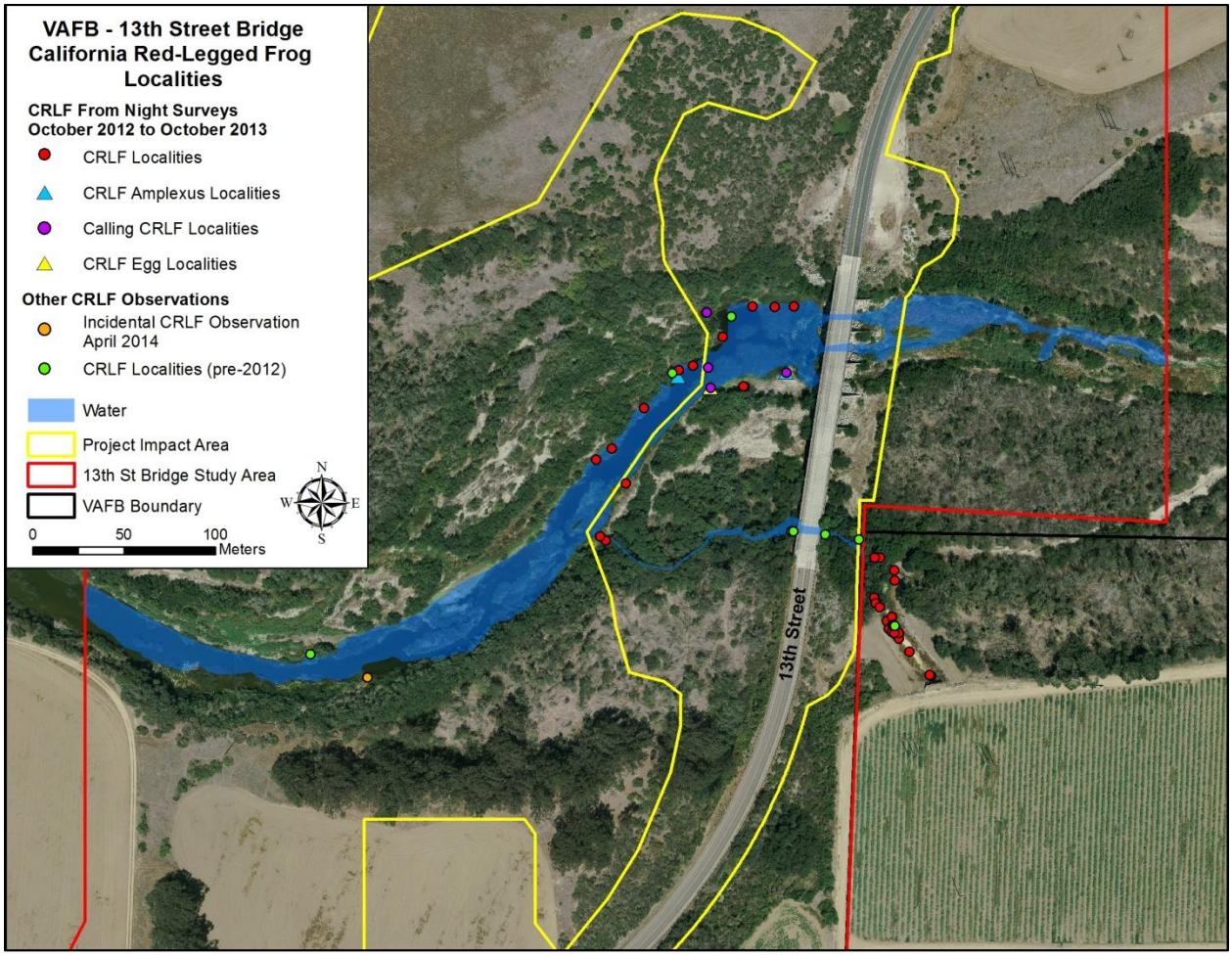

Figure 3-1. CRLF localities within the 13th Street Bridge Study Area.

3.1.1.2 Tidewater Goby

TWG is a federally threatened species occurring in coastal lagoons and estuaries including the Santa Ynez River estuary and upstream portions of the river. MSRS conducted two series of seine net surveys within potential TWG habitat to collect baseline data on the distribution and density of TWG and other fish species in the Santa Ynez River within the 13th Street Bridge Project Area. Surveys were conducted twice, in order to capture natural temporal variation in TWG population size. The first series of surveys occurred during July 2013 to document TWG numbers at peak abundance. The second series of surveys occurred in October 2013 after post breeding declines.

MSRS selected the number of seine transects based on the recommended coverage for seine net surveys within a given area as outlined in the United States Fish and Wildlife Service (USFWS) Tidewater Goby Survey Protocol (USFWS 2005). Seine transects were placed to capture all potential habitat types. Eleven seine transects were sampled in July and thirteen seine transects were sampled in October (Figure 3-2).

Once a site was selected, GPS coordinates of seine transects were recorded. Surveyors characterized the habitat at each transect location, including depth, width, substrate composition, and extent and composition of floating and emergent vegetation. Following site characterization, MSRS used a beach seine, appropriately sized for TWG sampling (16 feet x 6.5 feet net with 1/16 inch mesh) to pull one drag across the transect. The length, width, and depth of the area seined at each transect was recorded to determine the density of animals within the seined area. Prior to seining, surveyors avoided entering transect areas so fish would not flush out of the area

To sample each transect, two surveyors moved the seine into position, while closely skirting the bank. They then dragged the seine through the water perpendicular to the direction of flow. Other surveyors were on hand to assist in landing the net. To prevent the escape of fish during drags, surveyors took care to ensure that the bottom of the net maintained good contact with the river bottom and the top of the net did not fall below the surface. In narrow stretches of creek, the entire width was sampled while in wide areas, drags were initiated mid-water and terminated at the north or south bank with direction chosen dependent on bank conditions.

All vertebrates captured were identified, measured, and tallied into size categories (0 to 1-centimeter [cm], 1 to 2-cm, 2 to 3-cm, 3 to 4-cm, etc.). Surveyors returned native species to the water and dispatched non-native species. All vertebrates were inspected for visual signs of parasites or disease. In fish, indications of spawning were noted and the development stage of amphibian larvae was noted. In addition, notes were made on the occurrence of potential invertebrate prey items captured or observed at each site. MSRS also recorded water quality parameters along fixed intervals for the length of the survey area and recorded channel width and maximum depth at these fixed interval locations. These survey results are detailed in MSRS 2014d.

TWG habitat is not present within the Wetland Mitigation Area, therefore surveys were not performed.

3.1.1.3 Southern Steelhead

MSRS utilized two survey methodologies for southern steelhead within the 13th Street Bridge Project Area: seine net surveys (described in the section above) and snorkel surveys. Although the seine net surveys conducted in 2013 were performed to survey for TWG, they were also an effective means of documenting southern steelhead, especially steelhead smolts, if present (see Figure 3-2 for survey sites).

In addition, MSRS performed two snorkel surveys for fish in May 2014 within the 13th Street Bridge Study Area. Southern steelhead occurring within the 13th Street Bridge project area are likely to be transient individuals, as they emigrate from and immigrate to the ocean; therefore they are most likely to be found in this area during migration events which are timed around lagoon mouth breaching. Ideally these surveys would have occurred when the estuary mouth was open to the ocean and the river was accessible to upstream migrating adults. In the hopes of an eventual estuary breaching event, MSRS delayed performing snorkel surveys and waited for such an event to occur. However, due to two consecutive winters of below average rainfall, the estuary mouth remained closed for the entire period of performance and the surveys were conducted during May 2014 without a breaching event.

During snorkel surveys, two surveyors progressed downstream from the bridge and worked together to scan the entire stream channel. Surveyors took care to not cause unnecessary water disturbance, which

could scare fish and disturb sediment and impair visibility. All fish species and relative abundance were recorded. Surveyors also recorded water quality measurements at four equally dispersed intervals within the biological survey area during the second survey. Water quality could not be recorded on the first survey due to equipment malfunction. Parameters recorded were temperature dissolved oxygen, and conductivity. No southern steelhead were documented during seine net or snorkel surveys. Survey results are detailed in MSRS 2014d.

Southern steelhead habitat is not present within the Wetland Mitigation Area, therefore surveys were not performed.

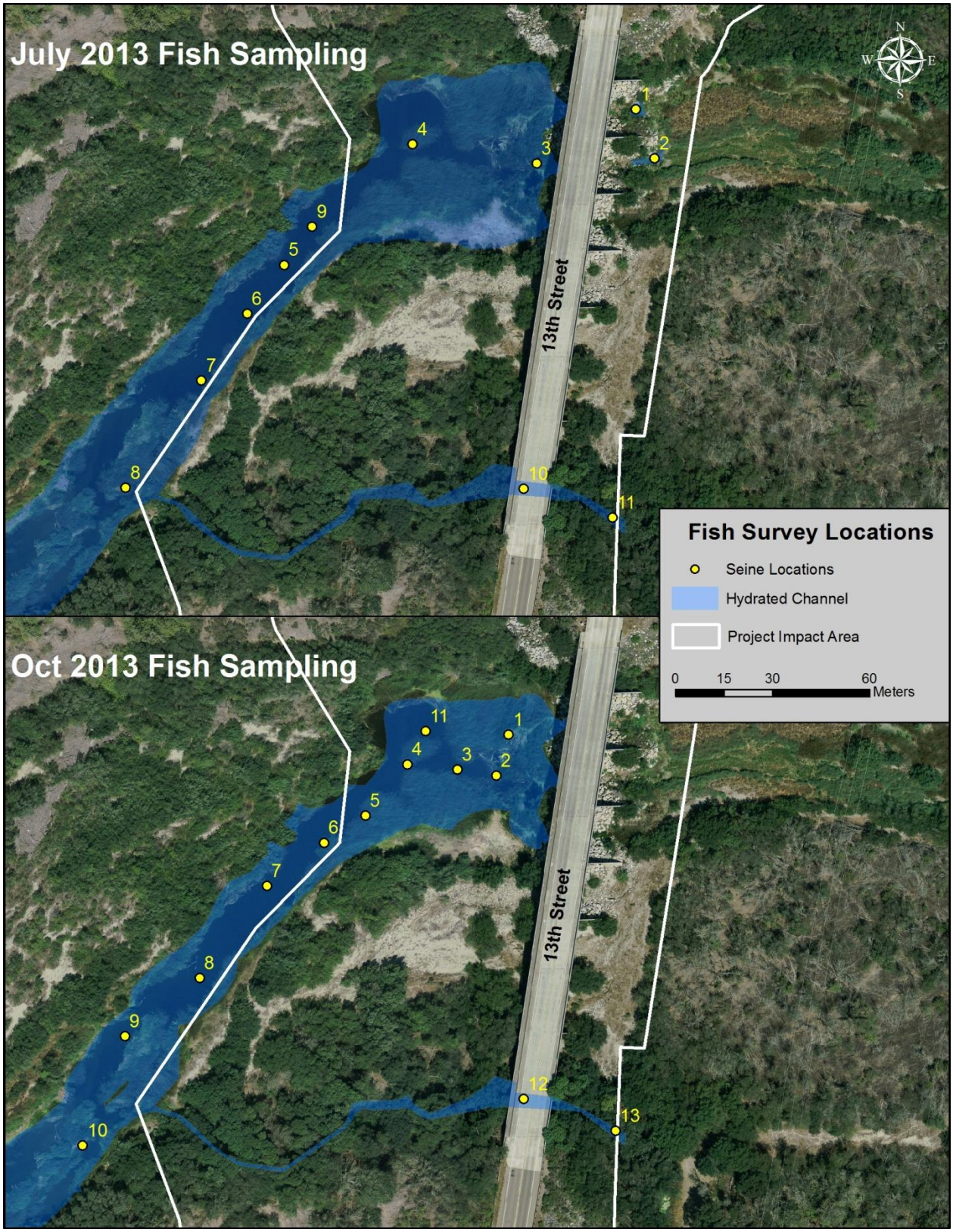

Figure 3-2. Fish survey locations within the 13th Street Bridge Study Area.

3.1.1.4 Breeding Songbirds

Using standardized point count protocols (Ralph et al. 1993; Ralph et al. 1995), surveys were performed at 26 points along a pre-existing route once between 15 May and 1 June, and again between 1 June and 15 June (Figure 3-3) which encompassed the 13th Street Bridge Project Area. Surveyors trained in bird identification and distance estimation conducted 5-minute point counts at each survey point between sunrise and 1000 Pacific daylight time (PDT) only on days when the wind was < 11-km per hour (hr) and precipitation was no heavier than mist. During these surveys, surveyors recorded all birds seen or heard within and without a 50 m radius of the point location. For each bird detection, the type (song, call, or visual) and approximate distance to the bird was recorded.

The 26 point count locations can be divided into three subsets:

1. A subset of 4 points counts which are located downstream of the 13th Street Bridge Project Area and potentially will be indirectly impacted by project activities (Figure 3-3).
2. Two are located within the 13th Street Bridge Project area and will be directly impacted by project activities (Figure 3-3).
3. A subset of 17 point counts that are located upstream of the 13th Street Bridge Project Are, which will function as a control reference group (Figure 3-3).

Survey results are detailed in DiGaudio et al. 2011.

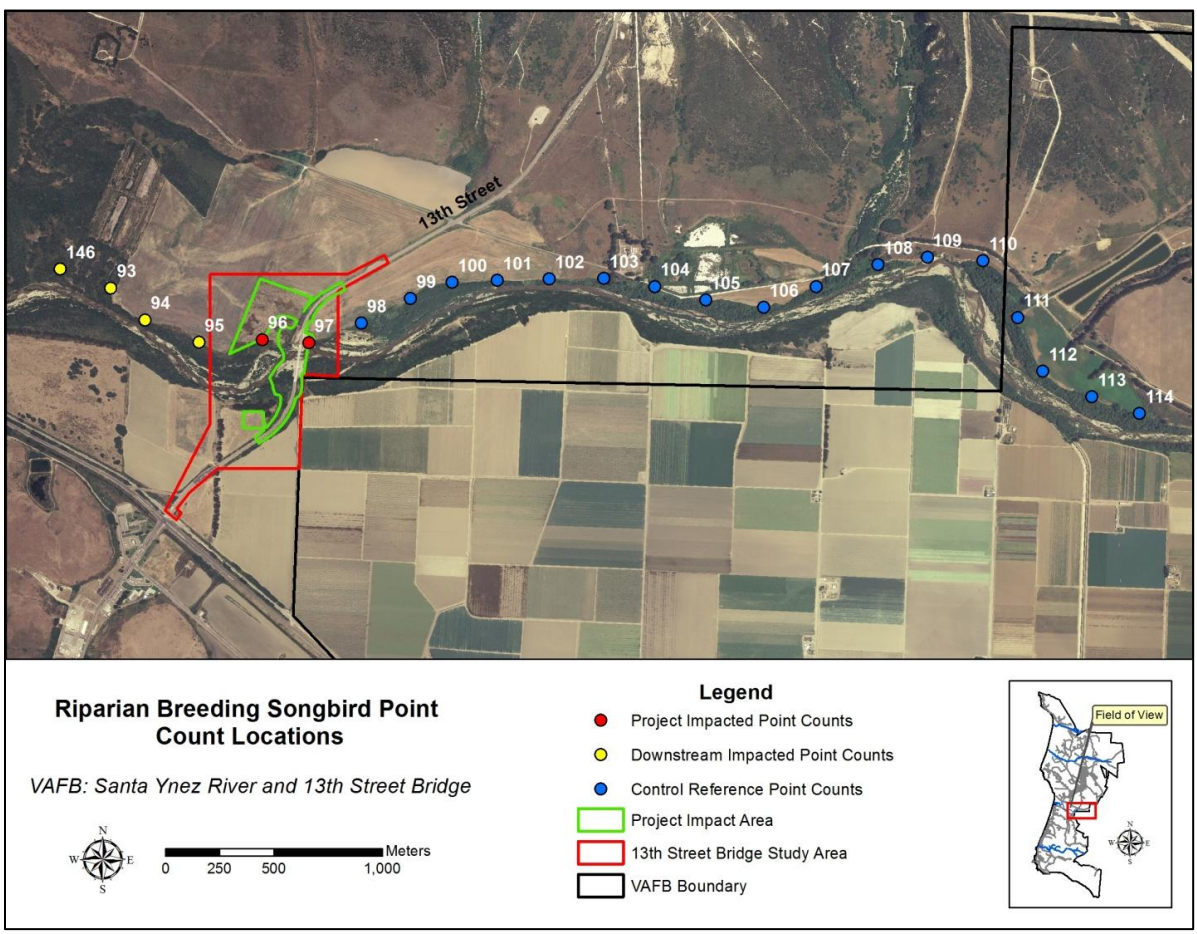

Figure 3-3. Riparian songbird point count locations spanning the 13th Street Bridge Project Area.

3.1.2 Habitat

3.1.2.1 CRAM

To further categorize wetland habitats the within both the 13th Street Bridge Study Area and the Wetland Mitigation Area, these areas were assessed using metrics and methods established for CRAM. At the time CRAM assessments were conducted the extent and location of the 13th Street Project Impact Area had not been finalized so the 13th Street Bridge Study Area was assessed in its entirety. CRAM scores wetlands based on ecological services provided. Value is dependent on the diversity of services provided opposed to the level of any one service. CRAM operates from the premise that diversity of services increases with the size and structural complexity of the wetland. To determine wetland value, specific metrics are scored as A, B, C, or D. These letters correspond to numeric values: A=12, B=9, C=6 and D=3. These metric scores are used to calculate scores for each of four attributes: buffer and landscape context, hydrology, physical structure, and biotic structure. The overall score for the AA is calculated by averaging the four attribute scores. Metrics and scoring vary by wetland type (CWMW 2013a).

The maximum possible score represents the best condition that is likely to be achieved for the type of wetland being assessed. The overall score for a wetland indicates how the wetland compares relative to the best achievable conditions. CRAM also provides guidelines for identifying stressors that might account for low scores. Evident stressors are characterized as present or present and having a significant negative effect on an attribute score (CWMW 2013a).

In preparation for CRAM analysis, the 13th Street Bridge Project Area was divided into eight AAs according to criteria outlined in the CRAM Riverine Wetlands Field Book ver. 6.1 (CWMW 2013b). AAs were delineated to encompass as much of the 13th Street Bridge Project Area as possible, while adhering to CRAM criteria. One AA was established that spanned the river upstream of the 13th Street Bridge, where surface water was shallow enough to allow foot crossing. An additional six one-sided AAs were established downstream of the 13th Street Bridge, where water was too deep to permit crossing on foot. Both the current 13th Street Bridge and the secondary agricultural channel input were determined to be hydrologic breaks and were not spanned by the AAs. An additional AA was established along the secondary agricultural channel to characterize this portion of the project area (Figure 1-4).

The Wetland Mitigation Area was also assessed using CRAM. However, the Wetland Mitigation Area falls outside of CRAM guidelines for establishment of a Bar-Built Estuarine AA because it is almost entirely upland habitat and is therefore unsuitable for assessment using CRAM (CWMW 2013c). A reference AA was established immediately downstream of the Wetland Mitigation Area (Figure 1-7). This AA was established for comparison purposes following restoration actions, since it includes native habitat that restoration seeks to re-establish.

See MSRS 2014c for detailed results and discussion.

3.1.2.2 Compensatory Habitat Mapping

To determine pre-construction habitat acreages (Table 1-5), MSRS mapped the habitat composition of the 13th Street Bridge Study Area (Figure 1-6) and the Wetland Mitigation Area (Table 1-8, Figure 1-8). This was accomplished by digitally mapping habitat transitions with ArcGIS software using the latest orthographic photos of VAFB from 2009. A minimum 10-feet by 10-feet polygon size was used to delineate habitat types. Following digital mapping, habitat transition-lines were ground-truthed in the field using a sub-meter accuracy GPS device (Trimble® GeoXT). Habitat type nomenclature where suitable followed Holland 1986 and plant species nomenclature followed the Jepson Manual, Second Edition (Baldwin et al 2012). See MSRS 2014a for detailed results and description of habitat types.

3.1.2.3 Photo Documentation

Photo documentation was not performed, but a series of base-line photographs capturing conditions within the 13th Street Bridge Project Area and the Wetland Mitigation Area shall be taken prior to the bridge construction and demolition, post construction and demolition, following initial revegetation and mitigation activities, and throughout the monitoring period.

3.1.2.4 Invasive Species

Prior to the Proposed Action, the percent aerial cover of native vegetation, and non-native (invasive) vegetation within each habitat type was estimated within the 13th Street Bridge Project Area and the Wetland Mitigation Area (MSRS 2014a). The area or unvegetated habitat was also quantified within each habitat type. See Tables 3-4 and 3-5.

Table 3-1. Percent cover of non-native species, native species, and unvegetated within the 13th Street Bridge Project Impact Area.

Habitat Types	Native (%)	Non-Native (%)	Unvegetated (%)
Willow Riparian	68.3	32.6	12.6
Freshwater Marsh	76.6	8.1	19.9
Central Coast Scrub	97.8	9.2	0
Non-Native Habitats	0.4	98.1	1.7
Anthropogenic	0.1	52.0	32.4

NOTE: In cases where native and non-native cover overlap, the sum of percent native, percent non-native and percent unvegetated may exceed 100 percent.

Table 3-2. Percent cover of non-native species, native species, and unvegetated within the Wetland Mitigation Area.

Habitat Types	Native (%)	Non-Native (%)	Unvegetated (%)
Coastal Salt Marsh	85.8	21.4	3.0
Central Coast Scrub	88.7	16.9	0.05
Native Grassland	100	0	0
Degraded Habitats	86.7	21.3	0
Non-native Habitats	8.7	92.5	3.1

NOTE: In cases where native and non-native cover overlap, the sum of percent native, percent non-native and percent unvegetated may exceed 100 percent.

3.1.2.5 Sedimentation

Sedimentation monitoring was not performed, but base-line data quantifying pre-project conditions within the 13th Street Bridge Project Area shall be conducted prior to the Proposed Action.

3.1.2.6 Jurisdictional Delineations with the 13th Street Bridge Project Area and Wetland Mitigation Area

Wetland surveys were conducted within the 13th Street Bridge Project Area and the Wetland Mitigation Area in spring 2014. See Section 1.5.2 for summary information pertaining to the 13th Street Bridge Project Area and Section 1.6.2.1.2 for summary information pertaining the Wetland Mitigation Area and MSRS 2014c for detailed results and discussion pertaining to both areas.

3.2 Present and Proposed Uses of Adjacent Areas

The landscape context and condition of buffer land for the AAs comprising the 13th Street Bridge Study area and the Wetland Mitigation area was analyzed as part of CRAM. A detailed discussion of this attribute and associated metrics for each AA is available in MSRS 2014c. Beyond the riparian corridor associated with the Santa Ynez River, the 13th Street Bridge Study Area is largely bordered and occupied by agricultural fields in active use (Figure 1-2). The Wetland Mitigation Area is part of the Santa Ynez Estuary with intact estuary habitat extending north and east and west with roadways and railroad tracks comprising the southern border. Ocean Beach County Park is also present west of the Wetland Mitigation Area (Figure 1-2).

3.3 Reference Sites

Portions of the 13th Street Bridge Study Area outside of the 13th Street Bridge Project Impact Area will serve as reference sites. These sites can be compared to the 13th Street Bridge Restoration Area following restoration activities (Figure 1-4).

The high quality CSM habitat comprising the reference AA for the Wetland Mitigation Area (Figure 1-7) was sampled with the intention of it serving as a reference site. This site can be compared to the Wetland Mitigation Area following restoration activities.

4 Habitat Restoration and Mitigation: Implementation and Maintenance

4.1 Rationale for Success

The process of site preparation, planting, irrigation and maintenance that is detailed below has a proven track record of success on VAFB. In 2009, VAFB implemented the San Antonio Creek Restoration Project which installed grade control and bank stabilization structures and reconstructed flood terraces along 0.87 miles of San Antonio Creek, between California Highway 1 and the Lee Road utility bridge. The methods presented here are directly based on the successful strategies that were developed and employed at the San Antonio Creek Restoration Site.

4.2 Avoidance and Minimization Measures

The following minimization measures would be employed to prevent impacts to special status species within restoration areas.

1. Revegetation and weed control activities would be overseen by a qualified biological monitor. Any activity that could potentially impact listed species would be monitored by a USFWS-approved biologist.
2. When pumping water from the Santa Ynez River for irrigation or use of the water stinger, the pump intake would be placed in a 30 gallon barrel with fine mesh (16th inch) screened holes to protect listed species from entering the pump intake. A USFWS-approved biologist would monitor placement.
3. All herbicides will be used in accordance with the pesticide label and California Department of Pesticide Regulation, Department of Defense, and Air Force Pest Management regulations. Herbicide application will also comply with the U.S. District Court for the Northern District of California injunction on pesticide use in CRLF habitat (20 October 2006). Glyphosate herbicide will not be applied within 15 feet of aquatic features, and herbicides that leave residue will not be applied within the Ordinary High Water Mark (Waters of the United States).
4. Treatment within or adjacent to aquatic resources will only utilize appropriately labeled products.
5. If herbicide application occurs during the CRLF breeding season and within riparian habitat, USFWS-approved biologists will conduct egg mass and/or tadpole surveys within 100 feet downstream or downslope of the application area prior to chemical application. If CRLF eggs or larvae are found, no pesticide application will be conducted within the riparian habitat.
6. Equipment maintenance and fueling will occur at least 250 feet away from riparian habitat and wetlands.
7. Herbicides will not be sprayed when wind velocities at the site exceed five miles per hour or in foggy or rainy conditions when ground moisture becomes excessive. Non-target species, especially native species, will be avoided during spraying. A biological monitor familiar with the site will be present to supervise herbicide spraying activities.

4.3 Restoration Site Preparation, Planting, Irrigation and Maintenance

4.3.1 13th Street Bridge Restoration Area

4.3.1.1 Pre-construction

Upland areas containing non-native invasive species will be treated with herbicide two weeks prior to ground disturbing activities. In areas without infestations of invasive weeds, topsoil to the depth of 12 to 18 inches shall be salvaged whenever possible. Salvaged topsoil shall be stockpiled at a pre-approved site and held for the restoration phase of the project. Native plants that would be impacted by the project, not including temporary access roads, shall be salvaged and stockpiled at a pre-approved location prior to ground disturbing activities. These salvaged plants shall be shredded and used as natural mulch within the restoration area following construction completion. Native plants that would be impacted by temporary access road construction shall be cut and mulched in place. Native seed will be collected from the project area during pre-construction activities if the season is appropriate for this activity. Otherwise, native seeds shall be collected within a reasonable distance of the project area to preserve the genetic integrity of the natural plant community.

4.3.1.2 Concurrent with Construction to the January Following Construction

RIP habitat will be restored within undeveloped portions of the channel, as depicted in Figure 2-2. Due to the presence of buried rock left from previous bridge retrofits and repairs, successful restoration of these areas will be dependent on access of heavy equipment to aid in restoration. Restoration of RIP, therefore, will occur prior to removal of the temporary access roads. To successfully re-establish willows in these areas, a series of staggered trenches two feet wide will be excavated. Wherever possible, trenches will be excavated until the water table is reached. Willow poles will be placed in these trenches, at a spacing of six feet on center, and the trenches refilled to within two feet of the ground surface. Trenches should be spaced such that a willow pole density of eight feet on center throughout the riparian restoration areas is achieved. The shallow residual trenches will allow supplemental watering of pole plantings if winter rains are insufficient to allow establishment. Due to shading, RIP habitat is unlikely to successfully be re-established under the bridge. RIP habitat is also unlikely to be successfully restored in upland habitats or in areas covered by rip-rap.

Terrestrial habitat under the new bridge is likely to remain predominantly unvegetated due to reduced light. To prevent invasive species establishment in this area, native riparian understory species should be planted as depicted in the area designated “Riparian Understory” on Figure 2-2. Recommended species include blackberry (*Rubus ursinus*), mugwort (*Aremisia douglasiana*) and creeping rye grass (*Leymus triticoides*). Creeping ryegrass should be seeded and the broad-leaf species installed as plantings at six feet on center.

The southern staging areas will not be restored to native vegetation. Instead, the southern staging area will be returned to active agricultural use. The northern staging area will seeded with a species pallet designed to provide sufficient vegetative cover and soil stabilization to meet construction permit requirements. Formulation of the erosion control mix will be subject to approval of the VAFB botanist.

4.3.1.3 Year 1

Following construction activities, non-native invasive species within areas designated for restoration will be chemically treated prior to revegetation activities and application of topsoil. Disturbed areas will then be recontoured as necessary to mimic surrounding natural conditions. Salvaged topsoil will be respread within areas to be restored. The restoration area will be divided into sub-sites dependent on conditions present and actions needed within each area.

Sub-sites where CCS restoration will occur with compacted soils will be ripped prior to the initiation of restoration activities. Restoration of these areas will be accomplished by hydroseeding of a native grass seed mix, excluding giant wild rye (*Eleymus condensatus*) as this species is susceptible to broad-leaf specific herbicides. Post seed application, these areas would be chemically treated for broad-leaf weeds and physically managed for non-native grasses until weeds are controlled. Once weed control has been established, CCS restoration sites will be seeded with giant wild rye at a rate of 20 pounds per acre. Giant wild rye will be seeded no earlier than October to minimize consumption of seed by granivores.

Also following weed control, CCS plantings that have been propagated from VAFB sourced seed and grown in four-inch containers will be installed at six feet on center. For their protection, each planting will be installed in a gopher basket and a wire herbivore exclosure cage. To the extent feasible, container plantings would be installed during the last week of October and the first week of November, unless weather forecasts dictate otherwise (i.e. if the significant rainfall is delayed, the plantings will be delayed to coincide with the onset of substantial rainfall. Ideally, planting will occur after the first significant rain event of the season.

Plantings would receive an initial watering of approximately 0.5 to 0.75 gallon per plant using the VAFB water supply (lightly chlorinated) at the time of planting. Additional watering would occur once every two week period that receives less than 0.25 inches of rainfall until 15 April. At that point, watering would be discontinued to allow the plants to acclimate to the natural central California climate. Plant health would continue to be monitored monthly. In the event that water stress surpasses the ability of plantings to adapt, supplemental watering would be resumed on a bi-weekly basis.

Areas where Understory restoration and RIP restoration were conducted during the Proposed Action will be assessed monthly to evaluate the need for supplemental watering and the installation of additional plantings. Infill riparian understory plantings would be propagated using the same methods employed for CCS plantings. Because this area is subject to scouring during high flow events, gopher basket and a wire herbivore exclosure cages will not be used in this area.

For additional riparian pole installation, if the site is accessible by heavy equipment or hand excavation is feasible, trenches two feet wide will be excavated. Wherever possible, trenches will be excavated until the water table is reached. Willow poles will be placed in these trenches, at a minimum spacing of six feet on center, and the trenches refilled to within one to two feet of the ground surface. Trenches will be spaced such that a minimum willow pole density of eight feet on center throughout the riparian restoration areas is achieved. The shallow residual trenches will allow supplemental watering of pole plantings if winter rains are insufficient to allow establishment. If the site is not accessible by heavy equipment, a water stinger will be used to install pole cuttings at 5 to 8 feet deep. The water stinger will utilize water pumped from the Santa Ynez River to operate. The water pump intake will be placed in a

30 gallon barrel with fine mesh (1/16th inch) screened holes to protect fish and wildlife from entering the pump intake.

Pole plantings will be watered upon installation and once every two week period thereafter that receives less than 0.25 inches of rainfall until 15 April. At that point, watering will be discontinued to allow the plants to acclimate to the natural central California climate. Plant health will continue to be monitored monthly for 12 months. In the event that water stress surpasses the ability of plantings to adapt, supplemental watering will be resumed on a bi-weekly basis for every period thereafter that receives less than 0.25 inches of rainfall until the following 15 April.

Sub-sites where FWM vegetation is expected to regenerate naturally will be re-evaluated following winter flows to ensure that natural processes are restoring this habitat type. If this habitat type is not regenerating naturally and site hydrology is determined to be insufficient to support FWM vegetation, actions will be undertaken to restore these areas to RIP.

See Section 6 for schedule.

4.3.1.4 Year 2-5

If monitoring indicates that sub-sites are not meeting success criteria in terms of percent native cover, percent invasive, percent overall vegetation cover, or percent of a specific vegetation type, reasons for the delinquency will be identified and measures taken to remedy the situation. Remedial actions will include, as warranted, application of native seed, propagation and installation of additional infill plantings, additional riparian pole installation (using the water stinger or trench installation approach), supplemental watering of existing plantings, and/or weed control activities.

Seed mix formulation and application rate would be discussed and approved by 30 CES/CEI. Supplemental seed applications would be conducted no earlier than October to minimize seed consumption by granivores prior to germinating rains.

Propagation, installation and watering of infill plantings and riparian pole plantings will follow the same procedures detailed in Year 1 and the schedule detailed in Section 6.

4.3.2 Wetland Mitigation Area

4.3.2.1 Preconstruction

Native seed will be collected prior to grading. Native seeds shall be collected within a reasonable distance of the project area to preserve the genetic integrity of the natural plant community. A total of at least 40 pounds of seed containing pickleweed, alkali heath, saltgrass, and fleshy jaumea must be collected to be available for sowing within lowland areas following grading.

4.3.2.2 Concurrent with Construction to the January Following Construction

At the completion of grading activities, all disturbed soil would be sown with one of two native seed mixes. The portion of the site that was excavated to a lower elevation would be seeded with a salt marsh seed mix of pickleweed, alkali heath, saltgrass, and fleshy jaumea, applied at a recommended rate of 10 pounds per acre (pers. comm., S&S Seeds, Inc.). The sediment deposition area and access roads would be seeded with a native grass seed mix at a rate of a 35 pound per acre (pers. comm., S&S

Seeds, Inc.). This native grass mix would include saltgrass, alkali rye (*Elymus triticoides*), meadow barley (*Hordeum brachyantherum*), and giant wild rye (*Elymus condensatus*).

Establishing native grasses within the site prior to broadleaf container plantings allows for one to two years of aggressive broadleaf invasive species control to exhaust the weed seed bank at the site prior to container planting.

4.3.2.3 Year 1

Following construction activities, non-native invasive species within areas designated for upland restoration will be managed to control invasive weeds prior to installation of container plants. These areas would be chemically treated for broad-leaf weeds and physically managed for non-native grasses until weeds are controlled.

Once weeds are controlled, plantings that have been propagated from VAFB sourced seed and grown in four-inch containers will be installed at six feet on center. For their protection, each planting will be installed in a gopher basket and a wire herbivore exclosure cage. To the extent feasible, container plantings would be installed during the last week of October and the first week of November, unless weather forecasts dictate otherwise (i.e. if the significant rainfall is delayed, the plantings will be delayed to coincide with the onset of substantial rainfall. Ideally, planting will occur after the first significant rain event of the season.

Plantings would receive an initial watering of approximately 0.5 to 0.75 gallon per plant using the VAFB water supply (lightly chlorinated) at the time of planting. Additional watering would occur once every two week period that receives less than 0.25 inches of rainfall until 15 April. At that point, watering would be discontinued to allow the plants to acclimate to the natural central California climate. Plant health would continue to be monitored monthly. In the event that water stress surpasses the ability of plantings to adapt, supplemental watering would be resumed on a bi-weekly basis.

Excavated areas will be assessed monthly to evaluate the need for supplemental seeding and invasive control.

See Section 6 for schedule.

4.3.2.4 Year 2-5

If monitoring indicates that restored areas are not meeting success criteria in terms of percent native cover, percent invasive, percent overall vegetation cover, or percent of a specific vegetation type, reasons for the delinquency will be identified and measures taken to remedy the situation. Remedial actions will include, as warranted, application of native seed, propagation and installation of additional infill plantings, supplemental watering of existing plantings, and/or weed control activities.

5 Monitoring Plan for 13th Street Bridge Project Area and Wetland Mitigation Area

5.1 Final Success Criteria

The restoration will be considered successful when all of the following criteria are achieved; success criteria are applicable to both the 13th Street Study Area and the Wetland Mitigation Area unless otherwise noted:

- At least 70 percent relative cover by native plant components that are similar in composition to those of adjacent high-quality habitat.
- Evidence that the site is sustainable by showing signs of regeneration (progeny and new growth)healthy plants, a low mortality rate, and resistance to weeds (less than 10 percent nonnative weed cover, less than 5 percent cover by nonnative herbaceous invasive weeds, absence of nonnative perennial invasive weeds, and minimal weed maintenance during the previous spring season).
- The site has gone without irrigation for a period of two years.
- The level of ecological services provided within the 13th Street Bridge Study Area following restoration is commensurate with services provided prior to the proposed action. Any acceptable loss in services must be the result of natural processes and not the proposed action.
- The soil removal area within the Wetland Mitigation Area should meet the criteria for wetland and be suitable for analysis using CRAM. The level of ecological services provided, as measured by CRAM, should be commensurate with those assessed within the Reference AA.

It is the goal of the project to meet all of the above success criteria within 5 years following installation. By the end of the program, the cover of invasive non-native species will not exceed that in adjacent natural areas. Weedy species will not threaten the recovery of native species in the restoration area and will not invade adjacent natural areas. The restored area will provide the same suite of ecological services that existed prior to the proposed action in the case of the 13th Street Restoration. In the case of the Wetland Mitigation Area, the level of ecological services provided should mirror those documented within the Reference AA.

5.2 Target Functions and Values

The objective of mitigation, monitoring, and restoration measures within the 13th Street Bridge Project Area is to reestablish native habitats temporarily impacted by bridge construction and demolition.

The objective of mitigation, monitoring, and restoration measures within the Wetland Mitigation Area is to reestablish native habitats lost due to sedimentation.

In the long term, these communities must be healthy, self-sustaining, regenerating, and result in effective soil stabilization that provides adequate erosion and sediment control. Additionally, these restored areas should be as weed-free as possible and comprised of local plant genotypes. Once these areas are restored, they should further function as habitat for special-status species and replace such habitat lost or adversely impacted by the bridge replacement project.

5.3 Target Hydrological Regime

Within the 13th Street Bridge Project Impact area, to the extent feasible and practicable, the site contours, river channel, and habitat types would be restored within to pre-construction conditions.

Within the Wetland Mitigation Area, the soil removal area should be restored to an elevation that permits inundation during high water conditions within the estuary. The hydrological regime following restoration should allow the establishment and persistence of hydric CSM vegetation.

5.4 Target Jurisdictional Acreage to be Created/Enhanced

Removal of the existing 13th Street bridge and associated in channel rip-rap is anticipated to allow for the restoration of 1.27 acres Freshwater Marsh habitat and the preservation of 0.29 acres of Freshwater Marsh habitat. These areas are expected to meet the criteria for Jurisdictional Wetlands provided channel depth, width and proportion vegetated remain consistent with levels documented during 2014 surveys. Because the river is a dynamic system, these numbers may change dramatically as a result of natural processes.

Areas where FWM will be restored within the 13th Street Bridge Project Impact Area are currently covered by rock rip-rap with rocks positioned too high above the water table to allow for the establishment of FWM vegetation. Areas to be enhanced consist of low density FWM vegetation growing through rip-rap; it is anticipated that restoration of natural substrates in these areas will lead to increased vegetation density and vigor. CRAM will be used to assess the level of ecological services provided by restored wetland habitat.

Within the Wetland Mitigation Area removal of sediment from a 4.02 acre area is expected to result in the restoration of 0.09 acres of CSM that currently meet the definition of Jurisdictional Wetland. The 0.17 acres of CSM currently present that does not meet the characteristics of Jurisdictional Wetlands will be enhanced by decreasing the existing grade and promoting more frequent/regular hydration; post grading this area is expected to meet the criteria of Jurisdictional Wetlands and Waters of the United States. The remaining 3.75 acres of upland habitat will be restored to CSM (CSM likely existed in this area prior to the accumulation of sediment due to the old 35th Street Bridge abutment); this area is also expected to meet the criteria of Jurisdictional Wetlands. CRAM will be used to assess the level of ecological services provided by restored wetland habitat.

5.5 Performance Criteria

Restoration programs require the development of performance criteria to evaluate the progress and success of restoration and mitigation activities, and to guide the implementation of remedial measures or contingency actions when the criteria are not being met. The goals of restoration are to control erosion, establish self-sustaining native plant communities that develop the characteristics of neighboring natural habitats, and restore ecological services. Specific performance criteria to be met in this restoration program over the monitoring period are outlined below.

The restoration sites will attain 30 percent or more total vegetation cover in the first year, increasing to 40 percent in the second year, and thereafter to 50 percent or more. The cover of native perennials will increase from 10 percent or more in the second year by 10 percent each year, to 40 percent or more by

the fifth year. By the end of the program, species richness and cover in the revegetation areas will be increasingly comparable to adjacent natural areas.

Vegetation monitoring including quantification of vegetation composition, vegetation cover, habitat and type will be used to assess both upland and wetland restoration areas. CRAM scoring will be used to further gauge success of restoring ecological services in wetland areas. Vegetation restoration will be deemed successful when target functions and values are met. Native species cover should meet or exceed pre-project levels, and invasive species cover should be equal to or less than pre-project levels.

For wetland areas, CRAM attribute scores dependent on conditions within the AA pertaining to Hydrology, Physical Structure and Biotic Structure should meet or exceed pre-project scores. Within the 13th Street Study Area, the channel should not exhibit increased aggregation or degradation relative to levels observed prior to the Proposed Action, patch richness and topographical complexity should be maintained and there should not be a decrease in native plant species cover, diversity, or structural complexity. There also should be no decline in CRAM buffer scores for buffer areas affected by the Proposed Action. Within the Wetland Mitigation Area the soil excavation area should exhibit the characteristics of wetland habitat and be suitable for analysis with CRAM. CRAM scores should mirror those within reference AA.

Within the 13th Street Bridge Project Impact Area CRLF, TWG, and breeding songbird numbers and distributions should meet or exceed pre-project levels. Any declines in numbers or distribution should be attributable to natural processes as opposed to results of the Proposed Action. Southern steelhead movement through the 13th Street Project Impact Area must be un-obstructed; the Proposed Action should not lead to the formation of any additional barriers to southern steelhead movement within the Santa Ynez River. Within the Wetland Mitigation Area, the soil excavation area should support similar assemblages and relative numbers of breeding songbirds to those observed in CSM habitat west of the Wetland Mitigation Area.

All erosion control structures will be maintained and soil stabilization measures performed until revegetation results in adequate protective cover. Landslides, gullying, or blowouts will be prevented, and topsoil in the restoration sites will be maintained in a stable condition and not subject to excessive water and wind erosion.

5.6 Monitoring Methods

5.6.1 Wildlife

5.6.1.1 California Red-legged Frog

Prior to the Proposed Action, 13 monthly CRLF surveys were conducted from October 2012 to October 2013 within the 13th Street Bridge Study Area. Upon completion of the Proposed Action, described in Section 2.0, the CRLF population within the 13th Street Bridge Study Area will be assessed by conducting monthly night surveys annually, until it is demonstrated that success criteria have been achieved. See Section 6 for schedule. Surveys will be conducted in accordance with methods detailed in Section 3.1.1 to ensure comparability to October 2012 to October 2013 surveys.

CRLF aquatic habitat is not present within the Wetland Mitigation Area and impacts to CRLF are not expected in this area, therefore, surveys are unnecessary.

5.6.1.2 Tidewater Goby

Prior to project initiation, TWG numbers were assessed within the 13th Street Bridge Study Area during two surveys, one in July and one in October 2013. Post construction annual surveys will be conducted in July and October to assess the TWG population within the project area until it is demonstrated that success criteria are met. Surveys will be conducted in accordance with methods detailed in Section 3.1.1.2 to ensure comparability to July and October 2013 surveys. See Section 6 for schedule.

TWG aquatic habitat is not present within the Wetland Mitigation Area and impacts to TWG are not expected in this area, therefore, surveys are unnecessary.

5.6.1.3 Southern Steelhead

Prior to project initiation, the potential presence of southern steelhead was assessed within the 13th Street Bridge Study Area during three surveys: seine surveys for TWG in July and one in October 2013 and snorkel surveys conducted during May 2014. Steelhead were not detected, but this was likely due poor water conditions (relatively high water temperatures and/or low dissolved oxygen levels) and the failure of the estuary to open to the ocean April 2012 through October 2014. Post construction, the presence and density of southern steelhead will be assessed by conducting annual seine surveys during July and October. Surveys will be initiated upon project completion. See Section 6 for schedule. Surveys will be conducted in accordance with methods detailed in Section 3.1.1.3 to ensure comparability to the surveys conducted in July and October 2013. Post construction snorkel surveys will also be conducted. These surveys will be conducted during the October to March period and timed to coincide with estuary breech. If the estuary does not breech, surveys will not be conducted during that year.

Southern steelhead aquatic habitat is not present within the Wetland Mitigation Area and impacts to southern steelhead are not expected in this area, therefore, surveys are unnecessary.

5.6.1.4 Breeding Songbirds

Prior to project initiation, avian point count surveys were performed at 26 points along a pre-existing route encompassing the 13th Street Bridge Study Area (Figure 3-3) once between 15 May and 1 June 2014, and again between 1 June and 15 June 2014. Points were surveyed using standardized point count protocols (Ralph et al. 1993; Ralph et al. 1995). See Section 3.1.1.4 for additional details. Following the Proposed Action, avian point count surveys will be conducted annually, until it is demonstrated that success criteria have been achieved. Surveys will be conducted along the same route, following the same methodology utilized during preconstruction surveys. Surveys will be initiated during the spring following completion of the Proposed Action.

Prior to project initiation songbird survey locations will be designated within the Wetland Mitigation Area and one round of surveys conducted to establish base-line information.

See Section 6 for schedule.

5.6.2 Habitat

5.6.2.1 Jurisdictional Delineation

Following bridge construction and demolition, a wetland delineation will be conducted in year 3 in both the 13th Street Bridge Project Impact Area and the Wetland Mitigation Area. If success criteria are not met during year 3, a second wetland delineation will be conducted in year 5. Wetlands will be delineated in accordance with USACE standards.

Wetland delineations will evaluate all potential wetland features to determine jurisdictional status and delineate wetland boundaries. Transect and plot placement and number will be dictated by conditions in the field and current USACE guidelines. Concurrent with wetland delineations, the boundaries of Waters of the United States will be assessed and delineated.

See Section 6 for schedule.

5.6.2.2 California Rapid Assessment Method (CRAM)

In spring-summer 2014, the 13th Street Bridge Study Area was divided into eight AAs which were scored using CRAM (see Section 3.2.2). Following construction, the boundaries used to delineate AAs will be re-assessed and AA boundaries will be re-drawn as necessary to ensure continued adherence to CRAM requirements. Post construction AAs will be delineated such that the entire 13th Street Bridge Study Area is encompassed, and results from assessments of post construction AAs are comparable to CRAM assessments conducted prior to construction (i.e. unless countermanded by CRAM guidelines, previously established AA boundaries are to be maintained). CRAMs will be conducted in year 3 following the Proposed Action. If success criteria are not met during year 3, a second round of CRAMs will be conducted in year 5.

Within the Wetland Mitigation Area, two AAs are anticipated to be required to encompass areas suitable for analysis with CRAM after the completion of the Proposed Action (see Section 3.2.2). These AAs were delineated to ensure comparability with the reference AA analyzed in 2014. Following completion of the Proposed Action, AA boundaries within the Wetland Mitigation Area will be established and CRAMs will be conducted in year 3 within the reference AA and the new AAs within the Wetland Mitigation Area. If success criteria are not met during year 3, a second round of CRAMs will be conducted in year 5.

See Section 6 for schedule.

5.6.2.3 Compensatory Habitat Mapping

Following bridge construction and demolition within the 13th Street Bridge Project Impact Area and grading within the Wetland Mitigation Area, boundaries of habitat types will be re-mapped in the field. Habitat mapping will be conducted annually in years 1 through 5 following methods described in Section 3.2.3. These acreages will be used to measure habitat acreages within the 13th Street Bridge Project Area and Wetland Mitigation Area relative to those designated in success criteria.

See Section 6 for schedule.

5.6.2.4 Vegetation Recovery

Following bridge construction and demolition, areas directly impacted by project activities where vegetation has been cleared or active vegetation management is determined to be necessary (revegetation, invasive species management), will be divided into sub-sites. Sub-sites should be homogenous with respect to habitat, physical characteristics (slope, aspect, moisture regime, soils, etc.), restoration requirements, and weed infestation level. The Wetland Mitigation Area is to be similarly assessed and divided into sub-sites.

Each sub-site will be assessed annually in years 1 through 5. Assessments should take place in the May through July period with exact timing coinciding with what is determined to be the peak of the growing season during the year during which the assessment is occurring. Sites will be assessed using the "Rapid Vegetation Assessment" sampling method, developed by the California Native Plant Society (http://www.cnps.org/cnps/vegetation/protocol.php). Characteristics assessed are to include:

1. Surface cover
    a. percent bare ground,
    b. percent litter, and
    c. percent basal vegetation
2. Areal cover of each plant species
3. Areal cover of each habitat type
    a. percent Willow Riparian (13th Street Bridge Project Area only),
    b. percent native shrubland,
    c. percent native grassland,
    d. percent Coastal Salt Marsh (Wetland Mitigation Area only),
    e. percent non-native broad-leaf, and
    f. percent non-native grassland
4. Areal cover of overall
    a. percent native vegetation,
    b. percent non-native vegetation, and
    c. percent vegetated,
5. Physical characteristics
    a. slope,
    b. aspect,
    c. topography, and
    d. soils

5.6.2.5 Invasive Species

Immediately prior to bridge construction and demolition, the 13th Street Bridge Project Impact Area and the Wetland Mitigation Area will be surveyed to map weed distribution and to quantify acreage and nature of infestations prior to disturbance. This survey will help biological monitors implement proper measures during construction that will minimize the expansion of invasive weeds within the site and prevent their transport to un-infested areas of the site.

Following the bridge construction and demolition, each sub-site (see Vegetation Recovery for details regarding sub site delineation) will be inspected monthly during the growing season (March to October) to identify invasive weed species present, determine appropriate nature and timing of treatments, and

to implement treatments. The eradication of invasive plants will be accomplished through hand removal, mechanical removal (e.g. weed whacker), and/or herbicide application. The mitigation measures detailed in Section 4.2 will be followed. The efficacy of treatment will be evaluated quantitatively through releves conducted to assess post construction vegetation recovery and qualitatively through photo documentation.

5.6.2.6 Erosion

Following completion of the Proposed Action, all erosion control structures within the 13th Street Bridge Project Impact Area and Wetland Mitigation Area will be maintained until revegetation has created sufficient protective cover to prevent landslides, gullying, and blowouts. Erosion control measures must also protect the topsoil from excessive wind and water erosion.

The 13th Street Bridge Project Impact Area and Wetland Mitigation Area will be inspected following all major rain-events for signs of erosion (the threshold, i.e. definition of what constitutes a major rain event, will be detailed in permits issued by the applicable regulatory agencies). If erosion is identified, appropriate strategies and mitigation measures will be identified and implemented to repair damage and prevent further erosion in both the short and long term.

Short term erosion prevention measures may include the installation of additional erosion control structures. All erosion control structures utilized will be bio-degradable and not create an entrapment hazard to wildlife. To assess long term protection, the efficacy of existing re-vegetation measures will be evaluated. If existing re-vegetation measures are determined to be insufficient for long term site protection, supplemental seeding or plant installation will be conducted. In cases where erosion is identified, erosion control measures would be implemented prior to the next significant rain event. The period spanning October through March is most likely to experience significant rain events.

5.6.2.7 Sedimentation

Prior to the initiation of the Proposed Action, river bed elevation values downstream of the 13th Street Bridge Project Impact Area will be assessed to document base-line conditions. Cross-sectional stream bed elevation profiles should be measured running along a transect from the south bank across to the north at 10 fixed locations spaced every 100 meters downstream of the 13th Street Bridge Project Direct Impact Area. These measurements will be used to determine if the bed profile up to one-kilometer downstream of the 13th Street Bridge Project Impact Area experiences significant change following construction activities. Measurements of river level or water depth alone are not a good indication of sedimentation or channel incision because depth is dependent on the flow volume and the riverbed structural profile. For this reason, it is important to measure the actual stream bed elevation relative to fixed points on the upper terrace. To accomplish this, a fixed benchmark of known elevation will be established along the high bank on either side of the river at each of the 10 riverbed elevation monitoring stations. A taut transect line will be strung between the two benchmarks and a vertical measurement from the base of streambed to the transect line will be recorded at 2-meter intervals. Water level will also be recorded at each transect location.

These pre-construction surveys will be repeated post construction during September October in year 1, 3, and 5. These data would indicate whether incision or sedimentation is occurring as a result of the

Proposed Action or whether equilibrium conditions are being maintained. This information will also be important in assessing and providing rational for upward or downward population trends in special status aquatic species or changes in aquatic species distributions.

See Section 6 for schedule.

5.7 Annual Reports

A compensatory mitigation and monitoring report will be completed annually. This report will include a comparison of the current year's data to data collected pre, during, and following bridge construction and demolition, analysis and discussion of changes in numbers or species distributions documented, analysis of changes in vegetative cover and acreage changes, percent change from previous years, and restoration activities. The results of biological surveys, photo monitoring, vegetation sampling, and GIS mapping will be presented and used to evaluate progress towards restoration success criteria. Reports will also provide recommendations for future strategies to ensure VAFB meets restoration goals and success criteria for species recovery. See Section 6 for schedule.

6 Restoration, Monitoring, and Reporting Schedule for the 13th Street Bridge Project Area and the Wetland Mitigation Area

Note:

PIA = Activities will be performed in/for the 13th Street Bridge Project Impact Area

WMA = Activities will be performed in/for the Wetland Mitigation Area

Pre-Construction	January	February	March	April	May	June	July	August	September	October	November	December
Biological Monitoring												
Breeding Songbird Surveys (WMA)												
Habitat Monitoring												
Photo Documentation (PIA & WMA)												
Invasive Species Mapping (PIA & WMA)												
Sedimentation (PIA)												
Habitat Restoration												
Seed Collection (PIA & WMA)												
Reporting Activities												
Draft Pre-construction Monitoring Report (PIA & WMA)												
Final Pre-construction Monitoring Report (PIA & WMA)												

During Construction	January	February	March	April	May	June	July	August	September	October	November	December
Biological Monitoring												
Special Status Species Monitoring (PIA)	Duration of construction											
Habitat Monitoring												
Photo Documentation (PIA & WMA)	Following completion of construction											
Erosion (PIA & WMA)	Duration of construction											
Habitat Restoration												
Seeding (PIA & WMA)	Following completion of construction											
Seed Collection for Container Plantings (PIA)	Timing dependent on species seed availability and construction time-line, seed for container plantings must be collected at minimum 4 months before projected need date to allow sufficient time for propagation											
Propagate Container Plaintings (PIA)	Understory plantings only; propagation timed so plants will be ready for installation following completion of construction, minimum 4 months required for propagation of 4x4" container plantings											
Install Container Plantings (PIA)	Understory plantings only; following completion of construction											
Install Riparian Pole Plantings (PIA)	Trench plant willows using heavey equipment prior to access road removal											
Invasive Species (PIA & WMA)	Following completion of construction											
Reporting Activities												
Draft Construction Monitoring Report (PIA & WMA)	One month following completion of construction											
Final Construction Monitoring Report (PIA & WMA)	One month following submission of Draft											

Year 1, 2, and 4	January	February	March	April	May	June	July	August	September	October	November	December
Biological Monitoring												
California Red-legged Frog Surveys (PIA)												
Breeding Songbird Surveys (PIA & WMA)												
Tidewater Goby Surveys (PIA)												
Southern Steelhead Surveys (PIA)												
Habitat Monitoring												
Comprehensive Habitat Mapping (PIA & WMA)												
Vegetation Recovery Monitoring (PIA & WMA)												
Photo Documentation (PIA & WMA)												
Erosion (PIA & WMA)												
Sedimentation (PIA, Year 1 Only)												
Habitat Restoration												
Seeding (PIA & WMA)												
Seed Collection for Container Plantings (PIA & WMA)												
Propagate Container Plaintings (PIA & WMA)												
Install Container Plantings (PIA & WMA)												
Install Riparian Pole Plantings (PIA)												
Invasive Species (PIA & WMA)												
Reporting Activities												
Draft Construction Monitoring Report (PIA & WMA)												
Final Construction Monitoring Report (PIA & WMA)												

Year 3 and 5	January	February	March	April	May	June	July	August	September	October	November	December
Biological Monitoring												
California Red-legged Frog Surveys (PIA)												
Breeding Songbird Surveys (PIA & WMA)												
Tidewater Goby Surveys (PIA)												
Southern Steelhead Surveys (PIA)												
Habitat Monitoring												
Wetland Delineation (PIA & WMA)												
California Rapid Assessment Method (PIA & WMA)												
Comprehensive Habitat Mapping (PIA & WMA)												
Vegetation Recovery Monitoring (PIA & WMA)												
Photo Documentation (PIA & WMA)												
Erosion (PIA & WMA)												
Sedimentation (PIA)												
Habitat Restoration												
Seeding (PIA & WMA)												
Seed Collection for Container Plantings (PIA & WMA)												
Propagate Container Plaintings (PIA & WMA)												
Install Containrer Plantings (PIA & WMA)												
Install Riparian Pole Plantings (PIA)												
Invasive Species (PIA & WMA)												
Reporting Activities												
Yearly Draft Construction Monitoring Report (PIA & WMA)												
Yearly Final Construction Monitoring Report (PIA & WMA)												

7 Completion of Mitigation

7.1 Notification of Completion

Upon achievement of the five year success criteria and completion of the five-year maintenance period, a Final Monitoring and Notice of Completion Report will be prepared. The Final Monitoring and Notice of Completion Report will be submitted to the pertinent resource agencies for evaluation of the success of the restoration effort and final acceptance. This notification may occur before five years if the site meets the fifth year criteria and the irrigation has been terminated for a period of at least two years.

If at the end of the five years, any of the created areas fail to meet the project's final success criteria, consultation will occur with the resource agencies. This consultation will be undertaken with the understanding that the failure of any significant portion of the restoration area may result in a requirement to conduct additional restoration actions and/or extend the monitoring and maintenance period until all success criteria are met.

7.2 Agency Confirmation

Upon receipt of the Final Monitoring and Notice of Completion report, the regulatory agencies would have a 30-day period to evaluate the reports and site conditions to confirm required milestones have been met. If success criteria have not been met to the satisfaction of the regulatory agencies, additional monitoring and/or restoration actions may be required.

A request for concurrence would be provided along with the Notice of Completion. Upon receipt of this concurrence or expiration of the 30-day review period, the mitigation requirements would be deemed satisfied, unless the review period has been extended through mutual agreement.

8 Contingency Measures: Wetland Mitigation Area

The Wetland Mitigation Area discussed herein is designed to function as a contingency measure if restoration goals of no net loss of Jurisdictional or special aquatic habitats cannot be met within the 13th Street Bridge Project Impact Area. To ensure availability of the Wetland Mitigation Area for restoration, its use as a restoration site and potential impacts relating to restoration have been incorporated in environmental documents related to the 13th Street Bridge replacement and demolition. These documents include documents in support of Section 7 consultation with USFWS; Section 7 consultation with NOAA Fisheries; CWA Section 401 water quality certification from the RWQCB; and CWA Section 404 permit from USACE.

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APPENDIX I: California Coastal Commission Consultation

DEPARTMENT OF THE AIR FORCE
30TH SPACE WING (AFSPC)

31 July 2014

Beatrice L. Kephart
30 CES/CEI
1028 Iceland Avenue
Vandenberg AFB CA 93437-6010

Mr. Larry Simón
Federal Consistency Supervisor
California Coastal Commission
45 Fremont Street, Suites 1900 & 2000
San Francisco CA 94105-2219

Dear Mr. Simón

Under the Federal Coastal Zone Management Act of 1972, as amended, Section 307c(1), and 15 CFR Part 930, the U.S. Air Force (AF) determined that our proposed replacement of the 13th Street Bridge crossing over the Santa Ynez River on Vandenberg Air Force Base (VAFB; Figure 1) will not affect coastal uses or resources because of measures that are integrated into the projects design to prevent, minimize, and mitigate impacts. Additionally, because the proposed bridge location is approximately 2 miles inland of the coastal zone boundary, the project will not likely to have adverse affects on coastal resources. Therefore, the Proposed Action does not require a consistency determination.

PROJECT DESCRIPTION

Overview and Purpose

The Air Force proposes to construct a replacement bridge for the 13th Street crossing of the Santa Ynez River and install a fiber optic communications line underneath the Santa Ynez River on VAFB. The 13th Street Bridge project area is located approximately three miles inland from the Pacific Ocean (Figure 2). The bridge is on 13th Street, approximately a half mile northeast of the access gate to South VAFB at Ocean Avenue (Figure 2). The Proposed Action has four components: 1) construction of a new bridge on 13th Street over the Santa Ynez River and corresponding approach roads; 2) demolition and removal of the existing 13th Street Bridge and existing approach roads; 3) installation of a fiber optic communication cable under the Santa Ynez River, approximately 1,100 feet (ft) west of the existing bridge; and 4) establishment of a wetland mitigation area at the Santa Ynez River Estuary to offset any potential project related impacts to wetlands that cannot be restored within the main project area. The Proposed Action would occur in two project areas within the lower Santa Ynez River area (Figure 2).

The Proposed Action will sustain vital infrastructure for mission support by maintaining a critical transportation link between South and North VAFB, along with the associated utilities and communication lines that are carried across the Santa Ynez River along the 13th Street Bridge. The existing 13th Street Bridge is unsafe and at risk of failure and is the only on-base transport route and vehicle link between North and South VAFB. The Proposed Action would provide a replacement bridge that meets all current design standards, accommodates mission objectives, and provides essential utilities and communications. The installation of an additional fiber optic line under the Santa Ynez River will assure diverse communications support during bridge construction for mission critical programs.

Construction of New Bridge

The new bridge would be approximately 650 ft in length and would be located between 50 and 80 ft west of the existing bridge crossing the Santa Ynez River and associated riparian corridor (Figure 3). There will be two piers total, both within the channel, located between 200 and 270 ft apart (Figure 4), as opposed to the current bridge, that has eight pier walls spaced 60 ft apart. There will be no scour protection needed at the base of the piers, since fewer piers will reduce the scour potential and velocity of flows under the bridge. This will differ from the current piers on the existing bridge that have riprap scour protection which impacts the natural flow of the river (Figure 5).

The new bridge abutments will be anchored at the top of the slopes on the north and south banks and located as such to create a superstructure with balanced end spans (Figure 4). The existing banks and the new approach fills would be protected from erosion and scour. The new north abutment would be protected by adding approximately 12.5 ft of rock riprap, as well as leaving the existing rock riprap, gabion baskets, concrete, and steel wall associated with the existing north abutment in place (Figure 6). The south abutment would be protected by installing approximately 12.5 ft of new ungrouted rock riprap at the base of the abutment (Figure 4). The embankments for the new approach roadways would receive rock slope protection.

New approach roadways would be constructed on the north (approximately 950 ft) and south (approximately 880 ft) ends of the new bridge (Figure 3). Compacted backfill materials (sand, native fill, and roadbase) would be used to raise the approach roads from existing elevation to approximately 45 ft above sea level, or 10 ft above existing grade on the north and south banks, to meet the elevation of the new bridge.

Restoration of the area impacted during the installation of the new bridge would begin during the final stages of all construction activities as access roads are removed and construction machinery and materials are removed. All access roads, surplus and waste materials, and temporary facilities would be removed from the project area, unless they are also required for the demolition of the existing bridge. To the extent feasible and practicable, the site contours, river channel, and habitat types would be restored to pre-construction conditions. Prior to removal of access roads, a backhoe would be used to assist in the installation of willow cuttings at or near the water table along both banks of the channel. A water stinger would be used to install pole cuttings at 5 to 8 ft deep on the banks of the channel, near riprap, and in other locations where a backhoe cannot access. The water stinger will utilize water pumped from the Santa Ynez River to operate. The water pump intake would be placed in a 30 gallon barrel with fine mesh (1/16th inch) screened holes by a qualified biologist to protect fish and wildlife from entering the pump intake. All access roads that are not needed for the demolition of the existing bridge would be removed.

Demolition of Existing Bridge

After the completion of the new bridge, the existing bridge and approach roadways would be demolished and removed. Demolition would occur during the dry season, beginning in spring 2016 to the onset of significant rainfall. The existing approach roads, including the subbase, base, and bituminous surfacing, would be removed to a depth of at least 6 inches below the grade of the existing surfacing. Holes and depressions left as a result of removal of the approach roads and railings would be backfilled with clean fill and graded to blend with the surrounding terrain. Temporary support shoring, temporary bracing, and protective covers would be installed to support portions of the bridge as the existing support structures are removed during the demolition process. Piling, piers, abutments, and pedestals would be

removed to 3 ft below the ground line or 3 ft below finished grade, whichever is lower. The concrete bridge abutments would be removed in their entirety. The riprap at the base of the pilings within the river channel and at the piers at the south abutment will be removed in their entirety. The north abutment and associated riprap, gabion baskets, and concrete wall at the base of this abutment would be left in place in order to increase protection of the new north bank approach road and abutment (Figure 6).

Site restoration would begin at the completion of the demolition and removal of the existing bridge. Any remaining access roads, surplus and waste materials, and temporary facilities would be removed from the project area. To the extent feasible, the site contours, river channel, and habitat types would be restored to mimic the surrounding natural conditions. As access roads would be removed, construction equipment (e.g., backhoe) would be used to install willow cuttings at or near the water table along the banks of the channel. A water stinger would be used to install willow pole cuttings at 5 to 8 ft deep on the banks of the channel, near riprap, and in other locations where a backhoe cannot access. The water stinger will again utilize water pumped from the Santa Ynez River to operate in the same manner described above. Any remaining disturbed areas would be restored to native vegetation under direction of VAFB biologists or on-site qualified biological monitors. The biologists would ensure that all disturbed areas are restored, at a minimum, to the original condition, and, if feasible, enhance the wetlands and riparian corridor within the project footprint to compensate for the net loss of wetlands or other sensitive plant communities that may occur due to the Proposed Action.

Dewatering and Temporary Access Roads

To facilitate constructing the new bridge and destroying the existing bridge, the river flow would need to be diverted through a series of culverts that will pass under temporary access roads created by placing fill in the channel above the culverts. Prior to commencing bridge construction or demolition, the project site would be dewatered by installing up and down stream dams and pumping the water within the project area out of the channel to the adjacent agricultural field. Integrated into the process of dewatering would be the diversion of the active river channel through culverts passing through the project site to keep soil and debris out of the riverbed as well as prevent flowing water from flooding the column excavations. Diversion of the river flow would be temporary and would be restored prior to the onset of the rainy season. The culverts and access roads would be reinstalled following the end of the rainy season to allow construction and demolition activities to be completed. Following completing all construction and demolition activities associated with the bridge, the access roads, fill materials, and culverts would be removed and the site would be contoured to mimic the natural channel to the extent feasible.

Temporary staging areas would be established on the terrace above the riparian corridor for storage of equipment, materials, and temporary personnel facilities and office trailers, as well as establishing a dewatering area with berms and a percolation reservoir. Temporary access roads would be constructed into the riparian corridor and riverbed to enable construction equipment, materials, and temporary supports to be moved into position for utilization during construction and demolition. The temporary access roads would be installed across the riverbed on both sides of the proposed new bridge location and be approximately 50 ft wide to accommodate cranes and other construction equipment. Clean soil, gravel, and shale would be used for the access roads to construct a firm surface capable of supporting travel by heavy construction equipment. A partial trestle might also be constructed to provide additional access and support during bridge construction. The trestle will be designed to withstand a 5 to 10 year

flood event and may be left in place over the rainy season if construction has not been completed prior to the onset of a significant rainfall event (0.5 inches during a 24 hour period).

Installation of Fiber Optic Cable

Four separate 2-inch diameter high density polyethylene conduits would be installed via one, 12 inch directional drilling/boring (approximate locations shown on Figure 3). All ducts would have a sleeve or bell end type coupling and would be watertight when assembled. With the exception of the Santa Ynez River crossing, all conduits would be installed at a minimum of 60 inches below grade. The new conduit would be installed starting at handhold (HH)-1 along 13th Street north of the bridge and paralleling the road until it intercepts the newly installed MH-A. The conduit route would then cross VAFB agriculture fields to intercept existing MH-1 approximately 700 ft north of the river. From MH-1, conduit will be bored under Santa Ynez River, between MH-1 and new MH-B, at a minimum of 25 ft below grade (Figure 7) and an approximate distance of 1,100 ft. From MH-B, conduit will be bored southwest under agricultural fields to intercept new MH-C, northwest of the intersection of Highway 246 and 13th Street and then finally bored to intercept existing MH-2 on the east side of 13th Street. The total length of conduit to be installed is approximately 5,500 ft.

All grounds disturbed during installation of the maintenance holes, conduit, and/or fiber optic cable would be restored to pre-activity conditions. Any bare soils at the completion of the project would be seeded with a seed mix representing an appropriate palette of native species, to be determined by a qualified biologist.

Wetland Mitigation Area

The U.S. Army Corps of Engineers and Regional Water Quality Control Board strive to maintain a “no net loss” of value and physical size of wetlands and other water bodies. The requirements of the Clean Water Act Section 401 and 404 permits that will be issued for the Proposed Action will include mitigation measures for temporary and permanent impacts to wetlands. Temporary impacts to wetlands would be mitigated at a 1:1 ratio (area mitigated: area impacted) by restoring disturbed areas within the project area to pre-construction conditions. Permanent impacts to wetlands are required to be mitigated at a 2:1 (area mitigated: area impacted) for restored or enhanced wetlands. The design of the new bridge and demolition of the existing bridge will improve wetland and aquatic habitat by reducing the obstruction of flow and allowing the river more area to meander. However, it is anticipated that the required mitigation for permanent impacts to wetlands cannot be achieved at the site of the 13th Street Bridge. Therefore, an area adjacent to the Santa Ynez River estuary was identified for wetland mitigation, if necessary, to meet the 401 and 404 permit criteria. This site is located on the seaward edge of the coastal zone boundary, however is on property owned and operated by the AF (Figure 2). Re-establishment of up to four acres of currently impaired estuarine habitat along the southeast portion of the Santa Ynez River estuary is therefore included as a component of the Proposed Action (Figure 2).

The portion of the Santa Ynez River estuary near the proposed Wetland Mitigation Area is currently 1.5 to 4 ft higher than the requisite elevation to create the habitat conditions to support a broad spectrum of native salt marsh plant and animal species (Ball & Robinette 2012). The current ground elevations within the Wetland Mitigation Area are the result of more than 70-years of sediment accretion caused by river flow conditions influenced by old 35th Street Bridge abutments (Figure 8). Though that bridge was demolished in 1970, the structural abutments on either bank still remain in place. Decades of high flow events have caused a gradual buildup of sediment immediately downstream of these barriers. This has caused the southwest portion of

the estuary to transition from estuarine habitat to upland habitat, dominated by a mix of invasive broadleaf plants and native central coast scrub species. As a result, this area no longer functions as wetland habitat and does not support obligate estuary species. Grading this area to an average elevation of approximately 10.5 feet would cause the habitat to transition from upland dominated by invasive species to an irregularly flooded middle salt marsh wetland. At this elevation, the area would not be regularly inundated. As a result, it would support small passerine bird species, such as savannah sparrow (*Passerculus sandwichensis*) and serve as refuge habitat for tidewater goby (*Eucyclogobius newberryi*) during irregular high flow events.

The proposed wetland restoration would require grading and relocation of between 10,000 and 11,000 cubic yards of accumulated sediment at the south eastern edge of the estuary (Figure 9). Prior to grading activities, the vegetation within the site, which is predominately non-native, would be grubbed with a masticator. The restoration area will then be graded to an average elevation of approximately 10.5 feet. All excavated soil would be transferred 800 to 1,100 feet for deposition at a 2.1 acre site at the southwestern edge of the remnant 35th Street Bridge causeway and abutments (Figure 9). The soil would be deposited in a gradually sloped lens along the embankment and restored as native upland habitat.

Once soil excavation and deposition activities at the Wetland Mitigation Area have been completed, all disturbed soil would be sown with one of two native seed mixes. The portion of the site that was excavated to a lower elevation would be seeded with a native salt marsh seed mix and the sediment deposition area and access roads would be seeded with a native grass seed mix. During the second winter after seeding has occurred, native broadleaf container plantings would be installed in the areas seeded with native grasses. Establishing native grasses within the site prior to broadleaf container plantings allows for one to two years of aggressive broadleaf invasive species control to exhaust any weed seed bank that may be present at the site prior to container plantings. Invasive control and site maintenance will include manual, mechanical (e.g., weed wacker), and herbicide treatments.

Native broadleaf plantings in four-inch containers would be installed at a spacing of six feet on center with the onset of winter rainfall. For protection of the plantings, each planting would be protected by a gopher basket and a wire herbivore exclosure cage. If necessary, plantings would receive an initial watering of approximately 0.5 to 0.75 gallon per plant using the VAFB water supply (lightly chlorinated) at the time of planting (approximately 0.5 to 0.75 gallon per plant). Additional watering would occur once every two week period that receives less that than 0.25 inches of rainfall until 15 April. At that point, watering would be discontinued to allow the plants to acclimate to the natural central California climate. In addition to container plantings, a native upland broadleaf seed mix would be applied to the upland portion (soil deposition area) of the site at the time of installing plantings.

Establishing native salt marsh, grassland, and upland plants at the Wetland Mitigation Area would help prevent and control potential erosion and sedimentation from the site during rain fall or high flooding events. The 35th Street Bridge was built in 1941 and included significant concrete capped abutments in order to create a salt water barrier (Leeds, Hill, Barnard, & Jewett Engineers 1941). These abutments constricted flow and reduced the size of the estuary as soil was deposited on both sides of the abutments over time (ESA PWA 2010). Since the AF does not propose to remove the remnant 35th Street abutments at this time, sediment would be re-deposited over time in the excavated portion of the Wetland Mitigation Area. However, the excavation would have a temporary, but relatively long-term effect of increasing lateral marsh habitat by returning the elevation of the site to conditions that existed before decades of soil deposition.

Site Maintenance and Monitoring

Post-construction monitoring would be conducted to assess the effectiveness of the initial revegetation efforts and provide guidance for follow-up maintenance, based on performance criteria that will be described in a *Five-Year Habitat Maintenance and Monitoring Plan*. The post-construction monitoring would focus on the extent of native species cover and the diversity and presence of non-native, invasive plant species. Eradication of invasive plants, through hand removal, mechanical removal (e.g., weed wacker), and herbicide application is anticipated to be necessary throughout the monitoring period.

PROJECT SCHEDULE

Construction of the new bridge and demolition of the existing bridge is anticipated to begin in late spring or early summer 2015 and last approximately 12 to 20 months. Construction activities in the river channel would be completed or paused prior to the forecast and onset of significant rainfall (0.5 inches within a 24-hour period) and all temporary fill, water diversion, and materials placed in the river channel would be removed. Temporary trestles may be left in place throughout the rainy season, but will be designed to withstand a 5 to 10-year flood event. Some construction activities may continue on the upper bank during the rainy season (installation of decking, conduit, and approach roads, etc.).

Demolition and removal of the existing approach roads are estimated to begin in April 2016 and last between five and six months. The installation of the fiber optic cable under the Santa Ynez River is estimated to begin in April 2015 and last approximately four months. Wetland mitigation at the designated restoration area in the Santa Ynez River Estuary would begin after construction and demolition activities for the bridge and fiber optic cable has been completed and final project impacts assessed.

Grading at the Wetland Mitigation Area would occur after 15 August to avoid impacts to nesting birds and prior to the onset of the rainy season. Grading would be postponed if the restoration area is inundated (due to elevated estuary water levels) until water levels subside.

DETERMINATION

The AF determined that replacing the 13th Street Bridge at the Santa Ynez River crossing will not significantly impact natural, cultural and paleontological resources, access to the coast, or coastal scenic and visual qualities. The AF has determined that the Proposed Action, as described above, would occur outside the coastal zone. As defined in Section 304 of the Act, the term “coastal zone” does not include “lands the use of which is by law subject solely to the discretion of or which is held in trust by the Federal government.” The Proposed Action will occur within VAFB, which is wholly owned and operated by the Department of Defense, and therefore is excluded from the coastal zone. The AF has therefore determined that the Proposed Action will not affect the coastal zone and does not require a consistency determination.

However, the AF recognizes that actions outside the coastal zone may affect land or water uses or natural resources along the coast and therefore are subject to the provisions of the Act. Consequently, an analysis of the impacts of the Proposed Action on the coastal zone was conducted.

Replacing the 13th Street Bridge crossing at the Santa Ynez River and associated installation of a fiber optic cable and Wetland Mitigation Area were reviewed for potential impacts on the marine environment and land resources. The 13th Street Bridge project area is approximately 1.8 miles upstream from the coastal zone boundary (Figure 2) and is not visible from public access points at or near the coast. The Wetland Mitigation Area is located at the seaward edge of the coastal zone boundary (Figure 2).

In accordance with the National Environmental Policy Act, the AF is also preparing a draft environmental assessment (EA) and a Finding of No Significant Impact (FONSI) for this project. The document will be issued for a 30-day public review in January 2015. We will mail the draft EA and FONSI for the Proposed Action to your office at the start of the public review period. In addition, to assist you in your review, we have enclosed copies of the Biological Assessments completed for the section 7 consultations with the U.S. Fish and Wildlife Service (USFWS) and NOAA Fisheries. The Biological Assessments include detailed descriptions of the minimization and monitoring measures that will be implemented to avoid significant impacts to natural resources potentially affected by the Proposed Action.

Biological Resources and Water Quality

The biological resources and the water quality of the Santa Ynez River and adjacent streams, wetlands, and estuaries, may be temporarily affected by the project, but long term effects are not anticipated. The river flow at the 13th Street Bridge will be temporarily diverted to facilitate the creation of an exclusion zone around the project areas. The construction site would need to be dewatered. Diversion of the river flow would be temporary and would be restored prior to the onset of the rainy season. The culverts and access roads would be reinstalled following the end of the rainy season to allow construction and demolition activities to be completed. Following completing all construction and demolition activities associated with the bridge, the access roads, fill materials, and culverts would be removed and the site would be contoured to mimic the natural channel to the extent feasible.

The exclusion zone and water diversion will enable construction of the new bridge and demolition of the existing bridge to occur without significant impacts to biological resources, the active channel, or water quality. Biological monitors, qualified by the USFWS and NOAA Fisheries, will direct and implement the creation of the exclusion zone. Aquatic and terrestrial fish and wildlife, including special status species, will be captured, relocated to the nearest suitable habitat, and excluded from active project areas for the duration of in-stream construction and demolition activities.

To minimize impacts to water quality in the project area as well as downstream at the estuary, construction of the new bridge, the subsequent demolition of the existing bridge, and the implementation of the Wetland Mitigation Area would be completed or paused prior to the forecast and onset of significant rainfall (0.5 inches within a 24-hour period) and all temporary fill, water diversion, and materials placed in the river channel would be removed. Temporary trestles may be left in place at the 13th Street Bridge project area throughout the rainy season, but will be designed to withstand a 5 to 10 year flood event. VAFB will implement Best Management Practices, including erosion control devices (e.g., wattles, silt fences, etc.) throughout the 13th Street Bridge project area and Wetland Mitigation Area. Silt fence and/or biodegradable straw wattles would be placed along the edge of the Wetland Mitigation Area adjacent to the estuary prior to construction activities in order to capture sediments during any potential run-off event from the Wetland Mitigation Area during construction. These would be

removed at the end of construction once exposed soil on the site has been revegetated and/or stabilized with additional erosion control measures.

The AF determined that three special status species present within the project area may be potentially affected by the Proposed Action: California red-legged frog (*Rana draytonii*; federally threatened), tidewater goby (*Eucyclogobius newberryi*; federally endangered), and the Southern California Evolutionarily Significant Unit of Southern Steelhead (*Oncorhynchus mykiss*; federally endangered). Of these, the tidewater goby and southern steelhead are found in the estuary and river mouth, within the Coastal Zone. A summary of the potential effects of the Proposed Action on these species is presented below. Full detail and supporting information is available in the attached Biological Assessments.

Tidewater Goby

In July 2013 and October 2013, surveys for tidewater goby were conducted within the 13th Street Bridge project area to estimate baseline tidewater goby density and population size. In July 2013, 9,831 tidewater goby were captured within this survey area, resulting in an estimate of 453,394 tidewater goby within the 13th Street Bridge project area. The July goby captures included young of the year and female gobies in spawning condition, indicating breeding was occurring within the 13th Street Bridge project area. In October 2013, the 13th Street Bridge project area was resurveyed, resulting in 2,514 tidewater gobies captured and an estimate of 68,785 tidewater gobies within the 13th Street Bridge project area. The density of tidewater gobies observed during October 2013 was significantly lower than the density observed in July 2013 and likely reflects natural seasonal fluctuations in abundance that are well-documented in this species (USFWS 2005). Tidewater goby occurrence in the Santa Ynez River estuary, adjacent to the Wetland Mitigation Area is well documented from prior survey efforts (Swift et al. 1989; Swift et al. 1997) and recently verified in September 2011 by other researchers (Spies 2014).

When the Proposed Action is implemented, the number of tidewater goby present within the Action Area may be significantly different from the population size estimated during these surveys. Factors, such as the area inundated with water, time of year, the amount of seasonal rainfall received, and whether any recent scour events have occurred, will have significant effects on tidewater goby population size and habitat suitability (Swift et al. 1989; Swift et al. 1997; USFWS 2004).

The AF determined that the Proposed Action has the potential to result in short-term temporary adverse effects to tidewater goby in the immediate area of disturbance and downstream of the 13th Street Bridge. The activities that could directly or indirectly adversely affect this species include construction of access roads and staging areas, excavation, removal of vegetation, movement of workers and vehicles, and relocation of individuals out of the project area. Potential impacts associated with these activities include death or injury caused from temporary containment of the creek channel, relocation of tidewater goby out of the project site; downstream sedimentation smothering tidewater goby and/or their prey base; contamination of the waterway from accidental spills or improper maintenance; and noise disturbance, and temporary loss of habitat. The implementation of minimization and monitoring measures and use of qualified biologists would reduce the risk of these potential effects.

Southern Steelhead

The Santa Ynez River in Santa Barbara County, California, once supported what was likely the largest steelhead run south of San Francisco Bay (Busby et al. 1996; Shapovalov & Taft 1954). The construction of Gibraltar and Bradbury Dam's has reduced run sizes to less than

100 individuals (Nehlesen et al. 1991; Reavis 1991). Currently, steelhead utilize all suitable habitat in the Santa Ynez River watershed downstream of Bradbury Dam; however, all spawning and rearing occurs upstream of the 13th Street Bridge (U.S. Bureau of Reclamation 1999). Adults usually run upstream from January to March, but can run as early as December and as late as April (U.S. Bureau of Reclamation 1999). Smolts emigrate from February to May (U.S. Bureau of Reclamation 1999). Juvenile fish are transients in the Santa Ynez River lagoon, although adults may become trapped as flows diminish, as evident by two resident adult steelhead documented in the lagoon in 1998 (Titus, pers. comm. cited in U.S. Bureau of Reclamation 1999). Smolts may also be trapped and over summer in the estuary if the lagoon mouth is closed during spring emigration (T. Robinson, pers. comm.). Adults are also sometimes trapped in the mainstem as flow diminishes, as evident by two observations of adult steelhead trapped in pools near the 13th Street Bridge (ManTech SRS Technologies 2014). In general, steelhead may be present within or adjacent to the Proposed Action Area at any time of year, either as transitory or trapped adults and/or smolts.

Activities associated with the replacement of the 13th Street Bridge have the potential to result in short-term temporary adverse effects to populations of southern steelhead in the immediate area of disturbance. The activities that could directly or indirectly adversely affect this species include construction of access roads and staging areas, excavation, removal of vegetation, movement of workers and vehicles, and relocation of individuals out of the project area. Potential impacts associated with these activities include death or injury caused from temporary containment of the creek channel, or relocation of southern steelhead out of the project site; downstream sedimentation smothering southern steelhead and/or their prey base; contamination of the waterway from accidental spills or improper maintenance; and noise disturbance. The implementation of minimization and monitoring measures and use of qualified biologists would reduce the risk of these potential effects.

Long Term Biological Effects

By fixing an otherwise meandering channel between narrow abutments and narrow bays, the existing 13th Street Bridge has contributed to increased scour immediately west of the bridge and downstream (ESA PWA 2010; Penfield & Smith 2012). Riprap that was put around the base of each pier wall in 2003 further constricts flow and has likely contributed to the formation of a scour pool on the west side of the existing bridge. If the depth of this pool continues to increase, a fish passage barrier may eventually be created as the riprap at the base of each bay becomes further exposed.

The new bridge will span 650 ft of channel, compared to 500 ft spanned by the existing bridge, and replace the existing eight pier walls with two octagonal piers. As a result, the river flow will be allowed to meander through a broader, less constricted channel and the new bridge is expected to decrease sediment deposition and downstream scour (Moffatt & Nichol 2014). Over the long term, the Proposed Action should enhance steelhead and tidewater goby habitat by reducing erosion and obstruction to flow and allowing the river more area to meander. The removal of the existing bridge and associated riprap will also eliminate the possibility of a fish passage barrier forming at this site. The Wetland Mitigation Area is also expected to provide a long term benefit to the tidewater goby because it would increase lateral marsh habitat in the estuary during high flow events and prolonged periods without breaching. This increase in lateral marsh habitat would likely benefit tidewater goby by increasing refugia and foraging habitat during these conditions.

Diking, Filling, or Dredging

Within Article 4, Section 30233 of the Act, provision (a)(4) allows for activities that support "public service purposes, including but not limited to, burying cables and pipes," which is relevant to installing the fiber optic cable under and across the river. Provision (a)(6) allows for the "diking, filling, or dredging" wetland and estuarine areas for restoration proposes. Alterations to existing wetland areas at the project site would occur during construction of the new bridge and demolition of the existing bridge. Wetland areas would be restored at the project site following demolition of the existing bridge. The Wetland Mitigation Area would be used to offset impacts to wetlands at the project site that cannot be restored to original conditions.

The preferred alternative, as described in the EA and presented in this consistency determination, is the only feasible alternative and would have the least environmental impact of any alternative. In addition, proposed mitigation measures would reduce or minimize potential adverse effects to coastal zone resources.

Water Supply and Flood Control

Constructing the new bridge and subsequently demolishing the existing bridge would involve temporarily diverting the river flow into two culverts to allow for construction activities. Water flow would be temporarily diverted into the culverts to keep soil and debris out of the streambed and to prevent flowing water from flooding the column excavations. The culverts would extend approximately 100 ft upstream of the existing bridge, and 100 ft downstream of the new bridge location. The culverts would be maintained in place throughout the construction period and removed prior to the forecast and onset of significant rainfall (0.5 inches within a 24-hour period). Following bridge construction and demolishing the existing bridge, the project site would be restored to a natural state to mitigate impacts, including grading, shoreline stabilization with riprap, and native plantings.

Environmentally Sensitive Habitat Areas

Constructing the new bridge and demolishing the existing bridge would disturb wetland and estuarine habitat at the project site. Locating the new bridge close to the existing bridge limits impacts to nearby habitats by minimizing the project footprint and enabling existing roadways to provide access to the new bridge with minimal modifications. Installing the fiber optic cable using directional drilling instead of trenching minimizes disturbance to terrestrial and wetland habitats, and burying the cable segment spanning the river at a depth of approximately 25 ft under the river bed minimizes any potential impact to aquatic habitat. Furthermore, restoring wetland areas after demolishing the existing bridge would mitigate any disturbance to wetland habitat.

Archaeological or Paleontological Resources

Archival research indicates that no archaeological sites were previously recorded within the 13th Street Bridge Replacement Project area. Furthermore, surface surveys and subsurface trenching found no evidence of an archaeological site within the project area. One archaeological site, is nearby but no evidence of the site was found within the project area. Therefore, construction of the replacement 13th Street Bridge is not anticipated to impact archaeological resources. The Proposed Action would comply with Section 106 of the National Historic Preservation Act. In the event that previously undocumented cultural resources are discovered during monitoring of construction activities, guidelines set forth in the VAFB Integrated Cultural Resources Management Plan (2005) will be followed.

If you need additional information, or if you have any questions, please do not hesitate to call me at (805) 605-7924, or email me at beatrice.kephart@us.af.mil. You can also direct your questions or comments to Andrew Edwards at andrew.edwards@us.af.mil.

Sincerely

BEATRICE L. KEPHART
Chief, Installation Management Flight

9 Attachments:

Figure 1: Vandenberg Air Force Base and Surrounding Area
Figure 2: Proposed Project Area and Vicinity In Relation to the California Coastal Zone Boundary
Figure 3: Project Area Footprint Showing the Locations of the Existing Bridge and the Proposed New Bridge
Figure 4: New Bridge Design Overview
Figure 5: Three of the Eight Existing 13th Street Bridge Piers Showing Riprap; View from South-West Bank
Figure 6: Existing North Abutment: Riprap, Gabion Baskets, Concrete Abutment, and Steel Wall to Remain After Demolition
Figure 7: Conduit to be Installed at a Minimum of 25 ft Below the Riverbed Under the Santa Ynez River
Figure 8: Remnant 35th Street Bridge Abutment and Causeway on the South Bank of the Santa Ynez River
Figure 9: Proposed Wetland Restoration Area and Underlying Topography

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List of Personal Communications

Timothy Robinson, Ph.D. (Cachuma Operation and Maintenance Board, Santa Barbara, CA), Senior Resources Scientist; personal communication via email on 7 January 2014.

STATE OF CALIFORNIA – NATURAL RESOURCES AGENCY EDMUND G. BROWN, JR., GOVERNOR

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September 10, 2014

Beatrice L. Kephart
Chief, Installation Management Flight
30 CES/CEI
ATTN: Andrew Edwards
1028 Iceland Avenue
Vandenberg AFB, CA 93437-6010

Subject: Negative Determination ND-0028-14 (Replacement of 13th Street Bridge over Santa Ynez River, Vandenberg Air Force Base, Santa Barbara County)

Dear Ms. Kephart:

The Coastal Commission staff has reviewed the above-referenced project. The U.S. Air Force proposes to replace the 13th Street Bridge at the Santa Ynez River crossing on federal land two miles inland of the coastal zone boundary within Vandenberg Air Force Base (VAFB). The existing 44-year-old bridge is unsafe and at risk of failure and is the only on-base transport route and vehicle link between North and South VAFB. Previous repair and reinforcement work at the bridge does not adequately protect the structure from collapse during a Richter magnitude 4.0 or larger earthquake or from a 5-year storm flood event. The proposed project has four elements: (1) construction of a new two-lane bridge and corresponding approach roads, and placement of a water main, natural gas conduit, and communication conduits on the bridge; (2) demolition and removal of the existing bridge and approach roads; (3) installation of a fiber optics communication cable 25 feet under the bed of the Santa Ynez River 1,100 feet west of the existing bridge; and (4) establishment of a wetland mitigation area at the Santa Ynez River estuary. The Air Force anticipates construction to commence in April 2015 and last between 12 and 20 months, depending on flow conditions in the Santa Ynez River and the length of the rainy season, as in-channel construction activities will be constrained during high-water periods.

The proposed wetland mitigation area is located on VAFB immediately seaward of the coastal zone boundary, on an upland area between the remnant 35th Street Bridge causeway and the levee along the southern side of the Santa Ynez River channel. The purpose of this project element is to provide a four-acre mitigation site should there be insufficient area at and adjacent to the bridge construction site for mitigation of permanent wetland impacts arising from the project. The Air Force states that the portion of the Santa Ynez River estuary at the proposed wetland mitigation area is currently 1.5 to 4.0 feet higher than the requisite elevation to create the habitat conditions to support a broad spectrum of native salt marsh plant and animal species. The current ground elevation is the result of more than 70 years of sediment accretion caused by river flow conditions influenced by the old 35th Street Bridge abutments and causeway. This bridge was removed in 1970 but the abutments and causeways on both banks still remain in place and continue to affect river flow and sediment transport. The project would relocate approximately

10,000 cubic yards of accumulated sediment from the restoration site eastward 1,000 feet to an upland area abutting the remnant causeway. This area would be planted with a native upland grass seed mix, including saltgrass, alkali rye, meadow barley, and giant wild rye. The wetland restoration area would be graded to an elevation of 10.5 feet above mean sea level, allowing this area to transition from upland dominated by invasive species to an irregularly flooded middle salt marsh wetland supporting pickleweed, alkali heath, and saltgrass. The wetland site will be seeded with a native salt marsh seed mix, and in the second year of restoration native broadleaf container species will be planted within both the wetland and upland restoration areas. The project also includes a five-year monitoring and maintenance plan to ensure successful native species coverage and eradication of invasive plants at the restoration site, and to ensure restoration using native plant materials of all disturbed construction sites.

The Air Force has determined that the proposed bridge replacement and wetland restoration activities on VAFB will not adversely affect coastal resources. The new bridge would span 650 feet of the river channel (compared to the 500-foot span of the existing bridge), would require only two piers located in the channel rather than the eight existing piers, and is expected to decrease sediment deposition and downstream scour. The new bridge will allow the Santa Ynez River to flow and meander through a broader, less-constricted channel and will enhance steelhead and tidewater goby habitat by reducing erosion and obstructions to flow within the channel. There will be temporary construction impacts but these will be minimized by implementation of best management practices to protect water quality and sensitive aquatic species (including tidewater goby and southern steelhead) at and downstream of the project site. River flow will be diverted into culverts to allow construction of temporary in-channel access roads and the two new bridge piers. The culverts and access roads will be removed from the river channel prior to the rainy season and then reinstalled during the second and final year of construction to allow for winter flood flows to travel unimpeded through the project site, the estuary, and into the Pacific Ocean. The wetland restoration area in the estuary will serve in part as refuge habitat for the tidewater goby and southern steelhead during irregular high river flow events.

In conclusion, the Commission staff **agrees** that the proposed 13th Street Bridge replacement project on Vandenberg Air Force Base will not adversely affect coastal zone resources and will improve habitat conditions for aquatic species that periodically move from the coastal zone upstream onto VAFB. We therefore **concur** with your negative determination made pursuant to 15 CFR 930.35 of the NOAA implementing regulations. Please contact Larry Simon at (415) 904-5288 should you have any questions regarding this matter.

Sincerely,

(for) CHARLES LESTER
Executive Director

cc: CCC – Central Coast District