# DRAFT

## **ENVIRONMENTAL ASSESSMENT**

## FOR

## POINT CONCEPTION RESTORATION AT VANDENBERG SPACE FORCE BASE, CALIFORNIA





Space Launch Delta 30, Installation Management Flight 1028 Iceland Avenue Vandenberg Space Force Base, California 93437

September 2023

#### PRIVACY ADVISORY

This Environmental Assessment (EA) is provided for public comment in accordance with the National Environmental Policy Act (NEPA), the President's Council on Environmental Quality NEPA Regulations (40 Code of Federal Regulations [CFR] Parts 1500-1508), and 32 CFR Part 989, Environmental Impact Analysis Process (EIAP).

The EIAP provides an opportunity for public input on Department of the Air Force (DAF) decision making, allows the public to offer input on alternative ways for the DAF to accomplish what it is proposing, and solicits comments on the DAF's analysis of environmental effects.

Public commenting allows the DAF to make better, informed decisions. Letters or other written or oral comments provided may be published in the EA. As required by law, comments provided will be addressed in the EA and made available to the public. Providing personal information is voluntary. Any personal information provided will be used only to identify your desire to make a statement during the public comment portion of any public meetings or hearings or to fulfill requests for copies of the EA or associated documents. Private addresses will be compiled to develop a mailing list for those requesting copies of EA; however, only the names of the individuals making comments and specific comments will be disclosed. Personal home addresses and phone numbers will not be published in the EA.

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#### DEPARTMENT OF THE AIR FORCE DRAFT FINDING OF NO SIGNIFICANT IMPACT (FONSI)

## Point Conception Restoration at Vandenberg Space Force Base, California

Pursuant to provisions of the National Environmental Policy Act (NEPA), 42 United States Code 4321 et seq., Council on Environmental Quality Regulations, 40 Code of Federal Regulations (CFR) Parts 1500-1508, and 32 CFR Part 989, *Environmental Impact Analysis Process*, Space Launch Delta 30 (SLD 30) of the Department of the Air Force (DAF) assessed the potential environmental consequences associated with habitat restoration activities at Point Conception, Vandenberg Space Force Base (SFB), Santa Barbara County, California. Point Conception, owned by DAF, is 29.6 acres of stabilized dunes and sharp cliffs, bordered on the west and south by the Pacific Ocean, and on the east by the Jack and Laura Dangermond Preserve (Dangermond Preserve).

## **Purpose and Need**

The purpose of the Proposed Action is to support native wildlife and ecological diversity at Vandenberg SFB and meet the requirements of the Sikes Act; Endangered Species Act; Department of Defense (DoD) directives such as DoD Instruction (DODI) 4150.7, *DoD Pest Management Program* and DODI 4715.03, *Natural Resources Conservation Program*; and Executive Order (EO) 13751, *Safeguarding the Nation from the Impacts of Invasive Species*.

The Proposed Action is needed because select nonnative plant species dominate Point Conception, greatly reducing habitat quality for native plants and wildlife. Controlling nonnative plant species would allow for native-dominated habitat restoration and natural recovery at Point Conception. The Proposed Action need schedule and requirements are driven by the implementation of the proposed habitat restoration activities described in the Point Conception Restoration Plan.

## **Description of the Proposed Action and Alternatives**

SLD 30 would implement the Point Conception Restoration Plan to reduce invasive plant species occurrence and cover, open niche space for native plant species, establish selfsustaining native habitat that is resistant to invasion, and meet the requirements of the Sikes Act, Endangered Species Act, and various DODIs and EOs. SLD 30 would conduct routine maintenance of the site to prevent surrounding source populations of nonnative species from reinvading the site. SLD 30 would monitor habitat restoration activities to determine restoration success as well as the effectiveness of environmental protection measures. SLD 30 anticipates that the ecological value of the site would increase under the Proposed Action as restoration activities are implemented, providing SLD 30 an opportunity to complement restoration efforts at the adjacent Dangermond Preserve.

SLD 30 would construct buck and rail fence to prevent livestock on adjacent lands from entering the restoration area. The fence would be made of wood posts and designed to be built without digging holes and setting posts in the ground. SLD 30 would construct approximately 2,000 feet

of fence along the Point Conception and Dangermond Preserve property boundary. SLD 30 would install one hanging gate on the road providing access to the lighthouse. SLD 30 would dig two holes, 12 inches wide and 24 inches deep, on both sides of the road, and set one post in each hole, anchored with concrete. The gate would then be attached to the posts. Overall, implementation of the Point Conception Restoration Plan would establish native habitat types. Native habitats would be self-sustaining, self-reproducing, expanding, and exhibit resistance to reintroduction and reestablishment of invasive plant species with minimal maintenance effort. SLD 30 would accomplish habitat restoration implementation in approximately five consecutive years of effort.

SLD 30 evaluated three alternatives for implementing the Proposed Action. Under Alternative 1, the phased restoration approach, SLD 30 would phase habitat restoration at Point Conception across geographically distinct Restoration Zones. SLD 30 would prioritize restoration areas based on available resources and phase in restoration activities as needed. Under Alternative 2, SLD 30 would implement habitat restoration at Point Conception across the entire property simultaneously. There would be no phasing of restoration activities and no prioritization based on resource availability. Under Alternative 3, SLD 30 would limit habitat restoration at Point Conception to select areas where restoration was deemed most critical, such as those areas that are currently supporting Gaviota tarplant (Deinandra increscens ssp. villosa). This would leave portions of Point Conception dominated by nonnative plant species but would focus potentially limited resources on areas determined to be most important for federally and state listed species. Only one of the three action alternatives, Alternative 1, met the project's purpose and need and all selection standards. Alternatives 2 and 3 were considered and eliminated from detailed consideration in this EA because they would not meet the purpose of and need for the action, the selection standards, or were not sufficiently different from Alternative 1 to be evaluated further.

Under Alternative 1, SLD 30 would complete restoration of Point Conception in three phases: 1) control of nonnative plant species, 2) outplanting of native plant species, and 3) monitoring of restoration activities. Approximately 11 acres of the 29.6-acre Point Conception property consists of developed areas, cliff faces, and rock-covered areas and would not be part of the restoration. Restoration at Point Conception is constrained by various factors, such as the need to protect cultural sites and aesthetics during restoration, as well as the lack of a consistent water supply, which is needed to provide supplemental irrigation to native outplantings. To balance the various challenges, constraints, and goals, SLD 30 developed 10 Restoration Priority Zones to guide restoration efforts. Depending on resources available, SLD 30 would approach restoration starting sequentially in Restoration Priority Zones in a phased approach.

#### **No Action Alternative**

Under the No Action Alternative, the Proposed Action would not occur, and no habitat restoration activities would take place at Point Conception. Nonnative plant species would continue to dominate the habitats at Point Conception under the No Action Alternative.

#### **Summary of Findings**

The attached Environmental Assessment (EA) analyzes the potential environmental consequences of activities associated with the Proposed Action and the No Action Alternative. Based on the analysis, neither the Proposed Action nor the No Action Alternative would result in individual or cumulatively significant impacts on any resources. Specific environmental resources with the potential for environmental consequences include land use and coastal zone management, air quality including greenhouse gases, human health and safety, water resources, earth resources, biological resources, cultural resources, and hazardous materials and wastes. Further, the DAF concludes that the Proposed Action would have no impacts on the following environmental resources: airspace management, noise, socioeconomics, environmental justice, or infrastructure, transportation, and utilities. Environmental protection measures that are incorporated into the Proposed Action (identified as required in the EA) would be implemented to avoid and/or minimize potential adverse impacts. Discretionary environmental protection measures may further reduce potential impacts of the Proposed Action.

#### **Preferred Alternative**

Alternative 1 is the Preferred Alternative because it is the only alternative that fulfills the purpose and need and meets selection standards for the Proposed Action.

#### **Public Review and Comment**

The Draft EA and FONSI were made available for public review and comment for 30 days following the publication of the Notice of Availability in the *Lompoc Record* and *Santa Maria Times*. The Draft EA and FONSI were also distributed per the current SLD 30 NEPA Distribution List, including the California State Clearinghouse. The Final EA will include Appendix B, containing the Notice of Availability, proofs of publication, proofs of library deliveries, NEPA distribution list, public comments, and SLD 30 responses.

#### Conclusion

**Finding of No Significant Impact.** Based on my review of the facts and analyses contained in the attached EA, conducted per the NEPA, 42 United States Code 4321 et seq., implementing Council on Environmental Quality Regulations, 40 CFR Parts 1500–1508, and 32 CFR Part 989, *Environmental Impact Analysis Process*, I conclude that implementing the Proposed Action (Preferred Alternative) will not have a significant effect on the human or natural environment. Therefore, further analysis with an Environmental Impact Statement is not required and a FONSI is appropriate. I made this decision after considering all submitted information, including reviewing public and agency comments submitted during the 30-day public comment period, and considering a full range of reasonable alternatives to meet project requirements and are within the legal authority of the DAF.

MARK A. SHOEMAKER, Col, USSF Commander, Space Launch Delta 30 DATE

Attachment: Draft Environmental Assessment for Point Conception Restoration at Vandenberg Space Force Base, California (2023)

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## LIST OF ACRONYMS AND ABBREVIATIONS

30 CES/CEIEA	30th Civil Engineer Squadron, Installation Management Flight,
	Environmental Conservation
ACAM	Air Conformity Applicability Model
AFI	Air Force Instruction
AFMAN	Air Force Manual
AFMPP	Air Force Mishap Prevention Program
AFOSH	Air Force Occupational Safety and Health
APE	area of potential effect
ATV	all-terrain vehicle
BCC	federal bird of conservation concern
BE	Bioenvironmental Engineering
BMP	best management practice
CAAQS	California Ambient Air Quality Standards
Cal/OSHA	California Division of Occupational Safety and Health
CCA	California Coastal Act
CCC	California Coastal Commission
CCMP	California Coastal Management Program
CCR	California Code of Regulations
CCRWQCB	Central Coast Regional Water Quality Control Board
CDFW	California Department of Fish and Wildlife
CEIEC	Installation Management Flight, Environmental Compliance
CEQ	Council on Environmental Quality
CFR	Code of Federal Regulations
CO	carbon monoxide
CO <sub>2</sub>	carbon dioxide
CWA	Clean Water Act
CZMA	Coastal Zone Management Act
DAF	Department of the Air Force
DoD	Department of Defense
DODI	Department of Defense Instruction
DPR	California Department of Pesticide Regulation
EA	Environmental Assessment
EIAP	Environmental Impact Analysis Process
EO	Executive Order
EPM	environmental protection measure
ERP	Environmental Restoration Program
ESA	Endangered Species Act
FE	federally endangered
FONSI	Finding of No Significant Impact
FR	Federal Register
GHG	greenhouse gas

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GWP	global warming potential
HazMart	Hazardous Materials Pharmacy
HFC	hydrofluorocarbon
HS	hydrogen sulfide
ITLO	Installation Tribal Liaison Officer
µg/m³	micrograms per cubic meter
MBTA	Migratory Bird Treaty Act
MCV2	Manual of California Vegetation, second edition
MSRS	ManTech SRS Technologies, Inc.
NAAQS	National Ambient Air Quality Standards
NEPA	National Environmental Policy Act
NHPA	National Historic Preservation Act
NO <sub>2</sub>	nitrogen dioxide
NOA	Notice of Availability
NO <sub>x</sub>	oxides of nitrogen
NPDES	National Pollutant Discharge Elimination System
NRHP	National Register of Historic Places
O <sub>3</sub>	ozone
OEL	occupational exposure limit
OSHA	Occupational Safety and Health Administration
P2	pollution prevention
Pb	lead
PCE	primary constituent element
PM <sub>2.5</sub>	particulate matter, less than 2.5 micrometers
PM <sub>10</sub>	particulate matter, less than 10 micrometers
POL	petroleum, oil, and lubricant
ppb	parts per billion
PPE	personal protective equipment
ppm	parts per million
QAC	Qualified Applicator Certificate
QAL	Qualified Applicator License
RCRA	Resource Conservation and Recovery Act
ROG	reactive organic gases
ROI	region of influence
SBCAPCD	Santa Barbara County Air Pollution Control District
SCCAB	South Central Coast Air Basin
SFB	Space Force Base
SHPO	State Historic Preservation Officer
SLD	Space Launch Delta
SO <sub>2</sub>	sulfur dioxide
SO <sub>4</sub>	sulfates
SO <sub>x</sub>	sulfur oxides
SSC	California species of special concern

SYBCI	Santa Ynez Band of Chumash Indians
TNC	The Nature Conservancy
ULV	ultra-low volume
US	United States
USC	United States Code
USCG	US Coast Guard
USCG	US Coast Guard
USEPA	US Environmental Protection Agency
USFWS	US Fish and Wildlife Service
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FORMAT PAGE

#### 1.0 INTRODUCTION

Space Launch Delta 30 (SLD 30), 30th Civil Engineer Squadron, Installation Management Flight, Environmental Conservation (30 CES/CEIEA) prepared this Environmental Assessment (EA) to evaluate the potential impacts from proposed habitat restoration activities at Point Conception. Ownership of the Point Conception land parcel was transferred from the United States Coast Guard (USCG) to the Department of the Air Force (DAF) in 2020. SLD 30 finalized its Point Conception Restoration Plan in 2022 (ManTech SRS Technologies, Inc. [MSRS] 2022; **Appendix A**).

SLD 30 prepared this EA per the National Environmental Policy Act (NEPA) of 1969 (42 United States Code [USC] § 4321 et seq.), the Council on Environmental Quality's (CEQ's) Regulations for Implementing the Procedural Provisions of NEPA (40 Code of Federal Regulations [CFR] Parts 1500-1508), and the DAF's Environmental Impact Analysis Process (EIAP; 32 CFR Part 989). This EA follows the updated 20 May 2022 CEQ NEPA rules (87 Federal Register [FR] 23453 through 23470; pending congressional review).

Vandenberg SFB is located in central Santa Barbara County, California, near the town of Lompoc, and occupies approximately 99,572 acres (Vandenberg Air Force Base 2019). Point Conception is located 5 miles south of Vandenberg SFB's southern border (**Figure 1-1**).

SLD 30 at Vandenberg SFB is the US Space Force organization responsible for supporting Department of Defense (DoD) space and missile launch activities on the west coast of the United States (US). SLD 30 supports satellite launches destined for polar or near-polar orbit and ballistic missile testing from Vandenberg SFB. SLD 30 supports West Coast launch activities for the DAF, DoD, Missile Defense Agency, National Aeronautics and Space Administration, foreign nations, and various private contractors.

The Nature Conservancy (TNC) manages the 24,364 acres adjacent to Point Conception as the Jack and Laura Dangermond Preserve (Dangermond Preserve; **Figure 1-2**). SLD 30 cooperates with TNC to utilize its roads to access Point Conception. Point Conception is well known for the lighthouse that still stands, operated by the USCG since 1856, composed of several different structures in at least two different locations over time, and automated in 1973.

Point Conception is 29.6 acres of stabilized dunes and sharp cliffs, bordered on the west and south by the Pacific Ocean (**Figure 1-2**). Point Conception is a headland on the central coast of California that divides the state from its prevailing north-south orientation to an east-west alignment where the Pacific Ocean meets the Santa Barbara Channel (**Figure 1-1**). The topography of Point Conception extends from sea level to 217.9 feet at the highest point. Biogeographically, Point Conception is commonly understood as the transition between the flora and fauna of northern California and southern California, and many species find either their northern or southern limits at or near this location (Smith 1998). The area currently supports remnants of coastal vegetation embedded within large swathes of various nonnative iceplant species.



## Figure 1-1. Location of Vandenberg Space Force Base and Point Conception



Figure 1-2. Property Boundaries of Point Conception and Surroundings

Strong winds, generally westerly prevailing, have formed small rolling dunes across the widest portion of the headland just north of the highest point on Point Conception. These eolian sands are deposited on escarpments of Monterey shale (US Geological Survey 2016). The topography of Point Conception is mirrored in these soil characteristics, with gentle slopes found in the dune areas to the northeast and extremely steep cliff faces and slopes found on the perimeter of the headland.

## 1.1 Purpose of and Need for the Proposed Action

The purpose of the Proposed Action is to support native wildlife and ecological diversity at Vandenberg SFB and meet the requirements of the Sikes Act; Endangered Species Act (ESA); DoD directives such as DoD Instruction (DODI) 4150.7, *DoD Pest Management Program* and DODI 4715.03, *Natural Resources Conservation Program*; and Executive Order (EO) 13751, *Safeguarding the Nation from the Impacts of Invasive Species*.

The Proposed Action is needed because select nonnative plant species dominate Point Conception greatly reducing habitat quality for native plants and wildlife. Controlling nonnative plant species would allow for native-dominated habitat restoration and natural recovery at Point Conception. The Proposed Action need schedule and requirements are driven by the implementation of the proposed habitat restoration activities described in the Point Conception Restoration Plan (MSRS 2022).

#### **1.2** Scope of the Environmental Assessment

The scope of the Proposed Action comprises the proposed habitat restoration activities described in the Point Conception Restoration Plan (MSRS 2022). This EA evaluates the potential environmental consequences of implementing the Proposed Action and alternatives for restoration activities at Point Conception. The EA identifies environmental permits relevant to the Proposed Action. The Proposed Action incorporates standard procedures that will avoid, prevent, or minimize environmental impacts.

#### **1.3** Interagency Coordination and Consultation

In accordance with 32 CFR § 989.14(I), SLD 30 will involve other federal agencies, state, tribal, and local governments, and the public in EA preparation. In meeting this requirement, as well as meeting the requirements of EO 12372, *Intergovernmental Review of Federal Programs*, SLD 30 notified and consulted with relevant federal and state agencies on the Proposed Action and alternatives to identify potential environmental issues and regulatory requirements associated with project implementation (**Appendix B**). The following discussion summarizes the agency completed coordination and consultations.

Under the Coastal Zone Management Act (CZMA) of 1972 (16 USC § 2452-24645), a federal action that may affect the coastal zone must be carried out in a manner that is consistent with state Coastal Zone Management Programs. The DAF prepared a Negative Determination, and

Purpose of and Need for Action

the California Coastal Commission (CCC) concurred with the Negative Determination on 8 August 2023 (**Appendix C**).

The Proposed Action is a federal undertaking subject to compliance with Section 106 of the National Historic Preservation Act (NHPA) of 1966 as amended (16 USC § 470 et seq.). SLD 30 initiated consultation with the State Historic Preservation Officer (SHPO) under 36 CFR Part 800. SLD 30 determined that there would be no historic properties affected by the Proposed Action. The SHPO concurred on 8 November 2022 with SLD 30's determination of no adverse effect on historic properties (**Appendix D**). Native American traditional cultural properties are also protected by the NHPA of 1966, as amended (16 USC § 470). Per NHPA implementing regulations at 36 CFR Part 800, consultation with the Santa Ynez Band of the Chumash Indians (SYBCI) is discussed below in **Section 1.4**.

Under section 7 of the ESA of 1973, as amended (16 USC § 1531 et seq.), federal agencies are required to assess the effect of projects authorized, funded by, or carried out by federal agencies on federally listed threatened or endangered species. Section 7 consultations with the US Fish and Wildlife Service (USFWS) and National Oceanic and Atmospheric Administration National Marine Fisheries Service 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. The DAF initiated informal section 7 consultation with the USFWS via a Biological Assessment for potential federally listed species impacts due to the Proposed Action. The USFWS concurred with DAF's determination that the Proposed Action may affect but is not likely to adversely federally listed species or designated critical habitat and a Biological Opinion through the formal Section 7 consultation process was not necessary and not included in the EA.

#### 1.4 Intergovernmental Coordination and Consultation

The SLD 30 Commander appointed Josh Smallwood (SLD 30/CEIEA) as the Installation Tribal Liaison Officer (ITLO). Mr. Smallwood carried out Native American consultation via email with Nakia Zavalla, the SYBCI tribal chairman's appointee for Section 106 consultations. As the SYBCI is the federally recognized Chumash Tribe with ancestral ties to Vandenberg SFB and Point Conception, SLD 30 regularly consults with the tribe on a government-to-government basis. On 30 September 2022, Mr. Smallwood notified the SYBCI of the Proposed Action and requested tribal comments to initiate government to-government consultation (**Appendix F**). The SYBCI responded by e-mail on 30 September 2022 requesting a tribal monitor be present during the implementation of the Proposed Action (**Appendix F**). The SYBCI followed up with a response letter from the Tribal Elders' Council on 14 November 2022. The Elders' Council requested formal consultation between the ITLO and the tribe's archaeologist, Dr. Wendy Teeter (**Appendix F**). The California SHPO responded with comments on 8 November 2022. The SHPO concurred with SLD 30's delineation of the area of potential effect (APE) and the finding of no adverse effect on historic properties.

#### 1.5 Public Notification and Review

Following the publication of a Notice of Availability (NOA) in the *Lompoc Record* and *Santa Maria Times*, the DAF made the Draft EA and Draft Finding of No Significant Impact (FONSI) available for public review and comment for 30 days. The DAF also distributed the Draft EA and Draft FONSI per the current Vandenberg SFB NEPA Distribution List, including the California State Clearinghouse. The public distribution list, newspaper publications of the NOA, and correspondence submitted by the public in response to the notification process are included in **Appendix B**. The Final EA will include a copy of the NOA, proofs of publication, proof of library deliveries, public correspondence, and responses to substantive public comments.

## 2.0 DESCRIPTION OF THE PROPOSED ACTION AND ALTERNATIVES

This chapter provides detailed descriptions of the Proposed Action and alternatives to implement the Proposed Action, as well as the No Action Alternative.

## 2.1 Proposed Action

Implementation of the Point Conception Restoration Plan (**Appendix A**; MSRS 2022) would establish native habitat types. Native habitats would be self-sustaining, self-reproducing, and expanding and would exhibit resistance to reintroduction and reestablishment of invasive plant species with minimal maintenance effort. SLD 30 would accomplish habitat restoration implementation in approximately five consecutive years of effort.

Nonnative plant species (various ornamentals and other more invasive species) dominate the Point Conception landscape. Lighthouse keepers who previously lived on the site likely introduced many of these plant species. A wide variety of ornamental succulents and bulbs currently grow around several of the historic buildings and have escaped farther into the landscape. SLD 30 would implement the Point Conception Restoration Plan (**Appendix A**; MSRS 2022) to reduce invasive plant species occurrence and cover, open niche space for native plant species, establish self-sustaining native habitat that is resistant to invasion, and meet the requirements of the Sikes Act, ESA, and various DODIs and EOs. SLD 30 would conduct routine maintenance of the site to prevent surrounding source populations of nonnative species from reinvading the site.

SLD 30 would construct buck and rail fence (**Figure 2-1**) to prevent livestock on adjacent lands from entering the restoration area. The fence would be made of wood posts and designed to be built without digging holes and setting posts in the ground. The bucks would be constructed perpendicular to the ground, forming a bipod-shaped structure with two posts, secured with screws or nails. The rails would then attach horizontally to each buck with screws or nails, locking the sections in place. SLD 30 would construct approximately 2,000 feet of fence along the Point Conception and Dangermond Preserve property boundary. The area needed to construct the fence would be 24 feet wide from the boundary line into the Point Conception property. The 24-foot-wide area would be utilized for vehicles to transport posts along the approximate 2,000-foot-long corridor where the fence will be assembled using hand tools. The staging area for the posts and supplies would be on the paved area of the terrace south of the main entry road. SLD 30 would install one hanging gate on the road providing access to the lighthouse. SLD 30 would dig two holes, 12 inches wide and 24 inches deep, on both sides of the road, and set one post in each hole anchored with concrete. The gate would then be attached to the posts.

It is difficult to set goals for restoration based on historic conditions since data are not available prior to grazing and other impacts at Point Conception. However, the remnant native flora documented during the vegetation surveys in 2016, 2017, and 2022 and historic locality records (**Appendix A**) were used to identify several native habitat types to guide restoration efforts. These habitat types are dune scrub, coastal bluff (windward and leeward), salt spray



Figure 2-1. Habitat Restoration Objectives for Point Conception

scrub, low-density bluff scrub, and swale (**Figure 2-1**). Point Conception is within the Conception-Gaviota unit of designated critical habitat for the federal and state listed endangered Gaviota tarplant (*Deinandra increscens* ssp. *villosa*). Additionally, the historically relevant Monterey cypress (*Hesperocyparis macrocarpa*) grove is included in the Restoration Plan for maintenance purposes.

SLD 30 would monitor habitat restoration activities to determine restoration success as well as the effectiveness of environmental protection measures. SLD 30 anticipates that the ecological value of the site would increase under the Proposed Action as restoration activities are implemented, providing SLD 30 an opportunity to complement restoration efforts at the Dangermond Preserve.

## 2.1.1 Environmental Protection Measures

Mandatory environmental protection measures (EPMs) (denoted by "shall" or "would") are part of the project design. SLD 30 would implement EPMs as part of the Proposed Action to avoid, minimize, reduce, or compensate for the anticipated environmental impacts. SLD 30 may or may not implement discretionary measures (denoted by "may" or "could") to further reduce environmental impacts.

## 2.1.1.1 <u>Air Quality</u>

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

- 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.
- The Proposed Action shall include best management practices (BMPs) to reduce dust emissions.
- Any portable equipment powered by an internal combustion engine with a rated horsepower of 50 brake horsepower or greater used for this project shall be registered in the California State-Wide Portable Equipment Registration Program or have a valid SBCAPCD permit to operate. Examples of such equipment are portable generators, compressors, and light-carts.

#### 2.1.1.2 <u>Biological Resources</u>

Although the measures listed below are proposed, the specific requirements of the final regulatory documents will be the required measures as they are a result of the end of the ESA section 7 consultation process.

#### **General Protection and Monitoring Measures**

SLD 30 would apply the following protection and monitoring measures to all aspects of the Proposed Action to protect and minimize effects on biological resources:

- 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.
- All erosion control materials used (e.g., gravel, sand, fill material, wattles) will be from weed-free sources. Only nonplastic, 100 percent biodegradable erosion control materials (e.g., erosion blankets, wattles) will be left in place following project completion.
- SLD 30 will utilize nonchemical control efforts whenever they meet project goals to minimize levels of chemical input and the potential for runoff. When herbicide treatment does occur, applications will follow herbicide label instructions to minimize the likelihood of runoff and drift. SLD 30 will employ a nonionic surfactant, Agri-Dex<sup>®</sup>, with all foliar treatments to maximize herbicide adherence to target plant surfaces. The droplet size and flow rates will be set to ensure that little to no leaf runoff occurs. SLD 30 will maintain a spill kit on site to respond to any leaks or spills. If a leak, spill, or overspray does occur, the contaminated soil and sorbent from the site will be removed and properly disposed of in compliance with California Department of Pesticide Regulations (DPR) requirements.
- Portable toilets would be placed only on paved surfaces or within designated staging areas.
- All human-generated trash at the project site shall be disposed of properly at the end of each workday, placed in proper containers, and removed from the work site. All debris and trash shall be removed from the work area upon completion of the project.
- Equipment and vehicles shall be cleaned of weed seeds prior to use in the project area to prevent the introduction of weeds. Prior to site transport, any skid plates shall be removed and cleaned. Equipment should be cleaned of weed seeds daily, especially wheels, undercarriages, and bumpers. Prior to leaving the project area, for vehicles that have caked-on dirt or mud, vehicles shall be cleaned with hand tools such as bristle brushes and brooms at a designated exit area. For vehicles with dry, dusted dirt (and no caked-on dirt or mud), prior to leaving a site at a designated exit area, equipment vehicles shall be thoroughly brushed; vehicles may alternatively be air blasted on site. Prior to use, all equipment will be inspected for weed seeds and debris by a qualified biological monitor who may refuse use of equipment that does not pass inspection.
- Fueling of equipment will be conducted in a predesignated location within the designated laydown areas at least 100 feet from coastal boundaries, and spill containment materials will be placed around the equipment before refueling. Stationary equipment will be outfitted with drip pans and hydrocarbon absorbent pads.

• Personnel will use established roads, both paved and unpaved, to the maximum extent practicable to stage and operate vehicles and equipment. In areas where this is not possible, personnel will use preexisting disturbed areas or areas occupied by nonnative vegetation to the maximum extent practicable.

## Marine Mammals and Nesting Birds

Marine mammals haul out in the sandy coves and rocks surrounding the base of the cliffs around Point Conception. A variety of bird species protected under the Migratory Bird Treaty Act (MBTA) also nest at the property. Minimization of effects on these animals will primarily consist of temporal and spatial avoidance. SLD 30 will employ the following minimization measures to ensure marine mammals are not harassed and nesting birds are not disturbed:

- Personnel will not approach cliff edges to the extent where they would be visible to pinnipeds at the haulouts below or nesting birds using cliff walls (this measure is also necessary for personnel safety).
- Personnel will not conduct any work on the beaches or cliffs surrounding Point Conception.
- During nesting season (15 February through 15 August), work areas will be surveyed by a qualified biologist for nesting birds protected under the MBTA, prior to initiating activities. If nesting birds are detected, an appropriate buffer around the nest(s) would be determined by the biologist and would be avoided until the biologist determines the nestlings have fledged.
- When and where practicable, nonnative vegetation within the Proposed Action Area may be removed during project-related activities under the direction of the biological monitor.

## Gaviota Tarplant

Gaviota tarplant impacts will be minimized or avoided during nonnative plant treatments and restoration activities by implementation of the following measures:

- Prior to implementation of restoration activities, the site will be surveyed for Gaviota tarplant, and any occupied habitat will be documented and marked for avoidance by a qualified biologist.
- If it is necessary to control nonnative species in any areas occupied by Gaviota tarplant, the work will be performed by one or more of the following methods:
  - When Gaviota tarplant is not dormant:
    - Hand removal of nonnative species under supervision of a qualified biologist within a 15-foot buffer of known occupied habitat; or
    - Herbicide application will be conducted within 45 feet of live Gaviota tarplant with an ultra-low-volume (ULV) applicator (Mankar<sup>®</sup>) that eliminates potential drift and nonpersistent herbicides and will be operated only under the supervision of a qualified biologist. Native plant species will be avoided and work conducted during cool (maximum temperature of 85 degrees Fahrenheit) weather and low wind conditions

(maximum wind speeds under 8 miles per hour). Work will be avoided within 24 hours of forecasted significant rainfall (0.2 inch or above). Most of the initial treatments will occur during peak winter months to minimize impacts on native plant growth periods and pollinators.

- When Gaviota tarplant is dormant:
  - Hand removal of nonnative species; and/or
  - Spot herbicide treatments with low-pressure backpack sprayer and nonpersistent herbicide. Except for ULV Mankar<sup>®</sup> applications, all projectrelated foliar herbicide treatments will utilize marker dyes so workers can readily see spills, drift, or misapplication.
- Any manual removal of invasive plants within 6 feet of Gaviota tarplant requiring soil disturbance would occur during moist soil conditions when Gaviota tarplant root systems are better able to recover from disturbance.
- SLD 30 will not use any persistent or preemergent herbicides within 150 feet of Gaviota tarplant.
- Any monitoring pole installation within or adjacent to Gaviota tarplant stands would take place outside of its growing season. Monitoring pole installation would follow the above measures to reduce effects on the seed bank.

## Gaviota Tarplant Critical Habitat

Gaviota tarplant designated critical habitat impacts will be minimized or avoided during nonnative plant treatments and restoration activities by implementation of the following measures:

- SLD 30 will minimize disturbance footprints to the maximum extent practicable and in coordination with qualified biologists.
- Prior to implementation of restoration activities, the site will be surveyed, and native plant species will be marked for avoidance by a qualified biologist.
- If SLD 30 removes a portion of the seed bank of native plants in critical habitat, SLD 30 may collect the topsoil containing seeds using hand tools or mechanized construction equipment, set it aside, and spread this topsoil near the project area or in adjacent similar quality habitat (similar invasive species type and quantity).
- Broad-spectrum herbicide (i.e., nonselective grass and broadleaf plant control) application would occur throughout designated critical habitat. Applicators will follow special precautions listed below to avoid impacts to native plant species including Gaviota tarplant:
  - Cool (maximum temperature of 85 degrees Fahrenheit), low wind conditions (maximum wind speeds under 8 miles per hour).
  - Low pressure/no-drift application of herbicides to include low-pressure backpack sprayer, ULV applicator, and/or wick application.
- Any monitoring pole installation within Gaviota tarplant critical habitat would take place outside of its growing season. Pole installation would avoid native plants comprising critical habitat and follow the above measures to reduce effects on the seed bank.

## 2.1.1.3 <u>Cultural Resources</u>

Archaeological surveys are not complete at Point Conception, but several documented sites should be considered during restoration activities (C. Ryan, personal communication). Midden sites, a large flake scatter, and the historic lighthouse and outbuildings, as well as historic midden heaps or refuse piles have all been documented. The following minimization measures for archaeological resources are designed to achieve complete avoidance of potential impacts:

- Prior to implementation of restoration activities, complete a survey of the property to determine the extent and nature of archaeological sites.
- Any artifacts found will be documented and reported to SLD 30 archaeologists. No artifacts (including modern refuse) shall be removed from the site.
- There will be no vehicle use off existing paved roads or disturbed surfaces/iceplant thatch.
- All iceplant treated at an archaeology site will be left in place so that as the iceplant dies, it creates a mulch that protects against erosion while native vegetation establishes.
- If installation of outplantings is necessary in any archeological site, it would be performed by hand tools (e.g., dibbler) to a depth of 4 to 7 inches (depending on the container size) and under supervision of a qualified archaeological monitor.
- A Native American monitor will be required whenever there is ground disturbance such as digging on the terraces of the Point Conception property; slopes greater than 30 degrees would not require a Native American monitor.

#### 2.1.1.4 Earth Resources

No EPMs specific to the protection of earth resources will be required for the Proposed Action.

## 2.1.1.5 Hazardous Materials and Waste Management

- Hazardous materials would be procured through or approved for use by Vandenberg SFB Hazardous Materials Pharmacy (HazMart). Monthly usage of hazardous materials will be reported to HazMart to meet legal reporting requirements.
- Hazardous materials would not be stored at Point Conception and would only be present at the site temporarily while workers are present. While on site, hazardous materials would be stored in proper containers secured within vehicles or vehicle beds with enclosed bed canopies.
- All herbicides would be handled, mixed, and applied in accordance with label instructions and DPR requirements by workers holding valid Qualified Applicator Certificates (QAC) or Qualified Applicator Licenses (QAL).
- 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 Proposed Action Area would be inspected regularly for fluid leaks. A Spill Prevention Plan would be approved by SLD 30 Installation Management Flight, Environmental Compliance (CEIEC) and implemented.

- Fueling of equipment would be conducted in predesignated location at least 100 feet from the shoreline, and spill containment materials would be placed around the equipment before refueling. Stationary equipment would be outfitted with drip pans and hydrocarbon-absorbent pads. Additionally, 40 CFR Part 112, *Spill Prevention, Control, and Countermeasure Plan*, requires that tanks and containers have secondary containment or that the tanks be double walled.
- 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.
- Hazardous waste shall be managed in accordance with the Hazardous Waste Management Plan, SLD 30 Plan 32-7043-A. A Community Awareness Emergency Response form would be completed and submitted to SLD 30 CEIEC within 24 hours of a hazardous materials spill or release.

#### 2.1.1.6 Coastal Zone Management

SLD 30 coordinated the Proposed Action with the CCC in compliance with the CZMA (see Section 1.3). The CCC concurred with DAF's Negative Determination (Appendix C).

## 2.1.1.7 <u>Solid Waste</u>

- Solid waste generated as part of the restoration activities would either be hauled to a municipal landfill (e.g., discarded personal protective equipment [PPE]) or disposed of as green waste to be composted (e.g., vegetation removed from the Proposed Action Area), if material is suitable for composting. Other possible waste, such as empty containers, would be recycled if possible.
- Debris shall be segregated to facilitate subsequent pollution prevention (P2) options. P2 options would be exercised in the following order: reuse of materials, recycling of materials, and then regulatory compliant disposal.
- All solid waste disposal and recycling tonnages would be tracked and reported to SLD 30 CEIEC on a quarterly basis during the project.

#### 2.1.1.8 <u>Transportation</u>

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

## 2.1.1.9 <u>Water Resources</u>

- Exposed soils will be permanently stabilized to prevent erosion.
- Only nonplastic, 100 percent biodegradable erosion control materials would be left in place following project completion.

- BMPs to prevent discharge of waste (construction materials, contaminants, washings, fuels, and oils) shall include the following measures:
  - a. Ensure all equipment is properly maintained and free of leaks during operation, and all necessary repairs carried out with proper spill containment.
  - b. Fueling of equipment would be conducted in a predesignated location at least 100 feet from the shoreline; spill containment materials would be placed around the equipment before refueling. Stationary equipment would be outfitted with drip pans and hydrocarbon-absorbent pads.
  - c. Hazardous materials would not be stored at Point Conception and would only be present at the site temporarily while workers are present. While on site, hazardous materials would be stored in proper containers secured within vehicles or vehicle beds with enclosed bed canopies.
  - d. Trash will be contained and regularly disposed of daily. Any trash that escapes from containers shall be collected immediately.
  - e. Portable toilets shall have secondary containment and be secured to prevent falling.
  - All herbicides would be handled, mixed, and applied in accordance with label instructions and California DPR requirements by workers holding valid QAC or QAL.

## 2.1.1.10 Human Health and Safety

- The restoration contractor(s) would comply with Occupational Safety and Health Administration (OSHA) and Air Force Occupational Safety and Health (AFOSH) regulations and other recognized standards and applicable DAF regulations or instructions.
- The restoration contractor(s) must also provide for the health and safety of workers and all subcontractors who may be exposed to their operations or services.
- Herbicides transported to the site will be stored, mixed, and applied in accordance with label instructions and DPR requirements by workers holding valid QACs or QALs.
- Workers will don appropriate PPE at all times while mixing and applying herbicides in accordance with label instruction and DPR requirements.
- During performance of work, the contractor(s) must comply with all provisions and procedures prescribed for the control and safety of personnel and visitors to the job site.

## 2.2 Alternatives to the Proposed Action

An alternative must be considered reasonable to warrant detailed evaluation in the EA. Reasonable alternatives include those that are practical or feasible from a technical and economic standpoint and use common sense, rather than simply being desirable from the standpoint of DAF. To be considered reasonable, an alternative must meet the purpose of and need for the action, be feasible and able to be implemented, and be suitable for consideration by decision makers. Guidance for complying with NEPA requires an assessment of potentially effective and reasonable alternatives for implementing the Proposed Action. An organized approach to evaluating alternatives can identify reasonable ways to achieve the Proposed Action's purpose and avoid unnecessary impacts.

The use of selection standards is an effective tool for identifying, comparing, and evaluating reasonable and feasible alternatives in NEPA documents (32 CFR § 989.8(c)). As such, SLD 30 developed the following selection standards to evaluate potential restoration alternatives at Point Conception:

- Alternatives must be effective and achieve the success criteria for target species following treatments. Effectiveness of restoration is a key component of the Point Conception Restoration Plan, and monitoring is included to gauge the overall effectiveness. To improve habitat for the federally listed Gaviota tarplant for ESA and Sikes Act requirements, SLD 30 needs to implement an effective habitat restoration program at Point Conception. SLD 30 would monitor to assess the effectiveness of nonnative plant control, native planting survivorship, and the Gaviota tarplant population to guide ongoing restoration efforts. Any alternatives that would obviously not achieve the restoration success criteria described in the Point Conception Restoration Plan would not be viable.
- Alternatives must meet the restoration timeline to complete restoration activities in a timely manner and move from restoration implementation to long-term management. Completing restoration activities in an orderly and timely manner ensures that native outplantings are properly conducted following the completion of nonnative plant removal and control activities, improving the likelihood of restoration success.
- Alternatives must allow for collaboration opportunities with TNC on adjacent nature preserve lands. Restoration is most successful when implemented at a large scale and in cooperation with other nearby land managers. TNC is implementing similar restoration activities at the Dangermond Preserve. Point Conception restoration activities should consider the benefits of collaboration to reduce the likelihood of future nonnative plant incursions into Point Conception and the opportunity to provide increased ecosystemwide resiliency.

The scope of this EA includes the implementation of the Point Conception Restoration Plan (MSRS 2022) and construction of a buck and rail fence along the Point Conception property boundary. Alternatives that adequately implement the plan as well as meet the project's purpose and need and selection standards are carried forward for detailed analysis.

Given the nature of the Proposed Action, the Point Conception Restoration Plan is not implementable at any location except Point Conception. Therefore, alternatives that would implement restoration activities at other locations would not meet the project's purpose and need and were not considered. Therefore, alternatives that included various timelines for implementation of habitat restoration activities at Point Conception were considered:

- <u>Alternative 1. Phased Restoration Approach</u> Under Alternative 1, SLD 30 would phase habitat restoration at Point Conception across geographically distinct Restoration Zones. SLD 30 would prioritize restoration areas based on available resources and phase in restoration activities as needed.
- <u>Alternative 2. Complete Restoration Approach</u> Under Alternative 2, SLD 30 would implement habitat restoration at Point Conception across the entire property simultaneously. There would be no phasing of restoration activities and no prioritization based on resource availability.
- <u>Alternative 3. Selective Restoration Approach</u> Under Alternative 3, SLD 30 would limit habitat restoration at Point Conception to select areas where restoration was deemed most critical, such as those areas that are currently supporting Gaviota tarplant. This would leave portions of Point Conception dominated by nonnative plant species but would focus potentially limited resources on areas determined to be most important for federally and state listed species.

## 2.3 Alternative Actions Eliminated from Further Consideration

Alternatives 2 and 3 were considered and eliminated from detailed consideration in this EA because they would not meet the purpose of and need for the action, the selection standards, or were not sufficiently different from Alternative 1 to be evaluated further.

Alternative 2 is not sufficiently different enough from Alternative 1, as the phased approach to the implementation of the Point Conception Restoration Plan would allow SLD 30 to implement restoration across all Restoration Zones simultaneously if resources were sufficient to support full implementation. However, Alternative 1 allows for temporal phasing of the restoration implementation to include all reasonable restoration variations up to a full simultaneous restoration of all zones as would be conducted by Alternative 2 (complete restoration), to multiyear phasing by priority Restoration Zones where resource availability (e.g., adequate water supply) is of concern.

Alternative 3 does not meet the selection standards. Only focusing on selective portions of Point Conception for habitat restoration implementation would not be effective as untreated areas would provide a source of nonnative plant species to migrate into treated areas. Subsequently, the desired control rate of target species following treatments would not be achieved. Further, this alternative would not provide the required collaboration with nearby land management efforts to control nonnative species and would not reduce the likelihood of future nonnative plant incursions into Dangermond Preserve where TNC restoration efforts are proceeding.

#### 2.4 Description of the Alternatives Considered for Detailed Analysis

NEPA and the CEQ regulations mandate the consideration of reasonable alternatives to the Proposed Action. "Reasonable alternatives" are those that meet the purpose of and need for the Proposed Action. One action alternative met the purpose and need for the Proposed Action,

satisfied the selection standards, and is carried forward for detailed analysis in this EA. The No Action Alternative provides a benchmark with which to compare potential impacts of the Proposed Action.

## 2.4.1 Alternative 1. Phased Restoration Approach

SLD 30 would complete restoration of Point Conception in three phases: 1) control of nonnative plant species, 2) outplanting of native plant species, and 3) monitoring of restoration activities. Approximately 11 acres of the 29.6-acre Point Conception property consists of developed areas, cliff faces, and rock-covered areas and would not be part of the restoration. Point Conception restoration activities are constrained by various factors that have been built into the design of the project. For example, SLD 30 must protect cultural resource sites and the aesthetics of the location. Further, native outplantings would require supplemental irrigation due to lack of consistent water supply at the site. To balance the various challenges, constraints, and goals, SLD 30 developed 10 Restoration Priority Zones to guide restoration efforts. Depending on resources available, SLD 30 would approach restoration starting sequentially in Restoration Priority Zones 1, which is the highest-priority zone, and proceed to the remaining Restoration Priority Zones in a phased approach (**Figure 2-2**).

If adequate resources are available, SLD 30 could choose to implement all of the Restoration Priority Zones simultaneously or choose to start with the highest-priority Restoration Zone 1 and complete restoration activities in lower-priority zones through Priority Zone 10 (the lowestpriority zone) as resources become available.



Figure 2-2. Priority Restoration Zones

## 2.4.1.1 Control of Nonnative Plant Species

To guide nonnative plant control efforts, the areas of mapped nonnative species are provided by restoration priority zone (**Table 2-1**). SLD 30 would control the following nonnative species under Alternative 1: Monterey cypress, red-hot poker (*Aloe maculata*), Australian saltbush (*Atriplex semibaccata*), pig's ear (*Cotyledon orbiculata*), century plant (*Agave americana*), veldt grass (*Ehrharta calycina*), and iceplant species (including crystalline iceplant [*Mesembryanthemum crystallinum*], coppery iceplant [*Malephora crocea*], and rosea iceplant [*Drosanthemum floribundum*]).

		Area of Infestation by Species (acres)								
Zone	Zone Area (acres)	Australian Saltbush	Century Plant	Crystalline Iceplant	lceplant Species	Pig's Ear	Red-Hot Poker	Rosea Iceplant	Veldt Grass	Total Area of Infestation (acres)
1	5.05	-	-	-	4.10	-	-	-	-	4.10
2	4.41	-	-	-	3.58	-	-	-	0.01	3.59
3	4.17	-	-	0.02	3.38	-	0.01	-	-	3.41
4	5.12	-	-	<0.01	4.16	-	-	-	-	4.16
5	5.13	-	-	0.12	4.16	-	-	-	0.04	4.32
6	1.16	0.01	-	0.01	0.94	-	-	0.87	-	1.83
7	2.16	-	<0.01	0.06	1.75	<0.01	0.1	-	-	1.91
8	1.17	-	-	0.05	0.95	-	0.01	0.28	-	1.29
9	1.06	<0.01	-	0.03	0.86	-	-	0.25	-	1.14
10	0.35	-	-	0.02	0.29	-	0.03	0.03	-	0.37
Total	29.79	0.01	<0.01	0.31	24.18	<0.01	0.15	1.43	0.05	26.13

Table 2-1. Infested Area of Nonnative Species by Restoration Zone

For large-scale nonnative plant infestations on flatter terrain, SLD 30 would use all-terrain vehicle (ATV)-mounted spray rigs for herbicide application. Access would be from either paved roads or over nonnative iceplant thatch so as not to disturb native mineral soils. For smaller-scale nonnative plant infestations, steeper terrain, and/or in areas with scattered inclusions of native plants, SLD 30 would use low-pressure backpack sprayers for herbicide applications.

In areas with densely mixed native and nonnative plants such as occupied Gaviota tarplant habitat or near the swale, SLD 30 would use ULV applicators, sponge applicators, or wick applicators allowing for quick application of concentrated product. This ensures a precisely targeted application to nonnative plants within a matrix of natives and minimizes the risk of drift. **Table 2-2** provides the treatments that SLD 30 would implement for nonnative species control at Point Conception.

Species	Treatment Recommendations						
Australian Saltbush	Chemical						
	ULV applicator: 100% glyphosate						
	Foliar low backpack sprayer: 2% glyphosate						
	Manual						
	Hand pull: if near native plants, hand pull in a "halo" to ensure no collateral damage						
Century Plant	<u>Chemical</u>						
	Cut stump: ground level, apply 10% imazapyr to main stem and removal all biomass						
Coppery Iceplant	<u>Chemical</u>						
	Foliar low backpack sprayer: 2% glyphosate / 1% imazapyr						
Crystalline Iceplant	Chemical						
	Foliar low backpack sprayer: 2% glyphosate; if near saltgrass: 1% triclopyr						
Iceplant Species	Chemical						
	ATV-mounted skid sprayer: for large infestation, 2% glyphosate/1% imazapyr mix and leave thatch in place						
	Foliar low backpack sprayer: 2% glyphosate/1% imazapyr mix and leave thatch in						
	place, if near swale habitat 1.5% glyphosate only						
	ULV applicator: 100% glyphosate near swale habitat						
Monterey Cypress	Small Seedlings/Saplings						
(escapees outside	<u>Chemical</u>						
extent)	Foliar low backpack sprayer: 2% glyphosate/1% imazapyr mix						
	Manual						
	Hand pull						
Pig's Ear	<u>Chemical</u>						
	Foliar low backpack sprayer: 2% glyphosate/1% imazapyr mix						
Red-Hot Poker	<u>Chemical</u>						
	Foliar low backpack sprayer: 2% glyphosate/1% imazapyr mix						
	<u>Manual</u>						
	Hand pull						
Rosea Iceplant	<u>Chemical</u>						
	ULV applicator: 100% glyphosate; may require a retreatment after 6 months						
	Foliar low backpack sprayer; 2% glyphosate						
	Manual						
	Hand pull; If near native plants, hand pull in a "halo" to ensure no collateral damage						
Veldt Grass	<u>Chemical</u>						
	Foliar low backpack sprayer: 2% glyphosate/1% imazapyr mix or 4% clethodim (two treatments: ~ February and ~ April)						

## Table 2-2. Treatment Recommendations for Nonnative Plant Species

ULV - ultra-low volume; ATV - all-terrain vehicle

## 2.4.1.2 Outplanting of Native Plant Species

Each Restoration Priority Zone may encompass multiple habitat types and associated objectives, thus requiring different plant species and numbers during the restoration phase. For instance, dune scrub is characterized by bare ground with plants widely spaced (6-feet on-center spacing), whereas salt spray scrub requires denser planting (3-feet on-center spacing) to retain soil and mimic natural distributions of the often rhizomatous or mat-forming species that typify that habitat type (**Table 2-3**).

Habitat Type Objective	Plants per Acre	On-Center Spacing
Coastal Bluff (leeward)	4,530	3.5 feet
Coastal Bluff (windward)	4,530	3.5 feet
Dune Scrub	1,541	6 feet
Low-Density Bluff Scrub	1,541	6 feet
Salt Spray Scrub	6,166	3 feet
Swale	3,468	4 feet

## Table 2-3. Outplanting Densities for Each Habitat Type Objective

SLD 30 evaluated the appropriate density and habitat type objectives to calculate the number of outplantings needed for each Restoration Zone. SLD 30 would plant an estimated total of 99,355 plants on 28.64 acres (**Table 2-4**). The habitat type objectives are discussed in detail in the Point Conception Restoration Plan (see Section 3.3 in **Appendix A**), including each species' palette and plant spacing requirements, though the total number of plants is defined by the priority Restoration Zone.

**Native Plant Collection.** SLD 30 would not use commercially available native seed for restoration at Point Conception. Source populations of native plants occur in sufficient quantity at or near Point Conception to collect enough seed to produce container plants, but they would not supply sufficient material for broadcast seeding. Therefore, SLD 30 would grow and install container plants for native plant restoration. Although container plants require additional maintenance, such as supplemental irrigation and weeding, they tend to result in greater success in establishing self-sustaining shrubs than broadcast seeding.

SLD 30 would collect propagule material in late summer or early fall, depending on the phenology of each species, from Point Conception or the adjacent Dangermond Preserve, if necessary, in cooperation with TNC. SLD 30 would collect enough material to propagate the total number of plants for each restoration priority zone to be planted (**Table 2-3**) and in the proper proportions according to Tables 3-4 through 3-9 in the Point Conception Restoration Plan (**Appendix A**). SLD 30 would propagate seedlings in 2-inch to 4-inch containers. SLD 30 would install seedlings during the rainy season, ideally after soils have saturated and more rain is forecasted, generally January through March. SLD 30 may install plants later, if given supplemental watering.
Zone	Habitat Restoration Objective	Area (acres)	Number of Outplantings
	Coastal Bluff (leeward)	<0.01	2
1	Dune Scrub	4.92	7,578
	Swale	0.13	465
	Total	5.05	8,046
	Coastal Bluff (leeward)	0.82	3,700
2	Dune Scrub	3.19	4,923
2	Low-Density Bluff Scrub	0.39	609
	Total	4.41	9,232
	Coastal Bluff (leeward)	1.77	8,005
	Coastal Bluff (windward)	0.57	2,585
3	Dune Scrub	1.77	2,724
	Salt Spray Scrub	0.06	365
	Total	4.16	13,679
	Coastal Bluff (leeward)	4.26	19,286
4	Dune Scrub	0.48	742
4	Low-Density Bluff Scrub	0.12	182
	Total	4.86	20,210
	Coastal Bluff (leeward)	2.26	10,254
5	Coastal Bluff (windward)	0.44	1,999
	Dune Scrub	1.54	2,367
	Salt Spray Scrub	0.67	4,107
	Total	4.91	18,727
0	Salt Spray Scrub	1.06	6,505
6	Total	1.06	6,505
	Coastal Bluff (leeward)	0.16	706
7	Coastal Bluff (windward)	1.39	6,300
(	Salt Spray Scrub	0.17	1,071
	Total	1.72	8,076
	Coastal Bluff (windward)	0.01	66
8	Salt Spray Scrub	1.13	6,979
	Total	1.15	7,044
9	Salt Spray Scrub	1.02	6,258
	Total	1.02	6,258
	Coastal Bluff (leeward)	0.15	659
10	Coastal Bluff (windward)	0.07	328
	Salt Spray Scrub	0.10	590
	Total	0.31	1,578
	Grand Total	28.64*	99.355

# Table 2-4. Outplantings Required for Each Zone by Habitat Type Objective

\* Acreage only includes plantable areas. Cliff faces and developed areas are not included.

**Planting Basin Creation and Outplanting Installation.** Outplanting basins serve to retain irrigation and rainwater around native plantings, thereby increasing the chance of successful installation. SLD 30 proposes several methods for basin creation, which would vary depending on the terrain in each Restoration Priority Zone. In all instances, SLD 30 would use previously treated and desiccated iceplant thatch as "mulch" around native outplantings to increase the success of outplanting survival, rather than importing off-site mulch materials. SLD 30 would create most basins directly in desiccated iceplant thatch.

- **Hand Tools.** In compact soil locations or on steep slopes, SLD 30 would use hand trowels, hoes, or pick mattocks to make 2-inch-deep basins for each planted plant. SLD 30 would install outplantings using a dibbler (a flat-tipped tool with a long handle used to create small holes for seeds or seedlings) to minimize disturbance of native soil.
- **Earth Auger**. Where there is level ground and uncompacted soil, SLD 30 would create basins for container plants using an earth auger with a modified drill bit that digs a 4-inch-deep planting hole while simultaneously creating a 17.5-inch-diameter and 2-inch-deep basin. The mechanized and simultaneous creation of both holes and basins enables rapid installation of a large numbers of container plants in a short period; however, this method is not suitable on slopes or in highly compacted soils.
- Light-Duty Excavator. Following the first year of iceplant treatments and/or once iceplant thatch has desiccated sufficiently, SLD 30 could use a light-duty excavator to excavate outplanting basins just through the organics layer (i.e., iceplant thatch) to the surface of mineral soils. However, native mineral soils would not be disturbed. Once all basins have been created by the light-duty excavator in the Restoration Priority Zone, SLD 30 would install outplantings utilizing a dibbler so as not to disturb mineral soils. SLD 30 would drive only light-duty excavators on treated iceplant thatch/organics layers and never directly on mineral soils.

Following any of these basin creation methods (e.g., hand tools, earth auger, light-duty excavator), as the holes are created, SLD 30 would remove plants from their containers and place them into the holes. SLD 30 would then backfill holes with a native soil by hand. If irrigation has not yet been installed, SLD 30 would apply approximately 0.25 to 0.5 gallon of water to each plant to provide supplemental moisture and ensure good contact between the roots and soil.

**Supplemental Watering.** Point Conception is not serviced by a municipal water source. SLD 30 would choose some combination of the following supplemental watering options dependent on conditions and resource availability: water tanks/irrigation lines, water trailer, fog-capturing system, and/or passive condensation harvesting.

SLD 30 could place one or more water tanks at the existing concrete/asphalt pad at or near the highest point on the site (**Figure 2-3**). SLD 30 would connect the tank(s) to aboveground irrigation lines providing water to outplantings through drip lines. SLD 30 would routinely fill the tank(s) from a water truck, approximately once every two weeks spring through fall during active

restoration activities. SLD 30 could also supplement watering by the use of a water trailer with an automatic shutoff valve. The advantage of using a water trailer would be that it could be moved around the site, would require less irrigation line, and could be removed when not in use. Much of the property can be fed by gravity, but some areas on the eastern portion may need to be assisted by small solar-powered pumps.

Fog-capturing could be used to supplement watering. Fog-capturing devices have variable designs, but generally work by condensing fog on loosely woven fabric and allowing it to drip directly onto a plant's root zone. If SLD 30 implements a fog-capturing water system, SLD 30 would first install an experimental array of fog-capture devices to test the efficacy of this method for the site, determine whether enough fog is available to provide useful irrigation, and determine the distribution of suitable sites for placement. After SLD 30 analyzes test array results, individual fog collectors could be used to provide supplemental water to outplantings in suitable areas during subsequent years of restoration effort. SLD 30 would position each device to water one or two plants and move to new plantings each year.

Passive condensation harvesting could be used as a supplemental water source, particularly in windward aspects. Metal conduit poles can act as a "catch" to water vapor in the air. Once in contact with the pole, water vapor condenses along the length of the pole, allowing water to drip into the root zone of outplantings. This is an effective and low-effort way to provide consistent watering to outplantings. However, SLD 30 would first implement a small experimental design to determine the locations throughout Point Conception that are most effectively harvesting condensation and ultimately the total number of poles to be installed to support outplantings.

# 2.4.1.3 <u>Restoration Monitoring</u>

SLD 30's goal for each restoration zone is an 80 percent control rate of the target species after the first year of treatment as described in the Point Conception Restoration Plan (**Appendix A**). SLD 30 would conduct follow-up treatments and installation of outplantings to ensure each zone is at greater than 90 percent control of the target nonnative plants by the third year of treatments and at least a 95 percent control by the fifth year.

Through the control of the target invasive species and provision of supplemental irrigation, 75 percent survival of outplantings would be expected one year after planting. If this criterion is not achieved, SLD 30 would perform an evaluation of factors that may have affected survival. These include species-specific survival, locations and distribution of dead plants, and irrigation, among other potential factors. SLD 30 would install replacement outplantings in the second year and would implement corrective actions based on this evaluation. Corrective actions could include installation of species that had greater survival success, changing the species palette if certain locations had particularly poor survival, or changing the irrigation regime to improve survivorship.



Figure 2-3. Proposed Water Tank Location at Point Conception

By the fifth year of restoration efforts within each Restoration Zone (with the exception of late phases in Zones 8 and 9), the outplantings should be self-sustaining without irrigation, showing signs of growth and reproduction and increasing cover.

**Restoration Timeline.** The Restoration Plan would be implemented over five years to fully restore all the Restoration Priority Zones. Based on available resources, restoration efforts may proceed in a single zone, multiple zones concurrently, or in a staged approach where different zones are in different stages of restoration. After the initial five years of restoration, maintenance of each zone would be ongoing and include control of nonnative species (new and previously identified) and seeding, propagating, and planting native plants as needed following the methods presented in the Point Conception Restoration Plan.

## 2.4.2 No Action Alternative

Under the No Action Alternative, the Point Conception Restoration Plan would not be implemented. There would be no nonnative plant removal and control and no native outplantings at the Point Conception property. SLD 30's management of Point Conception would not be consistent with the requirements of the Sikes Act. Further, SLD 30 would not contribute to the regional habitat restoration efforts being implemented on adjacent properties, including those by TNC. The No Action Alternative would not meet the project's purpose and need but is being carried forward as the analysis of the No Action Alternative provides a benchmark, enabling decision makers to compare the magnitude of the potential environmental effects of the Proposed Action. Further, NEPA requires an EA to analyze the No Action Alternative.

# 2.5 Identification of the Preferred Alternative

DAF has identified Alternative 1 as the Preferred Alternative. Alternative 1 fully implements the Point Conception Restoration Plan (**Appendix A**), provides maximum flexibility for SLD 30 to achieve the restoration goals and objectives with the resources available, and meets the project's purpose and need.

# 2.6 Summary of Potential Environmental Consequences

**Table 2-5** summarizes the impact characterizations from the Preferred Alternative and the No Action Alternative. The information is based on Chapter 3 (Environmental Consequences) of this EA and includes a concise definition of the issues addressed and the potential environmental impacts associated with each alternative.

Resource	Alternative 1	No Action Alternative
Land Use and Coastal Zone Management	There would be short-term minor adverse impacts from temporary irrigation installation and vegetation removal and long-term beneficial impacts from the restoration of native habitats on land use from the proposed restoration activities. There would be no recreation impacts under Alternative 1. The DAF prepared a Negative Determination, and the CCC concurred with a Negative Determination on 8 August 2023.	There would be no impacts on the designated land use or recreation under the No Action Alternative.
Human Health and Safety	There would be minor adverse impacts on human health and safety from potential exposure of workers to hazards associated with restoration activities. Due to the implementation of EPMs, awareness training for workers, and safe handling practices for herbicides, impacts would be minimized.	The No Action Alternative would have no impacts on human health and safety as no restoration activities would be implemented at Point Conception.
Air Quality	Impacts on air quality from activities related to the Point Conception habitat restoration would be generated primarily from the combustive emissions of fossil- fuel-powered equipment and fugitive dust emissions from the operation of equipment on exposed soil. Emissions were calculated using the Air Force's ACAM. The emissions would be below the applicable <i>de minimis</i> levels.	No impacts on air quality would occur under the No Action Alternative as no emissions would occur.
Earth Resources	Water lines for supplemental irrigation and the disturbance of soil for water basins around plantings would have minor short- term adverse impacts on soils at Point Conception. There would be no impacts on restoration activities from seismic events. There would be no impact on geologic resources under Alternative 1.	There would be a long-term minor adverse impact on soils under the No Action Alternative from increased soil salinity under iceplant and continued soil erosion. There would be no impacts on nonnative plant species from seismic events. There would be no impact on geologic resources under the No Action Alternative.
Water Resources	Erosion and the application of herbicides would impact surface waters of the project area and cause minor adverse short-term impacts on water resources under Alternative 1. There would be no impact on groundwater quality or quantity under Alternative 1.	Under the No Action Alternative, no herbicides or soil disturbance would occur. Water resources would remain the same as the existing conditions for Point Conception. Therefore, there would be no impact on water resources under the No Action Alternative.

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Resource	Alternative 1	No Action Alternative
Biological Resources	Alternative 1 would increase native plant cover and diversity and reestablish native vegetation communities, having beneficial effects on vegetation communities. There would be short-term minor adverse impacts on wildlife, including migratory birds, from noise, human disturbance, and herbicide use during restoration activities. However, following restoration activities, native habitat for wildlife would be improved, providing long-term beneficial impacts on wildlife. There is the potential for proposed project activities to adversely impact Gaviota tarplant in the short term, but they would provide a long-term beneficial impact on the Gaviota tarplant population and designated critical habitat. EPMs would greatly reduce impacts on all biological resources. The DAF initiated informal section 7 consultation with the USFWS. The USFWS completed the consultation and on 4 April 2023 issued a Biological Opinion.	The No Action Alternative would have no direct impacts on biological resources. However, under the No Action Alternative, nonnative habitats would continue to dominate the site and degrade native habitat, causing long-term adverse impacts on native populations and the likely loss of biological diversity and resources in the Proposed Action Area.
Cultural Resources	Alternative 1 would result in a favorable effect regarding the integrity of setting and feeling of the historical built-environment resources at Point Conception Light Station. The California SHPO concurred with SLD 30's finding that the undertaking will have no adverse effect on the significant qualities of the Point Conception Light Station Historic District, any of the individual contributing elements of the District, or any of the 12 prehistoric archaeological sites on the property. The SYBCI requested a tribal monitor be present during the implementation of the Proposed Action. The SYBCI Tribal Elders' Council requested formal consultation between the ITLO and the Tribe's archaeologist, Dr. Wendy Teeter.	Under the No Action Alternative, there would be long-term adverse effects on prehistoric archaeological sites eligible for the NRHP as iceplant can destabilize coastal soils and potentially damage archaeological sites.

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Resource	Alternative 1	No Action Alternative
Hazardous Materials and Wastes, ERP, and Toxic Substances	Using hazardous materials during the Proposed Action implementation under Alternative 1 would be limited to herbicide application and equipment maintenance (e.g., petroleum, oils, and lubricants). Accidental petroleum, oils and lubricants releases from vehicles and equipment leaks would generate hazardous wastes, resulting in potential adverse impacts on the Proposed Action Area. However, with adherence to existing policies and procedures as outlined in the applicable federal, state, and local regulations, as well as the EPMs, impacts from using hazardous materials and generating hazardous wastes associated with Alternative 1 would not be significant.	Under the No Action Alternative, Alternative 1 would not be implemented. As no additional impacts would be associated with the No Action Alternative, the No Action Alternative would have no impacts on hazardous materials and waste management.

**DAF** – Department of the Air Force; **CCC** – California Coastal Commission; **EPM** – environmental protection measure; **ACAM** – Air Conformity Applicability Model; **USFWS** – United States Fish and Wildlife Service; **SHPO** – State Historic Preservation Officer; **SLD** – Space Launch Delta; **SYBCI** – Santa Ynez Band of Chumash Indians; **ITLO** – Installation Tribal Liaison Officer; **NRHP** – National Register of Historic Places

#### 3.0 AFFECTED ENVIRONMENT

This chapter describes the existing environment for the Proposed Action Area. In this section, each resource is defined, and the geographic scope is identified. The expected geographic scope of potential consequences is referred to as the region of influence (ROI). The ROI boundaries varies depending on the nature of each resource (**Table 3-1**). For example, the ROI for some resources, such as air quality, extends over a larger jurisdiction unique to the resource. For some resources, the Proposed Action Area is limited to Point Conception.

Resource	Region of Influence	
Land Use and Coastal Zone Management	Point Conception	
Human Health and Safety	Point Conception and areas on Vandenberg SFB where pesticides may be stored or mixed	
Air Quality	Santa Barbara County Air Pollution Control District	
Earth Resources	Point Conception	
Water Resources	Point Conception	
Biological Resources	Point Conception	
Cultural Resources	Point Conception	
Hazardous Materials and Wastes, ERP, and Toxic Substances	Point Conception	

Table 3-1. Region of Influence for the Proposed Action by Resource

SFB – Space Force Base; ERP – Environmental Restoration Program

Resource areas not carried forward for detailed analysis include airspace management; noise; socioeconomics; environmental justice; infrastructure, transportation, and utilities; and solid waste. The following describe the justifications for not including more detailed analyses of these resources.

**Airspace Management.** The Proposed Action would not occur or alter in any way special use airspace or potentially impact the National Airspace System.

**Noise.** Noise generated by the Proposed Action would be temporary and primarily from periodic use of vehicles for egress and ingress to the Point Conception project area. No heavy equipment would be used that could generate unacceptable noise levels. Further, there are no sensitive noise receptors at or proximate to Point Conception.

**Socioeconomics.** Nonnative plant species control and habitat restoration activities under the Proposed Action would have no substantial impacts on the labor force, housing, or economic output of Santa Barbara County, California.

**Environmental Justice.** The Proposed Action would not include activities that could disproportionately impact minority, low-income, youth, or elderly populations. Further, none of these populations is located proximate to the Proposed Action Area.

**Infrastructure, Transportation, and Utilities.** Under the Proposed Action, there would be no use of or modification to existing infrastructure, transportation corridors, or utilities.

**Solid Waste.** Solid waste generated from the implementation of the Proposed Action would be disposed of properly. EPMs described in **Section 2.1.1.7** would ensure that there would be no impacts from solid waste generation or disposal.

# 3.1 Land Use and Coastal Zone Management

## 3.1.1 Definition of the Resource

The term "land use" refers to real property classifications that indicate either natural conditions or the types of human activities occurring on a defined parcel of land. In many cases, land use descriptions are codified in local zoning laws. Land use planning ensures orderly growth and compatibility between nearby property parcels or land areas.

Recreational resources are often considered as part of land use. Recreational resources include federal, state, and local parks, trails, scenic areas, beaches, indoor and outdoor community recreation centers, and playgrounds. Recreation areas are primarily limited to running and bicycle trails, ballfields, swimming pools, bowling alleys, theatres, playgrounds for children, and gymnasium facilities.

The CCC manages development along the California coast, except for San Francisco Bay. Point Conception is owned and operated by the federal government. As defined in section 304 of the California Coastal Act of 1976 (CCA), 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." However, the DAF 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 CZMA and the enforceable policies of the California Coastal Management Program (CCMP) found in Chapter 3 of the CCA.

## 3.1.2 Existing Conditions

The Santa Barbara County Land Use and Zoning Map (Santa Barbara County 2022) has a Recreation/Open Space Land Use Designation for Point Conception with a Land Use Class of Open Land Uses and the Land Use Type listed as Recreation. The Recreation/Open Space Land Use Designation includes public parks, flood control easements providing access to stream channels, and golf courses (Santa Barbara County 2022). According to the Santa Barbara County Comprehensive Plan Land Use Element (Santa Barbara County 2016), the Proposed Recreation Overlay designation "identifies those lands suitable for future inclusions within the recreational designation defined above. These lands include the following: lands selected by the County Park Department from those sites designated as having the highest suitability for recreational use; areas designated by advisory committees; shoreline areas designated within the County coastal zone; and additional access along creeks and drainage ways."

Most of Point Conception is undeveloped with 37.7 acres of stabilized dunes and cliffs making up the project area. One of the few structures in this area is the Point Conception lighthouse, which has been in operation since 1856. Point Conception also currently supports operations at Vandenberg SFB by hosting a weather station, ocean surface monitoring functions, and communications relay stations (Vandenberg SFB 2021). SLD 30 coordinates with TNC to use roads on the Dangermond Preserve to access Point Conception's roads. An old fence runs along the boundary of Point Conception and Dangermond Preserve. Access by the public to Point Conception for recreational activities is not permitted.

# 3.1.2.1 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 CCMP was formed through the CCA of 1972. SLD 30 is responsible for making final Coastal Zone Consistency Determinations or Negative Determinations for its activities within the state coastal zone or having effects on it. The CCC reviews federally authorized projects for consistency with the CCMP.

As defined in section 304(1) of the CCA, "however, for all purposes, including consistency reviews, arising under the CZMA, section 304(1) excludes from the coastal zone all lands held in trust by or whose uses are subject solely to the discretion of the federal government. Notwithstanding this exclusion, if activities on excluded lands affect land or water uses or natural resources of the coastal zone, they must be reviewed for consistency with the CCMP." Although the Proposed Action does not occur directly within the coastal zone, it may potentially affect resources within the coastal zone; therefore, a Consistency Determination or Negative Determination is required for the Proposed Action. The CCC reviews federally authorized projects for consistency with the CCMP, and either concurs with a Consistency Determination or Negative Determination finding or does not. Applicable CCA policies include:

- Providing for maximum public access to the coast
- Protecting marine and land resources, including environmentally sensitive habitat areas, such as wetlands, riparian corridors and creeks, rare and endangered species habitat, and marine habitat, such as tide pools
- Protecting the scenic beauty of the coastal landscape
- Maintaining productive coastal agricultural lands
- Recreational boating use

## 3.2 Human Health and Safety

## 3.2.1 Definition of the Resource

A safe environment is necessary to prevent or reduce the potential for death, serious injury or illness, or property damage. Safety and human health issues address workers safety while performing daily work duties. Human health and safety for the purposes of this analysis are

defined as occupational hazards associated with the operation of hand tools, motorized equipment, and herbicide application.

The OSHA program purpose is to protect personnel from occupational deaths, injuries, or illnesses. OSHA safety guidance published in the Department of Labor 29 series CFR governs general safety requirements relating to general industry practices (section 1910).

Air Force Instruction (AFI) 91-202, *Air Force Mishap Prevention Program (AFMPP),* and AFI 91-203, *Air Force Consolidated Occupational Safety Instruction*, implement Air Force Policy Directive 91-2, *Safety Programs*. AFI 91-202 establishes mishap prevention program requirements, assigns responsibilities for program elements, and contains program management information. The purpose of the AFMPP is to minimize loss of DAF resources and to protect DAF personnel from occupational deaths, injuries, or occupational Safety and Health standards and off duty. AFI 91-203 consolidates all DAF Occupational Safety and Health standards and defines the DAF's minimum safety, fire protection, and occupational health standards and assigns responsibilities to individuals or functions to help Commanders manage their safety and health programs to ensure they comply with OSHA and DAF guidance. These instructions apply to all DAF activities.

The DPR's mission is to protect human health and the environment by regulating pesticide sales and use, and by fostering reduced-risk pest management. DPR evaluates and registers pesticide products (which include herbicides) before sale or use in California by performing comprehensive assessments of pesticide risks to all populations from exposure via air, water, and food, and in the home and workplace. DPR determines best practices to ensure a safe pesticide workplace and provides a statewide licensing process for pesticide businesses, applicators, and other pesticide professionals to ensure they are adequately trained to use pesticides safely. This includes a program to issue QAC and QAL to applicators who have demonstrated knowledge and competence in pesticide laws and regulations, safe storage and mixing practices, PPE, and application methods. SLD 30 requires all personnel applying herbicides on DoD lands to hold a valid QAC or QAL.

## 3.2.2 Existing Conditions

Human health and safety resources includes all areas where activities associated with the Proposed Action may impact human health and safety. This includes the Point Conception property and areas on Vandenberg SFB where pesticides may be stored or mixed. All activities on Vandenberg SFB are subject to the requirements of the federal OSHA, AFOSH, and California Division of Occupational Safety and Health (Cal/OSHA) regulations and procedures.

The affected environment for human health and safety includes all established regulations to minimize or eliminate potential risk to the general public and personnel involved in the proposed project. The Proposed Action would involve habitat restoration activities and invasive weed control where workers could potentially be exposed to conditions that could adversely impact their health and safety.

# 3.3 Air Quality

## 3.3.1 Definition of the Resource

Air quality is defined by ambient air concentrations of specific pollutants determined by the US Environmental Protection Agency (USEPA) to be of concern with respect to the health and welfare of the general public, vegetation, and property. The six major pollutants of concern, called "criteria pollutants," are carbon monoxide (CO), sulfur dioxide (SO<sub>2</sub>), nitrogen dioxide (NO<sub>2</sub>), ozone (O<sub>3</sub>), suspended and fine particulate matter (particulate matter less than 10 micrometers [PM<sub>10</sub>] and particulate matter less than 2.5 micrometers [PM<sub>2.5</sub>]), and lead (Pb). The USEPA has established National Ambient Air Quality Standards for these pollutants (**Table 3-2**). Areas that exceed a federal air quality standard are designated as nonattainment areas. Nonattainment areas for some criteria pollutants are further classified, depending upon the severity of their air quality problem, to facilitate their management:

- O<sub>3</sub> marginal, moderate, serious, severe, and extreme
- CO moderate and serious
- Particulate matter moderate and serious

Ambient air quality refers to the atmospheric concentration of a specific compound (i.e., 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 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<sub>2</sub>, Pb, and some particulates, are emitted directly into the atmosphere from emission sources. Secondary pollutants, such as O<sub>3</sub>, NO<sub>2</sub>, and some particulates, are formed through atmospheric chemical reactions that are influenced by meteorology, ultraviolet light, and other atmospheric processes. PM<sub>10</sub> and PM<sub>2.5</sub> are generated as primary pollutants by various mechanical processes (for example, abrasion, erosion, mixing, or atomization) or combustion processes. However, PM<sub>10</sub> and PM<sub>2.5</sub> 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 and oxides of nitrogen [NO<sub>x</sub>], which are considered precursors for O<sub>3</sub>) are the pollutants for which emissions are evaluated to control the level of O<sub>3</sub> in the ambient air.

Pollutant		N	AAQS <sup>1</sup>	CAAQS <sup>2</sup>	
Pollulani	Averaging Time	Primary <sup>3</sup>	Secondary <sup>4</sup>	Concentration <sup>5</sup>	
0.	1 hour	-	-	0.09 ppm	
03	8 hours	0.070 ppm	Same as primary	0.070 ppm	
Respirable	24 hours	150 µg/m³	Same as primary	50 μg/m³	
Particulate Matter	Annual arithmetic	-	-	20 µg/m <sup>3</sup>	
(PM <sub>10</sub> )	mean				
Fine Particulate	24 hours	35 µg/m³	Same as primary	-	
Matter (PM <sub>2.5</sub> )	Annual arithmetic average	12 µg/m <sup>3</sup>	15 µg/m³	12 μg/m³	
<u> </u>	1 hour	35 ppm	-	20 ppm	
00	8 hours	9 ppm	-	9 ppm	
	1 hour	100 ppb	-	0.18 ppm	
NO <sub>2</sub>	Annual arithmetic	52 nnh	Samo as primary	0.030 ppm	
	average	33 hhn	Same as primary		
SO <sub>2</sub>	1 hour	75 ppb	-	0.25 ppm	
302	24 hours	-		0.04 ppm	
	30-day average	-	-	0.15 μg/m <sup>3</sup>	
Pb	Rolling 3-month	0.15 µg/m <sup>3</sup>	Same as primary	_	
	average	orro p.g			
Hydrogen Sulfide	1-hour			0.03 ppm	
(HS)				(42 µg/m <sup>3</sup> )	
Sulfates (SO <sub>4</sub> )	24-hour			25 μg/m <sup>3</sup>	
	8-hour			In sufficient amount to produce	
Visibility Reducing	(10 am to 6 pm.	No federal star	ndards	an extinction coefficient of 0.23	
Particles	Pacific Standard			per kilometer due to particles	
	Time)			when the relative humidity is	
	, ,	4		less than 70 percent.	
Vinyl chloride <sup>6</sup>	24-hour			0.01 ppm (26 µg/m³)	

Table 3-2. Ambient Air Quality Standards

<sup>1</sup> NAAQS (other than O<sub>3</sub>, particulate matter, and those based on annual averages or annual arithmetic mean) are not to be exceeded more than once a year. The O<sub>3</sub> 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<sub>10</sub>, 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<sub>2.5</sub>, 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.

<sup>2</sup> California Ambient Air Quality Standards for O<sub>3</sub>, CO (except Lake Tahoe), SO<sub>2</sub> (1- and 24-hour), NO<sub>2</sub>, PM<sub>10</sub>, and visibility reducing particles, are values that are not to be exceeded. All others are not to be equaled or exceeded.

- <sup>3</sup> National Primary Standards: The levels of air quality necessary, with an adequate margin of safety, to protect the public health.
- <sup>4</sup> National Secondary Standards: The levels of air quality necessary to protect the public welfare from any known or anticipated adverse effects of a pollutant.
- <sup>5</sup> Concentration expressed first in the units in which it was promulgated. Ppm in this table refers to ppm by volume or micromoles of pollutant per mole of gas.
- <sup>6</sup> The California Air Resources Board 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. Source: California Air Resources Board 2016

**NAAQS** – National Ambient Air Quality Standards; **CAAQS** – California Ambient Air Quality Standards; **O**<sub>3</sub> – ozone, **ppm** – parts per million; **PM**<sub>10</sub> – suspended particulate matter less than or equal to 10 micrometers in diameter; **µg/m**<sup>3</sup> – micrograms per cubic meter; **PM**<sub>2.5</sub> – fine particulate matter less than or equal to 2.5 micrometers in diameter; **CO** – carbon monoxide; **NO**<sub>2</sub> – nitrogen dioxide; **ppb** – parts per billion; **SO**<sub>2</sub> – sulfur dioxide; **Pb** – lead; **HS** – hydrogen sulfide; **SO**<sub>4</sub> – sulfates

The State of California has identified four additional pollutants for ambient air quality standards: visibility-reducing particles, sulfates, hydrogen sulfide, and vinyl chloride. The California Air Resources Board has also established the more stringent California Ambient Air Quality Standards. Areas within California in which ambient air concentrations of a pollutant are higher than the state or federal standard are considered to be nonattainment for that pollutant. **Table 3-2** 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, 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 GHGs, analogous to a greenhouse. GHGs are emitted by both natural processes and human activities. State law defines GHGs as any of the following compounds: carbon dioxide (CO<sub>2</sub>), methane, nitrous oxide, hydrofluorocarbons (HFCs), perfluorocarbons, and sulfur hexafluoride (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 "measure of the total energy that a gas absorbs over a particular period of time (usually 100 years), compared to carbon dioxide" (USEPA 2017).

# 3.3.2 Existing Conditions

Vandenberg SFB, including Point Conception, 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 semipermanent high-pressure zone of the Eastern Pacific Region. The coast 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 14.7 inches annually. The mean temperature in the Vandenberg SFB area, as reported by monitors in Lompoc, is 58.3 degrees Fahrenheit and the mean maximum and mean minimum temperatures are 69.6 degrees Fahrenheit and 47.0 degrees Fahrenheit, respectively (Western Regional Climatic Center 2016).

Santa Barbara County is attainment/unclassified for all federal ambient air quality standards, including the 2015 revision to the federal 8-hour  $O_3$  standard. With regard to California ambient air quality standards, Santa Barbara County is nonattainment/transitional for  $O_3$  and nonattainment for PM<sub>10</sub>.

#### 3.4 Earth Resources

#### 3.4.1 Definition of the Resource

Earth resources are defined as the physiography, topography, geology, and soils of a given area. Physiography and topography pertain to the general shape and arrangement of a land surface, including its height and the position of its natural and human-made features. Geology is the study of the Earth's composition and provides information on the structure and configuration of surface and subsurface features. Such information derives from field analysis based on observations of the surface and borings to identify subsurface composition. Soils are the unconsolidated materials overlying bedrock or other parent material. Soils typically are described in terms of their complex type, slope, and physical characteristics. Differences among soil types in terms of their structure, elasticity, strength, shrink-swell potential, and erosion potential affect their abilities to support certain applications or uses. In appropriate cases, soil properties must be examined for their compatibility with particular construction activities or types of land use.

#### 3.4.2 Existing Conditions

#### 3.4.2.1 Geology and Soils

Point Conception is in the westernmost part of the Western Transverse Ranges geologic province, which is north of the California Continental Borderland. The topography of the property is mirrored in the soil characteristics, with gentle slopes found in the dune areas to the northeast and extremely steep cliff faces and slopes found along the perimeter of the headland.

Concepcion soils, which occur across most of Point Conception, are on nearly level to steep terraces adjacent to and within 1 to 2 miles of the Pacific Ocean with slopes of 0 to 50 percent and elevations of 40 to 200 feet (Natural Resources Conservation Service 1997). The soils formed on weakly consolidated stratified alluvium or wind-deposited sandy material blown form nearby beaches. The soils are moderately well drained, have slow to very rapid runoff, and have very slow permeability. The periphery of the Point Conception headland is dominated by unvegetated cliff edges, totaling approximately 6.25 acres. This area contains pockets of soil that are occasionally colonized by weedy annual species. However, the area is dominated by bedrock exposed to salt spray and is therefore devoid of vegetation.

#### 3.4.2.2 <u>Seismicity</u>

The Santa Barbara County region is seismically active, with a major earthquake occurring in the region about every 15 to 20 years (US Air Force 1987). Point Conception is approximately 4 miles south of the Santa Ynez fault zone. It is a well-constrained fault with a slip rate of less than 0.2 millimeter per year. The Santa Ynez fault is an east-west structure located along the north side of the Santa Ynez and Topatopa Ranges and is largely responsible for the uplift of these ranges. The total fault length is 92 miles (Treiman 2000).

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 within or proximate to Point Conception.

#### 3.5 Water Resources

#### 3.5.1 Definition of the Resource

Water resources include surface waters, groundwater, and floodplains. Surface waters include all lakes, ponds, rivers, streams, impoundments, and wetlands within a defined area or watershed. Wetlands are transitional areas between terrestrial and aquatic systems with land covered by shallow surface water. Groundwater resources include water contained in soils, permeable and porous rock, or unconsolidated substrate. Floodplains are areas that are flooded periodically by the lateral overflow of surface water bodies.

Surface waters, as defined in 33 CFR § 328.3, are regulated under sections 401 and 404 of the Clean Water Act (CWA) and section 10 of the Rivers and Harbors Act. The CWA (33 USC § 1251 et seq.) regulates discharges of pollutants in surface waters of the US. Section 404 of the CWA establishes a program to regulate the discharge of dredged and fill material into waters of the US, including wetlands. The US Army Corps of Engineers defines wetlands as "those areas that are inundated or saturated with ground or surface water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted to life in saturated soil conditions" (Environmental Laboratory 1987). Wetlands generally include swamps, marshes, bogs, and similar areas (33 CFR Part 328). Federal protection of wetlands is also promulgated under EO 11990, *Protection of Wetlands,* the purpose of which is to reduce adverse impacts associated with the destruction or modification of wetlands. This order directs federal agencies to provide leadership in minimizing the destruction, loss, or degradation of wetlands.

The CWA provides the authority to establish water quality standards, control discharges into surface and subsurface waters (including groundwater), develop waste treatment management plans and practices, and issue permits for discharges. A National Pollutant Discharge Elimination System (NPDES) permit under section 402 of the CWA is required for discharges into surface waters. The USEPA oversees the issuance of NPDES permits at federal facilities as well as water quality regulations (section 401 of the CWA) for both surface and groundwater within states.

The Central Coast Regional Water Quality Control Board (CCRWQCB) is the local agency responsible for Point Conception. The CCRWQCB regulates surface water bodies primarily by adoption of its region-specific Water Quality Control Plan (Basin Plan) (CCRWQCB 2019). The Basin Plan incorporates State Water Resources Control Board plans and policies and contains a strategy for maintaining or achieving the highest water quality possible for the region's surface water and groundwater resources. The Basin Plan antidegradation policy states "wherever the existing quality of water is better than the quality of water established herein as objectives, such

existing quality shall be maintained unless otherwise provided by the provisions of the State Water Resources Control Board Resolution No. 68-16" (CCRWQCB 2019).

The Water Quality Control Plan for Ocean Waters of California (Ocean Plan) controls the discharge of waste to the ocean to prevent degradation of marine communities or threats to public health. It establishes beneficial uses and water quality objectives for the protection of ocean waters. The Ocean Plan and the Water Quality Control Plan for Inland Surface Waters, Enclosed Bays, and Estuaries of California were amended in 2015 to prohibit the discharge of trash.

Groundwater is water that occurs in the saturated zone beneath the earth's surface and includes underground streams and aquifers. It is an essential resource that functions to recharge surface water and can be used for drinking, irrigation, and industrial processes. Groundwater typically can be described in terms of depth from the surface, aquifer or well capacity, water quality, recharge rate, and surrounding geologic formations. The susceptibility of aquifers to groundwater contamination relates to geology, depth to groundwater, infiltration rates, and solubility of contaminants. Groundwater resources are regulated on the federal level by the USEPA under the Safe Drinking Water Act, 42 USC § 300f et seq. The USEPA's Sole Source Aquifer Program, authorized by the Safe Drinking Water Act, further protects aquifers that are designated as critical to water supply and makes any proposed federal or federal financially assisted project that has the potential to contaminate the aquifer, subject to USEPA review.

Floodplains are areas of low-level ground along rivers, stream channels, or coastal waters that provide a broad area to inundate and temporarily store floodwaters. In their natural vegetated state, floodplains slow the rate at which the incoming overland flow reaches the main water body. Floodplains are subject to periodic or infrequent inundation due to rain or melting snow. Risk of flooding typically hinges on local topography, the frequency of precipitation events, and the size of the watershed above the floodplain. Flood potential is evaluated and mapped by the Federal Emergency Management Agency, which defines the 100-year (regulatory) floodplain. The 100-year floodplain is the area that has a 1 percent chance of inundation by a flood event in a given year. Federal, state, and local regulations often limit floodplain development to passive uses, such as recreational and preservation activities, to reduce the risks to human health and safety.

EO 11988, *Floodplain Management*, provides guidelines that agencies should carry out as part of their decision making on projects that have potential impacts to or within the floodplain. This EO requires 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 and indirect support of floodplain development wherever there is a practicable alternative.

## 3.5.2 Existing Conditions

## 3.5.2.1 Surface Water and Floodplains

Point Conception lacks a consistent freshwater source (MSRS 2022). Rain is the most prevalent source of water for the project area, where most precipitation runs off into the ocean due to steep cliffs. There are no drainage channels or other surface water features in the Point Conception project area nor are there any jurisdictional waters of the US, including wetlands. Point Conception is bounded on the west by the Pacific Ocean and Santa Barbara Channel, and the Pacific Ocean coastline with its steep cliffs is one of the defining physical features of the Point Conception area. The portion of Point Conception where proposed habitat restoration activities would occur under the Proposed Action is not located in the 100-year floodplain.

## 3.5.2.2 <u>Groundwater</u>

Point Conception is within the Central Coast Hydrologic Region but not within a defined groundwater basin, which is an aquifer or stacked series of aquifers with reasonably well-defined boundaries in a lateral direction (California Department of Water Resources 2021). The majority of California's land area is in nonbasin areas, and groundwater extraction and use does occur within these nonbasin areas. Within the Central Coast Hydrologic Region, iron, manganese, and nitrate were the most commonly detected chemicals above a regulatory limit between 2009 and 2018 (California Department of Water Resources 2021). No groundwater wells or groundwater extraction occurs at Point Conception.

## 3.6 Biological Resources

## 3.6.1 Definition of the Resource

Biological resources include native or invasive plants and animals; sensitive and protected floral and faunal species; and the habitats, such as wetlands, forests, and grasslands, in which they exist. Habitat can be defined as the resources and conditions in an area that support a defined suite of organisms. The following is a discussion of the primary federal statutes that form the regulatory framework for the evaluation of biological resources.

**Endangered Species Act.** The ESA of 1973 (16 USC § 1531 et seq.) established protection over and conservation of threatened and endangered species and the ecosystems upon which they depend. Sensitive and protected biological resources include plant and animal species listed as threatened or endangered by the USFWS and the National Marine Fisheries Service. Under the ESA (16 USC § 1536), an "endangered species" is defined as any species in danger of extinction throughout all, or a large portion, of its range. A "threatened species" is defined as any species likely to become an endangered species in the foreseeable future. The USFWS maintains a list of species considered to be candidates for possible listing under the ESA. The ESA also allows the designation of geographic areas as critical habitat for threatened or endangered species. Although candidate species receive no statutory protection under the ESA, the USFWS has attempted to advise government agencies, industry, and the public that these species are at risk and may warrant protection under the ESA.

**Migratory Bird Treaty Act.** The MBTA of 1918 makes it unlawful for anyone to take migratory birds or their parts, nests, or eggs unless permitted to do so by regulations. Per the MBTA, "take" is defined as "pursue, hunt, shoot, wound, kill, trap, capture, or collect" (50 CFR § 10.12). Migratory birds include nearly all species in the US, with the exception of some upland game birds and nonnative species.

EO 13186, *Responsibilities of Federal Agencies to Protect Migratory Birds,* requires all federal agencies undertaking activities that may negatively impact migratory birds to follow a prescribed set of actions to further implement the MBTA. EO 13186 directs federal agencies to develop a Memorandum of Understanding with the USFWS that promotes the conservation of migratory birds.

The National Defense Authorization Act for fiscal year 2003 (Public Law 107-314, 116 Stat. 2458) provided the Secretary of the Interior the authority to prescribe regulations to exempt the armed forces from the incidental take of migratory birds during authorized military readiness activities. Congress defined military readiness activities as all training and operations of the US armed forces that relate to combat and the adequate and realistic testing of military equipment, vehicles, weapons, and sensors for proper operation and suitability for combat use.

**Bald and Golden Eagle Protection Act.** The Bald and Golden Eagle Protection Act of 1940 (16 USC § 668-668c) prohibits the "take, possess, sell, purchase, barter, offer to sell, purchase or barter, transport, export or import, at any time or any manner, any bald eagle [or any golden eagle], alive or dead, or any part, nest, or egg thereof." "Take" is defined as "pursue, shoot, shoot at, poison, wound, kill, capture, trap, collect, molest or disturb," and "disturb" is defined as "to agitate or bother a bald or golden eagle to a degree that causes, or is likely to cause, based on the best scientific information available, injury to an eagle, a decrease in productivity by substantially interfering with the eagle's normal breeding, feeding or sheltering behavior, or nest abandonment by substantially interfering with the eagle Protection Act also prohibits activities around an active or inactive nest site that could result in an adverse impact on the eagle.

## 3.6.2 Existing Conditions

Vandenberg SFB and Point Conception are within an ecological transition zone where the northern and southern ranges of many species overlap. Further the majority of the land within Vandenberg SFB and Point Conception boundaries has remained undeveloped.

## 3.6.2.1 <u>Vegetation Types</u>

In 2022, MSRS surveyed Point Conception to map vegetation using the standards of the *Manual of California Vegetation*, second edition (MCV2), to accurately classify vegetation by their membership rules (Sawyer et al. 2009; MSRS 2022). A total of nine MCV2 vegetation types were delineated at the Point Conception property: seven native and naturalized vegetation alliances and two unvegetated/developed types (**Table 3-3** and **Figure 3-1**). Each MCV2

vegetation alliance is described in detail in *Point Conception Restoration Plan 2022 Update* (MSRS 2022).

Vegetation Type	Acres			
Native and Naturalized				
Artemisia californica – Salvia luecophylla Shrubland Alliance	1.25			
Coreopsis gigantea Shrubland Alliance	0.65			
Frankenia salina Herbaceous Alliance	0.10			
Hesperocyparis macrocarpa – Pinus radiata Forest and Woodland Seminatural Alliance	0.18			
Juncus arcticus (var. balticus, mexicanus) Herbaceous Alliance	0.13			
Lupinus chamissonis – Ericameria ericoides Shrubland Alliance	2.36			
Mesembryanthemum spp. – Carpobrotus spp. Herbaceous Seminatural Alliance	24.14			
Unvegetated and Developed				
California Cliff, Scree, and Rock Vegetation Group Sparsely Vegetated/Barren	6.25			
Urban/Developed	0.97			

Table 3-3. V	Vegetation	Types	Mapped	at Point	Conception
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# 3.6.2.2 General Wildlife Resources

A variety of common bird species are associated with Point Conception and adjacent habitats including species such as house finch (*Haemorhous mexicanus*), lark sparrow (*Chondestes grammacus*), great horned owl (*Bubo virginianus*), and red-tailed hawk (*Buteo jamaicensis*). California gulls (*Larus californicus*) and western gulls (*Larus occidentalis*) are also common in the area. Amphibians that may occur at the site include the ensatina (*Ensatina eschscholtzii*) and the arboreal salamander (*Aneides lugubris*). Reptile species expected to occur at Point Conception include western fence lizard (*Sceloporus occidentalis*), southern alligator lizard (*Elgaria multicarinata*), legless lizard (*Anniella pulchra*), San Diego gopher snake (*Pituophis catenifer annectens*), and southern Pacific rattlesnake (*Crotalus oreganus helleri*). Various mammal species are also expected to occur within the project area, including brush rabbit (*Sylvilagus bachmani*), coyote (*Canis latrans*), bobcat (*Lynx rufus*), and black-tailed deer (*Odocoileus hemionus hemionus*). Small mammals include various species of mice and pocket gopher (*Thomomys bottae*).



Figure 3-1. Vegetation Types at Point Conception

#### 3.6.2.3 Special Status Species

Special status species include species protected by the ESA, MBTA, and Bald and Golden Eagle Protection Act. **Table 3-4** lists federal and state listed species that occur or have the potential to occur within the Proposed Action area and its vicinity. Potential occurrence near Point Conception was determined based on past documentation and on suitability of habitat and occurrence within the region of a particular species. Several species were excluded from potential occurrence because they do not occur at the site when project activities would occur; they do not breed within the Proposed Action Area and their special status affords them protection only during their breeding period; or they do not occur in a manner (rookeries or nesting colonies) that affords them special status protection.

Bald eagles (*Haliaeetus leucocephalus*, federal bird species of conservation concern, California endangered species, California fully protected species) are occasionally observed foraging in coastal habitat on Vandenberg SFB. However, this species is rarely sighted and, because bald eagles do not nest in the Proposed Action Area, they are not anticipated to be affected by project activities. In addition to the birds listed in **Table 3-4**, most bird species that may occur at the Proposed Action Area are protected under the MBTA. Several species of marine mammals haul out in the sandy coves and rocks around the base of the cliffs of Point Conception. The minimization measures listed in **Section 2.1.1.2** will ensure that marine mammals would not be harassed; therefore, they are not carried forward for further analysis in this EA. No federally listed, proposed listed, or candidate wildlife species are known to occur in the Proposed Action Area. One federally listed plant species, Gaviota tarplant (*Deinandra increscens* spp. *villosa*), and designated critical habitat for the Gaviota tarplant, occurs in the Proposed Action Area.

**Gaviota Tarplant (Federally Listed Endangered Species).** The USFWS listed Gaviota tarplant as endangered on 20 March 2000 (65 FR 14888). The USFWS has not developed a Gaviota tarplant Recovery Plan. The USFWS completed a 5-year review of this species in August 2011 (USFWS 2011). Gaviota tarplant was listed as federally endangered on 20 March 2000 (65 FR 14888-14898).

Gaviota tarplant is assumed present at Point Conception within 0.14 acre of thinly vegetated, deflated soils (**Figure 3-2**). This area was dominated by a mix of annual forb and grass species on sandy soils with California sagebrush and highly invaded by iceplant. Gaviota tarplant occurs elsewhere on Vandenberg SFB, and genetics work conducted by Baldwin (2007, 2009) indicates that there are two categories of tarplant stands on Vandenberg SFB:

- Gaviota tarplant: Stands comprised entirely of plants conforming to the Gaviota tarplant phenotype.
- Tarplant mixed: Stands comprised of plants conforming to the Gaviota tarplant phenotype, the grassland tarplant (*Deinandra increscens* ssp. *increscens*) phenotype, and plants exhibiting intermediate phenotypes (putative grassland x Gaviota intergrades).

# Table 3-4. Federal and State Listed Terrestrial Species with the Potential to Occur within the Proposed Action Area

	Status		Potential Occurrence within the		
Species	USFWS	CDFW	Proposed Action Area		
	Pla	ints	•		
Gaviota Tarplant (Deinandra increscens ssp. villosa)	FE	-	Present: one stand found at the site.		
	Rep	tiles			
Northern Legless Lizard	_ ·	SSC	Likely: occurs in sandy habitats		
(Anniella pulchra)			throughout central California.		
Alle wie Llewe wein els ind	BI	ras			
(Selasphorus sasin)	BCC	-	Likely: forages and may nest at the site.		
Black Oystercatcher	BCC	-	Present: forages on rocky coastline.		
Black Skimmer			Present: forages in nearshore ocean		
(Rynchops niger)	BCC	-	waters.		
Brant (Branta bernicla)	-	SSC	Present: forages in nearshore ocean		
Burrowing Owl	500		Likely: winters in burrows in grassland		
(Athene cunicularia)	BCC	SSC	areas.		
California Brown Pelican	_	Fully	Present: forages in nearshore ocean		
(Pelecanus occidentalis californicus)	-	protected	waters and roosts on beaches and rocks.		
Loggerhead Shrike	BCC	SSC	Likely: may forage in the site and may		
(Lanius Iudovicianus)	200	nesting	nest in shrub habitats.		
Northern Harrier	_	SSC	Present: forages in the site and may nest		
(Circus nudsonius)		nesting	in grassland.		
(Baeolophus inornatus)	BCC	-	Likely: may nest in nonnative tree habitat.		
		Fully			
Peregrine Falcon	BCC	protected	Present: hunts on coastal habitat.		
(Falco peregrinus anatum)		nesting			
White Tailed Kite		Fully			
(Flanus leucurus)	-	protected	Likely: may forage in the site.		
		nesting			
Terrestrial Mammals					
Pallid Bat ( <i>Antrozous pallidus</i> )	-	SSC	Potential: may roost in buildings at site.		
Townsend's Big-Eared Bat	-	SSC	Potential: may roost in buildings at site.		
Spotted Bat					
(Euderma maculatum)	-	SSC	Potential: may roost in buildings at site.		
Western Red Bat		000	Detential, may repet in buildings at site		
(Lasiurus blossevillii)	-	550	Polential: may roost in buildings at site.		
Western Mastiff Bat	_	SSC	Potential: may roost in buildings at site		
(Eumops perotis californicus)	_	000	r otoman. may roost in bundings at site.		
American Badger	-	SSC	Likely: may inhabit grassland habitat		
(Taxidea taxus)	1				

**USFWS** – US Fish and Wildlife Service; **CDFW** – California Department of Fish and Wildlife; **FE** – federally endangered species; **SSC** – California state species of special concern; **BCC** – federal bird of conservation concern



Figure 3-2. Extent of Gaviota Tarplant at Point Conception

The DAF did not own the Point Conception property during this genetics work. The population of tarplant at Point Conception requires genetic analysis to determine if the stands are pure Gaviota tarplant, Gaviota tarplant mixed with grassland tarplant phenotype, or pure grassland tarplant. Until this genetics study is completed, the DAF will assume the stand of tarplant on Point Conception consists of pure and mixed Gaviota tarplant.

The USFWS designated critical habitat for Gaviota tarplant on 7 November 2002 (67 FR 67968). Critical habitat is a specific geographic area that contains features essential to the conservation of an endangered or threatened species that may require special management and protection and may contain areas that are not currently occupied but will be needed for its recovery. The main contiguous portion of Vandenberg SFB was excluded from this designation under section 4(b)(2) of the ESA. Point Conception was acquired by the DAF in 2020 and currently does not qualify for exclusion or exemption from critical habitat designation. The Point Conception property is designated as critical habitat for Gaviota tarplant.

Primary constituent elements (PCEs) provide a basis on which to evaluate how actions are likely to affect critical habitat. PCEs are now commonly referred to as essential physical and biological features, but they will be referred to as PCEs in this document to align with the FR. Gaviota tarplant critical habitat PCEs identified in 67 FR 67976. These are:

- 1) Sandy soils associated with coastal terraces adjacent to the coast or uplifted marine sediments at interior sites up to 3.5 miles inland from the coast
- 2) Plant communities that support associated species, including needlegrass grassland and coastal sage scrub communities, particularly where the following associated species are found: needlegrass species (*Nassella* spp.), California sagebrush, coyote bush, sawtooth golden bush (*Hazardia squarrosa*), and California buckwheat (*Eriogonum fasciculatum*)

Primary threats to Gaviota tarplant critical habitat are habitat loss and habitat degradation, including development and competition with nonnative grasses (67 FR 67968). At Point Conception, the primary stressor to critical habitat is the spread of nonnative iceplant and veldt grass.

# 3.7 Cultural Resources

## 3.7.1 Definition of the Resource

Cultural resources are any prehistoric or historic district, site, building, structure, or object considered important to a culture or community for scientific, traditional, religious, or other purposes. These resources are protected and identified under several federal laws and EOs. Cultural resources include the following subcategories:

- Archaeological (i.e., prehistoric or historic sites where human activity has left physical evidence of that activity, but no structures remain standing)
- Architectural (i.e., buildings or other structures or groups of structures, or designed landscapes that are of historic or aesthetic significance)

• Traditional cultural properties (resources of traditional, religious, or cultural significance to Native American tribes)

Significant cultural resources are those that have been listed on the NRHP, or determined to be eligible for listing. To be eligible for the NRHP, properties must be 50 years old and have national, state, or local significance in American history, architecture, archaeology, engineering, or culture. They must possess sufficient integrity of location, design, setting, materials, workmanship, feeling, and association to convey their historical significance and meet at least one of four criteria:

- Associated with events that have made a significant contribution to the broad patterns of our history (Criterion A)
- Associated with the lives of persons significant in our past (Criterion B)
- Embody distinctive characteristics of a type, period, or method of construction, or represent the work of a master, or possess high artistic values, or represent a significant and distinguishable entity whose components may lack individual distinction (Criterion C)
- Have yielded or be likely to yield information important in prehistory or history (Criterion D)

Properties that are less than 50 years old can be considered eligible for the NRHP under Criterion Consideration G if they possess exceptional historical importance. Those properties must also retain historic integrity and meet at least one of the four NRHP criteria (A, B, C, or D). The term "historic property" refers to national historic landmarks and to NRHP-listed and NRHP-eligible cultural resources.

Federal laws protecting cultural resources include the Archaeological and Historic Preservation Act of 1960 as amended, the American Indian Religious Freedom Act of 1978, the Archaeological Resources Protection Act of 1979, the Native American Graves Protection and Repatriation Act of 1990, and NHPA, as amended through 2016, and associated regulations (36 CFR Part 800). The NHPA requires federal agencies to consider effects of federal undertakings on historic properties prior to making a decision or taking an action and to integrate historic preservation values into their decision-making process. Federal agencies fulfill this requirement by completing the section 106 consultation process as set forth in 36 CFR Part 800. Section 106 of the NHPA also requires agencies to consult with federally recognized Indian tribes with a vested interest in the undertaking.

Section 106 of the NHPA requires all federal agencies to seek to avoid, minimize, or mitigate adverse effects on these properties (36 CFR § 800.1[a]). For cultural resource analysis, the APE is used as the ROI. APE is defined as the "geographic area or areas within which an undertaking may directly or indirectly cause alterations in the character or use of historic properties, if any such properties exist" (36 CFR § 800.16[d]), and thereby diminish their historic integrity. The APE for direct effects includes the footprint of the proposed training areas (areas of potential direct disturbance). For architectural resources, the APE for indirect effects is a 1,000-foot buffer around the Proposed Action Area.

## 3.7.2 Existing Conditions

The APE includes the entire Point Conception property owned and managed by DAF. In an effort to identify historic properties in the APE, SLD 30 conducted a review of previous surveys and cultural resources recorded in the area and a field inspection of the APE to assess the potential for adverse effects from the Proposed Action.

The Point Conception Lighthouse Station is a NRHP-Listed Historic District (NRHP #81000176). The Historic District encompasses the entirety of the 29.6-acre property and includes 17 NRHPeligible historical contributors as well as 12 prehistoric archaeological sites that have not been individually evaluated (**Table 3-5**).

The Point Conception Light Station complex consists of several buildings, including the keeper's dwelling with the light tower built in 1881, the coal house, family quarters built in 1912, caretaker's quarters, a three-car garage, power house, a 10,000-gallon water tank built in 1881, and navigational aids (fog horn and visual aid). The light tower portion of the keepers dwelling is an attached circular structure which is 52 feet high and utilizes its original lens.

The SYBCI has designated the Point Conception property as part of a Chumash sacred site.

|--|

Site Number	Site Description	NRHP Eligibility
CA-SBA-204	This site presumably covered the entire top of the tallest hill on the property as well as the complete slope to the east. It was apparently a substantial midden deposit, but nearly all of this site has been heavily disturbed by construction of the Light Station roads and buildings.	Historic District contributing element and assumed eligible for this Proposed Action
CA-SBA-1594	This site is located 1,000 feet directly north of the top of the highest point of land of the property and is visible only as a stratum of midden eroding from the edge of the seacliff.	Historic District contributing element and assumed eligible for this Proposed Action
CA-SBA-1595	This site is located about 75 feet north and northeast of the pumphouse and is 1,000 feet directly north of the highest point of land on the property. In all likelihood, this site is continuous with CA-SBA-1594, located about 100 feet to the northwest. The western portion of the site contains a grey, sandy midden soil with moderately dense shellfish remains. The eastern portion of the site narrows and the deposit becomes considerably lighter in color, and midden constituents become increasingly sparse.	Historic District contributing element and assumed eligible for this Proposed Action
CA-SBA-1596	This site is located 800 feet north of the highest point of land on the property and 75 feet south of the pumphouse. It extends from the seacliff edge east approximately 50 feet and consists of two separate localities of midden.	Historic District contributing element and assumed eligible for this Proposed Action
CA-SBA-1597	This site is located on the east-northeast side of a large dune in an area of erosion and slumping, 50 feet west of a dirt road leading to the pumphouse. It consists of a litter of very recent historic trash overlying a very low-density scatter of shellfish remains.	Historic District contributing element and assumed eligible for this Proposed Action
CA-SBA-1598	This site is a midden located 350 feet north of the highest point of land on the property where the office/machinery building, and water tower are located.	Historic District contributing element and assumed eligible for this Proposed Action
CA-SBA-1599	This site is 650 feet directly east of the highest point of land on the property and 750 feet directly south of the road entrance to the property. It consists of a very light scatter of shellfish remains, chert flakes, and a sandstone pestle (not collected). Since the density of cultural debris is so low, the boundaries of the site are uncertain.	Historic District contributing element and assumed eligible for this Proposed Action
CA-SBA-1600	This site is located on a terrace along the northeastern margin of a large dune on both sides of the road leading to the pumphouse. The site consists of a low density of shellfish remains and chert flakes.	Historic District contributing element and assumed eligible for this Proposed Action
CA-SBA-1601	This site, located along a 30-foot side of the west road leading to the pumphouse, is 175 feet southeast of the pumphouse and 675 feet north of the caretaker's residence. It consists of a very sparse scatter (several flakes noted) of chert and quartzite flakes that have become exposed in the roadcut.	Historic District contributing element and assumed eligible for this Proposed Action
CA-SBA-1602	This site is adjacent to the south side of the road entrance to the Light Station buildings, just inside the fence defining the property boundary. It consists of a scatter of chert flakes and a point tip in a wind-deflated area approximately 100 feet in diameter.	Historic District contributing element and assumed eligible for this Proposed Action
CA-SBA-1603	This site is located 925 feet south-southeast of the road entrance to the property on the edge of the seacliff. It is observable as two sections separated by a horizontal distance of 5 feet consisting of a midden deposit buried under 3 to 6 feet of sand dune overburden.	Historic District contributing element and assumed eligible for this Proposed Action
CA-SBA-1604	This site is situated 530 feet directly south of the road entrance to the property. Portions of the site appear to be wind-deflated, which has resulted in the exposure of a medium brown, sandy midden with a light density of shellfish remains. A scatter of chert flakes, a chert core, burned animal bone, and a fragment of a bone artifact were also noted.	Historic District contributing element and assumed eligible for this Proposed Action

NRHP – National Register of Historic Places

#### 3.8 Hazardous Materials and Waste

#### 3.8.1 Definition of the Resource

Hazardous materials and wastes are those substances defined as hazardous by the Comprehensive Environmental Response, Compensation, and Liability Act (42 USC Chapter 103), as amended by the Superfund Amendments and Reauthorization Act (26 USC § 9507); the Environmental Health Standards for the Management of Hazardous Waste (California Code of Regulations [CCR] Title 22); the Toxic Substances Control Act (15 USC §§ 2601–2671); the Solid Waste Disposal Act (42 USC § 6903), as amended by the Resource Conservation and Recovery Act (RCRA; 42 USC §§ 6901-6992); and as defined in Title 8 CCR Section 5161. In addition, federal and state OSHA regulations govern protecting workplace personnel. In general, the definitions within the citations include substances that, because of their quantity, concentration, or physical, chemical, or infectious characteristics, may present substantial danger to public health and welfare, to workers, or to the environment.

#### 3.8.2 Existing Conditions

#### 3.8.2.1 <u>Hazardous Materials at Vandenberg Space Force Base</u>

Hazardous materials are compounds with the potential to harm human health and the environment through improper use, treatment, transportation, storage, or disposal in commercial, military, and industrial applications. They are harmful to life due to their concentrations and amounts, or physical and chemical attributes. Component hazardous materials, or hazardous constituents, are defined as hazardous materials with low concentrations that will not cause acute adverse effects. Hazardous constituents are present in propellants, batteries, fuels, hydraulic fluids, and munitions, and may harm human and environmental health through water, soil, or air contact.

Operations at Vandenberg SFB and associated properties require military personnel and on-Base contractors to use hazardous chemicals in varying quantities throughout the Base. Using hazardous material on Vandenberg SFB is regulated by the Hazardous Materials Management Process (DAF 2020), per Air Force Manual (AFMAN) 32-7002, *Environmental Compliance and Pollution Prevention*, and 40 CFR Part 112, *Spill Prevention, Control, and Countermeasure Plan.* Emergency response procedures for hazardous materials spills are established in SLD 30's *Installation Management Plan* (SLD 30 Plan 10-2). The restoration contractor would be responsible for preparing its own Emergency Response Plan per the SLD 30 *Installation Management Plan.* This plan would ensure that adequate and appropriate guidance, policies, and protocols regarding hazardous material incidents and associated emergency response are available to and followed by all installation personnel and commercial entities. For a spill, the restoration contractor would also be responsible for completing a Community Awareness and Emergency Response reporting form per local Santa Barbara County hazardous material and hazardous waste spill reporting requirements.

#### 3.8.2.2 Hazardous Waste at Vandenberg Space Force Base

Hazardous wastes contain hazardous materials that may exist as any state of matter, which may cause, or significantly contribute to, an increase in the likelihood of mortality or serious illness. Substantial human and environmental risks may be present when hazardous wastes are improperly used, stored, transported, or disposed of.

Hazardous waste at Vandenberg SFB complies with RCRA Subtitle C (40 CFR Sections 260-273) and with California hazardous waste control laws as administered by the California Environmental Protection Agency Department of Toxic Substances Control (22 CCR section 66260.10; 8 CCR section 5192). These regulations require that hazardous wastes be handled, stored, transported, disposed of, or recycled according to defined procedures. The SLD 30 Hazardous Waste Management Plan (SLD 30 Plan 32-7043-A; DAF 2022) details hazardous waste packaging, turn-in, transportation, storage, recordkeeping, and emergency procedures. The restoration contractor would be required to follow all federal, state, and local laws regulating generating, storing, transporting, and disposing hazardous waste. The restoration contractor would also be required to obtain a USEPA Generator identification number to manage and dispose hazardous waste generated by its site operations.

#### 3.8.2.3 Exposure Criteria

AFMAN 48-146, *Occupational and Environmental Health Program Management*, (published December 2022) defines the occupational exposure limit (OEL) as, "[T]he most conservative limit between the OSHA [permissible exposure limits] or [American Conference of Governmental Industrial Hygienists threshold limit values] unless a specific OEL is designated by the [Bioenvironmental Engineering (BE)] Associate Corps Chief on the BE Hive and [Environmental and Occupational Safety and Health] Service Center." Unless directed by higher authority, the SLD 30 Medical Group Bioenvironmental Engineering Chief would determine the OEL for chemicals estimated to pose the most significant health concerns to the public and launch facility workers. The exposure criteria are factored into the exposure prediction and risk management models and the launch commit decisions SLD 30/SEL uses.

FORMAT PAGE

# 4.0 ENVIRONMENTAL CONSEQUENCES

This chapter provides an analysis of the environmental consequences from the Proposed Action Alternatives. Reasonably foreseeable direct and indirect effects associated with other proposed projects at and proximate to Point Conception are also analyzed for each resource. There are no other proposed projects at Point Conception. However, TNC is actively implementing land management and habitat restoration activities at the 24,364-acre Dangermond Preserve, which is adjacent to Point Conception. TNC actively protects intact natural systems, restores impaired ecosystems, and implements adaptive management at the Preserve (TNC 2022). Further, post-restoration weed monitoring and treatment, as well as fence maintenance at Point Conception, would occur to support long-term management of the Proposed Action area.

## 4.1 Land Use and Coastal Zone Management

## 4.1.1 Environmental Consequences Evaluation Criteria

Potential impacts on land use are based on the level of land use sensitivity in areas potentially affected by the Proposed Action and alternatives as well as compatibility of those actions with existing conditions. In general, a land use impact would be adverse if it met one of the following criteria:

- Inconsistency or noncompliance with existing land use plans or policies;
- Precluded the viability of existing land use;
- Precluded continued use or occupation of an area;
- Incompatibility with adjacent land use to the extent that public health or safety is threatened; or
- Conflict with planning criteria established to ensure the safety and protection of human life and property.

## 4.1.2 Alternative 1. Phased Restoration Approach

There would be short-term minor adverse impacts and long-term beneficial impacts on land use from the proposed restoration activities under Alternative 1. Because there are no consistent water sources at the Point Conception Project Area, SLD 30 would install one or more water tanks at the existing concrete pad at or near the highest point on the site. SLD 30 would install aboveground irrigation lines to provide water from the tank to outplantings. Some areas of the property would require small solar-powered pumps where gravity cannot deliver water. Fog capture systems and condensation harvesters would also be installed to test if they are suitable for watering in hard-to-reach areas of the property. These irrigation measures would be temporary, and SLD 30 would remove them or abandon portions of the irrigation system in place after restoration activities are completed. The irrigation components of the restoration would have a minor impact on the Recreation/Open Space land use during their use, but impacts would cease when irrigation is no longer needed by SLD 30 to support habitat restoration activities.

The construction of the fence along the border of the Dangermond Preserve would cut off a grazing area for a small herd of cattle, but it is necessary for the restoration of native flora, on which the cattle prefer to graze. Otherwise, existing structures would not be affected by Alternative 1. The construction of a new fence along the perimeter of Point Conception would be consistent with existing land use and policies and would support the safety of those involved with restoration activities by separating grazing on adjacent lands from restoration activities at Point Conception. Following the multiyear phased approach to restoration implementation, native habitats would be better supported at Point Conception, the presence of invasive plant species would be minimized, and there would be improved habitat for the Gaviota tarplant. These changes would be a long-term minor beneficial impact on land use at Point Conception.

No access to Point Conception is currently allowed for public recreation, and no access would be allowed during or after habitat restoration activities. Therefore, there would be no change and subsequently the Proposed Action would have no significant impacts on recreation under Alternative 1.

A Negative Determination was received from the CCC on 8 August 2023 concurring that the Proposed Action would meet CZMA compliance requirements and have no adverse effect on coastal resourced (**Appendix C**).

#### 4.1.3 No Action Alternative

Under the No Action Alternative, there would be no restoration activities at Point Conception. Land use would remain unchanged, and invasive plant species would dominate the Point Conception site. There would be long-term, minor, adverse impacts on land use at Point Conception under the No Action Alternative as habitat degradation would continue.

## 4.1.4 Reasonably Foreseeable Future Actions and Other Considerations

The ongoing and proposed restoration activities of the Dangermond Preserve would complement those proposed under Alternative 1. As such, there would be a long-term cumulative beneficial impact on the Recreation/Open Space land use designated for these properties with the implementation of habitat restoration and long-term land management activities.

## 4.2 Human Health and Safety

## 4.2.1 Environmental Consequences Evaluation Criteria

Impacts that pose a long-term risk to human health or safety are evaluated. Impacts would be considered significant if federal, civilian, military, or contractor personnel did not comply with established OSHA and DAF safety guidelines. The health and safety of on-site military and civilian workers are safeguarded by numerous DoD and military branch-specific requirements designed to comply with standards issued by OSHA, USEPA, Cal/OSHA, and regulatory agencies. These standards specify health and safety requirements, the amount and type of

training required for workers, the use of PPE, administrative controls, engineering controls, and permissible exposure limits for workplace stressors.

## 4.2.2 Alternative 1. Phased Restoration Approach

With the implementation of all safety requirements as described in AFI 91-202 and AFI, 91-203 and EPMs described in **Section 2.1.1.10**, there would be minor impacts from habitat restoration activities on health and safety from the implementation of the Proposed Action at Point Conception.

The Proposed Action could result in the exposure of workers to hazards associated with restoration activities. These hazards include the potential for trips, slips, falls, and vehicular accidents: biological hazards such as spider bites and snakebites, as well as disease vectors: and exposure to hazardous materials, including herbicides, and hazardous waste. To minimize potential adverse impacts from biological hazards and physical hazards (such as from rocky and slippery surfaces), awareness training would be incorporated into the worker health and safety protocol. Contractors would be required to develop a site-specific safety plan that would address these potential hazards. Daily safety briefings would be conducted, and workers would be expected to comply with OSHA, AFOSH, Cal/OSHA and DPR requirements. Although herbicides can pose a risk to human health, these chemicals would be stored, mixed, and applied following strict regulations and guidelines, according to product label instructions, by personnel required to possess either a QAC or QAL. Workers would utilize all required PPE to minimize or eliminate potential exposure of personnel to herbicides. Herbicides would not be applied in windy conditions or during precipitation events to reduce the potential for herbicides to spread to areas outside of the study area and the study areas are in an isolated. nonpopulated area. Additional EPMs would be implemented to reduce risk of exposure and to protect human health and safety (Section 2.1.1.10). While adhering to these procedures, there would be no significant impacts on safety or occupational health.

## 4.2.3 No Action Alternative

Under the No Action Alternative, Alternative 1 would not be implemented. As no new impacts would be associated with the No Action Alternative, the No Action Alternative would have no impacts on human health and safety associated with the implementation of the phased restoration approach at Point Conception.

## 4.2.4 Reasonably Foreseeable Future Actions and Other Considerations

There are no other ongoing or proposed projects that in combination with the proposed implementation of the Proposed Action under Alternative 1 would cause adverse cumulative impacts on human health and safety.

## 4.3 Air Quality

#### 4.3.1 Environmental Consequences Evaluation Criteria

Factors considered in determining whether implementing an alternative may result in significant impacts on 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 exceed federal or state ambient air quality standards; or
- Exceed caps (limits) as imposed by federal and state GHG regulations.

Standard dust control measures (**Section 2.1.1.1**) 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.

For purposes of this air quality analysis, project emissions within the Vandenberg SFB region would be potentially significant if they exceed these thresholds.

## 4.3.2 Alternative 1. Phased Restoration Approach

Impacts on air quality from activities related to the Point Conception restoration under Alternative 1 would be generated primarily from the combustive emissions of fossil-fuel-powered equipment and fugitive dust emissions from the operation of equipment on exposed soil. The analysis therefore involves estimating emissions generated from the Proposed Action and assessing potential impacts on air quality. The emissions from these activities are calculated on an annual basis. The assumptions concerning the construction equipment, vehicles, and workforce required to implement the Proposed Action that were used for the analysis were presented in Chapter 2.

Restoration activities emissions were calculated using the DAF's Air Conformity Applicability Model (ACAM). ACAM is an air emissions estimating model that performs an analysis to assess the potential air quality impacts associated with a DAF action (e.g., military construction, aircraft operations) in accordance with the AFMAN 32-7002, *Environmental Compliance and Pollution Prevention*; Clean Air Act section 176(c); the EIAP (32 CFR Part 989); and the General Conformity Rule (40 CFR Part 93 Subpart B). The ACAM model estimates air emissions for activities associated with the Proposed Action and performs an analysis against regulatory thresholds.

As shown in **Table 4-1** the emissions are below the applicable *de minimis* levels. A Conformity Determination is not required, and a Record of Non-Applicability has been prepared. **Appendix G** contains the detailed ACAM report and the Record of Non-Applicability.
GHG emissions would be produced under Alternative 1. Emissions produced under Alternative 1 would be approximately 40.7 metric tons of CO<sub>2</sub> equivalent per year, which is comparable to approximately nine passenger vehicles driving for a year, or one year's worth of electricity for just over eight homes, using the USEPA's greenhouse gas equivalency calculator. As the national GHG emissions are approximately 53.9 billion metric tons per year, implementation of Alternative 1 would not significantly contribute to climate change or global warming.

Balbara obarty Air Fonation Control District (Fons per Fear)						
Equipment	со	NOx	ROG	SOx	<b>PM</b> 10	PM2.5
Ford 250 Pickup (daily usage, towing, materials handling)	0.033300	0.032597	0.007326	0.000160	0.001033	0.001005
Ford 250 Pickup (water deliveries)	0.006480	0.006343	0.001426	0.000031	0.000196	0.000196
ATV Usage	0.044264	0.024420	0.004292	0.000086	0.000839	0.000839
Honda GX160 Engine (ATV Sprayer engine)	0.006574	0.007079	0.000839	0.000012	0.000247	0.000247
Kubota D722 Excavator	0.030540	0.015138	0.003504	0.000078	10.40060	0.000600
STIHL BT 131 36 cc Auger	0.015018	0.008673	0.00129	0.000051	0.000129	0.000129
TOTAL	0.136176	0.09425	0.018677	0.000418	10.40304	0.003016

# Table 4-1. Estimated Annual Air Pollutant Emissions from Activities Within the Santa Barbara County Air Pollution Control District (Tons per Year)

**CO** – carbon monoxide; **NOx** – nitrous oxides; **ROG** – reactive organic gases; **SOx** – sulfur oxides; **PM**<sub>10</sub> – particulate matter, 10 microns; **PM**<sub>2.5</sub> – particulate matter, 2.5 microns; **ATV** – all-terrain vehicle

100

100

100

100

100

#### 4.3.3 No Action Alternative

De minimis levels

Under the No Action Alternative, Alternative 1 would not be implemented. As no additional impacts would be associated with the No Action Alternative, the No Action Alternative would have no impacts on air quality.

#### 4.3.4 Reasonably Foreseeable Future Actions and Other Considerations

100

Air emissions from the use of equipment similar to those proposed for use under the Proposed Action at the Dangermond Preserve for habitat restoration activities in combination with the emissions from equipment under Alternative 1 would have minor short-term cumulative impacts on air quality. However, following the completion of restoration activities, the emissions from equipment associated with restoration activities would end and there would be no further cumulative impacts on air quality.

#### 4.4 Geology and Earth Resources

#### 4.4.1 Environmental Consequences Evaluation Criteria

Protection of unique geological features, minimization of soil erosion, and the siting of facilities in relation to potential geologic hazards are considered when evaluating potential impacts of the Proposed Action on geological resources. Generally, impacts can be avoided or minimized if proper construction techniques, erosion control measures, and structural engineering design are incorporated into project development.

Effects on geology and soils would be adverse if they would alter the lithology, stratigraphy, or geological structure that control groundwater quality, distribution of aquifers and confining beds, and groundwater availability or change the soil composition, structure, or function within the environment.

Adverse impacts would result if the following occur:

- Regional geology is affected.
- Soils classified as prime and unique farmland are affected.
- Affected soils are considered unsuitable for development.
- Restoration activities are incompatible with the seismic risk status of the project area.

#### 4.4.2 Alternative 1. Phased Restoration Approach

Water lines for supplemental irrigation and the disturbance of soil for water basins around plantings would have minor, short-term, adverse impacts on soils at Point Conception. Supplemental water irrigation would be closely monitored so as to not inundate soils around planted plants and cause excess soil erosion into the surrounding landscape and the Pacific Ocean. Disturbance of soil from plantings and creating associated watering basins could exacerbate the problem of erosion by collecting too much water if precipitation is prevalent when the basins are created. Seed from native grasses and forbs would be utilized across the restoration site to bind soils following soil disturbance and minimize soil erosion during precipitation events. EPMs would be followed during restoration implementation to minimize soil erosion.

There would be no significant impacts on habitat restoration activities from seismicity in the region. Temporary irrigation, planted plants, sowing of native seed, and the boundary fence would not be significantly impacted by earthquake activity.

There would be no subsurface ground disturbance under Alternative 1. Therefore, there would be no significant impacts on geologic resources.

#### 4.4.3 No Action Alternative

Under the No Action Alternative, many of the nonnative species would overtake Point Conception changing the soil's characteristics and the landscape. Iceplant increases the salinity of the soil, killing off any native plants that could not grow in more saline soils (MSRS 2022). Veldt grass, left unchecked, rapidly spreads and would continue to convert dune habitats to grasslands that support far fewer native plants and animal species. Further, many nonnative species, such as iceplant, can cause soil erosion due to its growth form, even when it often provides nearly 100 percent ground cover. Therefore, there would be a long-term, minor, adverse impact on soils under the No Action Alternative. Further, there would be no impacts from seismic activity in the region under the No Action Alternative.

#### 4.4.4 Reasonably Foreseeable Future Actions and Other Considerations

Habitat restoration activities at the Dangermond Preserve in combination with those proposed under Alternative 1 would have minor adverse short-term cumulative impacts on soils. However, all restoration activities would minimize soil disturbance as is practicable, utilize native grass and forb seeds to stabilize bare soils, and apply the minimum irrigation water necessary to sustain planted plants. There would be no significant cumulative impacts on proposed restoration activities with the implementation of Alternative 1 in combination with those activities at the Dangermond Preserve.

#### 4.5 Water Resources

#### 4.5.1 Environmental Consequences Evaluation Criteria

Evaluation criteria for potential impacts on water resources are based on water availability, quality, and use; existence of floodplains; and associated regulations. Adverse impacts on water resources would occur if the Proposed Action were to do any of the following:

- Reduce water availability or supply to existing users.
- Cause overdrafts of groundwater basins.
- Exceed safe annual yield of water supply sources.
- Affect water quality adversely.
- Endanger public health by creating or worsening health hazard conditions.
- Violate established laws or regulations adopted to protect water resources.

Potential impacts related to flood hazards can be significant if such actions are proposed in areas with high probabilities of flooding; however, all impacts can be mitigated through the use of design features to minimize the effects of flooding.

#### 4.5.2 Alternative 1. Phased Restoration Approach

There could be minor adverse short-term impacts on water resources under Alternative 1. Erosion would present the most probable impact on water resources of the project area. The disturbance of soils during planting of plants and creation of outplanting basins as well as from removal of invasive species could also present a water quality issue from sediment in stormwater runoff if no precautions are taken. Sediment disturbance can create turbid waters which could have indirect effects on the ability of organisms to feed and influence their overall behavior (California State Lands Commission 2021). However, all disturbed bare soils would be managed through the application of native grass and forb seeds to bind surface soils, and ensure a minimal amount of exposed soils could be eroded from stormwater events. These measures, in combination with the EPMs listed in **Section 2.1.1.9**, would ensure that short-term impacts on water resources would be minor.

Herbicides applied to nonnative plants could run off in irrigation and/or stormwater into the surrounding ocean after application. The waters around the project area belong to the Point Conception State Marine Reserve, which is a marine protected area with various protected marine species. However, application of herbicide would only be conducted by DPR-licensed applicators, would be carefully monitored, used according to the label instructions to ensure safe application for Pacific Ocean waters and the surrounding marine ecosystem, and include the EPMs (**Section 2.1.1.9**) to minimize impacts on water quality. This would ensure that herbicides would not run off into the Pacific Ocean and would have no significant impacts on water resources. Following the completion of habitat restoration activities under Alternative 1, potential adverse impacts on surface water resources would cease, and native plant cover across the project area would ensure stormwater erosion of soils would be minimized.

There would be no significant impacts on groundwater under Alternative 1. Herbicides proposed for use to control nonnative plant species would readily bind to soils from any overspray of target plants, and would not be transported to subsurface aquifers. There are no surface water features at Point Conception that support groundwater resources through infiltration and recharge. Applied surface water from temporary irrigation would not affect groundwater quality or supplies.

#### 4.5.3 No Action Alternative

Under the No Action Alternative, no herbicides or soil disturbance would occur. Water resources would remain the same as the existing conditions for Point Conception. Therefore, there would be no impact on water resources under the No Action Alternative.

#### 4.5.4 Reasonably Foreseeable Future Actions and Other Considerations

There could be minor cumulative adverse short-term impacts on surface water resources from potential stormwater erosion on bare soils exposed during habitat restoration activities. However, native plant species would be used to control soil erosion, minimizing any potential impacts from erosion. Further, when active restoration activities cease, minor cumulative impacts on surface water resources would also end.

There would be no significant cumulative impacts on water resources from the use of herbicide because, under Alternative 1, both the restoration activities at the Dangermond Preserve and those at Point Conception would utilize qualified and licensed pesticide applicators applying only the smallest quantity of herbicides needed and following the label instructions.

#### 4.6 Biological Resources

#### 4.6.1 Environmental Consequences Evaluation Criteria

Factors considered in determining if implementing an alternative may result in significant impacts on biological resources include the extent or degree of the following:

- Unmitigable loss of important quantities of declining vegetation communities (including wetlands) that are considered rare;
- Impacts on special status species; or
- Alteration of regionally and locally important wildlife corridors that would severely and permanently limit their use.

Impacts would be significant if the USFWS determines that the action would be likely to jeopardize the continued existence of a federally listed threatened or endangered species or would result in destroying or adversely modifying federally designated critical habitat.

Impacts on biological resources would occur if special status species or their habitats would be affected directly or indirectly by project-related activities. These impacts can be short- or long-term impacts. Potential impacts on biological resources as a result of the Proposed Action include the following:

- 1. Permanent loss of habitat from construction related activities;
- 2. Loss of individuals due to crushing or physical injury;
- 3. Abandonment of breeding or roosting sites due to project-related noise; and
- 4. Disruption of foraging or roosting activities from project-related noise.

#### 4.6.2 Alternative 1. Phased Restoration Approach

#### 4.6.2.1 <u>Vegetation Communities</u>

Native vegetation communities may be adversely affected if native plants are crushed during site access by personnel on foot or ATV or by herbicide drift while treating invasives. However, personnel working at the site would be trained to identify native plants and avoid crushing or collateral damage from inadvertent application of herbicide. The EPMs outlined in **Section 2.1.1.2** would minimize impacts to native plant species, including herbicide drift. Approximately 26 acres of the 30-acre property are currently infested with nonnative invasive plant species (MSRS 2022). The expected outcome of the Proposed Action is to increase native plant cover and diversity and reestablish native vegetation communities. Therefore, the Proposed Action would have long-term beneficial effects on vegetation communities.

#### 4.6.2.2 <u>General Wildlife Resources</u>

During invasive weed treatments and restoration activities associated with the Proposed Action, animals could be inadvertently injured or killed by equipment or workers accessing the site. However, personnel on foot or operating offroad vehicles (i.e., ATV or light-duty excavator) would be actively scanning the work area for native plants and sensitive species while working and would avoid stepping on or driving over any wildlife encountered. ATVs and excavators would not be driven offroad faster than 5 miles per hour to enable the operators to scan for wildlife. As a result, potential physical impacts on wildlife species as a result of the Proposed Action would be less than significant.

Wildlife may be temporarily impacted by noise and visual disturbances as a result of use of increased human presence and use of mechanized equipment. These disturbances could cause short-term disruptions of normal activities or cause wildlife to avoid the work area during periods of activity. Project activities would be limited to relatively small areas within the Point Conception property on any given day of operation, and the overall extent of these disruptions would be minor, limited, and temporary. Wildlife species would likely temporarily shelter in burrows or other refugia or move to adjacent suitable habitat during project-related disturbances, but they would be expected to resume normal behaviors after the disruption ends. Impacts on wildlife resources from noise and visual disturbance would therefore be less than significant.

Wildlife may be exposed to herbicides during invasive weed treatments. The activities would be performed by qualified trained personnel deliberately selecting nonnative plants for herbicide treatment and avoiding wildlife. However, some animals may be directly exposed to herbicides during applications or to residual chemicals if moving through an area recently treated or ingesting treated plant materials. The potential impacts from exposure to herbicides depend on the toxicity of the chemicals, as well as the risk of exposure. **Table 4-2** presents toxicity and persistence of active ingredients for the proposed herbicide formulations. The proposed chemicals range from nontoxic to slightly toxic in effects on various taxa. The diversity and density of native wildlife are expected to be low in the project area because it is dominated by nonnative vegetation. With the implementation of the EPMs described in **Section 2.1.1.2**, very few animals would be expected to be exposure is low. Additionally, the Proposed Action is expected to create long-term benefits for wildlife species by enhancing native habitat, which would improve food sources and habitat structure. Impacts to fish and wildlife species from potential exposure to herbicides would therefore be less than significant.

Table 4-2. Toxicity and Environmental Persistence of Active Ingredientsin Proposed Herbicides

Active Ingredient	Amphibians	Birds	Terrestrial Invertebrates <sup>1</sup>	Half-Life in Soil (days)	Half-Life in Water (days)
Clethodim	No data available	Practically nontoxic <sup>2</sup>	Practically nontoxic <sup>2</sup>	Three <sup>2</sup>	128 in aqueous phase, 214 in sediment <sup>2</sup>
Glyphosate	Practically nontoxic <sup>3</sup>	Slightly toxic <sup>4</sup>	Nontoxic <sup>4</sup>	1 to 174 <sup>4</sup>	12 to 70 <sup>4</sup>

Active Ingredient	Amphibians	Birds	Terrestrial Invertebrates <sup>1</sup>	Half-Life in Soil (days)	Half-Life in Water (days)
Imazapyr	Practically nontoxic <sup>5</sup>	Practically nontoxic <sup>6</sup>	Practically nontoxic <sup>6</sup>	30 to 150 <sup>6</sup>	3 to 5 <sup>6</sup>

<sup>1</sup> Testing conducted on *Daphnia magna* and honeybees was restricted to acute toxicity (mortality) and may not be indicative of toxicity to other taxa.

<sup>2</sup> EXTOXNET 2022

<sup>3</sup> Vincent and Davidson 2015

<sup>4</sup> University of California at Davis 1996

<sup>5</sup> Trumbo and Waligora 2009

<sup>6</sup> Durkin 2011

#### 4.6.2.3 <u>Migratory Birds</u>

Migratory birds could be injured or killed by personnel accessing the site on foot or via ATVs, use of a light-duty excavator, herbicide application, or physical removal of nonnative plants. However, for any activities that would occur during bird nesting season (15 February through 15 August), a qualified biologist would survey the area for nesting birds and delineate buffers around nests to prevent damage to nests or loss of chicks or eggs. Therefore, direct impacts on migratory birds would be unlikely and less than significant.

Noise and visual disturbance associated with the Proposed Action may disturb breeding migratory birds. Disturbances to breeding birds include abandonment of breeding sites, egg breakage by "panicked" adults, physical damage or injury to the eggs or chicks due to heating and cooling from exposure, and increased vulnerability to predation during periods of nest abandonment. Chicks may also panic and leave the nest prematurely, resulting in potential injury or death. Impact severity would depend on the timing of the activity-related disturbance and noise exposure level (i.e., proximity of the breeding birds to the activity). If disturbance occurs after nesting has already been initiated, project-related noise could adversely impact reproductive success. The biologist would ensure that buffers around nesting birds are large enough to prevent noise and visual disturbances from impacting nesting birds. Therefore, impacts on migratory birds as a result of noise or visual disturbance would be unlikely.

The EPMs outlined in **Section 2.1.1.2** would serve to avoid or minimize potential adverse effects on migratory birds as a result of the Proposed Action. The outcome of the Proposed Action would be to increase native habitat within the Proposed Action Area, which would likely create new foraging and nesting habitat for native bird species. Therefore, the Proposed Action would not have a significant effect on migratory birds and would likely benefit those species.

#### 4.6.2.4 Gaviota Tarplant

Currently there are no known Gaviota tarplant populations in or adjacent to the proposed fence corridor, but there is potential for Gaviota tarplant to establish near the fence corridor in the future. Prior to installation and/or maintenance of the buck and rail fence, the footprint of the fencing corridor and access corridor would be surveyed for Gaviota tarplant by a qualified

biologist, and plants would be avoided. Installation and maintenance of the fence would not impact Gaviota tarplant.

Installation of monitoring poles at photograph monitoring and relevé locations would take place outside of the Gaviota tarplant growing season to avoid impacts on this species.

SLD 30 would prevent risks posed by drift or accidental overspray of broad-spectrum herbicides to Gaviota tarplant by employing precautions, including using low-pressure application techniques, only applying herbicide during low wind conditions, and other EPMs designed to avoid impacts to this species (**Section 2.1.1.2**). Based on these measures the chance of targeted herbicide application impacting Gaviota tarplant would be insignificant.

If invasive plants with similar phenology colonize a Gaviota tarplant stand, manual removal may represent the least injurious option for removing plants near Gaviota tarplant. In this case, personnel would hand pull or use appropriate hand tools to collect invasive plants. To minimize impacts on Gaviota tarplant root systems, any manual removal operations requiring soil disturbance within 15 feet of known occupied habitat would occur during moist soil conditions when Gaviota tarplant root systems would be better able to recover from disturbance (see **Section 2.1.1.2**).

All off-road ATV access would be restricted to preapproved routes that avoid impacts on Gaviota tarplant. Personnel will conduct all vehicle fueling, maintenance, and repairs outside of sensitive habitat to the degree practicable. If fueling or servicing vehicles in the field is necessary, fueling of equipment will be conducted in predesignated locations within designated laydown areas, and personnel will utilize appropriate spill containment measures including the employment of catch pans and protective mats (see **Section 2.1.1.5**).

There is potential for project activities, including herbicide application and manual invasive species removal, to impact Gaviota tarplant in the short term, but these activities would provide a long-term beneficial impact on the Gaviota tarplant population. The project would be implemented with all the appropriate EPMs outlined in **Section 2.1.1.2**. Therefore, the DAF has determined that the Proposed Action may affect but is not likely to adversely affect Gaviota tarplant. The USFWS concurred with the DAF on 4 April 2023 (**Appendix F**). Potential impacts on Gaviota tarplant as a result of the Proposed Action would be less than significant.

#### 4.6.2.5 Gaviota Tarplant Critical Habitat

Installation of the buck and rail fence will not significantly impact Gaviota tarplant critical habitat. The area where the fence would be installed is within 25 to 30 feet of the shared property line with TNC and is dominated by iceplant. There is a low number of native plants associated with tarplant (PCE no. 2; see **Section 3.6.2.2**) within the footprint of the fence, and the number of native plants that would be impacted by fence installation and maintenance is not significant. Impacts to 2 square feet of soils (PCE no. 1; see **Section 3.6.2.2**) would occur during installation of the gate on the fence, when two holes (1 square foot each) would be dug to install the gate posts; however, this area of impact would not constitute a significant effect on critical

habitat. Fence installation and maintenance within Gaviota tarplant critical habitat would be closely coordinated with the SLD 30 botanist, and implementation of minimization measures would reduce impacts on Gaviota tarplant critical habitat (see **Section 2.1.1.2**).

Seed collection of native plant species comprising a PCE of critical habitat would take place within Gaviota tarplant critical habitat. Collecting seed could have a short-term effect on specific native plant populations but would have an overall beneficial effect on the Gaviota tarplant's critical habitat. The amount of seed collected from native plants would not be enough to significantly impact those populations. Habitat restoration and/or enhancement would follow the Point Conception Restoration Plan and include container plant installation (via hand tools, handheld power auger, or light duty excavator) and watering (via water truck or trailer or fogcapturing devices).

SLD 30 would prevent risks posed by drift or accidental overspray of broad-spectrum herbicides to Gaviota tarplant critical habitat by employing precautions, including using low-pressure application techniques and only applying herbicide during low wind conditions (see Section 2.1.1.2). Based on these measures the chance of targeted herbicide application impacting Gaviota tarplant critical habitat would be insignificant.

SLD 30 may use manual and mechanized hand tools to remove invasive plant species within Gaviota tarplant critical habitat. Personnel would hand pull or use appropriate hand tools to collect invasive plants and dispose of them off the site. Manual removal of invasive plant species may result in small areas of soil disturbance and/or damage to root systems of adjacent native plants, but these areas of disturbance would be temporary and would not significantly impact critical habitat PCEs.

All off-road ATV access would be restricted to preapproved routes that minimize impacts on soils and native plants within Gaviota tarplant critical habitat. When conducting vehicle fueling, maintenance, and repairs, personnel will utilize appropriate spill containment measures, including the employment of catch pans and protective mats if fueling or servicing vehicles in the field within critical habitat is necessary (see **Section 2.1.1.2**).

Restoration monitoring may include installation of monitoring poles at photograph monitoring and relevé locations, which would take place outside of the Gaviota tarplant's growing season. These poles would be placed to avoid native vegetation comprising a PCE of critical habitat (see **Section 2.1.1.2**).

There is potential for project activities, including seed collection and manual invasive species removal, to impact PCEs of Gaviota tarplant critical habitat in the short term, but they would provide a long-term beneficial impact on the Gaviota tarplant's critical habitat. The project would be implemented with all the appropriate EPMs outlined in **Section 2.1.1.2.** Therefore, the DAF has determined that the Proposed Action may affect but is not likely to adversely affect Gaviota tarplant critical habitat. The USFWS concurred with the DAF on 4 April 2023 (**Appendix F**).

#### 4.6.3 No Action Alternative

Under the No Action Alternative, Alternative 1 would not be implemented. As no new impacts would be associated with the No Action Alternative, the No Action Alternative would have no direct impacts on biological resources. However, under the No Action Alternative, nonnative habitats would continue to dominate the site and degrade native habitat, causing long-term negative impacts to native populations and the likely loss of biological diversity and resources in the Proposed Action Area.

#### 4.6.4 Reasonably Foreseeable Future Actions and Other Considerations

Implementation of habitat restoration activities at the adjacent Dangermond Preserve in combination with those proposed under Alternative 1 would have long-term beneficial cumulative impacts on biological resources. Native vegetation would be restored and managed across a larger area of Santa Barbara County, and native vegetation would provide higherquality habitat for native wildlife species. The removal of invasive plant species would provide additional protections for Gaviota tarplant and improved habitat conditions within Gaviota tarplant designated critical habitat. Long-term weed monitoring and control and fence maintenance would provide a cumulative benefit to native plant species and wildlife habitat in the region.

#### 4.7 Cultural Resources

#### 4.7.1 Environmental Consequences Evaluation Criteria

Section 106 of the NHPA requires all federal agencies to assess the effects of their undertakings on historic properties and seek to avoid, minimize, or mitigate adverse effects on those properties [36 CFR § 800.1(a)]. For cultural resource analysis, the APE is used as the ROI. APE is defined as the "geographic area or areas within which an undertaking may directly or indirectly cause alterations in the character or use of historic properties, if any such properties exist" (36 CFR § 800.16[d]) and thereby diminish their historic integrity.

Direct effects include alteration or damage during construction activities. Indirect effects include the introduction of visual, audible, or atmospheric elements that are out of character with a property or that alter its historic setting. Direct and indirect effects are considered adverse if a project would cause a change in the quality of a property that qualifies it for inclusion in the NRHP. The APE for direct effects includes the footprints of the training areas where potential ground disturbance may occur. The APE for indirect effects includes a 1,000-foot buffer surrounding the training areas to account for auditory or visual impacts.

#### 4.7.2 Alternative 1. Phased Restoration Approach

Alternative 1 would not affect any of the characteristics that make up the contributing elements, the Historic District as a whole, or any of the prehistoric archaeological sites eligible for the NRHP. Studies show that iceplant's heavy leaves and shallow roots can destabilize coastal soil; it crowds out native species, alters soil chemistry, and may promote erosion. Therefore, the

removal and control of iceplant under Alternative 1 and planting of native species would result in a favorable effect regarding the stabilization of archaeological sites at Point Conception. Alternative 1 would also result in a favorable effect regarding the integrity of setting and feeling of the prehistoric sites at Point Conception Light Station. Cattle grazing can also damage surface soils and destabilize archaeological sites. The proposed construction of a buck and rail fence along the perimeter of the Point Conception project area would impede cattle from accessing Point Conception and the proposed fence style would minimize ground disturbance during its construction.

No historical built-environment resources would be directly or indirectly affected under Alternative 1. Other than the Monterey cypress trees at the 1912 Keeper's Cottage, none of the nonnative vegetation found in the Proposed Action's APE is important to the historical setting. The Monterey cypress would be trimmed to maintain a healthy appearance, and the native vegetation would bring the setting back to its late nineteenth-century appearance, prior to the introduction of iceplant and other invasive plant species. As such, Alternative 1 would result in a favorable effect regarding the integrity of setting and feeling of the historical built-environment resources at Point Conception Light Station.

The California SHPO concurred with SLD 30's finding that the undertaking will have no adverse effect on the significant qualities of the Point Conception Light Station Historic District, any of the individual contributing elements of the District, or any of the 12 prehistoric archaeological sites on the property (**Appendix E**).

The SYBCI identified Point Conception as a Chumash sacred site known as the "Western Gate," through which the souls of the dead could pass between the mortal world and the heavenly paradise of Similaqsa. In some Chumash dialects the location is called Humqaq ("The Raven Comes"). SLD 30 is consulting with the SYBCI on the Proposed Action (**Appendix E**) and will continue consultation with the tribe for the life of the project.

#### 4.7.3 No Action Alternative

Under the No Action Alternative, there would be long-term adverse effects on prehistoric archaeological sites eligible for the NRHP. Although iceplant is often planted purposefully to stabilize soils, with shallow roots and overlapping branches, and vegetative parts that typically swell during rain events, the plant becomes very heavy. The heavy, large mats of iceplant can fall off steep slopes and surfaces, eroding topsoil in the process (Central Coast Parks Association 2021). Therefore, iceplant's potential to destabilize coastal soils could damage archaeological sites. Under the No Action Alternative, the dominance of nonnative plants at Point Conception would continue to intrude on the setting and appearance of the historic setting of the Point Conception Light Station.

#### 4.7.4 Reasonably Foreseeable Future Actions and Other Considerations

SLD 30 has determined that the implementation of Alternative 1 would have no effect on any of the characteristics that make the contributing elements, the Historic District as a whole, or any

of the prehistoric archaeological sites eligible for the NRHP at Point Conception. There are no other ongoing or proposed projects that would impact these resources. Therefore, there would be no significant cumulative effect on these resources.

#### 4.8 Hazardous Materials and Waste

#### 4.8.1 Environmental Consequences Evaluation Criteria

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

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

Potential impacts resulting from hazardous materials and hazardous waste are evaluated using federal, state, and local regulatory requirements, contract specifications, and Base operating constraints, as outlined in **Section 3.8.1**. Noncompliance with applicable regulatory requirements, human exposure to hazardous materials and wastes, or environmental release above permitted limits, would be considered adverse impacts.

#### 4.8.2 Alternative 1. Phased Restoration Approach

Compliance with all pertinent federal, state, and local laws and regulations, and applicable DAF and SLD 30 plans would govern all actions associated with implementing the Proposed Action and would minimize the potential for significant impacts associated with the use of hazardous materials or generation and disposal of hazardous waste.

Using hazardous materials during the Proposed Action would be limited to herbicide application and equipment maintenance (e.g., fuels, oils, and lubricants). Materials that contain petroleum, oil, and lubricants (POLs) would be required to be properly contained, manifested, and managed per all federal, state, and local regulations, AFIs, AFMANs, DoD Directives, the sitespecific Health and Safety Plan, and associated EPMs.

Accidental POLs releases from vehicles and equipment leaks would generate hazardous wastes, resulting in potential adverse impacts on the Proposed Action Area. All hazardous wastes and spills would be properly managed and disposed of per applicable federal, state, and local hazardous waste regulations and the Hazardous Waste Management Plan (DAF 2022). Hazardous materials and waste management regulations would follow procedures outlined in the Hazardous Materials Management Process (DAF 2020) and the Hazardous Waste Management Plan (DAF 2022).

With adherence to existing policies and procedures as outlined in the applicable federal, state, and local regulations, as well as the EPMs described in **Section 2.1.1.5**, impacts from using

Environmental Consequences

hazardous materials and generating hazardous wastes associated with the Proposed Action would not be significant.

#### 4.8.3 No Action Alternative

Under the No Action Alternative, Alternative 1 would not be implemented. As no additional impacts would be associated with the No Action Alternative, the No Action Alternative would have no impacts on hazardous materials or waste management.

#### 4.8.4 Reasonably Foreseeable Future Actions and Other Considerations

Herbicide use for habitat restoration activities at the Dangermond Preserve would also be completed by licensed applicators following all labelling instructions. As licensed applicators, they would follow state and local requirements for the storage, use, and disposal of hazardous materials. Therefore, with the implementation of Alternative 1 in combination with ongoing and proposed restoration activities at the adjacent Dangermond Preserve, there would not be any significant cumulative impacts from using hazardous materials or generating hazardous wastes. FORMAT PAGE

#### 5.0 LIST OF AGENCIES, ORGANIZATIONS, AND PERSONS CONTACTED

California Coastal Commission – Energy, Ocean Resources, and Federal Consistency Division, San Francisco, CA

California Department of Fish and Wildlife, South Coast Region, Sacramento, CA

California Office of Historic Preservation, Sacramento, CA

Lompoc Public Library, Lompoc, CA

Office of the Governor, Office of Planning and Research, Sacramento, CA

Santa Barbara Public Library, Santa Barbara, CA

Santa Maria Public Library, Santa Maria, CA

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#### 7.0 REFERENCES

- Baldwin, B.G. 2007. A Systematic Investigation of Deinandra increscens, with Special Reference to Subsp. villosa. Jepson Herbarium and Department of Integrative Biology. University of California, Berkeley. 32 pp.
- Baldwin, B.G. 2009. *Morphological and Molecular Reconsideration of Deinandra increscens subsp. villosa.* Final report on file at Ventura Fish and Wildlife Office. 18 pp + appendices.
- California Air Resources Board. 2016. Ambient Air Quality Standards. 4 May 2016. <a href="https://ww2.arb.ca.gov/sites/default/files/2020-07/aaqs2.pdf">https://ww2.arb.ca.gov/sites/default/files/2020-07/aaqs2.pdf</a>>. Accessed March 2023.
- California Department of Water Resources. 2021. "California's Groundwater Update." Bulletin 118. November.
- California State Lands Commission. 2021. *Preliminary Environmental Assessment Vandenberg* Offshore Wind Energy Projects. July
- Central Coast Parks Association. 2021. *Ice Plant the Iconic but Destructive Piece of California Coastal Landscape.* March.
- Central Coast Regional Water Quality Control Board (CCRWQCB). 2019. *Water Quality Control Plan for the Central Coast Basin.* June. California Environmental Protection Agency.
- Department of the Air Force (DAF). 2020. *Vandenberg Air Force Base Environmental Program Guide Hazardous Materials Management Plan.* May 2015. Vandenberg Air Force Base, CA: US Air Force, 30th Space Wing.
- Department of the Air Force (DAF). 2022. *Hazardous Waste Management Plan.* January. Vandenberg Air Force Base, CA: US Air Force, Space Launch Delta 30.
- Durkin, P.R. 2011. *Imazapyr Human Health and Ecological Risk Assessment Final Report.* Syracuse Environmental Research Associates Inc., Manlius, NY. 215 pp.
- Environmental Laboratory. 1987. *Corps of Engineers Wetlands Delineation Manual.* Wetlands Research Program. Technical Report Y-87-1. January.
- EXTOXNET. 2022. Pesticide Information Profiles (PIPs). <a href="http://extoxnet.orst.edu/pips/ghindex.html">http://extoxnet.orst.edu/pips/ghindex.html</a>. Accessed on 1 December 2022.
- Jennings, C.W. 1994. Fault Activity Map of California and Adjacent Areas, with Locations of Recent Volcanic Eruptions: California Division of Mines and Geology Geologic Data Map 6, 92 p., 2 pls., scale 1:750,000.

- ManTech SRS Technologies, Inc. (MSRS). 2022. *Point Conception Restoration Plan, 2022 Update.* Vandenberg Space Force Base, CA. Prepared for Space Launch Delta 30/ Installation Management Flight, Environmental Conservation. September.
- Natural Resources Conservation Service. 1997. National Cooperative Soil Survey. Concepcion series. Official Series Description - CONCEPCION Series. <https://soilseries.sc.egov.usda.gov/OSD\_Docs/C/CONCEPCION.html#:~:text=The%20 Concepcion%20series%20consists%20of%20deep%2C%20moderately%20well,Pacific %20Ocean.%20Slopes%20are%200%20to%2050%20percent.>. Accessed 21 November 2022.
- Santa Barbara County. 2016. Land Use Element. In *Santa Barbara County Comprehensive Plan.* Adopted 1980, amended December 2016.
- Santa Barbara County. 2022. Santa Barbara County Land Use and Zoning Map. <a href="https://www.arcgis.com/home/webmap/viewer.html?webmap=fa3545a29dac49aeacc81">https://www.arcgis.com/home/webmap/viewer.html?webmap=fa3545a29dac49aeacc81</a> 669b956e3e5&extent=-120.9142,34.093,-118.9408,35.4355>. Accessed December 2022.
- Sawyer, J.O., T. Keeler-Wolf, and J.M. Evens. 2009. *A Manual of California Vegetation.* 2nd Edition. California Native Plant Society Press, Sacramento, CA.
- Smith, C.F. 1998. *A Flora of the Santa Barbara Region, California.* 2nd edition. Santa Barbara Botanic Garden and Capra Press, Santa Barbara, CA.
- The Nature Conservancy (TNC). 2022. *Stories in California.* The Jack and Laura Dangermond Preserve. <a href="https://www.nature.org/en-us/about-us/where-we-work/united-states/california/stories-in-california/dangermond-preserve/">https://www.nature.org/en-us/about-us/where-we-work/unitedstates/california/stories-in-california/dangermond-preserve/</a>. Last updated November 2022.
- Treiman, J.A. 2000. Fault Number 87a, Santa Ynez Fault Zone, Pacifico Section, in Quaternary Fault and Fold Database of the United States. US Geological Survey website. <a href="https://earthquakes.usgs.gov/hazards/qfaults">https://earthquakes.usgs.gov/hazards/qfaults</a>.
- Trumbo, J., and D. Waligora. 2009. "The Impact of the Herbicides Imazapyr and Triclopyr Triethylamine on Bullfrog Tadpoles." *California Fish and Game* 95(3):122-127.
- US Air Force. 1987. *Mineral Resource Management Plan: Potential Exploration, Development, and Production of Oil and Gas Resources, Vandenberg Air Force Base.*
- US Environmental Protection Agency (USEPA). 2017. Atmospheric Lifetime and Global Warming Potential Defined. <a href="https://19january2017snapshot.epa.gov/climateleadership/atmospheric-lifetime-and-global-warming-potential-defined\_.html">https://19january2017snapshot.epa.gov/climateleadership/atmospheric-lifetime-and-global-warming-potential-defined\_.html</a>. Last updated 19 January 2017.
- University of California at Davis. 1996. Extension Toxicology Network Glyphosate Pesticide Information Profile. University of California at Davis, Davis, CA. 4 pp.

- US Fish and Wildlife Service (USFWS). 2011. *Deinandra increscens* ssp. *villosa (Gaviota Tarplant), 5-Year Review: Summary and Evaluation*. US Fish and Wildlife Service, Ventura Fish and Wildlife Office, Ventura, CA. 34 pp.
- Vandenberg Air Force Base. 2019. Installation Development Plan, Vandenberg Air Force Base, California. 146 pp.

Vandenberg Space Force Base (SFB). 2021. Integrated Natural Resources Management Plan.

- Vincent, K., and C. Davidson. 2015. The Toxicity of Glyphosate Alone and Glyphosate– Surfactant Mixtures to Western Toad (*Anaxyrus boreas*) Tadpoles. *Environmental Toxicology and Chemistry* 34(12):2791-2795.
- Western Regional Climatic Center. 2016. Climate Data for Lompoc, California, Station 045064. <a href="https://wrcc.dri.edu/cgi-bin/cliMAIN.pl?ca5064">https://wrcc.dri.edu/cgi-bin/cliMAIN.pl?ca5064</a>>. Accessed March 2023.

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Appendix A. Point Conception Restoration Plan

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# **Point Conception Restoration Plan** 2022 Update - Vandenberg Space Force Base, California



### 15 September 2022

Prepared for:

Space Launch Delta 30, Installation Management Flight SLD 30/CEIEA 1028 Iceland Ave. Vandenberg Space Force Base, CA 93437-6010

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## Acronyms and Abbreviations

ac	acre
Cal-IPC	California Invasive Plant Council
ESBB	El Segundo blue butterfly
ft	feet/foot
GPS	global positioning system
ha	hectare
in	inch
MCV2	A Manual of California Vegetation, Second Edition
MSRS	ManTech SRS Technologies, Inc.
m	meter
MMU	minimum mapping unit
TNC	The Nature Conservancy
ULV	ultra low volume
USCG	United States Coast Guard
VSFB	Vandenberg Space Force Base

### 1.0 Introduction

Point Conception is a striking headland along the central coast of California that sharply divides the state from its prevailing north-south orientation to an east-west alignment where the Pacific Ocean meets the Santa Barbara Channel (Figure 1-1, Figure 1-2). The property was previously owned by the United States Coast Guard (USCG) until 2020, when it transferred ownership to Vandenberg Space Force Base (VSFB or Base). The USCG has operated the Point Conception lighthouse since 1856.

VSFB's property at Point Conception is approximately 30 acres (ac) (12 hectares [ha]) of stabilized dunes and sharp cliffs. Biogeographically, Point Conception is commonly understood as the transition between the flora and fauna of northern California and southern California, and many species find either their northern or southern limits at or near this location (Smith 1998). The point currently supports remnants of coastal vegetation embedded within large swathes of various, non-native iceplant species.

In 2016, ManTech SRS Technologies, Inc. (MSRS) was subcontracted by the California Association of Resource Conservation Districts through a cooperative agreement with the U.S. Air Force to survey the site to produce a vegetation map, non-native plant species map, and a restoration plan (MSRS 2017). Since ownership has transferred to VSFB, MSRS was tasked in 2022 to revise and update the Point Conception Restoration Plan produced in 2017 (MSRS 2017).

The goals of the revised Point Conception Restoration Plan include controlling or eradicating select non-native plant species to levels that will allow for restoration or natural recovery, and establishment or improvement of native-dominated habitat that will be resistant to further infestations. VSFB intends to restore the property to support wildlife and ecological diversity, consistent with the Sikes Act, as well as provide an aesthetically pleasing showcase of native vegetation.

This document serves as the revised Point Conception Restoration Plan that details native habitat restoration strategies and non-native plant control methods.



Figure 1-1. Point Conception regional location.



Figure 1-2. Point Conception property and surroundings.

### 1.1 Point Conception Setting

At the extreme western end of the Transverse Mountain Range, Santa Barbara County represents a significant geological and ecological transition between southern and northern California ecosystems. Point Conception and Point Arguello to the north represent two prominent headlands that define the western edge of the Transverse Range (Figure 1-1). The climate of Point Conception is Mediterranean and heavily influenced by its proximity to the coast's abrupt change of direction. The waters just off Point Conception at the entrance to the Santa Barbara Channel earned the nickname "graveyard of ships" as vessels attempting to pass through met the strong winds and swirling currents caused by the headland and channel (Mikesell 1954; Dorman and Winant 2000).

The strong winds, generally westerly prevailing, have caused small rolling dunes to form across the widest portion of the headland just north of the highest point on Point Conception. These eolian sands are deposited on escarpments of Monterey shale (USGS 2016). The topography of the property is mirrored in these soil characteristics, with gentle slopes found in the dune areas to the northeast and extremely steep cliff faces and slopes found along the perimeter of the headland.

### 2.0 Baseline Condition

#### 2.1 Vegetation & Non-Native Species Mapping Methods

To establish baseline conditions for Point Conception, in 2016 and 2017, MSRS mapped vegetation classes and invasive species occurrences via the methods described below, and again mapped vegetation classes in 2022 according to standards in the *Manual of California Vegetation*  $2^{nd}$  Edition (MSRS 2017, Sawyer et al. 2009).

In 2016 and 2017, vegetation was first interpreted by digitizing vegetation stands following Wildscape (2009) using an orthoimage produced by MSRS's DJI Phantom 4 small unmanned aerial vehicle (not subject to Department of Defense restrictions and waivers at that time). Vegetation polygons were delineated using a minimum mapping unit (MMU) of 0.15 ac (0.06 ha) and ground-verified between May 2016 and January 2017. In addition to vegetation mapping, MSRS developed a list of known and potential plant species for Point Conception during on-site surveys and by reviewing the Consortium of California Herbaria records and Calflora (Calflora 2017; Appendix A).

To map non-native species, MSRS walked meandering transects throughout the property. Target survey species were those that were identified to require specific treatment strategies or reached an acreage threshold necessary for management. Species with discrete infestation extents were mapped by delineating polygons around each stand (Table 2-1). Species with large or diffuse populations were mapped using a grid system set to a 98.4-foot (ft) (30-meter [m]) grid cell (Table 2-1). Ocular estimates of cover class values by species were applied to each 98.4-ft grid cell (30-m grid cell). Those non-native species not mapped were documented as present on the property and are listed in Appendix A.

In July 2022, MSRS again surveyed Point Conception to map vegetation using the standards of the *Manual of California Vegetation* 2<sup>nd</sup> Edition to accurately classify vegetation by their membership rules (MCV2; Sawyer et al. 2009) rather than attempting to cross walk from Wildscape (2009) to MCV2. Membership rules in the MCV2 require thresholds to be met by certain species (e.g., relative cover or dominance) to determine the correct vegetation alliance. MSRS also referenced *A Manual of California Vegetation Online* to confirm the most up-to-date nomenclature and alliance information. MSRS employed a MMU of 0.01 ac (0.005 ha) due to the overall small size of the property and extensive iceplant infestation that swamped more native habitats on the property for mapping.

For the purposes of this 2022 Restoration Plan, MSRS maintained non-native species occurrences information mapped in 2016 and 2017; however, all vegetation nomenclature is updated from the 2022 surveys following the standards in the MCV2.
Mapping Method	Common Name	Scientific Name
	Australian Saltbush	Atriplex semibaccata
	Century Plant	Agave americana
Polygon	Monterey Cypress	Hesperocyparis macrocarpa
Polygon	Pig's Ear	Cotyledon orbiculata
	Red-hot Poker	Aloe maculata
	Veldt Grass	Ehrharta calycina
30-Meter Grid Cell	Crystalline Iceplant	Mesembryanthemum crystallinum
	Iceplant species	Carpobrotus spp.
	Rosea Iceplant	Drosanthemum floribundum

**Table 2-1.** Non-native species surveyed and mapping method.

# 2.2 Overall Habitat Condition

Invasive species occurrences mapped in 2016 and 2017 and MCV2 vegetation alliances delineated in 2022 were used to characterize the baseline condition at Point Conception and inform the development of this Restoration Plan. A total of 86 plant taxa from 36 families were documented (Appendix A). Of the 86 taxa documented, 31 were non-native. A mid-spring visit at peak bloom would allow for the documentation of additional taxa, specifically annual species.

Vegetation types documented at Point Conception in 2022 ranged from large monotypic swathes of various iceplant species (*Carpobrotus* spp., *Mesembryanthemum crystallinum*) to a small swale with predominantly native riparian herbaceous vegetation along the western cliff at the pumphouse. Remnant stands of native scrub vegetation were found at the northern and southeastern tips of the property dominated by giant coreopsis (*Leptosyne gigantea*), mock heather (*Ericameria ericoides*), and California sagebrush (*Artemisia californica*).

Other habitats include a stand of planted Monterey cypress (*Hesperocyparis macrocarpa*) and coastal salt marsh vegetation surrounding the lighthouse likely supported by fog drip.

Non-native plant species (various ornamentals and other more invasive species) dominate the landscape at Point Conception, and many were likely introduced by lighthouse keepers who lived on-site. A wide variety of ornamental succulents and bulbs currently grow around several of the historical buildings and have escaped further into the landscape. In particular, red-hot poker (*Aloe maculata*) has been an aggressive invader.

Currently, the remnants of an old fence sporadically occur within 12 feet from the Point Conception boundary and the Jack and Laura Dangermond Preserve (herein Dangermond, Dangermond Preserve). While assessing baseline conditions at Point Conception and regularly thereafter, MSRS has observed a small herd of bulls grazing on Dangermond and observed their droppings on site. Animals seem to occasionally stray onto the Point Conception property in search of pasture, but the dominant cover of iceplant likely discourages frequent grazing for the time being. Cattle may impede some restoration efforts at Point Conception in the future and should be discouraged from entering the property.

Federally listed species documented include Gaviota tarplant (*Deinandra increscens* ssp. *villosa*). The entire property is within the Conception-Gaviota unit of designated Critical Habitat for this

federally endangered species (67 FR 67968). Gaviota tarplant was mapped due to its federal status and it encompassed 0.14 ac (0.06 ha) on thinly vegetated, deflated soils (Figure 2-1, Figure 2-2). This area was dominated by a mix of annual forb and grass species on sandy soils with California sagebrush and highly invaded by iceplant (Figure 2-1). However, no analogous alliance is recognized in Sawyer et al. (2009) and was therefore mapped separately so that restoration efforts may employ minimization and avoidance measures near the occurrence.

Additionally, seacliff buckwheat (*Eriogonum parvifolium*) is found throughout the property and on the adjacent Dangermond Preserve. Seacliff buckwheat is the host plant for the federally endangered El Segundo blue butterfly (*Euphilotes allyni*, ESBB), which until 2020 was thought to occur on VSFB (especially along nearby Tranquillon Ridge and Oak Mountain). However, the results of a genetic study published in 2020 indicate that the VSFB *Euphilotes* is genetically distinct from ESBB in Los Angeles (Dupuis et al. 2020). This likely indicates that the *Euphilotes* in the VSFB area are an undescribed species occupying a limited geographic range. Surveys conducted at Point Conception between 2008 and 2020 have not detected this *Euphilotes* but the large stands of seacliff buckwheat at the site and on the neighboring Dangermond Preserve would not preclude it from occurring there or colonizing the site in the future (MSRS 2021). Currently, the VSFB *Euphilotes* is not federally listed.



**Figure 2-1.** Gaviota tarplant occurrence at Point Conception; plants primarily grow in deflated soils in openings throughout iceplant. Inset: Gaviota tarplant in bloom.



Figure 2-2. Extent of Gaviota tarplant at Point Conception.

# 2.3 Vegetation Types

A total of nine MCV2 vegetation types were delineated at the Point Conception property; seven native and naturalized vegetation alliances and two unvegetated/developed types (Table 2-2). Each MCV2 vegetation alliance is described in detail below.

Vegetation Type	Acres	Hectares		
Native and Naturalized Types				
<i>Artemisia californica -</i> ( <i>Salvia leucophylla</i> ) Shrubland Alliance	1.25	0.50		
Coreopsis gigantea Shrubland Alliance	0.65	0.26		
Frankenia salina Herbaceous Alliance	0.10	0.04		
Hesperocyparis macrocarpa - Pinus radiata Forest & Woodland Semi-Natural Alliance	0.18	0.07		
<i>Juncus arcticus</i> (var. <i>balticus, mexicanus</i> ) Herbaceous Alliance	0.13	0.05		
<i>Lupinus chamissonis - Ericameria ericoides</i> Shrubland Alliance	2.36	0.96		
Mesembryanthemum spp Carpobrotus spp. Herbaceous Semi-Natural Alliance	24.14	9.77		
Unvegetated and Developed Types				
California Cliff, Scree & Rock Vegetation Group Sparsely Vegetated/Barren	6.25	2.53		
Urban/Developed	0.97	0.39		

 Table 2-2.
 Vegetation types mapped at Point Conception.

# Native and Naturalized Types

#### Artemisia californica – (Salvia leucophylla) Shrubland Alliance

A total of 1.25 ac (0.50 ha) of upper ridges and some low dune basins primarily within the central portion of the Point Conception property support the *Artemisia californica* – (Salvia leucophylla) Shrubland Alliance (California sagebrush - (purple sage) scrub) (Table 2-2, Figure 2-3, Figure 2-12). This vegetation alliance is characterized by California sagebrush as more than 50% dominant with other shrub species such as coastal goldenbush (*Isocoma menziesii*). Because of the heavy cover of iceplant species at Point Conception, most areas of California sagebrush do not meet threshold requirements for this alliance type.



Figure 2-3. Artemisia californica – (Salvia leucophylla) Shrubland Alliance characterized by California sagebrush but heavily invaded by iceplant.

#### Coreopsis gigantea Shrubland Alliance

Small, remnant patches of the *Coreopsis gigantea* shrubland alliance (giant coreopsis scrub) persist at Point Conception for a total of 0.65 ac (0.26 ha, Table 2-2). This alliance is characterized by greater than 30% relative cover of giant coreopsis (*Leptosyne gigantea*<sup>1</sup>, Figure 2-4, Figure 2-12) where scattered shrubs such as *Artemisia californica*, *Atriplex semibaccata*, *Baccharis pilularis*, *Ericameria ericoides*, *Frankenia salina*, *Isocoma menziesii*, *Lotus dendroideus*, and *Suaeda taxifolia* are present.

<sup>&</sup>lt;sup>1</sup> As of the 1 March 2007 correspondence with David J. Keil regarding genera revisions for the Jepson Manual, *Leptosyne* was split from *Coreopsis*. Though this species' taxonomy is updated, the MCV2 alliance "*Coreopsis gigantea* Shrubland Alliance" does not yet reflect the updated taxonomy and therefore, we defer to the currently accepted MCV2 alliance name.



Figure 2-4. Coreopsis gigantea Shrubland Alliance.

#### Frankenia salina Herbaceous Alliance

*Frankenia salina* herbaceous alliance (alkali heath marsh) was mapped at 0.1 ac (0.04 ha) along the northwestern edge of the lower terrace (Table 2-2, Figure 2-5, Figure 2-12). At Point Conception, this vegetation type was dominated by alkali heath (*Frankenia salina*) with saltgrass (*Distichlis spicata*), several species of *Atriplex*, *Suaeda taxifolia*, and scattered *Salicornia pacifica* (Figure 2-5). Though these representative species occur in other areas throughout the property, alkali heath must reach a relative cover of at least 30% and non-native infestations of crystalline iceplant and other iceplant species tend to dominate most vegetation stands swaying the final vegetation alliance.



Figure 2-5. An example of drought stressed Frankenia salina Herbaceous Alliance.

#### Hesperocyparis macrocarpa – Pinus radiata Forest & Woodland Semi-Natural Alliance

The monocultural and planted Monterey cypress (*Hesperocyparis macrocarpa*) grove near the highest point of Point Conception encompassed 0.18 ac (0.07 ha) and constitutes the *Hesperocyparis macrocarpa* – *Pinus radiata* Forest & Woodland Semi-Natural Alliance (Monterey cypress - Monterey pine woodland stands) (Table 2-2, Figure 2-6, Figure 2-12). Though considered invasive outside of its natural range farther north on the Central Coast, this grove of cypress trees is considered to have historical relevance. Thus, no mature trees are proposed to be removed and the grove will be maintained at its current extent.



Figure 2-6. Hesperocyparis macrocarpa – Pinus radiata Forest & Woodland Semi-Natural Alliance.

#### Juncus arcticus (var. balticus, mexicanus) Herbaceous Alliance

A small (0.13 ac [0.05 ha]) swale at the northwestern edge of the property, surrounding an old pumphouse, was classified as *Juncus arcticus* (var. *balticus, mexicanus*) Herbaceous Alliance (Baltic and Mexican rush marshes). This area was primarily dominated by dense Baltic rush (*Juncus balticus*) with scattered plants of saltmarsh baccharis (*Baccharis glutinosa*) and willow-leaf dock (*Rumex salicifolius*) (Table 2-2, Figure 2-7, Figure 2-12).



**Figure 2-7.** Juncus arcticus (var. balticus, mexicanus) Herbaceous Alliance. Structure in far right is the pump house associated with the lighthouse.

#### (Lupinus chamissonis) – Ericameria ericoides Shrubland Alliance

At Point Conception, the (*Lupinus chamissonis*) – *Ericameria ericoides* Shrubland Alliance (silver dune lupine - mock heather scrub) occupies 2.36 ac (0.96 ha) and is the second most common vegetation type but the most common native vegetation type (Table 2-2, Figure 2-8, Figure 2-12). Membership is defined by *Ericameria ericoides* and/or *Lupinus chamissonis* (at Point Conception, membership is defined by *Ericameria ericoides*) occupying more than 50% relative cover in the shrub canopy and these species occur characteristically with *Artemisia californica*, *Lupinus arboreus* and *Isocoma menziesii* (at Point Conception), as well as other species in other regions, e.g., *Opuntia littoralis*, *Rhus integrifolia* and *Toxicodendron diversilobum*.



**Figure 2-8.** *Lupinus chamissonis – Ericameria ericoides* Shrubland Alliance. At Point Conception, this vegetation type is dominated by mock heather and co-occurs with California sagebrush.

#### Mesembryanthemum spp. – Carpobrotus spp. Herbaceous Semi-Natural Alliance

Of all mapped vegetation types, *Mesembryanthemum* spp. – *Carpobrotus* spp. Herbaceous Semi-Natural Alliance (iceplant mats) is the most common at Point Conception and occupies 24.14 ac (9.77 ha, Table 2-2). Membership into the vegetation alliance requires a strongly dominant relative cover (greater than 80%) which tends to preclude the establishment of most native species (Figure 2-12).

The upper terraces, most of the low-lying dune areas, and southeastern slope at Point Conception are characterized by *Carpobrotus* spp. whereas crystalline iceplant occupied a large portion of

the southeast facing slope of the point as well as a portion of the northwest facing slope (Figure 2-9, Figure 2-10). This species dominated cliff edges on unstable soils and will be challenging to restore due to the topography and increased salinity of the soil caused by crystalline iceplant (Vivrette and Muller 1977).



**Figure 2-9.** *Mesembryanthemum spp. – Carpobrotus spp.* Herbaceous Semi-Natural Alliance; the upper terrace at Point Conception is dominated by *Carpobrotus* spp.



**Figure 2-10.** Crystalline iceplant dominates cliff edges in the foreground and *Carpobrotus* spp. dominates the terrace of Point Conception in the background. Both taxa comprise the *Mesembryanthemum spp. – Carpobrotus spp.* Herbaceous Semi-Natural Alliance.

# Unvegetated and Developed Types

#### California Cliff, Scree & Rock Vegetation Group – Sparsely Vegetated/Barren

The periphery of the Point Conception headland is dominated by unvegetated cliff edges, approximately 6.25 ac (2.53 ha) (Table 2-2, Figure 2-11, Figure 2-12). This area contains pockets of soil which are occasionally colonized by weedy annual species, such as annual iceplant, non-native grasses, etc. However, the majority is dominated by bedrock exposed to salt spray and therefore devoid of vegetation. Due to the instability and lack of soil, no restoration activities are proposed for cliff edges.



**Figure 2-11.** Unvegetated, layered shale cliffs surround the property on three sides and form the California cliff, scree and rock vegetation group.

#### Urban/Developed

Roads, buildings, and other infrastructure compose 0.97 ac (0.39 ha) at Point Conception and are excluded from any proposed restoration activities (Table 2-2, Figure 2-12).



Figure 2-12. Vegetation alliances mapped at Point Conception.

# 2.4 Non-Native Species Occurrences

A total of 31 non-native plant species were documented at Point Conception during the surveys in 2016 and 2017; however, the majority are considered naturalized to the site, e.g., great brome (*Bromus diandrus*). Only eight species were selected for mapping as they reached an acreage threshold warranting specific control strategies. Because non-native plants will be controlled at Point Conception for both aesthetic reasons and native habitat restoration, mapped non-native species occurrences were divided into the following categories:

**Ornamental** – a non-native plant species that was intentionally installed for landscaping purposes. These species may occasionally reproduce naturally. However, they do not *typically* result in ecological degradation of native habitats. Ornamental species are easily eradicable or certain stands are maintained for historical purposes where sprouting seedlings are controlled to prevent further spread.

**Invasive** – a non-native plant species that degrades native habitat by modifying the structure of the environment, changing ecological functions, or competing with native species.

At Point Conception, Australian saltbush was documented mainly within the *Frankenia salina* herbaceous alliance occupying 0.07 ac (0.02 ha) of the property (Table 2-3, Figure 2-14).

Century plant is typically a low-impact species; however, at Point Conception, it appears to be further spreading vegetatively throughout the *Mesembryanthemum* spp. – *Carpobrotus* spp. herbaceous semi-natural alliance. Century plant occupies 0.004 ac (Table 2-3, Figure 2-14).

Crystalline iceplant was the only annual species of the Aizoaceae documented at Point Conception and is an aggressive colonizer of open ground. Crystalline iceplant infested approximately 3.87 ac (1.57 ha) of the property, primarily along the western coast and southern tip of the headland (Table 2-3, Figure 2-13).

Two species of iceplant, *Carpobrotus edulis* and *Carpobrotus chilensis* hybridize and intergrade making identification between the two species challenging (D'Antonio 1993). Therefore, it is frequently lumped and considered by genus. *Carpobrotus* spp. was the most common and widespread invasive plant mapped at Point Conception, covering 29.25 ac (11.84 ha), as well as dominant enough to meet thresholds for its own vegetation alliance. This iceplant was also present within every other vegetation alliance at low levels. Approximately 81% of Point Conception is dominated by this iceplant (Table 2-3, Figure 2-13).

Although endemic to the Monterey Bay area, Monterey cypress is invasive in other regions of California due to its ability to quickly infiltrate and convert scrublands to low-diversity habitat dominated by cypress (California Invasive Plant Council [Cal-IPC] 2014). Monterey cypress is frequently planted in hedgerows or windbreaks and can spread aggressively, particularly after fires. At Point Conception, the 0.24 ac (0.10 ha) historically relevant stand is associated with the lighthouse buildings and is not proposed to be removed (Figure 2-6). However, the ability of this species to spread beyond its current footprint into native vegetation will require treatment of escaping seedlings (Table 2-3, Figure 2-14).

Pig's ear is an ornamental succulent that also exhibits invasive characteristics. At Point Conception, it has spread outward from the buildings into the surrounding habitat, where it occupies 0.02 ac (0.01 ha) within the *Mesembryanthemum* spp. – *Carpobrotus* spp. alliance. (Table 2-3, Figure 2-14).

Red-hot poker has established a large, dense infestation at Point Conception and continues to spread into the surrounding habitat. The largest infestations were at the highest elevation of the site with smaller patches near the lighthouse. Though it is not usually considered an invasive species in wildland settings, but the size, density, and spread of this infestation is concerning at 0.24 ac (0.10 ha) (Table 2-3, Figure 2-14).

Rosea iceplant occupied 2.26 ac (0.915 ha) of the steep slopes on the southern tip of the property within the *Frankenia salina* herbaceous alliance and *Mesembryanthemum* spp. – *Carpobrotus* spp. alliance (Table 2-3, Figure 2-13).

At Point Conception, veldt grass occupied 0.17 ac (0.07 ha) entirely within the *Mesembryanthemum* spp.- *Carpobrotus* spp. Herbaceous Semi-Natural Alliance (Table 2-3, Figure 2-14). Though documented at a low acreage, veldt grass poses a significant threat to the long-term sustainability of native habitat at the site. It is ranked as highly invasive by Cal-IPC, has invaded sandier soils throughout the world, and is particularly dense in coastal habitats on VSFB. Veldt grass causes type conversions of dune habitat to grasslands that support much fewer native plant and animal species (DiTomaso et al. 2013).

During the surveys in 2016 and 2017, the veldt grass infestation could still be controlled if addressed quickly but would likely continue to spread aggressively if left untreated, if restoration efforts open up habitat, or if surrounding infestations at the Dangermond Preserve reinfest the VSFB Point Conception property.

Common Name	Scientific Name	Status	Cal-IPC Panking	Acres of Infested	Acres of	Percent of Property Infested
common Name			Cal-IF C Naliking	Habitat	Infestation	(not including cliffs)
Australian Saltbush	Atriplex semibaccata	invasive	Moderate	0.07	0.01	0.03%
Century Plant	Agave americana	ornamental	Unranked	0.00	<0.01	0.03%
Crystalline Iceplant	Mesembryanthemum crystallinum	invasive	Moderate	3.87	0.31	1.04%
Iceplant species	Carpobrotus spp.	invasive	High	29.79	24.18	81.17%
Pig's Ear	Cotyledon orbiculata	ornamental	Unranked	0.02	<0.01	0.03%
Red-hot Poker	Aloe maculata	ornamental	Unranked	0.24	0.15	0.50%
Rosea Iceplant	Drosanthemum floribundum	invasive	Unranked	2.26	1.43	4.80%
Veldt grass	Ehrharta calycina	invasive	High	0.17	0.04	0.13%
	Tot				26.14	87.75%

**Table 2-3.** Non-native species and their mapped infested acres at Point Conception.

\*Total greater than the area of the property because the value includes overlapping areas.



Figure 2-13. Distribution and cover of iceplant, rosea iceplant, and crystalline iceplant at Point Conception.



**Figure 2-14.** Distribution of Monterey cypress, red-hot poker, Australian saltbush, pig's ear, century plant, and veldt grass distribution at Point Conception.

# 3.0 Restoration Plan

### 3.1 General Restoration Goals

Two over-arching and complementary goals should guide the restoration effort:

- 1. A reduction of invasive species occurrence and cover to open niche space for native species; and
- 2. The establishment of self-sustaining native habitat that is resistant to invasion (although routine maintenance of the site will be necessary to prevent surrounding source populations of non-native species from reinvading the site).

These goals should be pursued while preserving the cultural, educational, and aesthetic value of the site. Implementing a monitoring plan (Section 5.0) and minimization measures (Section 6.0) will protect these resources and ensure that restoration efforts are successful. The ecological and aesthetic value of the site will increase as restoration activities are implemented, providing VSFB with an opportunity to showcase natural resource conservation efforts and complement restoration efforts at the Dangermond Preserve (Section 7.0).

### **3.2 Prioritization Index**

Due to availability of resources and the size of the property, restoration at Point Conception property will require a phased approach to implement non-native control and to reestablish native species. Restoration is also constrained by various factors, such as the need to protect cultural sites and aesthetics during restoration, as well as the lack of a consistent water supply which is needed to provide supplemental irrigation to native outplantings. To balance the various challenges, constraints, and goals, a prioritization index was developed to help guide restoration efforts and methods are described in Appendix B.

Depending on resources available, the project can be approached by starting sequentially in the first Restoration Zone and proceeding to the remaining Zones in a phased approach (Figure 3-1). To guide efforts, the acres of mapped non-native species are also provided by Zone (Table 3-1).



Figure 3-1. Priority Restoration Zones.

	A arras of		Acres of Infestation By Species					Total Assess		
Zone Zone	Zone	Australian Saltbush*	Century Plant*	Crystalline Iceplant	Iceplant species	Pig's Ear*	Red-hot Poker*	Rosea Iceplant	Veldt Grass*	Infestation
1	5.05	-	-	-	4.10	-	-	-	-	4.10
2	4.41	-	-	-	3.58	-	-	-	0.01	3.59
3	4.17	-	-	0.02	3.38	-	0.01	-	-	3.41
4	5.12	-	-	<0.01	4.16	-	-	-	-	4.16
5	5.13	-	-	0.12	4.16	-	-	-	0.04	4.32
6	1.16	0.01	-	0.01	0.94	-	-	0.87	-	1.83
7	2.16	-	<0.01	0.06	1.75	<0.01	0.1	-	-	1.91
8	1.17	-	-	0.05	0.95	-	0.01	0.28	-	1.29
9	1.06	<0.01	-	0.03	0.86	-	-	0.25	-	1.14
10	0.35	-	-	0.02	0.29	-	0.03	0.03	-	0.37
Total	29.79	0.01	<0.01	0.31	24.18	<0.01	0.15	1.43	0.05	26.13

**Table 3-1.** Infested area of non-native species within each Restoration Zone.

\* Priority treatment species, should be treated during the first year of effort rather than in step with Zone treatments.

# 3.3 Native Habitat Type Restoration Objectives

Since historical data on conditions prior to grazing and other impacts at Point Conception are not available, it is difficult to set goals for restoration based on current conditions. However, the remnant native flora documented during the vegetation surveys in 2016, 2017, and 2022 and historical locality records (Appendix A) were used to identify several native habitat types to guide restoration efforts: dune scrub, coastal bluff (windward and leeward), salt spray scrub, low density bluff scrub (in Gaviota tarplant occupied habitat) and swale (Figure 3-2). Additionally, the historically relevant Monterey cypress grove is included for maintenance purposes.

Overall, the general goal at Point Conception to establish these native habitats to a point where they are self-sustaining, self-reproducing, expanding, and exhibiting resistance to reintroduction and re-establishment of invasive plant species with minimal maintenance effort. This objective should be achievable within each Restoration Zone with approximately five consecutive years of effort.



Figure 3-2. Habitat type objectives for Point Conception.

Each Restoration Zone may encompass multiple existing habitat types and objectives, thus requiring different plant species and numbers during the restoration phase. For instance, dune scrub is characterized by bare ground with plants widely spaced, whereas salt spray scrub requires denser planting to retain soil and mimic natural distributions of the often rhizomatous or mat-forming species that typify that habitat type (Table 3-2).

All restoration efforts should be undertaken sequentially by Zone. To calculate the number of outplantings needed for each Zone, at each 10-m x 10-m grid cell, the appropriate density and habitat type objective were evaluated (Table 3-3). The habitat type objectives are discussed below, including each species palette and plant spacing requirements, though total number of plants is defined by the priority Restoration Zone.

- 0		, i ,
Habitat Type Objective	<b>Plants Per Acre</b>	Spacing on Center
Coastal Bluff (leeward)	4529.83	3.5 ft
Coastal Bluff (windward)	4529.83	3.5 ft
Dune Scrub	1541.40	6 ft
Low-density Bluff Scrub	1541.40	6 ft
Salt Spray Scrub	6165.61	3 ft
Swale	3468.15	4 ft

**Table 3-2.** Outplanting densities for habitat type objectives.

Zone	Habitat Restoration	ו	Acres	Number of
	Coastal Bluff (looward)		0.0005	outplantings
1	Dune Scrub		1.0005	2 7578
-	Swale		4.92	/5/8
	JWale	Total	5.05	9046
	Coastal Pluff (looward)	Total	0.92	2700
2	Dune Scrub		2 10	/022
2	Low-density Bluff Scrub		0.39	609
Low-density Bluff Scrub		0.35	005	
	Coastal Dluff (looward)	TOLAI	4.41	9252
	Coastal Bluff (leeward)		1.77	8005
3	Duna Saruh		0.57	2585
	Salt Spray Scrub		1.77	2724
		Total	0.00	12670
	Constal Direff (Incompl)	TOLAI	4.10	13079
	Coastal Bluff (leeward)		4.26	19286
4	Dune Scrub		0.48	/42
	Low-density Bluff Scrub		0.12	182
		Total	4.86	20210
	Coastal Bluff (leeward)		2.26	10254
5	Coastal Bluff (windward)		0.44	1999
-	Dune Scrub		1.54	2367
	Salt Spray Scrub		0.67	4107
		Total	4.91	18727
6	Salt Spray Scrub		1.06	6505
		Total	1.06	6505
	Coastal Bluff (leeward)		0.16	706
7	Coastal Bluff (windward)		1.39	6300
	Salt Spray Scrub		0.17	1071
		Total	1.72	8076
0	Coastal Bluff (windward)		0.01	66
0	Salt Spray Scrub		1.13	6979
		Total	1.15	7044
9	Salt Spray Scrub		1.02	6258
		Total	1.02	6258
	Coastal Bluff (leeward)		0.15	659
10	Coastal Bluff (windward)		0.07	328
	Salt Spray Scrub		0.10	590
		Total	0.31	1578
	Grand	Total	28.64*	99.355

Table 3-3. Outplantings required for each Zone by habitat type objective.

\*Acreage includes only plantable areas. Cliff faces and developed areas are not included in the calculation.

# 3.3.1. Dune Scrub

Dune scrub at Point Conception is characterized by four main shrub species: California sagebrush, mock heather, seacliff buckwheat, and giant coreopsis (Table 3-4). Outplantings should be grown in 2" to 4" pots and installed at 6.0 ft (1.8 m) on center. This habitat type is appropriate to establish at the northeastern portion of the property in the rolling dunes (Figure 3-2).

	Common Name	Species	Proportion
	California sagebrush	Artemisia californica	15%
	Mock heather	Ericameria ericoides	15%
q	Seacliff buckwheat	Eriogonum parvifolium	15%
e Scrul	Giant coreopsis	Leptosyne gigantea	15%
	Morningglory	Calystegia macrostegia	10%
unc	Lizardtail	Eriophyllum staechadifolium	10%
	Rush broom	Acmispon junceus	5%
	California aster	Corethrogyne filaginifolia	5%
	California croton	Croton californicus	5%
	Menzies' goldenbush	Isocoma menziesii	5%

Table 3-4. Dune scrub species palette.

# 3.3.2. Coastal Bluff (Leeward)

Based on the prevailing winds, a central portion of the property falls on the leeward side of the headland and will be installed with coastal bluff species: California sagebrush, mock heather, seacliff buckwheat, California sunflower (*Encelia californica*), Menzies' goldenbush (*Isocoma menziesii*), and lemonade berry (*Rhus integrifolia*) (Table 3-5, Figure 3-2). California sagebrush and mock heather will be planted at the greatest proportion. Outplantings should be grown in 2" to 4" pots and installed at 3.5 ft (1.07 m) on center.

	Common Name	Species	Proportion
Coastal Bluff Leeward	California sagebrush	Artemisia californica	25%
	Mock heather	Ericameria ericoides	25%
	Seacliff buckwheat	Eriogonum parvifolium	20%
	California sunflower	Encelia californica	10%
	Menzies' goldenbush	Isocoma menziesii	10%
	Lemonade berry	Rhus integrifolia	10%

 Table 3-5. Coastal bluff leeward species palette.

### **3.3.3.** Coastal Bluff (Windward)

Coastal bluff species that can withstand the winds and harsher conditions will be planted on the north and northwest facing bluffs and margins of the site in a strip along the western edge (Figure 3-2). The most common plant in this habitat type is giant coreopsis with other scrub species such as seacliff buckwheat, lizard tail, and Menzies' goldenbush mixed throughout (Table 3-6). Outplantings should be grown in 2" to 4" pots spaced at 3.5 ft (1.07 m) intervals.

Though the primary method for supplemental watering will be via drip irrigation (Section 3.6), wind exposure in this habitat type can be leveraged to determine if alternative methods of irrigation such as fog capture devices and/or condensation harvesting (Section 3.6) can be utilized successfully.

	Common Name	Species	Proportion
	Giant coreopsis	Leptosyne gigantea	20%
Ŧ Ŧ	Seacliff buckwheat	Eriogonum parvifolium	15%
Coastal Blu <sup>†</sup> Windward	Lizardtail	Eriophyllum staechadifolium	15%
	Menzies' goldenbush	Isocoma menziesii	15%
	California sagebrush	Artemisia californica	10%
	Mock heather	Ericameria ericoides	10%
	Lemonade berry	Rhus integrifolia	10%
	Coyote bush	Baccharis pilularis	5%

#### Table 3-6. Coastal bluff windward species palette.

#### **3.3.4.** Low Density Bluff Scrub – Gaviota Tarplant Locality

Habitat type objectives surrounding the Gaviota tarplant locality are composed of coastal bluff species. However, within the Gaviota tarplant locality, the area is characterized by deflated soils and hard pan with a different composition of widely spaced bluff scrub species. For this reason, this area warrants a different outplanting palette dominated by coast dudleya (Dudleya caespitosa), common gumplant (Grindelia camporum), rush lotus (Acmison junceus var. junceus), seacliff buckwheat, and Menzies' goldenbush (Table 3-7). Plants should be grown in 2-4" containers and installed at 6 ft (1.8 m) on center.

	Common Name	Species	Proportion
Low-density Bluff Scrub	Coast dudleya	Dudleya caespitosa	20%
	Common gumplant	Grindelia camporum	15%
	Rush lotus	Acmispon junceus var. junceus	15%
	Seacliff buckwheat	Eriogonum parvifolium	25%
	Menzies' goldenbush	Isocoma menziesii	25%

 Table 3-7. Low density bluff scrub species palette.

#### 3.3.5. Swale

The swale at the pump house is dominated by a thick mat of Baltic rush with scattered marsh baccharis plants and will not require extensive restoration effort other than supplementation (Figure 3-2). Primarily, the addition of red willow (Salix laevigata) to the swale species composition will add vertical structure and increase the cover for marsh baccharis (and Baltic rush) thereby reducing evapotranspiration (Table 3-8).

Table 3-8. Swale species palette.					
e	Common Name	Species	Proportion		
Swal	Marsh baccharis	Baccharis glutinosa	50%		
	Red willow	Salix laevigata	50%		

Table 2.9 Swale species palette

# 3.3.6. Salt Spray Scrub

Salt spray scrub species exist on sandy saline soils, typically exposed to wind or ocean spray and are currently present in a small patch on the north aspect of the lower terrace below the lighthouse (mapped as *Frankenia salina* Herbaceous Alliance; Figure 2-12). This habitat type should exist in a greater area throughout the lower terrace extended upwards onto the northerly aspect of the upper terrace (Figure 3-2). At Point Conception, this habitat is marked by numerous lizardtail and Menzie's goldenbush. For that reason, the greatest proportion of outplantings include lizardtail, Menzies' goldenbush, followed by California saltbush (*Atriplex californica*), saltgrass, seacliff buckwheat, alkali heat, pickleweed, and wooly seablight (Table 3-9). Outplantings should be grown in 2" to 4" pots spaced at 3 ft on center.

	Common Name	Species	Proportion
	Lizardtail	Eriophyllum staechadifolium	15%
q	Menzies' goldenbush	Isocoma menziesii	15%
cru	Ocean bluff milk vetch	Astragalus nuttallii	10%
S YE	California saltbush	Atriplex californica	10%
Spr	Saltgrass	Distichlis spicata	10%
alt	Seacliff buckwheat	Eriogonum parvifolium	10%
S	Alkali heath	Frankenia salina	10%
	Pickleweed	Salicornia pacifica	10%
	Wooly seablight	Sueada taxifolia	10%

 Table 3-9.
 Salt spray scrub species palette.

The primary challenge to restoration where salt spray scrub is the habitat type objective is the extreme slope and risk of erosion posed by removing the existing vegetation on the hillside adjacent to the lighthouse (Zones 8 and 9; Figure 3-1). Restoration in Zones 8 and 9 needs to be conducted utilizing a different strategy and implementation plan than all other zones to prevent catastrophic erosion. Therefore, a phased approach was developed, where the hillside was divided into five sets of 6-ft (1.8-m) wide, horizontal bands that will be treated over the course of five years (Figure 3-3), followed by outplanting installation the year following treatment. This progression and phasing will allow non-native species to be treated and killed along isolated sections of the slope, thus minimizing any potential destabilization, followed by plant installation of each treated section in the subsequent year. Over the course of five years, the entire slope will have been treated at least once, but native outplantings installed in the intervening years will be at various stages of growth and providing erosion control with deeper root structures as compared to non-native iceplant. Because the strategy required for Zones 8 and 9 are different than the others, these are listed separately in the timeline presented in Section 6.0.

Soil stabilization devices such as straw wattles, mulch, jute netting, etc. may be necessary depending on the rate of establishment of plantings, rainfall levels, and micro-scale soil conditions. In addition, for the safety of personnel performing herbicide treatments and installing plants, either harnesses or suspended scaffolding will be necessary when working in Zones 8 and 9. Anchor points will need to be installed at various positions along the top of the hill and the hill side as the work progresses in this area.



Figure 3-3. Phased restoration approach in Zones 8 and 9.

### **3.3.7.** Monterey Cypress Grove

The Monterey cypress grove will be maintained at its current extent because of its historical importance. However, regular monitoring of the area surrounding the grove should identify seedlings that will be controlled before they establish or escape into adjacent habitats. The following section provides treatment recommendations for Monterey cypress seedlings.

# 3.4 Non-Native Species Management

Depending on access, terrain, the size of infestation, and the treatment efficacy tailored to the species, MSRS proposes to use a variety of chemical and manual methods to treat non-native plants species (Table 3-10).

For large scale non-native plant infestations on flatter terrain, MSRS proposes to utilize ATVmounted spray rigs. Access will either be from paved roads or over non-native iceplant thatch so as not to disturb native mineral soils.

For smaller scale infestations, steeper terrain, and/or in areas with scattered inclusions of native plants, MSRS proposes to use low-pressure backpack sprayers.

In areas with densely mixed native and non-native plants such as occupied Gaviota tarplant habitat or near the swale, MSRS recommends using ultra-low volume (ULV) sprayers that allow for quick application of concentrated product in a fashion similarly to a sponge or wick application that ensures a precisely targeted application to non-native plants within a matrix of natives (Figure 3-4).

ULV sprayers allow application of herbicide in these mixed stands without having the same collateral damage as traditional backpack sprayers. ULV sprayers use very small amounts of full-concentration herbicide that is emitted as a fine mist from the nozzle, which fits between or even underneath non-target plants, allowing for precision application to only the target plant. A round spray hood isolates the nozzle and protects non-target plants from off-target drift.



**Figure 3-4.** Left: Mankar<sup>®</sup> 8" HQ20 model ULV sprayer. Right: Potential application for the Mankar ULV sprayer within a dense matrix of native saltgrass, alkali heath and milkvetch embedded within a non-native rosea iceplant infestation.

Species	Treatment Recommendations			
Australian Saltbush	<u>Chemical</u>			
	ULV sprayer application: 100% glyphosate			
	Foliar low backpack sprayer: 2% glyphosate			
	Manual			
	Hand pull: if near native plants, hand pull in a "halo" to			
	ensure no collateral damage			
	Chemical			
Century Plant	<i>Cut stump:</i> ground level, apply 10% imazapyr to main stem			
,	& remove all biomass			
Coppery Iceplant	Chemical			
	Foliar low backpack sprayer: 2% glyphosate/1% imazapyr			
	mix			
Crystalline Iceplant	Chemical			
	<i>Foliar low backpack sprayer:</i> 2% glyphosate, if near native			
	saltgrass (Disticlis spicata) 1% triclopyr			
	Chemical			
	ATV-mounted skid sprayer: for large scale infestations, 2%			
	glyphosate/1% imazapyr mix & leave thatch in place			
Iceplant species	Foliar low backpack sprayer: 2% glyphosate/1% imazapyr			
	mix & leave thatch in place, if near swale habitat 1.5%			
	glyphosate only			
	ULV sprayer : 100% glyphosate near swale habitat			
	Small Seedlings/Saplings			
	Chemical			
	Foliar low backpack sprayer: 2% glyphosate/1% imazapyr			
Monterey Cypress	mix			
(escapees outside	Manual			
planted grove's historical	Hand pull			
cherry,	Reproductive Small Trees			
	Chemical			
	Cut stump: 10% imazapyr			
	Chemical			
Pig's Ear	Foliar low backpack sprayer: 2% glyphosate/1% imazapyr			
	mix			
	Chemical			
	Foliar low backpack sprayer: 2% glyphosate/1% imazapyr			
Red-hot Poker	mix			
	Manual			
	Hand pull			
	Chemical			
	ULV sprayer application: 100% glyphosate; may require a			
	retreatment after 6 months			
Rosea Iceplant	Foliar low backpack sprayer: 2% glyphosate			
	Manual			
	Hand pull: if near native plants, hand pull in a "halo" to			
	ensure no collateral damage			
	Chemical			
Veldt Grass	Foliar low backpack sprayer: 2% glyphosate/1% imazapyr			
	mix or 4% clethodim (2 treatments: ~February & ~April)			

Table 3-10.	Specific	treatment	recommendations	by s	pecies.
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# 3.5 Native Outplantings

### 3.5.1. Seed Collection

Commercially available native seed is not recommended for use at Point Conception because the plants that occur there are uniquely adapted to its microclimate and commercial seed is usually of uncertain provenance, very unlikely to be collected near Point Conception, and may introduce non-native genotypes. Source populations of native plants occur in sufficient quantity at or near Point Conception to collect enough seed to produce container plants, but they would not supply sufficient material for broadcast seeding. Although container plants require additional maintenance, such as supplemental irrigation and weeding, they tend to result in greater success in establishing self-sustaining shrubs than broadcast seeding.

Propagule material should be collected in late summer or early fall, depending on the phenology of each species, from Point Conception or the adjacent Dangermond Preserve, if necessary, in cooperation with The Nature Conservancy (TNC). Enough material should be collected to propagate the total number of plants for each priority Restoration Zone to be planted (Table 3-3) with the proportion of species listed in Table 3-4 through Table 3-9. Seedlings should be propagated in 2" to 4" containers and installed during the rainy season, ideally after soils have saturated and more rain is forecasted, generally January through March. Plants may be installed later, if given supplemental watering.

### 3.5.2. Basin Creation and Outplanting Installation

Outplanting basins serve to retain irrigation and rainwater around native plantings thereby increasing the chance of successful installation. Several methods for basin creation are proposed below and will vary depending on the terrain in each priority Restoration Zone. In all instances, MSRS proposes to leverage previously treated and desiccated iceplant thatch as "mulch" around native outplantings to increase the success of outplanting survival, rather than importing off-site mulch materials. Most basins would be created directly into desiccated iceplant thatch.

#### Hand Tools

In compact soil locations or on steep slopes, hand trowels, hoes or pick mattocks should be used to make 2" deep basins for each plant. Outplantings should be installed using a dibbler to minimize disturbance to native soil (Figure 3-5).



Figure 3-5. Utilizing a dibbler tool to install native outplantings minimizes disturbance to mineral soils.

### Earth Auger

Where there is level ground and uncompacted soil, basins for container plants should be created using an earth auger with a modified drill bit that digs a 4" deep planting hole while simultaneously creating a 17.5" diameter and 2" deep basin (Figure 3-6). The mechanized and simultaneous creation of both holes and basins enables rapid installation of a large numbers of container plants in a short period; however, this method is not suitable on slopes or in highly compacted soils.



Freshly Installed 2-inch Container Planting March 2019

Established Planting with Mulch and Drip Irrigation June 2019

**Figure 3-6.** Example of digging hole and basin for outplanting installation with an earth auger and modified drill bit. Note: no foreign mulch material is proposed for restoration at Point Conception. Rather, the remaining treated iceplant thatch will serve as mulch for outplantings.

#### **Light Duty Excavator**

At other restoration sites on VSFB, a light duty, track tire, mini excavator has been successfully utilized at efficiently creating hundreds of shallow basins for native outplanting installation with no impacts to sensitive resources (Figure 3-7).

Following the first year of iceplant treatments and/or once iceplant thatch has desiccated sufficiently, MSRS recommends employing the use of a light duty excavator to excavate outplanting basins just through the organics layer (iceplant thatch) to the surface of mineral soils, but not disturbing native mineral soils.

Once all basins have been created by the light duty excavator in the priority Restoration Zone, technicians should install outplantings utilizing a dibbler so as not to disturb mineral soils (Figure 3-5).

Light duty excavators should only be driven on treated iceplant thatch/organics layers and never directly on mineral soils.



Figure 3-7. Light duty, track tire excavator basin creation on Vandenberg Space Force Base.

Following any of these basin creation methods (e.g., hand tools, earth auger, mini excavator), as the holes are created, plants can be removed from their containers and placed into the holes and backfilled with a native soil by hand. If irrigation has not yet been installed, approximately ¼ to ½ gallon of water should be applied to each plant to provide supplemental moisture and ensure good contact between the roots and soil.

# 3.6 Supplemental Watering

Supplemental watering can significantly improve survival and growth rates of native outplantings, as has been shown at other restoration sites on VSFB (e.g., San Antonio Creek Restoration Project; MSRS 2016). Irrigating outplantings at Point Conception will be challenging because there is no municipal source of water available nearby. Instead, one or more water tanks should be placed at the concrete/asphalt pad at or near the highest point on the site (Figure 3-8) and connected to above ground irrigation lines that can provide water to outplantings through drip lines. The tank(s) would need to be routinely filled from a water truck; approximately once

every two weeks during spring through fall. Alternatively, a water trailer with an automatic shutoff valve could be used. The advantage of using a water trailer would be that it could be moved around the site, require less irrigation line, and removed when not in use. Much of the property can be fed by gravity, but some areas on the eastern portion may need to be assisted by small solar powered pumps.

Following a small pilot study to determine success, western and northwestern edges of the property may be irrigated using a fog capture watering system. These devices may have variable designs, but generally work by condensing fog on loosely woven fabric and allowing it to drip directly onto a plant's root zone (Figure 3-9). Fog capture devices have been successfully deployed locally on the Channel Islands modifying designs from South America (Bernard et al. 2016).

An experimental array of fog capture devices should be installed to test efficacy of this method for the site, determine whether enough fog is available to provide useful irrigation, and determine the distribution of suitable sites for placement. After test array results are analyzed, individual fog collectors can be used to provide supplemental water to outplantings in suitable areas during subsequent years of restoration effort (Figure 3-9). Each device can be positioned to water one or two plants and can be moved to new plantings each year.

Additionally, passive condensation harvesting may be employed as an alternative supplemental water source, particularly in windward aspects (Figure 3-10). As observed by MSRS on San Miguel and San Nicolas Islands, metal conduit poles act as a "catch" to water vapor in the air. Once in contact with the pole, water vapor condenses along the length of the pole wherein water can drip into the root zone of outplantings (Figure 3-10). This is an effective and low-effort way to provide consistent watering to outplantings; however, a small experimental design would also need to be implemented to determine the locations throughout the property that are most effectively harvesting condensation and ultimately the total number of poles to be installed.



Figure 3-8. Proposed water tank location.



**Figure 3-9.** Two fog capture device styles from Santa Rosa Island. Left: Test array square style with gutter flowing to catchment. Right: "sail" style for use with individual plant in a restoration site.



**Figure 3-10.** Metal conduit pole installed on San Nicolas Island effectively harvests water vapor producing condensation that can be leveraged for watering native outplantings.
# 4.0 Minimization Measures

Implementation of the following minimization measures would eliminate or minimize potential adverse effects to various sensitive resources at Point Conception during implementation of this Restoration Plan. Qualified personnel shall oversee the implementation of all measures.

## 4.1 Archaeological and Historical Resources

Archaeologic surveys are not complete at Point Conception, but several documented sites should be considered during restoration activities (C. Ryan, pers. comm.). Midden sites, a large flake scatter, and the historical lighthouse and outbuildings, as well as historical midden heaps or refuse piles have all been documented. The following minimization measures for archaeological resources are designed to achieve complete avoidance of potential impacts:

- Prior to implementation of restoration activities, complete a survey of the property to determine the extent and nature of archaeological sites.
- Any artifacts found will be documented and reported to VSFB Archaeologists. No artifacts (including modern refuse) shall be removed from the site.
- There will be no vehicle use off existing paved roads or disturbed surfaces/iceplant thatch.
- All iceplant treated at an archaeology site will be left in place so that as the iceplant dies, it creates a mulch that is protective against erosion while native vegetation establishes.
- If installation of outplantings is necessary in any archeological site, it would be performed by hand tools (e.g., dibbler) to a depth of 4"-7" deep (depending on the container size) and under supervision of a qualified archaeological monitor.

## 4.2 Marine Mammals and Nesting Birds

Marine mammals haul out in the sandy coves and rocks surrounding the base of the cliffs around Point Conception. A variety bird species protected under the Migratory Bird Treaty Act also nest at the property. Minimization of effects to these animals would primarily consist of temporal and spatial avoidance. The following minimization measures would be employed to ensure marine mammals are not harassed and nesting birds are not disturbed:

- Personnel will not approach cliff edges to the extent where they would be visible to pinnipeds at the haulouts below or nesting birds using cliff walls (this measure is also necessary for personnel safety).
- Personnel will not conduct any work on the beaches or cliffs surrounding Point Conception.
- During nesting season (15 February through 15 August), work areas will be surveyed by a qualified biologist for nesting birds protected under the Migratory Bird Treaty Act prior initiating activities. If nesting birds are detected, an appropriate buffer around the nest(s) would be determined by the biologist and avoided until the biologist determines the nestlings have fledged.

# 4.3 Gaviota Tarplant

Gaviota tarplant impacts will be minimized or avoided during non-native plant treatments and restoration activities by implementation of the following measures:

- Prior to implementation of restoration activities, the site will be surveyed for Gaviota tarplant and any occupied habitat documented and marked for avoidance by a qualified biologist.
- If it is necessary to control non-native species in any areas occupied by Gaviota tarplant, the work will be performed by one or more of the following methods:
  - When Gaviota tarplant is not dormant:
    - Hand removal of non-native species under supervision of a qualified biologist; or
    - Herbicide application with Mankar ULV sprayers that eliminate potential drift and non-persistent herbicides only under supervision of a qualified biologist.
  - When Gaviota tarplant is dormant:
    - Hand removal of non-native species; and/or
    - Spot herbicide treatments with low-pressure backpack sprayer and nonpersistent herbicide.

## 4.4 Seacliff Buckwheat

Although the *Euphilotes* butterfly in the VSFB area is no longer legally protected and has not been documented at the site, this species may be found at the property in the future because of the presence of relatively large stands of seacliff buckwheat and nearby localities. Since this *Euphilotes* species is likely a distinct population with limited geographic range and may warrant future protection, VSFB has directed project proponents to avoid damaging seacliff buckwheat when practicable. Therefore, the following measures will be employed:

- If necessary, herbicide applications within two ft of seacliff buckwheat would use nonpersistent chemicals only and be applied using ULV sprayers or wick application methods. Collateral damage to seacliff buckwheat because of drift would be avoided to the extent practicable.
- No ground-disturbing activities (e.g., outplanting installation) would occur within two ft of seacliff buckwheat.

# 5.0 Restoration Monitoring Plan

Regular assessments of the effectiveness of non-native plant control, native outplanting survivorship, and the Gaviota tarplant population will help guide restoration efforts to achieve the final restoration objectives.

## 5.1 Restoration Success Criteria

As each restoration is initiated within each priority Restoration Zone, an 80-percent control rate of the target species should be achieved after the first year of treatments. Follow-up treatments and installation of outplantings should ensure each Zone is at greater than 90-percent control of the target non-natives by the third year of treatments and at least a 95-percent control by year fifth year.

Through the control of the target invasive species and provision of supplemental irrigation, 75 percent survival of outplantings is expected one year after planting. If this criterion is not achieved, an evaluation of factors that may have affected survival should be performed, including species-specific survival, locations and distribution of dead plants, and irrigation, among other potential factors. Replacement outplantings should be installed the second year but should be informed by this evaluation so that corrective actions can be included, for instance, installing the species that had greater survival success, changing species palette if certain locations had particularly poor survival, or changing irrigation regime to improve survivorship.

By the fifth year of restoration efforts within each Zone (with the exception of late phases in Zones 8 and 9), the outplantings should be self-sustainable without irrigation, showing signs of growth and reproduction and increasing cover.

# 5.2 Grid-based Monitoring Protocol

Recent developments in mobile technology and spatial data management tools have allowed significant advances in tracking invasive plant infestations and their control methods through time. Leveraging mobile technology and cloud-based data abilities, MSRS has developed a novel approach to data management that addresses the difficulties of comparing and tracking plant polygons through time while visualizing background layers in the field. This mapping and data management system incorporates a nested grid system that is scalable for the treatment target(s) and achieves the goals of 1) collecting spatial data quickly and effectively (reducing data entry and improving data integrity); 2) allowing for a TRUE comparison of the extent and cover of infestations through time and space; 3) providing field technicians real-time historical context on past infestations; and 4) allowing project managers access to data in near real-time.

This methodology centers on the concept of collecting data that is attributed to each grid cell. The fixed grid cells are permanent sampling or census units in which data on the abundance, extent, density, and/or treatment methodologies can be analyzed and evaluated against a static framework through time.

To use the grid system in the field, a global positioning system (GPS) -equipped mobile device running Esri's mobile data collection platform Collector for ArcGIS displays orthoimagery overlaid

with 10-m grid cells and feature classes of any prior invasive plant treatment, as well as Gaviota tarplant occurrences and minimization measure requirements for each cell.

Utilizing the grid system, herbicide applicators will estimate and record the following parameters for each grid cell during every treatment effort within each Zone:

- Percent dead and live cover for each target invasive species.
- Percent overall dead and live cover for native and non-native species.
- Amount (volume and formulation) of herbicide(s) applied.

These parameters allow for spatial and temporal evaluation of the success criteria for invasive species control.

In addition, the number of native outplantings and survivorship success will be recorded using the grid system so that survivorship data are spatially coincident with non-native species control efforts and other grid-based data. During subsequent annual monitoring, survivorship per species will be recorded for a randomly chosen subset of 5% of the grid cells within the Zone planted the prior year.

Gaviota tarplant monitoring will be performed annually using the grid system as well. Since the stand is small, a qualified biologist will map Gaviota tarplant in late summer using a sub-meter GPS unit, the perimeter of the stand will be delineated. Individual plants that are greater than 10 m from the main population will be mapped as separate outlying occurrences. These data will be overlaid onto the grid and allow VSFB to track the maintenance and annual variation in extent and size of the population in relation to restoration efforts.

# 6.0 Restoration Timeline

Table 6-1 through Table 6-5 outline restoration and monitoring activities by month based on a five-year plan to fully restore Priority Zones. Based on available resources, restoration efforts may proceed in a single Zone, multiple Zones concurrently, or in a staged approach where different Zones are in different stages of restoration. The timeline below is based on the implementation year (Year One) which would be initiated whenever implementation begins in a Priority Zone. This plan is therefore intended to be flexible so that the level of effort can proceed based on VSFB priorities and levels of funding.

Site-wide activities, e.g., veldt grass control, are listed separately from Zone-specific activities on the annual timelines below. For each cycle of the five-year plan, most effort is performed during the first and second years, with the first year directed at preparing the Zone for native plant installation by reducing non-native species cover and propagating seedlings, and the second year primarily focused on installing outplantings and irrigation. After the second year of effort within each Zone, the effort is concentrated to follow-up treatments as necessary as native plants are given time to grow and reproduce. Monitoring will be performed throughout the five years.

After the initial five years of restoration, maintenance of each Zone would be ongoing and include control of non-native species (new and previously identified) and seeding, propagating, and planting native plants as needed following the methods presented in this Plan.

Year One	January	February	March	April	May	June	July	August	September	October	November	December
te-Wide Year One Activities												
Red-hot Poker, Pig's Ear, Monterey Cypress, and Century Plant												
Treatment												
Veldt Grass Treatment (2 separate treatments)												
Seed Collection												
Plant Propagation												
Priority Zone Year One Non-Native Species Treatment*												
Iceplant species												
Rosea and Crystalline Iceplant												
Australian Saltbush												
Site-wide and Priority Restoration Activities						· · ·		-				
Fog Collector Experimental Design Implementation												
Site-wide and Priority Zone Monitoring												
Non-Native Species Baseline Monitoring Assessment												
Baseline Gaviota Tarplant Monitoring Assessment												

 Table 6-1.
 Year One restoration actions.

Year Two	January	February	March	April	May	June	July	August	September	October	November	December
ite-Wide Year Two Activities												
Red-hot Poker, Pig's Ear, Monterey Cypress, and Century Plant												
Follow-up												
Veldt Grass Follow-up												
Seed Collection for Future Priority Zones												
Priority Zone Year Two Non-Native Treatment Follow-up*												
Iceplant species												
Rosea and Crystalline Iceplant												
Australian Saltbush												
Priority Zone Restoration Activities						-			-			
Outplanting												
Install Fog Capture Devices												
Install Supplemental Drip-Line Irrigation												
Plant Propagation if needed												
Site-wide and Priority Zone Monitoring	Site-wide and Priority Zone Monitoring											
Non-Native Control Success												
Outplanting Success												
Gaviota Tarplant												

 Table 6-2.
 Year Two restoration actions.

Year Three	January	February	March	April	May	June	July	August	September	October	November	December
Site-Wide Year Three Activities												
Veldt Grass Follow-up (if needed)												
Priority Zone Year Three Non-Native Treatment Follow-up*					•							
Iceplant species												
Rosea and Crystalline Iceplant												
Australian Saltbush												
Priority Zone Restoration Activities												
Replant mortalities												
Site-wide and Priority Zone Monitoring												
Non-Native Control Success												
Outplanting Success												
Gaviota Tarplant												

 Table 6-3.
 Year Three restoration actions.

Year Four	January	February	March	April	May	June	July	August	September	October	November	December
Site-Wide Year Four Activities	ite-Wide Year Four Activities											
Veldt Grass Planting (if delayed from year three)												
Veldt Grass Plantings Supplemental Irrigation (if needed)												
Seed Collection for Future Priority Zones												
Priority Zone Year Four Non-Native Treatment Follow-up*												
Iceplant species												
Rosea and Crystalline Iceplant												
Australian Saltbush												
Priority Zone Restoration Activities												
Remove Irrigation												
Site-wide and Priority Zone Monitoring												
Non-Native Control Success												
Outplanting Success												
Gaviota Tarplant												

 Table 6-4.
 Year Four restoration actions.

Year Five	January	February	March	April	May	June	July	August	September	October	November	December
Site-Wide Year Five Activities												
Monterey Cypress Seedling Treatment												
Veldt Grass Follow-up (if needed)												
Seed Collection for Future Priority Zones												
Priority Zone Year Five Non-Native Treatment Follow-up*	Priority Zone Year Five Non-Native Treatment Follow-up*											
Iceplant species												
Rosea and Crystalline Iceplant												
Australian Saltbush												
Priority Zone Restoration Activities												
			No act	tivities								
Site-wide and Priority Zone Monitoring												
Non-Native Control Success												
Outplanting Success												
Gaviota Tarplant												

 Table 6-5.
 Year Five restoration actions.

# 7.0 Collaboration Opportunities with The Nature Conservancy

Immediately surrounding VSFB's Point Conception property is the 24,364 ac (9,860 ha) Dangermond Preserve, a nature preserve managed by TNC. VSFB (particularly staff in the Environmental Assets division) and TNC staff at Dangermond cooperate closely on topics in land management given the proximity and similarity of land.

Both VSFB and TNC have similar conservation-based goals for the restoration of both properties. Currently, TNC is required to restore ~300 acres of iceplant denuded habitat just north of VSFB's Point Conception property under orders from the California Coastal Commission. Before implementing this project, TNC first engaged with local partners to design a pilot study that will aid in determining the most efficient method to control iceplant species in upland areas (290.6 ac) and throughout their headland bypass dune system (22.6 ac) to restore native habitats within an approximately five-year timeline (Figure 7-1). Implementation began in July 2022 for the pilot study.

Between VSFB's Point Conception property and Dangermond's upland and dune restoration area, 11.9 ac remain on Dangermond's property that are not currently planned for restoration efforts (Figure 7-1). This area as well as the northern extent of VSFB's Point Conception property are appropriate for dune scrub restoration. Restoring this interstitial area will connect both TNC and VSFB property and promote protection from non-native plant incursions and overall increased ecosystem-wide resiliency.

Following approximately two years of implementation and monitoring on both properties, MSRS recommends that VSFB, TNC, and project implementors collaborate to identify any restoration results that could mutually benefit both partners in restoration endeavors. Methods identified at one property may adaptively be implemented at the other property to foster cross-pollination and increase restoration success.

Finally, other opportunities for collaboration exist such as cross-property seed collection efforts. To promote local genetic integrity of native outplantings, VSFB and TNC should cooperate to allow seed collection to occur across properties to obtain the necessary amount of material from requisite species.



Figure 7-1. Collaborative restoration opportunities with Dangermond and Vandenberg's Point Conception properties.

# 8.0 Literature Cited

- Bernard, R., McEachern, K., and Niessen, K. 2016. Irrigation Efficiency of Santa Rosa Island Cloud Forest Restoration Project. California Polytechnic State University Digital Commons, San Luis Obispo, California.
- Calflora. 2017. What Grows Here Tool. Available online: https://www.calflora.org/ entry/wgh.html. Accessed February 2017.
- [Cal-IPC] California Invasive Plant Council. 2014. California Invasive Plant Inventory Database. [online]: http://www.cal-ipc.org/ip/inventory/weedlist.php. Retrieved August 2016.
- D'Antonio, C.M., D.C. Odion, C.M. Tyler. 1993. Invasion of maritime chaparral by the introduced succulent Carpobrotus edulis. Oecologia. 95(1): 14-21.
- DiTomaso et al. 2013. Weed Control in Natural Areas in the Western United States. University of California Weed Research & Information Center, Davis, California.
- Dorman, C. E., and Winant, C. D. 2000. The structure and variability of the marine atmosphere around the Santa Barbara Channel. Monthly Weather Review, 128(2): 261-282.
- Dupuis, J. R., Geib, S. M., Osborne, K. H., and Rubinoff, D. 2020. Genomics confirms surprising ecological divergence and isolation in an endangered butterfly. Biodiversity and Conservation. https://doi.org/10.1007/s10531-020-01950-6.
- Mikesell, M. W. 1954. The Changing Role of The Port of Santa Barbara. The Historical Society of Southern California Quarterly, 36(3): 238-244.
- ManTech SRS Technologies, Inc [MSRS]. 2016. San Antonio Creek Clean Water Act Section 404 Compliance – Year-6 Monitoring and Maintenance Report 2016. Prepared for 30th Civil Engineer Squadron, Installation Management Flight, Environmental Assets. 37 pp.
- MSRS. 2017. Point Conception Property Restoration Plan, Vandenberg Air Force Base, California. Prepared for 30th Space Wing Installation Management Flight, Environmental Conservation, Vandenberg Air Force Base, California. ManTech SRS Technologies, Inc., Lompoc, California. 72 pp.
- MSRS. 2021. 2020 Flight Season Surveys for Buckwheat Blue Butterflies (Euphilotes spp.). Prepared for 30th Space Wing Installation Management Flight, Environmental Conservation, Vandenberg Air Force Base, California. ManTech SRS Technologies, Inc., Lompoc, California. 37 pp.
- Sawyer, J. O., Keeler-Wolf, T. and Evens, J. M. 2009. A Manual of California Vegetation. 2nd Edition. California Native Plant Society Press, Sacramento, California.
- Smith, C. F. 1998. A flora of the Santa Barbara region, California. 2nd Edition. Santa Barbara Botanic Garden and Capra Press. Santa Barbara, California.
- Vivrette, N.J. and Muller, C.H., 1977. Mechanism of invasion and dominance of coastal grassland by Mesembryanthemum crystallinum. Ecological Monographs, 47(3), pp.301-318.

Wildscape Restoration. 2009. Classification Notes. Vandenberg Air Force Base Vegetation Mapping Project. Wildscape Restoration, Inc. Ventura, California.

# Appendix A. Documented Plant Species at VSFB's Point Conception

Family	Scientific Name	Native	Source of Record
Agavaceae	Agave americana	No	E. Howe Field obs.
Aizoaceae	Carpobrotus chilensis	No	E. Howe Field obs.
Aizoaceae	Carpobrotus edulis, limited C. chilensis	No	E. Howe Field obs.
Aizoaceae	Drosanthemum floribundum	No	E. Howe and S. Junak Field obs.
Aizoaceae	Malephora crocea	No	E. Howe and S. Junak Field obs.
Aizoaceae	Mesembryanthemum crystallinum	No	E. Howe and S. Junak Field obs.
Aizoaceae	Tetragonia tetragonioides	No	S. Junak- Field obs.
Amaryllidaceae	Narcissus sp.	No	E. Howe and S. Junak Field obs.
Anacardiaceae	Rhus integrifolia	Yes	E. Howe and S. Junak Field obs.
Apiaceae	Daucus pusillus	Yes	E. Howe and S. Junak Field obs.
Asphodelaceae	Aloe maculata	No	E. Howe and S. Junak Field obs.
Asteraceae	Achillea millefolium	Yes	Calflora
Asteraceae	Ambrosia chamissonis	Yes	E. Howe and S. Junak Field obs.
Asteraceae	Artemisia californica	Yes	E. Howe and S. Junak Field obs.
Asteraceae	Baccharis glutinosa	Yes	E. Howe and S. Junak Field obs.
Asteraceae	Baccharis pilularis	Yes	E. Howe and S. Junak Field obs.
Asteraceae	Cirsium occidentale var. coulteri	Yes	Calflora
Asteraceae	Cirsium occidentale var. occidentale	Yes	E. Howe and S. Junak Field obs.
Asteraceae	Cirsium rhothophilum	Yes	Calflora
Asteraceae	Leptosyne gigantea	Yes	E. Howe and S. Junak Field obs.
Asteraceae	Corethrogyne filaginifolia var. filaginifolia	Yes	E. Howe and S. Junak Field obs.
Asteraceae	Deinandra increscens ssp. villosa	Yes	E. Howe and S. Junak Field obs.
Asteraceae	Encelia californica	Yes	E. Howe and S. Junak Field obs.
Asteraceae	Ericameria ericoides	Yes	E. Howe and S. Junak Field obs.
Asteraceae	Eriophyllum staechadifolium	Yes	E. Howe Field obs.
Asteraceae	Grindelia camporum	Yes	M. Ball Field obs.
Asteraceae	Hypochaeris glabra	No	E. Howe and S. Junak Field obs.
Asteraceae	Isocoma menziesii var. vernonioides	Yes	S. Junak- Field obs.
Asteraceae	Lasthenia gracilis	Yes	S. Junak- Field obs.
Asteraceae	Pseudognaphalium biolettii	Yes	S. Junak- Field obs.
Asteraceae	Pseudognaphalium stramineum	Yes	Calflora
Asteraceae	Senecio blochmaniae	Yes	E. Howe and S. Junak Field obs.
Asteraceae	Senecio glomeratus	No	Calflora
Asteraceae	Senecio californicus	Yes	S. Junak- Field obs.
Asteraceae	Sonchus oleraceus	No	S. Junak- Field obs.
Asteraceae	Stephanomeria virgata	Yes	Calflora
Boraginaceae	Amsinkia menziesii var. intermedia	Yes	E. Howe Field obs.
Boraginaceae	Amsinkia spectabilis var. spectabilis	Yes	Calflora

Family	Scientific Name	Native	Source of Record
Boraginaceae	Cryptantha leiocarpa	Yes	S. Junak- Field obs.
Boraginaceae	Plagiobothrys nothofulvus	Yes	Calflora
Brassicaceae	Descurainia pinnata	Yes	S. Junak- Field obs.
Brassicaceae	Lepidium nitidum	Yes	E. Howe Field obs.
Brassicaceae	Matthiola incana	No	Calflora
Brassicaceae	Nasturtium officinale	No	Calflora
Caryophyllaceae	Cardionema ramosissima	Yes	E. Howe Field obs.
Caryophyllaceae	Silene gallica	No	E. Howe Field obs.
Caryophyllaceae	Spergularia bocconi	No	E. Howe and S. Junak Field obs.
Caryophyllaceae	Spergularia macrotheca var. macrotheca	Yes	Calflora
Caryophyllaceae	Spergularia marina	Yes	S. Junak- Field obs.
Chenopodiaceae	Atriplex californica	Yes	E. Howe and S. Junak Field obs.
Chenopodiaceae	Atriplex semibaccata	No	E. Howe and S. Junak Field obs.
Chenopodiaceae	Chenopodium rubrum	Yes	Calflora
Chenopodiaceae	Salicornia pacifica	Yes	E. Howe Field obs.
Chenopodiaceae	Suaeda taxifolia	Yes	E. Howe Field obs.
Convolvulaceae	Calystegia macrostegia ssp. cyclostegia	Yes	E. Howe and S. Junak Field obs.
Crassulaceae	Aeonium arboreum	No	E. Howe Field obs.
Crassulaceae	Cotyledon orbiculata	No	E. Howe and S. Junak Field obs.
Crassulaceae	Crassula connata	Yes	E. Howe and S. Junak Field obs.
Crassulaceae	Dudleya caespitosa	Yes	S. Junak- Field obs.
Cupressaceae	Hesperocyparis macrocarpa	No	E. Howe and S. Junak Field obs.
Cuscutaceae	Cuscuta salina	Yes	S. Junak- Field obs.
Cyperaceae	Carex pansa	Yes	S. Junak- Field obs.
Cyperaceae	Isolepis cernua	Yes	Calflora
Euphorbiaceae	Croton californicus	Yes	E. Howe and S. Junak Field obs.
Fabaceae	Acmispon junceus var. junceus	Yes	E. Howe and S. Junak Field obs.
Fabaceae	Acmispon micranthus	Yes	E. Howe and S. Junak Field obs.
Fabaceae	Astragalus nuttallii var. nuttallii OR Astragalus pomonensis	Yes	S. Junak- Field obs.
Fabaceae	Lupinus albifrons	Yes	Calflora
Fabaceae	Lupinus arboreus	Yes	S. Junak- Field obs.
Fabaceae	Lupinus bicolor	Yes	Calflora
Fabaceae	Lupinus microcarpus var. densiflorus	Yes	S. Junak- Field obs.
Fabaceae	Lupinus nanus	Yes	Calflora
Fabaceae	Lupinus truncatus	Yes	S. Junak- Field obs.
Fabaceae	Medicago polymorpha	No	E. Howe Field obs.
Fabaceae	Melilotus albus	No	E. Howe Field obs.
Fabaceae	Trifolium depauperatum var. amplectens	Yes	Calflora

	1		
Fabaceae	Trifolium willdenovii	Yes	Calflora
Frankeniaceae	Frankenia salina	Yes	E. Howe and S. Junak Field obs.
Geraniaceae	Erodium cicutarium	No	E. Howe and S. Junak Field obs.
Juncaceae	Juncus balticus	Yes	S. Junak- Field obs.
Juncaceae	Juncus leseurii	Yes	S. Junak- Field obs.
Juncaceae	Juncus phaeocephalus var. phaeocephalus	Yes	Calflora
Lamiaceae	Salvia leucophylla	Yes	Calflora
Malvaceae	Malva parviflora	No	E. Howe Field obs.
Myrsinaceae	Anagalis arvensis	No	E. Howe Field obs.
Nyctaginaceae	Abronia umbellata ssp. umbellata	Yes	E. Howe and S. Junak Field obs.
Nyctaginaceae	Abronia villosa	Yes	Calflora
Onagraceae	Camissoniopsis cheiranthifolia ssp. cheiranthifolia	Yes	E. Howe and S. Junak Field obs.
Orobanchaceae	Castilleja affinis ssp. affinis	Yes	E. Howe and S. Junak Field obs.
Papaveraceae	Eschscholzia californica	Yes	E. Howe Field obs.
Phrymaceae	Mimulus guttatus	Yes	Calflora
Plantaginaceae	Linaria bipartita	No	Calflora
Plantaginaceae	Plantago coronopus	No	S. Junak- Field obs.
Plantaginaceae	Plantago subnuda	No	Calflora
Poaceae	Avena fatua OR A. barbata	No	E. Howe Field obs.
Poaceae	Bromus diandrus	No	E. Howe Field obs.
Poaceae	Bromus madritensis ssp. madritensis	No	E. Howe Field obs.
Poaceae	Distichlis spicata	Yes	E. Howe and S. Junak Field obs.
Poaceae	Ehrharta calycina	No	E. Howe and S. Junak Field obs.
Poaceae	Hordeum murinum ssp. leporinum	No	E. Howe Field obs.
Poaceae	Lamarckia aurea	No	E. Howe Field obs.
Poaceae	Schismus arabicus OR S. barbatus	No	E. Howe Field obs.
Polygonaceae	Eriogonum parvifolium	Yes	E. Howe and S. Junak Field obs.
Polygonaceae	Lastarriaea coricacea	Yes	Calflora
Polygonaceae	Mucronea californica	Yes	Calflora
Polygonaceae	Pterostegia drymarioides	Yes	E. Howe Field obs.
Polygonaceae	Rumex acetosella	No	S. Junak- Field obs.
Polygonaceae	Rumex salicifolius	Yes	E. Howe and S. Junak Field obs.
Rosaceae	Rosa californica	Yes	S. Junak- Field obs.
Salicaceae	Salix laevigata	Yes	E. Howe and S. Junak Field obs.
Salicaceae	Salix lasiolepis	Yes	S. Junak- Field obs.
Solanaceae	Solanum douglasii	Yes	Calflora
Solanaceae	Solanum xanti	Yes	Calflora
Themidaceae	Dichelostemma capitatum	Yes	E. Howe Field obs.

# **Appendix B. Restoration Priority Index Methods**

The Point Conception property requires phased treatment to implement extensive invasive plant species control and reestablishment of native species. Working on the property is also constrained by various factors, such as the need to protect cultural sites and aesthetics during restoration, as well as the lack of water supply which will be needed to provide supplemental irrigation to native outplantings. To balance the various challenges, constraints, and goals, a prioritization index was developed to help guide restoration efforts.

Seven factors were considered in the prioritization index (Table 4-1). Each factor was rated on a weighted scale of one to three, depending on the level of difficulty the factor would impart to implementing restoration (1 being greatest difficulty and 3 being lowest difficulty). These rankings were translated to spatial data across the Point Conception property. For example, the Slope Stability factor was delineated into polygons by assigning the extremely steep slopes along the tops of the cliff edge as 1 (greatest difficulty), the steep slope above the lighthouse as 2 (difficult), and the northern sand dunes areas and lower terrace as 3 (not difficult) (see Figure 4-1).

The seven indexed layers were compiled into a single feature class by combining the scores of each prioritization factor, thus producing an overall cumulative score. This feature class was merged with a 10x10 m grid system using a spatial join to provide a rasterized "heat map" to display individual priority index scores for each 10x10 m grid cell (Figure 4-2). Cliffs were clipped out of the final product because no restoration activities can be implemented in these areas due to the typical unvegetated nature of these areas and safety concerns.

To plan for achievable levels of effort each year, the heat map in Figure 4-2 was further divided into ten priority Restoration Zones (Figure 4-3). These Zones are ordered and sized to represent roughly equivalent levels of effort, with Zone 1 considerably larger than Zone 10 because of its relatively less-intensive restoration requirements. A portion of a Zone or the entire area can be selected for restoration, depending on resources available and progress of previous efforts. The area of invasive species found in each zone during the 2016 and 2017 surveys is shown in Table 4-2.

Factor	Range			
	1=difficult to water			
Watering Access	2=gravity feed possible			
	3=fog sails possible			
	1=saline soil			
Edaphic Challenges	2=seep			
	3=no challenge			
Slope Stability	1=requires safety equipment			
	2=steep but no safety equipment			
	3=no challenge			
Gaviota tarplant	1= occupied GTP habitat			
	2=possible GTP habitat			
	3=not GTP habitat			
	1=documented archaeology site			
Archaeology Constraints	2=flake scatter			
	3=no arch site			
	1=no existing protocol			
Weed Cover	2= heavy weed cover			
	3=light cover			
	1=highly visible area			
Aesthetics	2=moderately visible area			
	3=low visibility area			

Table B-1. Prioritization factors.



Figure B-2. Example priority factor: slope stability.



Figure B-3. Restoration prioritization index results.



Figure B-4. Priority restoration zones.

Appendix B. Distribution List, Notice of Availability, and Public Correspondence

## **B.1. Point Conception Restoration Environmental Assessment Distribution List**

#### **Federal**

NOAA – Channel Islands National Marine Sanctuary NOAA – National Marine Fisheries Service, Southwest Regional Office National Park Service, Channel Islands National Park US Army Corps of Engineers US Coast Guard US Department of Transportation, Federal Aviation Administration US Environmental Protection Agency, Region 9, Environmental Review Office US Fish and Wildlife Service, Ventura Fish and Wildlife Office

California Coastal Commission - Energy, Ocean Resources and Federal Consistency Division Central Coast Regional Water Quality Control Board Central Coast Regional Water Quality Control Board - Central Coast Ambient Monitoring Program California Department of Fish and Wildlife, South Coast Region California Environmental Protection Agency California Office of Historic Preservation Office of the Governor, Office of Planning and Research, State Clearinghouse

#### <u>Tribes</u>

Santa Ynez Band of Chumash Indians

#### Local

Santa Barbara County Board of Supervisors Santa Barbara County Planning and Development City of Lompoc, Economic and Community Development Santa Barbara County Air Pollution Control District

#### **Libraries**

Santa Barbara Public Library Lompoc Public Library Santa Maria Public Library

#### **Nongovernmental Organizations**

California Native Plant Society, Channel Islands Chapter California Trout Environmental Defense Center La Purisima Audubon Society Santa Barbara Museum of Natural History Sierra Club, Los Padres Chapter

Appendix C. Negative Determination

455 MARKET STREET, SUITE 300 SAN FRANCISCO, CA 94105 VOICE (415) 904-5260 FAX (415) 904-5400

CALIFORNIA COASTAL COMMISSION ENERGY, OCEAN RESOURCES AND FEDERAL CONSISTENCY

August 8, 2023

Beatrice L. Kephart Chief, Installation Management Flight United States Space Force 30 CES/CEI 1028 Iceland Avenue Vandenberg SFB 9437-6919

Re: Negative Determination No. ND-0021-23: Point Conception Restoration, Santa Barbara County

Dear Chief Kephart:

We have received your letter dated July 5, 2023, regarding the above-referenced project to install a buck and rail fence to prevent access by cattle, remove nonnative plant species, and outplant native species across roughly 19 acres immediately surrounding the Point Conception Lighthouse in Santa Barbara County. The U.S. Space Force has determined that this project would have no adverse effect on coastal resources for the reasons identified in Negative Determination No. ND-0021-23. The Coastal Commission staff agrees that the proposed project will not adversely affect coastal zone resources. We therefore **concur** with your negative determination made pursuant to 15 CFR Section 930.35 of the NOAA implementing regulations.

Please contact Cassidy Teufel at <u>Cassidy.Teufel@coastal.ca.gov</u> if you have any questions regarding this matter.

Sincerely,

CASSIDY TEUFEL Federal Consistency Coordinator (for)

Dr. Kate Huckelbridge Executive Director

Appendix D. National Historic Preservation Act Consultation



## DEPARTMENT OF THE AIR FORCE UNITED STATES SPACE FORCE SPACE LAUNCH DELTA 30

Lieutenant Colonel Nicholas C. Van Elsacker Commander, 30th Civil Engineer Squadron 1172 Iceland Ave Vandenberg SFB CA 93437-6011

Ms. Julianne Polanco State Historic Preservation Officer Department of Parks and Recreation Office of Historic Preservation P.O. Box 942896 Sacramento CA 94296-0001

## Dear Ms. Polanco

Space Launch Delta (SLD) 30 of the United States Space Force, Vandenberg Space Force Base (VSFB), proposes a native vegetation restoration project that will encompass the entire 29.6-acre Point Conception Light Station property in Santa Barbara County, California. The proposed *Point Conception Vegetation Restoration Project* would include controlling or eradicating select non-native plant species to levels that will allow for restoration or natural recovery, and establishment or improvement of native-dominated habitat. Staging of vehicles and water tanks will occur on existing pavement within the Light Station property. All the proposed methods of watering are temporary and will be removed once the plantings have successfully rooted. Finally, VSFB will construct a wooden buck-and-rail style fence along the eastern boundary of the property to keep out cattle. This type of fence sits on top of the ground, with no posts or stakes in the ground. Gate posts already exist at the entrance to the property, but a new swinging gate will need to be hung on the posts.

VSFB has carried out a reasonable and good-faith cultural resources investigation that fulfills federal agency responsibilities pursuant to 36 CFR 800.4(a)-(d) and 36 CFR 800.5(a)-(d). Per §800.3(c-f), VSFB is consulting with the California State Historic Preservation Officer (SHPO) on its findings.

An effort to identify historic properties in the Area of Potential Effect (APE) included a review of previous surveys and cultural resources recorded in the area and a field inspection of the APE to assess the potential for adverse effects. The Point Conception Light Station is a National Register of Historic Places (NRHP)-listed Historic District (NRHP #81000176). The Historic District encompasses the entirety of the 29.6-acre property and includes 17 NRHP-eligible historical contributors as well as 12 prehistoric archaeological sites (CA-SBA-204, -

1594, -1595, -1596, -1597, -1598, -1599, -1600, -1601, -1602, -1603, and -1604) which have not been individually evaluated (OHP file reference #USAF\_2020\_1207\_001).

Due to the thick covering of non-native ice plant (*Carpobrotus* spp.) across the surface of the archaeological sites, the field inspection was unable to adequately identify the horizontal extent of those archaeological deposits. Soil visibility across the property during this study was less than five percent due to thick vegetative ground cover. Despite the lack of surface soil visibility, the entirety of the Project APE is assigned a high archaeological sensitivity based on the previous survey by Michael Glassow in 1978 and the Santa Ynez Band of Chumash Indians' (SYBCI) designation of this locale as a Chumash Sacred Site. Due to the unknown data potential of these sites, all 12 prehistoric archaeological sites are assumed eligible for the NRHP for the purpose of this Project only.

Studies show that ice plant's heavy leaves and shallow roots can destabilize coastal soil; it crowds out native species, alters soil chemistry, and may promote erosion—the exact opposite of what it was supposed to do when it was introduced in the early 1900s. Therefore, the eradication of ice plant and return of native species will result in a favorable effect regarding the stabilization of archaeological sites at Point Conception. The Project will also result in a favorable effect regarding the integrity of setting and feeling of the prehistoric sites at Point Conception Light Station.

No historical built-environment resources will be directly or indirectly affected by the Project. Other than the Monterey cypress (*Hesperocyparis macrocarpa*) trees at the 1912 Keeper's Cottage, none of the non-native vegetation found in the Project APE is important to the historical setting. The Monterey cypress will be trimmed to maintain a healthy appearance, and the native vegetation will bring the setting back to its late nineteenth century appearance, prior to the introduction of ice plant and other invasive species. As such, the Project will result in a favorable effect regarding the integrity of setting and feeling of the historical built-environment resources at Point Conception Light Station.

In summary, the proposed Project does not have the potential to affect, either directly or indirectly, any of the characteristics which makes the contributing elements, the Historic District as a whole, or any of the prehistoric archaeological sites eligible for the NRHP.

Additionally, the SYBCI has identified Point Conception as a Chumash Sacred Site known as the "Western Gate," through which the souls of the dead could pass between the mortal world and the heavenly paradise of *Similaqsa*. In some Chumash dialects the location is called *Humqaq* ("The Raven Comes"). VSFB is consulting with the SYBCI and will continue consultation with the Tribe for the life of the project. VSFB will inform the SHPO of any substantive comments or concerns as well as communicate progress and/or the conclusion of the consultation in future correspondence. Furthermore, the proposed undertaking would not restrict the Tribe's access to the property, as required by Executive Order (EO) 13007, and VSFB will support the Tribe if they want a Native monitor present during any ground-disturbing activities (e.g., planting holes) associated with the Project.
VSFB seeks concurrence from the SHPO that the APE for this undertaking has been appropriately delineated. Furthermore, VSFB seeks concurrence from the SHPO on a finding of *no adverse effect* for the Point Conception Vegetation Restoration Project. Details of the investigation are provided in the attachment. VSFB presents the following federal agency findings and determinations for concurrence from the SHPO:

a. The APE for the *Point Conception Vegetation Restoration Project* is adequately delineated; and

b. The undertaking will have *no adverse effect* on the significant qualities of the Point Conception Light Station Historic District, any of the individual contributing elements of the District, or any of the 12 prehistoric archaeological sites on the property.

Pending concurrence with our above determinations, VSFB has reached a Section 106 finding of *no adverse efffect* for this undertaking. VSFB recognizes that the SYBCI may have concerns beyond the purview of the NHPA and will support the use of a Chumash monitor if the Tribe makes a request to monitor any ground-disturbing activity (e.g., planting holes) associated with the Project.

Barring objection to this finding by the SHPO, VSFB has fulfilled its Section 106 responsibilities for this undertaking and no further consultation is required. If, subsequent to this consultation, any changes to the design of the project are made with the potential to impact a historic property, or project implementation results in a significant discovery, VSFB will re-open Section 106 consultation for this project.

If you have any questions or require additional information, please contact Josh Smallwood, Historic Preservation Manager, 30 CES/CEIEA at (7

1. Thank you for your assistance with this undertaking.

Sincerely

VAN ELSACKER.NICHOLAS.C LARENCE.1251205554 LARENCE.1251205554 Date: 2022.10.19 16.59:14 -07'00'

NICHOLAS C. VAN ELSACKER, Lt Col, USAF Commander

Attachment:

Identification of Historic Properties and Assessment of Effect, Point Conception Vegetation Restoration Project (2020-P)



### DEPARTMENT OF PARKS AND RECREATION OFFICE OF HISTORIC PRESERVATION

Gavin Newsom, Governor

Armando Quintero, Director

Julianne Polanco, State Historic Preservation Officer 1725 23rd Street, Suite 100, Sacramento, CA 95816-7100 Telephone: (916) 445-7000 FAX: (916) 445-7053 calshpo.ohp@parks.ca.gov www.ohp.parks.ca.gov

November 8, 2022

Reply in Reference to: USAF\_2022\_1020\_001

Lt. Col Nicholas C. Van Elsacker Commander, 30<sup>th</sup> Civil Engineer Squadron 1172 Iceland Avenue Vandenberg AFB, CA 93437-6011

**VIA ELECTRONIC MAIL** 

Re: Section 106 Consultation for Point Conception Native Vegetation Restoration Project, Vandenberg SFB, Santa Barbara County

Dear Lt. Col. Van Elsacker:

The United States Air Force (USAF) is initiating consultation with the State Historic Preservation Officer (SHPO) regarding its effort to comply with Section 106 of the National Historic Preservation Act of 1966 (54 U.S.C. 306108), as amended, and its implementing regulation found at 36 CFR Part 800.

The USAF are proposing to undertake a native vegetation restoration project encompassing the entire 29.6-acre Point Conception Light Station property in Santa Barbara County. A full project description can be found in the USAF's consultation letter.

The Point Conception Light Station is a listed National Register of Historic Places property consisting of 17 built environment contributing resources and 12 unevaluated prehistoric archaeological sites. The USAF are proposing to assume the 12 sites NRHP eligible for the purpose of this undertaking only. Information obtained via tribal consultation with the Santa Ynez Band of Chumash Indians identified Point Conception as a Chumash Sacred Site known as the "Western Gate." The USAF's letter confirms that Tribal consultation is still in progress and will continue "for the life of the project."

The USAF are requesting concurrence with its APE definition and with a finding of no adverse effect. Upon review of the information provided, the SHPO does not object to the USAF's APE definition and concurs with its finding of effect. Be advised that under certain circumstances, such as an unanticipated discovery or a change in project description, the USAF may have future responsibilities for this undertaking under 36 CFR Part 800.

November 8, 2022 Lt. Col. Van Elsacker Page 2

This letter is being sent in electronic format only. Please confirm receipt of this letter. Please notify Ed Carroll, Historian II, at **Electronic format** if there are any questions or to request a hard copy of this letter.

Sincerely,

Julianne Polanco State Historic Preservation Officer

FORMAT PAGE

Appendix E. Endangered Species Act Consultation

FORMAT PAGE



IN REPLY REFER TO: 2023-0048861-S7

# **United States Department of the Interior**

U.S. FISH AND WILDLIFE SERVICE Ecological Services Ventura Fish and Wildlife Office 2493 Portola Road, Suite B Ventura, California 93003



April 4, 2023

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

## Subject: Informal Consultation for the Point Conception Restoration Project, Vandenberg Space Force Base, Santa Barbara County, California

Dear Beatrice Kephart:

We are responding to the U.S. Space Force's (Space Force) request, dated and received in our office February 6, 2023, on the Point Conception Restoration project at Vandenberg Space Force Base (VSFB), Santa Barbara County, California. You are requesting the U.S. Fish and Wildlife Service's (Service) concurrence with your determination that the Space Force's authorization of the project activities described within your biological assessment may affect, but is not likely to adversely affect, the federally endangered Gaviota tarplant (*Deinandra increscens* ssp. *villosa*) and its designated critical habitat. Your request and our response are made pursuant to section 7 of the Endangered Species Act (Act) of 1973, as amended (16 U.S.C. 1531 et seq.).

# **Project Overview**

Point Conception is a Geographically Separated Unit of VSFB and is located 5 miles south of the VSFB southern border. It consists of 37.3 acres of stabilized dunes and cliffs and currently supports remnants of coastal vegetation embedded within large swathes of various nonnative iceplant species (*Carpobrotus* spp., *Mesembryanthemum crystallinum*). The Space Force proposes to restore native vegetation within the Point Conception boundary and to construct a fence line along the property boundary. The Space Force would conduct routine maintenance of the site to prevent surrounding populations of nonnative species from reinvading the site.

The Space Force would construct approximately 2,000 feet of a buck and rail fence made of wood posts designed to minimize the number of in-ground posts. Minimal soil disturbance would be required during installation. The Space Force will establish the staging area for supplies on the paved terrace south of the main entry road. Additionally, seed collection of non-listed native plant species would occur within Gaviota tarplant critical habitat. Source populations of native plants occur in sufficient quantity at or near Point Conception to collect enough seed to produce

container plants (30 CES 2023, p. 13). The Space Force would grow and install container plants for native plant restoration.

The Space Force would complete restoration of Point Conception in three phases: (1) control of nonnative plant species using predominantly chemical control methods including glyphosate, imazapyr, triclopyr, and clethodim (30 CES 2023, p. 10); (2) outplanting of native plant species; and (3) monitoring of restoration activities. The Point Conception Restoration Plan and the biological assessment describe these activities in full (MSRS 2022, entire; 30 CES 2023, entire). Approximately 11 acres of the 37.3-acre Point Conception property consists of developed areas, cliff faces, and rock-covered areas and would not be part of the restoration. The Space Force developed 10 restoration priority zones to guide restoration efforts. Depending on available resources, the Space Force could approach restoration starting sequentially in zone 1, which is the highest priority zone, and proceed to the remaining zones in a phased approach or they could choose to implement all the restoration priority zones simultaneously.

The Space Force anticipates that it would take 5 years to fully restore all the restoration priority zones. After the initial 5 years, maintenance of each zone would be ongoing and include control of nonnative species (new and previously identified) as well as seeding, propagating, and planting native species as needed following the methods presented in the Point Conception Restoration Plan (MSRS 2022, entire). The Space Force would require an 80 percent control rate of target species after the first year of treatments and would conduct follow-up treatments and installations of outplantings to ensure each zone is at a greater than 90 percent control rate of target species by the third year of treatments and at least a 95 percent control rate by the fifth year (30 CES 2023, p. 16). The biological assessment describes the success criteria in full (30 CES 2023, p. 16).

### Gaviota Tarplant and Gaviota Tarplant Critical Habitat

Gaviota tarplant is present at Point Conception within a 0.14-acre area on thinly vegetated, deflated soils (Figure 1). A mix of annual forb and grass species on sandy soils with California sagebrush dominate this area that is highly invaded by iceplant.

The Service designated critical habitat for Gaviota tarplant on November 7, 2002 (67 FR 67968; Service 2002, entire), which includes Point Conception. The Space Force acquired Point Conception in 2020 and it currently does not qualify for exclusion or exemption from critical habitat designation under section 4(b)(2) of the Act. Based on the current knowledge of the life history, biology, and ecology of Gaviota tarplant, the Service determined that the primary constituent elements within the defined area that are essential to the conservation of the species include: (1) Sandy soils associated with coastal terraces adjacent to the coast or uplifted marine sediments at interior sites up to 3.5 miles inland from the coast; and (2) Plant communities that support associated species, including needlegrass grassland and coastal sage scrub communities, particularly where the following associated species are found: needlegrass species (*Nassella* spp.), California sagebrush, coyote bush, sawtooth golden bush (*Hazardia squarrosa*), and California buckwheat (*Eriogonum fasciculatum*). Primary threats to Gaviota tarplant critical habitat are habitat loss and habitat degradation including development and competition with non-

native grasses (Service 2002, p. 67969; Service 2022, p. 14). At Point Conception, the primary threat to Gaviota tarplant and its critical habitat is the spread of non-native iceplant and veldt grass (30 CES 2023, p. 26).

### **Biologist Definitions**

• Qualified Biologist: Biologist trained to accurately identify specific federally listed species and their habitats by either a Permitted or Service Approved Biologist. This person could perform basic project monitoring but would need to have oversight from a Permitted or Service Approved Biologist. Oversight will require a Permitted or Service Approved Biologist to be available for phone/electronic mail consultation during the surveys and to have the ability to visit during monitoring/survey activities if needed.

### **Avoidance and Minimization Measures**

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

- AM-1. The Space Force will require Qualified Biologists to 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, restrictions to protect these resources during project implementation, the provisions of the Act, the necessity of adhering to the provisions of the Act, and the penalties associated with violations of the Act.
- AM-2. The Space Force will use all erosion control materials (i.e., gravel, sand, fill material, wattles, etc.) from weed-free sources. The Space Force will leave only non-plastic, 100 percent biodegradable erosion control materials (e.g., erosion blankets, wattles) in place following project completion.
- AM-3. The Space Force will utilize non-chemical control efforts whenever they meet project goals to minimize levels of chemical input and the potential for runoff. When herbicide treatment does occur, applications will follow herbicide label instructions to minimize the likelihood of runoff and drift. The Space Force will employ a non-ionic surfactant, Agri-Dex®, with all foliar treatments to maximize herbicide adherence to target plant surfaces. The Space Force will set droplet size and flow rates to ensure that little to no leaf runoff occurs. The Space Force will maintain a spill kit on site to respond to any leaks or spills. If a leak, spill, or overspray does occur, the Space Force will remove contaminated soil and sorbent from the site and properly dispose of in compliance with California Department of Pesticide Regulations (DPR) requirements (Lum, L. Space Force, pers. comm. 2023a).
- AM-4. The Space Force will place portable toilets only over paved surfaces or within staging areas; they will not place portable toilets in restoration areas.

- AM-5. The Space Force will collect all human-generated trash at the project site in proper containers, remove it from the work site, and dispose of it properly at the end of each workday. The Space Force will remove all debris and trash from the work area upon completion of the project.
- AM-6. The Space Force will clean equipment and vehicles of weed seeds prior to use in the project area to prevent the introduction of weeds. Prior to site transport, the Space Force will remove and clean any skid plates. The Space Force will clean equipment and vehicles of weed seeds daily especially wheels, undercarriages, and bumpers. Prior to leaving the project area, for equipment and vehicles that have caked-on dirt or mud, the Space Force will clean with hand tools such as bristle brushes and brooms at a designated exit area. For equipment and vehicles with dry, dusted dirt (and no caked-on dirt or mud), prior to leaving a site at a designated exit area, the Space Force will thoroughly brush; equipment and vehicles may alternatively be air blasted on site. Prior to use, the Space Force will inspect all equipment and vehicles for weed seeds and debris by a Qualified Biologist who may refuse use of equipment and vehicles that do not pass inspection.
- AM-7. The Space Force will conduct fueling of equipment in a predesignated location within the designated laydown areas at least 100 feet from coastal boundaries and will place spill containment materials around the equipment before refueling. The Space Force will outfit stationary equipment with drip pans and hydrocarbon absorbent pads.
- AM-8. The Space Force will use established roads, both paved and unpaved, to the maximum extent practicable to stage and operate vehicles and equipment. In areas where this is not possible, the Space Force will use preexisting disturbed areas or areas occupied by nonnative vegetation to the maximum extent practicable.
- AM-9. Prior to implementation of restoration activities, the Space Force will require a Qualified Biologist to survey the site and any documented occupied habitat for Gaviota tarplant and mark for avoidance.
- AM-10. If it is necessary to control non-native species in any areas occupied by Gaviota tarplant, the Space Force will perform the work by one or more of the following methods:
  - a. When Gaviota tarplant is not dormant:
    - i. The Space Force will employ hand removal of non-native species under the supervision of a Qualified Biologist within a 15-foot buffer of known occupied habitat (Lum, pers. comm. 2023a); or
    - ii. The Space Force will limit herbicide treatments performed within 45 feet of live Gaviota tarplant to an atomized application of glyphosate using a Mankar® ultra low volume sprayer that prevents herbicide drift. The Space Force will avoid all native plant species and will conduct work during cool (maximum temperature of 85 degrees Fahrenheit) weather and low wind conditions (maximum wind speeds under 8 miles per hour). The Space Force will avoid conducting work within 24 hours

of forecasted significant rainfall (0.2 inch or above; Lum, pers. comm. 2023b). A Qualified Biologist will conduct or supervise all treatments. Most of the initial treatments will occur during peak winter months to minimize impacts to native plant growth periods and pollinators (Lum, pers. comm. 2023a).

- b. When Gaviota tarplant is dormant:
  - i. The Space Force will employ hand removal of non-native species; and/or
  - ii. The Space Force will employ spot herbicide treatments with lowpressure backpack sprayers and non-persistent herbicide. With the exception of Mankar® applications, all project related foliar herbicide treatments will utilize marker dyes so workers can readily see spills, drift, or misapplication (Lum, pers. comm. 2023b).
- AM-11. Any manual removal of invasive plants within 6 feet of Gaviota tarplant requiring soil disturbance would occur during moist soil conditions when Gaviota tarplant root systems are better able to recover from disturbance.
- AM-12. The Space Force will not use any persistent or pre-emergent herbicides within 150 feet of Gaviota tarplant.
- AM-13. Any monitoring pole installation within or adjacent to Gaviota tarplant stands will take place outside of its growing season to reduce effects to the seed bank.

### **Project Effects**

Installation and maintenance of the buck and rail fence would not impact Gaviota tarplant. Currently there are no known Gaviota tarplant populations in or adjacent to the proposed fence corridor, but there is potential for Gaviota tarplant to establish near the fence corridor in the future. Prior to installation and/or maintenance of the fence, the Space Force will require a Qualified Biologist to survey the footprints of the fencing corridor and access corridor for Gaviota tarplant and mark for avoidance (AM-9). Installation of the fence would also not significantly impact Gaviota tarplant critical habitat. Impacts to 2 square feet of soils (PCE 1) would occur during installation of a hanging gate on the fence; however, this area of impact does not constitute a significant effect to critical habitat. Iceplant dominates the area and there are a low number of native plants associated with Gaviota tarplant (PCE 2) within the footprint of the fence. The Space Force will closely coordinate fence installation and maintenance with the VSFB botanist and implementation of minimization measures will reduce impacts to Gaviota tarplant critical habitat.

Herbicide treatment may serve to control invasive species and benefit Gaviota tarplant through reduced competition. However, associated drift has the potential to damage Gaviota tarplant individuals as well as impact likely pollinators that include small native bees (*Lasioglossum* spp. and *Eucerini* spp., respectively) and soft-wing flower beetles (*Dasytinae* spp.) (Service 2022, p. 13). Gaviota tarplant is an annual species that is self-sterile and likely requires insect pollinators

for outcrossing and successful reproduction. Although research has documented insecticide toxicity to bees over the last fifteen years, relatively recent research demonstrates certain effects of various herbicides on a variety of bee species, often ranging from physiological to behavioral (Cullen et al. 2019, entire; Belsky and Joshi 2020, entire; glyphosate toxicity on bees reviewed in Battisti et. al 2021, entire). If Gaviota tarplant pollinators come into contact with herbicide treatment, less frequent floral visitation and subsequent pollination may result if herbicides damage or disorient pollinators. Being that Gaviota tarplant is an annual species, less pollination could result in lower seed set. However, because the Space Force would conduct the majority of treatments outside of the typical flowering period (June to September) for the species, we expect effects should be minimal and temporary (AM-10a).

To further minimize effects to Gaviota tarplant and its critical habitat, if invasive plants with similar phenology colonize a Gaviota tarplant stand, manual removal may represent the least injurious option for removing plants near Gaviota tarplant. In this case, personnel will hand pull or use appropriate hand tools to collect invasive plants (AM-10, 11). In the event that the Space Force conducts chemical application within occupied Gaviota tarplant habitat, the Space Force will not use persistent or pre-emergent chemicals within a 150-foot buffer (AM-12). The Space Force will minimize the risk of chemical drift or accidental overspray of non-persistent herbicides and surfactant (glyphosate and Agri-Dex®) to occupied Gaviota tarplant habitat by employing precautions including using low-pressure application techniques and only applying herbicide during cool weather with low wind outside of 24-hour forecasted rainfall windows (AM-10a).

To help reduce the potential for chemical exposure to vegetative Gaviota tarplant and its dormant seedbank, the Space Force will require a Qualified Biologist to survey and flag any occupied habitat for Gaviota tarplant avoidance prior to implementation of restoration activities (AM-9). The Service assumes that the Space Force will avoid chemical treatments during the Gaviota tarplant flowering period and that chemical treatments will be able to generally avoid flagged areas that likely contain dormant seedbank (AM-9, 10a). The Space Force indicates that very low to no chemical drift would occur being that California DPR standards dictate that herbicide treatments should not reach a threshold of runoff (Lum, pers. comm. 2023a). Although the Space Force would not use indicator dye applications for Mankar® treatments would utilize indicator dye and may help identify if chemical drift is occurring on site (AM-10b).

Seed collection of native plant species comprising PCE 2 would take place within Gaviota tarplant critical habitat, which would have a short-term effect on specific native plant populations but would have an overall beneficial effect on Gaviota tarplant critical habitat. The number of seeds collected from native plants would not appreciably reduce those populations. In addition, the Service agrees with local seed collection of native associate species as this would be beneficial to help maintain the genetic integrity of Gaviota tarplant critical habitat and prevents introduction of novel genotypes that may be less adapted for success in this micro-environment. Habitat restoration and/or enhancement will follow the Point Conception Restoration Plan (MSRS 2022, entire) and will include container plant installation (via hand tools, hand-held power auger, or light duty excavator) and watering (via water truck or trailer or fog-capturing

devices). The Space Force will not disturb native mineral soils during any of these activities (30 CES 2023, p. 13). Restoration monitoring may include installation of monitoring poles at photo monitoring and relevé locations, which will take place outside of the Gaviota tarplant growing season. The Space Force will place these poles to avoid native vegetation comprising PCE 2 (AM-13).

### Conclusion

After reviewing the information provided, we concur with your determination that the proposed action may affect but is not likely to adversely affect Gaviota tarplant or its designated critical habitat. Our concurrence is based on the following:

- Implementation of the avoidance and minimization measures will reduce the level of impacts of project activities to less than significant.
- This proposed project would require herbicide application and possible ground disturbance during invasive species control and fence installation but has the potential to ultimately result in long-term benefits to Gaviota tarplant and its designated critical habitat by reducing competition from invasive species.

Our concurrence with the determinations that the proposed action is not likely to adversely affect Gaviota tarplant or its designated critical habitat is contingent on the project activities as outlined above being implemented by the Space Force. If the Space Force fails to implement the project as proposed, we will consider our concurrence invalid. If the proposed action changes in any manner, if novel effects associated with the proposed project not previously considered within this concurrence are observed over time, or if new information reveals the presence of listed species in the project area, you must contact our office immediately to determine whether additional consultation is required. We would appreciate if the Space Force was able to send us annual results on the progress of this project and the distribution of Gaviota tarplant within the project area. This information will be helpful to inform future recommendations regarding the recovery of Gaviota tarplant and the restoration of Gaviota tarplant critical habitat. If you have any questions regarding this matter, please contact Sarah Termondt and Erin Arnold of my staff by electronic mail at sarah\_termondt@fws.gov and erin\_arnold@fws.gov.

Sincerely,

Christopher J. Diel Assistant Field Supervisor



Figure 1. Location of the 0.14-acre Gaviota tarplant stand within the Point Conception property.

### LITERATURE CITED

- Baldwin, B.G. 2007. A Systematic Investigation of *Deinandra increscens*, with Special Reference to subsp. *villosa*. Jepson Herbarium and Department of Integrative Biology. University of California, Berkeley. 32 pp.
- Baldwin, B.G. 2009. Morphological and molecular reconsideration of *Deinandra increscens* subsp. *villosa*. Final report on file at Ventura Fish and Wildlife Office. 18 pp + appendices.
- Battisti, L., M. Potrich, A. R. Sampaio, N. de Castilhos Ghisi, F. M. Costa-Maia, R. Abati, C. B. dos Reis Martinez, and S. H. Sofia. 2021b. Is glyphosate toxic to bees? A meta-analytical review. Science of The Total Environment 767:145397.
- Belsky, J., and N. K. Joshi. 2020. Effects of fungicide and herbicide chemical exposure on Apis and Non-Apis Bees in agricultural landscape. Frontiers in Environmental Science 8(July):1–10.
- Cullen, M. G., L. J. Thompson, J. C. Carolan, J. C. Stout, and D. A. Stanley. 2019. Fungicides, herbicides and bees: A systematic review of existing research and methods. PLoS ONE 14(12):1–17.
- [MSRS] ManTech SRS Technologies, Inc. 2022. Point Conception Restoration Plan, 2022 Update. Prepared for Space Launch Delta 30, Installation Management Flight, Vandenberg Space Force Base, California. Lompoc, California. 71 pp.
- [Service] U.S. Fish and Wildlife Service. 2002. Endangered and threatened wildlife and plants; Designation of critical habitat for *Eriodictyon capitatum* (Lompoc yerba santa) and *Deinandra increscens* ssp. villosa (Gaviota tarplant); Final rule. Federal Register 67: 67968 -68001.
- [Service] U.S. Fish and Wildlife Service. 2022. Gaviota Tarplant (*Deinandra increscens* ssp. *villosa* [*Hemizonia increscens* ssp. *villosa*]) 5-Year Review: Evaluation and Summary. 25 pp.
- [30 CES] 30<sup>th</sup> Civil Engineer Squadron. 2023. Biological Assessment for Point Conception Restoration. U.S. Space Force, Space Launch Delta 30, Installation Management Flight, Vandenberg Space Force Base, California. 41 pp.

### PERSONAL COMMUNICATIONS

- Lum, L. 2023a. Botanist & Biological Scientist, Environmental Section, Vandenberg Space Force Base, U.S. Space Force. Electronic mail to Erin Arnold, Biologist, U.S. Fish and Wildlife Service, Ventura Fish and Wildlife Office, regarding additional clarifications and measures for listed species for the Point Conception Restoration project at Vandenberg Space Force Base. Dated March 10, 2023.
- Lum, L. 2023b. Botanist & Biological Scientist, Environmental Section, Vandenberg Space Force Base, U.S. Space Force. Electronic mail to Erin Arnold, Biologist, U.S. Fish and Wildlife Service, Ventura Fish and Wildlife Office, regarding additional clarifications and

measures for listed species for the Point Conception Restoration project at Vandenberg Space Force Base. Dated March 23, 2023.

Appendix F. Tribal Consultation

FORMAT PAGE



### DEPARTMENT OF THE AIR FORCE UNITED STATES SPACE FORCE SPACE LAUNCH DELTA 30

Josh Smallwood, M.A., RPA Space Launch Delta 30 CES/CEIEA 1028 Iceland Avenue Vandenberg SFB, CA 93437-6010

Ms. Nakia Zavalla Santa Ynez Band of Chumash Indians P.O. Box 517 Santa Ynez, CA 93460

Dear Ms. Zavalla

Space Launch Delta (SLD) 30 of the United States Space Force, Vandenberg Space Force Base (VSFB), proposes a native vegetation restoration project that will encompass the entire 29.6-acre Point Conception Light Station property in Santa Barbara County, California. The proposed *Point Conception Vegetation Restoration Project* would include controlling or eradicating select non-native plant species to levels that will allow for restoration or natural recovery, and establishment or improvement of native-dominated habitat. Staging of vehicles and water tanks will occur on existing pavement within the Light Station property. All the proposed methods of watering are temporary and will be removed once the plantings have successfully rooted.

VSFB determined the Project is an undertaking subject to compliance with Section 106 of the National Historic Preservation Act (NHPA) of 1966 (54 USC 306108), as amended, and will comply with Section 106 using the implementing regulations [36 CFR Part 800]. With this letter and the accompanying report, VSFB is initiating consultation with the Tribe. VSFB carried out a reasonable and good-faith cultural resources investigation that fulfills federal agency responsibilities pursuant to 36 CFR 800.4(a)-(d) and 36 CFR 800.5(a)-(d). The effort to identify historic properties in the Area of Potential Effects (APE) included a review of previous surveys and cultural resources recorded in the area and a field inspection of the APE to assess the potential for adverse effects.

The Point Conception Light Station is a National Register of Historic Places (NRHP)-listed Historic District (NRHP #81000176). The Historic District encompasses the entirety of the 29.6-acre property and includes 17 NRHP-eligible historical contributors as well as 12 prehistoric archaeological sites (CA-SBA-204, -1594, -1595, -1596, -1597, -1598, -1599, -1600, -1601, -1602, -1603, and -1604) which have not been individually evaluated (OHP file reference #USAF\_2020\_1207\_001).

Due to the presence of thick coverings of ice plant across the surface of the archaeological sites, the present field inspection was unable to adequately identify the horizontal extent of those archaeological deposits. Soil visibility across the property during this study was less than five percent due to thick vegetative ground cover. Despite the lack of surface soil visibility, the entirety of the Project APE is assigned a high archaeological sensitivity based on the previous survey by Michael

Glassow in 1978 and the SYBCI's designation of this locale as a Chumash Sacred Site. Due to the unknown data potential of these sites, all 12 prehistoric archaeological sites are assumed eligible for the NRHP for the purpose of this Project only.

Studies show that ice plant's heavy leaves and shallow roots can destabilize coastal soil; it crowds out native species, alters soil chemistry, and may promote erosion—the exact opposite of what it was supposed to do when it was introduced in the early 1900s. Therefore, the eradication of ice plant and return of native species will result in a favorable effect regarding the stabilization of archaeological sites at Point Conception. The Project will also result in a favorable effect regarding the integrity of setting and feeling of the prehistoric sites at Point Conception Light Station. In summary, the proposed Project does not have the potential to affect, either directly or indirectly, any of the characteristics which makes the contributing elements, the Historic District as a whole, or any of the prehistoric archaeological sites eligible for the NRHP.

The SYBCI has identified Point Conception as a Chumash Sacred Site known as the "Western Gate," through which the souls of the dead could pass between the mortal world and the heavenly paradise of *Similaqsa*. In some Chumash dialects the location is called *Humqaq* ("The Raven Comes"). VSFB is soliciting any concerns or issues with the Project relating to any perceived or actual impacts to the Chumash Sacred Site known as the Western Gate and to any of the 12 prehistoric archaeological sites found on the property.

Details of the investigation are provided in the attachment, however briefly stated VSFB has determined the following:

a. The APE for the Point Conception Vegetation Restoration Project is adequately delineated; and

b. The undertaking will have *no adverse effect* on the significant qualities of the Point Conception Light Station Historic District, any of the individual contributing elements of the District, or any of the 12 prehistoric archaeological sites on the property.

Thus, VSFB has reached a Section 106 finding of *no adverse effect* for this undertaking. VSFB recognizes that the Tribe may have concerns beyond the purview of the NHPA and will support the use of a Chumash monitor if the Tribe makes a request to monitor any ground-disturbing activity (e.g., planting holes) associated with the Project. VSFB will continue consultation with the Tribe for the life of the project. Therefore, I am seeking any comments or concerns you may have at this time. I would appreciate receiving any feedback as part of this consultation within the next 30 calendar days. Please feel free to let me know if you require additional time. I can be reached at (7

l. Thank you for your assistance with this

undertaking.

Sincerelv S. Josh Smallwood

JOSH SMALLWOOD Base Archaeologist, Asset Management Flight

Attachment:

Identification of Historic Properties and Assessment of Effects, Point Conception Vegetation Restoration Project (2022-P)



Santa Ynez Band of Chumash Indians

**Tribal Elders' Council** P.O. Box 517 Santa Ynez CA 93460 Phone: (805)688-7997 Fax: (805)688-9578

November 14, 2022

Space Launch Delta 320 CES/CEIEA 1028 Iceland Avenue Vandenberg Space Force Base, Ca 934374

Att.: Josh Small, Historic Preservation Manager

Re: Point Conception Vegetation Restoration Project (2020-P)

Dear Mr. Small:

Thank you for contacting the Tribal Elders' Council for the Santa Ynez Band of Chumash Indians. We would like to have a formal consultation with regards to the above-mentioned project.

Please contact Cultural Resource Archaeologist, Dr. Wendy Teeter at your earliest availability for a time and date. You may contact her via email, phone or mail. See below for contact information.

P.O. Box 517, Santa Ynez, CA 93460

Thank you for your time and attention to this matter.

Sincerely Yours,

Crystal Mendoza

Crystal Mendoza Administrative Assistant | Cultural Resources Santa Ynez Band of Chumash Indians | Tribal Hall

From:	Wendy Teeter
To:	SMALLWOOD, STACY J GS-12 USSF SSC 30 CES/CEIEA
Cc:	<u>Crystal Mendoza; Nakia Zavalla; Kelsie Shroll</u>
Subject:	[Non-DoD Source] RE: {EXTERNAL} Section 106, Point Conception Vegetation Restoration Project (2020-P)
Date:	Friday, October 7, 2022 10:18:58 AM

This is super fantastic news! Thank you so much Josh! It's a total win. Best wishes and Happy Friday, Wendy

Wendy Giddens Teeter, PhD, RPA Cultural Resources Archaeologist | Elders' Council and Culture Department Santa Ynez Band of Chumash Indians

-----Original Message-----



Subject: RE: {EXTERNAL} Section 106, Point Conception Vegetation Restoration Project (2020-P)

Dear Nakia and All,

Regarding this Project, the Base has just added that they will install a fence along the eastern boundary of the 29.6-acre Point Conception property. Due to the high cultural and archaeological sensitivity of the property, I have convinced them to construct a wooden buck-and-rail style fence, instead of a post or staked fence. The buck-and-rail fence sits on top of the ground, with no stakes or posts driven into the ground. A historical iron-post gate already exists at the road entrance to the property; it just needs a new swinging gate attached, which does not require any ground disturbance. The buck-and-rail fence will be used to keep out cattle. The Project will in no way impede the SYBCI's access to the property. Respectfully, -Josh

Subject: [Non-DoD Source] RE: {EXTERNAL} Section 106, Point Conception Vegetation Restoration Project (2020-P)

Dear Josh,

Thank you for sending over this project proposal. The project itself sounds extremely important and the mitigation measures are adequate from an archaeological perspective. We would want to have Santa Ynez tribal monitors during the project. The last part is an important question for Nakia, "VSFB is requesting the Tribe's input on whether the undertaking presents an effect on the physical integrity of the Chumash Sacred Site known as the Western Gate and if that effect is adverse. VSFB cannot speak to that, as we lack the knowledge that the Tribe has regarding the important aspects of Point Conception in its role as the Western Gate. VSFB is also soliciting any concerns or issues with the Project relating to any perceived or actual impacts to any of the 12 prehistoric archaeological sites found on the property."

Consultation to answer this question might be the easiest. Best wishes, Wendy

Wendy Giddens Teeter, PhD, RPA Cultural Resources Archaeologist | Elders' Council and Culture Department Santa Ynez Band of Chumash Indians w

-----Original Message-----From: SMALLWOOD\_STACY LGS-12 USSF SSC 30 CES/CEIEA

Sent: Friday, September 30, 2022 2:35 PM To: Nakia Zavalla <N Cc: Crystal Mendoza

>; Wendy Teeter

Subject: {EXTERNAL} Section 106, Point Conception Vegetation Restoration Project (2020-P)

Caution: This message if from an EXTERNAL source. Please report suspicious messages by clicking the "Report Phish" button.

FORMAT PAGE

Appendix G. Air Quality Modeling Results

FORMAT PAGE

# AIR CONFORMITY APPLICABILITY MODEL REPORT RECORD OF AIR ANALYSIS (ROAA)

**1. General Information:** The Air Force's Air Conformity Applicability Model (ACAM) was used to perform an analysis to assess the potential air quality impact/s associated with the action in accordance with the Air Force Manual 32-7002, Environmental Compliance and Pollution Prevention; the Environmental Impact Analysis Process (EIAP, 32 CFR 989); and the General Conformity Rule (GCR, 40 CFR 93 Subpart B). This report provides a summary of the ACAM analysis.

#### a. Action Location:

Base:VANDENBERG AFBState:CaliforniaCounty(s):Santa BarbaraRegulatory Area(s):NOT IN A REGULATORY AREA

# **b. Action Title:** POINT CONCEPTION RESTORATION AT VANDENBERG SPACE FORCE BASE, CALIFORNIA

c. Project Number/s (if applicable):

#### d. Projected Action Start Date: 1 / 2024

#### e. Action Description:

Complete restoration of 26.3 acres of Point Conception in three phases: 1) control of nonnative plant species, 2) outplanting of native plant species, and 3) monitoring of restoration activities.

#### f. Point of Contact:

Name:	Lawrence Wolski
Title:	Director, Technical Project Management
Organization:	ManTech International Corporation
Email:	lawrence.wolslki@mantech.com
Phone Number:	858-345-1951

**2. Air Impact Analysis:** Based on the attainment status at the action location, the requirements of the General Conformity Rule are:

\_\_\_\_\_ applicable \_\_X\_\_ not applicable

Total net direct and indirect emissions associated with the action were estimated through ACAM on a calendar-year basis for the start of the action through achieving "steady state" (i.e., net gain/loss upon action fully implemented) emissions. The ACAM analysis used the latest and most accurate emission estimation techniques available; all algorithms, emission factors, and methodologies used are described in detail in the USAF Air Emissions Guide for Air Force Stationary Sources, the USAF Air Emissions Guide for Air Force Mobile Sources, and the USAF Air Emissions Guide for Air Force Transitory Sources.

"Insignificance Indicators" were used in the analysis to provide an indication of the significance of potential impacts to air quality based on current ambient air quality relative to the National Ambient Air Quality Standards (NAAQSs). These insignificance indicators are the 250 ton/yr Prevention of Significant Deterioration (PSD) major source threshold for actions occurring in areas that are "Clearly Attainment" (i.e., not within 5% of any NAAQS) and the GCR de minimis values (25 ton/yr for lead and 100 ton/yr for all other criteria pollutants) for actions occurring in areas that are "Near Nonattainment" (i.e., within 5% of any NAAQS). These indicators do not define a significant impact; however, they do provide a threshold to identify actions that are insignificant. Any action with net emissions below the insignificance indicators for all criteria pollutant is considered so insignificant that the action will not cause or contribute to an exceedance on one or more NAAQSs. For further detail on insignificance

# AIR CONFORMITY APPLICABILITY MODEL REPORT RECORD OF AIR ANALYSIS (ROAA)

indicators see chapter 4 of the Air Force Air Quality Environmental Impact Analysis Process (EIAP) Guide, Volume II - Advanced Assessments.

The action's net emissions for every year through achieving steady state were compared against the Insignificance Indicator and are summarized below.

#### Analysis Summary:

2024							
Pollutant	Action Emissions (ton/yr)	INSIGNIFICAN	CE INDICATOR				
		Indicator (ton/yr)	Exceedance (Yes or No)				
NOT IN A REGULATORY	AREA						
VOC	0.019	100					
NOx	0.094	100					
CO	0.136	250					
SOx	0.000	250					
PM 10	10.403	250					
PM 2.5	0.003	250					
Pb	0.000	25	No				
NH3	0.000	250					
CO2e	40.7						

#### 2025 - (Steady State)

Pollutant	Action Emissions (ton/yr)	INSIGNIFICANCE INDICATOR			
		Indicator (ton/yr)	Exceedance (Yes or No)		
NOT IN A REGULATORY	AREA		· · · · · · · · · · · · · · · · · · ·		
VOC	0.000	100			
NOx	0.000	100			
СО	0.000	250			
SOx	0.000	250			
PM 10	0.000	250			
PM 2.5	0.000	250			
Pb	0.000	25	No		
NH3	0.000	250			
CO2e	0.0				

None of estimated annual net emissions associated with this action are above the insignificance indicators, indicating no significant impact to air quality. Therefore, the action will not cause or contribute to an exceedance on one or more NAAQSs.No further air assessment is needed.

Lawrence Wolski, Director, Technical Project Management

DATE

### **1. General Information**

#### - Action Location

Base:VANDENBERG AFBState:CaliforniaCounty(s):Santa BarbaraRegulatory Area(s):NOT IN A REGULATORY AREA

- Action Title: POINT CONCEPTION RESTORATION AT VANDENBERG SPACE FORCE BASE, CALIFORNIA

- Project Number/s (if applicable):

#### - Projected Action Start Date: 1 / 2024

#### - Action Purpose and Need:

The purpose of the Proposed Action is to restore the Vandenberg SFB-owned Point Conception to support wildlife and ecological diversity, to meet the requirements of the Sikes Act; Endangered Species Act (ESA); DoD directives such as Department of Defense Instruction (DODI) 4150.7, DoD Pest Management Program and DODI 4715.03, Natural Resources Conservation Program; and Executive Order (EO) 13751, Safeguarding the Nation from the Impacts of Invasive Species. The Proposed Action is needed to control or eradicate select nonnative plant species at Point Conception allowing for native-dominated habitat restoration and natural recovery.

#### - Action Description:

Complete restoration of 26.3 acres of Point Conception in three phases: 1) control of nonnative plant species, 2) outplanting of native plant species, and 3) monitoring of restoration activities.

#### - Point of Contact

onne or contact	
Name:	Lawrence Wolski
Title:	Director, Technical Project Management
<b>Organization:</b>	ManTech International Corporation
Email:	lawrence.wolslki@mantech.com
Phone Number:	858-345-1951

#### - Activity List:

	Activity Type	Activity Title
2.	Construction / Demolition	STIHL BT 131 36 cc Auger Usage
3.	Construction / Demolition	Kubota D722 Excavator
4.	Construction / Demolition	Ford 250 Pickup USAGE
5.	Construction / Demolition	Ford F250 Pickup Usage for Water Deliveries
6.	Construction / Demolition	ATV Spray Rig Engine
7.	Construction / Demolition	ATV Usage

Emission factors and air emission estimating methods come from the United States Air Force's Air Emissions Guide for Air Force Stationary Sources, Air Emissions Guide for Air Force Mobile Sources, and Air Emissions Guide for Air Force Transitory Sources.

### 2. Construction / Demolition

### 2.1 General Information & Timeline Assumptions

#### - Activity Location

**County:** Santa Barbara **Regulatory Area(s):** NOT IN A REGULATORY AREA

- Activity Title: STIHL BT 131 36 cc Auger Usage
- Activity Description: 3 hrs/day @ 20 days/yr - gasoline
- Activity Start Date Start Month: 1 Start Month: 2024
- Activity End Date

Indefinite:FalseEnd Month:1End Month:2024

#### - Activity Emissions:

Pollutant	Total Emissions (TONs)
VOC	0.001290
SO <sub>x</sub>	0.000051
NO <sub>x</sub>	0.008673
CO	0.015018
PM 10	0.000129

Pollutant	Total Emissions (TONs)
PM 2.5	0.000129
Pb	0.000000
NH <sub>3</sub>	0.000000
CO <sub>2</sub> e	4.9

#### 2.1 Demolition Phase

### 2.1.1 Demolition Phase Timeline Assumptions

- Phase Start Date

Start Month:1Start Quarter:1Start Year:2024

- Phase Duration Number of Month: 0 Number of Days: 20

### 2.1.2 Demolition Phase Assumptions

- General Demolition Information Area of Building to be demolished (ft<sup>2</sup>): 1 Height of Building to be demolished (ft): 1
- Default Settings Used: No
- Average Day(s) worked per week: 7
- Construction Exhaust

Equipment Name	Number Of Equipment	Hours Per Day
Bore/Drill Rigs Composite	1	3

- Vehicle Exhaust

Average Hauling Truck Capacity (yd<sup>3</sup>):

#### Average Hauling Truck Round Trip Commute (mile): 0

- venicie Exhaust venicie Mixture (%)									
	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC		
POVs	0	0	0	0	0	100.00	0		

#### Vahiala Exhaust Vahiala Mixtu (0/)

#### - Worker Trips

Average Worker Round Trip Commute (mile): 0

#### - Worker Trips Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC	
POVs	50.00	50.00	0	0	0	0	0	

#### 2.1.3 Demolition Phase Emission Factor(s)

#### - Construction Exhaust Emission Factors (lb/hour)

Bore/Drill Rigs Composite								
	VOC	SOx	NOx	CO	PM 10	PM 2.5	CH4	CO <sub>2</sub> e
Emission Factors	0.0430	0.0017	0.2891	0.5006	0.0043	0.0043	0.0038	164.97

#### - Vehicle Exhaust & Worker Trips Emission Factors (grams/mile)

	VOC	SOx	NO <sub>x</sub>	CO	PM 10	PM 2.5	Pb	NH <sub>3</sub>	CO <sub>2</sub> e
LDGV	000.164	000.003	000.093	001.268	000.017	000.006		000.025	00285.560
LDGT	000.217	000.004	000.177	001.754	000.018	000.007		000.027	00356.560
HDGV	000.273	000.005	000.286	002.004	000.029	000.010		000.052	00545.059
LDDV	000.026	000.002	000.237	000.323	000.031	000.020		000.008	00225.935
LDDT	000.017	000.003	000.082	000.161	000.025	000.013		000.009	00309.267
HDDV	000.176	000.007	002.043	000.559	000.124	000.067		000.033	00760.601
MC	005.697	000.002	000.762	018.634	000.019	000.008		000.053	00210.432

### 2.1.4 Demolition Phase Formula(s)

#### - Fugitive Dust Emissions per Phase

PM10<sub>FD</sub> = (0.00042 \* BA \* BH) / 2000

PM10<sub>FD</sub>: Fugitive Dust PM 10 Emissions (TONs) 0.00042: Emission Factor (lb/ft<sup>3</sup>) BA: Area of Building to be demolished (ft<sup>2</sup>) BH: Height of Building to be demolished (ft) 2000: Conversion Factor pounds to tons

#### - Construction Exhaust Emissions per Phase

 $CEE_{POL} = (NE * WD * H * EF_{POL}) / 2000$ 

CEE<sub>POL</sub>: Construction Exhaust Emissions (TONs) NE: Number of Equipment WD: Number of Total Work Days (days) H: Hours Worked per Day (hours) EF<sub>POL</sub>: Emission Factor for Pollutant (lb/hour) 2000: Conversion Factor pounds to tons

#### - Vehicle Exhaust Emissions per Phase

VMT<sub>VE</sub> = BA \* BH \* (1 / 27) \* 0.25 \* (1 / HC) \* HT

VMT<sub>VE</sub>: Vehicle Exhaust Vehicle Miles Travel (miles)

BA: Area of Building being demolish (ft<sup>2</sup>)
BH: Height of Building being demolish (ft)
(1 / 27): Conversion Factor cubic feet to cubic yards (1 yd<sup>3</sup> / 27 ft<sup>3</sup>)
0.25: Volume reduction factor (material reduced by 75% to account for air space)
HC: Average Hauling Truck Capacity (yd<sup>3</sup>)
(1 / HC): Conversion Factor cubic yards to trips (1 trip / HC yd<sup>3</sup>)
HT: Average Hauling Truck Round Trip Commute (mile/trip)

 $V_{POL} = (VMT_{VE} * 0.002205 * EF_{POL} * VM) / 2000$ 

V<sub>POL</sub>: Vehicle Emissions (TONs)
VMT<sub>VE</sub>: Vehicle Exhaust Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF<sub>POL</sub>: Emission Factor for Pollutant (grams/mile)
VM: Vehicle Exhaust On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

- Worker Trips Emissions per Phase  $VMT_{WT} = WD * WT * 1.25 * NE$ 

VMT<sub>WT</sub>: Worker Trips Vehicle Miles Travel (miles)
WD: Number of Total Work Days (days)
WT: Average Worker Round Trip Commute (mile)
1.25: Conversion Factor Number of Construction Equipment to Number of Works
NE: Number of Construction Equipment

 $V_{POL} = (VMT_{WT} * 0.002205 * EF_{POL} * VM) / 2000$ 

V<sub>POL</sub>: Vehicle Emissions (TONs)
VMT<sub>WT</sub>: Worker Trips Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF<sub>POL</sub>: Emission Factor for Pollutant (grams/mile)
VM: Worker Trips On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

### 3. Construction / Demolition

#### 3.1 General Information & Timeline Assumptions

- Activity Location County: Santa Barbara Regulatory Area(s): NOT IN A REGULATORY AREA
- Activity Title: Kubota D722 Excavator
- Activity Description: 6 hrs/day @ 20 days/yr - diesel
- Activity Start Date Start Month: 1 Start Month: 2024
- Activity End Date Indefinite: False

End Month:	1
End Month:	2024

- Activity Emissions:

Pollutant	Total Emissions (TONs)
VOC	0.003504
SO <sub>x</sub>	0.000078
NO <sub>x</sub>	0.015138
CO	0.030540
PM 10	10.400600

Pollutant	Total Emissions (TONs)
PM 2.5	0.000600
Pb	0.000000
NH <sub>3</sub>	0.000000
CO <sub>2</sub> e	7.2

- 3.1 Trenching/Excavating Phase
- 3.1.1 Trenching / Excavating Phase Timeline Assumptions

- Phase Start Date

Start Month:	1
Start Quarter:	1
Start Year:	2024

- Phase Duration Number of Month: 0 Number of Days: 20

#### 3.1.2 Trenching / Excavating Phase Assumptions

- General Trenching/Excavating Information	
Area of Site to be Trenched/Excavated (ft <sup>2</sup> ):	1132560
Amount of Material to be Hauled On-Site (yd <sup>3</sup> ):	0
Amount of Material to be Hauled Off-Site (yd <sup>3</sup> ):	0

- Trenching Default Settings Default Settings Used: No Average Day(s) worked per week: 7

- Construction Exhaust

Equipment Name	Number Of Equipment	Hours Per Day
Excavators Composite	1	6

- Vehicle Exhaust

Average Hauling Truck Capacity (yd³):20Average Hauling Truck Round Trip Commute (mile):0

#### - Vehicle Exhaust Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	0	0	0	0	0	100.00	0

- Worker Trips

**Average Worker Round Trip Commute (mile):** 0

#### - Worker Trips Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	50.00	50.00	0	0	0	0	0

### 3.1.3 Trenching / Excavating Phase Emission Factor(s)

#### - Construction Exhaust Emission Factors (lb/hour)

#### - Vehicle Exhaust & Worker Trips Emission Factors (grams/mile)

						/			
	VOC	SO <sub>x</sub>	NO <sub>x</sub>	СО	PM 10	PM 2.5	Pb	NH <sub>3</sub>	CO <sub>2</sub> e
LDGV	000.240	000.004	000.179	002.019	000.047	000.020		000.034	00349.301
LDGT	000.529	000.004	000.390	003.951	000.049	000.022		000.034	00438.299
HDGV	001.133	000.012	002.177	017.401	000.185	000.079		000.045	01175.364
LDDV	000.057	000.003	000.387	000.455	000.084	000.055		000.008	00322.805
LDDT	000.127	000.004	000.747	000.768	000.138	000.107		000.008	00404.546
HDDV	000.429	000.015	008.814	001.758	000.338	000.240		000.029	01587.930
MC	004.838	000.002	001.285	028.044	000.019	000.009		000.050	00181.592

### 3.1.4 Trenching / Excavating Phase Formula(s)

#### - Fugitive Dust Emissions per Phase

PM10<sub>FD</sub> = (20 \* ACRE \* WD) / 2000

PM10<sub>FD</sub>: Fugitive Dust PM 10 Emissions (TONs)
20: Conversion Factor Acre Day to pounds (20 lb / 1 Acre Day)
ACRE: Total acres (acres)
WD: Number of Total Work Days (days)
2000: Conversion Factor pounds to tons

#### - Construction Exhaust Emissions per Phase

 $CEE_{POL} = (NE * WD * H * EF_{POL}) / 2000$ 

CEE<sub>POL</sub>: Construction Exhaust Emissions (TONs) NE: Number of Equipment WD: Number of Total Work Days (days) H: Hours Worked per Day (hours) EF<sub>POL</sub>: Emission Factor for Pollutant (lb/hour) 2000: Conversion Factor pounds to tons

#### - Vehicle Exhaust Emissions per Phase

 $VMT_{VE} = (HA_{OnSite} + HA_{OffSite}) * (1 / HC) * HT$ 

VMT<sub>VE</sub>: Vehicle Exhaust Vehicle Miles Travel (miles) HA<sub>OnSite</sub>: Amount of Material to be Hauled On-Site (yd<sup>3</sup>) HA<sub>OffSite</sub>: Amount of Material to be Hauled Off-Site (yd<sup>3</sup>) HC: Average Hauling Truck Capacity (yd<sup>3</sup>) (1 / HC): Conversion Factor cubic yards to trips (1 trip / HC yd<sup>3</sup>) HT: Average Hauling Truck Round Trip Commute (mile/trip)

 $V_{POL} = (VMT_{VE} * 0.002205 * EF_{POL} * VM) / 2000$ 

V<sub>POL</sub>: Vehicle Emissions (TONs)
VMT<sub>VE</sub>: Vehicle Exhaust Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF<sub>POL</sub>: Emission Factor for Pollutant (grams/mile)
VM: Vehicle Exhaust On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

#### - Worker Trips Emissions per Phase

#### $VMT_{WT} = WD * WT * 1.25 * NE$

VMT<sub>WT</sub>: Worker Trips Vehicle Miles Travel (miles)
WD: Number of Total Work Days (days)
WT: Average Worker Round Trip Commute (mile)
1.25: Conversion Factor Number of Construction Equipment to Number of Works
NE: Number of Construction Equipment

 $V_{POL} = (VMT_{WT} * 0.002205 * EF_{POL} * VM) / 2000$ 

 $V_{POL}$ : Vehicle Emissions (TONs) VMT<sub>VE</sub>: Worker Trips Vehicle Miles Travel (miles) 0.002205: Conversion Factor grams to pounds EF<sub>POL</sub>: Emission Factor for Pollutant (grams/mile) VM: Worker Trips On Road Vehicle Mixture (%) 2000: Conversion Factor pounds to tons

### 4. Construction / Demolition

### 4.1 General Information & Timeline Assumptions

 Activity Location County: Santa Barbara Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: Ford 250 Pickup USAGE

- Activity Description: 80 mi RT/day @ 60 days/yr - gasoline
- Activity Start Date Start Month: 1 Start Month: 2024
- Activity End Date

Indefinite:	False
End Month:	3
End Month:	2024

- Activity Emissions:

Pollutant	Total Emissions (TONs)
VOC	0.007326
SO <sub>x</sub>	0.000160
NO <sub>x</sub>	0.032597
CO	0.033300
PM 10	0.001033

Pollutant	Total Emissions (TONs)
PM 2.5	0.001005
Pb	0.000000
NH <sub>3</sub>	0.000000
CO <sub>2</sub> e	16.1

### 4.1 Site Grading Phase

#### 4.1.1 Site Grading Phase Timeline Assumptions

1

- Phase Start Date

Start Month:

Start Quarter:	1
Start Year:	2024

### - Phase Duration

Number of Month: 2 Number of Days: 1

### 4.1.2 Site Grading Phase Assumptions

- General Site Grading Information	
Area of Site to be Graded (ft <sup>2</sup> ):	1
Amount of Material to be Hauled On-Site (yd <sup>3</sup> ):	0
Amount of Material to be Hauled Off-Site (yd <sup>3</sup> ):	0

- Site Grading Default Settings	
<b>Default Settings Used:</b>	No
Average Day(s) worked per week:	7

#### - Construction Exhaust

Equipment Name	Number Of Equipment	Hours Per Day
Off-Highway Trucks Composite	1	2

### - Vehicle Exhaust

Average Hauling Truck Capacity (yd <sup>3</sup> ):	20
Average Hauling Truck Round Trip Commute (mile):	80

#### - Vehicle Exhaust Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	0	0	0	0	0	100.00	0

#### - Worker Trips

Average Worker Round Trip Commute (mile): 0

#### - Worker Trips Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	50.00	50.00	0	0	0	0	0

### 4.1.3 Site Grading Phase Emission Factor(s)

#### - Construction Exhaust Emission Factors (lb/hour)

Off-Highway Trucks Composite									
	VOC	SOx	NOx	CO	PM 10	PM 2.5	CH4	CO <sub>2</sub> e	
Emission Factors	0.1188	0.0026	0.5286	0.5400	0.0163	0.0163	0.0107	260.33	

#### - Vehicle Exhaust & Worker Trips Emission Factors (grams/mile)

	VOC	SO <sub>x</sub>	NO <sub>x</sub>	CO	PM 10	PM 2.5	Pb	NH <sub>3</sub>	CO <sub>2</sub> e
LDGV	000.164	000.003	000.093	001.268	000.017	000.006		000.025	00285.560
LDGT	000.217	000.004	000.177	001.754	000.018	000.007		000.027	00356.560
HDGV	000.273	000.005	000.286	002.004	000.029	000.010		000.052	00545.059
LDDV	000.026	000.002	000.237	000.323	000.031	000.020		000.008	00225.935
LDDT	000.017	000.003	000.082	000.161	000.025	000.013		000.009	00309.267
HDDV	000.176	000.007	002.043	000.559	000.124	000.067		000.033	00760.601
MC	005.697	000.002	000.762	018.634	000.019	000.008		000.053	00210.432
## 4.1.4 Site Grading Phase Formula(s)

#### - Fugitive Dust Emissions per Phase

 $PM10_{FD} = (20 * ACRE * WD) / 2000$ 

PM10<sub>FD</sub>: Fugitive Dust PM 10 Emissions (TONs)
20: Conversion Factor Acre Day to pounds (20 lb / 1 Acre Day)
ACRE: Total acres (acres)
WD: Number of Total Work Days (days)
2000: Conversion Factor pounds to tons

# - Construction Exhaust Emissions per Phase

 $CEE_{POL} = (NE * WD * H * EF_{POL}) / 2000$ 

CEE<sub>POL</sub>: Construction Exhaust Emissions (TONs) NE: Number of Equipment WD: Number of Total Work Days (days) H: Hours Worked per Day (hours) EF<sub>POL</sub>: Emission Factor for Pollutant (lb/hour) 2000: Conversion Factor pounds to tons

## - Vehicle Exhaust Emissions per Phase

 $VMT_{VE} = (HA_{OnSite} + HA_{OffSite}) * (1 / HC) * HT$ 

VMT<sub>VE</sub>: Vehicle Exhaust Vehicle Miles Travel (miles) HA<sub>OnSite</sub>: Amount of Material to be Hauled On-Site (yd<sup>3</sup>) HA<sub>OffSite</sub>: Amount of Material to be Hauled Off-Site (yd<sup>3</sup>) HC: Average Hauling Truck Capacity (yd<sup>3</sup>) (1 / HC): Conversion Factor cubic yards to trips (1 trip / HC yd<sup>3</sup>) HT: Average Hauling Truck Round Trip Commute (mile/trip)

 $V_{POL} = (VMT_{VE} * 0.002205 * EF_{POL} * VM) / 2000$ 

V<sub>POL</sub>: Vehicle Emissions (TONs)
VMT<sub>VE</sub>: Vehicle Exhaust Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF<sub>POL</sub>: Emission Factor for Pollutant (grams/mile)
VM: Vehicle Exhaust On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

## - Worker Trips Emissions per Phase

 $VMT_{WT} = WD * WT * 1.25 * NE$ 

VMT<sub>WT</sub>: Worker Trips Vehicle Miles Travel (miles)
WD: Number of Total Work Days (days)
WT: Average Worker Round Trip Commute (mile)
1.25: Conversion Factor Number of Construction Equipment to Number of Works
NE: Number of Construction Equipment

 $V_{POL} = (VMT_{WT} * 0.002205 * EF_{POL} * VM) / 2000$ 

V<sub>POL</sub>: Vehicle Emissions (TONs) VMT<sub>WT</sub>: Worker Trips Vehicle Miles Travel (miles) 0.002205: Conversion Factor grams to pounds EF<sub>POL</sub>: Emission Factor for Pollutant (grams/mile)

VM: Worker Trips On Road Vehicle Mixture (%) 2000: Conversion Factor pounds to tons

# 5. Construction / Demolition

## 5.1 General Information & Timeline Assumptions

- Activity Location County: Santa Barbara Regulatory Area(s): NOT IN A REGULATORY AREA
- Activity Title: Ford F250 Pickup Usage for Water Deliveries
- Activity Description: 80 mi RT/day @ 12 days/yr
- Activity Start Date Start Month: 1 Start Month: 2024
- Activity End Date
  - Indefinite:FalseEnd Month:1End Month:2024
- Activity Emissions:

Pollutant	Total Emissions (TONs)
VOC	0.001426
SO <sub>x</sub>	0.000031
NO <sub>x</sub>	0.006343
СО	0.006480
PM 10	0.000196

Pollutant	Total Emissions (TONs)
PM 2.5	0.000196
Pb	0.000000
NH <sub>3</sub>	0.000000
CO <sub>2</sub> e	3.1

## 5.1 Demolition Phase

#### 5.1.1 Demolition Phase Timeline Assumptions

```
- Phase Start Date
```

Start Month:1Start Quarter:1Start Year:2024

- Phase Duration Number of Month: 0 Number of Days: 12

## 5.1.2 Demolition Phase Assumptions

- General Demolition Information
   Area of Building to be demolished (ft<sup>2</sup>): 1
   Height of Building to be demolished (ft): 1
- Default Settings Used: No

## - Average Day(s) worked per week: 7

#### - Construction Exhaust

Equipment Name	Number Of Equipment	Hours Per Day
Off-Highway Trucks Composite	1	2

## - Vehicle Exhaust

Average Hauling Truck Capacity (yd³):20Average Hauling Truck Round Trip Commute (mile):80

#### - Vehicle Exhaust Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	0	0	0	0	0	100.00	0

#### - Worker Trips

**Average Worker Round Trip Commute (mile):** 0

#### - Worker Trips Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	50.00	50.00	0	0	0	0	0

# 5.1.3 Demolition Phase Emission Factor(s)

## - Construction Exhaust Emission Factors (lb/hour)

Off-Highway Trucks Composite									
	VOC	SOx	NOx	СО	PM 10	PM 2.5	CH4	CO <sub>2</sub> e	
<b>Emission Factors</b>	0.1188	0.0026	0.5286	0.5400	0.0163	0.0163	0.0107	260.33	

## - Vehicle Exhaust & Worker Trips Emission Factors (grams/mile)

			<b>I</b>			,			
	VOC	SOx	NO <sub>x</sub>	CO	PM 10	PM 2.5	Pb	$\mathbf{NH}_3$	CO <sub>2</sub> e
LDGV	000.164	000.003	000.093	001.268	000.017	000.006		000.025	00285.560
LDGT	000.217	000.004	000.177	001.754	000.018	000.007		000.027	00356.560
HDGV	000.273	000.005	000.286	002.004	000.029	000.010		000.052	00545.059
LDDV	000.026	000.002	000.237	000.323	000.031	000.020		000.008	00225.935
LDDT	000.017	000.003	000.082	000.161	000.025	000.013		000.009	00309.267
HDDV	000.176	000.007	002.043	000.559	000.124	000.067		000.033	00760.601
MC	005.697	000.002	000.762	018.634	000.019	000.008		000.053	00210.432
MC	005.697	000.002	000.762	018.634	000.019	000.008		000.053	00210.432

## 5.1.4 Demolition Phase Formula(s)

## - Fugitive Dust Emissions per Phase

 $PM10_{FD} = (0.00042 * BA * BH) / 2000$ 

PM10<sub>FD</sub>: Fugitive Dust PM 10 Emissions (TONs)
0.00042: Emission Factor (lb/ft<sup>3</sup>)
BA: Area of Building to be demolished (ft<sup>2</sup>)
BH: Height of Building to be demolished (ft)
2000: Conversion Factor pounds to tons

## - Construction Exhaust Emissions per Phase

 $CEE_{POL} = (NE * WD * H * EF_{POL}) / 2000$ 

CEE<sub>POL</sub>: Construction Exhaust Emissions (TONs)

NE: Number of Equipment WD: Number of Total Work Days (days) H: Hours Worked per Day (hours) EF<sub>POL</sub>: Emission Factor for Pollutant (lb/hour) 2000: Conversion Factor pounds to tons

#### - Vehicle Exhaust Emissions per Phase

 $VMT_{VE} = BA * BH * (1 / 27) * 0.25 * (1 / HC) * HT$ 

VMT<sub>VE</sub>: Vehicle Exhaust Vehicle Miles Travel (miles)
BA: Area of Building being demolish (ft<sup>2</sup>)
BH: Height of Building being demolish (ft)
(1 / 27): Conversion Factor cubic feet to cubic yards (1 yd<sup>3</sup> / 27 ft<sup>3</sup>)
0.25: Volume reduction factor (material reduced by 75% to account for air space)
HC: Average Hauling Truck Capacity (yd<sup>3</sup>)
(1 / HC): Conversion Factor cubic yards to trips (1 trip / HC yd<sup>3</sup>)
HT: Average Hauling Truck Round Trip Commute (mile/trip)

 $V_{POL} = (VMT_{VE} * 0.002205 * EF_{POL} * VM) / 2000$ 

V<sub>POL</sub>: Vehicle Emissions (TONs)
VMT<sub>VE</sub>: Vehicle Exhaust Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF<sub>POL</sub>: Emission Factor for Pollutant (grams/mile)
VM: Vehicle Exhaust On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

# - Worker Trips Emissions per Phase

 $VMT_{WT} = WD * WT * 1.25 * NE$ 

VMT<sub>WT</sub>: Worker Trips Vehicle Miles Travel (miles)
WD: Number of Total Work Days (days)
WT: Average Worker Round Trip Commute (mile)
1.25: Conversion Factor Number of Construction Equipment to Number of Works
NE: Number of Construction Equipment

 $V_{POL} = (VMT_{WT} * 0.002205 * EF_{POL} * VM) / 2000$ 

V<sub>POL</sub>: Vehicle Emissions (TONs)
VMT<sub>WT</sub>: Worker Trips Vehicle Miles Travel (miles)
0.002205: Conversion Factor grams to pounds
EF<sub>POL</sub>: Emission Factor for Pollutant (grams/mile)
VM: Worker Trips On Road Vehicle Mixture (%)
2000: Conversion Factor pounds to tons

# 6. Construction / Demolition

## 6.1 General Information & Timeline Assumptions

Activity Location
 County: Santa Barbara
 Regulatory Area(s): NOT IN A REGULATORY AREA

- Activity Title: ATV Spray Rig Engine

## - Activity Description:

4 hrs/day @ 60 days - gasoline Honda GX160 4.8 hp engine

- Activity Start Date

Start Month:	1
Start Month:	2024

- Activity End Date Indefinite: False End Month: 3 End Month: 2024

# - Activity Emissions:

Pollutant	Total Emissions (TONs)
VOC	0.000839
SO <sub>x</sub>	0.000012
NO <sub>x</sub>	0.007079
CO	0.006574
PM 10	0.000247

# PM 2.5 0.000247 Pb 0.000000 NH<sub>3</sub> 0.000000 CO<sub>2</sub>e 1.2

**Pollutant** 

**Total Emissions (TONs)** 

# 6.1 Demolition Phase

## 6.1.1 Demolition Phase Timeline Assumptions

- Phase Start Date

Start Month:	1
Start Quarter:	1
Start Year:	2024

- Phase Duration Number of Month: 2

Number of Days:

- 6.1.2 Demolition Phase Assumptions
- General Demolition Information
   Area of Building to be demolished (ft<sup>2</sup>): 1
   Height of Building to be demolished (ft): 1

1

- Default Settings Used: No
- Average Day(s) worked per week:
- Construction Exhaust

Equipment Name	Number Of Equipment	Hours Per Day
Pressure Washers Composite	1	4

Vehicle Exhaust
 Average Hauling Truck Capacity (yd<sup>3</sup>): 20
 Average Hauling Truck Round Trip Commute (mile): 0

7

- Vehicle Exhaust Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	0	0	0	0	0	100.00	0

- Worker Trips

Average Worker Round Trip Commute (mile): 0

- Worker Trips Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	50.00	50.00	0	0	0	0	0

# 6.1.3 Demolition Phase Emission Factor(s)

## - Construction Exhaust Emission Factors (lb/hour)

Pressure Washers Composite											
	VOC	SOx	NOx	CO	PM 10	PM 2.5	CH4	CO <sub>2</sub> e			
<b>Emission Factors</b>	0.0068	0.0001	0.0574	0.0533	0.0020	0.0020	0.0006	9.4290			

## - Vehicle Exhaust & Worker Trips Emission Factors (grams/mile)

	VOC	SOx	NO <sub>x</sub>	CO	PM 10	PM 2.5	Pb	NH <sub>3</sub>	CO <sub>2</sub> e
LDGV	000.164	000.003	000.093	001.268	000.017	000.006		000.025	00285.560
LDGT	000.217	000.004	000.177	001.754	000.018	000.007		000.027	00356.560
HDGV	000.273	000.005	000.286	002.004	000.029	000.010		000.052	00545.059
LDDV	000.026	000.002	000.237	000.323	000.031	000.020		000.008	00225.935
LDDT	000.017	000.003	000.082	000.161	000.025	000.013		000.009	00309.267
HDDV	000.176	000.007	002.043	000.559	000.124	000.067		000.033	00760.601
MC	005.697	000.002	000.762	018.634	000.019	000.008		000.053	00210.432

## 6.1.4 Demolition Phase Formula(s)

## - Fugitive Dust Emissions per Phase

PM10<sub>FD</sub> = (0.00042 \* BA \* BH) / 2000

PM10<sub>FD</sub>: Fugitive Dust PM 10 Emissions (TONs)
0.00042: Emission Factor (lb/ft<sup>3</sup>)
BA: Area of Building to be demolished (ft<sup>2</sup>)
BH: Height of Building to be demolished (ft)
2000: Conversion Factor pounds to tons

## - Construction Exhaust Emissions per Phase

 $CEE_{POL} = (NE * WD * H * EF_{POL}) / 2000$ 

CEE<sub>POL</sub>: Construction Exhaust Emissions (TONs)
NE: Number of Equipment
WD: Number of Total Work Days (days)
H: Hours Worked per Day (hours)
EF<sub>POL</sub>: Emission Factor for Pollutant (lb/hour)
2000: Conversion Factor pounds to tons

## - Vehicle Exhaust Emissions per Phase

 $VMT_{VE} = BA * BH * (1 / 27) * 0.25 * (1 / HC) * HT$ 

 $\begin{array}{l} VMT_{VE}: \ Vehicle \ Exhaust \ Vehicle \ Miles \ Travel \ (miles) \\ BA: \ Area \ of \ Building \ being \ demolish \ (ft^2) \\ BH: \ Height \ of \ Building \ being \ demolish \ (ft) \\ (1 \ / \ 27): \ Conversion \ Factor \ cubic \ feet \ to \ cubic \ yards \ (1 \ yd^3 \ / \ 27 \ ft^3) \\ \end{array}$ 

0.25: Volume reduction factor (material reduced by 75% to account for air space)
HC: Average Hauling Truck Capacity (yd<sup>3</sup>)
(1 / HC): Conversion Factor cubic yards to trips (1 trip / HC yd<sup>3</sup>)
HT: Average Hauling Truck Round Trip Commute (mile/trip)

 $V_{POL} = (VMT_{VE} * 0.002205 * EF_{POL} * VM) / 2000$ 

 $V_{POL}$ : Vehicle Emissions (TONs) VMT<sub>VE</sub>: Vehicle Exhaust Vehicle Miles Travel (miles) 0.002205: Conversion Factor grams to pounds EF<sub>POL</sub>: Emission Factor for Pollutant (grams/mile) VM: Vehicle Exhaust On Road Vehicle Mixture (%) 2000: Conversion Factor pounds to tons

# - Worker Trips Emissions per Phase

 $VMT_{WT} = WD * WT * 1.25 * NE$ 

VMT<sub>WT</sub>: Worker Trips Vehicle Miles Travel (miles)
WD: Number of Total Work Days (days)
WT: Average Worker Round Trip Commute (mile)
1.25: Conversion Factor Number of Construction Equipment to Number of Works
NE: Number of Construction Equipment

 $V_{POL} = (VMT_{WT} * 0.002205 * EF_{POL} * VM) / 2000$ 

 $V_{POL}$ : Vehicle Emissions (TONs) VMT<sub>WT</sub>: Worker Trips Vehicle Miles Travel (miles) 0.002205: Conversion Factor grams to pounds EF<sub>POL</sub>: Emission Factor for Pollutant (grams/mile) VM: Worker Trips On Road Vehicle Mixture (%) 2000: Conversion Factor pounds to tons

# 7. Construction / Demolition

## 7.1 General Information & Timeline Assumptions

- Activity Location
   County: Santa Barbara
   Regulatory Area(s): NOT IN A REGULATORY AREA
- Activity Title: ATV Usage
- Activity Description: 4 hrs/day @ 60 days/year 44 hp engine
- Activity Start Date Start Month: 1 Start Month: 2024
- Activity End Date

indefinite:	False
End Month:	3
End Month:	2024

г 1

## - Activity Emissions:

Pollutant	Total Emissions (TONs)
VOC	0.004292
SO <sub>x</sub>	0.000086
NO <sub>x</sub>	0.024420
CO	0.044264
PM 10	0.000839

Pollutant	<b>Total Emissions (TONs)</b>
PM 2.5	0.000839
Pb	0.000000
NH <sub>3</sub>	0.000000
CO <sub>2</sub> e	8.2

## 7.1 Demolition Phase

# 7.1.1 Demolition Phase Timeline Assumptions

Phase Start Date	
Start Month:	1
Start Quarter:	1
Start Year:	2024

- Phase Duration

\_

Number of Month: 2 Number of Days: 1

# 7.1.2 Demolition Phase Assumptions

- General Demolition Information
   Area of Building to be demolished (ft<sup>2</sup>): 1
   Height of Building to be demolished (ft): 1
- Default Settings Used: No
- Average Day(s) worked per week: 7
- Construction Exhaust

Equipment Name	Number Of Equipment	Hours Per Day
Tractors/Loaders/Backhoes Composite	1	4
Tractors/Loaders/Backhoes Composite	1	4

- Vehicle Exhaust

Average Hauling Truck Capacity (yd³):20Average Hauling Truck Round Trip Commute (mile):0

## - Vehicle Exhaust Vehicle Mixture (%)

I	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	0	0	0	0	0	100.00	0

- Worker Trips

Average Worker Round Trip Commute (mile): 0

## - Worker Trips Vehicle Mixture (%)

	LDGV	LDGT	HDGV	LDDV	LDDT	HDDV	MC
POVs	50.00	50.00	0	0	0	0	0

# 7.1.3 Demolition Phase Emission Factor(s)

Tractors/Loaders/Backhoes Composite												
	VOC	SOx	NOx	СО	PM 10	PM 2.5	CH4	CO <sub>2</sub> e				
Emission Factors	0.0348	0.0007	0.1980	0.3589	0.0068	0.0068	0.0031	66.875				

## - Construction Exhaust Emission Factors (lb/hour)

#### - Vehicle Exhaust & Worker Trips Emission Factors (grams/mile)

	VOC	SOx	NO <sub>x</sub>	CO	PM 10	PM 2.5	Pb	NH <sub>3</sub>	CO <sub>2</sub> e
LDGV	000.164	000.003	000.093	001.268	000.017	000.006		000.025	00285.560
LDGT	000.217	000.004	000.177	001.754	000.018	000.007		000.027	00356.560
HDGV	000.273	000.005	000.286	002.004	000.029	000.010		000.052	00545.059
LDDV	000.026	000.002	000.237	000.323	000.031	000.020		000.008	00225.935
LDDT	000.017	000.003	000.082	000.161	000.025	000.013		000.009	00309.267
HDDV	000.176	000.007	002.043	000.559	000.124	000.067		000.033	00760.601
MC	005.697	000.002	000.762	018.634	000.019	000.008		000.053	00210.432

## 7.1.4 Demolition Phase Formula(s)

## - Fugitive Dust Emissions per Phase

 $PM10_{FD} = (0.00042 * BA * BH) / 2000$ 

PM10<sub>FD</sub>: Fugitive Dust PM 10 Emissions (TONs)
0.00042: Emission Factor (lb/ft<sup>3</sup>)
BA: Area of Building to be demolished (ft<sup>2</sup>)
BH: Height of Building to be demolished (ft)
2000: Conversion Factor pounds to tons

#### - Construction Exhaust Emissions per Phase

 $CEE_{POL} = (NE * WD * H * EF_{POL}) / 2000$ 

CEE<sub>POL</sub>: Construction Exhaust Emissions (TONs)
NE: Number of Equipment
WD: Number of Total Work Days (days)
H: Hours Worked per Day (hours)
EF<sub>POL</sub>: Emission Factor for Pollutant (lb/hour)
2000: Conversion Factor pounds to tons

#### - Vehicle Exhaust Emissions per Phase

 $VMT_{VE} = BA * BH * (1 / 27) * 0.25 * (1 / HC) * HT$ 

VMT<sub>VE</sub>: Vehicle Exhaust Vehicle Miles Travel (miles)
BA: Area of Building being demolish (ft<sup>2</sup>)
BH: Height of Building being demolish (ft)
(1 / 27): Conversion Factor cubic feet to cubic yards (1 yd<sup>3</sup> / 27 ft<sup>3</sup>)
0.25: Volume reduction factor (material reduced by 75% to account for air space)
HC: Average Hauling Truck Capacity (yd<sup>3</sup>)
(1 / HC): Conversion Factor cubic yards to trips (1 trip / HC yd<sup>3</sup>)
HT: Average Hauling Truck Round Trip Commute (mile/trip)

 $V_{POL} = (VMT_{VE} * 0.002205 * EF_{POL} * VM) / 2000$ 

 $\begin{array}{l} V_{POL}: \ Vehicle \ Emissions \ (TONs) \\ VMT_{VE}: \ Vehicle \ Exhaust \ Vehicle \ Miles \ Travel \ (miles) \\ 0.002205: \ Conversion \ Factor \ grams \ to \ pounds \\ EF_{POL}: \ Emission \ Factor \ for \ Pollutant \ (grams/mile) \\ VM: \ Vehicle \ Exhaust \ On \ Road \ Vehicle \ Mixture \ (\%) \end{array}$ 

2000: Conversion Factor pounds to tons

## - Worker Trips Emissions per Phase

 $VMT_{WT} = WD * WT * 1.25 * NE$ 

VMT<sub>WT</sub>: Worker Trips Vehicle Miles Travel (miles)
WD: Number of Total Work Days (days)
WT: Average Worker Round Trip Commute (mile)
1.25: Conversion Factor Number of Construction Equipment to Number of Works
NE: Number of Construction Equipment

 $V_{POL} = (VMT_{WT} * 0.002205 * EF_{POL} * VM) / 2000$ 

 $V_{POL}$ : Vehicle Emissions (TONs) VMT<sub>WT</sub>: Worker Trips Vehicle Miles Travel (miles) 0.002205: Conversion Factor grams to pounds EF<sub>POL</sub>: Emission Factor for Pollutant (grams/mile) VM: Worker Trips On Road Vehicle Mixture (%) 2000: Conversion Factor pounds to tons