

3 Affected Environment and Environmental Consequences

1 This chapter describes the conditions of the existing environment and environmental consequences for
2 resources potentially affected by implementation of Alternative 1 (Full Mitigation Area), Alternative 2
3 (Partial Configuration A – Areas Alpha, Bravo North, Delta, and Echo), Alternative 3 (Partial
4 Configuration B – Areas Charlie, Delta, Echo, and Foxtrot), and the No Action Alternative. The resources
5 evaluated in detail in this chapter include Air Quality (Section 3.1), Biological Resources (Section 3.2),
6 Cultural Resources (Section 3.3), Geological Resources (Section 3.4), Land Use (Section 3.5), Water
7 Resources (Section 3.6), and Public Health and Safety (Section 3.7).

3.1 Air Quality

3.1.1 Definition of Resource

8
9
10 Air quality in a given location is defined by pollutant concentrations in the atmosphere and is generally
11 expressed in units of parts per million (ppm) or micrograms per cubic meter. One aspect of significance is
12 a pollutant's concentration in comparison to a national ambient air quality standard. Such standards
13 represent the maximum allowable atmospheric concentrations that may occur while still protecting public
14 health and welfare with a reasonable margin of safety. The EPA established the National Ambient Air
15 Quality Standards (NAAQS). The NAAQS represent maximum acceptable concentrations that generally
16 may not be exceeded more than once per year, except annual standards, which may never be exceeded.
17 The NAAQS are shown in Table 3-1.

18 This section addresses baseline air quality conditions for MCAS Miramar and includes a description of air
19 quality terminology, regulatory requirements applicable to the project alternatives, and current air quality
20 conditions. The main pollutants of concern considered in this air quality analysis include volatile organic
21 compounds (VOCs), carbon monoxide (CO), oxides of nitrogen (NO_x), particulate matter less than or
22 equal to 10 microns in diameter (PM₁₀), and particulate matter less than or equal to 2.5 microns in
23 diameter (PM_{2.5}). Although VOCs and NO_x (other than nitrogen dioxide) have no established ambient
24 standards, they are important as precursors to ozone (O₃) formation.

25 Toxic air contaminants (TACs) include air pollutants that can cause serious illnesses or increased
26 mortality, even in low concentrations. TACs are compounds that generally have no established ambient
27 standards, but are known or suspected to cause short-term (acute) and/or long-term (chronic
28 non-carcinogenic or carcinogenic) adverse health effects. The California Air Resources Board
29 (California ARB) designates diesel particulate matter from the combustion of diesel fuel as a TAC.
30 Hazardous air pollutants (HAPs) are the term used by the federal Clean Air Act (CAA) for a set of air
31 pollutants that are similar to TACs. The CAA identifies 187 substances as HAPs, such as benzene,
32 formaldehyde, mercury, and toluene.

33 In addition to the criteria pollutants listed below, anthropogenic (caused by human activities) greenhouse
34 gases (GHGs) have been identified as contributors to global climate change. GHGs include carbon
35 dioxide (CO₂), methane (CH₄), nitrous oxide (N₂O), and other trace gases that are present in trace
36 amounts in the atmosphere. This is a developing area of scientific study with no established thresholds to
37 determine significance of impacts under NEPA. The potential effects of proposed GHG emissions are by
38 nature global and cumulative impacts, as individual sources of GHG emissions are not large enough on
39 their own to have an appreciable effect on climate change. Therefore, the impact of proposed
40 GHG emissions to climate change is discussed in the context of cumulative impacts in Chapter 4.

Table 3-1. National Ambient Air Quality Standards

Pollutant	Averaging Time	National Standards ^(a)	
		Primary ^(b, c)	Secondary ^(b, d)
Ozone (O ₃)	8-hour	0.075 ppm (147 µg/m ³)	Same as primary
Carbon monoxide (CO)	8-hour	9 ppm (10 mg/m ³)	---
	1-hour	35 ppm (40 mg/m ³)	---
Nitrogen dioxide (NO ₂)	Annual	0.053 ppm (100 µg/m ³)	Same as primary
	1-hour	0.10 ppm (188 µg/m ³)	---
Sulfur dioxide (SO ₂)	3-hour		
	1-hour	0.075 ppm (196 µg/m ³)	---
PM ₁₀	24-hour	150 µg/m ³	Same as primary
PM _{2.5}	Annual	15 µg/m ³	---
	24-hour	35 µg/m ³	---
Lead	Rolling 3-month average	0.15 µg/m ³	Same as primary
	Quarterly average	1.5 µg/m ³	Same as primary

Notes: ppm = parts per million; µg/m³ = micrograms per cubic meter.
a Standards other than the 24-hour PM₁₀, 24-hour PM_{2.5}, and those based on annual averages are not to be exceeded more than once a year.
b Concentrations are expressed first in units in which they were promulgated. Equivalent units given in parentheses.
c Primary Standards: The levels of air quality necessary, with an adequate margin of safety to protect the public health. Each state must attain the primary standards no later than three years after that state's implementation plan is approved by the EPA.
d Secondary Standards: The levels of air quality necessary to protect the public welfare from any known or anticipated adverse effects of a pollutant.
Source: California ARB 2012

1 3.1.2 Region of Influence

2 The region of influence (ROI) for this air quality analysis is defined as all of San Diego County, which
3 equates to the San Diego Air Basin (SDAB). Air basins are areas with similar geographical and
4 meteorological features that are designed to manage the air resources of those areas. Identifying the ROI
5 for air quality requires knowledge of the types of pollutants being emitted, pollutant emission rates,
6 topography, and meteorological conditions. The ROI for inert pollutants (generally pollutants that do not
7 undergo secondary reactions in the atmosphere) is generally limited to a few miles downwind from a
8 source. The ROI for photochemical pollutants, such as O₃, can extend much farther downwind than for
9 inert pollutants. Ozone is a secondary pollutant formed in the atmosphere by photochemical reactions
10 (chemical reactions caused by the absorption of light) of its precursors, or previously emitted pollutants.
11 Ozone precursors are mainly VOCs and NO_x. These precursors mix with free oxygen in the air. Solar
12 radiation then allows for the necessary input of energy to cause a reaction, which creates O₃. Ozone is a
13 global environmental concern. The maximum effect of VOCs and NO_x emissions on O₃ levels usually
14 occurs several hours after they are emitted and many miles from the source.

3.1.3 Affected Environment

3.1.3.1 Baseline Air Quality

The EPA designates all areas of the U.S. in terms of having air quality better than (attainment) or worse than (nonattainment) the NAAQS. Former nonattainment areas that have attained the NAAQS are designated as maintenance areas. Presently, the SDAB is in attainment of the NAAQS for all pollutants except O₃. Additionally, the western portion of the SDAB (the portion of San Diego County generally west of the interior desert region) is also a maintenance area for CO.

Ozone concentrations are generally the highest during the summer months, coinciding with the period of maximum regional insolation (solar radiation received at the earth's surface). Maximum O₃ concentrations tend to occur over a wide region, as its precursor emissions and resulting concentrations homogeneously disperse with time in the atmosphere. Inert pollutants, such as CO, tend to have the highest concentrations during the colder months of the year, when light winds and nighttime/early morning surface-based temperature inversions (increasing temperature with height from the surface) inhibit the dispersion of these pollutants. Maximum inert pollutant concentrations are usually found in direct proximity to an emission source.

3.1.3.2 Regional and Local Air Pollutant Sources

The SDCAPCD periodically updates emissions for the SDAB for purposes of forecasting future emissions, analyzing emission control measures, and for use in regional air quality modeling. The largest sources of VOCs, CO, and NO_x emissions within the region are on-road vehicles. The 2008 annual emissions inventory determined that on-road vehicles emitted 33 percent of the VOCs, 64 percent of the CO, and 56 percent of the NO_x emissions within the entire SDAB (California ARB 2009). Other large contributors of VOCs within the region include the use of solvents and surface coatings. Combustive sources such as vehicles, diesel engines, and industrial facilities emit fine particulate matter (PM_{2.5}) and gaseous pollutants (such as NO_x), which can react in the atmosphere to produce secondary fine particulates. Coarser particles (PM₁₀) are directly emitted from soil-disturbing activities such as construction, mining, agriculture, and vehicular road dust.

Emission sources associated with existing uses at MCAS Miramar include civilian and military personal vehicles, commercial and military vehicles, aircraft engines, tactical support equipment, small stationary sources, maintenance, and construction activities.

3.1.3.3 Greenhouse Gas Emissions

Greenhouse gases are gases that trap heat in the atmosphere. These emissions occur from natural processes and human activities. The accumulation of GHGs in the atmosphere influences the long-term range of average atmospheric temperatures. Scientific evidence indicates a trend of increasing global temperature over the past century due to an increase in GHG emissions from human activities. The climate change associated with this global warming is predicted to produce negative economic and social consequences across the globe.

The most common GHGs emitted from natural processes and human activities include CO₂, CH₄, and N₂O. Examples of GHGs created and emitted primarily through human activities include fluorinated gases (hydrofluorocarbons and perfluorocarbons used in refrigerants and propellants, among other products) and sulfur hexafluoride. Each GHG is assigned a global warming potential (GWP), which equates to the ability of a gas or aerosol to trap heat in the atmosphere. The GWP rating system is standardized to CO₂, which has a value of one. For example, CH₄ has a GWP of 21, which means that it has a global warming effect 21 times greater than CO₂ on an equal-mass basis. The total GHG emissions from a source are often expressed as a CO₂ equivalent (CO₂e). The CO₂e is calculated by multiplying the emission of each GHG by its GWP and adding the products together to produce a single, combined emission rate representing all GHGs.

1 Recent observed changes due to global warming include shrinking glaciers, thawing permafrost,
2 a lengthened growing season, and shifts in plant and animal ranges (California Energy Commission 2012;
3 Intergovernmental Panel on Climate Change 2014; United States Global Change Research
4 Program 2014). Predictions of long-term environmental impacts due to global warming include sea level
5 rise; changing weather patterns with increases in the severity of storms and droughts; changes to local and
6 regional ecosystems, including the potential loss of species; and a significant reduction in winter snowpack.
7 In California, global warming effects are predicted to include exacerbation of air quality problems; a
8 reduction in municipal water supply from the Sierra snowpack; a rise in sea level that would displace coastal
9 businesses and residences; damage to marine and terrestrial ecosystems; and an increase in the incidence of
10 infectious diseases, asthma, and other human health problems (California Energy Commission 2012).

11 Federal agencies on a national scale address emissions of GHGs by reporting and meeting reductions
12 mandated in federal laws, EOs, and agency policies. The most recent of these are EOs 13423 and 13514
13 and the *EPA Final Mandatory Reporting of Greenhouse Gases Rule*. Several states have promulgated
14 laws as a means of reducing statewide levels of GHG emissions. In particular, the California Global
15 Warming Solutions Act of 2006 (Assembly Bill 32) directs the State of California to reduce statewide
16 GHG emissions to 1990 levels by the year 2020. Groups of states also have formed regionally based
17 collectives (such as the Western Climate Initiative) to jointly address GHG pollutants.

18 In an effort to reduce energy consumption, reduce dependence on petroleum, and increase the use of
19 renewable energy resources in accordance with the goals set by EOs and the Energy Policy Act of 2005,
20 the Marine Corps and DoD have implemented a number of renewable energy projects (NAVFAC 2006a).
21 The types of projects currently in operation within the southwest region include thermal and photovoltaic
22 solar systems, geothermal power plants, and wind generators. The military also purchases one-half of the
23 biodiesel fuel sold in California and continues to promote and install new renewable energy projects
24 within the southwest region.

25 On 18 February 2010, the CEQ proposed for the first time draft guidance on how federal agencies should
26 evaluate the effects of climate change and GHG emissions for NEPA documentation (CEQ 2010). The
27 CEQ does not provide a reference point as an indicator of a level of GHG emissions that may
28 significantly affect the quality of the human environment. In the analysis of the effects of a proposed
29 action, the CEQ proposes that it would be appropriate to: 1) quantify cumulative emissions over the life
30 of the project; 2) discuss measures to reduce GHG emissions, including consideration of reasonable
31 alternatives; and 3) qualitatively discuss the link between such GHG emissions and climate change.

32 **3.1.4 Applicable Regulations and Standards**

33 The CAA establishes the NAAQS and requires states to implement a plan that will achieve those
34 standards. To that end, it also delegates authority to enforce the standards. In California, the California
35 ARB is responsible for enforcing air pollution regulations. In San Diego County, the SDCAPCD has this
36 responsibility. Basic elements of the CAA include the NAAQS for criteria air pollutants, hazardous air
37 pollutant standards, attainment plans, motor vehicle emission standards, stationary source emission
38 standards and permits, and enforcement provisions.

39 The CAA establishes air quality planning processes and requires areas in nonattainment of an NAAQS to
40 develop a State Implementation Plan (SIP) that details how the state will attain the standard within
41 mandated time frames. The requirements and compliance dates for attainment are based on the severity of
42 the nonattainment classification of the area. Section 3.1.4.1, Federal Regulations, and Section 3.1.4.2,
43 Local Regulations, provide a summary of the federal, state, and local air quality rules and regulations that
44 apply to the proposed action and its alternatives.

3.1.4.1 Federal Regulations

Clean Air Act

Section 176(c) of the CAA, as articulated in the EPA General Conformity Rule, states that a federal agency cannot issue a permit or support an activity unless the agency determines that it will conform to the most recent EPA-approved SIP. This means that projects using federal funds or requiring federal approval in nonattainment or maintenance areas must not: 1) cause or contribute to any new violation of an NAAQS; 2) increase the frequency or severity of any existing violation; or 3) delay the timely attainment of any standard, interim emission reduction, or other milestone. Emissions of attainment pollutants are exempt from the conformity rule. Actions would conform to a SIP if their annual emissions remain less than applicable *de minimis* thresholds (10 to 100 tons per year, depending on the pollutant and nonattainment rating). Formal conformity determinations are required for any actions that exceed these thresholds. Based on the present attainment status of the SDAB, the proposed action would conform to the most recent EPA-approved SIP if its annual construction or operational emissions do not exceed 100 tons of VOCs, CO, or NO_x. SDCAPCD Rule 1501 implements the EPA General Conformity Rule. The conformity evaluation for the proposed action is summarized in Section 3.1.5 and presented in complete form in Appendix C of this EA.

Executive Orders

The following EOs regulate air quality.

- EO 12088, *Federal Compliance with Pollution Control Standards*, requires federal agencies to comply with applicable pollution control standards and to cooperate with EPA, state, and local regulatory agencies;
- EO 13423, *Strengthening Federal Environmental, Energy, and Transportation Management*, sets goals to reduce GHG emissions by reducing energy intensity by 3 percent annually or 30 percent by 2015;
- EO 13432, *Cooperation Among Agencies in Protecting the Environment with Respect to Greenhouse Gas Emissions from Motor Vehicles, Nonroad Vehicles, and Nonroad Engines*, ensures the coordination between federal agencies to protect the environment with respect to GHG emissions from vehicles, engines, and motor vehicle fuels; and
- EO 13514, *Federal Leadership in Environmental, Energy, and Economic Performance*, establishes sustainability goals for federal agencies. This EO requires federal agencies to increase energy efficiency, reduce GHG emissions, conserve water, reduce waste, support sustainable development, reduce petroleum consumption, and promote environmentally responsible products and technologies.

3.1.4.2 Local Regulations

The SDCAPCD is the local agency responsible for enforcement of air quality regulations in the project region. The SDCAPCD has developed air quality plans to reduce emissions to a level that will bring the SDAB into attainment of the ambient air quality standards (SDCAPCD 2013a). Control measures for stationary sources proposed in the air quality plans and adopted by the SDCAPCD are incorporated into the SDCAPCD Rules and Regulations (SDCAPCD 2013b).

3.1.5 Environmental Consequences

3.1.5.1 Alternative 1: Full Mitigation Area (Preferred Alternative)

Air quality impacts from the proposed action due to the creation, restoration, or enhancement of potentially up to 22 acres of vernal pools would occur from: 1) combustive emissions due to the use of fossil fuel-powered construction equipment and trucks and 2) fugitive dust emissions (PM₁₀ and PM_{2.5}) due to the operation of equipment on exposed soils. Equipment usages associated with these activities and their resulting emissions are not specifically known at this time; however, recent vernal pool and upland enhancement projects at MCAS Miramar required the use of small mechanical vehicles such as D4 bulldozers, bobcats, and construction work trucks, and this project would likely require the same or similar types of equipment. In addition, the proposed action would minimize ground disturbances, which would minimize equipment usages needed for the development of vernal pools.

Implementation of Alternative 1 would occur during many phases and over a period of several years or decades, with short periods of high intensity grading and contouring at individual subsites (days to weeks in duration), followed by extended periods of passive habitat monitoring (i.e. minimal additional ground disturbing activities). The proposed annual equipment usages and fugitive dust generating activities would be comparable or less than another recent short-term construction projects at MCAS Miramar, which was estimated to produce annual air emissions substantially less than (approximately 0.5 to 1.5 percent) their applicable conformity *de minimis* or Prevention of Significant Deterioration (PSD) threshold. Therefore, Alternative 1 would also produce less than significant air quality impacts. Implementation of standard fugitive dust and construction equipment emission control measures (Environmental Protection Measures 1 and 2) would further minimize emissions of PM₁₀ and PM_{2.5}.

Equipment used for the development of vernal pools would emit TACs that could potentially impact public health. The main source of TACs would occur in the form of particulates from the combustion of diesel fuel. Due to the mobile and intermittent operation of diesel-powered equipment over a large development area, there would be minimal ambient impacts of TACs in a localized area. As a result, Alternative 1 would produce less than significant impacts to public health and no mitigation is required.

Maintenance and monitoring activities associated with Alternative 1 would produce minor amounts of air emissions due to the occasional use of light-duty vehicles and equipment. Therefore, this activity would produce annual air emissions that would be substantially less than their applicable conformity *de minimis* or PSD threshold. As a result, operation of Alternative 1 would produce less than significant air quality impacts and no mitigation is required.

The results of air quality analysis indicate that emissions from the proposed action would not exceed their applicable conformity *de minimis* thresholds. Appendix C of this EA includes a CAA Record of Non-Applicability (RONA) documentation for Alternative 1.

3.1.5.2 Alternative 2: Partial Configuration A (Areas Alpha, Bravo North, Delta, and Echo)

Air quality impacts from Alternative 2 would be similar but slightly less than Alternative 1, as the alternative potentially would develop 15 rather than 22 acres of vernal pools. Restoration of fewer pools equates to less grading, which requires fewer hours of heavy-equipment-generating emissions. Similar to Alternative 1, the development, maintenance, and monitoring of vernal pools under Alternative 2 would produce annual air emissions that would be substantially less than their applicable conformity *de minimis* or PSD threshold. Therefore, Alternative 2 would produce less than significant air quality impacts and no mitigation is required.

1 Implementation of standard fugitive dust and construction equipment emission control measures
2 (Environmental Protection Measures 1 and 2) would minimize emissions of PM₁₀ and PM_{2.5}.

3 **3.1.5.3 Alternative 3: Partial Configuration (Areas Charlie, Delta, Echo, and Foxtrot)**

4 Air quality impacts from Alternative 3 would be similar to Alternative 2, as both alternatives potentially
5 would develop 15 acres of vernal pools. Similar to Alternative 2, the development, maintenance, and
6 monitoring of vernal pools under Alternative 3 would produce annual air emissions that would be
7 substantially less than their applicable conformity *de minimis* or PSD threshold. Therefore, Alternative 3
8 would produce less than significant air quality impacts and no mitigation is required. Implementation of
9 standard fugitive dust and construction equipment emission control measures (Environmental Protection
10 Measures 1 and 2) would minimize emissions of PM₁₀ and PM_{2.5}.

11 **3.1.5.4 No Action Alternative**

12 Under the No Action Alternative, development and management of vernal pools on a project-by-project
13 basis would require minimal amounts of equipment usages and therefore would produce annual air
14 emissions that would not exceed any applicable conformity *de minimis* or PSD threshold. As a result, the
15 No Action Alternative would not produce significant air quality impacts and no mitigation is required.

3.2 Biology

3.2.1 Definition of Resource

For the purposes of this EA, biological resources are defined as plant communities, plant species, wildlife species, habitat linkages, and special status communities and species that may be affected by implementation of the proposed action and alternatives. These resources are divided into four major categories: vegetation communities, general wildlife, special status species, and wetlands and other Waters of the U.S.

Vegetation communities include all existing terrestrial plant communities, with the exception of special status plant species.

General wildlife includes all animals with the exception of those identified as special status species. Wildlife includes invertebrates, fish, amphibians, reptiles, birds, and mammals.

Special status species are defined as those that are: 1) listed as threatened or endangered, proposed for listing as threatened or endangered, or are candidates for such listing under the federal ESA, which protects federally listed threatened and endangered plant and animal species; or 2) species that have similar status under the California ESA. Although DoN policy encourages cooperation to protect state-listed species, there is no statutory mandate for protection by federal entities. Also included in this special status category are species protected by the Bald Eagle Protection Act; federal Migratory Bird Treaty Act (MBTA); and EO 13186, *Responsibilities of Federal Agencies to Protect Migratory Birds*. Critical habitat, as defined under the ESA, has not been designated on MCAS Miramar because the USFWS has determined that the MCAS Miramar INRMP provides a conservation benefit for the species.

Wetlands are defined under CWA regulations (33 CFR 328) as “those areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted to life in saturated soil conditions. Wetlands generally include swamp, marshes, bogs, and similar areas.” The term “jurisdictional wetlands” is used for those wetlands subject to regulation by the USACE under the CWA. These include wetlands adjacent to traditional navigable waters or tributaries to traditional navigable waters. The USACE may also assert jurisdiction over wetlands if they have a significant nexus with a traditional navigable water.

The following data sources were consulted/developed to support the analysis presented in this chapter:

- MCAS Miramar INRMP (MCAS Miramar 2011a);
- MCAS Miramar GIS resource database (MCAS Miramar GIS data 2014);
- MCAS Miramar Natural Resource Division staff and NAVFAC SW natural resource and planning staff provided additional relevant information and technical reports;
- Rare plant survey data (Dossey and Associates 2006, 2008; Tetra Tech, Inc. 2012, 2013);
- Coastal California gnatcatcher survey data (Haas 2010; Tierra Data Inc. 2014); and
- Wetlands/Waters of the U.S. (Lichvar and Dixon 2008; MCAS Miramar GIS data 2014).

3.2.2 Region of Influence

The ROI for biological resources is defined as areas wherein biological resources may be directly or indirectly affected due to ground disturbance during restoration activities. For the purposes of this analysis, this includes the proposed mitigation areas for Alternative 1, Alternative 2, Alternative 3, and immediately adjacent areas.

3.2.3 Affected Environment

3.2.3.1 Vegetation Communities

Plant community terminology presented in this EA aligns with the most recently completed MCAS Miramar INRMP (2011a). MCAS Miramar recently received updated Station-wide vegetation mapping, which utilizes the relatively new National Vegetation Classification (NVC) System. MCAS Miramar is coordinating with the California Department of Fish and Wildlife Department (CDFW) and the U.S. Fish and Wildlife Service (USFWS) regarding the use of this new vegetation classification system for conservation as part of the Station's INRMP update, which is in process but has not been completed (personal communication Dave Boyer January 2015). Because the new NVC data were received only recently, terminology is different from existing data, and its use has not been fully developed; this EA presents vegetation data and terminology available at the time the EA started and that would be more familiar to readers. As application of the new NVC system is determined through a complete update of the INRMP, the guidance and terminology in that INRMP update will be applied to project execution.

The vegetation communities described in this EA are from MCAS Miramar data depicting those found within and adjacent to the proposed mitigation areas (MCAS Miramar GIS data 2014). The descriptions and mapping of vegetation communities in this EA are based on O'Leary *et al.* (1994; 2002), with nomenclature following Holland 1986. Table 3-2 provides the acreage of the vegetation communities within each proposed mitigation area, and Figure 3-1 depicts vegetation communities identified within the proposed mitigation areas. A detailed description of each community is provided in the MCAS Miramar INRMP, and a general description of the vegetation communities is provided following Figure 3-1.

Table 3-2. Existing Vegetation Communities within the Proposed Mitigation Areas

Vegetation Community	Proposed Mitigation Area (Areas in acres)							Total
	Alpha	Bravo North	Bravo South	Charlie	Delta	Echo	Foxtrot	
Chamise Chaparral	1.4	3.8	26.0	2.1	10.1	10.4	4.5	58.2
Coastal and Valley Fresh Water Marsh	--	--	--	--	--	0.2	--	0.2
Coastal Sage-Scrub Chaparral	--	--	--	--	--	4.6	--	4.6
Developed	0.1	1.5	--	1.5	0.3	5.4	--	8.8
Diegan Coastal Sage Scrub	--	--	--	--	0.1	6.9	--	7.0
Disturbed Chamise Chaparral	20.1	29.0	21.9	17.9	30.0	26.0	12.5	157.4
Disturbed Coastal and Valley Fresh Water Marsh	--	--	--	--	--	0.5	--	0.5
Disturbed Diegan Coastal Sage Scrub	--	14.3	--	28.5	29.9	15.8	1.4	90.0
Disturbed Habitat	--	1.8	--	10.0	3.5	90.7	14.2	120.2
Disturbed Non-Native Grassland	20.1	23.1	7.0	11.2	6.3	--	11.5	79.2
Disturbed Non-Native/Native grassland	--	3.7	3.4	--	--	1.3	--	8.5
Disturbed Sage-Scrub Chaparral	--	2.4	--	--	--	--	--	2.4
Disturbed Southern Mixed Chaparral	--	--	1.4	--	0.1	1.2	--	2.6
Disturbed Vernal Marsh	--	--	--	--	--	0.1	0.2	0.4
Eucalyptus Woodland	--	--	--	--	1.7	--	--	1.7
Native Grassland	--	--	2.2	8.1	--	--	--	10.3
Non-Native Grassland	--	--	--	20.7	42.6	--	--	63.2
Non-Native/Native Grassland	--	--	--	1.8	5.6	--	--	7.4
Scrub Oak Chaparral	--	--	1.4	--	0.2	--	--	1.6
Southern Mixed Chaparral	--	--	34.0	4.4	--	22.3	0.1	60.8
Vernal Marsh	--	3.9	1.7	2.7	1.8	3.5	--	13.6
Total	41.7	83.5	99.1	108.9	132.0	189.1	44.4	698.8

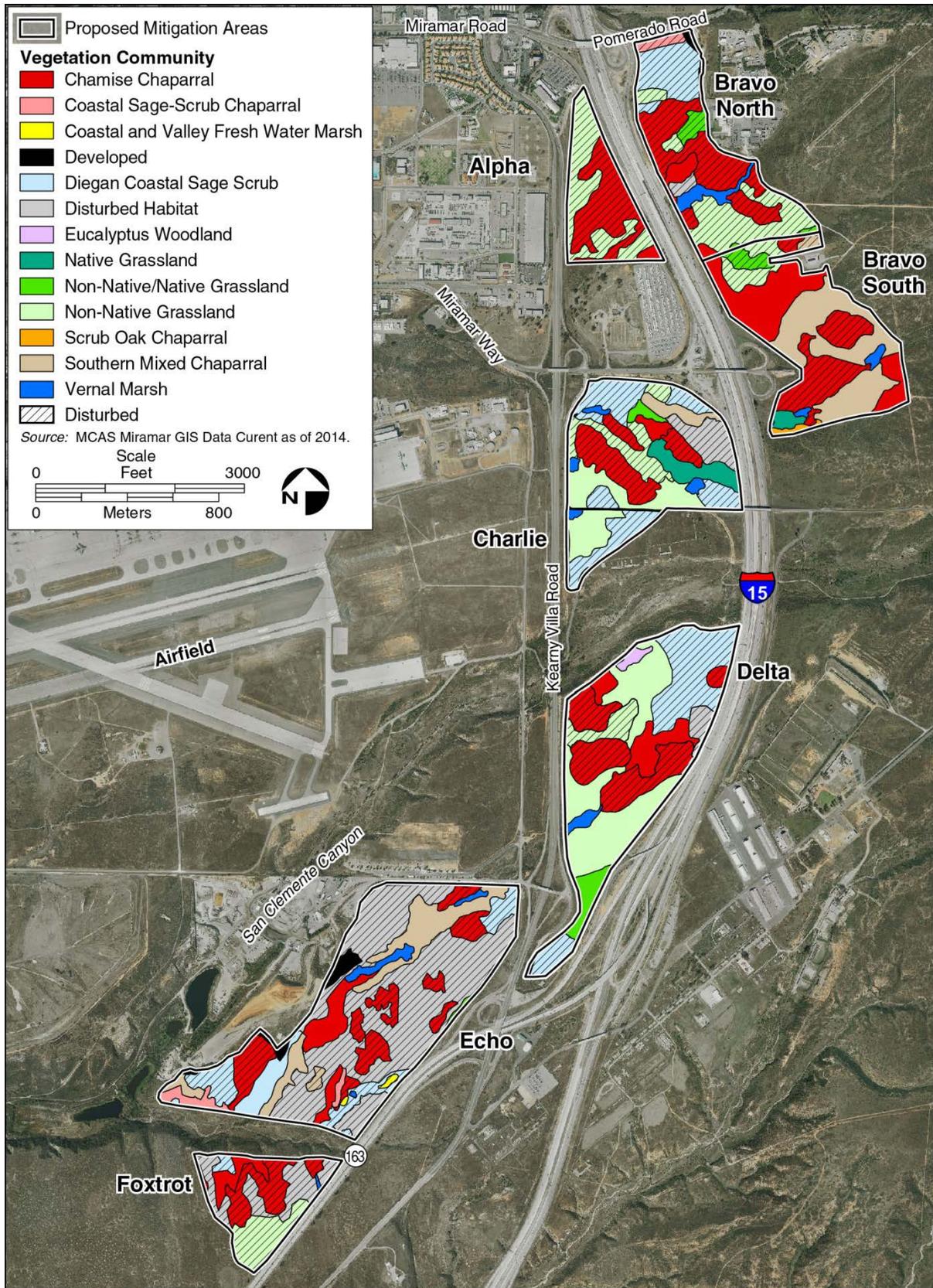


Figure 3-1. Vegetation Mapping within the Proposed Mitigation Areas

Chaparral (Chamise, Southern Mixed, and Scrub Oak)

Chaparral is made up of shrubs with small, hard, evergreen leaves (i.e., sclerophyllous) that are adapted to prevent wilting during dry periods. Chamise (*Adenostoma fasciculatum*) is an indicator species that defines chaparral vegetation types and is present to some degree in all chaparral vegetation at MCAS Miramar. Chaparral types are chamise, southern mixed chaparral, Nuttall's scrub oak (*Quercus dumosa*), and ceanothus (*Ceanothus tomentosus* and *C. verrucosus*) with mixed and disturbed versions of each.

Coastal Sage Scrub (Diegan Coastal Sage Scrub)

This land type consists of sparsely to densely spaced, low-growing, drought deciduous shrubs. It frequently occurs on south-facing slopes and ridges where the rainfall, drainage, soil type, and exposure to the sun provide conditions necessary for the plant community. Species characteristic of coastal sage scrub include California sagebrush (*Artemisia californica*), California buckwheat (*Eriogonum fasciculatum*), black sage (*Salvia mellifera*), white sage (*Salvia apiana*), bush monkey-flower (*Mimulus aurantiacus*), saw-toothed goldenbush (*Hazardia squarrosa*), laurel sumac (*Malosma laurina*), and lemonade berry (*Rhus integrifolia*).

Coastal Sage Scrub/Chaparral

Coastal sage scrub/chaparral vegetation combines attributes, in nearly equal measures, of coastal sage scrub and chaparral vegetation types.

Grasslands (Native and Non-native)

Grasslands are a characteristic feature of the California landscape; however, most grasslands present today are dominated by non-native annual grasses. Native grasslands are dominated by perennial needlegrasses (*Stipa* spp.) and are characterized by 40 percent ground cover of grasses and forbs, with greater than two-thirds of cover attributable to needlegrasses; native and non-native grasses and forbs may be intermixed. Non-native grass species include wild oats (*Avena* spp.) and bromes (*Bromus* spp.).

Eucalyptus Woodland

Eucalyptus woodlands are assigned to areas with greater than 25 percent of the overstory cover (the uppermost layer of plant growth) consisting of *Eucalyptus* species.

Vernal Marsh

A vernal marsh is a seasonal wetland that is dominated by plant species in the Juncaceae family such as the common spike rush (*Eleocharis macrostachya*), dubious rush (*Juncus dubius*), and common toad rush (*Juncus dubiosus* and *bufonius*). Other forbs and herbaceous or grasslike species occur but to a much lesser extent. These vernal marshes typically occur in ephemeral and intermittent streambeds or washes as opposed to depressions that would typically be considered vernal pool habitat.

Coastal and Valley Fresh Water Marsh

Fresh water marshes are permanently flooded sites without significant water currents and are dominated by plant species in the Cyperaceae family. These marshes are dominated by perennial plants that are adapted to flooded conditions. Species present in fresh water marshes include cattails (*Typha* spp.), bullrushes (*Scirpus* spp.), smartweed (*Polygonum* spp.), dock (*Rumex* spp.), and California tule (*Schoenoplectus californica*).

1 **Disturbed Habitat**

2 Disturbed habitat areas are classified based on the prevalence of past or present physical disturbance
3 (e.g., brushing, tilling, or vehicle disturbance), where more than half of the area is covered by species
4 adapted to disturbance, especially forbs, or by bare ground. Disturbed areas have the potential to support
5 native vegetation if left undisturbed or are subjected to active restoration actions.

6 **Developed**

7 Developed areas are those with little or no potential for conversion to native plant communities in the
8 near future. These include landscaped areas, buildings, pavement, and recently graded areas.

9 **3.2.3.2 General Wildlife and Wildlife Corridors**

10 MCAS Miramar supports habitat for a wide variety of wildlife species, including seven species of
11 amphibians, 30 species of reptiles, over 200 species of birds, and 39 species of mammals (MCAS
12 Miramar 2011a). A complete list of wildlife species known to occur on MCAS Miramar is provided in the
13 INRMP (MCAS Miramar 2011a).

14 The ROI is representative of wildlife habitats common on MCAS Miramar and the greater San Diego
15 region. In the project vicinity, a variety of common wildlife species are expected to occur based on the
16 presence of suitable habitat. Species likely present at the proposed mitigation areas include: fence lizard
17 (*Sceloporus occidentalis*), side-blotched lizard (*Uta stansburiana*), California king snake (*Lampropeltis*
18 *getula californicae*), western scrub-jay (*Aphelocoma californica*), California towhee (*Melospiza crissalis*),
19 California quail (*Callipepla californica*), mourning dove (*Zenaidura macroura*), Anna's hummingbird
20 (*Calypte anna*), bobcat (*Felis rufus*), coyote (*Canis latrans*), mule deer (*Odocoileus hemionus fuliginita*),
21 and California ground squirrel (*Spermophilus beecheyi*).

22 San Clemente Canyon and Rose Canyon serve as the primary east-west corridors for wildlife movement
23 on MCAS Miramar and provide connectivity to habitat patches west of the Air Station (MCAS Miramar
24 2011a). There is evidence that mule deer utilize the area between Kearny Villa Road and I-15 and move
25 east via San Clemente Canyon through a box culvert under I-15. Security fencing along Kearny Villa
26 Road may limit movement opportunities for large animals along San Clemente Canyon to the west.

27 **3.2.3.3 Special Status Wildlife**

28 MCAS Miramar surveys and monitors special status wildlife on the Station. For the purpose of this EA,
29 special status wildlife is defined as:

- 30 • species listed as threatened or endangered, or proposed for listing as threatened or endangered
31 under the federal or California ESAs;
- 32 • candidates for such listing; and
- 33 • species protected by the Bald and Golden Eagle Protection Act and the MBTA.

34 On MCAS Miramar, recent wildlife surveys include coastal California gnatcatcher (*Poliophtila californica*
35 *californica*) (Haas 2010; Tierra Data Inc. 2014), least Bell's vireo, and lepidoptera (e.g., Hermes copper
36 butterfly [*Hermelycaena hermes*]), and surveys are ongoing for fairy shrimp (MCAS Miramar 2011a).
37 Eight special status wildlife species are known or have the potential to occur at MCAS Miramar. Five of
38 these species were eliminated from further analysis in this EA because they are considered not present
39 within the proposed mitigation areas and/or no suitable habitat occurs within the project vicinity. These
40 species include quino checkerspot butterfly (*Euphydryas editha quino* [federally listed as endangered]),

1 hermes copper butterfly (federal candidate for listing), golden eagle (*Aquila chrysaetos* [fully protected
 2 under the Bald and Golden Eagle Protection Act]), southwestern willow flycatcher (*Empidonax traillii*
 3 *extimus* [federally listed as endangered]) and least Bell’s vireo (*Vireo bellii pusillus* [federally listed as
 4 endangered]). The remaining three species that occur in the proposed mitigation areas and ROI, and are
 5 carried forward for detailed analysis (Table 3-3), include San Diego fairy shrimp (*Branchinecta*
 6 *sandiegensis* [federally listed as endangered]), coastal California gnatcatcher (federally listed as
 7 threatened), and Riverside fairy shrimp (*Streptocephalus woottoni* [federally listed as endangered]).

**Table 3-3. Special Status Wildlife
 Occurring in the Vicinity of the Proposed Mitigation Areas**

Species	Status	Habitat/Occurrence	Proposed Mitigation Areas in Which Species Occurs
BIRDS			
<i>Polioptila californica californica</i> Coastal California Gnatcatcher	FT, CSSC	This species is locally abundant on MCAS Miramar where suitable habitat exists. Coastal California gnatcatchers activity and use areas occur in several east-west trending drainages on MCAS Miramar (Haas 2010; Tierra Data 2014). In the past decade, only proposed mitigation areas Charlie and Echo have supported gnatcatchers and only proposed mitigation area Echo supported gnatcatchers in 2013 (Tierra Data 2014).	Charlie, Echo (2013)
INVERTEBRATES			
<i>Branchinecta sandiegensis</i> San Diego Fairy Shrimp	FE	San Diego fairy shrimp may be present in seasonally astatic (flooded) vernal pools and other (non-vernal pool) seasonally ponded basins in coastal areas. This species is known to occur throughout MCAS Miramar and is the subject of long-range planning and management efforts. Vernal pools and other seasonally ponded basins that support San Diego fairy shrimp occur in all proposed mitigation areas.	Alpha, Bravo North, Bravo South, Charlie, Delta, Echo, Foxtrot
<i>Streptocephalus woottoni</i> Riverside Fairy Shrimp	FE	The Riverside fairy shrimp is found in vernal pool habitat and ephemeral wetlands with hardpan and claypan soils that retain water through the warmer weather of late spring (April – May). This species requires deeper and more persistent ponding than San Diego fairy shrimp, typically at least 12 inches in depth. On MCAS Miramar, Riverside fairy shrimp are known to occur in two impoundments east of I-15, which are located in the proposed Bravo North mitigation area.	Bravo North
Status (only status codes used are included): Federal Status (determined by U.S. Fish and Wildlife Service): FE Federally Listed as Endangered FT Federally Listed as Threatened California State Status (determined by California Department of Fish and Wildlife [CDFW]): CSSC California Species of Special Concern			

8 **Coastal California Gnatcatcher**

9 The coastal Californian gnatcatcher was federally listed as threatened on 30 March 1993 in response to
 10 habitat loss and degradation from development, fragmentation, invasive weed establishment, and brood
 11 parasitism⁵ by brown-headed cowbirds (*Molothrus ater*; USFWS 1993b; USFWS 2010a). Coastal

⁵ The brown-headed cowbird is a brood parasite species that lays its eggs in the existing nests of other species, in this case the coastal California gnatcatcher, thereby shifting the responsibility to raise the young to the host species. Brood parasitism can result in nest abandonment and other adverse responses.

1 California gnatcatcher habitat occurs on MCAS Miramar, but lands on MCAS Miramar are excluded
2 from the formal critical habitat designation because the Air Station has a legally operative INRMP
3 (MCAS Miramar 2011a). The completed federal listing and detailed information on the coastal California
4 gnatcatcher regulatory history, range, life history, habitat, and abundance can be found in the *Federal*
5 *Register* 58(59): 16742 and 65(206):63680–63743 (USFWS 1993b, 2000).

6 Coastal California gnatcatcher surveys on MCAS Miramar have been conducted periodically since the
7 species was listed, and focused surveys have been carried out since 1994 to determine home range and
8 dispersal (Haas 2010). In 2003 the Cedar Fire burned an estimated 17,600 acres of the total 23,015 acres
9 on the Air Station, which substantially restricted the availability of suitable habitat. Since then, surveys
10 have occurred in 2004, 2007, 2009, and 2013 (Bitterroot Restoration, Inc. 2005; Haas 2010; RECON
11 Environmental, Inc. 2008; Tierra Data Inc. 2014). Hubbs-Sea World Research Institute (2006) noted that
12 post-fire survey data for gnatcatchers approximated pre-fire results. In addition, the most recent results
13 (2013) were consistent with prior years, even though suitable habitat in some areas on MCAS Miramar
14 prior to the Cedar Fire has not fully returned (MCAS Miramar GIS data 2014). In 2013, 52 total
15 territories were identified, which included individuals, pairs, and juveniles associated with major east-
16 west drainages on MCAS Miramar (Figure 3-2; Tierra Data Inc. 2014).

17 Of the six proposed mitigation areas, only proposed mitigation areas Echo and Charlie have been found to
18 support coastal California gnatcatchers in the past decade (MCAS Miramar GIS data 2014) (Figure 3-2).
19 The most recent surveys in 2013 did not find any individuals or breeding pairs in proposed mitigation
20 area Charlie; however, individual males were observed between proposed mitigation areas Charlie and
21 Delta. The southwest corner of proposed mitigation area Echo supported both individuals and pairs in
22 2013 (Figure 3-2).

23 **San Diego Fairy Shrimp**

24 San Diego fairy shrimp was federally listed as endangered on 3 February 1997 (USFWS 1997). The
25 USFWS determined that the continued survival of the species was threatened by habitat destruction from
26 agricultural and urban development, alteration of wetland hydrology by draining, off-road vehicle
27 activity, cattle grazing, and replacement by other fairy shrimp species that are habitat generalists. The
28 *Recovery Plan for Vernal Pools of Southern California* (that includes San Diego fairy shrimp) was
29 finalized in 1998 (USFWS 1998). Critical habitat has been designated in the region for San Diego fairy
30 shrimp; however, similar to coastal California gnatcatcher, the USFWS has determined that the MCAS
31 Miramar INRMP provides a conservation benefit for the species beyond that which would be afforded by
32 critical habitat designation. Thus, no critical habitat occurs on MCAS Miramar. San Diego fairy shrimp
33 occurs in ephemeral wetlands (i.e., lasting only a short period of time, such as vernal pools) and other
34 ephemeral wet basins, such as ditches or road ruts (herein referred to as other seasonally ponded
35 basins). The fairy shrimp life history pattern is unique to the short-term nature of its habitat.
36

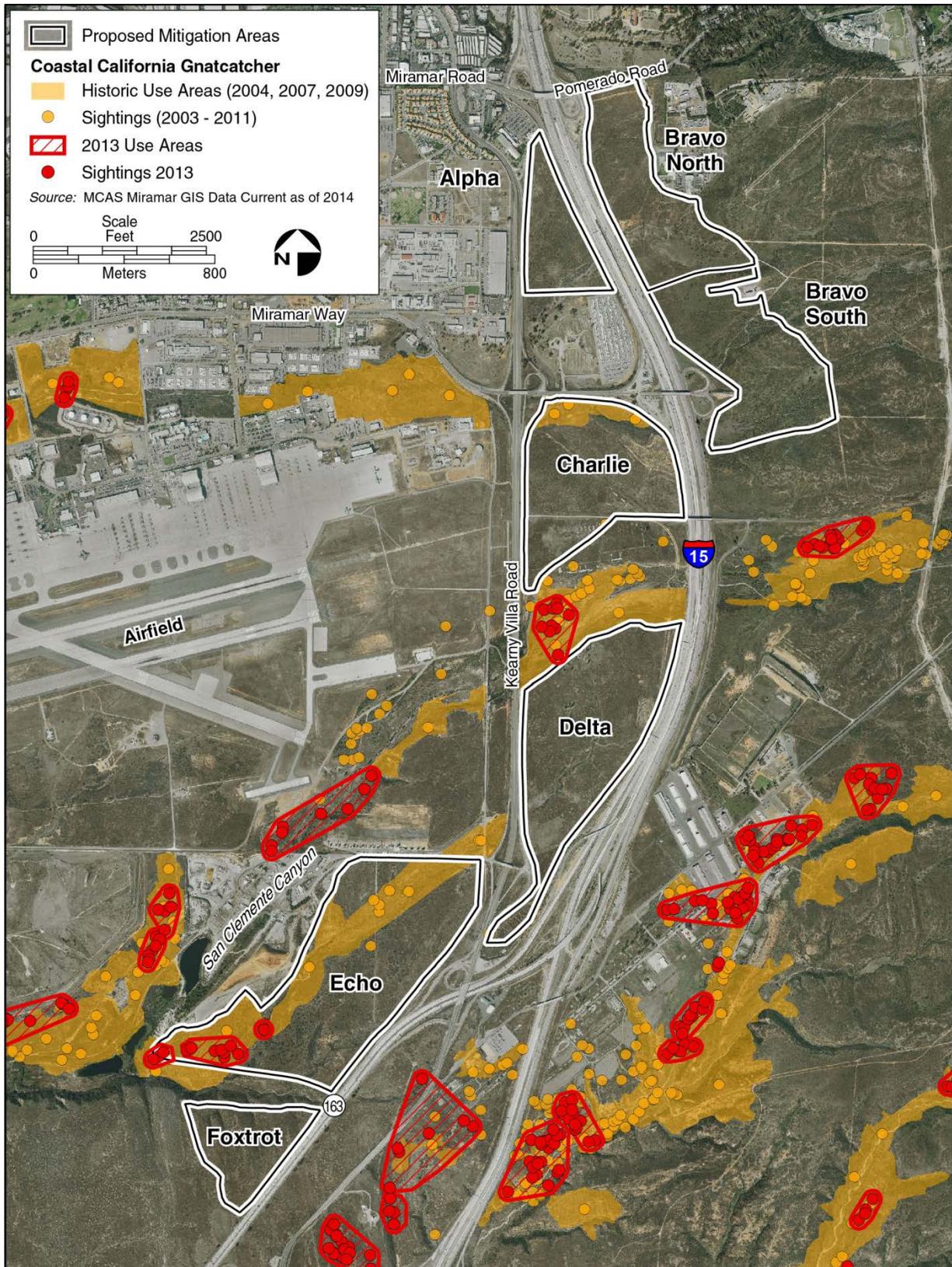


Figure 3-2. Historic and Recent Coastal California Gnatcatcher Occurrences in the Vicinity of Proposed Mitigation Areas

1 Fairy shrimp eggs can remain dormant for long dry periods as desiccation-resistant cysts, and
2 build up over time, creating a cyst bank on or near the surface of the ephemeral feature (Donald 1983;
3 USFWS 2002). When environmental cues occur, such as heavy winter rains, dormancy ends for some of
4 the cysts in the bank, and the time to adult maturity is measured in days to weeks (USFWS 2002).
5 Suitable habitat for the San Diego fairy shrimp requires a water depth from 2 to 12 inches with water
6 temperatures from 50 to 68 degrees Fahrenheit; water chemistry is one of the most important factors in
7 determining species' distribution (USFWS 1997). A complete description of the regulatory and natural
8 history for this species can be found in the *Federal Register* (65 FR 63 63438; USFWS 2007) on
9 the USFWS website (www.ecos.fws.gov).

10 MCAS Miramar supports thousands of occurrences of San Diego fairy shrimp associated with vernal
11 pools and other seasonally ponded basins, including within all of the proposed mitigation areas
12 (Figure 3-3). San Diego fairy shrimp habitat is managed on Station through the INRMP (MCAS Miramar
13 2011a) which identifies and prioritizes management areas. The vast majority of vernal pool habitat on
14 MCAS Miramar is encompassed within Level I Management Areas, which connotes the highest
15 conservation priority on the Air Station (MCAS Miramar 2011a).

16 **Riverside Fairy Shrimp**

17 Riverside fairy shrimp were listed as endangered on 3 August 1993 (USFWS 1993a). The Riverside fairy
18 shrimp has one of the most geographically restricted distributions of fairy shrimp species (Eriksen and
19 Belk 1999). This species is known to occur in vernal pools near Temecula in Riverside County, in Orange
20 County (one population), on Otay Mesa and MCAS Miramar, and in Baja California (two locations)
21 (USFWS 1993a). A *Recovery Plan for Vernal Pools of Southern California* (that includes Riverside fairy
22 shrimp) was finalized in 1998 (USFWS 1998). Critical habitat has been designated in the region for
23 Riverside fairy shrimp; however, similar to San Diego fairy shrimp, the USFWS has determined that the
24 MCAS Miramar INRMP provides a conservation benefit for the species beyond that which would be
25 afforded by critical habitat designation. A complete description of the regulatory and natural history for
26 this species can be found in the *Federal Register* (77 FR 233 72070; USFWS 2012b) and on the USFWS
27 website (www.ecos.fws.gov).

28 Similar to San Diego fairy shrimp, Riverside fairy shrimp eggs can remain dormant for long dry periods
29 as desiccation-resistant cysts, and build up over time, creating a cyst bank on or near the surface of the
30 ephemeral feature (Donald 1983; USFWS 2002). Riverside fairy shrimp tend to occur in water that has
31 temperatures ranging from 50 to 68 degrees Fahrenheit and a minimum depth of 12 inches. Eggs of this
32 species will not hatch in pools that are too shallow (less than 12 inches) or receive cool waters from early
33 winter rains. On MCAS Miramar, Riverside fairy shrimp are known to occur in two impoundments east
34 of I-15 in proposed mitigation area Bravo North.

35 **Migratory Bird Treaty Act Species**

36 The MBTA is an international agreement among the U.S., Canada, and Mexico that protects designated
37 species of birds. More specifically, the MBTA controls the taking of these birds, their nests, eggs, parts,
38 or products. Virtually all birds are protected under the MBTA, with only a few exceptions, such as the
39 California quail. A complete list of all migratory birds protected by the MBTA is in the *Federal Register*
40 (50 CFR 10.13). EO 13186, *Responsibilities of Federal Agencies to Protect Migratory Birds*, directs
41 federal agencies to take actions to further implement the MBTA. A Memorandum of Understanding
42 between the DoD and the USFWS was developed under EO 13186 to promote the conservation of
43 migratory birds. Twenty-two bird species designated as Species of Concern under the MBTA have the
44 potential to occur in the project vicinity (Table 3-4).

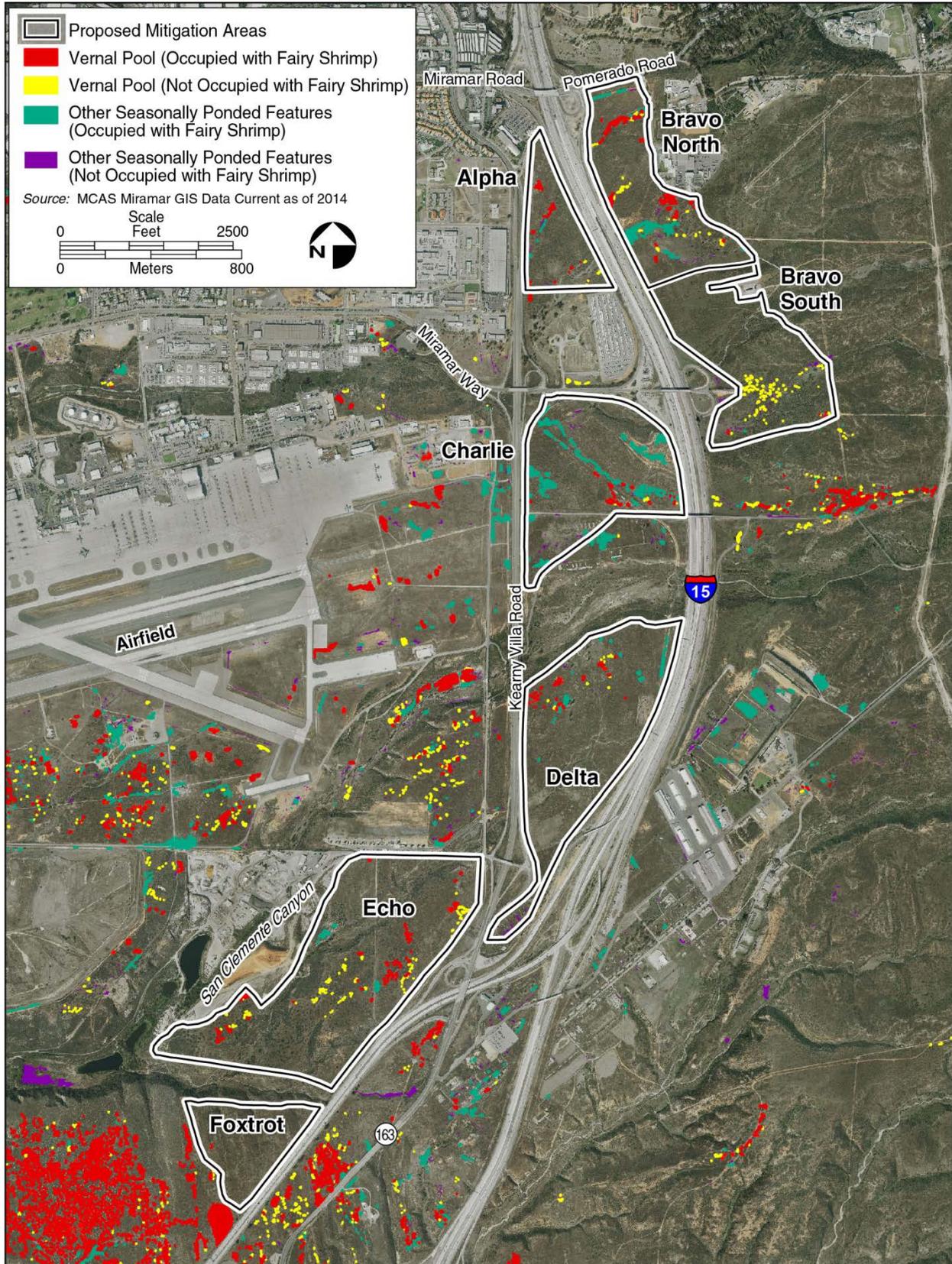


Figure 3-3. Vernal Pool Fairy Shrimp in the Vicinity of Proposed Mitigation Areas

**Table 3-4. Avian Species of Concern under the MBTA
Known to Occur in the Vicinity of
the Proposed Mitigation Areas**

Common Name	Scientific Name
DUCKS, GEESE, SWANS	
Wood Duck	<i>Aix sponsa</i>
Cinnamon Teal	<i>Anas cyanoptera</i>
Northern Shoveler	<i>Anas clypeata</i>
Canada Goose	<i>Branta canadensis</i>
Snow Goose	<i>Chen caerulescens</i>
Ruddy Duck	<i>Oxyura jamaicensis</i>
HERONS, SPOONBILLS	
Snowy Egret	<i>Egretta thula</i>
Black-crowned Night Heron	<i>Nycticorax nycticorax</i>
VULTURES, HAWKS, FALCONS	
Peregrine Falcon	<i>Falco peregrinus</i>
RAILS, LIMPKINS, CRANES	
American Coot	<i>Fulica americana</i>
PIGEONS	
White-winged Dove	<i>Zenaida asiatica</i>
Mourning Dove	<i>Zenaida macroura</i>
SWIFTS, HUMMINGBIRDS	
Costa's Hummingbird	<i>Calypte costae</i>
Rufous Hummingbird	<i>Selasphorus rufus</i>
Allen's Hummingbird	<i>Selasphorus sasin</i>
SONGBIRDS	
SHRIKES, VIREOS	
Loggerhead Shrike	<i>Lanius ludovicianus</i>
LARKS, WRENS, GNATCATCHERS	
California Horned Lark	<i>Eremophila alpestris</i>
Coastal California Gnatcatcher	<i>Polioptila californica californica</i>
Bewick's Wren	<i>Thryomanes bewickii</i>
SPARROWS	
Grasshopper Sparrow	<i>Ammodramus savannarum</i>
Sage Sparrow	<i>Amphispiza belli</i>
BLACKBIRDS	
Red-winged Blackbird	<i>Agelaius phoeniceus</i>

1 **3.2.3.4 Special Status Plant Species**

2 Ten special status plant species are known or have the potential to occur at MCAS Miramar. For the
3 purpose of this EA, special status plants are defined as:

- 4 • species listed under the federal or California ESAs, and/or the Native Plant Protection Act §1901; and
5 • candidates for such listing.

6 Five of the special status plant species are not carried forward for analysis in this EA because they are
7 considered not present within the proposed mitigation areas and/or no suitable habitat occurs within the

1 vicinity of the proposed mitigation areas. These five species include San Diego thornmint (*Acanthomintha*
2 *ilicifolia* [federally listed as threatened]), San Diego ambrosia (*Ambrosia pumilia* [federally listed as
3 endangered]), Del Mar manzanita (*Arctostaphylos glandulosa* ssp. *crassifolia* [federally listed as
4 endangered]), Encinitas baccharis (*Baccharis vanessae* [federally listed as threatened]), and Orcutt's
5 spineflower (*Chorizanthe orcuttiana* [federally listed as endangered]). The remaining five species that
6 occur near or within the proposed mitigation areas include San Diego button-celery (*Eryngium*
7 *aristulatum* var. *parishii* [federally listed as endangered]), San Diego mesa mint (*Pogogyne abramsii*
8 [federally listed as endangered]), spreading navarretia (*Navarretia fossalis* [federally listed as
9 threatened]), California Orcutt grass (*Orcuttia californica* [federally listed as endangered]), and willow
10 monardella (*Monardella viminea* [federally listed as endangered]). Table 3-5 summarizes information on
11 the federally sensitive plant species that were surveyed for within MCAS Miramar boundaries and occur
12 within the vicinity of the proposed mitigation areas.

13 The remainder of this section provides summaries of the basic biology and distribution of the plant
14 species federally listed as threatened or endangered that occur or may potentially occur in the project
15 vicinity. Sensitive plants with no potential to occur within the project vicinity are not discussed.

16 **San Diego Button-Celery**

17 San Diego button-celery (*Eryngium aristulatum* var. *parishii*) is usually an annual; however, under
18 favorable conditions it can become a perennial herb with a perennial tap root. It is a member of the carrot
19 family (Apiaceae), with heads of greenish flowers and spine-tipped bract margins at the base of the flower
20 stalk and blooms from May through June (USFWS 1993a). San Diego button-celery was listed by the
21 USFWS as endangered on 3 August 1993 (USFWS 1993a) and by the State of California as endangered
22 in July of 1979, under the California ESA. Protection measures for San Diego button-celery are provided
23 in the *Recovery Plan for Vernal Pools of Southern California*, released in 1998 (USFWS 1998). Critical
24 habitat has not been designated for this species. A complete description of the regulatory and natural
25 history for this species can be found in the *Federal Register* (58 FR 47 41384–41392; USFWS 1993a)
26 and on the USFWS website (www.ecos.fws.gov).

27 San Diego button-celery is restricted in California to vernal pools and vernal moist areas in San Diego
28 and Riverside counties. It is also known to occur in Baja California Norte. Approximately 65 remnant
29 populations exist in San Diego County (USFWS 1993a). It is typically associated with white clay bottom
30 pools devoid of hard pans, but within MCAS Miramar the species occurs in the vicinity of and in vernal
31 pool basins and is more abundant in the moist watershed/grassland areas near vernal pools. Other
32 sensitive species that typically occur with San Diego button-celery include San Diego mesa mint
33 (*Pogogyne abramsii*) and California Orcutt grass (*Orcuttia californica*), among others. On MCAS
34 Miramar, San Diego button-celery is predominantly associated with vernal pool complexes south of the
35 runway in the flightline area and within the Miramar Mounds National Natural Landmark area to the
36 southwest of proposed mitigation area Foxtrot (MCAS Miramar GIS data 2014). There are also several
37 occurrences within proposed mitigation areas Charlie and Delta.

Table 3-5. Special Status Plants Occurring in the Vicinity of Proposed Mitigation Areas

Species	Status	Habitat/Occurrence	Proposed Mitigation Areas in Which Species Occurs
<i>Eryngium aristulatum</i> var. <i>parishii</i> San Diego Button-Celery	FE/CE/1B	This species occurs in vernal pools and seasonally ponded basins in San Diego and Riverside counties. On MCAS Miramar, major populations occur south of the flightline and within the Miramar Mounds National Natural Landmark. Occurrences also occur within proposed mitigation areas Charlie and Delta.	Charlie, Delta
<i>Monardella viminea</i> Willow Monardella	FE/CE/1B	This species occurs in rocky washes and drainages. This species is known to occur in the western portion of MCAS Miramar and is associated with Rose and San Clemente Canyon drainages. There are no known occurrences in proposed mitigation areas. However, several occurrences are in the canyons in close proximity to the proposed mitigation areas (MCAS Miramar GIS data 2014).	None
<i>Navarretia fossalis</i> Spreading Navarretia	FT/—/1B	This species occurs in vernal pools and is known to occur north of the flightline and within the Miramar Mounds National Natural Landmark. There are no known occurrences in proposed mitigation areas. However, it occurs southwest of proposed mitigation area Foxtrot.	None
<i>Orcuttia californica</i> California Orcutt Grass	FE/CE/1B	This species occurs in vernal pools with sandy soils. This species is known to occur north of the flightline and within the Miramar Mounds National Natural Landmark. There are no known occurrences in proposed mitigation areas. However, it occurs southwest of proposed mitigation area Foxtrot.	None
<i>Pogogyne abramsii</i> San Diego Mesa Mint	FE/CE/1B	This species occurs in vernal pools and is known to occur in all of the proposed mitigation areas, except Foxtrot, associated with vernal pool complexes and other seasonally ponded basins.	Alpha, Bravo North, Charlie, Delta, Echo
Status (only status codes used are included): Federal Status (determined by U.S. Fish and Wildlife Service): FE Federally Listed as Endangered FT Federally Listed as Threatened California State Status (determined by California Department of Fish and Wildlife [CDFW]): CE California Listed as Endangered — No Listing California Rare Plant Rank (determined by California Native Plant Society [CNPS] and CDFW): 1B Rare, Threatened, or Endangered in California and Elsewhere			

1 Willow Monardella

2 Willow monardella (*Monardella viminea*) is an erect perennial herb that is a member of the mint family
 3 (Lamiaceae). Willow monardella is found within the ephemeral drainages of installation canyons.
 4 Primarily, it grows along the banks of streams, on sandbars within streams, and on nearby floodplain
 5 mesas. It has been observed in open areas, within scrub communities, mixed with taller shrubs or trees,
 6 and within the streambed proper (personal communication Kassebaum 2015). It was federally listed as
 7 endangered on 13 October 1998 (USFWS 1998; identified at the time of listing as *Monardella linoides*
 8 ssp. *viminea*). A complete description of the regulatory and natural history for this species can be found in
 9 the *Federal Register* (77 FR 44 13394–13447; USFWS 2012c) and on the USFWS website
 10 (www.ecos.fws.gov).

11 MCAS Miramar routinely conducts census/monitors for the willow monardella. The 2012 Station-wide
 12 census identified 1,181 clumps of willow monardella on MCAS Miramar, associated with six watersheds
 13 on east and west Miramar (Tetra Tech 2013). Willow monardella on MCAS Miramar is strongly

1 associated with riparian drainages of San Clemente, Oak, Spring, Quail, West Sycamore, and Sycamore
2 canyons (Figure 3-4; Tetra Tech 2013). The species was historically known in areas near the proposed
3 Bravo North and Charlie mitigation areas, prior to the 2003 Cedar Fire; however, these occurrences were
4 not rediscovered in 2012. The closest mapped occurrences to a proposed mitigation area based on the
5 2012 census are between the proposed Echo and Foxtrot mitigation areas and west of the proposed Delta
6 mitigation area.

7 **Spreading Navarretia**

8 Spreading navarretia (*Navarretia fossalis*) is a low, spreading or ascending, annual herb and is a member
9 of the phlox family (Polemoniaceae). This wetland species is typically associated with vernal pools and
10 ditches (Baldwin *et al.* 2012; Skinner and Pavlik 1994). Spreading navarretia was listed as threatened on
11 13 October 1998 (USFWS 1998). Critical habitat has been designated in the region for spreading
12 navarretia; however, the USFWS has determined that the MCAS Miramar INRMP provides a
13 conservation benefit for the species beyond that which would be afforded by critical habitat designation.
14 A complete description of the regulatory and natural history for this species can be found in the *Federal*
15 *Register* (75 FR 194 62192–62255; USFWS 2010b) and on the USFWS website (www.ecos.fws.gov).

16 In San Diego County, spreading navarretia appears to be restricted to vernal pools. However, it occurs in
17 relatively undisturbed and moderately disturbed vernal pools and in alkali playa habitats near Hemet,
18 along the San Jacinto River in Riverside County and on MCB Camp Pendleton (MCAS Miramar 2011a).
19 On MCAS Miramar, the closest mapped occurrence for spreading navarretia is within the Miramar
20 Mounds National Natural Landmark area southwest of the proposed mitigation area Foxtrot (MCAS
21 Miramar GIS data 2014). This species is not known to be present within any of the proposed mitigation
22 areas.

23 **California Orcutt Grass**

24 California Orcutt grass is a small annual that is a member of the grass family (Poaceae). It reaches about
25 four inches in height, is bright gray-green, secretes sticky droplets, and blooms from May through July.
26 California Orcutt grass is usually found in vernal pool habitats and was federally listed as endangered on
27 3 August 1993 (USFWS 1993a). A complete description of the regulatory and natural history for this
28 species can be found in the *Federal Register* (58 FR 147 41384–41392; USFWS 1993a) and on the
29 USFWS website (www.ecos.fws.gov).

30 Fewer than 30 populations of California Orcutt grass exist in the U.S. Nearly 60 percent of these
31 populations are concentrated in three locations in California: on Otay Mesa in southern San Diego
32 County, along the San Jacinto River in Riverside County, and near Hemet in western Riverside County
33 (USFWS 1993a). On MCAS Miramar, California Orcutt grass is known to occur in a few pools south of
34 the runway and west of the flightline, as well as in association with a large pool southwest of proposed
35 mitigation area Foxtrot (Figure 3-4). No occurrences have been recorded within any of the proposed
36 mitigation areas (MCAS Miramar GIS data 2014).

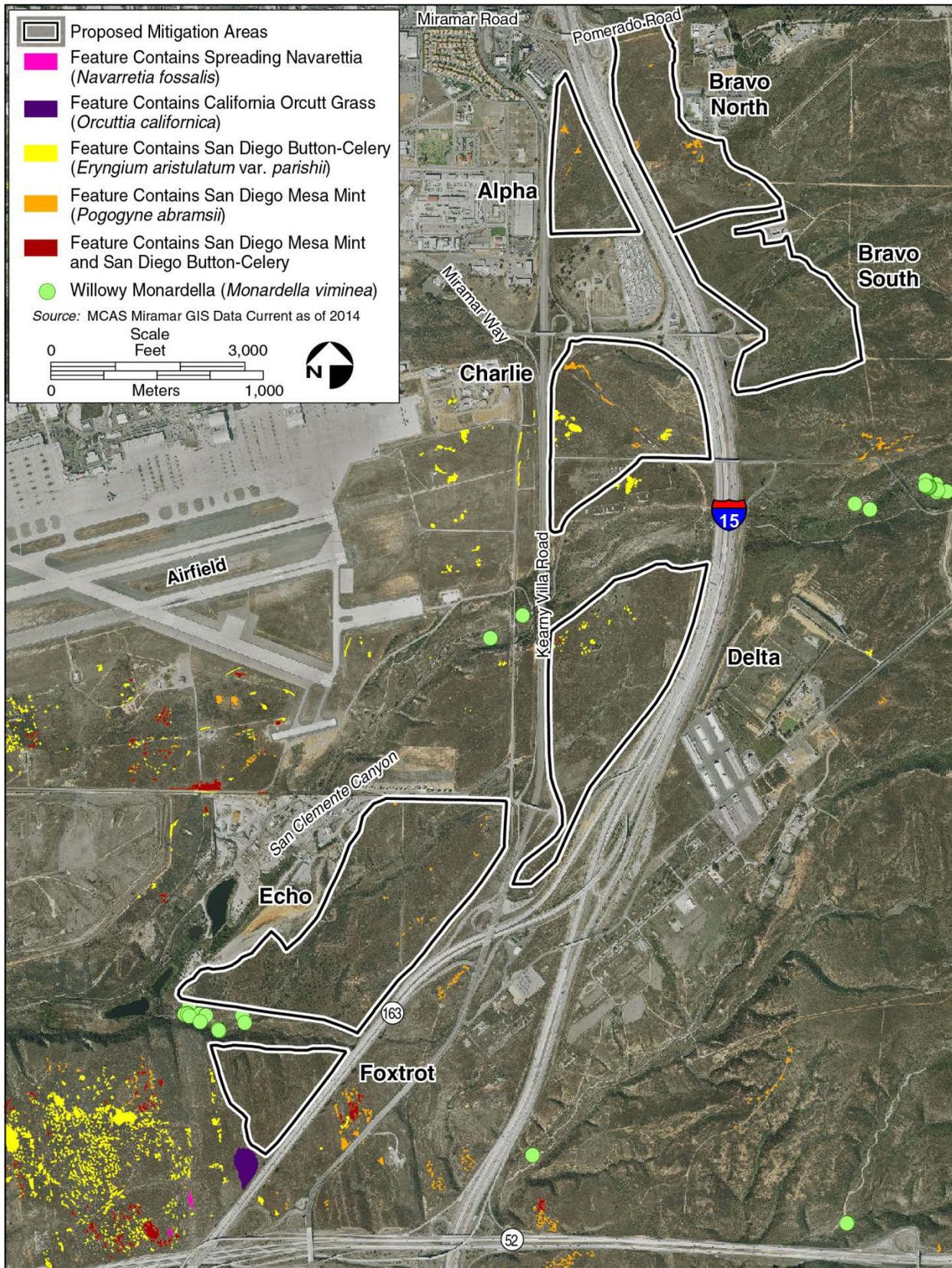


Figure 3-4. Special Status Plant Species in the Vicinity of the Proposed Mitigation Area

1 **San Diego Mesa Mint**

2 San Diego mesa mint (*Pogogyne abramsii*) is an annual herb in the mint family (Lamiaceae). This species
3 occasionally reaches one (1) foot in height and typically blooms from May to early July. San Diego mesa
4 mint inhabits vernal pool complexes. It may also be found on coastal terraces and vernal pools in San Diego
5 County (Baldwin *et al.* 2012; Skinner and Pavlik 1994). San Diego mesa mint was listed as endangered on
6 28 September 1978 (USFWS 1978). A recovery plan for the species was finalized in 1998 (USFWS 1998).
7 No critical habitat has been designated for this species. San Diego mesa mint was also listed by the State of
8 California as endangered in January of 1979. A complete description of the regulatory and natural history
9 for this species can be found in the *Federal Register* (43 FR 189 44810–44811; USFWS 1978) and on the
10 USFWS website (www.ecos.fws.gov).

11 San Diego mesa mint is endemic to San Diego County. The northern limit of distribution for this species
12 is Del Mar Mesa, and it occurs south on Mira Mesa, MCAS Miramar, and Kearny Mesa, with a few
13 scattered populations in western Tierrasanta. San Diego mesa mint populations have been extirpated from
14 the Linda Vista area, the vicinity of Balboa Park, Normal Heights, and the area surrounding San Diego
15 State University. On MCAS Miramar, San Diego mesa mint is associated with vernal pools and other
16 seasonally ponded basins throughout the Station, and is known to occur within proposed mitigation areas
17 Alpha, Bravo North, Charlie, Delta, and Echo.

18 **3.2.3.5 Other Species of Regional Concern**

19 Several plant and wildlife species that occur on MCAS Miramar are not listed as either threatened or
20 endangered under ESA but are of regional concern and are known to or potentially occur on MCAS
21 Miramar. Consideration of these species in management actions on MCAS Miramar to protect viable
22 populations can help preclude the need for their listing under the ESA. Detailed information on all species
23 of regional concern is included in the Section 4.7 and Table 4.7 of the MCAS Miramar INRMP
24 (MCAS Miramar 2011a). Other species of regional concern that occur or may occur within the proposed
25 mitigation areas based on known occurrences and/or requisite habitat include the following: San Diego
26 goldenstar (*Bloomeria clevelandii*), Orcutt’s brodiaea (*Brodiaea orcuttii*), long-spined spineflower
27 (*Chorizanthe polygonoides* var. *longispina*), San Diego barrel cactus (*Ferocactus viridescens*), little
28 mousetail (*Myosurus minimus* ssp. *apus*), Nuttall’s scrub oak (*Quercus dumosa*), and Otay lilac
29 (*Ceanothus otayensis*).

30 **3.2.3.6 Wetlands and Other Waters of the United States**

31 Determinations regarding the potential for jurisdiction discussed in this EA are preliminary and subject to
32 verification and approval by the USACE. Potential federal CWA jurisdictional wetlands, other Waters of
33 the U.S., and non-jurisdictional wetland features are present in the proposed mitigation areas based on
34 planning level (not suitable for project-specific permitting) determinations by MCAS Miramar
35 (MCAS Miramar GIS data 2014) (Figure 3-5).

36 **Jurisdictional Wetlands and Other Waters of the United States**

37 Frequently the term “wetlands and other Waters of the U.S.” is used when describing areas under USACE
38 jurisdiction. Waters of the U.S. are those that have been, are, or may be used in interstate or foreign
39 commerce; all interstate waters; and all other waters the use, degradation, or destruction of which could
40 affect interstate or foreign commerce. Under federal regulations, wetlands are defined as areas that are
41 “inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and
42 that under normal circumstances do support, a prevalence of vegetation typically adapted for life in
43 saturated soil conditions” (33 CFR 328.3; 40 CFR 230.3). Jurisdictional wetlands include wetlands
44 adjacent to traditional navigable waters or tributaries to traditional navigable waters.

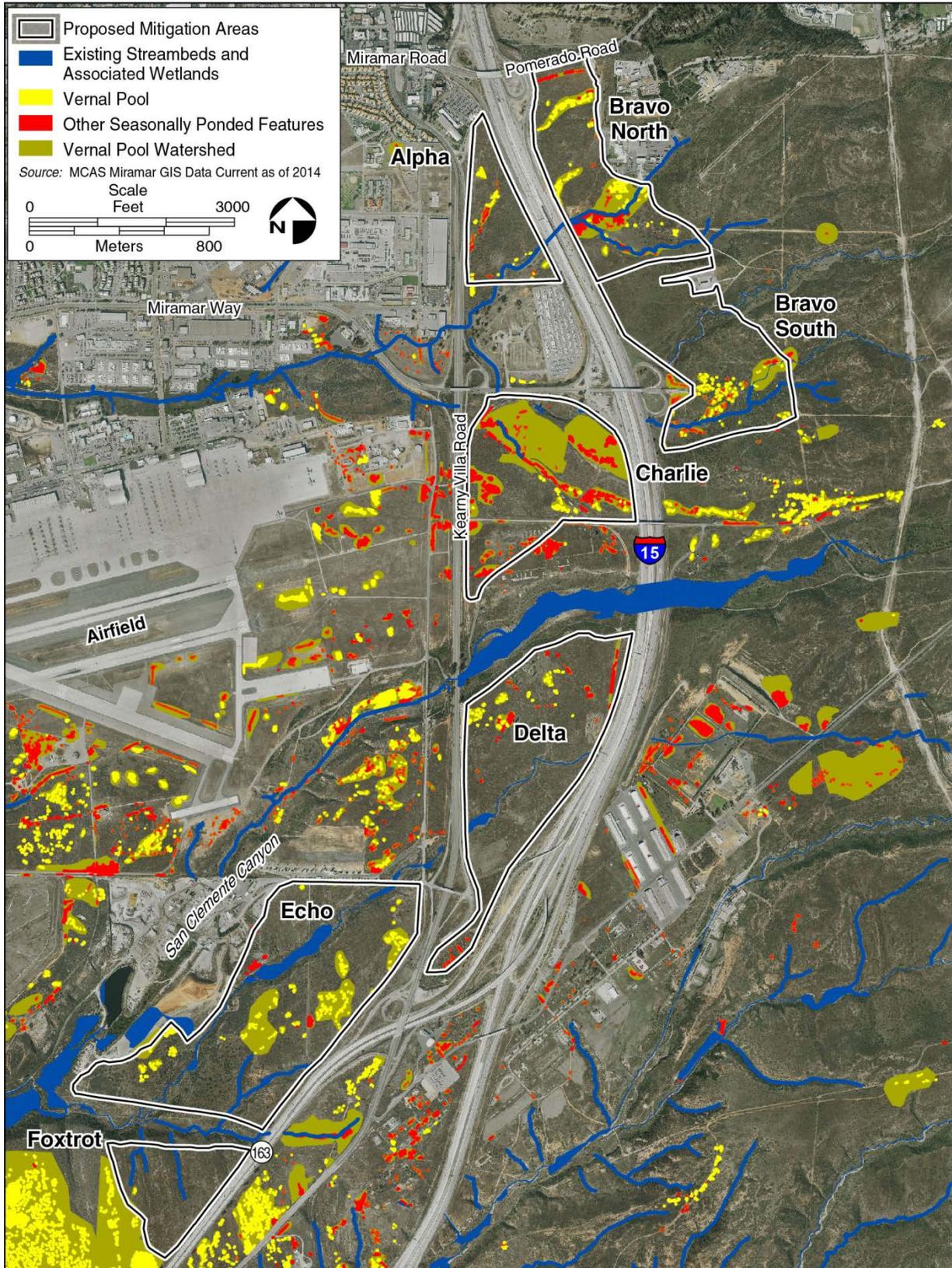


Figure 3-5. Existing Streambeds and Associated Wetlands in the Vicinity of the Proposed Mitigation Areas

1 The USACE may also assert jurisdiction over wetlands if they have a significant nexus with a traditional
2 navigable water. EO 11990 (dated 24 May 1977 and amended by EO 12608 on 9 September 1987) and
3 MCO P5090.2A require federal agencies to minimize the destruction, loss, or degradation of wetlands and
4 to enhance their natural and beneficial values.

5 All of the proposed mitigation areas contain streambeds and associated wetlands that were classified at a
6 planning level (i.e., not accurate enough for project permitting) as jurisdictional Waters of the U.S.
7 (Smith and Lichvar 2001) (Figure 3-5). Potential jurisdictional wetlands also include existing wetland
8 restoration sites.

9 ***Vernal Pools***

10 Vernal pools are seasonal wetlands that develop on a variety of soils, usually underlain by an iron-silica
11 hardpan water-restricting layer, typically on coastal terraces (MCAS Miramar 2011a). Vernal pools are
12 defined as naturally occurring or purposely created/restored depressions with a basin that holds water
13 following a series of winter rainfall events in normal years; they are usually very well vegetated with
14 plants indicative of vernal pool conditions unless restoration is ongoing. Vernal pools develop during
15 seasonal rains that begin in late fall or early winter and extend into the spring. Year-to-year variation in
16 the time and duration of precipitation affects the depth and extent of standing water. In dry years, many
17 pools do not fill. Vernal pool basins can provide habitat for federally listed fairy shrimp and vernal pool-
18 obligate plants, as discussed in Section 3.2.3.3.

19 Vernal pool habitat typically occurs on the coastal terraces of MCAS Miramar in the western half of the
20 Air Station. Vernal pools are not uniformly distributed, but occur in groups or clusters on mesas where
21 soil and topographic conditions (i.e., shallow sloping basins) favor their development. Historically, vernal
22 pool clusters were separated from each other by a system of canyons trending in a northeast/southwest
23 direction and draining toward the ocean. Three of these large canyons drain MCAS Miramar: Rose
24 Canyon, San Clemente Canyon, and Murphy Canyon. Existing vernal pools are present in all of the
25 proposed mitigation areas (Figure 3-5). Similar to wetlands, vernal pools can be regulated by the USACE
26 if they meet the significant nexus standard (see Section 3.2.3.6).

27 ***Other (Non-Vernal Pool) Seasonally Ponded Basins***

28 Other seasonally ponded basins are depressions that hold water following a series of rainfall events, but
29 have not been identified by Miramar Natural Resource Division as true vernal pools.⁶ Other seasonally
30 ponded basins are assigned “type” descriptors (e.g., puddle, road rut, ditch, marsh, watercourse, and
31 impoundment), based on the conditions that are apparently causing water to pond (MCAS Miramar
32 2011a). These basins are mapped and managed by MCAS Miramar primarily on the basis of whether they
33 support federally listed fairy shrimp species. Other seasonally ponded basins occur within and adjacent to
34 the proposed mitigation areas, and may be candidates for enhancement to improve the ecological
35 condition with the objective of establishing true vernal pools.

⁶ MCAS Miramar differentiates “true” vernal pools from road ruts, ditches, and other man-made seasonally ponded basins. True vernal pools have formed naturally in landforms or were purposely created/enhanced to provide natural habitats as compensatory mitigation unlike other features that result from human disturbance

3.2.4 Environmental Consequences

Several types of impacts on biological resources could result from restoration activities under Alternative 1, Alternative 2, and Alternative 3 including permanent and temporary impacts, as well as direct and indirect impacts. The definitions of the four types of impacts to biological resources are described next.

- *Direct Impact.* Any alteration, disturbance, or destruction of biological resources (specifically through vegetation/habitat removal) that would result from project-related activities and occurs at the same time and in the same place as the action is considered a direct effect;
- *Indirect Impact.* Indirect impacts are defined as those impacts that are caused by, or would result from, a proposed project and are later in time, but are still reasonably certain to occur;
- *Temporary Impact.* Any impact to biological resources that is considered reversible. Examples include the generation of noise and activity during restoration activities or the removal of plant communities associated with restoration and the subsequent revegetation of the affected area; and
- *Permanent Impact.* Any impact that results in the irreversible removal of biological resources is considered permanent. Examples include the development of permanent basins where restoration is not proposed.

The significance of potential impacts on a biological resource is based upon:

- Unmitigated permanent or long-term temporary impact to federally listed species, including significant loss of occupied habitats;
- Unmitigated adverse impact to populations of migratory birds listed as Species of Concern under the MBTA;
- Unmitigated loss or impact to large quantities of wetlands in federal CWA jurisdictional Waters of the U.S.;
- Unmitigated effects to important quantities of regionally and declining populations (i.e., federal species of special concern and species considered rare and threatened or endangered by the State of California).
- Unmitigated loss of important quantities of declining vegetation communities that are considered rare, both locally and regional;
- Alteration of regionally and locally important wildlife corridors that would severely and permanently limit their use by wildlife species; and/or
- Substantial, unmitigated erosion resulting in loss of site integrity to support vegetation and degradation of downstream water quality by sediment loading.

Statement of Compliance with EO 11990

Executive Order 11990, Protection of Wetlands (42 FR 26961, 3 CFR, 1977) directs all federal agencies to provide leadership and take action to minimize the destruction, loss, or degradation of wetlands as well as to preserve and enhance the beneficial values of wetlands. The order directs agencies to avoid activities in wetlands unless a determination has been made that there is no practicable alternative, and that all practicable measures to minimize impacts to wetlands are included. Marine Corps Order P5090.2A (Chapter 12) further requires that all activities adversely affecting the quality or quantity of tidelands

1 or fresh water wetlands that are not covered by nationwide or regional permits have, at a minimum,
2 an EA prepared.

3 All Alternatives carried forward address the need for the USMC to establish mitigation areas for impacts
4 to federally listed vernal pool species and jurisdictional Waters of the U.S., which complies with and
5 supports the USMC's responsibility under EO11990 to preserve and enhance the natural and beneficial
6 values of wetlands. Establishment and enhancement activities, as noted in this section, could result in the
7 minor temporary disturbance of wetlands; however, no permanent loss of wetlands would occur and, at
8 completion, would be beneficial due to an increase in the amount and ecological condition of
9 jurisdictional and non-jurisdictional wetlands on site. The application of Environmental Protection
10 Measures presented in Section 2.3, as well as compliance with the NPDES permit program (General
11 Measure 2), would minimize, if not avoid, all temporary impacts to wetlands.

12 **3.2.4.1 Alternative 1: Full Mitigation Area (Preferred Alternative)**

13 ***Vegetation Communities***

14 As described in Section 3.2.3.1, plant community terminology presented in this EA aligns with the most
15 recently completed MCAS Miramar INRMP (2011a). As application of the new NVC system is
16 determined through a complete update of the INRMP, the guidance and terminology in that INRMP
17 update will be applied to project execution.

18 Alternative 1 includes the creation, restoration, and/or enhancement of individual vernal pool basins
19 within suitable sites of each proposed mitigation area. In Alternative 1, the total mitigation area would
20 include 699 acres, with 210 acres that would be potentially suitable sites for vernal pool restoration
21 (Table 3-6). The total potential vernal pool basin area that would be developed is approximately
22 210 acres. The relatively small size of vernal pools compared to the total proposed mitigation area allows
23 for preservation and incorporation of desirable shrubs and perennial grasses into the watershed area of
24 pools when adapting the design to site-specific conditions (Environmental Protection Measure 5).

25 Temporary, direct impacts would include the temporary clearing of upland vegetation during the creation
26 of individual basins (Environmental Protection Measure 3). Specific creation sites would be cleared of
27 vegetation and graded to create new basins through soil re-contouring. Following basin development, the
28 basin areas would be enhanced and revegetated on-site to provide habitat for sensitive resources, and
29 upland areas disturbed by restoration activities would be replanted with appropriate native seed or
30 plantings as outlined in site-specific restoration plans described in Section 2.1.1.2. The vernal pool
31 restoration sites would be actively maintained and monitored by the restoration contractor for at least
32 5 years following restoration, or until the performance standards are met. At completion of each
33 restoration, the result would be the conversion of disturbed, degraded, or non-native habitats to vernal
34 pool habitat and native upland vegetation communities, which represents a permanent long-term
35 beneficial impact. Thus, temporary, adverse direct impacts to vegetation communities as a result of vernal
36 pool development would not be significant and no direct, permanent adverse impacts would occur.
37 However, long-term permanent beneficial impacts would occur resulting from restoration/development
38 activities, and the conservation strategies for the proposed mitigation areas.

39 Indirect impacts to vegetation communities could occur due to the establishment of invasive plants, which
40 could decrease the overall quality of habitat by out-competing native species, contributing to reduced
41 diversity and structure, and reduced vernal pool habitat functions and values. The potential for
42 establishment of invasive plants would be avoided through implementation of invasive weed control
43 (e.g., hand removal, mechanical) in areas reseeded/replanted until the native vegetation is established
44 (Environmental Protection Measure 7) and equipment washing would occur prior to delivery to the

1 proposed mitigation areas (Environmental Protection Measure 7), a majority of which is disturbed habitat
 2 (Table 3-6).

Table 3-6. Vegetation Communities in Alternative 1

Vegetation Community	Total Area Within Alternative 1 (all proposed mitigation areas; acres)	Potential Suitable Sites for Restoration/Development in Alternative 1 (acres)
Chamise Chaparral	58.2	14.1
Coastal and Valley Fresh Water Marsh	0.2	0.0
Coastal Sage-Scrub Chaparral	4.6	0.0
Developed	8.8	0.0
Diegan Coastal Sage Scrub	7.0	0.0
Disturbed Chamise Chaparral	157.4	55.8
Disturbed Coastal and Valley Fresh Water Marsh	0.5	0.0
Disturbed Diegan Coastal Sage Scrub	90.0	29.4
Disturbed Habitat	120.2	40.0
Disturbed Non-Native Grassland	79.2	30.1
Disturbed Non-Native/Native grassland	8.5	3.6
Disturbed Sage-Scrub Chaparral	2.4	0.0
Disturbed Southern Mixed Chaparral	2.6	1.2
Disturbed Vernal Marsh	0.4	0.0
Eucalyptus Woodland	1.7	0.0
Native Grassland	10.3	1.5
Non-Native Grassland	63.2	27.5
Non-Native/Native Grassland	7.4	4.6
Scrub Oak Chaparral	1.6	0.0
Southern Mixed Chaparral	60.8	1.6
Vernal Marsh	13.6	0.1
Total	699	210

3 **General Wildlife and Wildlife Corridors**

4 Alternative 1 would result in the direct, temporary disturbance of approximately 210 acres (associated
 5 with pool and adjacent upland watershed). Restoration activities could result in the direct loss of common,
 6 less-mobile wildlife species such as lizards and rodents. However, the number of individuals that could be
 7 lost would be inconsequential to populations present on MCAS Miramar.

8 Temporary, direct impacts to general wildlife species may also occur within adjacent habitat due to an increase
 9 in dust, noise, or other restoration-related disturbances. Temporary disturbances due to noise associated with
 10 the operation of heavy machinery during soil re-contouring, as well as an increase in the general activity and
 11 human presence, could mask bird vocalizations, invoke stress in birds and reduce breeding success, and cause
 12 common bird and wildlife species to avoid the work area during active restoration periods. However, impacts
 13 would be minimal because the adjacent lands primarily consist of suitable habitat for wildlife and the common
 14 species in the vicinity of the proposed mitigation areas have adapted to ongoing human activity and elevated
 15 noise associated with traffic along I-15 and military operations within the Station, including aircraft operations
 16 at the nearby flightline and training activities in East Miramar. Also, the overall footprint of the disturbance at
 17 any given time would be small compared to the habitat provided by the proposed mitigation area. Most
 18 wildlife would be able to temporarily relocate away from the disturbance and would recolonize the area after
 19 the construction has ended. Finally, the use of heavy equipment for vernal pool establishment/enhancement

1 would occur when the soil is completely dry (approximately March – June) and therefore would avoid a
2 portion of bird breeding season. As a result, indirect impacts are expected to be minimal. Potential effects
3 should be avoided by following seasonal restrictions outlined in Environmental Protection Measure 6.
4 Therefore, based on adherence to seasonal timing restrictions and restoration requirements, temporary indirect
5 impacts to general wildlife species would not be significant and no mitigation is required.

6 ***Special Status Species***

7 *Special Status Wildlife*

8 **Coastal California gnatcatcher.** As noted in Section 3.2.3.3, of the six proposed vernal pool mitigation
9 areas, only Charlie and Echo have been found to support coastal California gnatcatchers in the past
10 decade (see Figure 3-2). Permanent and temporary direct impacts would occur at these locations if
11 restoration activities resulted in the removal of occupied habitat, nest destruction or disturbance, or
12 increased noise and activity in the vicinity of occupied habitat, any of which could result in the loss of
13 individuals and/or reduced nesting success. Proposed restoration activities could also affect the behavior
14 of coastal California gnatcatchers located in the project vicinity by masking calls, causing stress, or
15 disturbing food gathering or nesting activities. However, limiting removal of occupied habitat during the
16 nesting season (15 February to 15 August), as prescribed in Environmental Protection Measure 5, would
17 avoid direct nest loss and would limit the potential for noise and activity to reduce breeding success.
18 Non-breeding individuals could also be present during other restoration activities, following vegetation
19 removal/grubbing. The suitable sites proposed for vernal pool restoration and the nearest observations of
20 coastal California gnatcatchers are located within the departure corridor of current aircraft operations,
21 immediately adjacent to major roads and highways, and are thus subject to noise associated with general
22 military industrial use. Therefore, additional temporary noise associated with development activities
23 would be negligible compared to the other existing noise sources.

24 Gnatcatchers do not necessarily occupy the same specific use areas year after year; therefore, temporary
25 removal of suitable habitat outside of the breeding season could also reduce availability for future
26 occupation during the time that restoration is occurring, which would represent an indirect impact. Only
27 proposed mitigation areas Charlie and Echo have supported coastal California gnatcatchers over the past
28 decade. Therefore, indirect impacts, if they were to occur, would be most likely limited to the removal of
29 unoccupied suitable habitat in those areas. This temporary impact would be small to negligible, because
30 all suitable habitat temporarily removed as part of a restoration would be immediately replaced on site,
31 and none of the primary habitat elements required would be permanently removed. Furthermore, if
32 disturbed or degraded areas are the subject of the specific restoration, upland restoration activities would
33 likely result in an increase in suitable habitat for this species.

34 As a result, although temporary direct and indirect impacts could occur, measures included as part of the
35 project would further reduce any potential for impact to coastal California gnatcatchers or their habitat to
36 negligible levels. Furthermore, all temporary adverse impacts would occur in discrete locations associated
37 primarily with a small section of proposed mitigation area Echo, or possibly along the northern border of
38 proposed mitigation area Charlie, which has historically supported gnatcatchers. In contrast, the upland
39 watershed restoration component proposed under this alternative would be beneficial to coastal California
40 gnatcatchers through the establishment and conservation of suitable habitat, particularly in currently
41 degraded habitats. When restoration activities are complete, the resulting project would maintain or
42 increase native habitats associated with the upland watersheds, as well as develop, restore, and conserve
43 vernal pool habitat and associated functions. Therefore, although temporary adverse impacts could occur
44 to coastal California gnatcatchers and their associated habitat, overall the proposed action under this
45 alternative would result in a small permanent beneficial impact to the species.

1 **San Diego fairy shrimp.** Some existing basins that currently support federally listed species, including
2 San Diego fairy shrimp, may be selected for enhancement to improve the ecological condition of these
3 features. Enhancement activities primarily include the expansion, recontouring, and deepening of basins,
4 combining multiple basins, and inoculation with San Diego fairy shrimp and/or vernal pool plants. As a
5 result of the necessary ground disturbance associated with these activities, enhancement of existing
6 occupied basins would result in temporary disturbance of occupied habitat and likely damage to
7 San Diego fairy shrimp cysts.

8 In addition, the collection of inoculum from donor pools would also, by design, result in the removal of
9 San Diego fairy shrimp cysts and vernal pool plant seed bank from existing pools (donor pools) on
10 MCAS Miramar and translocation into restored/enhanced pools. Unmanaged, the disturbance and
11 relocation of cysts may reduce the viability of the relocated inoculum, as well as damage/reduce the
12 ecological function of the donor pool system. To minimize potential adverse effects, Environmental
13 Protection Measure 8 limits the collection of inoculum to 5 percent⁷ of the donor pool area and requires
14 that all activities and collection would occur under the direction of a USFWS-permitted biologist and/or
15 MCAS Miramar biologist.

16 Under all alternatives, Area Delta would be restored first because it supports an existing vernal pool
17 mitigation project currently undergoing active maintenance and monitoring. A preliminary analysis of
18 enhancement opportunities in Area Delta identified approximately 19 basins suitable for enhancement
19 ranging in size from 100 square feet to 1,100 square feet (approximately 8,700 square feet of basins). Of
20 the pools identified as suitable for enhancement, eight currently support San Diego fairy shrimp, and two
21 support San Diego button celery. An estimate of total restored vernal pool acreage resulting from
22 enhancement activities in Area Delta is approximately 38,000 square feet, equating to a 400 percent
23 increase in vernal pool habitat.

24 The benefits of restored/enhanced vernal pools to supported species, including San Diego fairy shrimp,
25 are anticipated to exceed the adverse impacts associated with the disturbance of generally small, but
26 occupied seasonally ponded basins, and the removal and resulting disturbance of donor pools during the
27 collection of inoculum. Establishing functioning vernal pool systems in advance of project-specific
28 mitigation requirements would result in an increase in San Diego fairy shrimp habitat. Restored pools
29 would be managed to minimize invasive weed establishment and would be monitored for long-term
30 success. Temporal losses typically associated with project-specific impact and mitigation restoration
31 programs would also be avoided because functional mitigation areas would be established in advance of
32 specific future impacts. As a result, although some disturbance of San Diego fairy shrimp habitat and/or
33 cysts could occur, the long-term impacts on San Diego fairy shrimp would be beneficial.

34 **Riverside fairy shrimp.** Riverside fairy shrimp are known to occur in two impoundments east of I-15 in
35 proposed mitigation area Bravo North. However, this alternative does not include the restoration of
36 existing Riverside fairy shrimp-occupied impoundments or the development of new basins near existing
37 impoundments. Further, vernal pools that support Riverside fairy shrimp would not be used as donor
38 pools. As a result, there is no potential for the loss of Riverside fairy shrimp individuals or the
39 loss/degradation of its habitat.

40 *Special Status Plant Species*

41 **San Diego button-celery.** Some basins that currently support federally listed species, including
42 San Diego button-celery, may be selected for enhancement to improve the ecological condition of these

⁷ Limiting the amount collected from any individual donor pool avoids the potential for permanently reducing available species and seed bank.

1 features. Ground disturbance and recontouring may damage or remove the uppermost layers of soil that
2 support the seed bank and therefore reduce the viability of existing San Diego button-celery seed bank. In
3 addition, direct, adverse impacts to San Diego button-celery would also occur, by design, during the
4 collection of seed from donor vernal pools. The transfer of seed and inoculum from donor vernal pools
5 with populations of San Diego button-celery would provide a seed bank to introduce the federally listed
6 plant into the proposed mitigation areas. The disturbance associated with the collection and translocation
7 of seed bank may reduce the viability of the relocated seed, as well as damage/reduce the ecological
8 function of the donor pool system.

9 As described under San Diego fairy shrimp, Area Delta would be restored first because it supports an
10 existing vernal pool mitigation project currently undergoing active maintenance and monitoring. A
11 preliminary analysis of enhancement opportunities in Area Delta identified approximately 19 basins
12 suitable for enhancement ranging in size from 100 square feet to 1,100 square feet (approximately
13 8,700 square feet of basins). An estimate of total restored vernal pool acreage resulting from enhancement
14 activities in Area Delta is approximately 38,000 square feet, equating to a 400 percent increase in vernal
15 pool habitat suitable for vernal pool plant species such as San Diego button-celery.

16 To minimize potential adverse effects, Environmental Protection Measure 8 limits the collection area to
17 5 percent of the total donor pool area and requires that all activities occur under the direction of a
18 USFWS-permitted biologist and/or MCAS Miramar biologist. In addition, the benefits of
19 restored/enhanced vernal pools to supported species, including San Diego button-celery, are anticipated
20 to exceed the adverse impacts associated with the removal and resulting disturbance of donor pools
21 during active restoration. Establishing functioning vernal pool systems in advance of project-specific
22 mitigation requirements would provide new San Diego button-celery habitat. As a result, although some
23 disturbance of San Diego button-celery seed bank and habitat could occur, the long-term increase and
24 conservation of San Diego button-celery would be beneficial.

25 **San Diego mesa mint.** Similar to San Diego button-celery, ground disturbance and recontouring may
26 damage or remove the uppermost layers of soil that support the seed bank and therefore reduce the
27 viability of existing San Diego mesa mint seed bank. Also, direct impacts to San Diego mesa mint would
28 occur, by design, during the collection of seed from existing vernal pools on MCAS Miramar. No more
29 than 5 percent of the surface of any seed bank donor pool would be collected (Environmental Protection
30 Measure 6), and all collection would occur under the direction of a USFWS-permitted biologist and/or
31 MCAS Miramar biologist. At completion, restoration/development activities would result in an expansion
32 of suitable habitat for this species, which represents a long-term beneficial impact to San Diego mesa
33 mint. As a result, although some disturbance of San Diego mesa mint seed bank and habitat could occur,
34 the long-term increase and conservation of this species would be beneficial.

35 **Spreading Navarretia.** This species has not been identified within the vernal pool complexes in the
36 proposed mitigation areas for Alternative 1; therefore, no direct impacts associated with restoration would
37 occur. However, restored/developed vernal pools would be inoculated with vernal pool soil collected
38 from donor pools on MCAS Miramar, which could result in the disturbance of established seed bank for
39 this species. Seed would be collected for the purposes of increasing the range of this federally listed
40 species on the Station which, following the short-term disturbance, would represent a beneficial impact
41 similar to the other vernal pool-obligate San Diego button-celery and San Diego mesa mint. In accordance
42 with Environmental Protection Measure 6, no more than 5 percent of the surface of any seed source pool
43 would be collected to limit the potential for a permanent modification of the donor pool ecology.
44 Collection would be supervised by a USFWS-permitted biologist or MCAS Miramar biologist. Therefore,
45 although some short-term disturbance of existing spreading navarretia and its seed bank could occur, the
46 long-term restoration benefits associated with the establishment of functioning vernal pools with

1 spreading navarretia would far outweigh the focused adverse impacts. As a result, although short-term
2 impacts would be adverse, long-term impacts to this species would be beneficial.

3 **California Orcutt grass.** Similar to spreading navarretia, California Orcutt grass does not occur within
4 any proposed mitigation areas for Alternative 1; thus, impacts would be limited to donor pools associated
5 with the collection of inoculum and seed bank. The long-term restoration benefits associated with the
6 establishment of functioning vernal pools with associated federally listed vernal pool species would far
7 outweigh the short-term, adverse impacts. As a result, although short-term impacts would be adverse,
8 long-term impacts to this species would be beneficial.

9 **Willowy monardella.** Willowy monardella does not occur in any of the proposed mitigation areas, and
10 seed bank/inoculum would not be collected from any sites that support this species. Therefore, no impacts
11 to this species would occur.

12 *Migratory Bird Treaty Act Species*

13 The proposed mitigation areas in Alternative 1 support suitable habitat for migratory bird species.
14 Alternative 1 would temporarily remove generally low habitat quality vegetation for the purposes of
15 establishing and/or enhancing the ecological condition of vernal pools. Temporary impacts to MBTA
16 species may also occur within adjacent habitat due to an increase in dust, noise, or other restoration-
17 related disturbances. Impacts to MBTA species would be similar to those described above for general bird
18 species and for the coastal California gnatcatcher. The potential for restoration activities to adversely
19 modify behavior of MBTA species is unlikely, particularly because of the temporary nature of the activity
20 and the proximity to the active flightline and general military industrial uses of the Station. The following
21 measures would be implemented to avoid potential impacts to MBTA species: 1) habitat clearing
22 activities would be timed to avoid the breeding season to the maximum extent practicable to avoid
23 damage to active bird nests (Environmental Protection Measure 4); and, 2) if nesting birds or eggs are
24 encountered, restoration would be phased to avoid disrupting the birds. Therefore, development of
25 Alternative 1 would not result in significant adverse impacts to MBTA species and no mitigation is
26 required.

27 After vernal pool development and site restoration is completed, activities associated with monitoring and
28 maintenance of Alternative 1 would not result in significant impacts to MBTA species or suitable habitat
29 for these species and no mitigation is required.

30 *Other Species of Regional Concern*

31 Alternative 1 has the potential to impact other regionally sensitive plant species that occur or may occur
32 in the proposed mitigation areas including San Diego goldenstar, Orcutt's brodiaea, long-spined
33 spineflower, San Diego barrel cactus, little mousetail, Nuttall's scrub oak, and Otay lilac. However, these
34 plant species are not protected by state or federal law and the limited amount of habitat proposed for
35 removal would result in a corresponding low number of individuals that may occupy the proposed
36 mitigation areas. As a result, project implementation under this alternative is unlikely to jeopardize the
37 regional population. In addition, Alternative 1 would provide a conservation benefit through long-term
38 protection of existing occurrence. Therefore, development and management of Alternative 1 would not
39 result in significant adverse impacts to other species of regional concern.

40 ***Wetlands and Other Waters of the United States***

41 *Jurisdictional Wetlands and Other Waters of the United States*

42 Waters of the U.S. occur in all of the proposed mitigation areas. Some of the channels and vernal pools
43 within proposed mitigation areas Alpha, Bravo North, Bravo South, and Charlie have a nexus to

1 Rose Creek (Water of the U.S.). Channels and some pool complexes within proposed mitigation areas
2 Charlie, Delta, Echo, and Foxtrot have a nexus to San Clemente Canyon (Water of the U.S.). Where
3 possible, Alternative 1 includes restoration/development of vernal pools that are immediately adjacent to
4 and/or connected to federal CWA jurisdictional Waters of the U.S. or new ephemeral streambed channels
5 created by this project.

6 Temporary, indirect impacts to Rose Creek and San Clemente Canyon and other Waters of the U.S. are
7 unlikely to occur from the proposed vernal pool activities. New/enhanced vernal pools would be designed
8 to capture and hold water above the cemented hardpan base, and associated surrounding upland would be
9 designed to run off into pools. Further, restoration activities would most likely occur during dry
10 conditions which limit the likelihood of sediment transport to adjacent areas.

11 Temporary access roads, however, could increase the risk of sedimentation if they were planned adjacent
12 to jurisdictional Waters of the U.S. Any areas impacted would be returned to existing conditions
13 following development. Temporary sediment control measures and restoration/development scheduling
14 outside of the wet season (Environmental Protection Measure 6) would minimize soil loss and the runoff
15 of soil-laden storm water from the proposed mitigation areas. In addition, because Alternative 1 would
16 result in a disturbance of greater than one (1) acre phased over an extended period of time, the project
17 would be coordinated with the San Diego RWQCB to ensure compliance with the NPDES permit
18 program as described in General Measure 2. Responsibilities may include development of an SWPPP, or
19 a small construction activity waiver, which may also require compliance monitoring or development of
20 additional BMPs (e.g., waddles, biotextiles, silt fences, or other controls) in accordance with Section 402
21 of the CWA.

22 In the long-term, establishment and enhancement of vernal pools provides an ecological benefit and an
23 increase in the amount of Waters of the U.S. At least some of the established and/or enhanced pools
24 would be designed to be jurisdictional, which would increase the amount and ecological condition of
25 jurisdictional (and non-jurisdictional) features on site. Therefore, no significant temporary, adverse
26 impacts to federal CWA jurisdictional wetlands or Waters of the U.S. would occur. In contrast, the project
27 at completion would be beneficial due to an increase in the amount and ecological condition of
28 jurisdictional and non-jurisdictional features on site.

29 **3.2.4.2 Alternative 2: Partial Configuration A (Areas Alpha, Bravo North, Delta, and Echo)**

30 ***Vegetation Communities***

31 Alternative 2 would be similar to Alternative 1 except mitigation areas Bravo South, Charlie, and Foxtrot
32 would not be developed. Alternative 2 would include the development of approximately 15 acres of
33 vernal pool basins within approximately 144 acres of suitable sites for vernal pool restoration (Table 3-7).
34 As described for Alternative 1, vernal pool sites would be cleared of vegetation and graded to create
35 new/restored basins through soil re-contouring. Upland areas disturbed by restoration activities would be
36 replanted with appropriate native seed or plantings as outlined in site-specific restoration plans.
37 Temporary direct impacts (removal of habitat) and indirect (invasive species) impacts to vegetation
38 during the creation of individual basins would be similar to but slightly less than those discussed for
39 Alternative 1 because less vegetation would be removed.

40 The relatively small size of vernal pools compared to the total proposed mitigation area allows for
41 preservation and incorporation of desirable shrubs and perennial grasses into the watershed area of pools
42 when adapting the design to site-specific conditions. Overall, Alternative 2 would result in the conversion
43 of disturbed, degraded, or non-native habitats to vernal pool habitat and native upland vegetation
44 communities. Based on long-term positive impacts of the restoration on native vegetation communities,
45 no significant impacts to vegetation communities would occur and no mitigation is required. However,

1 since Alternative 2 would result in a smaller area of vernal pool mitigation as compared to Alternative 1
 2 (144 acres compared to 210 acres), the conservation benefit to native vegetation communities would be
 3 less than Alternative 1.

Table 3-7. Vegetation Communities in Alternative 2 (Proposed Mitigation Areas Alpha, Bravo North, Delta, and Echo)

Vegetation Community	Total Area Within Alternative 2 (acres)	Potential Suitable Sites for Restoration in Alternative 2 (acres)
Chamise Chaparral	25.6	3.4
Coastal and Valley Fresh Water Marsh	0.2	0.0
Coastal Sage-Scrub Chaparral	4.6	0.0
Developed	7.3	0.0
Diegan Coastal Sage Scrub	7.0	0.0
Disturbed Chamise Chaparral	105.1	39.9
Disturbed Coastal and Valley Fresh Water Marsh	0.5	0.0
Disturbed Diegan Coastal Sage Scrub	60.1	26.0
Disturbed Habitat	96.0	26.6
Disturbed Non-Native Grassland	49.5	18.1
Disturbed Non-Native/Native grassland	5.1	0.8
Disturbed Sage-Scrub Chaparral	2.4	0.0
Disturbed Southern Mixed Chaparral	1.2	1.2
Disturbed Vernal Marsh	0.1	0.0
Eucalyptus Woodland	1.7	0.0
Native Grassland	0.0	0.0
Non-Native Grassland	42.6	23.0
Non-Native/Native Grassland	5.6	4.6
Scrub Oak Chaparral	0.2	0.0
Southern Mixed Chaparral	22.3	0.0
Vernal Marsh	9.2	0.0
Total	446	144

4 **General Wildlife and Wildlife Corridors**

5 Alternative 2 would result in the direct, temporary disturbance of approximately 144 acres (associated
 6 with pool and adjacent upland watershed). Similar to Alternative 1, vernal pool development could result
 7 in the direct loss of common, less-mobile wildlife species such as lizards and rodents; and temporary,
 8 indirect impacts to wildlife species within adjacent habitat due to an increase in dust, noise, or other
 9 disturbances related to vernal pool development. Potential effects should be avoided by following
 10 seasonal restrictions outlined in Environmental Protection Measure 4. Therefore, direct and indirect
 11 impacts to general wildlife species would not be significant, and no mitigation is required. However,
 12 because Alternative 2 would result in a smaller area of vernal pool mitigation compared to Alternative 1
 13 (144 acres compared to 210 acres), impacts to general wildlife and wildlife corridors would be less than
 14 Alternative 1.

15 **Special Status Species**

16 *Special Status Wildlife*

17 **Coastal California gnatcatcher.** Under Alternative 2, only proposed mitigation area Echo has supported
 18 coastal California gnatcatchers over the past decade. Therefore, indirect and direct impacts to coastal

1 California gnatcatcher would be similar to but less than Alternative 1, which includes both mitigation
2 areas Charlie and Echo. As described for Alternative 1, measures included as part of the project would
3 further reduce any potential for impact to coastal California gnatcatchers or their habitat to near zero
4 levels, and restoration associated with the upland watersheds would increase native habitats for this
5 species. Therefore, direct and indirect impacts to coastal California gnatcatcher would not be significant
6 and overall would result in a small permanent beneficial impact to the species. However, because
7 Alternative 2 would result in a smaller area of vernal pool mitigation within suitable coastal California
8 gnatcatcher habitat compared to Alternative 1, impacts as well as the benefit to this species would be less
9 than Alternative 1.

10 **San Diego fairy shrimp.** San Diego fairy shrimp are known to occupy vernal pools and other seasonally
11 ponded basins in all the proposed mitigation areas in Alternative 2. As described under Alternative 1,
12 some existing basins that currently support federally listed species, including San Diego fairy shrimp,
13 may be selected for enhancement to improve the ecological condition of these features. Similar to
14 Alternative 1, although some disturbance of San Diego fairy shrimp habitat and/or cysts could occur, the
15 long-term impacts on San Diego fairy shrimp would be beneficial. However, because Alternative 2 would
16 result in a smaller area of vernal pool mitigation within compared to Alternative 1, impacts as well as the
17 benefit to this species would be less than Alternative 1.

18 **Riverside fairy shrimp.** Riverside fairy shrimp are known to occur in two impoundments east of I-15
19 (Vernal Pool Unit 4, group AA1 south) in mitigation area Bravo North. Bravo North would be included in
20 Alternative 2. However, this alternative does not include the restoration of existing Riverside fairy
21 shrimp-occupied impoundments or the development of new basins near existing Riverside-fairy shrimp-
22 occupied impoundments. Further, vernal pools that support Riverside fairy shrimp would not be used as
23 donors. As a result, there is no potential for the loss of Riverside fairy shrimp individuals or the
24 loss/degradation of its habitat.

25 *Special Status Plant Species*

26 **San Diego button-celery.** Under Alternative 2, impacts to San Diego button-celery would be similar to
27 but less than Alternative 1, because only populations within Area Delta would be impacted. As described
28 for Alternative 1, Environmental Protection Measure 8, which limits the collection area to 5 percent of the
29 total donor pool area and requires that all activities occur under the direction of a USFWS-permitted
30 biologist and/or MCAS Miramar biologist, would minimize potential adverse effects. In addition, the
31 benefits of restored/enhanced vernal pools to supported species, including San Diego button-celery, are
32 anticipated to exceed the adverse impacts associated with the removal and resulting disturbance of donor
33 pools during active restoration. Similar to Alternative 1, although some disturbance of San Diego button-
34 celery seed bank and habitat could occur, the long-term increase and conservation of San Diego button-
35 celery would be beneficial. However, because Alternative 2 would result in a smaller area of vernal pool
36 mitigation within compared to Alternative 1, impacts as well as the benefit to this species would be less
37 than Alternative 1.

38 **San Diego mesa mint.** Under Alternative 2, impacts to San Diego mesa mint would be similar to but less
39 than Alternative 1, because only populations within Area Alpha, Bravo North, Delta, and Echo would be
40 impacted. As described for Alternative 1, no more than 5 percent of the surface of any seed bank donor
41 pool would be collected (Environmental Protection Measure 6), and all collection would occur under the
42 direction of a USFWS-permitted biologist and/or MCAS Miramar biologist. In addition, at completion,
43 restoration/development activities would result in an expansion of suitable habitat for this species, which
44 represents a long-term beneficial impact. Similar to Alternative 1, although some disturbance of
45 San Diego mesa mint seed bank and habitat could occur, the long-term increase and conservation of this
46 species would be beneficial. However, because Alternative 2 would result in a smaller area of vernal pool

1 mitigation within compared to Alternative 1, impacts as well as the benefit to this species would be less
2 than Alternative 1.

3 **Spreading Navarretia.** This species has not been identified within the vernal pool complexes in the
4 proposed mitigation areas for Alternative 2; therefore, no direct impacts associated with restoration would
5 occur. Similar to Alternative 1, restored/developed vernal pools would be inoculated with vernal pool soil
6 collected from donor pools on MCAS Miramar, which could result in the disturbance of established seed
7 bank for this species. Seed would be collected for the purposes of increasing the range of this federally
8 listed species on the Station which, following the short-term disturbance, would represent a beneficial
9 impact similar to the other vernal pool-obligate species. In accordance with Environmental Protection
10 Measure 6, no more than 5 percent of the surface of any seed source pool would be collected to limit the
11 potential for a permanent modification of the donor pool ecology, and collection would be supervised by
12 a USFWS-permitted biologist or MCAS Miramar biologist. Although some short-term disturbance of
13 existing spreading navarretia and its seed bank could occur, the long-term restoration benefits associated
14 with the establishment of functioning vernal pools with spreading navarretia would far outweigh the
15 focused adverse impacts. As a result, although short-term impacts would be adverse, long-term impacts to
16 this species would be beneficial.

17 **California Orcutt grass.** Similar to spreading navarretia, California Orcutt grass does not occur within
18 any proposed mitigation areas for Alternative 2; thus, impacts would be limited to donor pools associated
19 with the collection of inoculum and seed bank. The long-term restoration benefits associated with the
20 establishment of functioning vernal pools with associated federally listed vernal pool species would far
21 outweigh the short-term, adverse impacts. As a result, although short-term impacts would be adverse,
22 long-term impacts to this species would be beneficial.

23 **Willow monardella.** Willow monardella does not occur in any of the proposed mitigation areas, and
24 seed bank/inoculum would not be collected from any sites that support this species. Therefore, no impacts
25 to this species would occur.

26 *Other Species of Regional Concern*

27 Other regionally sensitive species that are not federally or state listed occur or may occur in the project
28 area. Based on known occurrences and/or requisite habitat, these plant species as identified for
29 Alternative 1 have the potential to occur within the project area and thus would be potentially impacted
30 by the proposed action: San Diego goldenstar, Orcutt's brodiaea, long-spined spineflower, San Diego
31 barrel cactus, little mousetail, Nuttall's scrub oak, and Otay lilac. However, these plant species are not
32 protected by state or federal law and the limited amount of habitat proposed for removal would result in a
33 corresponding low number of individuals that may occupy the project area. As a result, project
34 implementation under this alternative is unlikely to jeopardize the regional population and continued
35 existence of these species (Environmental Protection Measure 3) and would provide a conservation
36 benefit through long-term protection of existing occurrence. Therefore, no significant impacts to other
37 species of regional concern would occur.

38 *Migratory Bird Treaty Act Species*

39 The proposed mitigation areas in Alternative 2 support suitable habitat for migratory bird species,
40 including 22 species designated as Species of Concern. Similar to Alternative 1, due to the small amount
41 of area (3 percent of the total proposed mitigation area) that would be disturbed and the large amount of
42 suitable habitat outside the proposed mitigation areas, MBTA species would be expected to utilize
43 suitable habitat that lies adjacent to the project sites during vernal pool development and restoration. In
44 addition, implementation of Environmental Protection Measure 4 would avoid the potential for adverse
45 impacts to migratory bird species. Therefore, impacts from Alternative 2 would be similar to but less than
46 those for Alternative 1. After vernal pool development and site restoration is completed, activities

1 associated with management and maintenance of Alternative 2 would not result in significant impacts to
 2 MBTA species or suitable habitat for these species, and no mitigation is required..

3 **Wetlands and Other Waters of the United States**

4 *Jurisdictional Wetlands and Other Waters of the United States*

5 Impacts to jurisdictional wetlands and other waters of the U.S. would be similar to Alternative 1 except
 6 that mitigation areas would not be established in Areas Bravo South, Charlie, and Foxtrot under this
 7 alternative. Therefore, Alternative 2 would not result in significant impact to jurisdictional wetlands and
 8 other waters of the U.S. However, because Alternative 2 would result in a smaller area of vernal pool
 9 mitigation within compared to Alternative 1, impacts as well as the benefit to jurisdictional wetlands and
 10 other waters of the U.S. would be less than Alternative 1.

11 **3.2.4.3 Alternative 3: Partial Configuration B (Areas Charlie, Delta, Echo, and Foxtrot)**

12 **Vegetation Communities**

13 Alternative 3 includes less mitigation area than Alternatives 1 or 2, with proposed mitigation areas Alpha,
 14 Bravo North, and Bravo South excluded. In Alternative 3, the total proposed mitigation area would
 15 include 474 acres, with 139 acres that would be potentially suitable sites for vernal pool restoration (Table
 16 3-8). Individual vernal pools would be created, restored, and/or enhanced within suitable sites. Specific
 17 creation sites would be cleared of vegetation and graded to create new basins through soil re-contouring.
 18 Temporary direct impacts to vegetation would occur during the creation of individual basins.

Table 3-8. Vegetation Communities in Alternative 3 (Proposed Mitigation Areas Charlie, Delta, Echo, and Foxtrot)

Vegetation Community	Total Area Within Alternative 3 (acres)	Potential Suitable Sites for Restoration in Alternative 3 (acres)
Chamise Chaparral	27.1	1.5
Coastal and Valley Fresh Water Marsh	0.2	0.0
Coastal Sage-Scrub Chaparral	4.6	0.0
Developed	7.2	0.0
Diegan Coastal Sage Scrub	7.0	0.0
Disturbed Chamise Chaparral	86.4	29.7
Disturbed Coastal and Valley Fresh Water Marsh	0.5	0.0
Disturbed Diegan Coastal Sage Scrub	75.6	22.1
Disturbed Habitat	118.4	39.9
Disturbed Non-Native Grassland	29.0	11.5
Disturbed Non-Native/Native grassland	1.3	0.0
Disturbed Sage-Scrub Chaparral	0.0	0.0
Disturbed Southern Mixed Chaparral	1.2	1.2
Disturbed Vernal Marsh	0.4	0.0
Eucalyptus Woodland	1.7	0.0
Native Grassland	8.1	0.8
Non-Native Grassland	63.2	27.5
Non-Native/Native Grassland	7.4	4.6
Scrub Oak Chaparral	0.2	0.0
Southern Mixed Chaparral	26.8	0.0
Vernal Marsh	8.0	0.0
Total	474	139

1 The relatively small size of vernal pools compared to the total proposed mitigation area allows for
2 preservation and incorporation of desirable shrubs and perennial grasses into the watershed area of pools
3 within the proposed mitigation areas when adapting the design to site-specific conditions. The net effect
4 of Alternative 3 on the vegetation communities would be the conversion of disturbed, degraded, or non-
5 native habitats to vernal pool habitat and native upland vegetation communities. Therefore, based on
6 long-term positive impacts of the restoration on native vegetation communities, the impacts to vegetation
7 communities would not be significant and no mitigation is required. Since Alternative 3 has a smaller area
8 that would likely be restored (139 acres compared to 210 acres), the conservation benefit to native
9 vegetation communities would be less than Alternative 1.

10 **General Wildlife and Wildlife Corridors**

11 Alternative 3 would result in the direct, temporary disturbance of approximately 139 acres (associated
12 with pools and adjacent upland watershed). Similar to Alternative 1, vernal pool development could result
13 in the direct loss of common, less-mobile wildlife species such as lizards and rodents and temporary,
14 indirect impacts to wildlife species within adjacent habitat due to an increase in dust, noise, or other
15 disturbances related to vernal pool development. Potential effects should be avoided by following
16 seasonal restrictions outlined in Environmental Protection Measure 4. Therefore, direct and indirect
17 impacts to general wildlife species would not be significant, and no mitigation is required. However,
18 because Alternative 3 would result in a smaller area of vernal pool mitigation compared Alternative 1
19 (139 acres compared to 210 acres) impacts to general wildlife and wildlife corridors would be less than
20 Alternative 1.

21 **Special Status Species**

22 *Special Status Wildlife Species*

23 **Coastal California gnatcatcher.** Alternative 3 would be similar to Alternative 1 except that areas Alpha,
24 Bravo North, and Bravo North would be excluded. However, no use areas or historic use areas for coastal
25 California gnatcatcher occur within any of these three areas. Therefore, Alternative 3 would result in the
26 same impacts to coastal California gnatcatcher as described for Alternative 1, measures included as part
27 of the project would further reduce any potential for impact to coastal California gnatcatchers or their
28 habitat to near zero levels, and restoration associated with the upland watersheds would increase native
29 habitats for this species. Therefore, direct and indirect impacts to coastal California gnatcatcher would not
30 be significant and overall would result in a small permanent beneficial impact to the species.

31 **San Diego fairy shrimp.** San Diego fairy shrimp are known to occupy vernal pools and other seasonally
32 ponded basins in all the proposed mitigation areas in Alternative 3. Some existing basins that currently
33 support federally listed species, including San Diego fairy shrimp, may be selected for enhancement to
34 improve the ecological condition of these features. Similar to Alternative 1, although some disturbance of
35 San Diego fairy shrimp habitat and/or cysts could occur, the long-term impacts on San Diego fairy shrimp
36 would be beneficial. However, Alternative 3 would result in a smaller area of vernal pool mitigation
37 within compared to Alternative 1. Therefore, impacts as well as the benefit to this species would be less
38 than Alternative 1.

39 **Riverside fairy shrimp.** Riverside fairy shrimp are only are known to occur in mitigation area Bravo
40 North. Bravo North would not be included in Alternative 3. Therefore, Alternative 3 would not impact the
41 Riverside fairy shrimp or provide additional conservation to the existing occurrences on MCAS Miramar.

42 *Special Status Plant Species*

43 **San Diego button-celery.** Under Alternative 3, impacts to San Diego button-celery would be the same as
44 Alternative 1, because areas Charlie and Delta are proposed under both alternatives. As described for
45 Alternative 1, Environmental Protection Measure 8, which limits the collection area to 5 percent of the

1 total donor pool area and requires that all activities occur under the direction of a USFWS-permitted
2 biologist and/or MCAS Miramar biologist, would minimize potential adverse effects. In addition, the
3 benefits of restored/enhanced vernal pools to supported species, including San Diego button-celery, are
4 anticipated to exceed the adverse impacts associated with the removal and resulting disturbance of donor
5 pools during active restoration. Therefore, although some disturbance of San Diego button-celery seed
6 bank and habitat could occur, the long-term increase and conservation of San Diego button-celery would
7 be beneficial.

8 **San Diego mesa mint.** Under Alternative 3, impacts to San Diego mesa mint would be similar to but less
9 than Alternative 1, because populations within areas Alpha and Bravo North would not be impacted. As
10 described for Alternative 1, no more than 5 percent of the surface of any seed-bank donor pool would be
11 collected (Environmental Protection Measure 6), and all collection would occur under the direction of a
12 USFWS-permitted biologist and/or MCAS Miramar biologist. In addition, at completion,
13 restoration/development activities would result in an expansion of suitable habitat for this species, which
14 represents a long-term beneficial impact. Similar to Alternative 1, although some disturbance of
15 San Diego mesa mint seed bank and habitat could occur, the long-term increase and conservation of this
16 species would be beneficial. However, because Alternative 3 would result in a smaller area of vernal pool
17 mitigation within compared to Alternative 1, impacts as well as the benefit to this species would be less
18 than Alternative 1.

19 **Spreading Navarretia.** This species has not been identified within the vernal pool complexes in the
20 proposed mitigation areas for Alternative 3; therefore, no direct impacts associated with restoration would
21 occur. Similar to Alternative 1, restored/developed vernal pools would be inoculated with vernal pool soil
22 collected from donor pools on MCAS Miramar, which could result in the disturbance of established seed
23 bank for this species. In accordance with Environmental Protection Measure 6, no more than 5 percent of
24 the surface of any seed source pool would be collected to limit the potential for a permanent modification
25 of the donor pool ecology, and collection would be supervised by a USFWS-permitted biologist or
26 MCAS Miramar biologist. As described for Alternative 1, although some short-term disturbance of
27 existing spreading navarretia and its seed bank could occur, the long-term restoration benefits associated
28 with the restoration of functioning vernal pools with spreading navarretia would far outweigh the focused
29 adverse impacts. As a result, although short-term impacts would be adverse, long-term impacts to this
30 species would be beneficial.

31 **California Orcutt grass.** Similar to spreading navarretia, California Orcutt grass does not occur within
32 any proposed mitigation areas for Alternative 3; thus, impacts would be limited to donor pools associated
33 with the collection of inoculum and seed bank. The long-term restoration benefits associated with the
34 establishment of functioning vernal pools with associated federally listed vernal pool species would far
35 outweigh the short-term, adverse impacts. As a result, although short-term impacts would be adverse,
36 long-term impacts to this species would be beneficial.

37 **Willow monardella.** Willow monardella does not occur in any of the proposed mitigation areas, and
38 seed bank/inoculum would not be collected from any sites that support this species. Therefore, no impacts
39 to this species would occur.

Other Species of Regional Concern

Other regionally sensitive species that are not federally or state listed occur in the project vicinity. Based on known occurrences and/or requisite habitat, these plant species as identified for Alternative 1 have the potential to occur within the proposed mitigation areas and thus would be potentially impacted by the proposed action: San Diego goldenstar), Orcutt's brodiaea, long-spined spineflower, San Diego barrel cactus, little mousetail, Nuttall's scrub oak, and Otay lilac. However, these plant species are not protected by state or federal law and the limited amount of habitat proposed for removal would result in a corresponding low number of individuals that may occupy the proposed mitigation areas. As a result, project implementation under this alternative is unlikely to jeopardize the regional population and continued existence of these species and would provide a conservation benefit through long-term protection of existing occurrence. Therefore, no significant impacts would occur.

Migratory Bird Treaty Act Species

The proposed mitigation areas in Alternative 3 support suitable habitat for migratory bird species, including 22 species designated as Species of Concern. Similar to Alternative 1, due to the small amount of area (3 percent of the total proposed mitigation area) that would be temporarily disturbed and the large amount of suitable habitat outside the proposed mitigation areas, MBTA species would be expected to utilize suitable habitat that lies adjacent to the project sites during vernal pool development and restoration. In addition, implementation of Environmental Protection Measure 4 would avoid the potential for adverse impacts to migratory bird species. Therefore, impacts from Alternative 3 would be similar to but less than those for Alternative 1. After vernal pool development and site restoration is completed, activities associated with management and maintenance of Alternative 3 would not result in significant impacts to MBTA species or suitable habitat for these species and no mitigation is required.

Wetlands and Other Waters of the United States

Jurisdictional Wetlands and Other Waters of the United States

Under Alternative 3, impacts to jurisdictional wetlands and other waters of the U.S. would be similar to Alternative 1 except that mitigation areas would not be established in areas Alpha, Bravo North, and Bravo South. Therefore, Alternative 3 would not result in significant impact to jurisdictional wetlands and other waters of the U.S. However, because Alternative 3 would result in a smaller area of vernal pool mitigation within compared to Alternative 1, impacts as well as the benefit to jurisdictional wetlands and other waters of the U.S. would be less than Alternative 1.

3.2.4.4 No Action Alternative

For the No Action Alternative, there would be no change in existing conditions, and no impacts to biological resources would occur. Under the No Action Alternative, specific proposed mitigation areas would not be identified and approved. Impacts to federally listed vernal pool species and jurisdictional Waters of the U.S. would be mitigated on a project-by-project basis. In addition, the No Action Alternative would not provide environmental benefits through restoration (establishment, enhancement, and/or preservation) of habitat and would not provide functions, services, or values for sensitive biological resources on MCAS Miramar.

3.3 Cultural Resources

3.3.1 Definition of Resource

Cultural resources are comprised of districts, buildings, sites, structures, landscapes, areas of traditional use, or objects with historical, architectural, archeological, cultural, or scientific importance. They include archeological resources (both prehistoric and historic), historic architectural resources (physical properties, structures, or built items), and traditional cultural resources (those important to living Native Americans for religious, spiritual, ancestral, or traditional reasons).

The NHPA of 1966, as amended, sets forth national policy and procedures regarding historic properties. Federal regulations define historic properties to include prehistoric and historic sites, buildings, structures, districts, or objects listed or eligible for listing on the National Register of Historic Places (NRHP), as well as artifacts, records, and remains related to such properties (NHPA, as amended [54 USC 300101 et seq.]). Compliance with Section 106 of the NHPA, which directs federal agencies to take into account the effect of a federal undertaking on a historic property, is outlined in the Advisory Council on Historic Preservation's regulations, Protection of Historic Properties (36 CFR Part 800).

3.3.2 Definition of the Area of Potential Effects

The Area of Potential Effects (APE) of an undertaking is defined at 36 CFR 800.16(d) as "the geographic area or areas within which an undertaking may directly or indirectly cause changes in the character or use of historic properties, if any such properties exist." The APE for the proposed action consists of all areas of ground disturbance associated with proposed vernal pool restoration sites and maintenance activities. The approximately 699-acre (283-hectare) APE, consisting of proposed mitigation areas Alpha, Bravo (North and South), Charlie, Delta, Echo, and Foxtrot, is shown in Figure 2-1. Although vernal pool restoration sites are not proposed for the entire APE, this area allows for flexibility in the placement of vernal pool restoration sites and access roads. The exact locations of the vernal pools within each mitigation area would be determined based on final mitigation and design plans. However, all areas potentially disturbed are included within the boundaries of the APE.

For historic architectural resources, the APE includes any viewsheds of historic buildings that may be affected by establishment of proposed vernal pool restoration sites. For Native American resources, the APE includes the restoration/development footprint and the viewsheds of any traditional cultural resources that could be affected by restoration.

3.3.3 Affected Environment

3.3.3.1 Prehistoric and Historic Setting

Regional Prehistory

The regional prehistory is divided into the Paleoindian, Archaic, and Late Prehistoric periods. The Paleoindian period ranges from approximately 10,000 to 7,200 years before present (BP) and is represented by an artifact assemblage known as the San Dieguito complex that consists almost entirely of flaked stone tools thought to be associated with big game hunting.

The Archaic period ranges from 7,000 years BP, and possibly 9,000 years BP, to 2,000 to 800 years BP, and is represented by the La Jolla complex. Artifacts typically encountered include cobble grinding tools (manos and basin metates) and marine shells. Archaic shell dumps (middens) are well documented in coastal San Diego County. In contrast to the Paleoindian period, the economy of the Archaic is thought to

1 be based on a more general subsistence strategy with emphasis on gathering maritime and plant resources,
2 in addition to small and large mammals. Despite this dependence on marine resources, populations settled
3 inland along waterways, as well as on the coast.

4 The Late Prehistoric period appears to begin between 2,000 and 800 years BP and is locally characterized
5 by the Cuyamaca complex, which represents the Yuman forebears of the Kumeyaay (also known as the
6 Diegueño for the Mission San Diego de Alcalá). Artifacts typically encountered from this period include
7 small projectile points and ceramics. Subsistence emphasis was placed on collection, processing, and
8 storage of plant foods, and acorns are thought to have been a major resource. Inland villages were
9 established along major waterways, and mountain areas were seasonally occupied to exploit acorns and
10 pinyon nuts. Coastal and near-coastal village sites were also occupied as maritime resources continued to
11 contribute to the native diet and lifeways.

12 ***History of the Miramar Area***

13 At the time of European contact, the Station lands were located within the Kumeyaay traditional territory.
14 Descendants of the Late Prehistoric people, the Kumeyaay had great variability in their social
15 organization and settlement patterns and thrived in a wide variety of environments. Permanent villages
16 and campsites were located in valleys and basins in the coastal zone, the western foothills, the Peninsular
17 Range and, less often, in the desert further east. Kumeyaay culture and society remained stable until the
18 late eighteenth and early nineteenth centuries, with the establishment of missions and displacement by
19 Hispanic populations. The effects of the mission system, as well as the introduction of European diseases,
20 greatly reduced the native population of southern California.

21 As discussed in Appendix B (*Detailed History of Miramar*) of the ICRMP (MCAS Miramar 2011b), the
22 project area is within lands that were used for grazing livestock belonging to the Mission San Diego de
23 Alcalá and Presidio of San Diego. The land encompassing MCAS Miramar was part of a grant of land in
24 1846 from Governor Pio Pico to Santiago Arguello for services rendered to the Mexican government. By
25 the late 1880s, the MCAS Miramar area supported a small farming community known as Linda Vista.
26 Located in San Clemente Canyon east of I-15 (not the contemporary Linda Vista east of Mission Bay),
27 the historic Linda Vista community included a post office, general store, school, cemetery, and access to a
28 train station approximately 4.5 miles to the west.

29 The first formal military presence in the area, Camp Kearny, was established on the Linda Vista mesa
30 in 1917 as an Army Infantry training base for U.S. involvement in World War I. The base was closed
31 in 1922 and most of its buildings were destroyed or moved off-base, but the camp was sporadically used
32 for numerous Army and DoN training missions.

33 In 1932, DoN took over the Miramar property and the first runways were constructed in 1940. World
34 War II saw the use of the Camp Kearny area by the Marines, as well as the development of Camp Elliott
35 (originally known as Camp Holcomb). An Auxiliary Air Station to Naval Air Station (NAS) North Island
36 was developed in the southern portion of the present day MCAS Miramar. When Camp Pendleton
37 was established in 1944, Camp Elliott was vacated by the Marines and taken over by DoN. By 1950,
38 NAS Miramar was established, and Marine and Army Reserve units continued to use Camp Elliott
39 throughout the late 1950s and 1960s. Camp Elliott was added to NAS Miramar in 1961, doubling the
40 base's size to 15,000 acres. Over the Cold War years, the Air Station changed names and missions
41 a number of times; it was during this time that NAS Miramar changed from a multi-use station to a
42 fighter base. In 1997, NAS Miramar was realigned as a Marine base and became MCAS Miramar
43 (MCAS Miramar 2011b: Appendix B).

3.3.3.2 Cultural Resources within the Area of Potential Effects

Approximately 21,641 acres of MCAS Miramar, or 93 percent of the total Station surface area, have been adequately surveyed for cultural resources, including all of the land within the six proposed mitigation areas comprising the project APE (MCAS Miramar 2011b). In 2014, Quach and Becker (2015) conducted a re-survey of the entire APE, except for proposed mitigation area Alpha. No new cultural resources were relocated; all previously recorded resources were relocated, except for prehistoric isolate 37-013751, and found to be in the same condition as their last recording (Quach and Becker 2015).

Traditional Cultural Resources

There are no known traditional cultural resources within or adjacent to the APE. MCAS Miramar initiated Tribal Consultation with the following 12 tribes on 24 February 2014: the Sycuan Band of the Kumeyaay Nation, Viejas Band of Kumeyaay Indians, San Pasqual Band of Mission Indians, La Posta Band of Mission Indians, Iipay Nation of San Ysabel, Mesa Grande Band of Mission Indians, Manzanita Band of the Kumeyaay Nation, Inaja-Cosmit Band of Mission Indians, Jumul Indian Village Kumeyaay Nation, Campo Kumeyaay Nation, Ewiiapaayp Band of Kumeyaay Indians, and Barona Band of Mission Indians.

Historic Buildings and Structures

There are several old World War II range structures recorded as part of Site 37-025578 in area Bravo. Although these buildings were recommended as not eligible for NRHP by the original recording, the structures are being evaluated for historical significance. The determination of significance, following consultation with the California SHPO, will be updated in the Final EA.

Archeological Resources

Five archeological sites at seven locations have been recorded in the APE, all of which have been evaluated for NRHP eligibility. Four of the sites are related to historic military activity at the Station, and one is a prehistoric isolate. The known resources in the project APE are presented in Table 3-9 and described below for each of the proposed mitigation areas.

Table 3-9. Archaeological Resources Recorded in the Project APE

Site Designator	Trinomial Number	Site Type	Status	NRHP Eligibility	Mitigation Area
37-025578	None	Concrete Military Live-Fire Barricades	Extant	Not Eligible*	Bravo North, Bravo South
37-13751	None	Prehistoric Isolate	Not relocated in 2004 or 2014	Not Eligible*	Bravo South
9128	CA-SDI-9128H	Historic Landscaping	Disturbed	Not Eligible	Charlie
37-13814	CA-SDI-13817H	Historic Structure, and Foundations	Extant	Not Eligible	Charlie, Delta
37-12605	CA-SDI-12605H	Historic Foundation, Landscaping, and Trash Scatter	Extant	Not Eligible*	Delta

Notes: *The CA State Historic Preservation Officer (SHPO) has not yet concurred with this determination. Recently completed additional surveys will inform consultation with SHPO. SHPO concurrence letters are cited in text for site eligibility determinations made with the CA SHPO.

Mitigation Area Alpha. Mitigation area Alpha is a 42-acre parcel located between I-15 and Kearny Villa Road (Figure 2-1). There are no known cultural resources in Area Alpha.

1 **Mitigation Area Bravo (North and South).** Mitigation area Bravo is a 183-acre parcel located directly
2 east of I-15 and south of Pomerado Road (Figure 2-1). The mitigation area is divided into
3 Bravo North and Bravo South. Two archeological sites partially or wholly occur within mitigation area
4 Bravo. Site 37-025578 is a complex of concrete Military Live-Fire barricades recorded in 2004
5 that occurs in both Bravo North and Bravo South. The site was previously recommended as not
6 NRHP-eligible (Giacomini and Caudell 2004); however, additional evaluation is underway confirming
7 the recommendation. Site 37-13751 is a prehistoric isolate recorded in Bravo South in 1994 as two
8 quartzite flakes located 30 meters north of a drainage (Kyle and Gallegos 1994). This isolate could not be
9 relocated during a 2004 effort to evaluate 19 prehistoric and historic sites/isolates for NRHP eligibility
10 (Hector et al. 2004) or 2014 field survey (Quach and Becker 2015). As a non-diagnostic isolate that could
11 not be relocated, 37-13751 is considered not NRHP-eligible. MCAS Miramar has initiated consultation
12 with the State Historic Preservation Officer (SHPO) to reach concurrence on these NRHP eligibility
13 determinations.

14 **Mitigation Area Charlie.** Mitigation area Charlie is a 109-acre parcel located between I-15 and Kearny
15 Villa Road south of Miramar Way (Figure 2-1). Two archeological sites partially or wholly occur within
16 the mitigation area. Site SDI-9128H, located in the northern portion of mitigation area Charlie, was
17 recorded as “Historic Landscaping” in 1981. During evaluation of 19 prehistoric and historic sites/isolates
18 for NRHP eligibility, Site SDI-9128H was determined to have been disturbed by various processes and
19 recommended as not NRHP-eligible (Hector *et al.* 2004) and SHPO has concurred (15 August 2014).
20 MCAS Miramar has initiated consultation with SHPO to reach concurrence on this eligibility
21 determination. The western half of Site SDI-13817H occurs in the southern portion of mitigation area
22 Charlie, and is associated with the remains of World War II Camp Elliott that included a Linda Vista Tent
23 Camp in area Charlie. Site SDI-13817H was recommended as not NRHP-eligible, and SHPO has
24 concurred (SHPO Reference #: 22 April 1996 USN950228A NAS Miramar Realignment).

25 **Mitigation Area Delta.** Mitigation area Delta is a 132-acre parcel located between I-15 and Kearny Villa
26 Road to the south of mitigation area Charlie (Figure 2-1). Two archeological sites partially occur within
27 the mitigation area. Site SDI-12605H straddles the northern boundary of the area and consists of an
28 historic foundation, landscaping, and trash scatter. During evaluation of 19 prehistoric and historic
29 sites/isolates for NRHP eligibility, Site SDI-12605H was recommended as not NRHP-eligible (Hector
30 *et al.* 2004). MCAS Miramar has initiated consultation with SHPO to reach concurrence on this eligibility
31 determination. World War II Camp Elliot buildings and foundations were also recorded as part of Site
32 SDI-13817H, a small portion of which occurs in the southernmost part of mitigation area Delta. As noted
33 above, SDI-13817H was determined by the USMC and SHPO as not NRHP-eligible.

34 **Mitigation Area Echo.** Mitigation area Echo is a 189-acre parcel located west of Highway 163 and
35 Kearny Villa Road (Figure 2-1). There are no known cultural resources in mitigation area Echo.

36 **Mitigation Area Foxtrot.** Mitigation area Foxtrot is a 44-acre parcel located west of Highway 163 south
37 of Area Echo (Figure 2-1). There are no known cultural resources in mitigation area Foxtrot.

38 **3.3.4 Environmental Consequences**

39 Section 106 of the NHPA requires that federal agencies take into account the effects of their proposed
40 actions on historic properties. Under Section 106 of the NHPA, adverse effects on cultural resources
41 include directly or indirectly altering any of the characteristics of a historic property that qualify the
42 property for inclusion in the National Register in a manner that would diminish the integrity of the
43 property's location, design, setting, materials, workmanship, feeling, or association. Adverse effects on an
44 historic property require further consultation with the SHPO to avoid or minimize the adverse effect. For
45 the purposes of this EA analysis, significant impacts on cultural resources may include physically

1 altering, damaging, or destroying all or part of a resource, altering characteristics of the surrounding
2 environment that substantially contribute to the resource's significance; introducing visual or audible
3 elements that are out of character with the property or that alter its setting; neglecting the resource to the
4 extent that it deteriorates or is destroyed; or the sale, transfer, or lease of the property out of agency
5 ownership (or control) without adequate legally enforceable restrictions or conditions to ensure
6 preservation of the property's historic significance. Activities associated with the development of each
7 mitigation area described in Section 2.1 with the potential to impact archeological resources include
8 temporary access roads and laydown areas if necessary; land re-contouring for vernal pool creation and
9 enhancement; weed/exotic plant control and removal; as well as maintenance.

10 **3.3.4.1 Alternative 1: Full Mitigation Area (Preferred Alternative)**

11 There are no known traditional cultural resources within or adjacent to the APE. There are also no historic
12 buildings or structures eligible for the NRHP located in the project APE or immediately adjacent to the
13 APE. Archeological resources occurring partially or wholly within the proposed mitigation areas include
14 four historic period archeological sites and one prehistoric isolate; however, all known sites have been
15 previously recommended as not NRHP-eligible (pending SHPO agreement for some resources); however,
16 additional surveys are underway to confirm previous recommendations (Table 3-9). Therefore, there
17 would be no effect on a historic property, and no significant impacts would occur under the NEPA.

18 In compliance with Section 106 of the NHPA, MCAS Miramar has initiated consultation with the SHPO
19 and potentially affected Indian Tribal government entities regarding the archeological site NRHP
20 eligibility determinations and the finding of no historic properties affected for the proposed action. In the
21 event that previously unrecorded or unevaluated cultural resources are encountered, MCAS Miramar
22 would manage these resources in accordance with the NHPA and other federal and state laws; USMC and
23 DoD regulations and instructions; and DoD American Indian and California Native Policy as specified in
24 the ICRMP (MCAS Miramar 2011b).

25 **3.3.4.2 Alternative 2: Partial Configuration A (Areas Alpha, Bravo North, Delta, 26 and Echo)**

27 There are no known traditional cultural resources within or adjacent to the APE. There are no historic
28 buildings or structures eligible for the NRHP located in the project APE or immediately adjacent to the
29 APE. Archeological resources occurring partially or wholly within the four proposed mitigation areas
30 include three historic period sites determined not NRHP-eligible (pending SHPO agreement) (Table 3-9).
31 Therefore, there would be no effect on a historic property, and no significant impacts would occur under
32 the NEPA.

33 In the event that previously unrecorded or unevaluated cultural resources are encountered, MCAS
34 Miramar would manage these resources in accordance with the NHPA and other federal and state laws;
35 USMC and DoD regulations and instructions; and DoD American Indian and California Native Policy as
36 specified in the ICRMP (MCAS Miramar 2011b).

37 **3.3.4.3 Alternative 3: Partial Configuration B (Areas Charlie, Delta, Echo, and Foxtrot)**

38 There are no known traditional cultural resources within or adjacent to the APE. There are no historic
39 buildings or structures eligible for the NRHP located in the project APE or immediately adjacent to the
40 APE. Archeological resources occurring partially or wholly within the four proposed mitigation areas
41 include three historic period archeological sites determined not NRHP-eligible (pending SHPO
42 agreement) (Table 3-9). Therefore, there would be no effect on a historic property, and no significant
43 impacts would occur under the NEPA.

1 In the event that previously unrecorded or unevaluated cultural resources are encountered, MCAS
2 Miramar would manage these resources in accordance with the NHPA and other federal and state laws;
3 USMC and DoD regulations and instructions; and DoD American Indian and California Native Policy as
4 specified in the ICRMP (MCAS Miramar 2011b).

5 **3.3.4.4 No Action Alternative**

6 Under the No Action Alternative, the establishment and management of proposed mitigation areas would
7 not occur, and there would be no effect to cultural resources.

3.4 Geologic Resources

3.4.1 Definition of Resource

Geologic resources are defined as the geology, soils, and general topography of a given location. The term geology encompasses surface and subsurface bedrock units (e.g., formations), as well as associated structural elements (e.g., faults) and related hazards (e.g., seismicity). Soils are generally defined as the unconsolidated materials overlying bedrock deposits, and may be derived directly from bedrock (e.g., decomposed granite), or subject to chemical and/or physical alteration (e.g., topsoil or hardpan). Topography is generally described to include factors such as elevation, slope, aspect, and landform type. The described resources can exhibit scientific, economic, and/or recreational value, as well as hazards and constraints to development from conditions such as steep slopes, expansive soils, erosion, or liquefaction (i.e., the process by which soils become liquid when subject to seismically induced ground shaking).

3.4.2 Region of Influence

The ROI for geologic resources includes applicable portions of the proposed mitigation areas where ground disturbance (e.g., clearing and grading) and vernal pool restoration activities are proposed, as well as on- and off-site areas that could potentially be affected by project-generated conditions such as erosion.

3.4.3 Affected Environment

3.4.3.1 Topography

MCAS Miramar is located on a gently sloping mesa surface dissected by Rose Canyon, San Clemente Canyon, and their tributary canyons. The canyons drain primarily to the west. Elevations at the Air Station range from approximately 1,200 feet in the east to 200 feet in the west. The proposed mitigation areas are located on gently sloping, hummocky topography adjacent to Rose Canyon and San Clemente Canyon, at an elevation of 420 to 530 feet above mean sea level (MCAS Miramar 2011a; NAVFAC 2006b).

3.4.3.2 General Geology

Stratigraphy

The proposed mitigation areas are underlain by alluvium and marine terraces of the Lindavista Formation. The alluvium ranges up to 20 feet in thickness and consists of stream channel deposits of boulders, gravel, sand, and silt. The Lindavista Formation is 10 to 100 feet thick and consists of marine and fluvial deposits of clay, silt, sand, gravel, and boulders (NAVFAC 2006b).

Soils

The soils in the vicinity of MCAS Miramar have been mapped as Redding gravelly loam (2 to 9 percent slopes) or Redding cobbly loam (9 to 30 percent slopes; NRCS 2014). These soils are generally not susceptible to settlement, but have a moderate to high expansion potential, and a severe potential for erosion as a result of shallow depth to bedrock and localized steep slopes. Permeability is very slow due to a hardpan and fertility is low, which is a key element to the existence of naturally occurring seasonally ponded basins, as well as proposed vernal pool restoration. In gently sloping areas, these soils form a hummocks topography, known as “mima mounds,” which harbor vernal pool habitat (MCAS Miramar 2011a; United States Department of Agriculture Soil Conservation Service 1973).

3.4.4 Environmental Consequences

3.4.4.1 Alternative 1: Full Mitigation Area (Preferred Alternative)

Topography and Slope Stability

The project areas all consist of gently sloping topography. One of the selection criteria in identifying conceptual vernal pool restoration development areas was nearly level topography (i.e., less than 5 percent slope). Therefore, the existing topography is not susceptible to slope failure. Individual basins would be created by clearing, grading, and re-contouring the existing topography to duplicate hydrologic depth, surface area, and inundation period of similar naturally occurring vernal pools. As a result, vernal pool side slopes would be gently sloping and not subject to failure. Therefore, no significant topographic and slope stability impacts would occur as a result of Alternative 1.

Soils and Erosion

Although the slope gradient within the project areas is gentle, soils exhibit a high erosion potential. Proposed grading and re-contouring activities associated with vernal pool restoration would result in the removal of existing vegetation and associated soil disturbance. Similarly, temporary restoration access roads may also be required to access suitable sites identified for vernal pool restoration within the proposed mitigation areas, thus resulting in soil disturbance. This would temporarily exacerbate the potential for erosion; however, basins and associated watersheds are designed to pool and collect water, and thus any resulting sedimentation would occur within the restoration itself. In addition, development of the vernal pools would be conducted in accordance with applicable erosion control measures as required by the NPDES construction permit program (General Measure 2), which would minimize temporary impacts from soil and erosion during vernal pool development.

While upland areas disturbed by vernal pool restoration activities would be replanted with appropriate native seed or plantings, erosion potential would be higher in the short term than for existing conditions. Short-term erosion and sedimentation impacts associated with temporary access roads, if required, would be mitigated through implementation of BMPs and incorporation of standard erosion control measures into the project design. MCAS Miramar is required to manage its lands to control and prevent soil erosion and preserve natural resources by conducting surveys and implementing soil conservation measures.

Following vernal pool restoration, biological monitoring would include recommendation and implementation of BMPs if exposed areas are still contributing to erosion-induced siltation within the watershed. Erosion control materials would be maintained for at least five years, as appropriate. As a result, no significant erosional impacts associated with project management would occur; thus, implementation of Alternative 1 would not have a significant impact to geologic resources.

3.4.4.2 Alternative 2: Partial Configuration A (Areas Alpha, Bravo North, Delta, and Echo)

Topographic, slope stability, and seismic impacts would be similar to those described for Alternative 1. However, this alternative reduces the options for phased implementation of vernal pool restoration and the total potential vernal pool restoration. Fewer sites suitable for vernal pool restoration would result in less ground disturbance and associated potential erosion-induced siltation of local water bodies. As described for Alternative 1, erosion control measures would be implemented to minimize such off-site siltation; therefore, implementation of Alternative 2 would not have a significant impact to geologic resources and no mitigation is required.

1 **3.4.4.3 Alternative 3: Partial Configuration B (Areas Charlie, Delta, Echo, and Foxtrot)**

2 Topographic, slope stability, and seismic impacts would be similar to those described for Alternative 1.
3 However, similar to Alternative 2, this alternative reduces the options for phased implementation of
4 vernal pool restoration and the total potential vernal pool restoration. Fewer sites suitable for vernal pool
5 restoration would result in less ground disturbance and associated potential erosion-induced siltation of
6 local water bodies. As described for Alternative 1, erosion control measures would be implemented to
7 minimize such off-site siltation; therefore, implementation of Alternative 3 would not have a significant
8 impact to geologic resources and no mitigation is required.

9 **3.4.4.4 No Action Alternative**

10 Under the No Action Alternative, the establishment and management of proposed mitigation areas and the
11 development of vernal pool restoration areas would not occur. Therefore, there would be no significant
12 impacts to geologic resources under the No Action Alternative.

3.5 Land Use

3.5.1 Definition of Resource

Land use is the description of developed and undeveloped land occurring at a particular location. Land use categories typically include residential; commercial; manufacturing; transportation, communication and utilities; recreation; institutional; mining and extraction; and agriculture and forestry. On MCAS Miramar installations, land use is divided into military and non-military operational and support functions. On MCAS Miramar, the *MCAS Miramar Master Plan* and Air Installations Compatible Use Zones (AICUZ) program determine the type and extent of land use allowable on the Station and are intended to protect specially designated or environmentally sensitive areas. The *MCAS Miramar Airport Land Use Compatibility Plan* determines the type and extent of land use allowable in areas surrounding the Station.

3.5.2 Region of Influence

The ROI for land use resources includes applicable portions of the project sites where a change in land use would occur and the surrounding area.

3.5.3 Affected Environment

3.5.3.1 Surrounding Area and Project Sites

Land use in the vicinity of MCAS Miramar is primarily open space, industrial, commercial, office, and residential. Industrial, commercial, and office land surround West Miramar. San Diego County has jurisdiction over unincorporated lands to the northeast of East Miramar. Also abutting MCAS Miramar are areas within the Multiple Habitat Planning Area, as designated by the Multiple Species Conservation Program that are to be permanently preserved and managed for biological resources.

The Station is composed of three primary (functional) use areas as defined by the *MCAS Miramar Master Plan*: the Main Station, East Miramar, and South/West Miramar (Figure 3-6). The mitigation sites are located mainly in East Miramar, with two proposed mitigation areas (Echo and Foxtrot) located in South/West Miramar. The Main Station, located to the north and west of the proposed mitigation areas, is largely developed with military land uses that include airfield and aircraft operation areas and maintenance and supply. Non-operational military uses within this area include housing, community support, and recreation. In addition, MCAS Miramar supports non-military land use, primarily as a result of private inholdings, lease and land use agreements, and easements. The City of San Diego has been operating landfills on MCAS Miramar property since 1952 (MCAS Miramar 2011a). Other examples of inholdings and easements include, but are not limited to, a Veterans Administration cemetery, utility pipelines (water, electricity, refined petroleum), an asphalt aggregate plant, and a small arms training area (MCAS Miramar 2011a).

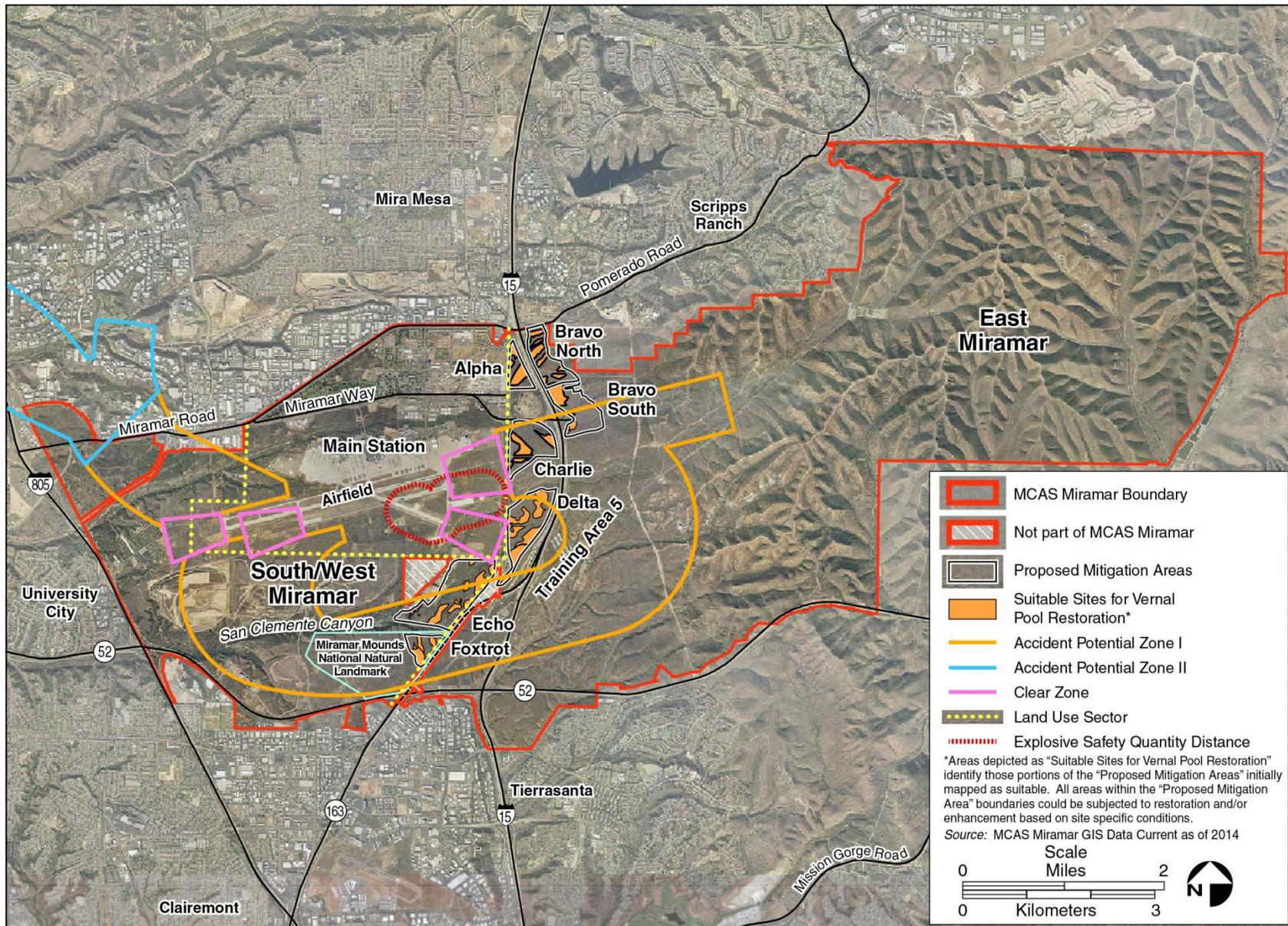


Figure 3-6. Land Use Sectors and Existing Land Use Constraints

1 South/West Miramar includes the areas west of Kearny Villa Road and south and west of the
2 Main Station. Land uses in this area are constrained by APZs, noise zones, horizontal planes and
3 transitional surfaces, areas of electromagnetic interference, and vernal pool habitat. Military operational
4 uses in South/West Miramar include designated aircraft clear zones and APZs associated with the airfield.
5 Non-military and non-operational uses include city landfills, a bulk fuel storage facility, a facility for the
6 production of asphalt and concrete products, reclaimed water program facilities and pipeline, Veteran's
7 Administration Cemetery, and the Miramar Mounds National Natural Landmark (MCAS Miramar 2011a;
8 NAVFAC 2006b). Proposed mitigation areas Echo and Foxtrot are located in an undeveloped portion of
9 South/West Miramar bordering the flightline to the south.

10 East Miramar, located east of Kearny Villa Road, is mostly undeveloped but supports operational military
11 land uses, including field training, ordnance storage and assembly, small arms ranges, and warehousing.
12 Non-military land uses include the San Diego County Sheriff's Department working dog training area and
13 small arms range, the San Diego Community College Fire Academy, National Weather Service facilities,
14 SDG&E substation and transmission lines, and three San Diego County Water Authority aqueducts. Land
15 use constraints in this area include APZs, noise zones, small arms surface danger zones, areas of
16 electromagnetic interference, Explosive Ordnance Disposal Training Range, and Explosive Safety
17 Quantity Distance arcs that surround ordnance magazines (MCAS Miramar 2011a). Proposed mitigation
18 areas Alpha, Bravo (North and South), Charlie, and Delta are located on undeveloped land within
19 East Miramar.

20 **3.5.3.2 Land Use Management Plans**

21 ***MCAS Miramar Master Plan***

22 Land use and development on MCAS Miramar is guided by the *MCAS Miramar Master Plan*, which
23 includes development guidelines for optimum utilization of land and airspace to support MCAS
24 Miramar's mission (NAVFAC 2006b). Revisions to portions of the Master Plan are underway and more
25 are in the planning stages. This document contains overall land management guidelines based on a
26 consideration of the location of MCAS Miramar, its land use, operation, and natural resources. It
27 describes overall development constraints within the Station as severe, high, moderately high, moderate,
28 moderately low, low, or none. Conformity with these guidelines is a key factor as to whether a specific
29 land use is suitable for a given site or area. Changes to land use at MCAS Miramar would require a
30 Master Plan update and internal coordination. MCAS Miramar's INRMP also establishes guidelines for
31 integrating MCAS Miramar's land use needs in support of the military missions, with continued
32 management and conservation of natural resources (MCAS Miramar 2011a).

33 ***Air Installation Compatible Use Zones***

34 The MCAS Miramar AICUZ program assesses the relationship between land use and air operations for
35 the Station and surrounding areas. The primary compatibility considerations in the AICUZ are noise zone,
36 APZ, and obstruction clearances. The goal of the AICUZ program is to protect the public from aircraft
37 noise and hazards and to prevent encroachment from degrading the operational capability of the Station in
38 meeting national security objectives (MCAS Miramar 2005). The AICUZ study provides analysis of
39 noise levels, accident potential, and obstruction clearance criteria associated with military airfield
40 operations. Development within MCAS Miramar must comply with the AICUZ Suggested Land Use
41 Compatibility as outlined in Chief of Naval Operations Instruction (OPNAVINST) 11010.36B.

3.5.4 Environmental Consequences

3.5.4.1 Alternative 1: Full Mitigation Area (Preferred Alternative)

Land Use Compatibility

The proposed mitigation sites would be located on undeveloped land on the Station that are limited by existing land use constraints and not actively used for military ground training/operations, existing leases, or easements (e.g., lands designated as APZs). As each individual area is restored following the previously described phased approach, the proposed mitigation sites would also be designated as INRMP Level I Management Areas. This Management Area designation supports the Station's conservation and management of vernal pool habitat and limits future land uses (MCAS Miramar 2011a). These areas receive the highest conservation priority. The use of the proposed mitigation sites for natural resource conservation is compatible with existing uses and land use constraints (e.g., compatible with APZ designations) at the project sites and in the project vicinity.

Implementation of the proposed mitigation/conservation strategy would reduce costs and facilitate regulatory approval of improvements elsewhere on MCAS Miramar, a benefit to the Station. Alternative 1 would have a beneficial impact on land use by improving strategic planning for future mission requirements, reducing cost, utilizing partially constrained land for compensatory mitigation, and minimizing land use incompatibility issues. Therefore, significant impacts on land use compatibility would not occur.

Land Use Management Plans

Under Alternative 1, the proposed mitigation sites would be sited, designed, established, and managed in accordance with the guidelines stipulated in the *MCAS Miramar Master Plan* and the *MCAS Miramar INRMP* regarding future development at the project sites. However, the establishment of formally designated mitigation sites would require an update to the *MCAS Miramar Master Plan* and the *MCAS Miramar INRMP*. Following the update, Alternative 1 would be consistent with the *MCAS Miramar Master Plan* and the *MCAS Miramar INRMP*.

Alternative 1 would also be consistent with the MCAS Miramar AICUZ program because the establishment of proposed mitigation sites would be contained within MCAS Miramar, and would not involve activities that conflict with these plans. Therefore, significant impacts on land use management plans would not occur.

3.5.4.2 Alternative 2: Partial Configuration A (Areas Alpha, Bravo North, Delta, and Echo)

Land Use Compatibility

The use of the proposed mitigation sites for natural resource conservation is compatible with existing uses and land use constraints (APZ and AICUZ) at the project sites and in the project vicinity. Military operations would still occur over and in areas to the north, west, and east of the proposed mitigation areas. Therefore, significant impacts on land use compatibility would not occur.

Land Use Management Plans

Similar to Alternative 1, the proposed mitigation sites under Alternative 2 would be sited, designed, established, and managed consistent with the guidelines stipulated in the *MCAS Miramar Master Plan* and the *MCAS Miramar INRMP* regarding future development at the project sites. However, the establishment of formally designated mitigation sites would require an update to the *MCAS Miramar*

1 *Master Plan* and the *MCAS Miramar INRMP*. Following the update, Alternative 2 would be consistent
2 with the *MCAS Miramar Master Plan* and the *MCAS Miramar INRMP*.

3 **3.5.4.3 Alternative 3: Partial Configuration B (Areas Charlie, Delta, Echo, and Foxtrot)**

4 ***Land Use Compatibility***

5 The proposed mitigation sites would be located in portions of the Station that are limited by land use
6 constraints and not actively used for military ground training/operations, existing leases, or easements.
7 Similar to Alternative 1, Alternative 3 would have a beneficial impact on land use by maximizing land
8 utilization, minimizing land use incompatibility issues, and improving strategic planning for future
9 mission requirements.

10 Similar to Alternative 1, Alternative 3 would change the existing use of the proposed mitigation sites (i.e.,
11 minimal development within the APZs) to natural resource conservation. The proposed mitigation sites
12 would be designated as INRMP Level I Management Areas, which would support the Station's
13 conservation and management of vernal pool habitat and limit future land uses (MCAS Miramar 2011a).
14 The use of the proposed mitigation sites for natural resource conservation is compatible with existing uses
15 and land use constraints (APZ and AICUZ) at the project sites and in the project vicinity. Military
16 operations would still occur over and in areas to the north, west, and east of the proposed mitigation sites.
17 Therefore, significant impacts on land use compatibility would not occur.

18 ***Land Use Management Plans***

19 Similar to Alternative 1, the mitigation sites proposed under Alternative 3 would be sited, designed,
20 established, and managed consistent with the guidelines stipulated in the *MCAS Miramar Master Plan*
21 and the *MCAS Miramar INRMP* regarding future development at the project sites. However, the
22 establishment of formally designated mitigation sites would require an update to the *MCAS Miramar*
23 *Master Plan* and the *MCAS Miramar INRMP*. Following the update, Alternative 3 would be consistent
24 with the *MCAS Miramar Master Plan* and the *MCAS Miramar INRMP*.

25 **3.5.4.4 No Action Alternative**

26 Under the No Action Alternative, the establishment and management of the proposed mitigation areas
27 would not occur. Therefore, existing land use conditions would remain as described in Section 3.5.1 and
28 no impacts on land use would occur; thus, no mitigation would be required. However, the beneficial land
29 use impacts associated with the proposed mitigation/conservation strategy would not occur and
30 conservation of these regulated resources would not be ensured to support the mission and future military
31 operations at MCAS Miramar.

3.6 Public Health and Safety

3.6.1 Definition of Resource

This section addresses issues that could potentially affect the safety of personnel and children at MCAS Miramar. Specifically, safety issues associated with hazardous materials and hazardous wastes, including Installation Restoration and Munitions Response sites, are addressed in this section.

Hazardous materials and wastes include substances that pose a potential hazard to human health and safety or the environment due to their quantity, concentration, and/or physical and chemical properties. Hazardous materials and wastes are characterized by their ignitability, corrosiveness, reactivity, and toxicity. Hazardous materials and wastes include any material that, due to its quantity, concentration, physical, chemical, or infectious characteristics, may either cause or significantly contribute to an increase in mortality, serious irreversible illness, incapacitating reversible illness, or genetic changes that may pose a substantial threat to human health or the environment when improperly treated, stored, transported, disposed, or otherwise managed.

The management of hazardous materials and wastes at MCAS Miramar is guided by Station Order 5090.5 (*MCAS Hazardous Waste Management Plan*), Station Order 5100.1 (*Occupational Safety and Health Administration Manual*), MCAS Miramar SPCC Plan, and the MCAS Miramar IRP, in accordance with CERCLA (42 USC 9601 *et seq.*). The Air Station's IRP is a program for the evaluation and cleanup of sites where past practices at MCAS Miramar resulted in the contamination of soils, groundwater, or other media by hazardous substances. NAVFAC administers the IRP at MCAS Miramar. An Initial Assessment Study to identify areas of contamination was originally conducted in 1984. Since that time, the IRP has performed ongoing response actions to investigate the release of hazardous substances, pollutants, and contaminants into the environment and to select and implement appropriate remedial and removal actions addressing such releases.

The MMRP was established in 2001 to manage the environmental, health, and safety issues presented by Munitions and Explosives of Concern at MCAS Miramar. The MMRP is an element of the DERP and adheres to the CERCLA process. Munitions and Explosives of Concern distinguishes specific categories of military munitions that may pose unique explosives safety risks; these include: 1) UXO (munitions used for their intended purpose but failed to function); 2) Discarded Military Munitions (items abandoned without proper disposal); and 3) Munitions Constituents (munitions present in sufficient concentrations to constitute an explosive hazard).

3.6.2 Region of Influence

The ROI for hazardous materials is the project area, which corresponds to the geographic area in which hazardous materials are involved in the restoration of the proposed vernal pools.

3.6.3 Affected Environment

Protection of Children (Executive Order 13045)

EO 13045, *Protection of Children from Environmental Health Risks and Safety Risks (Protection of Children)*, was issued in 1997. This order requires each federal agency to "...make it a high priority to identify and assess environmental health and safety risks that may disproportionately affect children and shall...ensure that its policies, programs, activities and standards address disproportionate risks to children..."

1 The project area is spread across a large north-south trending swath of land, generally parallel to and on
2 both sides of I-15. Aside from the interstate, most of the southern portions of the project area are sparsely
3 populated; however, the proposed vernal pool sites are in proximity to Main Station facilities in the
4 northern project area. Recreational areas and community support facilities are located immediately west,
5 southwest, and south of mitigation area Alpha. Similarly, a family housing unit is located approximately
6 500 feet west of mitigation area Alpha, at the closest point (NAVFAC 2006b).

7 ***Petroleum Products and Waste Disposal***

8 Petroleum-based wastes are accumulated at 60-day sites within the Air Station for temporary storage and
9 are picked up weekly by materials handlers and disposed of at permitted hazardous waste disposal
10 facilities in accordance with local, state, and federal regulations.

11 ***Installation Restoration Program***

12 No IRP sites are located within proposed mitigation areas. The closest such sites are located
13 approximately 1,000 feet northwest of mitigation area Charlie and mitigation area Delta, respectively
14 (MCAS Miramar GIS data 2014) (Figure 3-7).

15 ***Military Munitions Response Program***

16 A total of 12 Munitions Response sites have been identified at MCAS Miramar. One such site, known as
17 MRP Site 1, partially overlaps with mitigation area Delta (MCAS Miramar GIS data 2014) (Figure 3-7).
18 This historical grenade course range has already been administratively closed and is currently being
19 addressed by CERCLA under the MMRP. MRP Site 1 would be restored as a separate phase from other
20 portions of Area Delta to allow for remediation under the MMRP process. A possible addition to the IRP
21 would be World War II Camp Elliot buildings and foundations located in the southernmost part of area
22 Delta. These buildings and foundations are potentially contaminated with asbestos and/or lead-based paint
23 and will be evaluated under the appropriate federal, state and local regulations. Camp Elliot is the only
24 known area of concern for potential asbestos and lead contamination within any of the proposed
25 mitigation areas.

26 ***Resource Conservation and Recovery Act Petroleum, Oil, and Lubricants Sites***

27 The Resource Conservation and Recovery Act (RCRA) sets forth a framework for the management of
28 Petroleum, Oil, and Lubricant (POL) sites, which are regulated under the Underground Storage
29 Tank/Aboveground Storage Tank program at MCAS Miramar. However, there are no RCRA POL sites at
30 or near the proposed mitigation areas. The closest underground storage tank site is the NEX gas/service
31 station, located approximately 1,500 feet southwest of mitigation area Alpha, at the closest point
32 (NAVFAC 2006b). Therefore, RCRA POL sites are not discussed further in this EA.

33 ***Other Federal Health and Safety Requirements***

34 The DoN maintains health and safety programs to protect its personnel and property. Occupational health
35 is an element of the overall DoN Occupational Safety and Health program, which includes explosive,
36 nuclear, aviation, industrial, and off-duty safety. All proposed grading activities must meet the
37 requirements of EO 13423 (*Strengthening Federal Environmental, Energy, and Transportation*
38 *Management*). These requirements are intended to ensure, wherever feasible, that pollution would be
39 prevented or reduced at the source. Pollution that cannot be prevented or recycled would be treated in an
40 environmentally safe manner and disposal or other releases to the environment would be employed as a
41 last resort. These requirements are contained in all contractual documents pertaining to new construction
42 at MCAS Miramar.

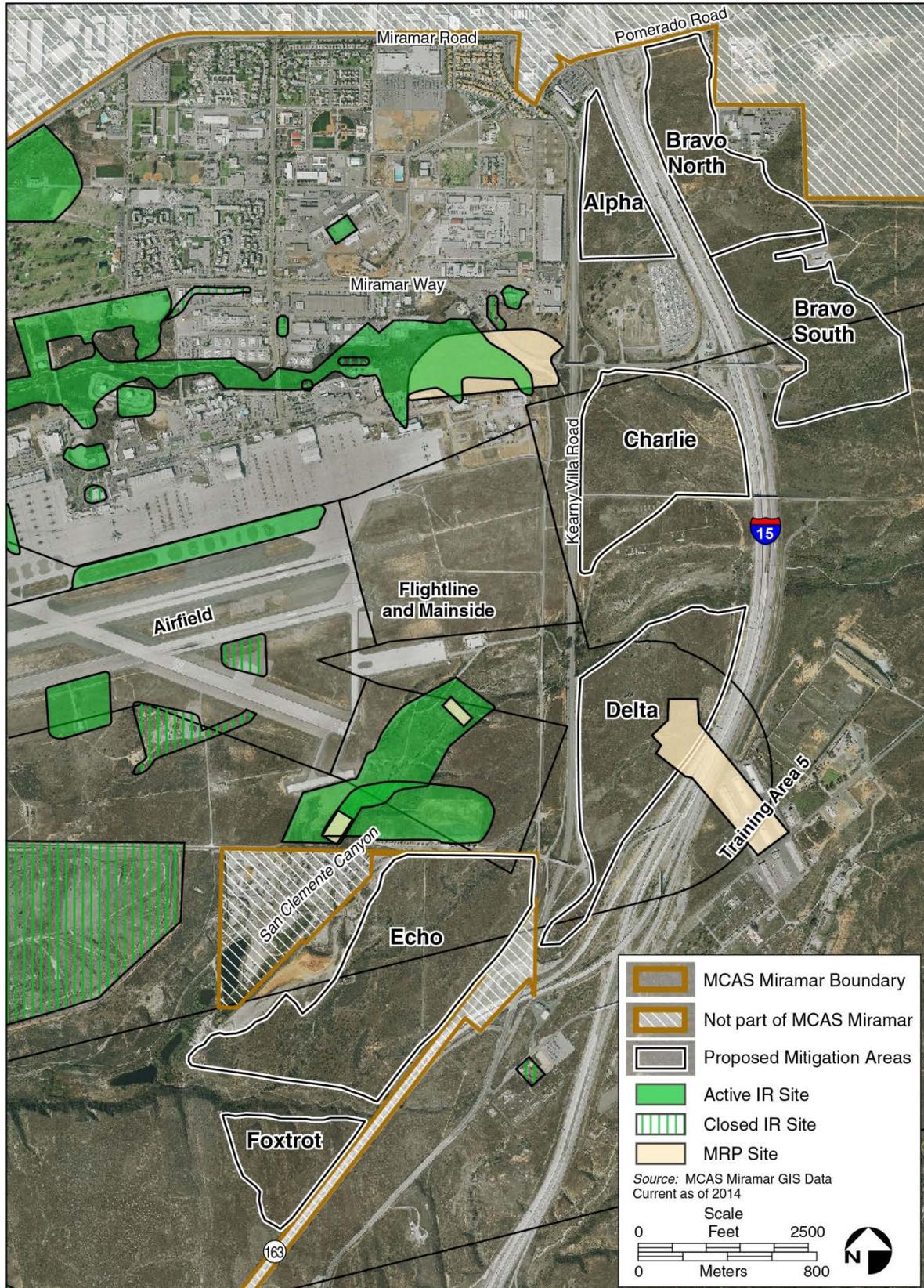


Figure 3-7. Installation Restoration and Munitions Response Program Sites in the Vicinity of Proposed Mitigation Areas.

3.6.4 Environmental Consequences

3.6.4.1 Alternative 1: Full Mitigation Area (Preferred Alternative)

Protection of Children (Executive Order 13045)

Recreational, community support facilities, and family housing are located in proximity to mitigation area Alpha. However, the proposed action would primarily involve grading in a confined and controlled area, such that no children would be exposed to environmental conditions or potential safety issues associated with heavy equipment. Accordingly, implementation of Alternative 1 would not have a significant impact to the protection of children and no mitigation is required.

Petroleum Waste Disposal

Grading activities associated with Alternative 1 would require the use, transport, and storage of fuel and other petroleum products for fueling and maintenance of grading and excavation equipment. The transport, management, and disposal of minor amounts of petroleum waste generated during project activities would be manifested through the Waste Management Division of the MCAS Miramar EMD. The project would also comply with DERP, USACE EM 385-1-4 (*U.S. Safety and Health Requirement Manual*), and MCO 5090.2a (*USMC Environmental Compliance and Protection Manual*). Therefore, no significant petroleum waste related impacts would occur in association with Alternative 1 and no mitigation is required.

Military Munitions Response Sites

MRP Site 1 partially overlaps with mitigation area Delta (Figure 3-7). This historical grenade course range has already been transferred to the MMRP for evaluation and possible remediation of munitions constituents and UXO. At a minimum, the range would require consultation with MARCORSSCOM and Explosive Ordnance Disposal (EOD) support in order to determine appropriate explosive safety protocol during grading activities. MRP Site 1 would be restored as a separate phase from other portions of Area Delta to allow for possible remediation under the MMRP/CERCLA process.

USMC guidance allows for an incompatible use area to be closed if no known current or historical military munitions use resulted in a potential release, as defined by the MMRP. Closed ranges will require approval from MCAS Miramar S-3 Training, MCI West, TECOM, and MCICOM.

In the case where a release is suspected, the project will be required to follow the MMRP/CERCLA cleanup process to evaluate and, if contaminants are present, remove the contaminants within the incompatible use areas prior to or in conjunction with the commencement of grading and activities, in accordance with all appropriate state and federal regulations. The MMRP/CERCLA process includes investigation, removal actions, and remedial actions at MRP sites. This EA will not evaluate or document any portion of the MMRP/CERCLA cleanup process because

In addition to range removal, the CERCLA/IRP cleanup process may apply to any pre-existing or newly discovered contaminated areas, including any potential asbestos and/or lead paint contamination associated with old buildings and foundations, such as those present in the southernmost part of Area Delta, which were associated with World War II Camp Elliot. These CERCLA actions will also be exempted from NEPA and will not be evaluated by this EA. As a result, no significant public health related impacts would occur in association with Alternative 1 and no mitigation is required.

Unidentified Soil Contamination

The potential exists for encountering previously unknown soil contamination during grading of vernal pools and associated access roads. Such contamination could adversely impact the health and safety of on-site personnel, as well as require special handling and disposal of contaminated soil. If prior to or during restoration activities CERCLA contaminants are discovered, removal actions would be subject to the requirements of CERCLA (40 CFR Part 300) and RCRA (40 CFR 260). In addition, the project would: 1) coordinate with MCAS Miramar EMD, Installation Restoration Program Manager; and 2) receive concurrence from the Remedial Project Manager at NAVFAC and San Diego RWQCB prior to execution of the project to ensure conformance with CERCLA. As previously discussed, CERCLA remedial actions are exempted from the procedural requirements of NEPA; therefore, any such actions conducted as part of this alternative are not evaluated in this EA. As a result, no significant soil contamination related impacts would occur in association with Alternative 1 and no mitigation is required.

Other Federal Health and Safety Requirements

The proposed requirements of EO 13423 (*Strengthening Federal Environmental, Energy, and Transportation Management*) would be specified in restoration contractor contracts and implemented with standard BMPs associated with Alternative 1. Therefore, restoration activities associated with Alternative 1 would not have a significant impact to public health and safety associated with environmental health risks.

The proposed action would not potentially affect the health and safety of personnel completing long-term maintenance of the proposed mitigation areas. Consequently, there would be no increase in potential public health and safety impacts. Therefore, Alternative 1 would not have a significant impact to public health and safety.

3.6.4.2 Alternative 2: Partial Configuration A (Areas Alpha, Bravo North, Delta, and Echo)

For Alternative 2, safety and environmental health impacts would generally be the same as those described for Alternative 1. Accordingly, implementation of Alternative 2 would not have a significant impact to public health and safety and no mitigation is required.

3.6.4.3 Alternative 3: Partial Configuration B (Areas Charlie, Delta, Echo, and Foxtrot)

For Alternative 3, safety and environmental health impacts would generally be the same as those described for Alternative 1. Accordingly, implementation of Alternative 3 would not have a significant impact to public health and safety and no mitigation is required.

3.6.4.4 No Action Alternative

The No Action Alternative represents the baseline condition described in Chapter 3. Under this alternative, potential health and safety impacts associated with restoration/development would not occur.

3.7 Water Resources

3.7.1 Definition of Resource

Water resources include surface water, groundwater, water quality, and floodplains/flooding. Surface water includes all lakes, ponds, rivers, streams (perennial, intermittent, and ephemeral), impoundments, and wetlands within a defined area or watershed. Groundwater is located beneath the ground surface in soil pore spaces or in bedrock fractures. Water quality refers to the chemical and physical composition of water as affected by natural conditions and human activities. Floodplains are areas subject to inundation (flooding) from defined storm events. A 100-year floodplain, for example, is the inundation area associated with a 100-year storm (i.e., a storm event having a one percent chance of occurring in any given year).

3.7.2 Region of Influence

The ROI for water resources includes the proposed mitigation areas and associated off-site areas that could potentially be affected by project-generated changes in hydrologic conditions.

3.7.3 Affected Environment

3.7.3.1 Surface Water

MCAS Miramar is located on the coastal plain of San Diego County, within the San Clemente and Rose Canyon drainage basins and the project sites are located within these two watersheds. These canyons converge west of MCAS Miramar. Rose Canyon and San Clemente Canyon traverse MCAS Miramar from east to west and intersect several minor tributaries that flow in north/south trending canyons. The intermittent creek within Rose Canyon extends generally northeast to southwest through West Miramar, and ultimately turns south before entering Mission Bay, approximately 7 miles southwest of the proposed mitigation areas. Rose Canyon Creek has been channelized; however, much of the surface water within the broad-based canyon occurs primarily as overland sheet flow during periods of heavy rainfall in early spring and winter. Due to low average rainfall, surface water runoff is relatively low. Surface runoff from MCAS Miramar primarily drains into Rose Canyon and San Clemente Canyon and to a lesser extent into Sycamore Canyon. Drainage occurs through natural topographic gradients and man-made drains (San Diego RWQCB 2011; DoN 1996).

3.7.3.2 Water Quality

No known water quality data are available for runoff within or adjacent to the proposed mitigation areas, although storm water flows are typically subject to wide variations in water quality with factors such as runoff volume, velocity, and adjacent land uses. Specifically, runoff from urban areas typically exhibits higher concentrations of contaminants such as dissolved and suspended solids, metals, nutrients, chemical pesticides/herbicides, oxygen demanding substances (materials that remove dissolved oxygen from water by chemical reactions or other means), and hydrocarbons derived from vehicles on streets and highways, garden application of fertilizers and pesticides, and other human activities than undeveloped areas. The Rose Canyon and San Clemente Canyon watersheds encompass development such as urban properties (on and off of the Air Station), aircraft facilities, a golf course, and various Air Station facilities. Surface water monitoring conducted for downstream portions of the Rose Canyon Creek watershed (including Mission Bay) since 2001 has identified generally moderate to poor water quality, with established thresholds exceeded for constituents, including sulfate, manganese, turbidity, pH, Diazinon, and toxicity (Weston Solutions 2007). Mission Bay at the Rose Creek mouth is listed as a 303(d) impaired water body for eutrophication (excess nutrients) and lead. Total Maximum Daily Loads are scheduled to be

1 developed for nutrients and lead in 2019 (AMEC Environment & Infrastructure, Inc. 2014). As discussed
2 in Section 3.4.3.2, the soils on MCAS Miramar (Redding gravelly loam) have a severe potential for
3 erosion, and Rose Canyon is known to have stream bank erosion problems. Rose Canyon was identified
4 as a source of high concentrations of organically rich fine sediments draining into Mission Bay,
5 aggravating silting of the bay and degrading bottom sediment quality (MCAS Miramar 2011a).

6 **3.7.3.3 Groundwater**

7 Groundwater at MCAS Miramar generally occurs in two aquifers: the Quaternary alluvium and the
8 confined regional aquifer of the Scripps Formation. In addition, groundwater potentially occurs in the
9 transient, gravity-controlled system in the Stadium Conglomerate and Lindavista Formation (DoN 1996).
10 The project sites are located within Rose Canyon and San Clemente Canyon watersheds and underlain
11 primarily by Lindavista Formation, with lesser amounts of Quaternary alluvium. Tributary groundwater
12 flowing toward these canyons recharges the shallow aquifer within the alluvium, which occurs at a depth
13 of approximately 10 to 25 feet below ground surface. Although the groundwater is permanent and
14 supports sycamore and oak trees, this alluvial aquifer is not considered a significant groundwater basin
15 (AMJV 2012; DoN 1996; NAVFAC 2006b; San Diego RWQCB 2011).

16 A regional aquifer occurs within the sand and gravel layers of the Eocene Scripps Formation, located at a
17 depth of approximately 160 to 250 feet below ground surface. Groundwater flow in this aquifer in the
18 vicinity of the project sites is predominantly to the west and southwest, parallel to Rose Canyon and San
19 Clemente Canyon. Aquicludes, which are low-permeability units that form the upper or lower boundary
20 of an aquifer, consist of sandy clays and claystones in the upper Scripps Formation, thus creating
21 confining conditions. The resulting pressure on the aquifer is sufficient to raise the groundwater as much
22 as 100 feet above the water table (DoN 1996).

23 The amount of groundwater within the Stadium Conglomerate and the Lindavista Formation overlying
24 the aquicludes of the regional aquifer is variable and limited in quantity. Low annual rainfall, combined
25 with low average soil moisture and the very low permeability of the Stadium Conglomerate, result in
26 limited groundwater recharge (DoN 1996).

27 Groundwater quality beneath MCAS Miramar is generally poor due to high total dissolved solids
28 concentrations. Total dissolved solids concentrations generally exceed the groundwater quality objective
29 of 750 milligrams/liter. The regional confined aquifer beneath the project area has been designated by the
30 San Diego RWQCB as having no existing beneficial uses (DoN 1996; San Diego RWQCB 2011).
31 Therefore, MCAS Miramar receives potable water supplies from the City of San Diego Water
32 Department.

33 **3.7.3.4 Floodplains/Flooding**

34 EO 11988, dated 24 May 1977, requires agencies to avoid adverse effects and incompatible development
35 of floodplains and to preserve the natural and beneficial values served by floodplains. Where the only
36 practicable alternative is to site an action in a floodplain, a specific eight-step process must be followed to
37 comply with EO 11988. Federal Emergency Management Agency (FEMA) floodplain maps do not
38 extend into MCAS Miramar (i.e., MCAS Miramar is marked as “area not included”). The FEMA
39 floodplain maps for 100-year and 500-year flood events have been prepared for only areas of Rose
40 Canyon and San Clemente Canyon located outside of MCAS Miramar. However, the approximate limits
41 of the 100-year floodplain associated with these canyon creeks have been delineated by the USACE as
42 part of the 2001 Planning Level Delineation of Aquatic Resources, Floodplain Mapping, and Functional
43 Assessment of Riparian Ecosystems at MCAS Miramar, San Diego County, California (Smith and
44 Lichvar 2001). This analysis identifies a 100-year floodplain for Rose Canyon and San Clemente Canyon

1 creeks based on assessment of historical rainfall/drainage data and mathematical modeling efforts. As
2 shown in Figure 3-8, many of the suitable sites for vernal pool restoration are located within the 100-year
3 floodplains of Rose Canyon and San Clemente Canyon creeks.

4 **3.7.4 Environmental Consequences**

5 **3.7.4.1 Alternative 1: Full Mitigation Area (Preferred Alternative)**

6 ***Surface Water***

7 No project activities are proposed within existing drainages and therefore, no direct impacts would occur;
8 however, localized grading and re-contouring activities associated with vernal pool restoration would
9 result in the permanent alteration of upland flow patterns within the watersheds of San Clemente and
10 Rose Canyons. The purpose of the proposed clearing, grading, and re-contouring of the existing
11 topography would be to duplicate hydrologic depth, surface area, and inundation period of similar
12 naturally occurring vernal pools, and thus would not adversely alter surface water system functions.
13 Excavated material from new basin areas would typically be used on-site to create upland mounds. As part
14 of the site selection criteria, areas to be re-contoured would be nearly level, with less than five percent
15 slope. Soil re-contouring associated with restoration/enhancement of existing basins would be done
16 carefully, using small-scale equipment or hand tools. Such minor improvements to the area topography
17 would only slightly alter the existing drainage pattern in the area. Therefore, Alternative 1 would not
18 result in significant adverse impacts to surface water and no mitigation is required.

19 ***Water Quality***

20 Potential adverse water quality impacts from Alternative 1 would be associated with temporary, ground
21 disturbance-related erosion/sedimentation and the use/storage of equipment related petroleum products
22 (e.g., fuels, lubricants, and solvents). Disturbance-related erosion and sedimentation issues would be
23 minimized by compliance with the ND PES permit program (General Measure 2). To comply with the
24 permit program, grading and re-contouring activities associated with the vernal pool enhancement and
25 creation could be scheduled to occur in the late summer and early fall, when the rainfall erosivity factors
26 are low (less than five), so the project would be eligible for a Rainfall Erosivity Waiver. Otherwise, the
27 project would be required to develop and implement a SWPPP to minimize erosion and sedimentation
28 impacts (General Measure 2). Most runoff would be contained within the restored/developed vernal pool
29 basins. During large storm events, runoff from some of the vernal pool restoration sites may overflow into
30 Rose Creek and eventually reach Mission Bay. Mission Bay at the Rose Creek mouth is a 303(d)
31 impaired water body for lead and eutrophication (caused by excess nutrients). No lead-containing
32 materials or fertilizers would be used in Alternative 1 and the vernal pool restoration activities would not
33 contribute to further degradation of the water quality of Mission Bay.

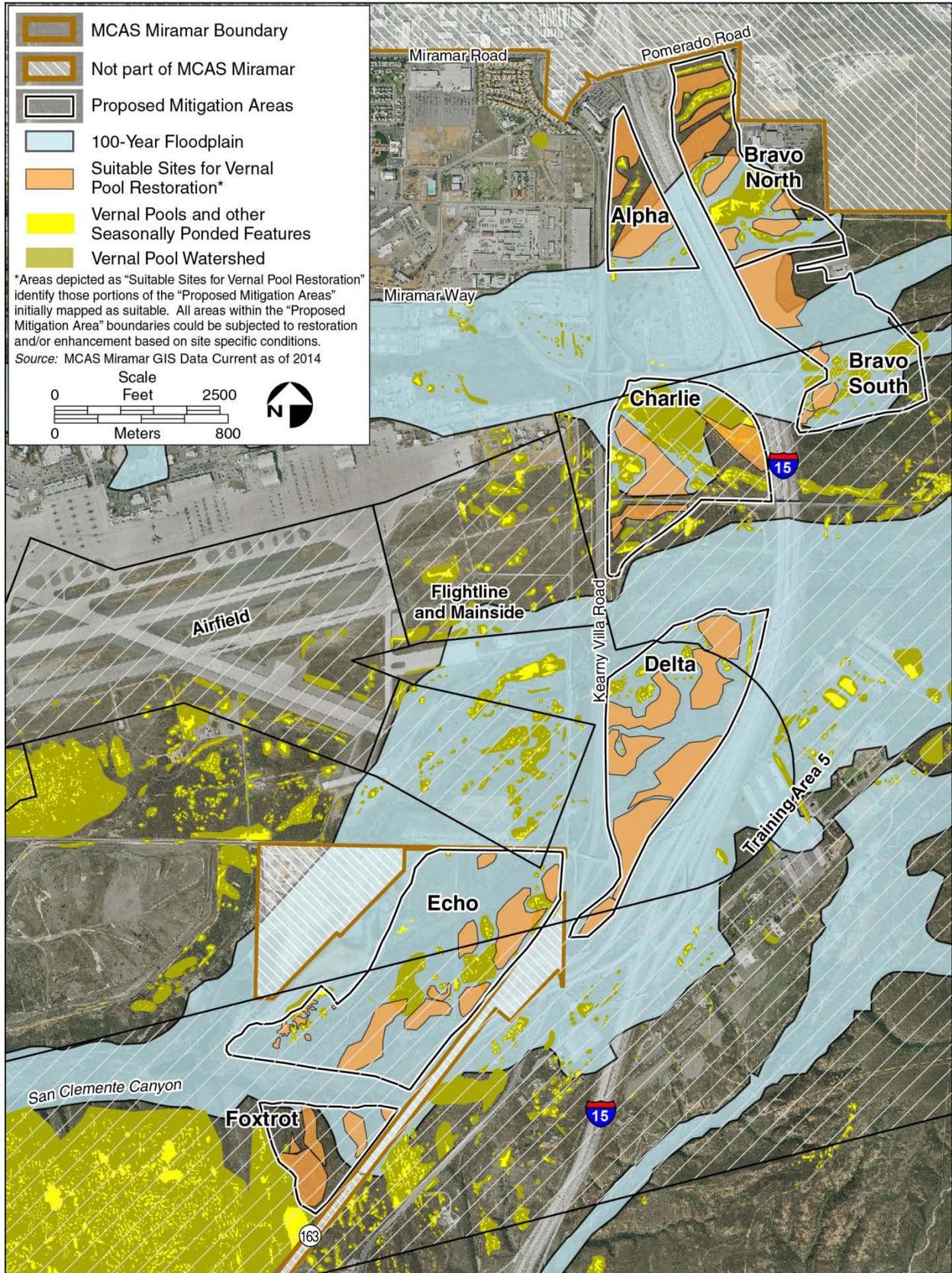


Figure 3-8. 100-Year Floodplain at MCAS Miramar

1 Increased erosion potential during restoration has been discussed in Section 3.4, *Geologic Resources*.
2 With respect to incidental spills of petroleum products during vernal pool restoration activities, surface
3 water and/or shallow groundwater quality impacts could potentially occur as a result of inadvertent
4 dispersion of contaminants during grading, which would require the use of vehicles and equipment powered
5 by diesel fuel/gasoline and lubricated with oil and other mechanical fluids. Accidental releases of such
6 substances (e.g., spills arising from leakage of fuel, motor oil, or hydraulic fluid during operation and/or
7 equipment maintenance) could also occur; however, all work would be conducted during dry conditions and
8 adverse impacts, if any, would be focused on small areas where basin development/restoration would occur.
9 All vehicles and equipment would carry supplies of fuel and other mechanical fluids only in the quantities
10 needed for their operation. The use of licensed, trained personnel for the safe operation of vehicles and
11 equipment required for vernal pool restoration, as well as performance of a regular, comprehensive
12 maintenance program would further reduce the potential for an accident to occur. To minimize the risk of
13 release of fuel or other petroleum products, equipment fueling and maintenance would be completed at
14 designated fueling stations. In addition, Alternative 1 would comply with the SPCC Plan (General Measure
15 5) as described in Section 2.3.1, which would minimize potential impacts to water quality. Therefore,
16 Alternative 1 would not result in significant water quality impacts due to the inadvertent dispersion of
17 contaminants during grading and no mitigation beyond the Environmental Protection Measures described
18 in Section 2.3 would be required.

19 **Groundwater**

20 Alternative 1 would not involve the long-term use or extraction of groundwater for consumptive or other
21 purposes, and no associated impacts would occur. As such, Alternative 1 would not result in impacts to
22 water supply and no mitigation is required.

23 **Floodplains/Flooding**

24 A portion of the proposed vernal pool restoration sites are within the 100-year floodplains of Rose
25 Canyon and San Clemente Canyon creeks. Because the vernal pool restoration sites should be close to
26 Waters of the U.S. and thereby in or adjacent to floodplains, there is no practicable alternative to locating
27 restoration sites in the floodplain. In accordance with EO 11988 and FEMA guidance, the USMC
28 determined that the action would not adversely affect floodplain resources, induce incompatible
29 development of floodplains, or increase flooding of Rose Canyon and San Clemente Canyon creeks.
30 Alternative 1 would provide minor beneficial impacts to floodplain resources and could result in a slight
31 reduction of flooding during moderate storm events due to the retention of the runoff in the vernal pools.
32 Therefore, Alternative 1 would not result in significant flooding related impacts and no mitigation beyond
33 the Environmental Protection Measures described in Section 2.3 would be required.

34 **3.7.4.2 Alternative 2: Partial Configuration A (Areas Alpha, Bravo North, Delta, 35 and Echo)**

36 Water resources impacts associated with this alternative would be similar to, but less than those
37 associated with Alternative 1. However, this alternative reduces the options for phased implementation of
38 vernal pool restoration and the total potential vernal pool restoration. A smaller proposed mitigation area
39 would result in less grading equipment subject to incidental leaks and spills of petroleum products into
40 surface waters and underlying groundwater. As described for Alternative 1, impacts would be addressed
41 through conformance with the NPDES permit program (General Measure 2) and the SPCC Plan (General
42 Measure 5). Therefore, Alternative 2 would not result in significant impacts to surface water resources
43 and no mitigation is required.

1 **3.7.4.3 Alternative 3: Partial Configuration B (Areas Charlie, Delta, Echo, and Foxtrot)**

2 Under Alternative 3, water resources impacts would be similar to, but less than those associated with
3 Alternative 1. Similar to Alternative 2, this alternative reduces the options for phased implementation of
4 vernal pool restoration and the total potential vernal pool restoration. A smaller proposed mitigation area
5 would result in less grading equipment subject to incidental leaks and spills of petroleum products into
6 surface waters and underlying groundwater. As described for Alternative 1, impacts would be addressed
7 through conformance with applicable requirements including the NPDES permit program (General
8 Measure 2) and the SPCC Plan (General Measure 5). Therefore, Alternative 3 would not result in
9 significant impacts to surface water resources and no mitigation is required.

10 **3.7.4.4 No Action Alternative**

11 Under the No Action Alternative, the establishment and management of proposed mitigation areas would
12 not occur. Therefore, no grading related impacts on water quality would occur and mitigation is not
13 required.

This page intentionally left blank.

4 Cumulative Impacts

1 CEQ regulations for implementing NEPA require that the cumulative impacts of a proposed action be
2 assessed (40 CFR Parts 1500-1508). A cumulative impact is defined as the following:

3 *...the impact on the environment which results from the incremental impact of the action when added*
4 *to other past, present, and reasonably foreseeable future actions regardless of what agency (federal*
5 *or non-federal) or person undertakes such other actions. Cumulative impacts can result from*
6 *individually minor but collectively significant actions taking place over a period of time.”*
7 *(40 CFR § 1508.7)*

8 CEQ’s guidance for considering cumulative effects states that NEPA documents “should compare the
9 cumulative effects of multiple actions with appropriate national, regional, state, or community goals to
10 determine whether the total effect is significant” (CEQ 1997). The first step in assessing cumulative
11 effects, therefore, involves identifying and defining the scope of other actions and their interrelationship
12 with the proposed action or alternatives. The scope must consider other projects that coincide with the
13 location and timeline of the proposed action and other actions. Section 4.1.1 identifies the projects
14 considered in the cumulative analysis. Section 4.2 provides an analysis of cumulative impacts for each of
15 the environmental resources discussed in this EA.

16 4.1 Projects Considered in the Cumulative Analysis

17 Cumulative impacts may occur when there is a relationship between a proposed action and other actions
18 expected to occur in a similar location or during a similar time. This relationship may or may not be
19 obvious. Actions overlapping, or in close proximity to, the proposed action can have more potential for
20 cumulative impacts on “shared resources” (e.g., air quality/GHG, biological resources, and water
21 resources) than actions that may be geographically separated. Similarly, actions that coincide temporally
22 may have the higher potential for cumulative impacts. To the extent that details regarding such actions
23 exist and the actions have a potential to interact with the proposed action outlined in this EA, these
24 actions are included in the cumulative analysis. For the purposes of this EA, the time frame of current
25 and/or reasonably foreseeable projects extends from 2015 to 2020. No other projects were identified after
26 the year 2020. The cumulative actions are summarized in Section 4.1.1 through Section 4.1.6 and
27 Table 4-1.

28 4.1.1 Sewer Line Equalization Tanks

29 This EA describes the potential environmental consequences resulting from a proposal by MCAS
30 Miramar, San Diego, California to upgrade its existing sewer system to reduce the effluent flow into the
31 City of San Diego’s sewer system to less than the permitted limit of 1.6 million gallons per day. The
32 project involves construction and operation of a storage tank with a holding capacity sufficient to
33 temporarily retain excess sewage flow generated by a nominal 10-year 24-hour storm event (1.5 million
34 gallons); an active flow control system to regulate the discharge flow; and associated piping, pumps,
35 conduits, and access points. Additional supporting improvements include site access and utility
36 infrastructure upgrades. Site improvements would include grading and clearing, demolition and repaving
37 of the existing road surface and culverts, and restoration of disturbed areas and the ephemeral streambed,
38 to pre-construction conditions. Construction would occur over a 15-month period. Operation and
39 maintenance of the facility would entail annual cleaning and inspection of the storage tank. This project is
40 reasonably foreseeable; however, a development schedule is not currently available.

Table 4-1. Related and Cumulative Projects

Project Title	Project Description	Anticipated Buildout Date	Project Impacts
Sewer Line Equalization Tank	Upgrade to the existing MCAS Miramar sewer system to reduce the effluent flow into the City of San Diego's sewer system to less than the permitted limit of 1.6 million gallons per day.	2016	Potential project impacts may include: Air Quality, GHG, and Biological Resources; Public Health and Safety, Recreation, Transportation, Utilities, and Water Resources.
Fort Rosecrans National Cemetery Annex, MCAS Miramar	90,000-grave national cemetery	2010-2040	<ul style="list-style-type: none"> • Traffic: 253 additional daily trips in 2010 – no impacts; 1,012 additional daily trips in 2030. Significance thresholds will not be exceeded, but some intersections, roadway segments, and freeway segments will operate at unacceptable level of service (LOS) during peak hours under all scenarios. • Air Quality: Temporary construction emissions will be less than significant; long-term reactive organic gases and NO_x emissions will be below the General Conformity Rule <i>de minimis</i> threshold and will be partially offset by avoidance of longer vehicle trips to Riverside and Los Angeles national cemeteries. Further measures to minimize air emissions related to grading, earthwork, and operations were identified in the Final Environmental Impact Statement (EIS) and will be implemented. • Noise: Aircraft noise ranges from 68–79 decibels A-weighted (dBA) Community Noise Equivalent Level (CNEL). Noise impacts associated with land use compatibility will occur if interior noise levels on the site are not reduced to below 50 dBA; design measures will reduce interior noise levels accordingly. Noise generated by the site will be minimal (vehicles and small construction equipment) and will not affect sensitive receptors due to distance and intervening traffic. • GHG: No GHG analysis was done; however, based on the facility's planned Leadership in Energy and Environmental Design (LEED) status, it can be assumed that operational GHGs would be minimized. Construction-related GHGs also likely will be minimized through the implementation of air emission reduction measures referenced above. • Biological Resources: The project would remove approximately 6.37 acres of occupied coastal California gnatcatcher habitat. In addition, the project would impact two vernal pool basins occupied by San Diego fairy shrimp (approximately 0.01 acres), 27 man-made and occupied basins (0.299 acres), and four unoccupied basins (0.013 acres). Impacts to biological resources will be mitigated to below a level of significance.

Table 4-1. Related and Cumulative Projects

Project Title	Project Description	Anticipated Buildout Date	Project Impacts
West Coast Basing of the MV-22	Approved replacement of CH-46E medium lift helicopters with the MV-22 Osprey for the 3 rd and 4 th MAWs.	2010–2020	<ul style="list-style-type: none"> • Traffic: Significant unmitigated direct impacts due to degradation of LOS from an additional 867 operational average daily trips on a segment of Miramar Way that is currently operating at an unacceptable LOS F. Significant unmitigated direct and cumulative impacts to six road segments will occur during operations of the MV-22 project, in conjunction with estimated traffic volumes for 2010 and 2020. Cumulatively significant construction-related traffic impacts could be mitigated to less than significant by limiting construction activities to off-peak hours. • Air Quality: No significant construction-related impacts were identified for air quality. Operational emissions will exceed the General Conformity Rule <i>de minimis</i> threshold for NO_x (100 tons per year); a formal CAA General Conformity Determination was prepared and the emissions were determined to conform to the most recent federally approved O₃ SIP for the SDAB. Based on incorporation in that SIP of an NO_x emissions growth increment for military programs, impacts will be less than significant. • Noise: No significant impacts were identified for noise. • GHG: Cumulative GHGs will be less than significant because they are approximately 0.002 percent of the U.S. total CO_{2e} emissions. • Biological Resources: The project would impact: 0.1 acre of scrub habitat, 0.42 acres of disturbed scrub habitat, and 8.4 acres of Native and Non-Native Grassland. The project would also impact 0.078 acres of CWA jurisdictional seasonally ponded basins occupied San Diego fairy shrimp; 0.029 acres of non-jurisdictional/unoccupied vernal pools; 0.006 acres of non-jurisdictional/occupied vernal pool basins; 0.016 acres of occupied seasonally ponded basins; 0.02 acres of CWA jurisdictional wetlands; and 0.11 acres of jurisdictional ephemeral streambed. Direct and indirect impacts to biological resources will be mitigated to reduce impacts to habitat, sensitive species and water quality. • Cultural Resources: Potential impacts to cultural resources will be avoided, minimized, or (when necessary) mitigated through implementation of measures contained in the Programmatic Agreement between the USMC, California State Historic Preservation Office, Advisory Council on Historic Preservation, and other consulting parties.

Table 4-1. Related and Cumulative Projects

Project Title	Project Description	Anticipated Buildout Date	Project Impacts
West Coast Basing of the Joint Strike Fighter (F-35B), MCAS Miramar	Proposed replacement of the F-18/AV-8B with the F-35B.	2013–2023	<ul style="list-style-type: none"> • Traffic: Temporary construction traffic would occur, but the project would result in removal of military personnel from MCAS Miramar and an overall net reduction in trips would occur. No impacts to ground traffic and transportation would occur. • Air Quality: Demolition and construction emissions would be minimal and temporary and would be below <i>de minimis</i> thresholds. Operation would result in a net increase in annual emissions for all criteria pollutants except SO₂, which would increase only nominally. • Noise: Relative to baseline, 3 to 4 dB CNEL increase at 7 of 17 representative receptor sites under the Preferred Alternative. Five sites would experience decreased noise levels. A total of 72 percent reduction in population within the 65 dB CNEL curve would occur. • GHGs: Cumulative GHGs would be less than significant because they are approximately 0.003 percent of U.S. total CO₂e emissions. • Biological Resources: The project would impact 2.5 acres of suitable habitat occupied by coastal California gnatcatcher; 9.0 acres of suitable habitat not occupied by coastal California gnatcatcher; and 0.01 acre of non-native grassland. The project would also impact 0.5 acres of vernal pools occupied by San Diego fairy shrimp; 0.02 acres of unoccupied non-jurisdictional vernal pools; 0.2 acres of unoccupied, CWA jurisdictional wetlands; and 1,303 linear feet of jurisdictional Waters of the U.S. Impacts to biological resources would be reduced through avoidance, restoration, and compensation.

Table 4-1. Related and Cumulative Projects

Project Title	Project Description	Anticipated Buildout Date	Project Impacts
U.S. Army Reserve Center, MCAS Miramar	Proposed construction and operation of an U.S. Army Reserve Center, including construction of three buildings within a 15-acre parcel southeast of the Naval and Marine Corps Reserve Center.	2016	<ul style="list-style-type: none"> • Traffic: Construction would result in temporary minor traffic impacts on Pomerado Road. Access road LOS would improve following construction. • Air Quality: Minor short-term impacts would occur due to construction emissions. Emissions would be less than the General Conformity Rule <i>de minimis</i> thresholds. • GHG: Construction-related GHG emissions would be temporary and cease at the end of construction. BMPs to reduce air pollutants would minimize GHG as well. LEED construction, efficient layout, and energy-efficient appliances and practices would minimize the amount of electrical demand and GHG emission for this facility. • Noise: No detailed analysis was conducted for noise; no impacts are anticipated. • Biological Resources: The project would impact 10 acres of Chemise Chaparral and 1.4 acres of Non-native Grassland. Impacts to biological resources would be mitigated through avoidance/BMPs and revegetation.
Wet Weather In-Stream Discharge	Proposed construction of facilities on the Metropolitan BioSolids Center leasehold on MCAS Miramar to alleviate the peak wet weather flows in the City of San Diego's Metropolitan Wastewater System. Facilities include installation of piping and dechlorination systems, upgrades to the existing storm-water outfall structure, installation of a rip rap apron, and creation of an access roadway.	2017	<ul style="list-style-type: none"> • Air Quality: Minor, short-term impacts would occur due to construction emissions. Emissions would be less than the General Conformity Rule <i>de minimis</i> thresholds. • Biological Resources: The project would impact 0.38 acres of suitable habitat, unoccupied by coastal California gnatcatcher within Management Area Level IV; wart-stemmed ceanothus; and 0.01 acre of streambed.

Table 4-1. Related and Cumulative Projects

Project Title	Project Description	Anticipated Buildout Date	Project Impacts
Other Miscellaneous Non-Federal Projects	<p>Caltrans District 11 serves San Diego and has several cumulative projects in the vicinity of MCAS Miramar.</p> <ul style="list-style-type: none"> • Seismic retrofit and structure rehabilitation project on I-805 at Mesa College Drive/Kearny Villa Road and at the intersection of I-5/SR-56. • I-15 Direct Access Ramp and Transit Station. and • I-805 Express Lanes North. 	<ul style="list-style-type: none"> • Spring 2015. • Construction started in July 2012 and was completed in October 2014. • Construction of Phase I began in February 2013 and is expected to be completed in 2016. The schedule for the additional phases is contingent upon funding. 	<ul style="list-style-type: none"> • Traffic: Construction would result in temporary minor traffic impacts. Operations would result in beneficial impacts to traffic. • Air Quality: Minor short-term impacts would occur due to construction emissions. Emissions would be less than the General Conformity Rule <i>de minimis</i> thresholds. • GHG: Construction-related GHG emissions would be temporary and cease at the end of construction. BMPs to reduce air pollutants would minimize GHG as well.

4.1.2 Fort Rosecrans National Cemetery Annex

DoN and the Department of Veterans Affairs (VA) prepared an Environmental Impact Statement (EIS) to address the potential environmental impacts from building an annex to the Fort Rosecrans National Cemetery. The proposed cemetery annex would be a partnership between the VA and DoN to ease the shortage of burial plots in San Diego for honorably discharged veterans and their families. The national cemetery annex would be located on approximately 323 acres in the northwest corner of MCAS Miramar, with approximately 214 acres to comprise the development footprint identified in the Final EIS. The cemetery annex would be constructed over a 30-year planning period to provide 50,000 casketed gravesites and 40,000 columbarium niches. The first phase of construction began in January 2010 and will provide approximately 22,500 gravesites. The remaining portions of the proposed cemetery annex will be developed in similar phases as each previous phase is depleted. Buildout of the proposed action is anticipated to be completed by 2040. The Final EIS was completed and a Record of Decision (ROD) was signed on 01 April 2008. Although no significant air quality impacts were identified, the VA will incorporate measures to minimize air emissions from grading, earthwork, and operations, as established in the Final EIS. Noise compatibility impacts from aircraft will be reduced through project design measures. Significant impacts to biological resources, including habitat occupied by the coastal California gnatcatcher, vernal pools with and without San Diego fairy shrimp, and jurisdictional Waters of the U.S. will occur; however, these impacts have been fully mitigated by the VA.

4.1.3 West Coast Basing of the MV-22

DoN prepared an EIS for the introduction of a new tilt-rotor aircraft, the MV-22 Osprey, to the Third and Fourth MAWs to replace the veteran CH-46E medium-lift helicopters, which the USMC plans to remove from service. The installations examined in the EIS for potential MV-22 basing were MCB Camp Pendleton, MCAS Miramar, MCAS Yuma, Naval Air Facility El Centro, and Edwards Air Force Base. The ROD was signed on 17 November 2009. The Marine Corps began basing the aircraft at MCAS Miramar in 2010. Eight squadrons will be based at MCAS Miramar, and two at MCB Camp Pendleton, with the roll-out complete in 2017. Basing at MCAS Miramar includes construction of new hangar modules, modification of existing hangars, replacement of refueling facilities and wash racks on the flightline. The proposed action will result in an increase of 48 aircraft and 746 personnel at MCAS Miramar. Traffic impacts from continuing operations are expected to be significant and unmitigable. Significant impacts to biological resources, including jurisdictional wetlands, vernal pools, San Diego fairy shrimp, and coastal California gnatcatcher, are being mitigated to less than significant.

4.1.4 West Coast Basing of the F-35B

The USMC prepared an EIS for the introduction of the next generation warplane known as the Joint Strike Fighter, or F-35B, to the Third and Fourth MAWs to replace the Marine Corps F-18 and AV-8B. Although the F-35B is still in development, the Marine Corps version of the plane would be a single-seat, short take-off, vertical landing aircraft that could be based at two locations on the West Coast, including MCAS Miramar and MCAS Yuma, beginning as early as 2013 and possibly extending through 2023. The supersonic stealth aircraft would be used by the Marine Corps, DoN, and Air Force. The preferred alternative would base six operational F-35B squadrons at MCAS Miramar. New support facilities at MCAS Miramar under the proposed action also would include new hangars, helipad and apron expansion, wash racks and rinse facilities, a simulator facility, and a runway upgrade. The preferred alternative would result in reduction of 30 aircraft and 635 military personnel at MCAS Miramar. The ROD was signed on 08 December 2010. Impacts from the preferred alternative on biological resources (threatened and/or endangered species including the coastal California gnatcatcher and San Diego fairy shrimp, and associated habitat, jurisdictional wetlands) would be mitigated to less than significant.

4.1.5 United States Army Reserve Center

The Army has prepared a Final EA for the proposed construction and operation of an U.S. Army Reserve Center (Center) within a 15-acre vacant parcel southeast of the Navy Marine Corps Reserve Center at MCAS Miramar. Three buildings are proposed, including a 90,138-square feet administration and training building, a 6,681-square feet unheated storage facility, and a 5,703-square feet Organizational Maintenance Shop. Additional proposed site improvements include approximately 89,640 square feet of Privately Owned Vehicles parking, approximately 105,696 square feet of military equipment parking, a military vehicle wash rack with an oil/water separator at the Organizational Maintenance Shop, perimeter security fencing, area lighting, and extension of utilities to the site. Up to 600 Army Reserve personnel could be stationed at the Center, and as many as 300 soldiers would be expected to train at the Center on any given weekend. Approximately 40 full-time Army Reserve personnel would work at the Center Monday through Friday. The Finding of No Significant Impact (FONSI) was signed on 9 June 2011. Minor short-term air quality and traffic impacts would occur during construction, but would not be significant or result in operational impacts. Construction-related GHG emissions would be temporary and minimized by construction BMPs; the Center's Leadership in Energy and Environmental Design (LEED) status would minimize the generation of operational GHG emissions. Impacts from the project on biological resources, including downstream vernal pools and associated endangered species, would be prevented through conservation measures to be incorporated into the project during design, construction, and operation.

4.1.6 Wet Weather In-stream Discharge

The City of San Diego proposes a project to alleviate the peak wet weather flows in the City of San Diego's Metropolitan Wastewater System. The project would construct the following facilities on the Metropolitan BioSolids Center leasehold located on MCAS Miramar: connection to existing 36-inch recycled water pipeline; installation of an isolation valve, flow control valve, and flow meter structure; sampling stations; turnout piping (approximately 200 feet of 36-inch pipe); a dechlorination system facility (approximately 1,800 square foot building); upgrades to an existing 48-inch storm drain outfall structure; installation of a rip rap apron (approximately 2,800 square feet), electrical service; installation of a Supervisory Control and Data Acquisition system; and a paved access roadway. Biological Resources including 0.38 acres of suitable habitat, unoccupied by coastal California gnatcatcher within Management Area Level IV; impacts to wart-stemmed ceanothus; and 0.01 acre of streambed. A Draft Mitigated Negative Declaration was submitted on 30 October 2013. A Final MND was prepared on 3 February 2014. A Notice of Determination is pending.

4.1.7 Miscellaneous Non-Federal Projects

Caltrans District 11 serves San Diego and Imperial counties and is responsible for maintaining the state's transportation system. Caltrans has several cumulative project in the vicinity of MCAS Miramar. These include:

- Seismic retrofit and structure rehabilitation project on I-805 at Mesa College Drive/Kearny Villa Road and at the intersection of I-5/SR-56. The estimated completion date is spring 2015;
- I-15 Direct Access Ramp and Transit Station: This project will construct a direct access ramp and transit station that will connect to the I-15 express lanes in Mira Mesa. The transit station will be located south of the Hillery Drive/Westview Parkway intersection and will join the direct access ramp. The construction started in July 2012 and was completed in October 2014; and
- I-805 Express Lanes North. Express lands will be constructed along 4.4 miles of I-805 from just south of SR-52 to just north of Mira Mesa Boulevard. The project would also construct a transit

1 station and direct access ramp at Nobel Drive, a direct access ramp from southbound I-805 at
2 Carroll Canyon road, a direct connector between SR-52 and the I-805 and the I-805 express lanes
3 and relocate the Park and Ride lot at Governor Drive. Construction of Phase I began in
4 February 2013 and is expected to be completed in 2016. The schedule for the additional phases is
5 contingent upon funding.

6 **4.2 Cumulative Impact Analysis**

7 This section addresses the potential cumulative impacts of the proposed action in conjunction with the
8 aforementioned projects. These projects represent past, present, and reasonably foreseeable actions with
9 the potential for cumulative impacts when considered in conjunction with the potential impacts from the
10 Proposed Action. However, if a project would not result in direct or indirect impacts on a resource area, it
11 would not contribute to a cumulative impact on that resource area. CEQ guidance states, “A cumulative
12 effects analysis should ‘count what counts,’ not produce superficial analyses or a long laundry list of
13 issues that have little relevance to the effect of the Proposed Action or the eventual decisions”
14 (CEQ 1997). Therefore, the following cumulative impact analysis focuses on: 1) those resource areas with
15 the potential to be significantly impacted by the project; and/or 2) those resource areas currently in poor
16 or declining health or at risk even if project impacts would be relatively small (not significant).

17 **4.2.1 Air Quality**

18 **4.2.1.1 Criteria Pollutants**

19 The ROI of the criteria air pollutant cumulative analysis is primarily the SDAB. As described in
20 Section 3.1.5 of this EA, restoration/pool development activities associated with project Alternatives 1
21 through 3 would produce emissions that would be substantially below all emission significance
22 thresholds. Emissions from cumulative projects would potentially contribute to the ambient pollutant
23 impacts generated from proposed construction activities. However, these emissions would occur far
24 enough away from proposed construction such that they would produce low ambient pollutant impacts in
25 proximity to the proposed mitigation areas. Therefore, air quality impacts from the minor amounts of
26 project emissions, in combination with emissions from cumulative projects, would not be substantial
27 enough to contribute to an exceedance of an ambient air quality standard. Implementation of standard
28 fugitive dust and construction equipment emission control measures (Environmental Protection
29 Measures 1 and 2) would ensure that air emissions from earthwork activities proposed for project
30 Alternatives 1 through 3 would not result in a significant cumulative impact.

31 As described in Section 3.1.5, establishment and management activities associated with project
32 Alternatives 1 through 3 would produce nominal emissions. Consequently, proposed activities also would
33 not result in a significant cumulative impact to criteria pollutant levels.

34 **4.2.1.2 Greenhouse Gases**

35 The potential effects of proposed GHG emissions are by nature global and cumulative impacts, as
36 individual sources of GHG emissions are not large enough to have an appreciable effect on climate
37 change. Therefore, an appreciable impact on global climate change would only occur when proposed
38 GHG emissions combine with GHG emissions from other man-made activities on a global scale.

39 Currently, there are no formally adopted or published NEPA thresholds of significance for GHG
40 emissions. Therefore, in the absence of an adopted or science-based NEPA significance threshold for
41 GHGs, this EA compares GHG emissions estimated for project Alternatives 1 through 3 to the U.S. net

1 GHG emissions inventory of 2011 (EPA 2013) to determine the relative increase in proposed GHG
2 emissions.

3 Similar to the conclusions of the air quality analysis in this EA, restoration/pool development activities
4 associated with project Alternatives 1 through 3 would produce nominal amounts of GHGs. The CO_{2e}
5 emissions associated with the net U.S. and California sources in 2011 are approximately 5,797 and
6 541 million metric tons, respectively. Emissions of GHGs from project Alternatives 1 through 3 would
7 equate to minimal amounts of the U.S. and California inventories. As a result, they would not
8 substantially contribute to global climate change. Therefore, GHG emissions from the project alternatives
9 would not produce significant cumulative impacts to global climate change.

10 Although project Alternatives 1 through 3 would not produce significant cumulative impacts to global
11 climate change, the USMC and DoN implement broad-based programs to reduce energy consumption and
12 shift to renewable and alternative fuels, thereby reducing overall emissions of GHGs. Some of these
13 programs include the following:

- 14 • EO 13514, *Federal Leadership in Environmental, Energy, and Economic Performance*, adopted
15 in October 2009, directs federal agencies to increase renewable energy use to achieve general
16 GHG emission reductions. EO 13514 requires federal agencies to develop a 2008 GHG emissions
17 baseline and to develop a percentage reduction target for agency-wide GHG reductions by
18 fiscal year. As part of this effort, federal agencies will evaluate sources of GHG emissions and
19 develop, implement, and annually update an integrated Strategic Sustainability Performance Plan
20 that will prioritize agency actions based on lifecycle analyses. The DoD is currently developing
21 its Strategic Sustainability Performance Plan that will guide USMC initiatives to reduce GHG
22 emissions;
- 23 • The Commandant of the Marine Corps' "*Bases-to-Battlefield*" *Expeditionary Energy Strategy*
24 *and Implementation Plan* (2011) declares the intent to implement measures to conserve energy
25 and to reduce a dependence on foreign oil. The campaign plan identifies long-term goals to
26 reduce energy intensity and increase the amount of renewable electrical energy usage. This plan
27 requires base commanders to evaluate the effectiveness of incorporating emerging technologies
28 that would reduce GHGs;
- 29 • MCI West has undertaken a study to evaluate and address GHG emissions, as documented in the
30 draft *Greenhouse Gas Assessment for Marine Corps Installations West* (MCI West 2009). The
31 study provides the basis for recommended GHG management policies at MCI West;
- 32 • On 16 October 2009, the Secretary of the Navy announced five energy targets for DoN and
33 USMC, as summarized here.
 - 34 o When awarding contracts, appropriately consider energy efficiency and energy footprints as
35 additional factors in acquisition decisions.
 - 36 o By 2012, demonstrate a Green Strike Group composed of nuclear vessels and ships powered
37 by biofuels. By 2016, sail the Strike Group as a Great Green Fleet composed of nuclear ships,
38 surface combatants equipped with hybrid electric alternative power systems running on
39 biofuels, and aircraft running on biofuels.
 - 40 o By 2015, cut petroleum use in its 50,000 non-tactical commercial fleet in half, by phasing in
41 hybrid, flex fuel, and electric vehicles.
 - 42 o By 2020, produce at least half of the shore-based installations energy requirements from
43 alternative sources. Also, convert 50 percent of all shore installations to net zero energy
44 consumers.

1 o By 2020, half of the DoN's total energy consumption for ships, aircraft, tanks, vehicles and
2 shore installations will come from alternative sources.

- 3 • As part of its efforts to encourage the development of alternative fuels, on 22 January 2010 the
4 DoN and the United States Department of Agriculture signed a Memorandum of Understanding
5 to encourage the development of advanced biofuels and other renewable energy systems.

6 Renewable energy projects currently implemented and planned within the jurisdiction of MCI West
7 would reduce emissions of GHGs by about 250,000 metric tons from current operations over a 25-year
8 life cycle (DoN 2010). These projects include thermal and photovoltaic solar systems, geothermal power
9 plants, and wind generators. These renewable energy initiatives are not proposed as emission reductions
10 to directly offset GHG emissions produced by either alternative, but rather demonstrate initial responses
11 for DoN compliance with EO 13514 and to factor GHG management into DoN proposals and impact
12 analyses.

13 **Climate Change Adaptation**

14 In addition to assessing whether project Alternatives 1 through 3 would potentially impact climate change,
15 the following considers how climate change could impact these actions and what adaptation strategies, if
16 any, would be required to respond to these future conditions. For projects within southern California, the
17 main effect of climate change to consider is increased temperatures, droughts, and wildfires, as
18 documented in *Our Changing Climate 2012 - Vulnerability & Adaptation to the Increasing Risks from*
19 *Climate Change in California* (California Energy Commission 2012). Current operations at MCAS
20 Miramar have adapted to the relatively arid conditions in the area, as well as the prevalence of wildfires.
21 Exacerbation of these conditions in the future could impede proposed restoration/pool development and
22 operational activities during extreme events or could cause smoke obscurations from wildfires. No other
23 substantial effects from future climate change would impact proposed activities.

24 **4.2.2 Biological Resources**

25 The ROI of cumulative impacts varies and is based on the presence of suitable habitat and known
26 occurrences of the federally listed coastal California gnatcatcher, and vernal pools or seasonally ponded
27 occupied by the federally listed San Diego fairy shrimp and vernal pool-obligate plant species—on or in
28 the vicinity of MCAS Miramar. Projects with potential direct and indirect impacts on biological resources
29 include those that would result in the loss of native plant communities, permanent loss of sensitive plant
30 populations, species losses that affect population viability, and the reduction in adjacent habitat quality
31 from temporary actions including the addition of noise and dust during restoration activities to permanent
32 effects such as the addition of lighting. For native plant and wildlife communities, other significant
33 impacts could include habitat fragmentation or the permanent loss of contiguous (interconnecting) native
34 habitats such as migration or movement corridors.

35 The projects listed in Table 4-1 have the potential to impact biological resources. Potential impacts from
36 past, present, and reasonably foreseeable actions in the project areas range from the loss of various-sized
37 areas of vegetation communities to impacts to habitat occupied by the coastal California gnatcatcher
38 and/or San Diego fairy shrimp. These impacts are mitigable and have been/will be mitigated. In addition,
39 all ground-disturbing projects at MCAS Miramar are required to adhere to various protection measures
40 designed to minimize effects to vulnerable species and their habitats including vernal pools and associated
41 federally listed species, and wetlands or other Waters of the U.S.

42 Furthermore, the potential for cumulative effects on biological resources at MCAS Miramar associated
43 with habitat and wildlife disturbance is much reduced because of on-going monitoring and management
44 activities in place to minimize adverse effects from development and management. Potential cumulative

1 effects of federal actions on federally listed species are addressed project-by-project through the Section 7
2 ESA consultation process with USFWS. Through this process MCAS Miramar and USFWS jointly assess
3 project-specific effects and develop and implement appropriate measures that reflect current conditions
4 and status of the species. Consultation has resulted in development of conservation programs for federally
5 listed species and their habitats as outlined in the MCAS Miramar INRMP. Collectively, these
6 requirements ensure that the incremental effects of individual projects do not result in significant
7 cumulative impacts to biological resources.

8 As discussed in Section 3.2, Alternative 1, Alternative 2, and Alternative 3 would result in the temporary
9 removal of less desirable disturbed or non-native communities and the creation of higher quality vernal
10 pool basin habitat and native upland vegetation. Restoration activities would be phased over time, likely
11 decades, with only smaller discrete individual areas disturbed at any given time. Implementation of
12 Environmental Protection Measures 3 through 8 would ensure that restoration and maintenance associated
13 with the alternatives would contribute minimally and only temporarily to adverse effects on these
14 biological resources. Permanent impacts from vernal pool restoration, which include an increase in
15 available suitable habitat for vernal pool-obligate federally listed species and an increase in functions and
16 values of restored systems, would otherwise be beneficial. As a result, the cumulative impacts identified
17 for biological resources for Alternative 1, Alternative 2, and Alternative 3 combined with other
18 cumulative projects listed in Table 4-1, would not be cumulatively significant.

19 In addition, MCAS Miramar currently consults on impacts to natural resources and develops mitigation
20 on a project-by-project basis. Alternative 1, Alternative 2, and Alternative 3 would provide advanced
21 mitigation planning to compensate potential habitat loss impacts of the projects in Table 4-1. This broad
22 mitigation/conservation strategy allows for mitigation from the projects in Table 4-1 to be interconnected
23 and interrelated, which has the potential to reduce mitigation costs and increase the success rate of habitat
24 compensation restoration projects. Therefore, the advanced planning/conservation strategy for the
25 mitigation of impacts of future projects (Table 4-1) would provide a conservation benefit to biological
26 resources on MCAS Miramar.