Wetland Statement of Findings

Wetland Statement of Findings

Marin Headlands and Fort Baker Transportation Infrastructure and Management Plan

Marin County, California

Prepared by:

WRA Environmental Consultants
Amy Parravano,
2169-G East Francisco Blvd.
San Rafael, CA 94901
(415) 454-8868
(415) 454-0129 fax
parravano@wra-ca.com

National Park Service, GGNRA
Liz Varnhagen,
Fort Mason, Bldg. 201
San Francisco, CA 94123
(415) 561-2888
liz_varnhagen@nps.gov

March 2009

Wetland Statement of Findings

Marin Headlands and Fort Baker Transportation Infrastructure and Management Plan

Marin County, California
Final Environmental Impact Statement
March 2009

National Park Service
Golden Gate National Recreation Area

Recommended:

_____ _____
General Superintendent, Date
Golden Gate National Recreation Area

Concurred:

_____ _____
Wetlands Program Leader Date
WASO - Water Resources Division

Approved:

_____ _____
Regional Director Date
Pacific West Region

TABLE OF CONTENTS

INTRODUCTION

This Wetlands Statement of Findings (WSOF) characterizes the wetland resources that occur within the project area of the Marin Headlands and Fort Baker Transportation Infrastructure and Management Plan (MH/FB TIMP), describes the impacts the project will likely have on these aquatic resources, and documents the steps the NPS will take to avoid, minimize, and offset these impacts.

Purpose of the Wetlands Statement of Findings

Under Directors Order #77-1 for Wetland Protection, Part 2.5 states:

> Actions proposed by the NPS that have the potential to have adverse impacts on wetlands will be addressed in an Environmental Assessment (EA) or an Environmental Impact Statement (EIS). If the preferred alternative in an EA or EIS will result in adverse impacts on wetlands, a "Statement of Findings" documenting compliance with this Director's Order (D.O.) and Procedural Manual #77-1 will be completed. Actions that may be excepted from the Statement of Findings requirement are identified in the Procedural Manual.

In #77-1, Section 5.3.4 (3):

> "….A draft EIS that identifies a preferred alternative that will have adverse impacts on wetlands must be accompanied by a separately identifiable draft WSOF that explains why an alternative with such impacts was chosen and that meets the other requirements identified in Section 5.3.5 of these procedures. Draft EIS/draft WSOF distribution must include all affected parties, other interested parties and organizations, and the agencies listed in Section 5.3.4.1 of this document.
>
> "Following public and agency review of the draft EIS/draft WSOF and any public meetings/hearings as provided for in the D.O. #12, the NPS must reevaluate the alternatives and impacts and revise the documents as necessary. If the preferred alternative in the Final EIS still results in adverse impacts on wetlands, a Final WSOF must be completed according to the requirements in Section 5.3.5 of these procedures. The Final signed WSOF must be attached to the ROD as a separately identifiable document."

This Wetland Statement of Findings for the MH/FB TIMP includes:

- A series of maps that show the locations, and boundaries of Cowardin wetlands, and jurisdictional waters of the U.S. under the Clean Water Act, within in the project areas Appendix A.
- Documentation of the qualifications of the staff and consultants who identified wetlands within the Project area.
- Detailed descriptions of the affected wetlands.
- Functional descriptions of the affected wetlands.
- Full disclosure of the adverse impacts on the wetland habitats, processes, functions and values, and acreages at the sites where wetlands will be impacted.
- A discussion of the various factors and trade-offs considered in arriving at the decision to impact wetlands.

- A description of how the preferred alternative was designed to minimize wetland impacts to the greatest extent practicable.
- A description of the proposed wetlands compensation.

Additionally, the WSOF will demonstrate how the NPS will:

- Address the directives of Executive Order 11990 (Protection of Wetlands);
- Ensure “no net loss” of wetland functions or values.

PROJECT OVERVIEW

The Marin Headlands/Fort Baker (MH/FB) Transportation Management Plan is proposed by the National Park Service to improve transportation management and infrastructure within the Golden Gate National Recreation Area (GGNRA). GGNRA is one of the largest urban national parks in the world and was established to make natural park resources more accessible to urban populations. The Project Area is located in the Marin Headlands and Fort Baker in Marin County, California and is defined as the historic US Army Forts Baker, Barry and Cronkhite, and the corridors of roads and trails that connect the three forts to the US Highway 101 corridor and the Golden Gate Bridge.

Little rehabilitation work has been accomplished on the current road network at MH/FB, which was built by the Army primarily between the 1870s and World War II (1940s). Most of the park roads are narrow and twisting with numerous blind curves, and lack of shoulder space or bicycle lanes. Undersized, plugged, and collapsed culverts have been the cause of numerous washouts, landslides and sinkholes in the roads over the past 25 years. Most of the asphalt roadway paving is 30 or more years old, and reaching an age where the pavement will increasingly crack, fail and break up. With the heavy use of the roads by bicycles and the many steep grades that result in bicycles traveling at high speeds, rough pavement can contribute to bicycle accidents. The MH/FB trail system, which primarily makes use of former Army dirt roads is steep, subject to severe soil erosion, and has circuitous routes that make it difficult to access many of the current visitor destinations.

Many popular destinations lack sufficient parking capacity to accommodate current demand, while other locations have parking space that seldom fills. Parking areas in the Headlands tend to be major sources of sediment water pollution since most are unpaved and subject to erosion. The high demand for parking in areas not designed to handle heavy use, results in extensive parking along narrow road shoulders.

Most of the proposed activities are within the Rodeo Lagoon watershed, a 1,148-hectare (2,837 acre) drainage basin in the jurisdictional boundary of GGNRA. Developed areas include Forts Cronkhite and Barry, Capehart Housing, Alexander Battery, and the Nike Missile Site (Figure 1). Major features include steep hills, two primary drainages, Gerbode and Rodeo Creeks, and a notable beach/lagoon complex connecting the lower reaches of the creeks with a tidal lagoon.

A few of the affected wetlands are within the Horseshoe Cove watershed of Fort Baker. Other infrastructure improvement activities affect areas that drain directly to the San Francisco Bay, as with East Fort Baker Road, and Conzelman Road.

Purpose and Need for Project

The purpose of the Project is to provide improved access to and within the Marin Headlands and Fort Baker for a variety of users, and to initiate these improvements in a way that minimizes impacts to the rich natural diversity and cultural resources of the Marin Headlands and Fort Baker.

The proposed project will provide infrastructure improvements in the park in order to:

- Promote public transit, pedestrian and bicycle travel to and within the park to improve visitor experience and enhance environmental quality;
- Rehabilitate the MH/FB road and trail infrastructure in a manner that protects resources and improves safety and circulation;
- Reduce traffic congestion and improve safety at key park locations and connecting roads.

Although the road system is largely in tact and much of it remains as the Army built it over 50 years ago, the road and trail system has received little additional investment in rehabilitation and is in a deteriorating state. Forts Baker, Barry and Cronkhite were listed as an historic district on the National Register of Historic Places in 1973, with a period of significance covering 1866 to 1972. From 1973 to the present, road modifications have been made under the direction of the NPS. In the *Historic Road Characterization Study*, (Feierabend, 2004) and in the FINAL EIS, the roads are evaluated with an understanding of the last round of major modifications by the Army, when the information is available.

Project Alternatives
The Final Environmental Impact Statement (Final EIS) describes four alternatives for the proposed MH/FB Transportation Infrastructure Management Plan. Alternative 3 is the NPS preferred alternative. The following project features are expected to result in minor fills in wetlands and other waters.

Under the Preferred Alternative, roadway infrastructure would be rehabilitated or reconstructed with non-character altering roadway widening, and parking facilities would be improved. Additional transit options would be provided. Extensive pedestrian facility enhancements would be implemented including closure and rerouting of existing trails and constructing new trails. Bicycle facilities would be improved. These actions would improve safety and circulation within the project area, alleviate traffic congestion, reduce impacts to resources in some locations, and enhance the visitor experience by providing improved facilities and opportunities for non-automobile modes of transportation. Alternative 3 was selected as preferred because it presents operational advantages over the other alternatives, while successfully minimizing and avoiding environmental impacts.

Other Alternatives Evaluated in the EIS
Alternative 1 is the no-build alternative in which the transportation infrastructure and operations in the Marin Headlands and Fort Baker would remain largely unchanged. Transportation improvements and travel demand management programs specified in the Fort Baker Plan EIS would be implemented. Alternative 1 represents the “No-Build Alternative” and provides a baseline on which to compare impacts from Alternatives 2, 3 and 4. However, with the wetland impact minimization and various restoration measures included in Alternative 3 such as the removal of fill material associated with two existing trails crossing the Rodeo Creek floodplain, and the re-routing of a segment of the Rodeo Valley Trail away from the riparian corridor, Alternative 1 may not necessarily be less damaging overall to wetlands because it passes up opportunities for restoration. Further, it does not accomplish the project purpose.

Under Alternative 2, roadway infrastructure would be rehabilitated within the existing roadway width; parking facilities would be improved; additional transit options would be provided to and within the park; and minor pedestrian and bicycle facility enhancements would be implemented to improve access to the park. These actions would improve safety and circulation within the

project area, alleviate traffic congestion, reduce impacts to resources in some locations, and enhance visitor experience by providing improved facilities and opportunities for non-automobile modes of transportation. Under this alternative, the physical infrastructure would not be appreciably altered, and instead the uses would be limited or reduced to fit within the available space. Of note are two proposed actions that would restore wetlands: eliminating some parking in a portion of the unpaved Rodeo Beach parking lot, and removing Smith Road and its associated parking. However, the compensatory wetland mitigation proposed under both Alternatives 3 and 4, which would restore up to 0.6 acre of wetlands and remove roadway fill at Sites 17 and 18 (Figure 3) is not contemplated under this Alternative. Similarly, the existing Creek crossings at Sites 4 and 7 would remain and not be replaced by elevated structures spanning the floodplain, as proposed in Alternatives 3 and 4. Given the need for consolidated parking as provided in Alternative 3, and considering the wetland enhancement features of Alternative 3, while this alternative may be less damaging to existing wetlands, Alternative 3 is more desirable for the net benefit of wetland enhancement in addition to the added parking capacity.

Under Alternative 4, roadway infrastructure would be reconstructed throughout the project area and parking facilities would be improved. Transit options would be similar to those provided in the Preferred Alternative, with the addition of connections to regional transit centers outside the park. More extensive pedestrian and bicycle facility enhancements would be implemented, including closure and rerouting of existing trails, construction of new trails, and wider bicycle lane construction on nearly all major roads. These actions would improve safety and circulation within the project area, alleviate traffic congestion. The wider road margins would increase the road footprint, necessitating extending the lengths of many road culverts. Essentially, Alternative 4 may result in a slightly greater area of impact to wetlands than Alternative 3.

PROJECT AREA

The Project Area is located in the Marin Headlands on Golden Gate National Recreation Area lands in Marin County, California (Figure 1). A Study Area was established so that within set boundaries, all wetlands that might be directly affected by the Project would be identified. The Study Area was drawn to envelop all the roadways and parking areas, trail construction areas, and wetland restoration areas that are part of the MHFB Transportation Infrastructure Management Plan (TIMP). Wetlands and other water features that intersect or that were adjacent to the Study Area were also mapped in order to show their hydrologic connection within the Study Area. Elevations range from sea level to approximately 800 feet NGVD. The Project Area is bound by the Pacific Ocean to the west, and San Francisco Bay to the south and east. Highway 101 intersects the eastern portion of the Study Area, just west of the Fort Baker headquarters. The site is within the Coast Range, therefore the topography is generally undulating and occasionally steep. The Study Area crosses various drainages and lowland areas that support extensive riparian communities and freshwater marshes.

Most of the Project Area is open space currently managed by the NPS for public use and the protection and management of cultural and natural resources. The Marin Headlands and Fort Baker areas were once important military property during World War 2, the Korean War and the Cold War; the Army installations were strategically located near the coast. Consequently, there are several developed areas, including the historic building complexes of Fort Cronkhite, Fort Barry, Fort Baker, the Alexander Battery and the Nike Missile Site as well as other facilities, now dedicated to multiple uses by the Park, our varied Park Partners and Park personnel.

Major features of the Rodeo Valley watershed include steep hills, two primary tributaries (Gerbode and Rodeo Creeks), and a notable beach/lagoon complex connecting the lower reaches of the creeks to the Pacific Ocean. Some portions of the Study Area are within the

100-year floodplain. Wetlands are well developed and continuous along the floor of Rodeo Valley, while the floor of Gerbode Valley is largely dry, consisting of upland vegetation in most places with relatively narrow riparian woodland immediately surrounding the channel (Striplen et al. 2004). The southernmost portion of the study area---along Conzelman Road, drains into San Francisco Bay (all the way to Point Bonita). The watershed east of Wolfback Ridge and the Bunker Road Tunnel drains through Fort Baker into San Francisco Bay at Horseshoe Cove.

Average annual rainfall on the Marin Headlands is around 24 inches with a Mediterranean climate characterized by wet winters and cool, dry summers. Annual rains typically occur in the months of October through April. It is not uncommon for the region to experience prolonged wet or dry spells which may last several years. As such, wetland areas respond with the drier wetlands disappearing during prolonged periods of below average rainfall. Winter precipitation is generally enhanced as moist air from the Pacific encounters the coastal mountains, rises, and water condenses. Annual rainfall is usually higher at the upper elevations, and ranges from about 22 inches near the coast to 28 inches at ridges in the east end of the watershed (Rantz, 1971).

A layer of coastal fog typically sets in over the watershed from May to September, commonly persisting for several days or weeks. As a result, direct sunlight is blocked and temperatures remain cool, thereby moderating evapotranspiration and water loss from streams and wetlands during the summer. At the same time, fog-drip plays an important role in providing moisture to the basin. (Shaw, 2005).

Wetlands are well developed and continuous along the floor of the Rodeo Valley, and Rodeo Creek usually flows year round.

WETLAND DISTRIBUTION AND CHARACTERISTICS

Wetland Mapping Methodology:

A team of NPS field specialists from both Point Reyes National Seashore and Golden Gate National Recreation Area mapped wetlands within the Rodeo Valley watershed while undertaking the *Wetlands Inventory for Golden Gate National Recreation Area 2002-2004 including Rodeo Valley, Lower Redwood Creek Watershed, Mori Point, and Bolinas Lagoon Sites, 2006.* Wetlands were classified according to the USFWS Cowardin Wetland Classification System (Cowardin et.al. 1979).

Fieldwork was conducted from June 2002 to October 2002 in the Rodeo Valley watershed. Vegetation communities were mapped in accordance with a national vegetation classification system using aerial imagery primarily from 1994 to 1995. The VegMap data includes information on the vegetation alliance and association of each vegetation polygon.

The wetland field data collected in Phase II for Rodeo Valley was overlain on the VegMap to determine which vegetation alliances were most often associated with wetlands. The alliances were ranked according to the probability that wetlands are present in the polygon. The high and moderate probability polygons were used to produce a Phase I map. These wetland polygons serve to help identify potential wetland areas at a large scale and focus planning efforts that either include or exclude wetlands.

A “cross-walk” was developed to correlate the subset of wetland vegetation alliances with the corresponding Cowardin wetland classification. Field visits to Rodeo Valley were conducted in April 2005. A wetland assessment was performed at each site which included making an initial wetland determination, identifying wetland boundaries, identifying the Cowardin wetland type, collecting plant composition and cover data, and assessing wetland function and

hydrogeomorphic structure. Representative examples of each wetland polygon were photodocumented using a digital camera.

The specialists used Cowardin classifications to classify wetland units. It defines wetlands as, "…lands transitional between terrestrial and aquatic systems where the water table is usually at or near the surface or the land is covered by shallow water. For purposes of this classification, wetlands must have one or more of the following three attributes: (1) at least periodically, the land supports predominantly hydrophytes; (2) the substrate is predominantly undrained hydric soil, and (3) the substrate is non-soil and is saturated with water or covered by shallow water at some time during the growing season of each year" (Cowardin et al., 1979). Field data characterizing the degree of dominance of hydrophytic vegetation, site hydrology and the presence of hydric soils were collected for the wetland determinations. Generally, the specialists only used the hydric soil criterion when there was uncertainty about hydrophytic vegetation or hydrology status.

Hydrophytic vegetation cover was estimated at each potential wetland site. If at least 50 percent of the wetland was covered with hydrophytic vegetation the first criterion was met. The wetland indicator status is listed for all plant species using the 1996 Draft USFWS National List of Plant Species that Occur in Wetlands (Reed1996). The indicator status was then used to assess the likelihood of an area being classified as a wetland as defined by Corps Manual (1987).

NPS specialists' determination of the predominance of wetland vegetation differed slightly from the Corps Manual. For GGNRA, the specialists used hydrophytic vegetation indicator species categorized as Obligate (OBL) and Facultative Wetland (FACW)—species that are commonly found in areas having saturated soil conditions. While the Corps Manual includes Facultative (FAC) plants as hydrophytic vegetation indicator as well, many of the FAC plants that occur in California coastal wetlands (Reed 1996) are just as commonly observed in non-wetland areas in this region. Based on local experience, both Point Reyes and GGNRA specialists felt that FAC plants in our foggy coastal environments were less reliable indicators of wetlands. The presence of certain FAC plant species, such as California blackberry or purple velvet grass (*Holcus lanatus*), for example does not necessarily indicate the presence of wetland hydrology.

Delineation of Waters of the U.S. for Section 404 of the Clean Water Act
Specialists referenced the Cowardin maps described above to guide more detailed site-specific field work to delineate waters of the United States under Section 404 of the Clean Water Act. The Cowardin mapping, through field tested, applied slightly different criteria, especially with respect to plant associations and classifications. Clean Water Act jurisdictional delineations are based on discrete field tested data points and site observations, based on the Corps of Engineers Manual.

The limits of Corps jurisdiction under Section 404 as given in 33 CFR 328.4 are as follows: (a) *Territorial seas:* three nautical miles in a seaward direction from the baseline; (b) *Tidal waters of the U.S.:* high tide line or to the limit of adjacent non-tidal waters; (c) *Non-tidal waters of the U.S.:* ordinary high water mark or to the limit of adjacent wetlands; (d) *Wetlands:* to the limit of the wetland. Section 328.3 of 33 CFR defines wetlands as:

> "Those areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs, and similar areas."

The delineation study determined the presence or absence of wetland indicators using the *Corps of Engineers Wetland Delineation Manual, Environmental Laboratory, U.S. Army Corps of Engineers Waterways Experiment Station, January 1987*. According to the Corps Manual:

> "... [E]vidence of a minimum of one positive wetland indicator from each parameter (hydrology, soil, and vegetation) must be found in order to make a positive wetland delineation."

On June 1-2, June 7, June 20, and August 8 2006, wetland biologists from WRA, Inc. and the National Park Service (NPS) conducted a routine wetland delineation to determine the presence of potential wetlands and other waters subject to Federal jurisdiction under Section 404 of the Clean Water Act. That year had experienced extensive precipitation during the months of March and April. All wetlands and waters within the Study Area were assessed for jurisdictional status, seeking evidence of the three wetland criteria.

To make the task manageable, the "Study Area" for the purpose of delineating waters of the U.S., was established as the outer limits of the proposed project construction/disturbance area. For roads, this was generally 2 feet outside the existing edge of road pavement to represent the outer margin of potential land disturbance, assuming the new road centerline would match the existing. Rationale for confining the study area largely to project right-of-way alignments for trails and roads was that an inventory of Cowardin wetlands was already mapped on the Marin Headlands. The methods for evaluating the presence of jurisdictional wetlands and other waters of the United States employed during each site visit are described below.

Observations of vegetation, hydrology, and soils were made at sample points during the site visits using standard Corps data sheets. Once an area was determined to meet the wetland criteria described in the Corps Manual, its boundaries were charted on a topographic map using GPS. The areas of potential jurisdictional wetlands were measured digitally using ArcGIS software.

Vegetation

Plant species identified on the project site were assigned a wetland status according to the U.S. Fish and Wildlife Service list of plant species that occur in wetlands (Reed 1988). This wetland classification system is based on the expected frequency of occurrence in wetlands as follows:

OBL	Always found in wetlands	>99% frequency
FACW	Usually found in wetlands	67-99%
FAC	Equal in wetland or non-wetlands	34-66%
FACU	Usually found in non-wetlands	1-33%
NL	Not listed (upland)	<1%

Plants with obligate (OBL), facultative wetland (FACW), and facultative (FAC) classifications are considered hydrophytic vegetation in the Corps Manual methodology. The hydrophytic vegetation criterion is met when greater than 50 percent of the dominant plant species have an indicator status of OBL, FACW, and/or FAC. Dominant plant species were determined by list each species in descending order of percent cover within the sample area, until 50% cumulative cover was exceeded.

Hydrology

The Corps jurisdictional wetland hydrology criterion is satisfied if an area is inundated or saturated for a period sufficient to create anoxic soil conditions during the growing season (minimum of 18 consecutive days in the San Francisco Bay Area). Evidence of wetland

hydrology can include direct evidence (primary indicators), such as visible inundation or saturation, drift lines, and surface sediment deposits (including algal mats), or indirect indicators (secondary indicators), such as oxidized root channels and the FAC-neutral test. If indirect or secondary indicators are used, at least two secondary indicators must be present to conclude that an area has wetland hydrology. Primary and secondary hydrology indicators were used to determine if areas surrounding each sample point in the Study Area satisfied the Corps hydrology criterion.

Soils

Soils formed over long periods of time under wetland conditions, often are subject to a fluctuating water table that causes shifting reducing and oxidizing conditions. This commonly causes the distinctive characteristics used as indicators of hydric soils. Hydric soils generally have a low matrix chroma, designated 0, 1, or 2, used to identify them as hydric. Chroma designations are determined by comparing a soil sample with a standard Munsell soil color chart. Soils with a chroma of 0 or 1 are considered hydric; soils with a chroma of 2 must also have mottles to be considered hydric. Soil profiles at each sample point in the Study Area were described to include horizon depths, color, redoximorphic features, and texture to determine if the soils satisfy the Corps criteria for hydric soils. The NRCS manual Field Indicators of Hydric Soils in the United States (USDA, NRCS, 2002) was also used as a guide for determining hydric soils in the Study Area.

Wetland Classification

The wetlands identified within the Project Study Area are predominantly palustrine (saturated grasslands and marshes, riparian communities, Rodeo Lake, and also a small area that is estuarine (Rodeo Lagoon). Based on the Cowardin classification system (1979), specific wetland classes within the Project Area include:

- Palustrine emergent – herbaceous (e.g. sedge, rush, grass) habitat within the Rodeo Creek watershed subject to various runoff and flooding regimes.
- Palustrine scrub-shrub – riparian scrub (e.g. willow) habitat within the Rodeo Creek watershed subject to various runoff and flooding regimes.
- Estuarine unconsolidated bottom – Rodeo Lagoon itself and adjacent wetlands sustained by a mix of tidal and freshwater input
- Estuarine emergent – Emergent wetland fringe surrounding Rodeo Lagoon sustained by a mix of fresh and tidal water input.

Plant Communities within Study Area

The Study Area, mostly road and trail right-of way, intercepts primarily five plant communities: non-native annual grassland (upland), riparian woodland (both jurisdictional and non-jurisdictional wetland), freshwater marsh (jurisdictional wetland), brackish marsh (jurisdictional wetland), and seasonal wetlands. Plant communities were classified based on existing descriptions developed by *The Manual of California Vegetation* (Sawyer and Keeler-Wolf 1995). However, in some cases it was necessary to identify variants of plant community types that are not described in the literature. The plant communities identified within the Study Area are discussed below:

California Annual Grassland. Upland vegetation in the Study Area is predominately comprised of California annual grassland. This community occurs along the roads, in flat areas, and on sloping hillsides. It is dominated by non-native annual grass species such as Italian ryegrass *(Lolium multiflorum,* NL*)*, wild oat (*Avena fatua,* NL), and rattail fescue (*Vulpia myuros,* NL), brome grasses (*Bromus diandrus,* NL; *B. hordeaceus,* NL), wild radish (*Raphanus sativus*, NL),

and black mustard (*Brassica nigra,* NL). Patches of coyote brush (*Baccharis pilularis*, NL) and other shrubs are common in some grassland areas.

Riparian willow scrub, palustrine scrub-shrub, occurs along some of the streams within the Study Area. These communities generally consist of an assemblage of willow species (*Salix spp.*), with several associated shrubs and herbaceous species in the understory, such as blackberry (*Rubus ursinus,* FAC) and Honeysuckle (*Lonicera involucrate,* FAC). These communities appear to occur along portions of intermittent or perennial streams, mostly associated with the Rodeo Creek floodplain corridor that has adequate soil moisture to support hydrophytic woody tree species.

Freshwater Marsh, palustrine emergent, -These wetlands have a perennial moisture regime that supports the growth of obligate plant species, many of which persist throughout the year. Common plant species included rushes such as baltic rush (*Juncus balticus* OBL) and soft rush (*Juncus effuses*, OBL); sedges (*Carex spp*.); small-fruited bulrush (*Scirpus microcarpus*, FACW); horsetail (*Equisetum arvense*, FAC); and some grasses including velvetgrass (*Holcus lanatus,* FACW*)* and Kentucky fescue (*Festuca arundinacea,* FAC-).

Brackish Marsh, estuarine emergent, - The brackish marsh is at the margins of Rodeo Lagoon, and has a perennial moisture regime that includes influx of fresh and salt water. This community can support plant species adapted to both saline and freshwater conditions. Common plant species include willows (*Salix spp*.), three-square bulrush (*Scirpus pungens,* OBL), American bistort (*Polygonum bistortoides*, OBL), soft rush, horsetail, and water parsley (*Oenanthe sarmentosa*, (OBL).

Seasonal Wetland, palustrine emergent or scrub-shrub, - These areas are commonly ponded or saturated at the surface for a prolonged period during the winter and spring months, and then dry completely during summer and fall. Natural springs are often only wet seasonally. Other examples are in local depressions. Intermittent or seasonal tributaries typically stop flowing and dry at the surface after the rains cease in the spring. Seasonal wetland plant communities within the Study Area generally occur within topographic depressions at the lower elevations of the Study Area. Examples of typical species found in palustrine emergent seasonal wetlands include Italian ryegrass, (*Lolium perenne* FAC), tall fescue, Festuca arundinacea, (FAC-), velvet grass, *Holcus lanatus* (FAC), slough sedge *Carex opnupta,* (OBL), brown-headed rush, *Juncus phaeocephalus* (FACW) and Pacific reed grass, Common species found in riparian zones include stinging nettle, C*onium maculatum* (FACW), California blackberry, *Rubus ursinus* FACW*, water parsley, *Oenanthe sarmentosa* (OBL), and willow, *Salix lasiolepis,*(FACW).

AFFECTED WETLANDS

A description of the wetlands and drainages that will likely be impacted by the proposed actions, the nature of the impacts, and efforts the NPS has made to minimize and avoid these impacts, is provided below. A summary table of the site number, map number, estimated area of impact, and description of proposed action is presented in Table 1. The complete set of referenced figures can be found in Appendix 1. The wetland areas estimated below represent wetlands believed to be jurisdictional under the Clean Water Act. However, to date, the Corps of Engineers has not yet officially verified the draft NPS map of delineated jurisdictional waters of the United States.

Summary of Wetland Impacts

The following table provides a summary of the acreage of wetlands impacted by the proposed project. Areas of restored wetlands are in bold type. All in all, the project will adversely impact about 0.36 acre of jurisdictional wetlands. The project will restore up to 0.60 acre with

compensatory mitigation. Site 16, the Rodeo Beach Parking Lot Wetland Restoration Project is considered a connected, but separate action, and thus is not being counted as mitigation for road and trail wetland impacts.

Table 1: Site Summary of Activities that Impact Waters of the United States

Site #	Figure #	Acres	Cowardin Class	Description of Activity
Site 1A	Figure 2	no fill	EUB - C	Install a stair pathway from Mitchell Road to Rodeo Beach
Site 1	Figure 2	0.002	PEM-B	Replace two 12-inch culverts with either a span or large arching open-bottom culvert under Mitchell Road
Site 2	Figure 2	0.008	PEM - B	Marine Mammal Center - Center curbing and gutter
Site 3	Figure 3	0.002	PEM - F	Widen pavement along Bunker Road and replace 2 culverts .
Site 4	Figure 4	**0.038**	PEM - B	Remove trail crossing Rodeo Creek corridor
Site 5	Figure 4	0.145	PEM - B	Smith Road parking lot
Site 6	Figure 4	0.049	PEM-B	Construct new crossing of Rodeo Creek at Smith Road Construct 60- foot long foot/bike/horse bridge, 12 feet wide
Site 7	Figure 5	**0.053**	PEM-B	Remove crossing of Rodeo Creek corridor at Rifle Range
Site 8	Figure 5	0.004	PEM-Bd	Drainage ditch along Julian Road by Rifle Range
Site 9	Figure 5	**0.027**	PEM-B	Fisherman's Trail removed and rehabilitated.
Site 10	Figure 6	0.038	PEM-F	Trail work affecting wetlands on Dubois Road;
Site 11	Figure 6	0.061	PEM-B	Construct new crossing of Rodeo Creek by Capehart Housing Construct bridge 180-feet long, 12 feet wide; 3 spans
Site 12	Sheet 7	0.011	PEM-C	McCullough Road hairpin curve widening and clearing vegetation to improve line of sight.
Site 13	Figure 8	0.018	PEM-B	East Bunker Road Bicycle Path. Approx. 180 foot long, 30-inch culvert to be installed.
Site 14	Figure 9	0.0	PEM-B	Trail by Marin YMCA and Field Road turn-around. The proposed trail alignment will now avoid wetlands completely.
Site 15	Figure 10	0.018	PEM-B	Wetlands on Rodeo Valley Trail – add crushed rock
Site 19	Figure 4	0.004	PEM-Bd	Clear and reconfigure existing ditches on west side of Rodeo Valley Stables; Replace culverts under Bunker Road
Site 20	Figure 11	0.0	PEM-A	Widening of Conzelman Road at Hwy 101

				Wetland Mitigation and Restoration
Site 16	Figure 2	≈ **3**	PEM-F	Rodeo Beach Parking Lot
Site 17	Figure 3	**0.28**	EEM-L	Rodeo Lagoon compensatory wetland mitigation
Site 18	Figure 3	**0.32**	PSS-F	Rodeo Lake compensatory wetland mitigation

Areas depicted in bold type represent estimates of restored wetlands, a beneficial impact. Other aerial estimates represent wetland losses.

Site 1A, Figure 2, Rodeo Beach
Proposed Action: Construction of a new staircase to access Rodeo Beach from the parking lot at the end of Mitchell Road. The structure to be built will not require the discharge of fill material into the area considered jurisdictional under both Section 404 of the Clean Water Act and Section 10 of the Rivers and Harbors Act, but will likely encroach into the zone which becomes wetted during the winter months and high tides, as an extension of the lagoon. The staircase will be about 6 feet in width, and will serve to concentrate the foot traffic of the visitors in this area, promoting visitor safety and abating environmental degradation resulting from having all the multiple use trails down the bluff.

Wetland resource: The small jurisdictional area shown at Site 1 is mapped at the boundary of the Study area as it was identified for the Fort Cronkhite study area. The area that becomes inundated when the mouth of the lagoon is breached was not visible in June 2008, after the sand bar at the mouth of the Lagoon had reestablished. The tidal finger illustrated in Figure 2 was completely dry, consisting of built up beach sand. During winter months, it may be that visitors descending the proposed pathway/stairs, will encounter a small finger of the lagoon at the bottom of the path where the beach begins; the topography of the beach is dynamic, and changes seasonally. No impacts to the intermittent aquatic resource are anticipated.

Site 1, Figure 2, Rodeo Beach Parking Lot at Mitchell Road
Proposed Action: Replace the existing pair of culverts that connect the wetland at the north end of the Rodeo Beach parking lot under Mitchell Road, with Rodeo Lagoon. The design of the new culvert will be determined as the design for the wetland restoration of this area progresses. Most likely, the new culvert will be larger in diameter than the two existing, and will arch to span natural substrate along the bottom. Alternatively, Mitchell Road may span the channel on a railroad car bridge or similar structure. Under either scenario, the aquatic substrate will be substantially enhanced and restored as a habitat for aquatic organisms.

Wetland resource: The wetland channel was originally excavated as a ditch, well-defined, straight, and vegetated. It was excavated within the fill substrate on which the parking lot sits. This channel drains the sizeable wetland area to the north east that is being targeted for wetland restoration as a separate project in the near future. The existing channel is about 5 feet wide at the base and is classified as palustrine emergent. It carries runoff under Mitchell Road much of the year.

Site 2, Figure 2, Marine Mammal Center
Proposed Action: Center curbing and gutter work is planned along the unimproved road margin. Stormwater runoff, currently in wetland ditch, will likely be directed underground in a culvert at this location to facilitate site drainage. These proposed improvements will fill 0.008 acres of waters of the U.S.

Wetland Resource**:** The ditch is completely vegetated with palustrine emergent herbaceous plants, mostly *Carex opnupta*, but also *Juncus* spp. has very little natural resource value; capturing runoff mostly from the road and developed area of the Marine Mammal Center above. The ditch drains into culverts under Old Bunker Road, which feed a small open natural water course which is channeled back into a culvert that passes under the Headlands Institute (HI) campus before discharging into the ocean at Rodeo Lagoon. HI has studied this drainage (Kamman, Kamman, Higgins, May, 2008) and may choose to enhance and restore its natural ecological functions as part of its campus improvements in the near future.

Site 3, Figure 2, west of T-1111
Proposed Action**:** Bunker Road pavement will be widened by approximately 4 feet, 2 feet on either side of the center line, for bicycle safety. They will construct a shoulder foreslope of approximately 3 feet where there is no current guardrail on the south side, and cut out a roadside ditch with a slope of 3:1, extending about 20 feet into non-jurisdictional riparian vegetation on the north side. The work would alter the appearance of this area and may end up expanding the wetland. The vegetation would be allowed to recover. The new ditch would likely need periodic maintenance in the form of discouraging dense willow growth so that the channel can be kept clear of obstructions. There is an existing guardrail and a trail on the south side of the roadway. The new designed width of pavement of Bunker Road between McCullough and Mitchell Roads will be 26 feet, two feet wider on each side than the current road width of 22 feet. Also, both culverts crossing under Bunker Road will be replaced. The goal is to stabilize the upstream slope and improve access for cleaning out the upstream culvert opening from obstructions. Passage of stormwater flows under Bunker Road should be improved. The total area of existing wetlands that will be directly altered from the work is 0.002 acre.

Wetland Resource**:** This site is at the crossing of a broad palustrine scrub-shrub corridor with overstory. There is a mid-gradient stream that receives runoff from the Marine Mammal Center above. It discharges over a wetland alluvial fan into Rodeo Lagoon through 2 culverts under Bunker Road. The hydrology is sustained by groundwater discharge and surface and subsurface flow in a defined shallow channel. A perimeter ditch circumscribes Building T-1111, much of which was evidently built in the wetland area, at a low elevation within the watershed. Dominant vegetation includes arroyo willow (*Salix lasiolepis* FACW), cape ivy and common velvet grass (*Holcus lanatus*, FAC) with soft rush (*Juncus effusus*, OBL), tall flatsedge (*Cyperus eragrostis*, FACW) and water parsley (*Oenanthe sarmentosa*, OBL) in the ditch. The wetland slows stormwater flows off the hillside, captures sediment before it reaches the lagoon, and provides habitat for reptiles and amphibians, birds and small mammals.

Trail Crossings of the Rodeo Creek Wetland Corridor

Proposed Actions**:** Two existing foot trails crossing the Rodeo Creek corridor will be removed, and two new pedestrian/mountain bicycle trails will be constructed in new locations.

Site 4, Figure 4: The 6-foot wide trail and foot bridge that crosses the lower Rodeo Creek floodplain and creek channel west of Smith Road will be removed and rehabilitated to natural conditions. The trail connects Bunker Road on the south side of the creek with the Rodeo Valley and Miwok trails to the north. The existing fill comprising the trail tread will be removed so the surface will be returned to grade and the corridor restored as riparian wetland. Approximately 150 linear feet of the trail is within the mapped riparian wetland corridor. Approximate area of wetland restoration is 0.038 acre.

Site 6, Figure 4: A new trail crossing the Rodeo Creek riparian corridor will start from the east end of Smith Road, opposite the Presidio Riding Club stables. A 60-foot long, 6-foot wide foot/bike/horse bridge will span much of the floodplain and the creek channel, with the north abutment placed just beyond the riparian zone. Also planned is approximately 400 linear feet of hardened substrate for the tread to connect from the bridge to its junction with the Rodeo Valley Trail. Dense wetland vegetation within the bridge corridor will need to be cleared initially; however, much of it will regenerate. The rest of the trail is mostly through grassland. The placement of hardened rock material for the trail tread will thus be minimized, limited to a few small areas where herbaceous wet meadow patches straddle the trail right-of-way, and a small amount of fill for the northern bridge abutment will be placed at the edge of the floodplain. The crossing itself has been located at a site that minimizes encroachment into wetlands, using Cowardin wetland maps. The area the trail and bridge will displace within the wetland corridor is 0.049 acre. The wetlands and proposed trail alignment mapped in Figure 4 may not accurately prepresent true proximity of the wetland boundaries and the trail location. In any case, NPS plans to route the proposed trail alignment away from wetlands to avoid impacts as much as possible.

Site 7, Figure 5: The 6-foot wide footbridge (with railing) and trail crossing the Rodeo Creek corridor at the Rifle Range parking area will be removed and rehabilitated. This trail was built through wetlands on the flood terrace surrounding the creek channel, and connects to a wetland portion of the Rodeo Valley Trail that will also be improved for better drainage. Again, fill will be removed and approximately 0.053 acre of wetlands will be allowed to recover.

Site 11, Figure 6: A new trail crossing of the Rodeo Creek corridor will be built to connect Bunker Road at the Capehart Housing complex with the Rodeo Valley Trail. The wooden pedestrian, bicycle, and equestrian bridge will span approximately 1,000 feet of wetland floodplain, including the active creek channel. There will be two small pier footings and abutment in wetlands at the north end of the bridge; the trail will be 6-feet wide. This will serve to divert recreational bikers from the paved road to an enhanced multi-use trail. The area of wetland vegetation that the footprint of the bridge corridor will displace within the wetland corridor will be 0.061 acre.

Wetland Resources: Rodeo Creek is a perennial creek that flows through the lowest portion of the watershed, heading toward the ocean. In recent times, it flows as an incised channel through layers of rich fluvial deposits; the watershed has been influenced from historic land uses such as grazing, and from various historic diversions of key fluvial tributaries at the Capehart Housing complex, at Smith Road and the Presidio Riding Club, for example. The riparian plant community development is pretty extensive along the base of the valley, segregated into by floodplain terraces with varying moisture regimes.

The riparian wetland complex is a mosaic of plant associations tied into the fluvial behavior of the riverine system. It is composed of a series of floodplain terraces of varying flood frequencies and elevations, that support mostly seasonally saturated palustrine emergent and palustrine scrub-shrub wetland communities. Dominant emergent vegetation includes slough sedge (*Carex obnupta*, OBL) and tall fescue (*Festuca arundinacae*, FAC-). Dominant palustrine scrub-shrub wetland vegetation includes arroyo willow, shining willow (*Salix lucida var lasiandra,* FACW) and twinberry honeysuckle (*Lonicera involucrate,* FAC). The primary hydrological source is groundwater discharge as well as surface runoff, and periodic seasonal inundation from flood stages of the creek itself. There area also the occasional cluster of coyote brush (*Baccharis pilularis*, NL) scattered throughout the higher flood terraces.

Wetland functions: The proposed new creek crossings at Sites 6 and 11 will encroach upon the wetland terraces and riparian communities, but the impacts to the plant communities are considered very minor. Impacts will be from shading of vegetation from the bridges, and some very small substrate disruptions at the bridge abutments and piers. The clearing of riparian vegetation for bridge construction is considered to be mostly a temporary impact, and the hydrology of the floodplain would not be impacted. The bridged trail crossings represent the least environmentally damaging practicable alternative to cross the Rodeo Creek wetland complex. The removal and restoration of the current trails at Sites 4 and 7, which were constructed with fill and a short bridge span, amount to about 0.091 acre of fill material that will be removed. A similar crossing design for the new trail alignments was rejected in favor of the proposed structural crossings of the floodplain. Any adverse effects from the new trail crossings will be largely offset in-kind by the removal of the two other corridor crossings at Sites 4 and 7 All fill material associated with these trail crossings that was placed in the wetland corridor in the past will be removed and the trail corridor will be restored to native conditions.

The Rodeo Creek corridor system performs multiple wetland functions and is considered a reasonably in tact, highly valued wetland resource. It provides diverse, high quality wildlife habitat for foraging, breeding, feeding and refuge, including habitat for endangered species such as the California red legged frog. It manages inflow and deposition of sediment within the watershed moving toward the lagoon, performs groundwater recharge and discharge functions, conducts stormwater flows, it also retains cultural resource values from the areas rich cultural history. None of these functions is expected to incur anything more than very minor to negligible impact from the proposed trail crossings.

Site 5, Figure 4 – Smith Road Parking Lot

Proposed Action: A new parking lot that can accommodate up to 200 vehicles is proposed. The lot will be placed in the open grassy area north of Bunker Road south of Smith Road and south of the riparian creek corridor. Only the access paths will be fully paved; most of the dedicated parking areas will be on a permeable gravel substrate. The lot will offer parking for the nearby new trailhead, as well as be the terminus for vehicular traffic on the Car Free days. The site is a suitable location for parking; it is reasonably level and adjacent to the main travel corridor, Bunker Road, would utilize the space of an abandoned road on a formerly developed site where housing units have been removed, and is elevated well above the floodplain of Rodeo Creek. The wetland area that has been mapped at this site covers approximately 0.145 acre.

The configuration of the parking lot is still being designed, giving careful consideration to the location of the wetlands on the site and exploring opportunities for wetland restoration and enhancement, while accommodating the anticipated demand for parking in this area. Also, stormwater draining off the parking lot that does not otherwise penetrate into the pervious substrate, will be collected through surface swales and retained in a small pervious basin. There will be no direct stormwater discharge from the parking lot into the Rodeo creek wetland corridor.

Wetland resource: Site 5 is partially covered by seasonally saturated palustrine emergent and scrub-shrub wetlands. Dominant vegetation includes *Carex obnupta (*OBL), *Carex feta* (OBL); *Juncus effusus (*FACW), *Festuca arundinacea (*FAC-), *Holcus lanatus (*FAC*),* and arroyo willow. The site is gently sloped, and supports a mosaic of hydrophytic and upland vegetation, such as patches of coyote brush. The wetland areas would be at least partly affected by the presence of a densely vegetated substantial drainage ditch that traverses across the field between the two roads from top to bottom, where it meets another ditch that collects water along the southern margin of Smith Road. The culvert passes the water under Smith Road and into the Rodeo

Creek riparian complex. Water flows seasonally; the ditches may be dry by the late summer and fall months in low precipitation years.

Historic photographs of this area reveal that there was substantial moisture draining northward from the hills through the location the balloon hangar and Presidio Riding Club stables occupy today, and sustained a broad wetland and riparian corridor feeding Rodeo Creek. Built and used as a motor pool by the Army during the Second World War, today, runoff is channeled away from the developed area in two to three drainage ditches that empty into culverts under Bunker Road. The western two culverts discharge onto Site 5, and the water flows through the large ditch or contributes to sheet flow across the site descending toward the lower ditch at Smith Road. The eastern portion of the site has more sparse vegetation probably because of both poor soil quality (chert gravel fill material) and poorer hydrologic conditions, although patches of *Juncus effusus* (FACW) are scattered throughout.

The emergent wetland on this site was not previously captured as part of the Cowardin wetland mapping of the Rodeo Valley (2006). It plays an important water quality function based on its location. Being situated below the horse stables, it captures some of the sediment that washes across and under the roadway, recycles nutrients, and keeps them out of Rodeo Creek. Sheet flow across the site is retarded by the vegetation, infiltrates, and recharges the water table. At the base of the slope, at Smith Road, there is a mature willow canopy, providing shade and high quality habitat for wildlife and birds. The site offers a rare opportunity for restoration and enhancement of the wet meadow. Fill material could be removed, and the upstream culverts modified to redistribute stormwater over more of the site, and away from the drainage ditches, which could be filled in and plugged to not drain the site as they currently do. However, given the shortage of suitable parking areas available, successfully avoiding wetland encroachment at the site is probably not practicable, and thus enhancement would also be infeasible.

Rationale

The emergent wetland on this site plays an important water quality function based on its location. Being situated below the horse stables, it captures some of the sediment that washes across and under the roadway, recycles nutrients, and keeps them out of Rodeo Creek. Sheet flow across the site is retarded by the vegetation, infiltrates, and recharges the water table. At the base of the slope at Smith Road, there is a mature willow canopy providing shade and high quality habitat for wildlife and birds. The site offers a rare opportunity for restoration and enhancement of the wet meadow. Fill material could be removed, and the upstream culverts modified to redistribute stormwater over more of the site, and away from the drainage ditches, which could be filled in and plugged to not drain the site as they currently do. However, with the Rifle Range ruled out for parking because of the NPS mandate to preserve and protect this cultural resource, given the overall shortage of suitable parking areas in the Headlands to meet peak demand (see Appendix C of the EIS, Traffic Analysis), successfully avoiding all wetland encroachment at this site would not be practicable.

While the wetlands at Smith Road help filter sediment and nutrients from stormwater runoff from the areas upslope which include the stables, the more substantial, more valuable wetland resource is the Rodeo Creek corridor itself, adjacent, and slightly lower on the landscape. The subject wetland sits on fill that was placed for building pads (when the site supported housing). Further, the ditches that traverse from the upper part of the site down to the base of Smith Road and along the Smith Road margin likely deprive the site the full wetland hydrology it once had and already compromise the functions and value of this altered wetland resource.

There are few other level sites close to Bunker Road that could accommodate the anticipated demand for parking associated with the Car Free Days, or various special events. The pistol

range at the lower western end of the rifle range just east of Smith Road is considered a sensitive cultural resource which would be unsuited for large numbers of cars. As it is, little vegetation can get established because of current use by parked cars. To restore and preserve the appearance and integrity of this cultural resource area, parking will not be allowed to continue in this area.

The unpaved parking area by the Presidio Riding Club has been typically used by equestrian visitors. While it offers parking for the general public, it does not offer enough spaces to meet demand. There are a few other small turn out areas along Bunker Road east of this proposed terminus location for Car Free days that are suitable for parking, but the combined capacity of these smaller areas, falls short of what would be needed.

Even though the NPS believes that with the implementation of the mitigation plan at Rodeo Lagoon, the loss of the wetlands at Smith Road will be adequately compensated, the NPS will continue to test alternative site designs that avoid and minimize wetland fill to the extent practicable. Further, the NPS will design a basin swale to retain and treat stormwater draining off the parking lot. The NPS acknowledges the opportunity to enhance and restore a small wetland area on the site, given the ample source of water from above the site. We are hopeful to arrive at a design that offers generous parking and still sets aside a portion of the site for wetland habitat enhancement and preservation.

Site 19, Figure 4, Rodeo Valley Stables ditches at Bunker Road
Proposed action: The culverts conducting runoff under Bunker Road from the channelized water courses (ditches) that drain the west side of the Rodeo Valley Stables will be replaced and reconfigured. The discharge openings on the other side of Bunker Road, which would drain on to the proposed parking lot by Smith Road, would likely be redirected slightly into either a new ditch that directed the water along the periphery of the parking lot, or diverted toward the open, unimproved portion of the site, where palustrine emergent wetlands will be enhanced/restored. Area of affected wetland is estimated at about 0.004 acre.

Wetland resource: These ditches convey the runoff that would otherwise flow through the Rodeo Valley Stables area. There is a luxuriant willow canopy in the portion of the ditch just above the culverts, a palustrine scrub-shrub wetland dominated by *Salix lasiolepis* (FACW) and *Juncus balticus* (FACW+). Ideally, the wetland vegetation will not be affected by the culvert replacement. The willows and emergent vegetation provide wildlife habitat, and take up nutrients from the runoff.

Site 15, Figure 10, Rodeo Valley Trail
The Rodeo Valley Trail which was once a dirt farm road is routed along the periphery of the extensive wetland riparian corridor associated with Rodeo Creek, in the lower portion of the Rodeo Valley. Starting approximately across the creek from the Capehart Housing complex and continuing westward, patches of palustrine emergent wetland meadow become prominent on both sides of the trail. Essentially, the trail passes through dense herbaceous wetland plant communities, where baseflow from the watershed may be coming to the surface complemented by precipitation of summer fog which dominates summer weather patterns. The wetland meadows are extensive and appear to be under-represented on Figures 5 and 6 where the trail tends to get muddy during the rainy season. The trail itself is mowed periodically to maintain a 12 to 15 foot wide clear area. Examination of the stubs of the mowed vegetation growing in the trail reveals they are predominantly wetland rushes and sedges.

Segments of this portion of the Rodeo Valley trail typically become saturate and muddy during the winter and early spring. As part of the project, these wet portions of the Rodeo Valley Trail

will be treated for better drainage. Immediately west of the trail junction of the crossing leading to the Pistol Range (proposed for removal) approximately 850 linear feet of the Rodeo Valley Trail will receive hardened rock to improve drainage for bicycle use and pedestrian use. East of this treatment, the tread will be raised slightly with a geoweb fabric atop crushed drainage rock extending for another 2,150 lf eastward, and beyond that, another 1,300 lf of hardening treatment. The trail cuts through sizeable patches of dense *Carex opnupta/Juncus effusus* dominated communities. The extent of these patches does not appear on the Cowardin Phase I wetland map for Rodeo Valley, or on the Section 404 map. These trail drainage improvements are expected to protect water quality by promoting sediment capture and facilitating drainage off of these use areas. The trail drainage treatment is not expected to affect the hydrology of the surrounding wetlands.

The Rodeo Valley Trail is an historic farm road, part of the cultural landscape. It is an established linear feature that can not be casually re-routed. However, there is a 900-foot long segment that is proposed to be realigned away from the dense riparian vegetation contiguous with the creek below, approximately across and north of Smith Road. This segment does not appear to intercept any wetlands unlike the segment described above, but NPS observes that it brings people right up against a valued riparian resource which would be better preserved/protected if a new segment of trail were constructed slightly upslope and farther away from the creek corridor. The original trail will be rehabilitated, and restored to native habitat. Rerouting the portions of the trail that are poorly drained and were likely placed in wetlands well before NPS owned the land would not be less environmentally damaging because: a) the fire road (trail) is well established (wide corridor of compacted soil), b) it has historic value, and c) because a minor alignment adjustment would likely run into other as yet unmapped wetlands in the vicinity.

Site 8, Figure 5: Julian Road Trail

Proposed Action: A sizeable wetland ditch follows the southern margin of Julian Road, which is proposed to be rehabilitated for use by hikers and mountain bicyclists. This ditch drains to Rodeo Creek through a culvert under Bunker Road. The ditch itself does not appear to be contiguous with segments connected through subsurface culverts. Maintenance and rehabilitation of this channelized drainage is needed. However, because the road is by the rifle range, its soils are likely to be contaminated with lead. Therefore the site would be further studied, and site remediation performed as needed in conjunction with improvements proposed in this area.

The plan is to re-establish the inboard drainage ditch and install a new storm drain culvert under Julian Road to replace the collapsed drain. Work also includes installing a new 24-inch ditch relief culvert and inlet basin, re-establishing the inboard ditch, replacing a 36-inch drainage-crossing culvert, and installing ditch relief culverts with above-ground 15-inch down drains and energy dissipaters along the trail. Farther up the trail, there is a small hillside seep at an “s” crease in trail; one of the seeps draining toward Capehart Housing below. The proposal is to address the wet area with drainage rock and geoweb as needed. The tread would be 6 feet wide at most. The total area of wetlands affected along Julian Trail is 0.004 acre, most of which would be the conversion of a vegetated open ditch to subsurface culvert.

Wetland Resource: The drainage ditch along this road includes both vegetated and un-vegetated stretches. Dominant wetland species include slough sedge, soft sedge, and patches of arroyo willow and California blackberry. The drainage ditch serves to collect runoff from Julian Road and also likely intercepts and replaces some natural small drainages from both the slope to the south and east, and that which come off the rifle range itself, portions of which are clearly palustrine emergent wetlands themselves. Rehabilitating the culverts on Julian Road will likely

eliminate the wetland plant communities currently lining the drainage ditch, which benefits water quality and offers wildlife habitat, but a chief benefit will be to rehabilitate Julian Road for long term preservation and to better manage the runoff.

Site 10, Figure 6 – Dubois Road and Trail
Proposed action: Dubois Road, an un-maintained dirt road will be partially removed and converted to a 6 foot wide multi-use foot trail. Dubois road branches off Julian Road above Capehart Housing. There is one overgrown wetland area fed by a local spring that was saturated in August 2006, when most other wetlands had long since dried out. The wetland extends approximately 200 linear feet along the trail. Much of the dense vegetation in the road corridor will be removed during rehabilitation, and gently sloped tread along with possibly a water bar and hard base rock covered with geoweb fabric will be added to handle the water on the trail. The area of impact to wetland is approximately 0.038 acre. The wetland alterations are considered minor and should not substantially affect wetland functions.

The intercepted wetland area extends up and down the ravine and is likely contiguous, at least below the surface, with the small wetland area intercepted by Julian Road above. This wet ravine drains toward Capehart Housing where it is diverted into a subterranean culvert and ultimately discharged into Rodeo Creek. It is a perennially saturated scrub-shrub wetland that spans the dirt road. The site is dominated by arroyo willow, shining willow, and wax myrtle (*Myrica californica*, FAC+). The trail itself supports standing water and saturated soil, and is dominated by *Juncus effuses* (FACW+), dotted smartweed (*Polygonum punctatum* OBL), bugle hedgenettle (*Stachys ajugoides,* OBL) and soft rush (*Juncus effuses,* FACW). This wetland is perennially wet and was inundated at the time of the delineation in August. Upstream from this site, there is a palustrine scrub-shrub wetland that is dominated by elderberry, (*Sambucus racemosa,* FACU) and *Carex obnupta* (OBL).

Site 9, Figure 5: Fisherman's Trail/Coastal Trail
Proposed Action: The trail connecting south off of Julian Road by the Rifle Range will be removed and rehabilitated. The wetlands will likely be further enhanced. The trail intercepts a distinct palustrine emergent wetland on both sides of the trail dominated by slough sedge. This seep is believed to be hydrologically isolated, not having a recognizable surface connection to Rodeo Creek. It is probably sustained by a spring from shallow bedrock bringing baseflows to the surface. Area of wetland enhancement would be 0.027 acre.

Site 12, Figure 7 - McCullough Road Hairpin Curve
Proposed Action: McCullough Road pavement will be widened by 1 foot on each side of centerline for bicycle safety, from 22 feet wide to 24 feet, except on the switchback corner where the pavement would be further widened to accommodate large vehicles such as buses in their respective lanes. FHWA drawings indicate the curve will be widening a total of about 7 feet and cleared and graded to improve line of sight, 40 feet from centerline. Wetland ditches on the outside of the road will be deepened and redefined. The culverts under the road will be replaced. The berm in the center of the curve will be removed for sight distance and to improve drainage. It appears that the willow canopy in the center of the curve will also be substantially cut back, and not allowed to re-attain its current density. There will need to be continued thinning in this area to keep the vegetative cover low, especially given the amount of moisture passing into this area that supports the current thicket. The earthwork in the center of the curve will impact the ravine in the center of the curve. The wetland channels/ditches on the outer edge of the curve will also be regraded and probably realigned slightly but left open so the vegetation can reestablish. The area of affected wetlands is difficult to estimate but will likely be about 0.011 acre.

Wetland resource: The hairpin curve was cut through the complex of two drainages with associated palustrine vegetation when it was constructed. This wetland complex continues downslope to Capehart Housing where it is diverted through a series of ditches and culverts before emptying into Rodeo Creek. The small channels foster semi-permanent flows and palustrine scrub-shrub emergent wetland. Dominant vegetation includes arroyo willow (especially in the center of the road curve), Pacific small-reedgrass (*Calamagrostis nutkaensis*, FACW), coyote brush, California blackberry and giant vetch. Groundwater seeps from shallow bedrock supply the semi-perennial flows, with much of the water diverted to a swale along the outside of the curve. One of the two small channels flows through a culvert under the road and into the center of the curve, supporting the luxuriant willow canopy that obstructs the line of sight of motorists around the curve.

The functions of this seasonal wetland drainage corridor were partially interrupted and compromised by the construction of McCullough Road. Even so, wetland habitat persists that captures sediment and moderate flows and provides wildlife habitat. Construction impacts will temporarily disrupt these functions but they are expected to recover in the long term, depending on the prescribed vegetative clearing maintenance within the center of the curve.

Site 13, Figure 8- East Bunker Road Bicycle Path

Proposed action: Construction of a new bike path connecting Bunker Road with Fort Baker will encroach upon a portion of an intermittent drainage channel that flows from a culvert underneath Hwy101 above the site. The water course will be routed through a 30-inch diameter culvert for 30 feet so that there is enough space for a wide bike path switchback. The slope from the road to the proposed tunnel is steep, and a switchback is needed to reduce the grade and make the path both safer and easier. The new path will be a little over 8-feet in diameter and affect 0.018 acre of wetlands.

Wetland resources: The wetlands in this area are seasonal palustrine scrub-shrub wetlands. The dominant vegetation includes arroyo willow, poison hemlock (*Conium maculatum*, FACW), cow parsnip, French broom (*Genista monspessulana*, NL) and poison oak (*Toxicodendron diversilobum*, NL); the project area is generally disturbed. Dominant vegetation includes French broom (*Genista monspessulana*, NL), cow parsnip, poison hemlock (*Conium maculatum*, FACW) and sticky snakeroot (*Ageratina adenophora*, NL). In the lower reach, where the tunnel under Alexander Avenue will be located, there is a small semi-permanently flooded palustrine emergent wetland with dominant vegetation includes soft rush (*Juncus effusus*, OBL) and cattail (*Typha latifolia*, OBL). Because it is low on the landscape at the base of the filled embankment for Alexander Avenue, it is likely the wetland hydrology is due to poor drainage at the site (it may be on imported soil). This area where the bicycle path will be placed is in a kind of bowl that has wetland seeps of its own in addition to the channelized drainage coming from Hwy 101, which collectively contribute to the ponded area at the base of the bowl. Because of the predominance of invasive species, and the general disturbed nature of the area, particularly form past road construction, these wetlands are not considered to have high habitat value. Mostly they function to discharge stormwater and recharge groundwater, and the vegetation helps to retard flows down the slope.

Site 14, Figure 9, Marin YMCA and Field Road Turnaround

Proposed action: A new trail will be built by the Marin YMCA which has been routed to avoid the palustrine emergent wetland that occurs to the west of the buildings. The trail will be the standard 6 feet wide.

Wetland resource: This is a sloped wetland dominated by *Oenanthe sarmentosa* (OBL) and *Potentilla anserina* (OBL). This wetland appears to be isolated, having no apparent surface

connectivity to the navigable water (ocean) below. The wetland is likely the result of a shallow impervious layer below the surface, bringing base flow to within 12 inches of the surface, and supporting lush wetland vegetation. It has value as wildlife habitat, stormwater retention, nutrient cycling, and is an amenity for education and aesthetics.

Proposed action: A new turn-around will be constructed at Field Road near the Point Bonita Lighthouse parking area. The turn around will be located in the lower portion of an area that was included on the Cowardin Wetland maps. However, when revisited to map Clean Water Act jurisdiction, on June 1, 2006, the vegetation on the lower portion of the site which is where the turn around would be placed, did not meet the criterion for hydrophytic vegetation and the lower portion of what was previously mapped was thus not considered jurisdictional. Portions of the site are dominated by various patches of *Juncus balticus*, *Carex* spp, coyote brush and iceplant (*Carpobrotus edulis*, NL). The western portion of the mapped Cowardin wet area which had a greater proportion of hydrophytic vegetation would likely not be considered jurisdictional by the Corps of Engineers because it appears to be isolated, lacking a clear surface connection to a tributary to navigable water. It does not appear that the proposed turnaround will directly impact the wetter portion of this wetland patch.

Site 20, Figure 11 – Conzelman Road at Hwy 101
Proposed action: The road shoulder by the on-ramp to Hwy 101 at Conzelman Road will be widened and realigned slightly to improve vehicular safety. To accomplish this, the vegetated slope on the west side of the road will be cut back to create space.

Wetland resource: A canopy of thick willows occurs along this road margin that was visited in 2006 by the NPS wetland specialists. They determined that the area did not exhibit sufficient evidence that it met the hydrology criterion, and therefore, was not considered a jurisdictional wetland. The dominant vegetation includes arroyo willow, California figwort (*Scrophularia californica*, FAC) and cow parsnip (*Heracleum lanatum*, FACU). Much of this riparian vegetation, which provides wildlife habitat, aesthetic qualities, and from the deep roots of the phreatophytic willows, ground stability with only moderate moisture content, will be taken out by the proposed roadway and sidewalk improvements.

WETLAND RESTORATION AND ENHANCEMENT

In compliance with the guidance of Director's Order #77-1 in which the NPS is encouraged to recover and restore wetlands and Executive Order 11190 in which Federal agencies are to incur no net loss of wetland resources, the NPS proposes to offset the loss of 0.373 acre of wetlands from implementation of the various activities in the MH/FB TIMP. Two 0.45 acre upland sites adjacent to the lagoon and lake respectively, were selected for wetland compensatory mitigation. If successful, the 0.60 acre of the new wetlands would also fulfill the requirements of Clean Water Act Section 404 authorization, and State Water Quality Control Board waste discharge requirements for the project.

Site 17 and 18: Figure 3 – Wetland Restoration in Rodeo Lagoon and Rodeo Lake
Proposed Action: The NPS originally proposed to create 0.28 acres of estuarine emergent wetland (EEM) at the edge of the lagoon and 0.32 acres of palustrine emergent (PEM) and scrub-shrub wetland (PSS) at the lake on the other side of the road crossing, for a total of 0.60 acres of reclaimed wetland. To accomplish this, approximately 2,260 cy of gravel-sized chert fill material would be removed from Site 17, and about 2,200 cy would be excavated from Site 18 in order to re-contour and lower the ground surface to an elevation compatible with lagoon and lake levels that sustain riparian wetland plant communities. Both sites were filled by the Army when it built the Bunker Road crossing of the lagoon in the 1940s, which impounded freshwater

away from the lagoon with a weir below the road crossing that allows fresh water to drain into the lagoon but prevents brackish lagoon water from entering the lake.

The Rodeo Lagoon restoration site is currently a grassy roadside flat with a small footpath through it. The flat drops steeply to the lagoon on a rip-rapped slope that is nearly devoid of vegetation. Approximately 150 cy of this riprap will be removed. Approximately 800 to 900 cy of the lagoon fill is concrete waste that must be disposed. At Rodeo Lake, the mitigation site is a flat roadside gravel pullout and picnic area devoid of vegetation. The flat pullout transitions into a willow community as the ground steeply drops to lake level. Utilities such as a sewer main and telephone wires traverse underground through this filled area limiting the area available for wetland restoration.

Wetland plant community composition

At the lagoon mitigation site which borders brackish water, the shoreline will be planted with *Scirpus pungens* and *Scirpus maritimus.* Slightly higher and farther from shore, *Carex obnupta* will be planted, followed by *Juncus balticus* and *Salix lasiolepis* in the highest zone of the lagoon mitigation wetland. Similarly, at the lake mitigation site the shoreline will be planted with *Carex obnupta* and *Juncus balticus*. Higher and farther from shore a second zone is proposed to be planted with *Salix lasiolepis* and *Salix lucida* ssp. *lasiandra*, *Symphoricarpos albus*, *Sambucus racemosa*, and *Cornus sericea*.

Ecological Goals

The target ecological functions of the restored wetlands would be as habitat for wildlife, for groundwater recharge, nutrient cycling, and reduction of sediment laden runoff. The restoration of emergent wetland and riparian habitat is also intended to provide improved foraging and cover for the federally-threatened California red-legged frog (*Rana draytonii*) known to occur in the area. The removal of the shoreline rip-rap and establishment of natural wetland vegetation would also increase habitat quality for the federally-endangered tidewater goby (*Eucyclogobius newberryi*). (Wolf and Cooper, 2008)

Compensating Wetland Impacts from the Proposed Actions

Most of the wetland areas that will be affected by the proposed activities are seasonal palustrine emergent wetlands (PEM) that perform important natural functions such as nutrient cycling, sediment entrapment, and wildlife habitat. To a large extent, wetland impacts have been avoided by refining alignments of trails, and minimizing encroachment into wet areas as much as possible. All areas where wetlands will be permanently lost are very small, measured in hundredths of an acre. Almost all of them are located within the Rodeo Valley watershed with the exception of the East Bunker Road bicycle path, Site 13, whose watershed drains into Horseshoe Cove. None of the proposed activities results in the loss of estuarine wetlands, yet 0.28 acre of estuarine emergent wetlands (EEM) is proposed as compensation. This is considered out-of-kind. However, this represents an opportunity to gain some valuable estuarine wetlands, which have been cumulatively lost throughout the Bay Area as well as up and down the West Coast. Further, in both Site 17 and 18, the fill that will be removed for the wetland restoration, was originally placed to construct Bunker Road. In other words, fill is being removed to offset the impacts of minor fills and alterations that are planned for the improvements to the road network on the Headlands.

Site 18, in which 0.32 acre of new wetland (PEM and PSS) is planned for the freshwater impoundment upstream of Rodeo Lagoon is contiguous with the riparian wetland corridor that extends the length of the Rodeo Valley floor. The natural functions that the proposed new wetland will perform should more than offset the functions that occur within the small areas that will be impacted. This compensatory wetland type is in-kind with what will be lost.

A full wetland mitigation plan has been drafted by Dr. David Cooper and Evan Wolf from Colorado State University (Cooper and Wolf, 2008) and is being refined in preparation for submittal to the San Francisco District Army Corps of Engineers and San Francisco Bay Regional Water Quality Control Board for Clean Water Act authorizations. The Plan specifies that compensatory wetland mitigation will be performed both prior to and simultaneously with the road and trail improvements in the Headlands. The Plan requires five years of monitoring and remedial work as needed, including the removal of invasive species, and the establishment of a reference site and success criteria. Emergent wetland plants should be well established within two to three years, and the wetland scrub-shrub vegetation should be well –established and achieving maturation within five years.

As per the proposed mitigation plan, a list of native plants that are to be planted at each site was generated and has already been submitted to the GGNRA native plant nursery staff so that seeds may be collected within the park for propagation in preparation for planting the Fall of 2010. Following the certification of the WSOF and concurrent with the public review of the FEIS, NPS will submit the proposed mitigation plan with a request for Clean Water Act nationwide permit authorization. Once the authorization is obtained, NPS will arrange to initiate work on the mitigation plan. NPS expects to perform much of the work ourselves, or use a contractor. Funding for the construction of the compensatory wetlands is largely from the Federal Highway Administration's Federal Lands program that is paying for most of the road improvements associated with the MH/FB TIMP.

Compensatory Mitigation Summary

The wetland mitigation for this project was planned somewhat ahead and independent of the tracking and defining wetland impacts. Now that the project impacts within the boundaries of Clean Water Act jurisdiction are better understood, NPS realizes that the total area of impacts to waters of the U.S. from all the proposed road and trail improvements would not be greater than 0.36 acre of wetlands. Of this, adverse impacts to about 0.19 acre (over 7 separate locations) would be attributed to the proposed road improvements. Impacts to wetlands from the proposed trail work would amount to 0.17 acre. Of the 0.17 acre, 0.11 acre is the footprint of the two new trail crossings of Rodeo Creek, which are not be considered fill activities because the trails would be elevated over the floodplain on a structure.

These small aerial estimates of impacts reflect thoughtful NPS and FHWA planning to avoid altogether and then minimize to the greatest extent practicable, impacts to waters of the U.S. from this project. As a consequence, NPS and FHWA have reduced their obligation to offset impacts through compensatory mitigation. It is possible, after final design and layout is considered, that only one of the two compensatory mitigation sites would suffice to ensure no net loss of wetland acreage, functions or values. However, NPS will commit to restoring wetlands on both compensatory wetland mitigation sites (Lagoon and Lake totaling 0.60 compensation acres for 0.36 acres of wetland impact). In addition, it should be noted that NPS will be removing two existing trails crossing the Rodeo Creek floodplain that were constructed on fill and will restore wetland habitat at these locations. This comes to 0.12 acre of restored wetlands, in addition to the compensatory mitigation.

Waters of the U.S. Impacts (Acres)	Compensatory Mitigation (Acres)	Compensatory Ratio
0.36	0.60	1.67

Site 16, Figure 3, Wetland Restoration at the Rodeo Beach Parking Lot
Within the Project Area, a connected but separate project is proposed to enhance and restore the large wetland area situated at the end of Mitchell Road, Fort Cronkhite. This restoration project would be performed pursuant to guidance in the NPS Director's Order #77-1, but would not be considered mitigation for the impacted wetlands resulting from the MH/FB TIMP. This project is connected to the MH/FB TIMP through the improvements to Mitchell Road that call for replacement of the culverts that drain the ditch and runoff from the large wetland. The construction of a bulkhead structure with concrete wing walls that anchored a large culvert to be placed underneath Mitchell Road was originally planned for this area, but more environmentally friendly designs are currently being explored for implementation with the project. Because the NPS is still in pursuit of sufficient funds, this restoration project would likely be undertaken after most of the MH/FB TIMP improvements have been completed.

Essentially, potential restoration sites within the Rodeo watershed were evaluated in the past, and the restoration of the Rodeo Beach parking lot (Site 16, Figure 2) appears to provide the greatest opportunity for wetland restoration with the fewest constraints (Shaw 2005). The NPS recently arranged to have a conceptual wetland restoration design and guidelines developed for the Rodeo Beach parking lot by a team of wetland scientists from Colorado State University, in cooperation with GGNRA specialists. The goal is to recreate the natural conditions which were present prior to the Army's filling of wetlands for roads and parking,

The palustrine emergent wetland at the end of the Mitchell Road upslope and north of the Rodeo Beach parking lot occupies approximately 4.7 acres total, of which 0.060 acres is willow shrub. The mid-upper portion is seasonally flooded and impounded emergent wetland. This basin is dominated by *Scirpus microcarpus* (OBL). The retaining wall, reflecting part of the historic use of this site, influences the hydrologic character. Below the palustrine emergent wetland is dominated by *Juncus balticus* (FACW+) and *Vicea gigantea* (NL). There are sinkholes within the lower scrub-shrub habitat that run through the center of this wetland up to 12 feet deep in some places. Much of the wetland complex drains into a vegetated ditch, which ultimately discharges through 2 two-foot wide culverts below Mitchell Road, into a finger of the Lagoon on Rodeo Beach. The sinkholes connect with a two-foot wide pipe at a depth of 10 feet. A ditch along the downstream edge of the arroyo willow scrub wetland diverts water south then west to Rodeo Beach.

Figure 11 shows the restoration project area in yellow which covers about 8.5 acres altogether. The design of this restoration project is in progress so all acreage estimates are very approximate. Essentially, about 0.9 acre of wetland, shown in red, will be filled with suitable substrate to negate the substantial gullies and surface irregularities caused by past site human alternations (0.74 acre of these are currently wetland). The area to be filled is shown in red, and the 1.6 acres to be excavated are shown in blue. All of the filled or excavated areas will be restored as wetlands, though some will shift from shrub to emergent. About 1.3 wetland acres from what is now upland parking lot will be converted back to wetland. As of October 2008, it is projected that NPS would replant about 3.8 acres of wetlands from above the farm road down the slope to underneath Mitchell Road, which will span the newly recreated wetland.

Under current conditions, Mitchell Road forms an impervious, static barrier between Rodeo Beach and upslope areas. Historic Coast Geodetic Survey maps from the 1850's show dunes extending into the lower portion of the unpaved parking lot. It is doubtful that these "dunes" were from wind-derived materials given the coarse materials present on Rodeo Beach. The natural condition of the shoreline would likely have been an alternation between active scarps in relict washover terrace deposits or alluvial fan deposits, and partially infilled, re-vegetated scarps (Baye 2006).

Replacement of existing road fill and culverts with a free-spanning structure at Mitchell Road will result in long-term, moderate benefits depending upon the length of the free-spanning structure. Beneficial impacts could include the development of dynamic banks cut into temporarily stabilized washover terraces formed by storm events. Aesthetic improvements will also result from the removal of road fill in this shoreline area, affording visitors a visual connection with the Pacific Ocean, beach, and upslope wetlands.

REGULATORY COMPLIANCE

Clean Water Act

The NPS will submit a request to San Francisco District Army Corps of Engineers for confirmation that the project is covered under Section 404 Nationwide permits 14 and 42. Nationwide permits (NWPs) are General permits for categories of activities that both individually and cumulatively have minimal adverse impacts to the aquatic environment (72 FR 11093). NWP 14 covers fill discharges associated with linear transportation projects, especially culverts and bridges. NWP 42 applies to development associated with recreational facilities for the non-linear components of the project, such as the parking areas. Neither of these NWPs may be applied if the total permanent loss of jurisdictional waters including wetlands exceeds 0.50 acre. The total area of jurisdictional waters (including wetlands) that may be permanently lost in this project is only 0.27 acre, while the compensatory wetland restoration project aims to restore up to 0.60 acre, in addition to the 0.12 acre of rehabilitated wetlands in the trails that will be decommissioned. The 0.60 acre of compensatory mitigation represents restoration of 0.28 acre of wetland in Rodeo Lagoon and 0.32 acre of wetland in Rodeo Lake. If funding is available to construct only one of these sites, NPS would likely pursue restoration at the Lagoon site because it would benefit a greater number of sensitive species. Pending approval by USACE for Section 404 authorization, compensatory mitigation of 0.28 acre rather than 0.60 acre may still adequately offset the long term impacts to 0.27 acre of wetlands, in combination with the removal of fill and restoration of wetlands associated with decommissioning three trails. (They amount to 0.118 acre of existing fill for trails to be removed in wetland areas). In either scenario, the NPS believes that with the implementation of the proposed compensatory mitigation the project will result in a net gain in area and function of wetlands on the Marin Headlands.

To confirm the NPS mapping of waters of the U.S. within the project areas, the NPS submitted a set of maps along with a report describing each site along with field data sheets to the Corps on November 24, 2006. Staff at the Corps of Engineers visited the site to verify the wetland boundaries in February 2007 and in August 2007. Since then, the mapped wetlands have been revised slightly, along with a few project modifications. The NPS will resubmit the revised jurisdictional maps along with the Pre-Construction Notification to the Corps in the near future, pending the completion of more refined project designs for the Smith Road parking lot and the footbridges that cross the riparian floodplain of Rodeo Creek.

The NPS will apply to the San Francisco Bay Regional Water Quality Control Board for a water quality certification waiver and waste discharge authorization, concurrently with our Corps NWP submittal request.

Endangered Species Act

The Rodeo Creek wetland complex is designated as critical habitat for the California Central Coast (CCC) coho salmon (*Oncorhynchus kisutch)* although observations of this species in the watershed have not been documented. Threatened CCC Steelhead trout *(Oncorhynchus mykiss)*, are know to occur. The National Marine Fisheries Service (NMFS) recommended in a letter dated August 7, 2007 which constituted informal Section 7 consultation under the Endangered Species Act, that the proposed new trail crossings of Rodeo Creek should span the

entire wetland floodplain. This would avoid all but very minor impacts on wetland floodplain function and hydrology. The proposed removal of historic fill from the two creek trail crossings is expected to enhance, rather than adversely impact fish habitat. The demolition and removal of existing bridges or construction of new bridges will be done from the top of the bank to the extent feasible.

NMFS has concurred that the proposed project is not likely to adversely affect either of the two listed salmonid species, based on NPS's commitment to construct the free spanning crossings, and also to implement best management practices (BMPs) to control or eliminate potential erosion, sedimentation, and other pollution sources. (See WLD-8 in the Final EIS.) Further, all work in the floodplain will be performed during the dry summer and autumn months when water in the creek is at its lowest levels and likely no fish are present. Many of the BMPs for salmonid fish have been incorporated in the list of BMPs below.

NPS determined that proposed activities adjacent to Rodeo Lagoon may affect the endangered tidewater goby (*Eucyclogobius newberryi).* Specifically, construction of the proposed 0.28 acre of restored wetland as compensatory mitigation at Site 15 by the road would alter the north eastern shoreline of Rodeo Lagoon. Similarly, the USFWS Biological Opinion also addresses potential impacts of project activities to the California Red-legged frog (*Rana aurora draytonii*). Potential impacts to tide water goby habitat and the California red-legged frog and its habitat are addressed in detail in the USFWS Biological Opinion, and summarized in the Final EIS in the section about endangered species.

Several of the acreage estimates of wetland habitat quoted in both the USFWS Biological Opinion and NMFS letter of concurrence that would be affected by the proposed project, including wetland restorations, may not be consistent with the acreages presented in the Wetland Statement of Findings. This is due to the early dates of the Section 7 consultations and conferencing, relative to the more precise jurisdictional wetland mapping and quantification of aerial impacts that subsequently was accomplished in the preparation of the WSOF. NPS will fully address these discrepancies with both NMFS and USFWS at a future time.

SUMMARY OF WETLAND FUNCTIONS AND VALUES

The wetlands in Rodeo Valley perform the following functions, although many sites are not reaching their full potential because of degraded conditions.

Biotic Functions

The relatively dense layer of herbaceous vegetation in the emergent wetlands and scrub-shrub wetlands provides a variety of benefits for many wildlife species such as foraging habitat and shelter for birds and mammals. Some of the species that utilize the wetlands are not tied to specific localities. As an example, the Townsend's big-eared bat and avian insectivores (e.g., violet green swallow) feed on insects that are produced from Rodeo Lagoon/Lake and the fringing wetlands.

Significant inventory work has been done in coastal wetland and riparian habitats in the Marin Headlands and many common mammal and herpetofauna have been detected there (Semenoff-Irving and Howell 2005). Ten species, including California vole and deer mouse, have been found in riparian and coastal wetland habitats (Semenoff-Irving and Howell 2005).

Rodeo Lagoon provides both seasonal and year-round habitat for a variety of birds. A total of 304 bird species have been identified over a 10-year survey period. Many of the observed

species are wetland or aquatic-dependent species such as mallards (resident), California brown pelican (seasonal), swamp sparrow, and common yellowthroat.

Many of the native plant communities in the Rodeo Lagoon area are considered rare by the State of California and the California Native Plant Society: central dune scrub, northern coastal salt marsh (Site 16), coastal brackish marsh, coastal freshwater marsh (Site 14), and central coast riparian scrub.

Project wetland sites that border Rodeo Lagoon and Lake provide habitat for various native fish species including three spine stickleback and prickly sculpin. The Federally endangered tidewater goby is found in Rodeo Lagoon, which has also been designated as critical habitat for the species. The brackish lagoon provides both rearing and foraging habitat for this fish. However, the presence of unnatural substrates (rock riprap) at Site 17 provides marginal value for this species which is found more commonly in unconsolidated substrates.

Federally threatened steelhead (Central California Coast distinct population segment) is also found in the Rodeo watershed with much of their juvenile life stages spent in creeks draining into Rodeo Lake. The palustrine scrub-shrub habitat associated with Site 3 provides essential habitat features for this species including terrestrial insects for food, wood materials to maintain channel form and function, and overhead provides an instream cover. Some of these essential functions are short of their full potential at this site because of entrenched channel conditions and loss of adjacent floodplain.

Some of the wetland sites provide breeding and foraging value for amphibians and reptiles. Breeding habitat for amphibians may be present in situations where slow-moving surface water may be retained for several months or be downstream of such areas (Site 3). At these locations, Pacific chorus frog and rough-skinned and California newts have been known to breed. Emergent wetland vegetation often serves as an attachment surface for eggs.

The project wetland sites also serve as rearing and potential breeding habitat for the California red-legged frog (Wood 2005, 2007). Some of the small drainages adjacent to the Presidio Riding Club as well as Rodeo Creek contain pools with dense adjacent cover that could provide for non-breeding use by the red-legged frog (Wood 2005). The emergent wetlands at Site 17 provide potential breeding habitat, although suboptimal, for this species. As with the other amphibians in this area, the emergent vegetation provides sites for egg attachment. However, the sparseness of emergent vegetation (due in part to riprap fill), brackish conditions, and fluctuating water levels during the winter breeding period are less than optimal for breeding. The presence of road-killed red-legged frogs around Rodeo Lake during the winter, indicate movement from non-breeding rearing habitats to breeding sites within the pond (Fong and Campo 2006). The high insect production (e.g., chironomid midges) at Rodeo Lake and Lagoon provide good foraging opportunities for the frogs.

Hydrologic Functions

Palustrine habitats play an important role in flood attenuation and sediment retention. Wetlands located below roads and other developed areas also serve to retain sediment and degrade nutrients before the runoff enters downstream systems. Estuarine habitats also play a role in flood control as well as ground water discharge. In addition, estuarine wetlands help to anchor the shoreline and dissipate erosive forces, protecting inland sites from storm surges.

Aesthetic/Recreational Values

Palustrine and estuarine habitats are important for passive recreational use within the park. Significant aesthetic values such as majestic views have brought appreciation and awareness of

these habitats to approximately two million park visitors every year. As an example, the Google Earth™ map of the Rodeo Lagoon vicinity has several links to photos taken by tourists of the estuarine wetland and fringing emergent wetlands with the Pacific in the backdrop as well as soaring brown pelicans.

Research/Scientific Values
Wetland habitats provide rich opportunities for scientific research. For example, they provide opportunities for research in the effectiveness of wetland restoration techniques. One of the wetland sites (Site 16, Rodeo Beach Unpaved Parking Lot) has been the site of intensive study by researchers from U.C. Berkeley and Colorado State Univ., specifically looking at how existing wetland conditions have been altered by human activity and possible restoration options. In addition, because of the Park's interest in protecting and restoring wetlands in this area, significant scientific investigation has been done in mapping wetlands (Castellini et al 2006), understanding historic wetland conditions (Striplen et al., 2004), and monitoring of threatened and endangered species.

Economic Values
For the reasons listed above, the wetland habitats could provide significant economic value for tourism and park partners. Currently, the watershed supports the Headlands Institute (HI), Marine Mammal Center and YMCA who have dedicated programs that focus on bringing real natural environment experiences to grammar school students. Environmental education programs from just the HI alone, serves some 250 students a week. Many of their programs focus on wetland and aquatic habitats, particularly Rodeo Lake. Site 18 serves as the main entry and staging locations for their school programs in teaching pond ecology.

BEST MANAGEMENT PRACTICES

The NPS and its contractors will implement Best Management Practices (BMPs) to minimize direct and indirect project-related impacts to sensitive wetland resources. The following BMPs will be implemented as appropriate, prior to, during, and/or after construction activities. More extensive BMPs may be found in the MH/FB TIMP Final EIS.

- Implement natural resource protection measures identified in the Final EIS. Standard measures include construction scheduling, biological monitoring, erosion and sediment control, use of fencing or other means to protect sensitive resources adjacent to the work area, and rehabilitation of disturbed areas.
- Inspect the work area to ensure that impacts stay within the parameters of the project and to ensure that the project conforms to all permits and project conditions.
- Confine work areas within wetlands, such as work pads that support construction equipment, in the smallest area necessary.
- To minimize the possibility of toxic substances seeping into soil or water, check construction equipment frequently to identify and repair any leaks. Standard measures include hazardous materials storage and handling procedures; spill containment, cleanup and reporting procedures; and confining refueling and other hazardous substance handling to designated upland sites.
- Store all construction equipment within the designated work area, and always well away from wetland areas.
- Avoid inadvertent damage to natural vegetation in and around the work areas. Provide temporary barriers to protect all trees, plants, and root zones as necessary, under the direction of the site biological monitor. Protective fencing will remain in place until all work is completed.

Erosion Control Plans will be prepared for various the components of the Project. Each site-specific plan will identify measures that will prevent erosion and sedimentation during construction, including the following:

- Construction equipment will not be operated in flowing water.
- Where construction areas are adjacent to or encroach on live streams, adequate barriers will be constructed to prevent the discharge of any substrate into an active channel.
- All disturbed soil and fill slopes will be stabilized in an appropriate manner.
- Surface drainage facilities will be designed to transport runoff in a non-erosive manner.
- Erosion control measures will be in place prior to construction activities and in good repair by October 15 of each year;
- Erosion control measures will be inspected daily during construction activities and monthly following construction activities, and adjusted/re-enforced as needed.
- Salvage hydric soils and use them as fill in wetland excavations to the maximum extent possible. Minimize use of fill materials with high permeability in wetland areas to prevent development of unnatural groundwater conduits.
- The BMPs for Invasive Plant Species Control from Chapter 4 of the Final EIS will be carefully followed in wetlands and riparian areas.
- Cover exposed soil with a combination of locally acquired native duff from adjacent riparian sites to provide immediate groundcover and facilitate the establishment of natural revegetation; Mulch or erosion control fabric will be placed on all bare riparian ground that results from project construction.
- Develop and implement a monitoring plan to ensure successful revegetation, maintain plantings, and replace unsuccessful plantings.
- Use native or seed-free mulch to minimize surface erosion and introductions of non-native plants.
- In general, cleared plant and soil material will be stored and reused at the site to the greatest extent practicable.

Steelhead BMPs

- To minimize impacts to steelhead, free-spanning structures will be used to negate the need to perform in-channel construction activities in Rodeo Creek. There would be no need to enter the channel, dewater the stream, or capture and relocate steelhead. Compensation actions that remove fill will avoid having to place equipment in the water, which in turn will also avoid impacting steelhead and other fish.
- Construction activities that may affect steelhead, including removing fill from Rodeo Lagoon, constructing new Rodeo Creek crossings, and removing existing crossings will be performed from July 1 to October 15.
- Roadside maintenance work including culvert replacements, on Bunker and Mitchell Roads and trail maintenance work along the Rodeo Valley Trail in the vicinity of Rodeo Creek, Lake, or Lagoon will be performed only in the dry season.
- Rehabilitation of riparian areas would be accomplished by hand treatment techniques, using erosion control materials if treatment areas were bare prior to rains, planting vegetation where needed and where possible, returning native woody material (large woody debris) to stream banks.

California red-legged frog BMPs

- Project Activities in the vicinity of Rodeo Creek and Lake would be performed only during the non-breeding season for California red-legged frogs (May through October).

- Roadside maintenance work on the shoulders of Bunker and Mitchell roads, as well as trail maintenance work along the Rodeo Valley Trail in the vicinity of Rodeo Creek, Lake or Lagoon, would only occur in the non-breeding season, except as required for emergency situations such as clogged culverts causing flooding.
- Silt fencing would be installed between Rodeo Lake and the work area during construction and restoration activities to exclude red-legged frogs from the work area and to protect existing lakeside riparian and emergent wetland habitat; if individuals were located within the work area or between the silt fencing and work area, a qualified and permitted biologist would collect and relocate any individuals to nearby suitable habitat.

Smith Road Parking Lot Measures

- The parking area will be configured so that the lowest portion of the site collects and retains stormwater from the parking lot in a grassy bioswale.
- Only the driving isles will be paved. The parking areas will be on pervious substrate.
- Stormwater from the surface of the parking lot will not be able to discharge directly into the Rodeo Creek wetland complex north of the site.
- All features of the site that are designed to capture potential water pollutants and prevent their entry into the Rodeo Creek floodplain will be maintained regularly to ensure proper function over the long term.

CONCLUSION

The purpose of the project is to provide greater access to and within the Marin Headlands and Fort Baker for a variety of users; and to initiate these improvements in a way that minimizes impacts to the rich natural diversity and cultural resources of the Marin Headlands and Fort Baker. Alternative 3, the preferred alternative, would result in localized, temporary and permanent impacts to wetland resources throughout the Project Area. However, the proposed project has been designed to avoid and minimize impacts to wetland resources to the greatest extent practicable. Thus, adverse effects on wetland resources are anticipated to be minimal and the proposed project would not be expected to have an overall detrimental effect on wetland resources within the Project Area. The localized impacts to wetland resources would not be of sufficient magnitude or nature to impair the functions and values of wetland resources that are necessary to fulfill specific purposes identified in the park's establishing legislation, key to opportunities for enjoyment of the park, or identified as a goal in the park's General Management Plan or other relevant planning documents.

All in all, Project Activities are expected to result in adverse impacts to a total of about 0.36 acre of wetlands. A portion of those impacts will be short term construction impacts in which wetland habitat will recover over time; longer term impacts to wetland will amount to close to 0.27 acre. To offset those impacts, NPS will perform compensatory mitigation by restoring a total of 0.28 acre of estuarine wetland in Rodeo Lagoon, and possibly 0.32 acre of palustrine wetland in Rodeo Lake. Additionally, with the removal of trails within the Rodeo Creek wetland complex, about 0.12 acre will be restored from decommissioned trails. All told, NPS is consistent with its no net loss of wetland policy.

The National Park Service finds the Preferred Alternative to be consistent with the NPS Director's Order 77-1.

REFERENCES

Baye, P.R. September 5, 2006. Rodeo Lagoon-northwestern wetland-terrestrial ecotone and freshwater fen. Memorandum prepared for Darren Fong, National Park Service, Golden Gate National Recreation Area, 10 pp.

Cooper, D., and E. Wolf. 2008. Compensatory Wetland Mitigation Plan, Marin Headlands/Fort Baker Transportation Infrastructure Improvement Plan, Golden Gate National Recreation Area. Department of Forest, Rangeland and Watershed Stewardship, Colorado State University, Fort Collins, Colorado.

Castellini, L., D. Fong, D. Schirokauer, S. Miller, and A. Parravano. 2006. Wetlands inventory for Golden Gate National Recreation Area 2002-2004 including Rodeo Valley, lower Redwood Creek watershed, Mori Point, and Bolinas Lagoon sites. San Francisco Bay Area Network, Inventory and Monitoring Program. National Park Service. 35 pp+appendices.

Cowardin, L.M., V. Carter, F.C. Golet and E.T. LaRoe. 1979. Classification of wetlands and deepwater habitats of the United States. U.S. Department of the Interior, Fish and Wildlife Service, Washington D.C. Jamestown, ND: Northern Prairie Wildlife Research Center Online. http://www.npwrc.usgs.gov/resource/1998/classwet/classwet.htm (Version 04DEC98).

Environmental Laboratory. 1987. Corps of Engineers Wetlands Delineation Manual. (Technical Report Yl-87-1). U.S. Army Corps of Engineers, Waterways Experiment Station, Vicksburg, MS. (Corps Manual).

Feierabend, C. 2004. Historic Road Characterization Study, Supplemental Work.

Fong, D. and J. Campo. 2006. Calendar Year 21003-2005 California red-legged frog (Rana draytonii) surveys, Golden Gate national Recreation Area. Unpublished report prepared for the National Park Service Golden Gate National Recreation Area and U.S. Fish and Wildlife Service Endangered Species Permits. 35 pp.

Kamman, R., G. Kamman & S. Higgins, K. L. May, 2008. Technical Memorandum: Summary of Site Conditions for the Headlands Institute Stream Corridor and Watershed. Prepared for Design Team at GGNRA.

National Park Service. 2008. National Park Service Procedural Manual #77-1: Wetland Protection.

National Park Service. 2008. Marin Headlands/Fort Baker Transportation Infrastructure and Management Plan Final Environmental Impact Statement.

Ranz, S.1971. Mean Annual Precipitation and Precipitation Depth-Duration-Frequency Data for the San Francisco Bay Region, California. U.S. Geological Survey Open File Report

Reed, Jr., P.B. 1996. National list of plant species that occur in wetlands: 1996 California (Region0). Draft. United States Department of Interior Fish and Wildlife Service, St. Petersburg, Florida.

Sawyer, J., and T. Keeler-Wolf. 1995. A Manual of California Vegetation. California Native Plant Society, Sacramento, California.

Shaw, S. David. 2005. Wetland Processes and Restoration Opportunities in the Rodeo Lagoon Watershed, Golden Gate National Recreation Area, Marin County, California.

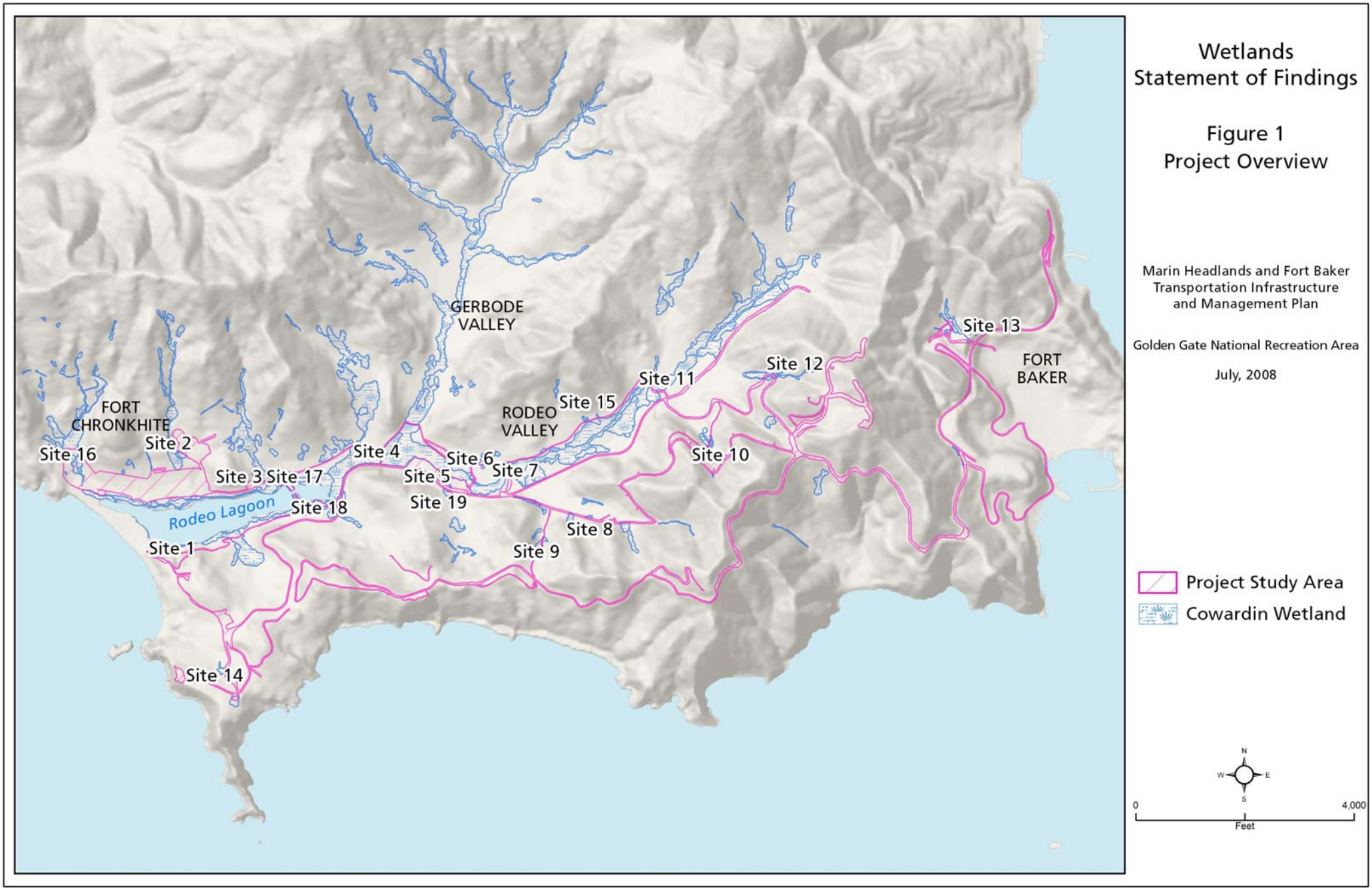
Semenoff-Irving, M. and J.A. Howell. 2005. Pilot inventory of mammals, reptiles, and amphibians, Golden Gate national Recreation Area, California, 1990-1997: U.S. Geological Survey, Open-File Report 2005-1381, 107 p.

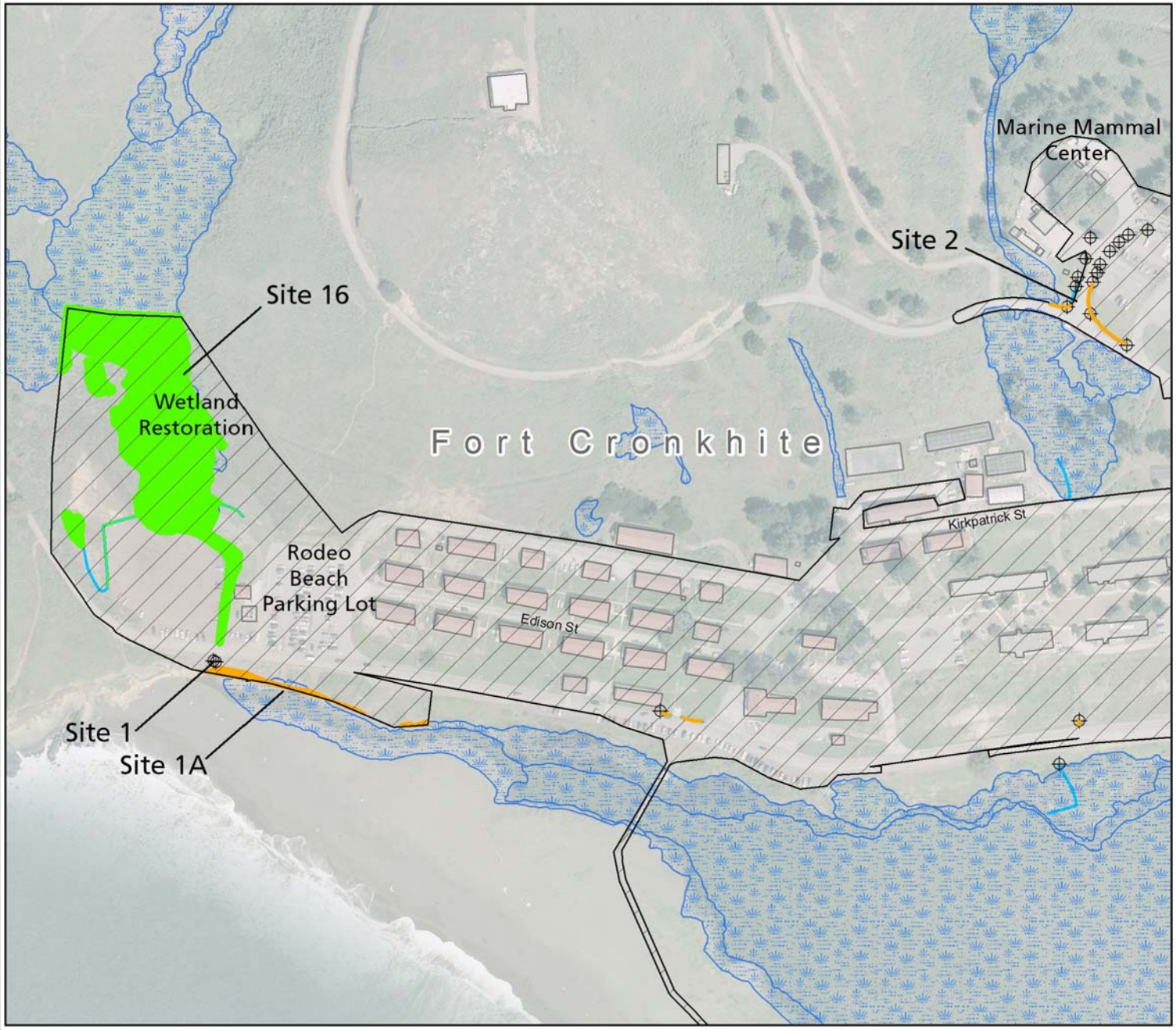
Striplen, C., R. Grossinger, and J. Collins. 2004. Wetland Habitat Changes in the Rodeo Lagoon Watershed, Marin County, California. A Technical Report of the Historical Ecology and Wetlands Programs, SFEI Contribution 116, San Francisco Estuary Institute, Oakland, California.

USDA, Soil Conservation Service. 1992. Field Office Official list of Hydric Soil Map Units for Marin County, California.

Wood, L.L. 2005. 2004-2005 California red-legged frog (Rana aurora draytonii) studies- habitat assessment report: Rodeo Creek tributaries and Tennessee Valley Creek and winter breeding surveys: Rodeo drainage. Unpublished report prepared for Golden Gate National Recreation Area

ATTACHMENT A – PROJECT FIGURES


GERBODE VALLEY
RODEO VALLEY
FORT CHRONKHITE
FORT BAKER
Site 1
Site 2
Site 3
Site 4
Site 5
Site 6
Site 7
Site 8
Site 9
Site 10
Site 11
Site 12
Site 13
Site 14
Site 15
Site 16
Site 17
Site 18
Site 19
Rodeo Lagoon
Wetlands
Statement of Findings
Figure 1
Project Overview
Marin Headlands and Fort Baker
Transportation Infrastructure
and Management Plan
Golden Gate National Recreation Area
July, 2008
Project Study Area
Cowardin Wetland
N
W
E
S
0
4,000
Feet



Wetlands Statement of Findings

Sites 1, 1A, 2 and 16

Marin Headlands and Fort Baker Transportation Infrastructure and Management Plan

Golden Gate National Recreation Area

July, 2008

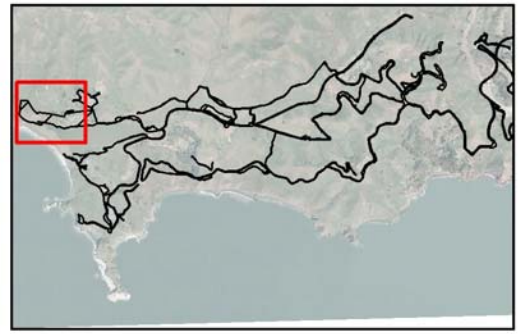
- Potentially Impacted Wetland
- Restored Wetland
- Project Study Area
- Cowardin Wetland (Outside of Study Area)
- Culvert

N W E S

0 400

Feet

Area of Detail



Sources: Marin County, NPS and Federal Highway Administration.

Figure 2, Fort Cronkhite West

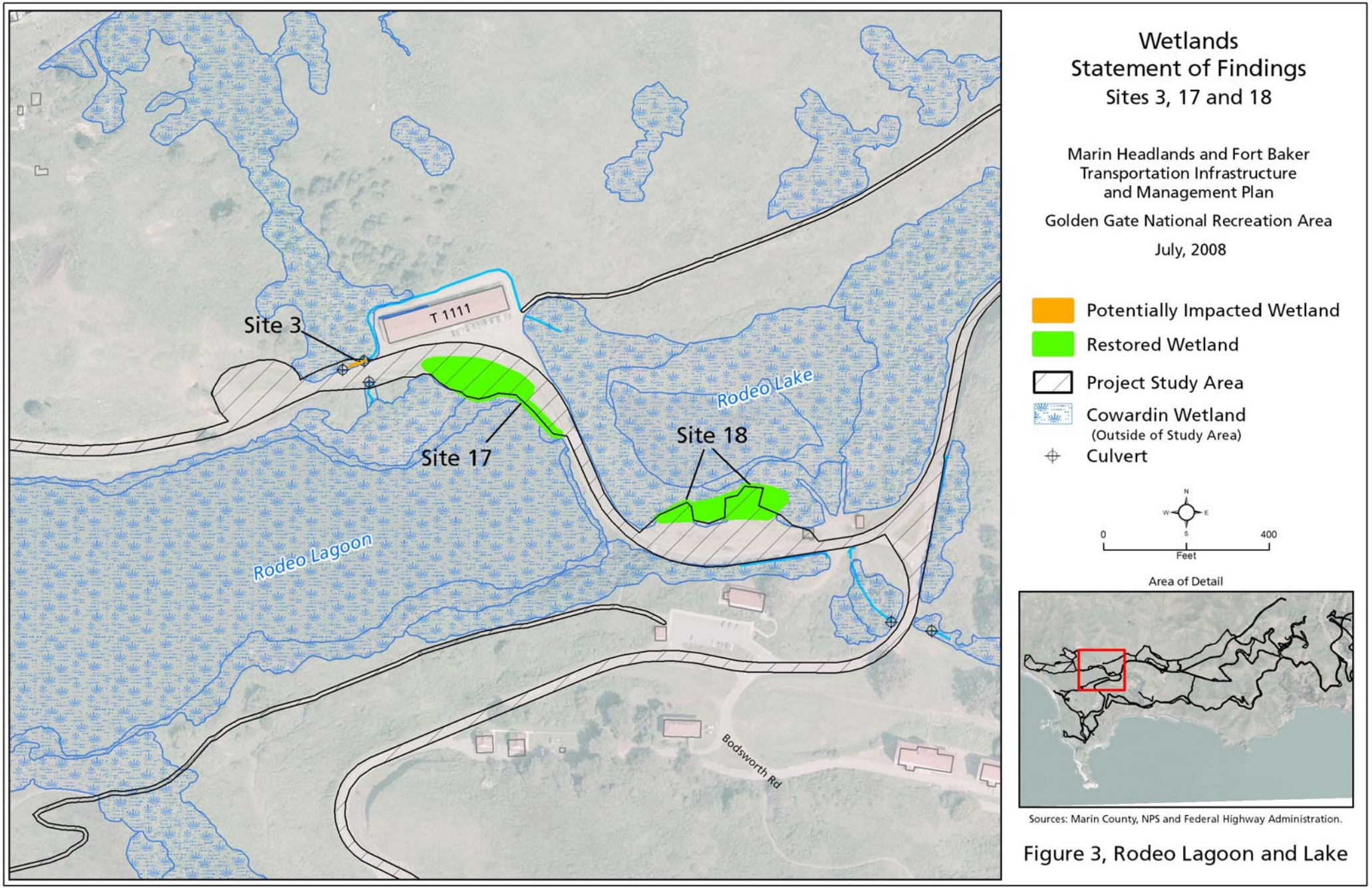
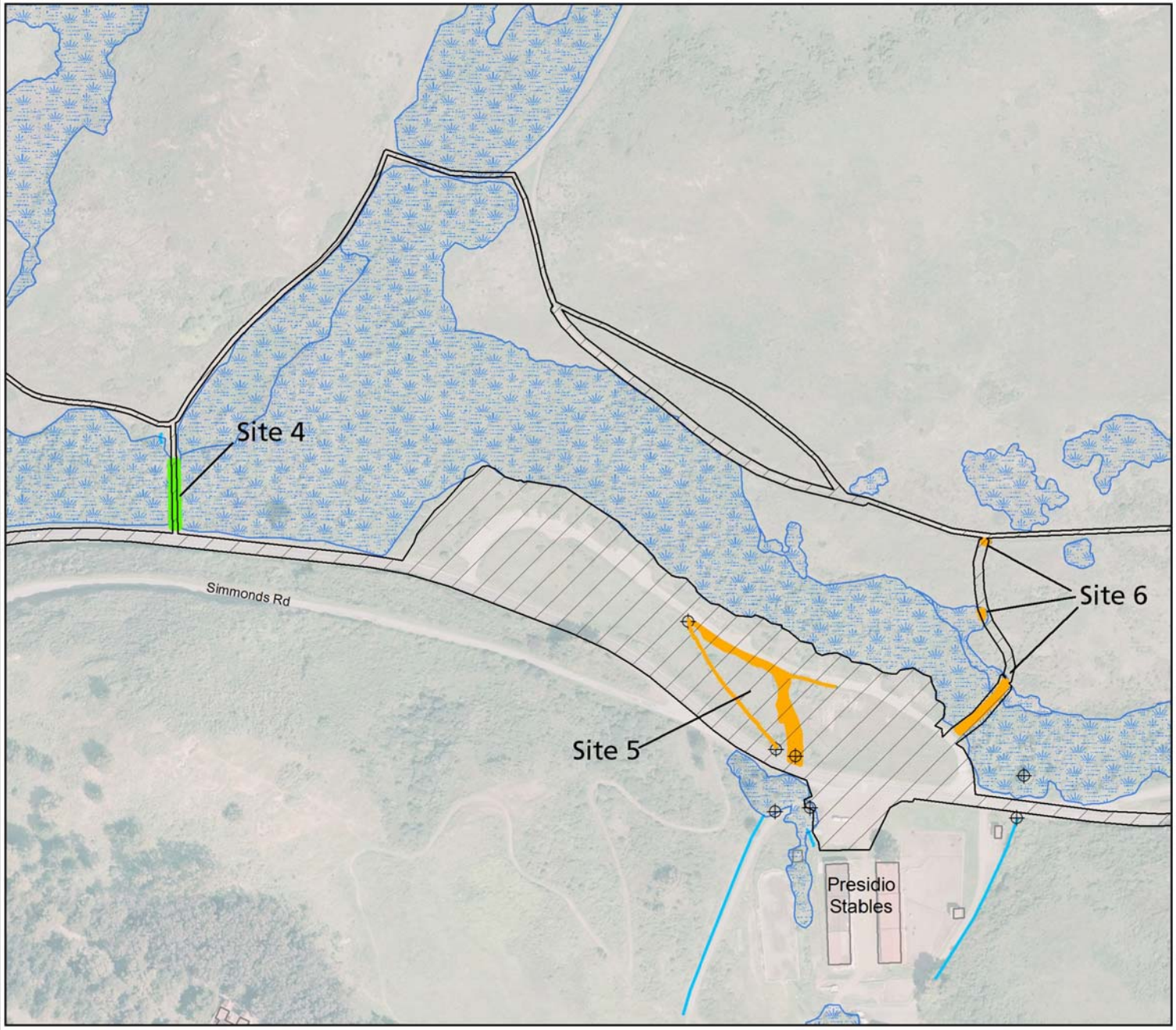


Figure 3, Rodeo Lagoon and Lake



Wetlands
Statement of Findings
Sites 4, 5, 6 and 19

Marin Headlands and Fort Baker
Transportation Infrastructure
and Management Plan

Golden Gate National Recreation Area

July, 2008

Potentially Impacted Wetland

Restored Wetland

Project Study Area

Cowardin Wetland
(Outside of Study Area)

Culvert

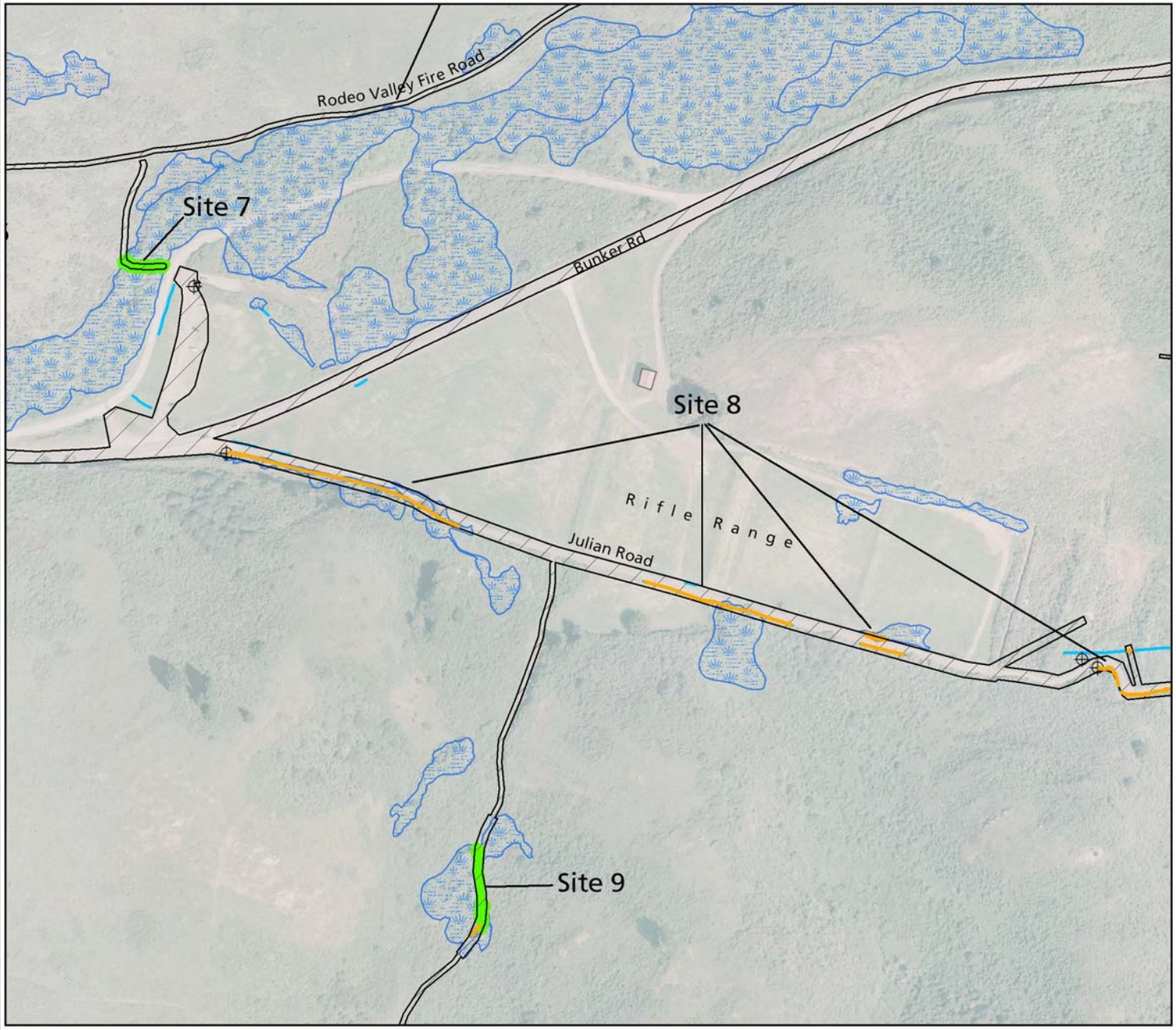
N
W E
S

0 400
Feet

Area of Detail

Sources: Marin County, NPS and Federal Highway Administration.

Figure 4, Smith Road



Wetlands
Statement of Findings
Sites 7, 8 and 9

Marin Headlands and Fort Baker
Transportation Infrastructure
and Management Plan

Golden Gate National Recreation Area

July, 2008

- Potentially Impacted Wetland
- Restored Wetland
- Project Study Area
- Cowardin Wetland
  (Outside of Study Area)
- Culvert

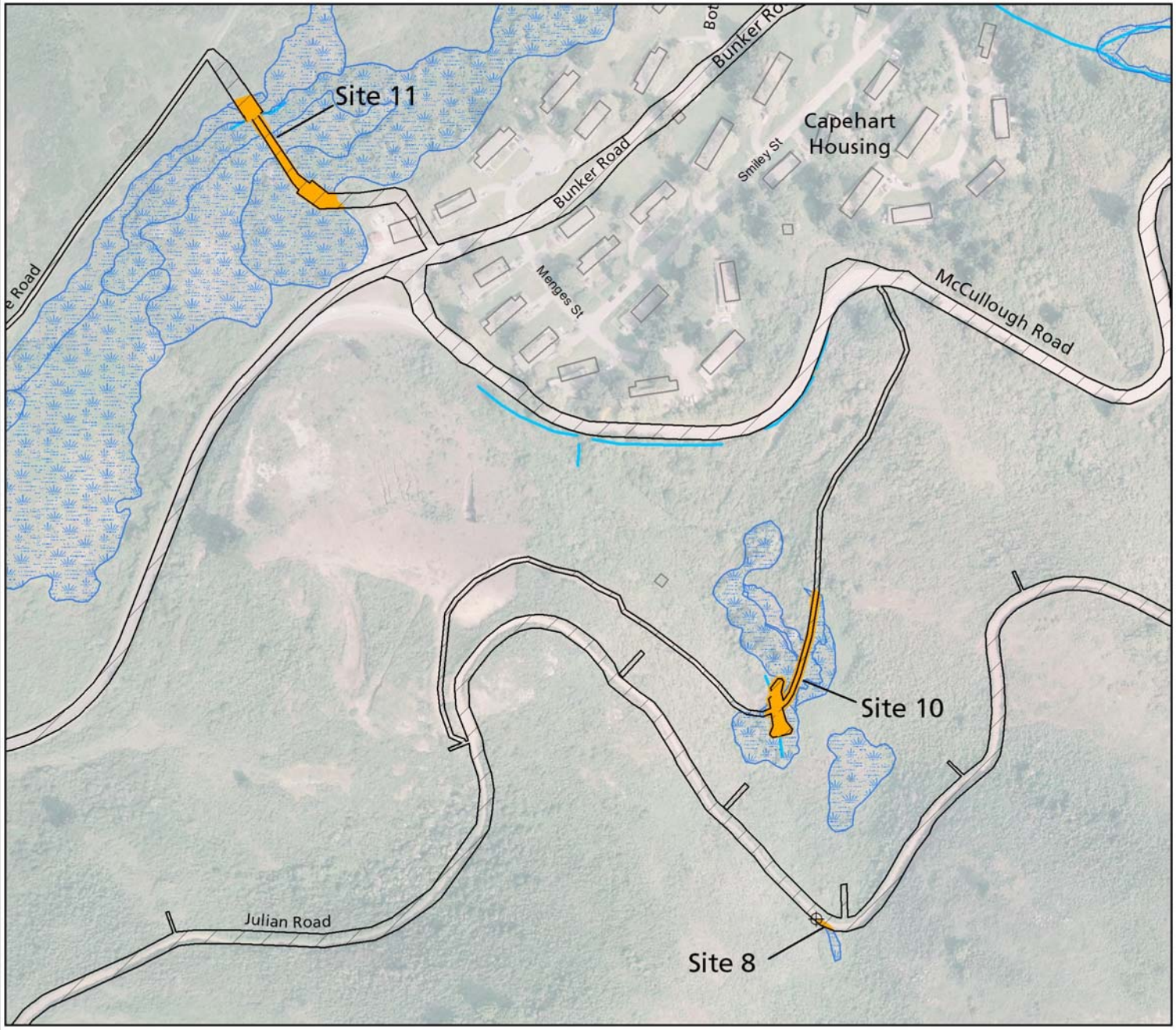
N
W E
S

0 400
Feet

Area of Detail

Sources: Marin County, NPS and Federal Highway Administration.

Figure 5, Rifle Range



Wetlands Statement of Findings

Sites 8, 10 and11

Marin Headlands and Fort Baker Transportation Infrastructure and Management Plan

Golden Gate National Recreation Area

July, 2008

- Potentially Impacted Wetland
- Restored Wetland
- Project Study Area
- Cowardin Wetland (Outside of Study Area)
- Culvert

N W E S

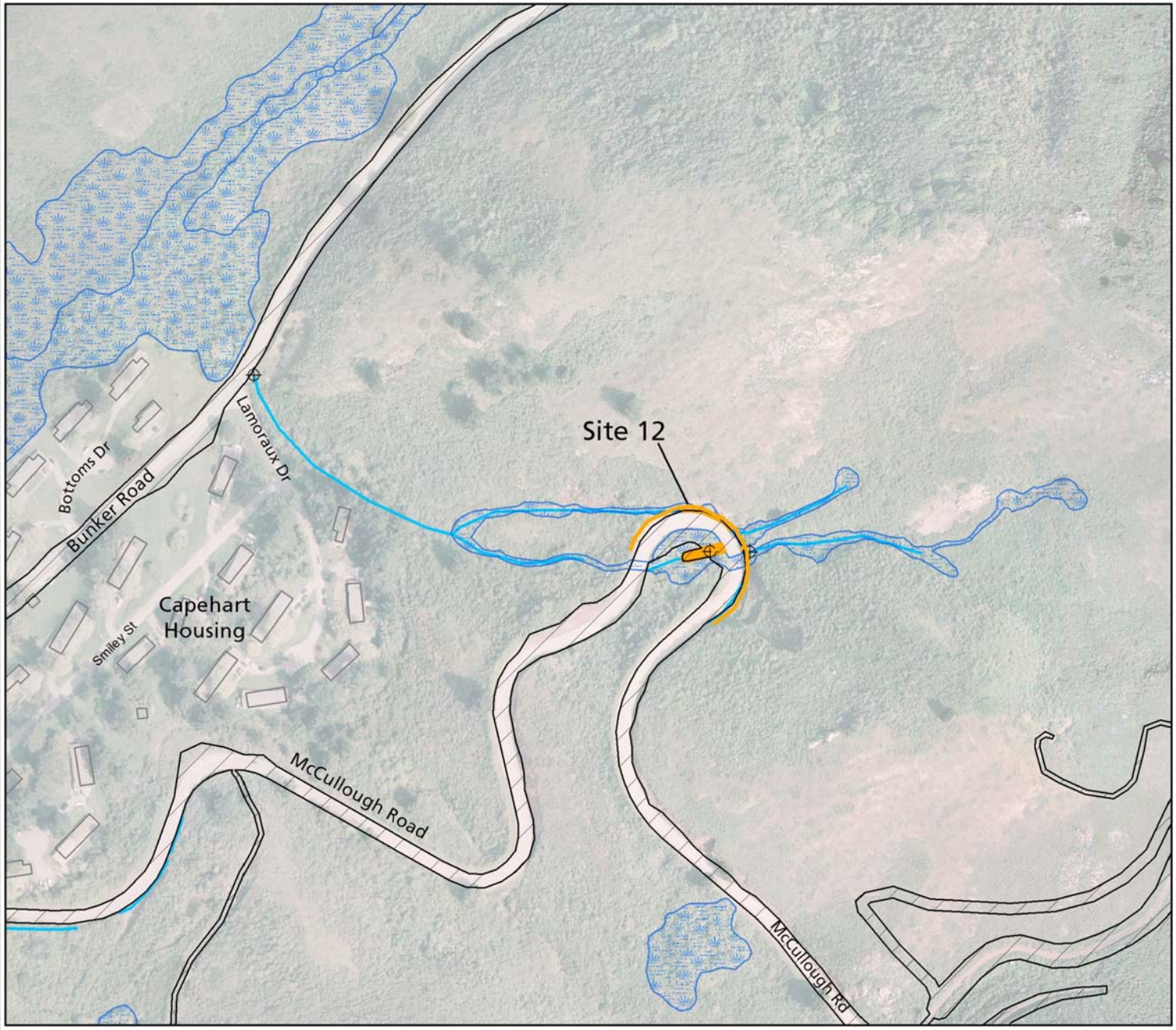
0 400

Feet

Area of Detail

Sources: Marin County, NPS and Federal Highway Administration.

Figure 6, Capehart Housing



Wetlands
Statement of Findings
Site 12

Marin Headlands and Fort Baker
Transportation Infrastructure
and Management Plan

Golden Gate National Recreation Area

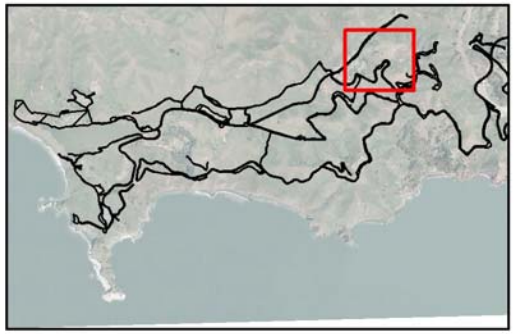
July, 2008

- Potentially Impacted Wetland
- Restored Wetland
- Project Study Area
- Cowardin Wetland
  (Outside of Study Area)
- Culvert

N
W E
S

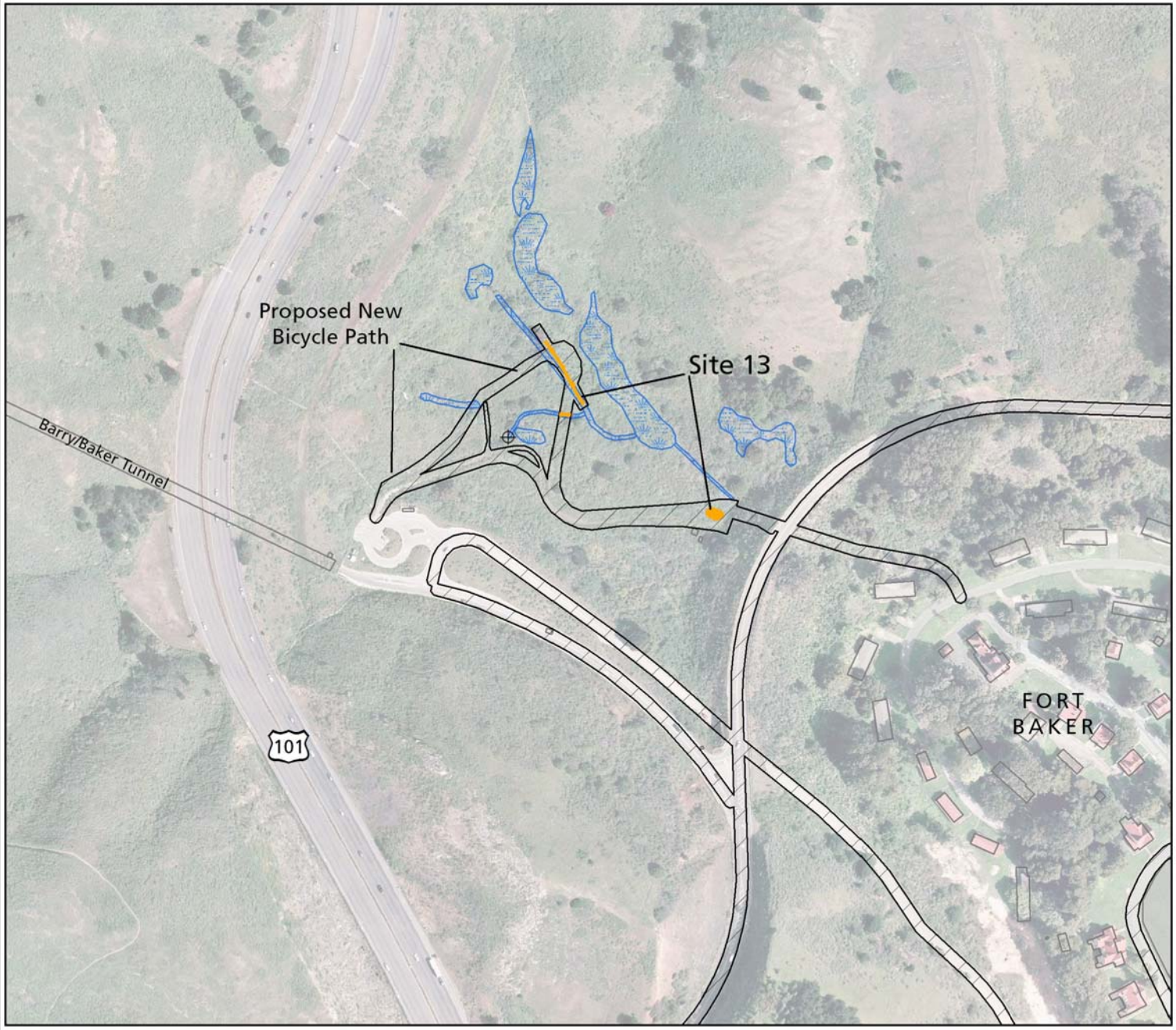
0 400
Feet

Area of Detail



Sources: Marin County, NPS and Federal Highway Administration.

Figure 7,McCullough Road



Wetlands
Statement of Findings
Site 13

Marin Headlands and Fort Baker
Transportation Infrastructure
and Management Plan

Golden Gate National Recreation Area

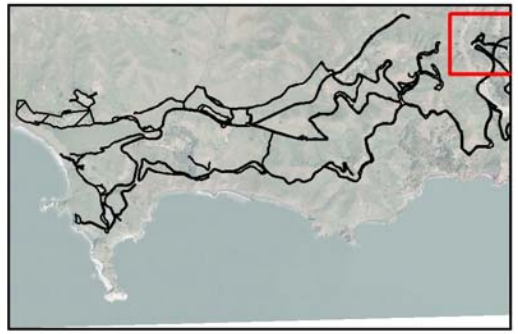
July, 2008

- Potentially Impacted Wetland
- Restored Wetland
- Project Study Area
- Cowardin Wetland
  (Outside of Study Area)
- Culvert

N
W E
S

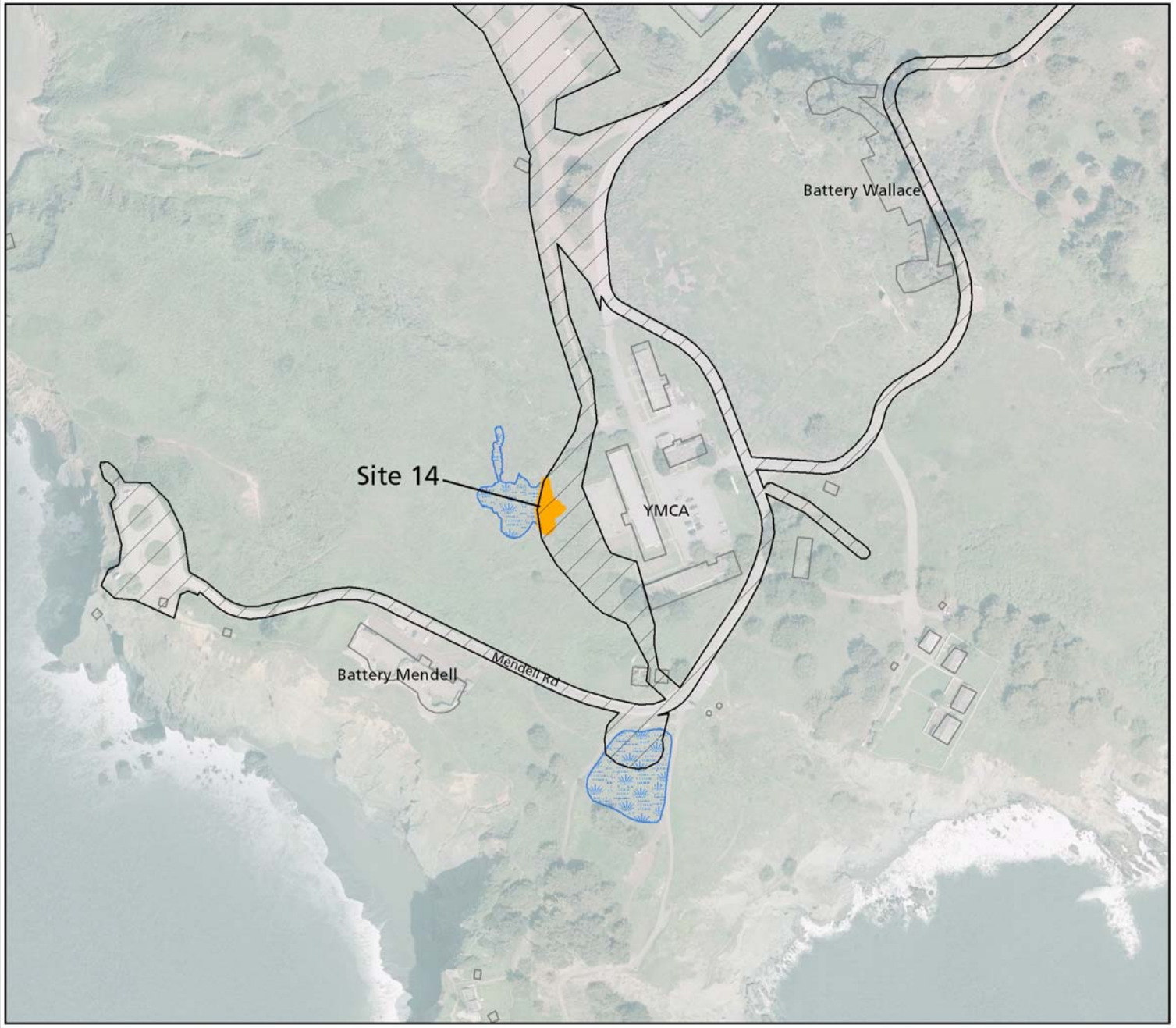
0 400
Feet

Area of Detail



Sources: Marin County, NPS and Federal Highway Administration.

Figure 8, Fort Baker Bike Path



Wetlands
Statement of Findings
Site 14

Marin Headlands and Fort Baker
Transportation Infrastructure
and Management Plan

Golden Gate National Recreation Area

July, 2008

- Wetland Avoided - No Impact
- Restored Wetland
- Project Study Area
- Cowardin Wetland (Outside of Study Area)
- Culvert

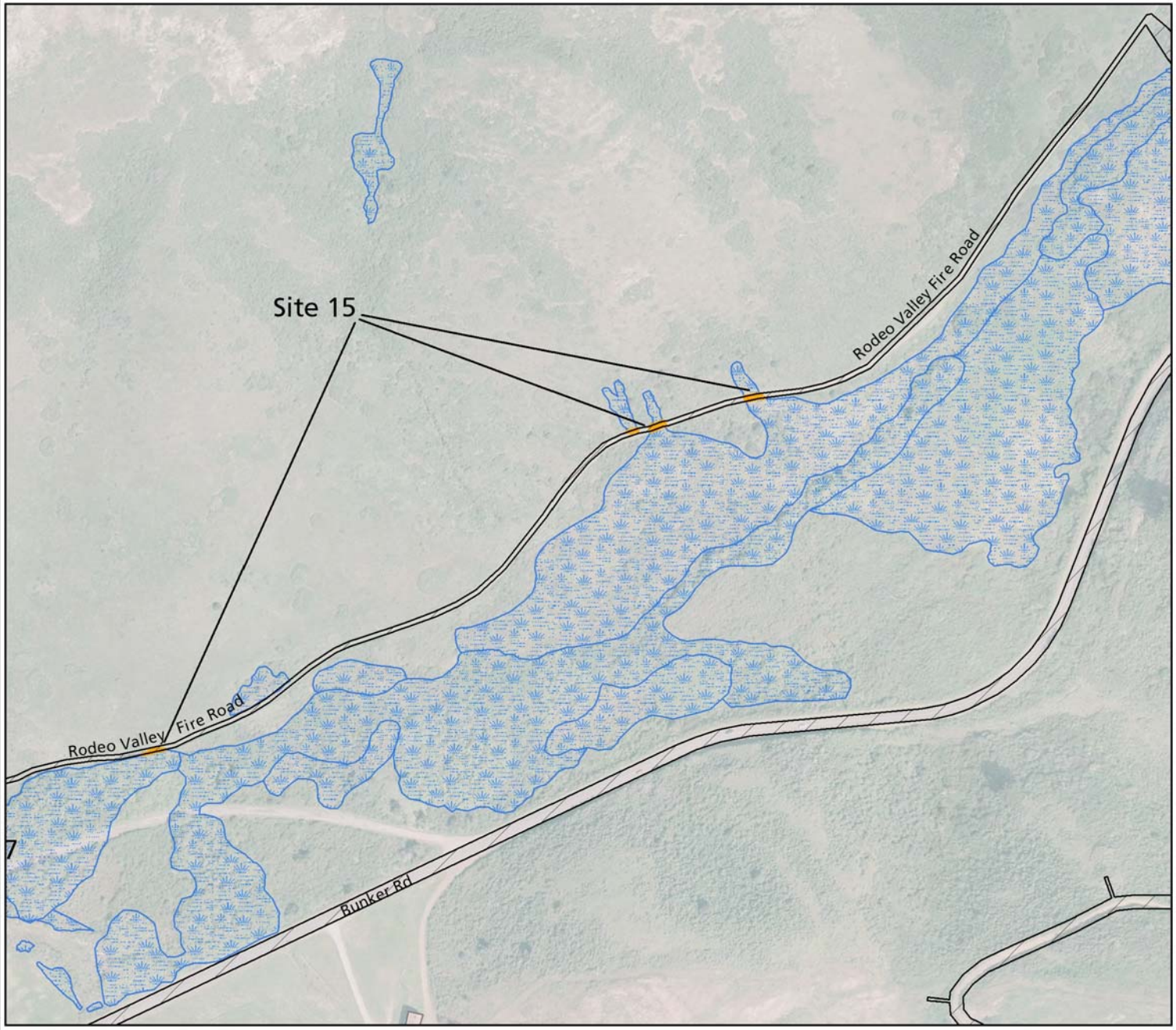
N
W E
S

0 400
Feet

Area of Detail

Sources: Marin County, NPS and Federal Highway Administration.

Figure 9, YMCA



Wetlands
Statement of Findings
Site 15

Marin Headlands and Fort Baker
Transportation Infrastructure
and Management Plan

Golden Gate National Recreation Area

July, 2008

- Potentially Impacted Wetland
- Restored Wetland
- Project Study Area
- Cowardin Wetland
  (Outside of Study Area)
- Culvert

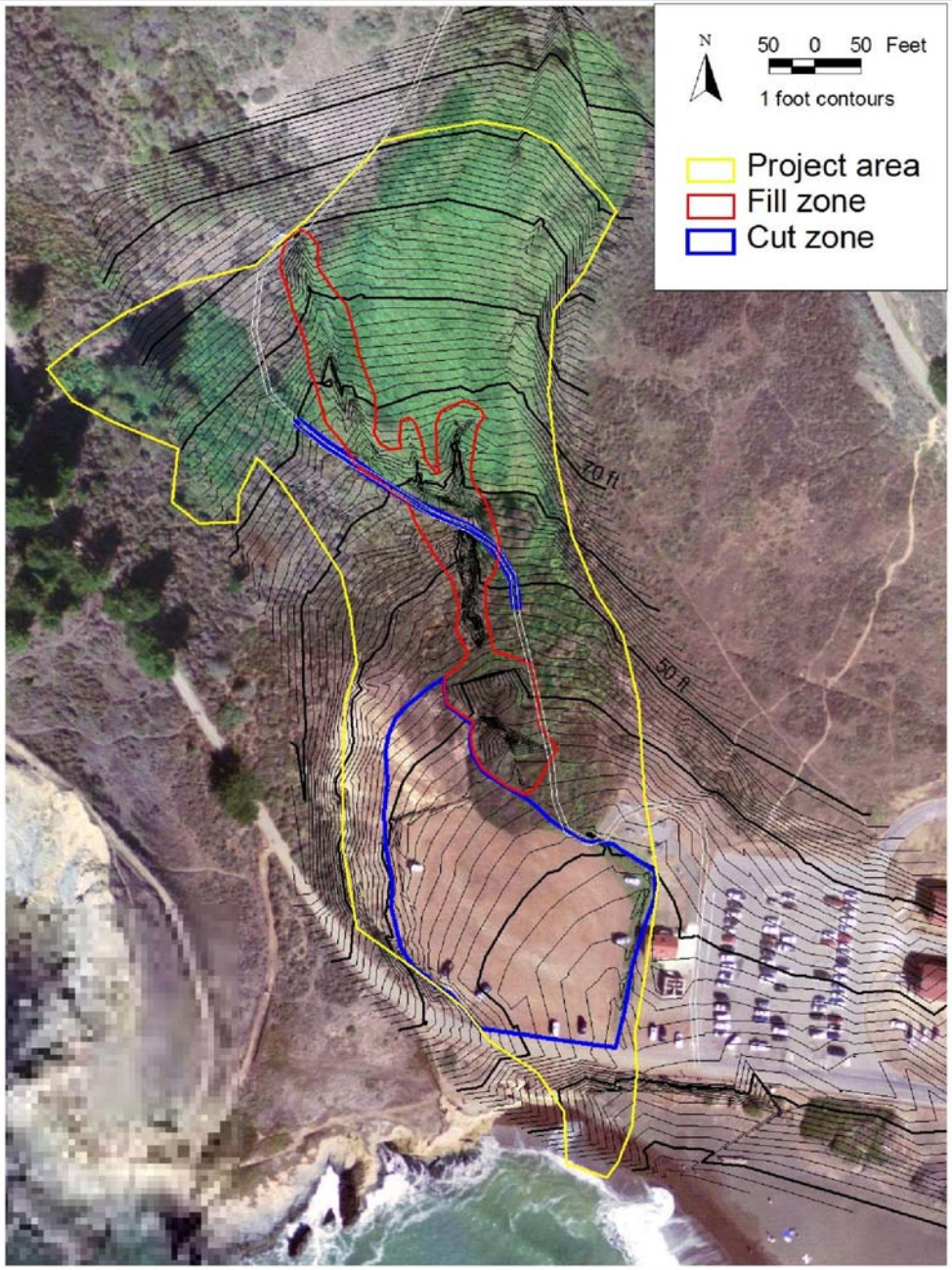
N
W E
S

0 400
Feet

Area of Detail

Sources: Marin County, NPS and Federal Highway Administration.

Figure 10, Rodeo Valley Fire Road



Wetlands
Statement of Findings

Proposed Wetland Restoration
Rodeo Beach Parking Lot

Marin Headlands and Fort Baker
Transportation Infrastructure
and Management Plan

Golden Gate National Recreation Area

July, 2008

Area of Detail

Sources: Marin County, NPS and Federal Highway Administration and Colorado State University.

Figure 11, Rodeo Beach