

APPENDIX A—NOTICE OF INTENT

Prisoners Harbor Coastal Wetland Restoration Plan Final Environmental Impact Statement

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ACTION: Notice of Proposed Reinstatement of Terminated Oil and Gas Lease.

SUMMARY: Under the provisions of 30 U.S.C. 188(d) and (e), and 43 CFR 3108.2-3(a) and (b)(1), the Bureau of Land Management (BLM) received a petition for reinstatement of oil and gas lease COC68788 from Gunnison Energy Corp., and SG Interests VII, LTD, for lands in Gunnison County, Colorado. The petition was filed on time and was accompanied by all the rentals due since the date the lease terminated under the law.

FOR FURTHER INFORMATION CONTACT: Bureau of Land Management, Milada Krasilinec, Land Law Examiner, Branch of Fluid Minerals Adjudication, at 303.239.3767.

SUPPLEMENTARY INFORMATION: The lessee has agreed to the amended lease terms for rentals and royalties at rates of \$10.00 per acre or fraction thereof, per year and 16 2/3 percent, respectively. The lessee has paid the required \$500 administrative fee and \$163 to reimburse the Department for the cost of this Federal Register notice. The lessees have met all the requirements for reinstatement of the lease as set out in Section 31(d) and (e) of the Mineral Lands Leasing Act of 1920 (30 U.S.C. 188), and the Bureau of Land Management is proposing to reinstate lease COC68788 effective February 1, 2008, under the original terms and conditions of the lease and the increased rental and royalty rates cited above.

Dated: June 6, 2008.
Milada Krasilinec,
Land Law Examiner.
[FR Doc. E8-13124 Filed 6-10-08; 8:45 am]
BILLING CODE 4310-JB-P

DEPARTMENT OF THE INTERIOR

Bureau of Land Management

[ID-410-1232-IA-ID27-241A, DEG080003]

Notice of Restriction Order No. ID-410-03, Wallace Forest Conservation Area; Idaho

AGENCY: Bureau of Land Management, Interior.

ACTION: Notice of Restriction.

SUMMARY: This restriction order prohibits overnight camping by any person or groups of persons within the Wallace Forest Conservation Area described as all public lands administered by the Bureau of Land

Management (BLM) located in Boise Meridian.

T.50 N., R. 2 W.,
Sec. 31, lots 5, 6, 7, 8, E1/2NE1/4SW1/4.
T. 50 N., R. 3 W.,
Sec. 26, portion of SW lying S & W of Sunnyside Road;
Sec. 35, portion of lots 1, 2, 7, lots 4, 5, 6, N1/2NW1/4, W1/2NE1/4.
T. 49 N., R. 2 W.,
Sec. 6, lot 4.
T. 49 N., R. 3 W.,
Sec. 1, portion of lots 1, 2, 5, 6.

All are contiguous lands in Kootenai County, Idaho.
The area described above is hereby closed to public occupancy and use daily, beginning one hour after sunset and continuing until one hour before sunrise. A map depicting the restricted area is available for public inspection at the Bureau of Land Management, Coeur d'Alene Field Office, 3815 Schreiber Way, Coeur d'Alene, Idaho. These restrictions become effective immediately and shall remain in effect until revoked or replaced with supplemental rules, or both.

FOR FURTHER INFORMATION CONTACT: Brian White at the BLM Coeur d'Alene Field Office, 3815 Schreiber Way, Coeur d'Alene, ID 83815 or call (208) 769-5031 or via e-mail at brian_white@blm.gov.

SUPPLEMENTARY INFORMATION: The authority for establishing these restrictions is 43 CFR 8364.1.

The 2007 Coeur d'Alene Resource Management Plan (Action RC-1.2.6, p. 47) calls for "establishing additional rules as needed in response to changing situations" under Objective RC-1.2. This objective applies specifically to recreation sites within the Coeur d'Alene Lake Special Recreation Management Area (SRMA). The subject public lands are entirely within this SRMA.

The BLM initiated a public participation process last year to get ideas and comments from the public about future management of this area. Three public workshops were held, including one on-site, which generated significant public interest. Area residents complained of loud parties, bonfires, and lewd activities visible from their homes. Other participants and the vast majority of public comments did not support overnight use or camping within the area.

Supplementary rules will be published according to decisions made within the Environmental Assessment and Recreation Project Plan for the Wallace Forest Conservation Area, which are expected to be completed in 2008.

The camping restriction is necessary to:

- (1) Protect public health and safety;
- (2) Protect persons, property, public land and resources from vandalism and other damage;
- (3) Protect water quality from improper disposal of human waste;
- (4) Prevent proliferation of illegal campfires; and
- (5) Prevent other activities which are illegal under state or Federal regulations, or both.

These restrictions do not apply to:

- (1) Any Federal, state or local government officer or member of an organized rescue or fire fighting force while in the performance of an official duty;
- (2) Any Bureau of Land Management employee, agent, contractor, or cooperater while in the performance of an official duty; and
- (3) Any person or group expressly authorized by the BLM to use the subject public land.

Penalties. Any person failing to comply with the closure orders may be subject to imprisonment for not more than 12 months, or a fine in accordance with the applicable provisions of 18 U.S.C. 3571, or both.

Dated: April 23, 2008.

Eric R. Thomson.

Coeur d'Alene Field Manager.

[FR Doc. E8-13106 Filed 6-10-08; 8:45 am]

BILLING CODE 4310-GG-P

DEPARTMENT OF THE INTERIOR

National Park Service

Coastal Wetlands Restoration at Prisoners Harbor, Santa Cruz Island, Channel Islands National Park, Santa Barbara County, CA; Notice of Intent to Prepare an Environmental Impact Statement

Summary: The National Park Service, in accordance with the provisions of the National Environmental Policy Act (42 U.S.C. 4321 *et seq.*), will prepare an Environmental Impact Statement (EIS) to consider suitable means for restoration of a wetland and stream corridor at Prisoners Harbor and lower Canada del Puerto drainage on Santa Cruz Island, Santa Barbara County, California. The Prisoners Harbor area is part of Channel Islands National Park managed by the National Park Service (NPS). The EIS will analyze alternatives for ecological restoration of the wetland and lower stream corridor, ensuring public access, and protecting cultural and historical resources.

Background: Channel Islands National Park is headquartered in

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Ventura, California. Congress established the park "[i]n order to protect the nationally significant natural, scenic, wildlife, marine, ecological, archeological, cultural, and scientific values of the Channel Islands" (Pub. L. 96-199). The park proposes to restore a functional, self-sustaining ecosystem at a former 9-acre backbarrier coastal wetland site known as Prisoners Harbor and an associated 40-acre stream corridor in the lower Canada del Puerto watershed on Santa Cruz Island. The proposed wetland restoration site includes what was once the largest backbarrier coastal wetland on the Channel Islands. The wetland and stream corridor have been extensively modified over the past 150 years by filling of wetlands, intentional planting and accidental introduction of non-native vegetation such as stone pines, eucalyptus, and kikuyu grass in the area, and construction of a levee, buildings, corral, and unsurfaced roads. These modifications to the creek and floodplain have altered channel hydraulics, resulting in reduced ecosystem function, and contributed to the estimated 95% decline of California's wetlands statewide.

The loss of natural wetland and riparian ecosystems in the Prisoners Harbor area has resulted in locally diminished habitat for federally listed Santa Cruz Island barberry, Santa Cruz Island silver lotus, Santa Cruz Island gooseberry, endemic Santa Cruz Island scrub jay, Santa Cruz Island deer mouse, the rare Channel Islands slender salamander, western harvest mouse, loggerhead shrike, other passerine birds, and migratory waterfowl. Proliferation of non-native eucalyptus trees in the riparian corridor has severely reduced plant and wildlife diversity and negatively affected habitat for species of special concern and passerine birds.

Preliminary Alternatives and Environmental Issues: The park proposes to restore wetland and riparian ecosystem function by removing fill from the historic wetland, reconnecting the Canada del Puerto stream with its floodplain, removing non-native eucalyptus and other vegetation in the lower drainage, and recreating habitat for special status species (both flora and fauna), passerine birds, and migratory waterfowl. Additionally the project proposes to protect significant cultural resources, and provide for an enhanced visitor experience. A successful project would meet the following goals:

- Restore functional wetland and riparian ecosystems and reduce the impact of non-native species on local biological diversity.

- Consistent with restoring functional ecosystems, recreate and maintain habitat adequate to support populations of special status species, passerine birds, and migratory waterfowl.

- Develop a restoration design that identifies and, to the extent possible, mitigates factors that reduce the site's full restoration potential.

- Protect archaeological resources from erosion during both normal and flood conditions.

- Provide access to the Central Valley inland from the affected area, NPS property east of Prisoners Harbor, and Nature Conservancy inholdings on NPS property upstream from the area of potential effect.

- Reduce risk of exposure to flooding that could damage the roadway and historic buildings.

- Provide visitor access and resource interpretation that are compatible with protection of resources.

- Enhance visitor knowledge and understanding of the prehistory, recent human history, and natural history of the Prisoners Harbor area.

Channel Islands National Park seeks public input to assist with identifying issues and developing a suitable range of alternatives for restoration of the lower Canada del Puerto watershed and Prisoners Harbor wetlands area. Restoration methods could include topographic alterations aimed at recovering natural hydrologic and ecological processes. These potential alterations could change the current hydrologic regime within the proposed project area, leading to either resumption of seasonal flooding of a fully restored wetland/floodplain or limited flooding of a partially restored wetland/floodplain. A "no-action" alternative, entailing no changes in current hydrologic regime, will also be assessed. An archeological site and some historic structures are located within the area of potential effect. Any restoration actions undertaken would be designed to ensure flood risks to the archeological site and historic resources will not be aggravated beyond current conditions and that influence of non-native species, including eucalyptus, on a restored ecosystem dominated by native species is reduced. As part of the effort to develop preliminary alternatives, the NPS will explore options for improved public access and enhancing educational opportunities consistent with ecosystem restoration.

Preliminary public outreach was initiated by the park in 2007. Concern was expressed about the possibility of removing cattle corrals constructed on filled coastal wetland. The corrals were built in the 1950's as part of rancher

Carrie Stanton's conversion to a cattle operation. The corrals are considered a "small scale feature" in the 2004 Cultural Landscape Inventory and deemed to be a contributing element to the eligibility of the Santa Cruz Island Ranching District to the National Register of Historic Places. The park has acknowledged this concern and will work with the State Historic Preservation Office in developing mitigation measures common to all alternatives or safeguards specific to a particular alternative if necessary. Other issues or concerns known at this time include potential effects upon: Threatened and endangered species protected under the federal and state Endangered Species Acts, floodplain and stream corridor, native flora and fauna; historic and archeological resources, land use, and opportunities for and constraints on public use.

Public Scoping and Comment Process: Notice is hereby given that the final public scoping phase is underway, with the express purpose of eliciting additional public comment regarding a suitable range of alternatives, the nature and extent of potential environmental impacts and benefits, and appropriate mitigation strategies that should be addressed in the forthcoming conservation planning and environmental impact analysis process. For those who have commented previously, it is not necessary to re-submit comments. Federal, state, and local agencies, Tribes, and interested organizations are also encouraged to participate in the scoping process. Whether California state or local involvement in the environmental impact analysis process is necessary is yet to be determined. If an environmental clearance document is required under the California Environmental Quality Act (CEQA), the NPS will coordinate the NEPA/CEQA process with the designated state agency (or agencies).

A timely opportunity to learn more about the proposed restoration and provide information is a public meeting to be held during summer 2008. Information expected to be provided at the public meeting includes the history of the Prisoners Harbor/Canada del Puerto area, purpose and need for the proposed restoration, opportunities and constraints in developing the restoration design, potential alternative courses of action with regards to restoration, potential effects of these courses of action, and appropriate strategies for mitigation and monitoring. All interested individuals, organizations, and agencies are encouraged to provide comments or suggestions. For those

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persons unable to attend the meeting, information about the project will be available at <http://parkplanning.nps.gov> or by contacting the park as noted below.

All written scoping comments must be postmarked or transmitted not later than 45 days following publication of this notice in the **Federal Register** (immediately upon publication of this notice, the confirmed deadline for comments to be submitted will be posted on the park Web site). Before including your address, phone number, e-mail address, or other personal identifying information in your comment, you should be aware that your entire comment—including your personal identifying information—may be made publicly available at any time. While you can ask us in your comment to withhold your personal identifying information from public review, we cannot guarantee that we will be able to do so. To provide comments or information pertinent to the proposal, inquire about the public meeting, or to request a printed copy of the scoping document, please contact Paula Power, Channel Islands National Park, Attn: Prisoners Harbor Coastal Wetland Restoration Project, 1901 Spinnaker Drive, Ventura, CA 93001, telephone (805) 658-5784; FAX (805) 658-5799; e-mail paulapower@nps.gov). Duplicate informational updates will be regularly posted on the park Web site http://www.nps.gov/chis/home_mngmntdocs.htm and also at <http://parkplanning.nps.gov>.

Decision Process: At this time, the draft EIS is expected to be available for public review in early 2009; following due consideration of all public and agency comments, it is expected that the final environmental document will be completed in late 2009. As a delegated EIS, the official responsible for the final decision is the Regional Director, Pacific West Region. Subsequently the Superintendent, Channel Islands National Park, would be responsible for implementing the approved restoration and management actions.

Dated: April 28, 2008.

Patricia L. Neubacher,
Acting Regional Director, Pacific West Region.
[FR Doc. E8-12965 Filed 6-10-08; 8:45 am]
BILLING CODE 4310-F6-M

DEPARTMENT OF THE INTERIOR

National Park Service

Off-Road Vehicle Management Plan (ORV Management Plan), Environmental Impact Statement (EIS), Lake Meredith National Recreation Area, Texas

AGENCY: National Park Service, Department of the Interior.

ACTION: Notice of Intent To Prepare an Environmental Impact Statement (EIS) for an Off-Road Vehicle Management Plan (ORV Management Plan) for Lake Meredith National Recreation Area, Texas.

SUMMARY: Pursuant to the National Environmental Act of 1969, 42 U.S.C. 4332(2)(C), the National Park Service is preparing an Environmental Impact Statement for an Off-Road Vehicle Management Plan (ORV Management Plan) for Lake Meredith National Recreation Area, Texas. This effort will result in an ORV Management Plan/EIS that will be used to guide the management and control of ORVs at the Recreation Area for approximately the next 15 to 20 years. It will also form the basis for a special regulation that will regulate ORV use at the Recreation Area. The ORV Management Plan/EIS will assess potential environmental impacts associated with a range of reasonable alternatives for managing ORV impacts on park resources such as soils, wetlands, wildlife, cultural resources, visitor experience, and public safety.

Lake Meredith Recreation Area was established in 1964 for the administration of public recreational facilities at the Sanford Reservoir area, Canadian River project, Texas. In 1990 Congress designated Lake Meredith a National Recreation Area to "provide for public outdoor recreation use and enjoyment of the lands and waters associated with Lake Meredith in the State of Texas, and to protect the scenic, scientific, cultural, and other values contributing to the public enjoyment of such lands and waters." (Pub. L. 101-628, 16 U.S.C. 460eee, November 28, 1990). Lake Meredith offers many recreational uses including boating, swimming, fishing, hunting and ORV use. Lake Meredith currently has two areas designated as ORV areas, Rosita (~1,740 acres) and Blue Creek (~275 acres). These areas were designated by special regulation, 36 CFR 7.57. Both areas were utilized by the local community for recreational use prior to the establishment of the Sanford Reservoir Project in 1965.

Executive Order 11644, issued in 1972 and amended by Executive Order

11989 in 1977, states that Federal agencies allowing ORV use must designate the specific areas and trails on public lands on which the use of ORVs may be permitted, and areas in which the use of ORVs may not be permitted. Agency regulations to authorize ORV use provide that designation of such areas and trails will be based upon the protection of the resources of the public lands, promotion of the safety of all users of those lands, and minimization of conflicts among the various uses of those lands. Executive Order 11644 was issued in response to the widespread and rapidly increasing use of ORVs on the public lands—"often for legitimate purposes but also in frequent conflict with wise land and resource management practices, environmental values, and other types of recreational activity." Code of Federal Regulations (CFR) 36 § 4.10 requires that "Routes and areas designated for off-road motor vehicle use shall be promulgated as special regulations." "In addition, such routes and areas may only be designated in national recreation areas, national seashores, national lakeshores and national preserves." Therefore, in accordance with the Executive Order, the purpose of this plan/EIS is to manage ORV use in compliance with the Recreation Area's enabling legislation, NPS management policies, and other laws and regulations to ensure protection of the natural, cultural, and recreational values of the Recreation Area's environment for present and future generations.

An ORV Management Plan is needed to address the inconsistent management of ORV use over time, address the impacts to both cultural and natural resources, and address ORV use outside of the authorized areas. Specifically, an ORV Management Plan is needed to: (1) Comply with Executive Orders 11644 and 11989 respecting ORV use, and with NPS laws, regulations (36 CFR 4.10), and policies to minimize impacts to Recreation Area resources and values; (2) Provide for sustainable recreational ORV use areas; (3) Address the lack of an approved plan, which has led to ORV use outside of authorized areas; (4) Address resource impacts resulting from ORV use; and (5) Address the change in numbers, power, range and capabilities of ORVs. The ORV Management Plan/DEIS will cover all lands administered by the NPS at the Recreation Area.

Through internal scoping efforts, several draft objectives were outlined for the EIS:

Visitor Use and Safety: Manage ORV use to minimize conflicts among different ORV users; promote safe

APPENDIX B—SUMMARY OF SCOPING COMMENTS

Summary of Scoping Comments Prisoners Harbor Coastal Wetland Restoration

National Park Service Channel Islands National Park

Introduction

The National Park Service (NPS), in accordance with provisions in the National Environmental Policy Act (NEPA), conducted public scoping for the Prisoners Harbor Coastal Wetland Restoration Plan Environmental Impact Statement (EIS). Public scoping is held early in the NEPA process to seek public input on the range of concerns, issues and alternatives that should be addressed in the EIS. This summary informs the public on the extent and nature of the comments received by the NPS during public scoping.

Background on Public Scoping

A preliminary public input meeting was conducted at Prisoners Harbor on Santa Cruz Island on April 5, 2007. Thirty-three interested individuals, experts, and partners were invited. Twenty-one non-NPS individuals attended. The agenda for the meeting included introductions, site orientation with an informal walking tour of the site, followed by a round-robin discussion with opportunity to ask questions and express concerns (Table 1, Table 2).

Table 1. Informal walking tour included NPS experts stationed at specific locations to answer questions.

| LOCATION | TOPIC | DISCUSSION | EXPERT |
|-------------------------------|--------------------------|--|----------------|
| A. Road to Archeological site | Hydrology | Removing levee, changes in hydrology | Mike Martin |
| B. Eastern edge of corrals | Wetland Restoration | Restoration method, removing and relocating fill, revegetation | Joel Wagner |
| C. Warehouse | Historic District | Cattle/sheep corrals | Ann Huston |
| D. Archeological site | Archeological site | Location and extent of Archeological site | Kelly Minas |
| E. Seating area | Environmental Compliance | Public Input to the NEPA process | Marie Denn |
| F. Beach | Natural Resource Values | Backbarrier wetland, history, ecological benefits | Kate Faulkner, |

Table 2. Major issues and concerns expressed during the on-island site visit.

| MAJOR ISSUE | CONCERN | NAME |
|--------------------------------|--|---|
| Visitor Experience | Control visitor impacts (mischief, vandalism) using boardwalks, viewing platforms | Island Packers |
| | Control and educate the public so no damage is done to arch site | Santa Ynez Band of Chumash Indians |
| | Educate visitors to reduce potential for disturbance or desecration of arch site | Santa Cruz Island Descendent |
| Historic Resources | Reduce size of corrals to 55', this creates buffer, reduces potential visitor impacts, and preserves part of corral | Santa Cruz Island Foundation |
| Natural Resources | Don't extirpate harvest mouse during construction Plan for desirable wetland species Do not lose human history Plan for veg. management in corrals Control Kikuyu grass Campground near wetland will affect wetland re:buffer | Santa Barbara Museum of Natural History |
| | Potential for increased sedimentation and/or decreased run-off should be included in the model | University of California Natural Reserve System |
| | Eucalyptus are a recent occurrence and disrupt water budget | The Nature Conservancy |
| | Avoid extirpation of harvest mouse during construction | Interested Individual |
| Archeological Resources | Preserve arch site, preserve levee adjacent to arch site, add berm to south side of arch site | Interested Individual |
| | Removing levee may impact arch site | Santa Ynez Band of Chumash Indians |
| Park Planning | Should not proceed without GMP | Santa Cruz Island Foundation |
| Maintenance | Potential long-term maintenance needs Earth moving concerns, deposition of fill Potential for water impacts to road and arch site | Interested Individual |

A Notice of Intent (NOI) to prepare an EIS and conduct public scoping was published in the Federal Register on June 11, 2008. On June 12, 2008, a press release announcing public scoping was distributed to the Ventura County Star and the Santa Barbara News-Press, as well as 73 other media outlets, including newspaper, radio stations, and television stations. The press release explained the public scoping process, announced two public open houses, and provided the web address for Channel Islands National Park

and NPS park planning. The NOI and press release were posted on the park website. A notice of the public scoping open houses was printed in the Ventura County Star on June 23, 2008 and in the Santa Barbara News-Press on June 23, 2008.

The NPS mailed approximately 240 public scoping announcements with the time, date, and location of the public open houses.

Approximately nine members of the public attended the public open house at Channel Islands National Park Headquarters and approximately 13 members of the public attended the public open house at the Santa Barbara Public Library.

The 45-day public scoping period closed July 27, 2008.

Public Response to Scoping

Five individuals or private organizations hand delivered or emailed comments regarding the Prisoners Harbor Coastal Wetland Restoration Plan. Commenting organizations included The Nature Conservancy and the Santa Cruz Island Foundation. No comments were received from federal or state agencies. Four letters supported wetland restoration, one letter expressed concern about park planning and the impacts of levee removal, another letter wanted to see support for the project from the Chumash.

The following table consolidates scoping comments under major issue topics.

| ISSUE TOPIC | COMMENT | |
|---------------------------|--|------------------------------|
| Park Planning | Enabling legislation does not mandate restoration of island conditions to pre-European times | Santa Cruz Island Foundation |
| | Park should not undertake Prisoners Harbor Coastal Wetland Restoration without a current General Management Plan | Santa Cruz Island Foundation |
| Historic Resources | Support for relocating the scalehouse and removing the corrals | Interested Individual |
| | Concern that removing the levee will cause irreparable harm to archeological site, historic warehouse, and corral system | Santa Cruz Island Foundation |
| | Supports designing the wetland to prevent damage to road and warehouse during flooding | Interested Individual |

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|--------------------------------|--|---|
| Archeological Resources | Support for making the archeological site visible with signage | Interested Individual |
| | Chumash tribe should support the project | Journalist |
| Wetland Restoration | General support for restoring wetland and riparian ecosystems | The Nature Conservancy, Interested Individual, Journalist |
| Eucalyptus removal | Supports removing eucalyptus | Interested Individual |
| Visitor experience | Would support a “nature” trail with signage describing wildlife, Chumash and ranching history along the perimeter of the wetland | Interested Individual |

Written comments received by the NPS are available for review at Channel Islands National Park. Notes from the April 5, 2007 site visit are available for review at the NPS park planning website at <http://parkplanning.nps.gov>.

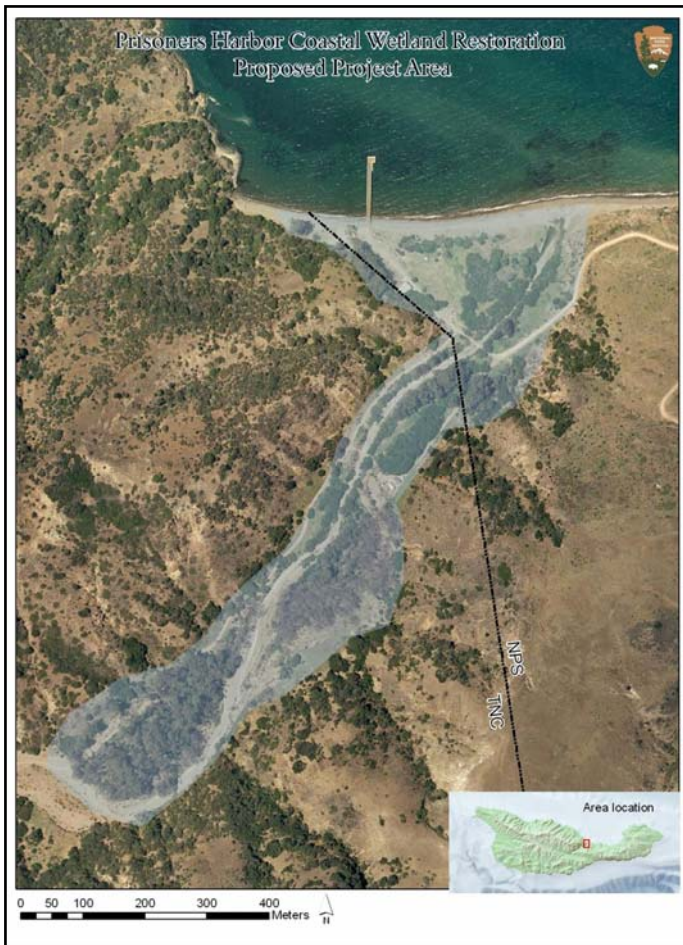
APPENDIX C—GIS ANALYSIS OF REVEGETATION PLANS

Using GIS to Develop Revegetation Plans

Melissa Hayashida
Channel Islands National Park Intern
Channel Islands National Park, Ventura, CA
November 2009

With its ability to manage and analyze spatial data, GIS (geographic information systems) is a powerful resource management tool. GIS analysis helps solve problems by identifying geographic patterns and relationships. Because of its ability to organize geographic data and combine a variety of datasets into an interactive map (Essays on Geography and GIS 2008), GIS was chosen to help form a basis for a revegetation plan on Santa Cruz Island, the largest island in Channel Islands National Park. Specifically, Channel Islands National Park used GIS to identify suitable vegetation for a fill disposal site on Prisoners Harbor. The fill disposal site is part of its Prisoners Harbor Coastal Wetland Restoration Plan.

Through its Prisoners Harbor Coastal Wetland Restoration Plan, the Park seeks to restore the 9-acre Prisoners Harbor coastal wetland site and its 40-acre associated stream corridor in the lower Cañada del Puerto Creek on Santa Cruz Island (Figure 1). Prisoners Harbor wetland was the largest wetland complex on Santa Cruz Island. Before the early 1800's, the wetland site supported about 12 acres of coastal marsh and riparian forest. A mixed live oak savannah was likely supported in lower Cañada del Puerto on the floodplain terraces immediately upstream from Prisoners Harbor. The wetland was filled in by agriculturalists in the 19th and 20th centuries to support sheep and cattle operations. The loss of important wetland



functions and ecosystem services was further amplified by the channelizing of the Cañada del Puerto stream and the introduction of invasive species. With the Prisoners Harbor Coastal Wetland Restoration Plan, the Park will reconnect the Cañada del Puerto stream with its floodplain, remove non-native vegetation, enhance the visitor experience, and protect cultural and historic resources.

Figure 1. Prisoners Harbor Wetland Restoration Project Area

Approximately 13,000 +/- 20% cubic yards of fill material will be removed from atop the buried wetland surfaces to restore 2/3 of the buried wetlands. This fill will be placed at one or two nearby fill disposal sites, compacted and sloped to natural contours, and seeded with native plants (NPS Prisoners Harbor Coastal Wetland Restoration Plan Draft EIS 2009). The Park decided to use ESRI's ArcGIS to help choose which native plants should be planted in the fill disposal site/s. GIS was used to search for places on the island that are similar to the fill disposal site and identify the vegetation types growing in those places.

Methods

Data Sources

Our GIS analysis relied on a variety of datasets. An elevation dataset was used to determine elevation, aspect, and slope for the entire island. The elevation data used was Southern California Interferometric Synthetic Aperture Radar (IfSAR) data, which was collected for Santa Cruz Island in the winter of 2002/2003. The IfSAR data *has three meter point spacing and approximately one-meter vertical accuracy in non-vegetated areas* (NOAA NOS and CSC 2004).

Using the slope and aspect tools (part of ArcGIS's Spatial Analyst extension), slope and aspect were derived from the IfSAR data. The slope tool *calculates the maximum rate of change between each cell and its neighbors* and the aspect tool *identifies the downslope direction of the maximum rate of change in value from each cell to its neighbor* (ESRI 2007).

The Nature Conservancy (TNC) contracted Aerial Information Systems, Inc. to create a vegetation map of Santa Cruz Island. We used this vegetation map to identify vegetation classes and vegetation types (vegetation alliances and sub-alliances) throughout the island. Aerial Information Systems, Inc. used base imagery (IKONOS one-meter natural color and color-infrared imagery 2005; Air Photo USA one-meter natural color photography 2002; I.K. Curtis 1:12000 natural color photography 2005), aerial photographs, field plots, field reconnaissance, and other source material to identify vegetation on the island. Further details regarding the map can be found in the Santa Cruz Island Photo Interpretation and Mapping Classification Report (Aerial Information Systems, Inc. 2007).

To determine soil types throughout the island, the Natural Resources Conservation Service Soil Survey of Channel Islands National Park was consulted (USDA NRCS 2007).

Shoreline data from 1994 USGS Digital Orthophoto Quarter Quads (Schwemm 1998) supplied provided a fairly accurate representation of Santa Cruz Island's shoreline.

Geoprocessing Steps

1. Relevant factors for vegetation success were chosen

Elevation, slope, aspect, soil type, and proximity to the coast were identified as important, defining characteristics of a vegetation's habitat.

2. The slope, aspect, elevation, and proximity to the coast of the fill disposal site were determined

In order to determine the elevation, slope, aspect, soil type, and proximity to the coast of the fill disposal site, it was necessary to identify the location of the fill disposal site on an aerial photograph (a secondary disposal site, not shown below, was chosen in case the amount of fill exceeds the capacity of the first fill site; see Appendix A). Within ArcMap, a polygon was digitized to define the area enclosed by the disposal site (Figure 2).

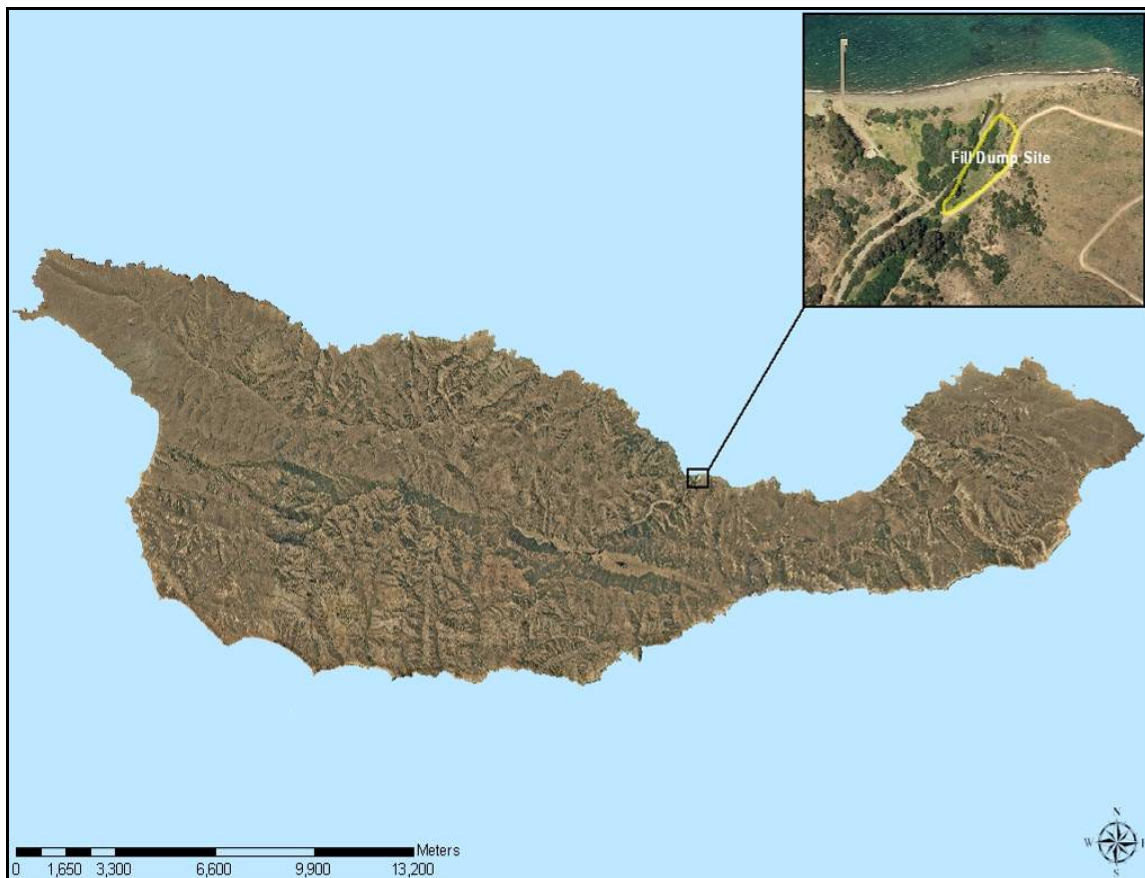


Figure 2. Prisoners Harbor Wetland Restoration Fill Disposal Site

Using the elevation, slope, aspect, soil, and shoreline datasets, the elevation, slope, aspect, soil type, and proximity to the coast of the fill disposal site were determined. The zonal

statistics tool (part of the Spatial Analyst extension), which *calculates statistics on values of a raster within the zones of another dataset* (ESRI 2008), was used to find out the range of elevation and the range of slope within the fill disposal site. The aspect of the fill disposal site was determined by simply overlaying the aspect layer on top of the fill disposal site and then visually inspecting the disposal site area. This same method could be used to figure out which soil types fall within the fill disposal sites; however, it’s also possible to use the “Select by Location” feature (simply select for soil types that fall within the fill disposal site polygon). Finally, the “measure” tool was used to obtain the disposal site’s proximity to the coast.

Using these methods, the following characteristics of the disposal site were determined:

| | <i>Elevation</i> | <i>Slope</i> | <i>Aspect</i> | <i>Soil Type</i> | <i>Proximity to coast</i> |
|---|------------------|--------------|--------------------|---|---------------------------|
| Fill Disposal Site Characteristics | 6.74-42.81m | 0.15-45.27% | Northwest and West | Starboard-Fantail-Halyard; Typic Xerofluvents Riverwash | ~50 meters from the coast |

Table 1. Characteristics of the fill disposal site

It would be too restricting to search for places on the island with *exactly* the same characteristics as the fill disposal sites. Because of this, the criteria used to search for places on the island with similar characteristics as the fill disposal sites were based on the figures in Table 2. The search criteria differ slightly from the actual fill disposal characteristics in order to search for places on the island that may be very similar to, but perhaps not exactly alike, the fill disposal site. The search criteria also take into account the fact that some characteristics of the fill site will change with the addition and contouring of the fill material.

| | <i>Elevation</i> | <i>Slope</i> | <i>Aspect</i> | <i>Soil Type</i> | <i>Proximity to coast</i> |
|------------------------|------------------|--------------|--------------------|---|---------------------------|
| Search Criteria | 0-150m | 0-32% | Northwest and West | Starboard-Fantail-Halyard; Typic Xerofluvents Riverwash | Within 1 mi |

Table 2. Search Criteria

3. GIS was used to locate areas on the island that are similar (in elevation, slope, aspect, soil type, and proximity to the coast) to the fill disposal site

Once the search criteria were defined, the raster calculator was used to produce new elevation, aspect, and slope rasters from the original elevation, aspect, and slope rasters. These new rasters only included the range of values specified in our search criteria. A new elevation raster was created that showed only those places on the island with an elevation between 0 and 150m, a new slope raster was created that showed only those places with slopes between 0 and

32%, and a new aspect raster was created that showed only those places with Northwest and West aspects.

Next, the raster calculator was used again (see Geoprocessing Details for explanation) to produce a single raster that shows only those places on the island where the new elevation, slope, and aspect rasters overlap. This single raster shows only those places on the island where the elevation is between 0 and 150m AND where the slope is between 0 and 32% AND where there are Northwest and West-facing slopes.

Geoprocessing Details

- The new elevation, slope, and aspect rasters each contain two grid values:
0 (not part of specified range of values) and 1 (part of specified range of values)
- The raster calculator is used to find all areas where:
elevation raster + slope raster + aspect raster = 3 (where the specified ranges of all three rasters overlap)
- This produces a new raster, again with two grid values:
0 (areas where all three rasters did NOT overlap) and 1 (the overlapping areas of all three rasters)

Then, this single raster was converted to a polygon/vector feature to enable future manageability with other polygon/vector features. (After converting the new raster to a polygon, a definition query was used to select only those areas where the grid value = 1).

The next step involves narrowing our result to only those areas in certain soil types and within a certain distance from the coast (the polygon just created is not restrictive in regard to soil type and distance from the coast). So, the polygon was clipped by only the areas on the island with Starboard-Fantail-Halyard or Typic Xerofluvents Riverwash soils. It was also clipped by only the areas on the island within 1 mile from the coast.

4. Using the vegetation map, the vegetation known to exist in these areas was determined

The resulting polygon included only the areas on the island whose elevation, slope, aspect, soil type, and proximity to the coast match the search criteria values (Figure 3). This polygon feature had no information regarding vegetation type, so the vegetation map was added to the ArcMap workspace. This vegetation map was then clipped by our polygon in order to eliminate all areas on the vegetation map that do not fall within the specified elevation, aspect, and slope ranges, are not within the soil types of interest, and that are not within one mile from the coast.

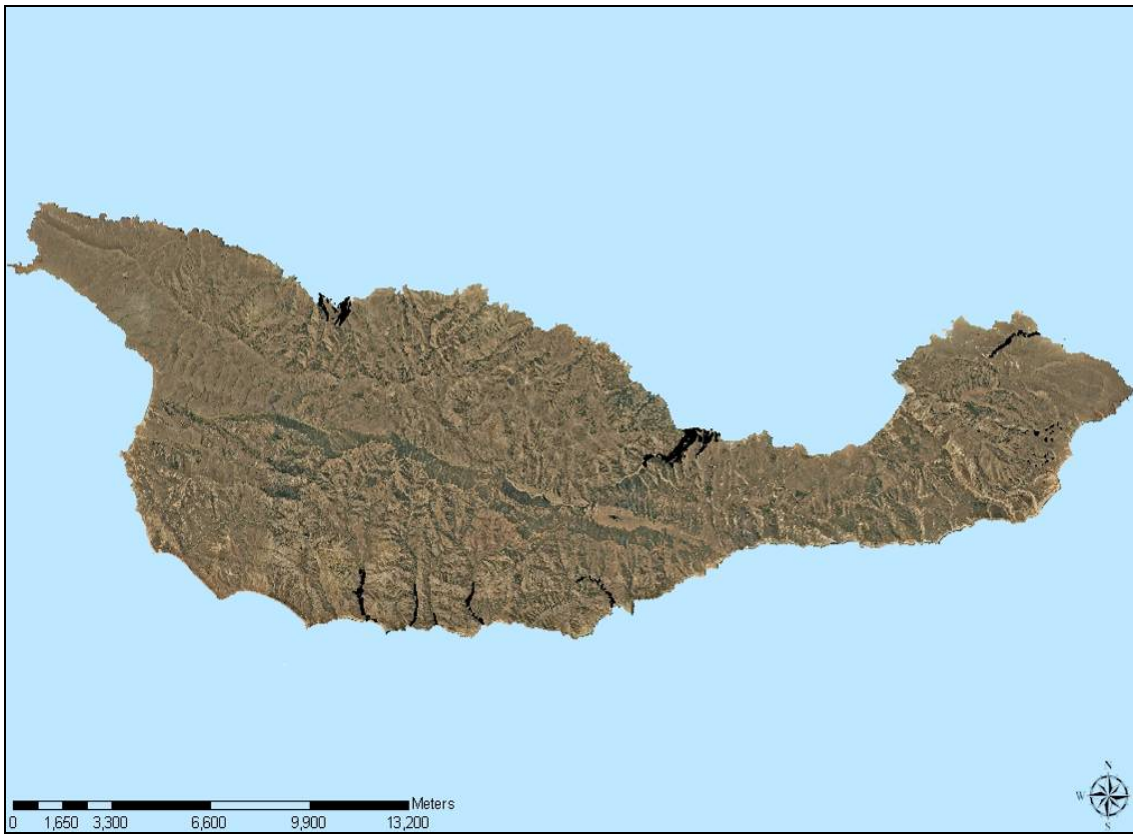


Figure 3. The black polygons represent areas on the island with a similar elevation, slope, aspect, soil type, and proximity to the coast as the fill disposal site

The result of this clip included information on the vegetation classes and the vegetation types within the areas on the island that are similar (in regard to our criteria) to the fill disposal site (Figure 4). Now, it was possible to determine which vegetation classes/types cover what percentage of these areas. First, the “calculate geometry” feature was used to update the area calculations in the vegetation layer’s attribute table. Next, the “summary” feature (located within the vegetation map’s attribute table) was used to sum the area for each vegetation class/type. In doing this, the dominant vegetation classes/types located in areas similar to the fill site were determined.

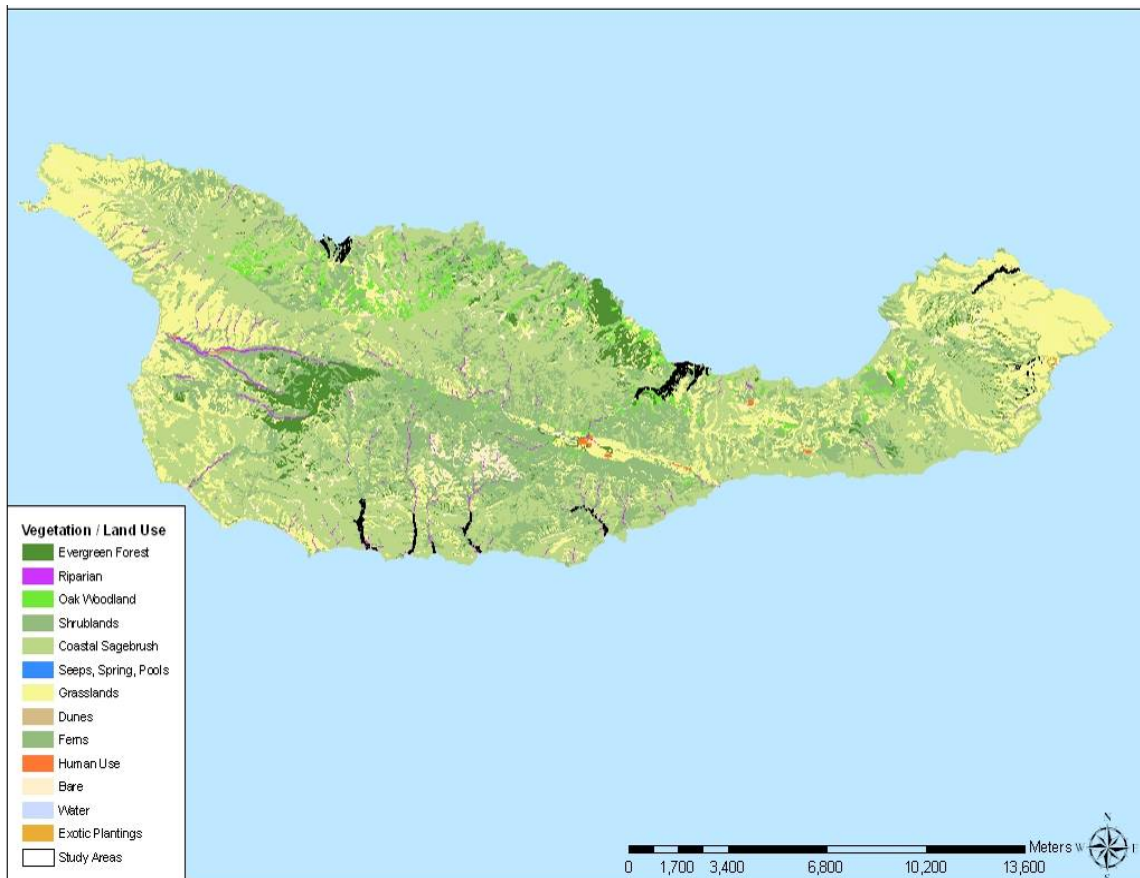


Figure 4. The black polygons (which represent areas on the island with a similar elevation, slope, aspect, soil type, and proximity to the coast as the fill disposal site) are overlaid upon the vegetation map

Results

The dominant vegetation classes/types in the areas were determined in regards to soil type. In other words, the dominant vegetation classes/types were determined for those areas in Starboard-Fantail-Halyard soils (Figure 5, Table 3) and the dominant vegetation classes/types were determined for those areas in Typic Xerofluvents Riverwash soils (Figure 6, Table 3). In Starboard soils, the dominant vegetation classes included Coastal Sagebrush, Grasslands, Shrublands, and Oak Woodland. In Riverwash soils, the dominant vegetation classes included Shrublands, Riparian, Bare, Grasslands, Evergreen Forest, Oak Woodland, Coastal Sagebrush, and Human Use.

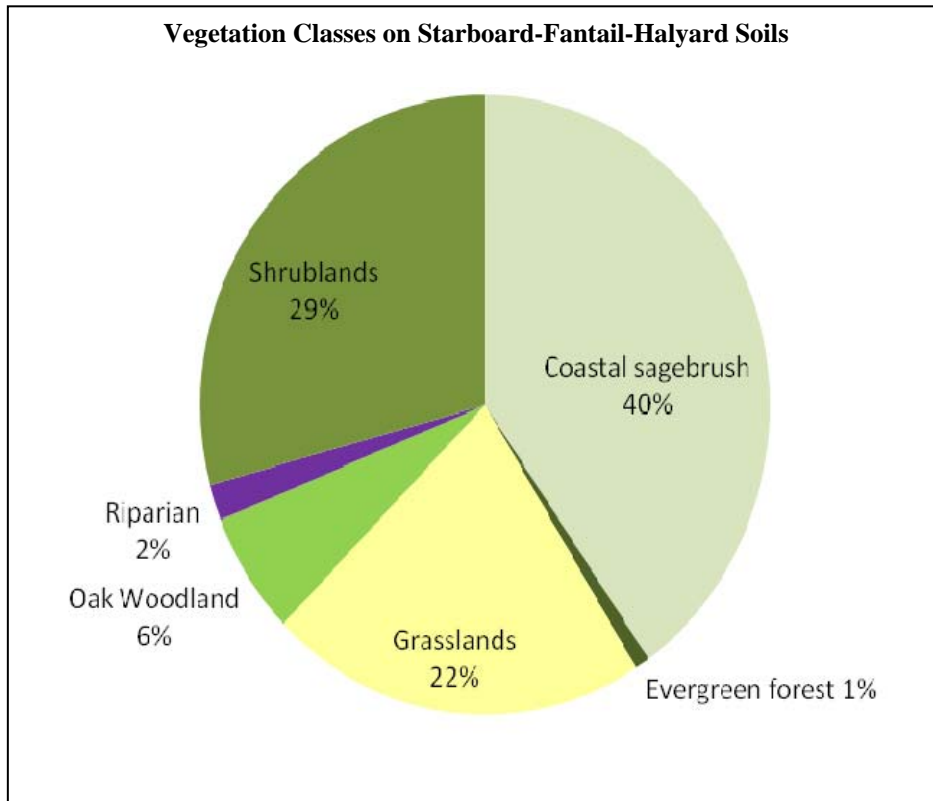


Figure 5. Shows **vegetation classes** for areas on the island with **Starboard soils** and a similar elevation, slope, aspect, and proximity to the coast as the fill disposal site

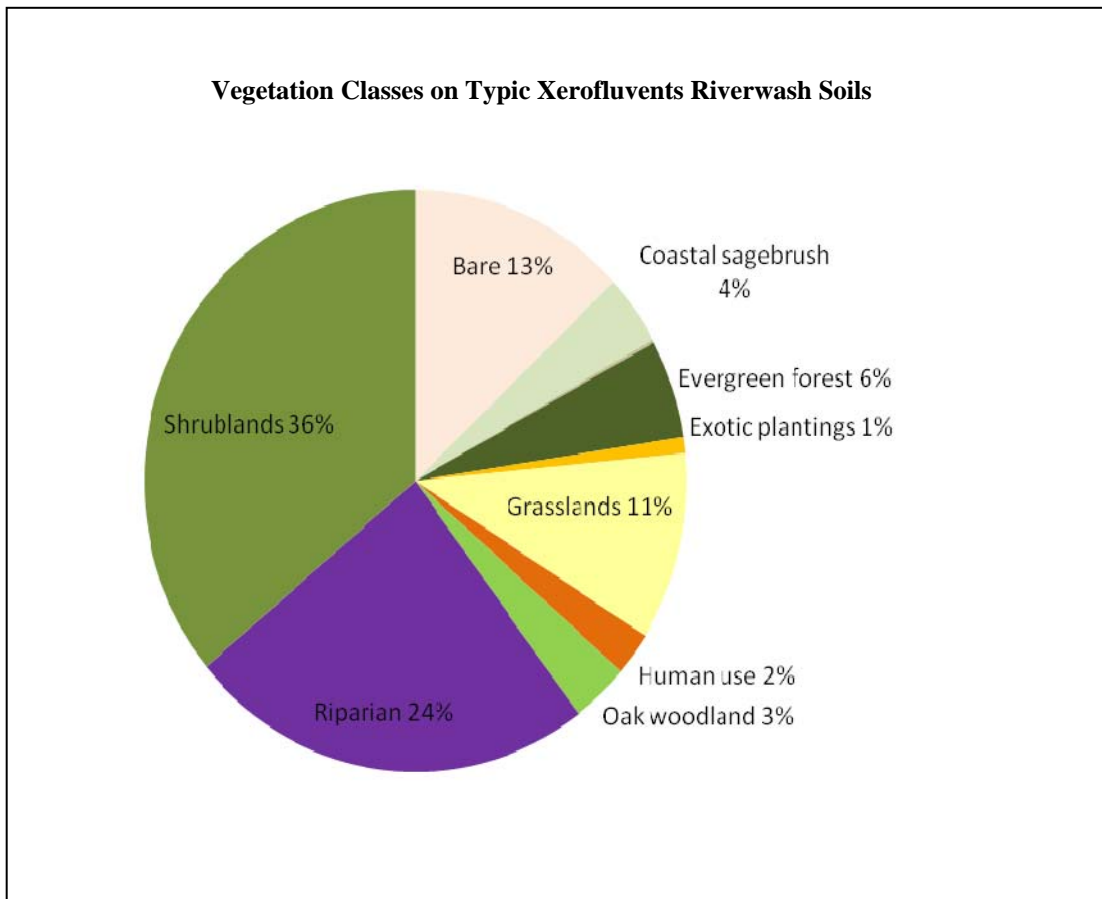


Figure 6. Shows **vegetation classes** for areas on the island with **Riverwash soils** and a similar elevation, slope, aspect, and proximity to the coast as the fill disposal site

| Top Vegetation Types (see descriptions Appendix B) | |
|---|---|
| Starboard-Fantail-Halyard Soils | Typic Xerofluvents Riverwash soils |
| California Sagebrush – Lemonadeberry 15.78% | Mulefat Alliance 20.22% |
| California Annual Grasslands Alliance 14.63% | Mixed Arroyo Willow- Mule Fat Mapping Unit 18.41% |
| Coast Live Oak Alliance 10.51% | Stream Beds and Flats 11.79% |
| Island Scrub Oak- Coastal Sage Scrub Transition 9.27% | Eucalyptus Stands Mapping Unit 7.60% |
| Coyote Brush Alliance 7.56% | Coyote Brush Alliance 7.34% |
| Coastal Bluff Scrub Habitat 7.50% | Tall Temperate Annual Graminoids 5.73% |
| California Sagebrush Alliance 7.00% | Live Oak Alliance 4.45% |
| Island Scrub Oak – Island Ceanothus 4.67% | Arroyo Willow Alliance 4.00% |
| Fennel Mapping Unit 4.39% | Fennel Mapping Unit 2.48% |
| Santa Cruz Island Buckwheat Alliance 2.81% | Built-up 2.21% |

Table 3

Discussion

It is important to recognize the limitations involved with using the preceding methods to determine which vegetation may be appropriate for the fill site. The datasets upon which the analysis was conducted (the elevation, slope, and aspect datasets; and the vegetation and soil maps) have to be accurate, of an appropriate spatial resolution, up-to-date, etc., if the analysis results are to be of any use. Also, it may be difficult to determine all of the factors that influence vegetation success. For our analysis, we chose elevation, slope, aspect, soil type, and proximity to the coast as important factors. These may or may not be the only useful or most useful factors for determining vegetation suitability. Furthermore, when looking for vegetation that’s suitable for the fill site, we chose a range of values for elevation, slope, aspect, and proximity to the coast that we thought would represent the places on the island that are similar to the fill site. These were somewhat arbitrary choices. For example, if we expanded our elevation range to include just slightly steeper slopes, the analysis output may have included different types of vegetation.

While our GIS analysis contains various shortcomings, there are some methods that, with more expertise and time, could be used to increase accuracy, efficiency, and repeatability. In our analysis, equal value was assigned to each fill site characteristic. Elevation, slope, aspect, soil type, and proximity to the coast were all equally important in finding areas similar to the fill

site. In reality, it may be more important to emphasize one or some characteristic/s over others. Using the Weighted Overlay tool, it is possible to give certain characteristics more or less weight. With the Weighted Overlay tool, such parameters can be easily changed to test many different scenarios (ESRI 2008).

ModelBuilder, an application within ArcGIS, could help document the steps used in the analysis. Within ModelBuilder, a model links geoprocessing tools together, feeding the output of each tool into the input of the next (ESRI Developer Network). The geoprocessing tools and the datasets used by those tools are saved within the model (see Figure 7). The model can be exported to script and passed on for use by others. In this way, other users can easily run the same analysis (using different datasets if desired).

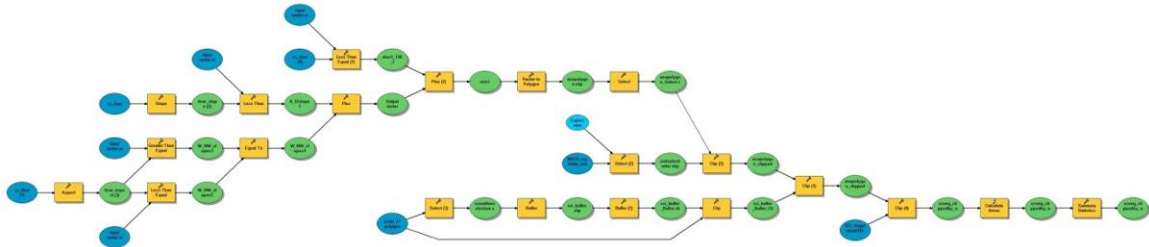


Figure 7: ModelBuilder Model

Although our GIS analysis contains limitations, it does provide a *basis* for determining which vegetation types should be used to revegetate the disposal site. Once again, the disposal site will contain fill material (which may be a mixture of Riverwash soil, Starboard soil, and other soil types) and it will be contoured such that it slopes downward toward the west (toward the stream). Using the output of our GIS analysis, it seems sensible to plant riparian vegetation along the fill site's wetter western border. As the site slopes upward toward the east and becomes drier, a transition from riparian vegetation to sagebrush/grasslands should take place (Figure 8).

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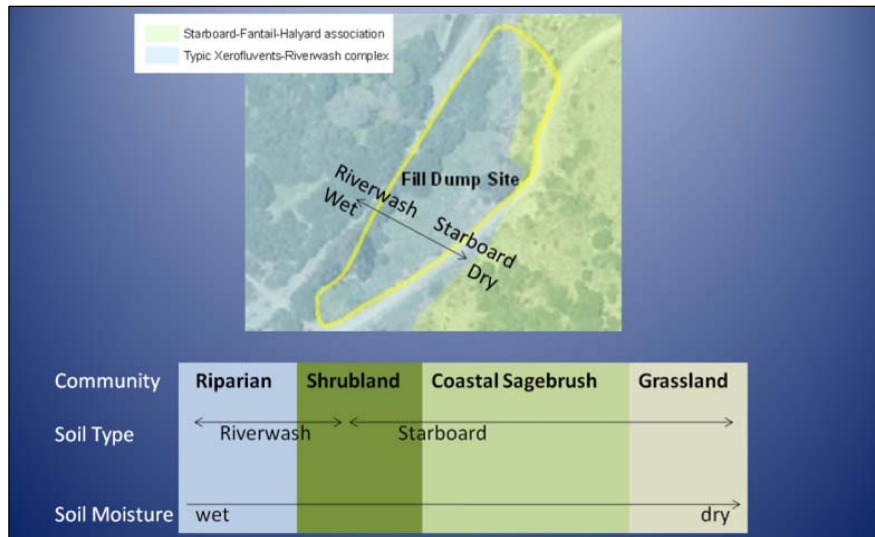


Figure 8: Outlines a possible revegetation plan

This represents a basis for a revegetation plan and must be altered or added to with the knowledge of plant and island specialists before devising a final, more detailed plan. However, GIS- with its ability to overlay a variety of data layers, search for and select certain criteria, and summarize results- serves as a valuable tool in the establishment of a revegetation strategy.

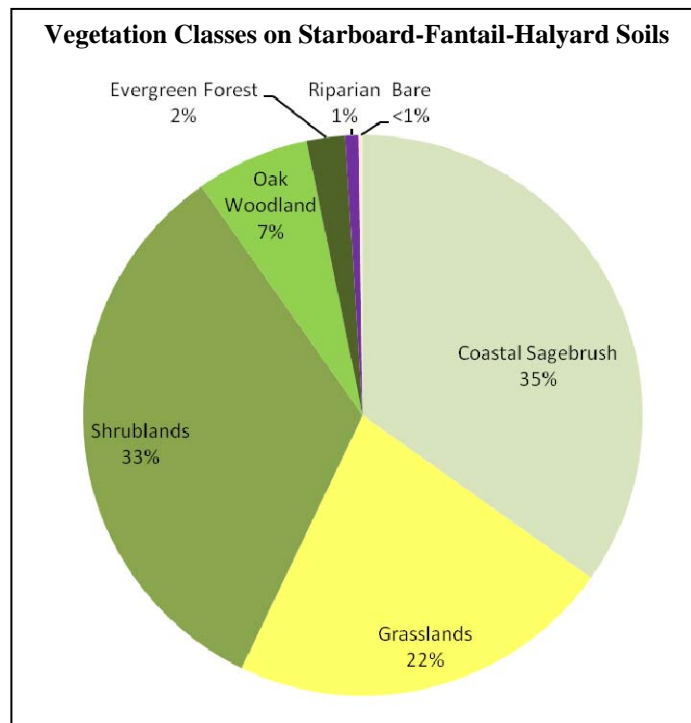
Appendix A Fill Disposal Site #2

The secondary, potential fill site is located within a fennel infestation along Cañada del Puerto (see below). If necessary, it's possible to use the same steps described for the main fill site to determine potential vegetation types to plant in this fill site. Most of those steps have already been done below.

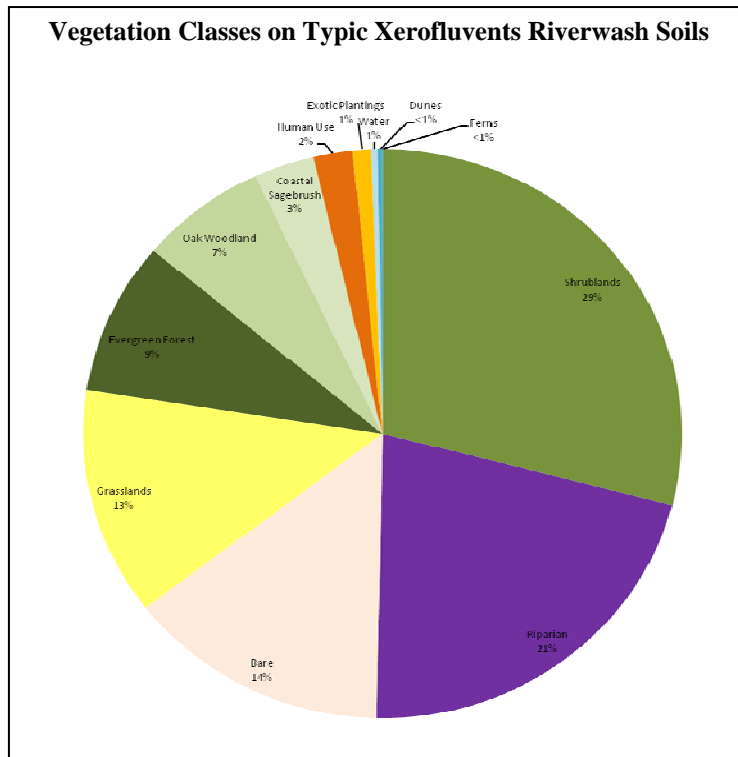


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| | <i>Elevation</i> | <i>Slope</i> | <i>Aspect</i> | <i>Soil Type</i> | <i>Proximity to coast</i> |
|---|------------------|--------------|----------------------------|---|---------------------------|
| Fill Disposal Site 2 Characteristics | 12-46m | 0.86-51.59% | North, Northwest, and West | Starboard-Fantail-Halyard; Typic Xerofluvents Riverwash | Within 1 mi |
| Search Criteria | 0-150m | 0-52% | North, Northwest, and West | Starboard-Fantail-Halyard; Typic Xerofluvents Riverwash | Within 1 mi |



Shows **vegetation classes** for areas on the island with **Starboard soils** and a similar elevation, slope, aspect, and proximity to the coast as fill disposal site #2



Shows **vegetation classes** for areas on the island with **Riverwash soils** and a similar elevation, slope, aspect, and proximity to the coast as fill disposal site #2

Appendix B Vegetation Type Descriptions

(summarized from Aerial Informations Systems, Inc. 2007)

Top Vegetation Types on Starboard-Fantail-Halyard Soils

California Sagebrush – Lemonadeberry 15.78% (Mapped where *Artemisia californica* dominates or co-dominates the shrub layer with *Rhus integrifolia* generally in dense settings. *Rhus integrifolia* can locally dominate over small areas. Mapped in a wide variety of slope related settings from gentle to steep, usually trending southerly in fairly exposed, xeric environments. Most polygons mapped fairly close to the shoreline extending inland along Canada Christy and Canada Medio. Stands mapped in the south and above mentioned canyons often transition into a mix of *Quercus Pacifica*, *Artemisia californica*, and *Rhus integrifolia*. This type is commonly mapped on the western side of the island)

California Annual Grasslands Alliance 14.63% (Mapped in generally dense cover where species from the genera *Avena*, *Bromus*, *Hordeum*, or *Lolium* usually dominate. Forbs and other species of annual grass can dominate over smaller areas. Ridgelines, spurs and rockier areas generally have a significant native component of *Nasella*. Woody vegetation is generally well below 10% cover and often includes species such as *Baccharis salicifolia* and *Artemisia californica*. Mapped extensively on deep poorly drained soils in valleys and ridgelines throughout the island in a variety of slope positions. Much more extensively mapped on the eastern third of the island but common throughout except on rocky slopes and ridges)

Coast Live Oak Alliance 10.51% (*Quercus agrifolia* Alliance; mapped only to the alliance level where *Quercus agrifolia* dominates the tree layer; conditions vary from riparian to gently sloping ridgelines and spurs, rarely noted on south trending slopes, but found occasionally on steep concave to neutral north facing slopes)

Island Scrub Oak- Coastal Sage Scrub Transition 9.27% (Mapped where *Quercus pacifica* generally dominates the chaparral canopy, usually with a minor component of *Rhus integrifolia*. Coastal sage scrub species (CSS) usually are an important component to this type as an open to dense understory, with *Artemisia californica* the most common species in the CSS layer. Other CSS species such as *Eriogonium arborescens* can be a sparse component to the stand. Annual grasses can be an important component to this type; mapped in the most xeric settings for this alliance, often interfacing with dry CSS or inland bluff scrub communities, common on steep south, east and west trending slopes not too far inland from coast; Good representative stands occur on the southern canyons near the coast and on south facing slopes in the eastern portion of the Central Valley. Most stands are within about ½ mile from the coast)

Coyote Brush Alliance 7.56% (Generally mapped in open grassy settings where *Baccharis pilularis* dominates the shrub layer in sparse to moderate cover. Stands can occasionally have a dense cover of over 60% especially on gentle north trending slopes in the isthmus region. *Rhus integrifolia* and or *Artemisia californica* can be minor components to the stand in coastal areas. Sparse stands of *Baccharis pilularis* below 5-10% cover in grassy settings are common and are noted as a shrub component in the density cover layer; Mapped on gentle to moderately sloping environments of deep soil on a variety of aspects and slope positions. Also noted on drier riparian fringes of major washes and on old stream terraces just upslope from the active channel. Commonly found on most portions of the island with the exception of the highest and most inland slopes. Good representative stands are found on gentle slopes on the northern third of the island and northern portions of the isthmus and in the vicinity of Campo Del Norte)

Coastal Bluff Scrub Habitat 7.50% (Mapped based primarily on location where bluff and steep cliffs extend no further than several hundred meters from the shoreline. Vegetation is usually sparse; often in a rocky setting with a sparse herbaceous layer, but overall cover is at least 2-5%. Species dominating or sharing dominance on the bluff may include the following, but is not limited to: *Artemisia californica*, *Dudleya*, *Coreopsis gigantean*, *Encelia californica*, *Eriophyllum staechadifolium*, *Leymus condensatus*, *Rhus integrifolia*, and *Opuntia littoralis*. Further analysis of the plot data may categorize the mapped polygons into floristic types that will be too fine scale to distinguish on the aerial photography. Subsequent modeling efforts based on geologic substrate or slope related characteristics may aid in refining the

mapped polygons into a floristic type. Several patches on the bluff itself are mapped to floristic alliances including (*Rhus integrifolia* or *Artemisia californica*) where visible on the imagery. Moderately steep to vertical cliff faces that are generally rocky with minimal soil development characterize most of the coastal bluffs along Santa Cruz Island. Over 90% of the island's coastal fringe end in a steep bluff edge; bluff faces are interrupted generally where larger streams form small sandy beaches at their mouth)

California Sagebrush Alliance 7.00% (Mapped where *Artemisia californica* dominates the stand in a wide variety of settings from an open sparse shrub layer to a dense cover. Mapped to the alliance level where photo interpreters cannot distinguish at finer levels in the classification or in extremely small patches below approximately one hectare. Most stands mapped within a mile of the coast extending inland into the western portions of the Central Valley and well into Canada Christy. It is less common on well-drained, coarser, grained soils. Several stands, especially in the southern portion of the island west of the isthmus have a significant component of *Salvia mellifera*, however, no signature correlate has been developed for this species off the aerial photography)

Island Scrub Oak – Island Ceanothus 4.67% (mapped where *Quercus pacifica* dominates or co-dominates the stand with *Ceanothus arborus*, both generally as tall shrubs; mesic scrub oak type found on north trending canyons and upper coves on neutral to concave settings in a variety of positions from lower to upper slopes)

Fennel Mapping Unit 4.39% (Mapped where *Foeniculum vulgare* dominates the herbaceous layer. Annual grasses including *Avena spp.*, *Bromus spp.* and *Hordeum spp.* can dominate in portions of the mapped polygon. Shrubs, especially *Baccharis pilularis* are often a common overstory component and may be increasing in cover during the past decade. Common invasive plant in a variety of sparse shrub and grassy areas, which is potentially limited only by very steep, rocky environments. *Foeniculum vulgare* often grows in dense stands on gentle slopes in grasslands adjacent to major stream channels. The most extensive fennel stands occur on the isthmus along Navy Road west of Mount Pleasant. Other areas of dense fennel are located west of the UC Field Station, Christy Ranch, Main Ranch Airfield and the hills south of Smugglers' Cove. Dense fennel is occasionally mapped in narrow channels downstream from large ridge top stands; these channels may act as a conduit for further spreading of this invasive weed to grassy areas in the extreme southern portions of the island. Note plot data along San Justiniano Road northeast of Willows Anchorage depicting this species in the southern portion of the island.

Santa Cruz Island Buckwheat Alliance 2.81% (Mapped where *Eriogonum arborescens* dominates the stand as extremely sparse to sparse cover over a rocky or herbaceous understory. Other species common to inland bluff scrub environments may be a component to the stand. Occasionally, shrub cover becomes dense over very small areas in locally favorable settings, which aren't quite as steep or rocky. Generally found on steep to very steep mid to upper south trending slopes, which are usually rocky but not as severe as inland bluff scrub conditions. Often found just upslope from the California Sagebrush – Santa Cruz Island Buckwheat type (type 3312) and adjacent to inland bluff scrub which is normally found in harsher settings. Mapped extensively, especially on the western half of the island in areas near the coast to well inland.

Top Vegetation Types on Typic Xerofluents Riverwash Soils

Mulefat Alliance 20.22% (Mapped where *Baccharis salicifolia* dominates the stand or co-dominates the stand with *Baccharis pilularis*. Willow species, especially *Salix lasiolepis* can be a minor component to wetter stands. Understory herbaceous layer varies considerably. Noted in active sandy or gravelly well-drained flat channels in environments wetter than *Baccharis pilularis* but drier than *Salix lasiolepis*. Fairly common in most major stream channels that are not too narrow. The most extensive stands occur on the west side of the island in the larger south trending drainages from Playa Larga to White Rock.)

Mixed Arroyo Willow- Mule Fat Mapping Unit 18.41% (Mapped where *Baccharis salicifolia* or *Salix lasiolepis* either dominates or co-dominates riparian stands of vegetation in moderately dense to dense cover. Drier fringes contain less *Salix lasiolepis* with a minor component of *Baccharis pilularis*. Wetter locations tend to have more *Salix lasiolepis*, possibly with other *Salix* or *Populus* individuals as a minor component to the stand. Found in riparian and riparian fringe areas in streams with a large watershed, allowing for seasonal to perennial flow during most years. Stream channel width varies considerably.

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Wider systems may contain a zone of pure willow in the wettest portions that transition to coyote brush dominant areas on the higher terraces with *Baccharis salicifolia* occupying intermediate locations. Common in streams, especially streams that drain south of Ridge Road south of the Central Valley. Major watersheds where this type is extensively mapped include: Canada Christy, Laguna Canyon, Willows Canyon and Canada del Puerto. Much more extensively mapped west of the isthmus)

Stream Beds and Flats 11.79% no description

Eucalyptus Stands Mapping Unit 7.60% (mapped as pure stands where *Eucalyptus spp.* (primarily *E. globules*) is the sole component of the canopy layer. Noted primarily in association with land use related features. Several stands notes, primarily in the Central Valley. Largest stands noted west of the UC research headquarters on the western side of the island and adjacent to the NPS headquarters on the eastern portion of the island.)

Coyote Brush Alliance 7.34% (see above)

Tall Temperate Annual Graminoids 5.73% no description

Live Oak Alliance 4.45% (see above)

Arroyo Willow Alliance 4.00% (Mapped where *Salix lasiolepis* is the sole dominant to the tall shrub or small tree canopy, usually in dense stands. Other willow species in addition to *Populus fremontii* or *P. balsamifera* can form a minor emergent tree layer to the canopy. Found extending several hundred meters below small springs in upper drainages or in streams where water flows most of the year. Stands are rarely found beyond the active flood channel except in saturated conditions. Not as common as the mixed arroyo willow - mule fat type (type 3401), but found in most of the drainages mentioned in that community. Stands are also not as extensive and often form very narrow linear polygons in narrow canyons with large watersheds.)

Fennel Mapping Unit 2.48% (see above)

Built-up 2.21% no description

Appendix C Reverse Analysis

In our analysis, a search was conducted for vegetation that grows in areas similar to the fill site. Our planting site was already known, but the vegetation with which to plant in the site had yet to be identified. Instead, what happens if a vegetation type is known and suitable planting sites for that vegetation type need to be located? In this case, suitability or site selection modeling can be performed using GIS. First, existing occurrences of the vegetation type of interest are located. The dominant characteristics of these locations are then used to discover other potential habitats for that vegetation type. An example is shown below using Fremont Cottonwoods.

| | <i>Elevation</i> | <i>Slope</i> | <i>Aspect</i> | <i>Soil Type</i> |
|--|---------------------|--------------|--|--|
| <i>Characteristics of areas on the island where cottonwoods are found</i> | <i>7-450 meters</i> | <i>0-28%</i> | <i>Mostly North, Northwest, and West</i> | <i>Mostly Spinnaker-Starboard-Rock outcrop complex</i> |



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APPENDIX D—COWARDIN WETLANDS DELINEATION

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United States Department of the Interior
NATIONAL PARK SERVICE
Natural Resource Program Center
Water Resources Division
1201 Oakridge Drive, Suite 250
Fort Collins, Colorado 80525

September 5, 2008

L54 (2380)

PWR/CHIS

Memorandum

To: Russell Galipeau, Superintendent, Channel Islands National Park

Through: Joel Wagner, NPS Wetlands Program Lead, NPS Water Resources Division;
Kevin Noon, Wetlands Ecologist, NPS Water Resources Division

From: Marie Denn, Aquatic Ecologist, NPS Pacific West Region and NPS Water
Resources Division

Copy: Kate Faulkner, Chief of Natural Resources, Channel Islands National Park; Paula
Power, Ecologist, Channel Islands National Park; Dirk Rodriguez, Botanist, Channel
Islands National Park; Clark Cowan, Natural Resource Management Technician,
Channel Islands National Park; Rocky Rudolph, GIS Specialist, Channel Islands
National Park

Subject: Results of Wetlands Mapping at Prisoners Harbor, Santa Cruz Island, July 3 - 5,
2008

Summary

This Memorandum presents a map of wetlands surveyed at Prisoners Harbor and lower Cañada del Puerto on Santa Cruz Island in July 2008. The Memorandum also reproduces a 2007 Natural Resource Conservation Service soil map for the area, a 2007 vegetation map for the area, and a 2008 inventory of vascular plants observed at Prisoners Harbor. These data are for use in the Channel Islands National Park planning effort to enhance wetland resources at Prisoners Harbor. Depending on the extent of the proposed actions at Prisoners Harbor, additional wetlands mapping work may be needed to complete the evaluation of potential environmental impacts from the proposed project.

Prisoners Harbor Coastal Wetland Restoration Plan

Final Environmental Impact Statement

Purpose and Need

Channel Islands National Park (CHIS) and the National Park Service Water Resources Division (WRD) are preparing an Environmental Impact Statement and Environmental Impact Report to consider alternatives for restoring coastal wetlands at Prisoners Harbor on Santa Cruz Island, California. As a part of the evaluation of potential impacts of project alternatives, the National Park Service (NPS) and its partners will examine effects that the project may have on wetlands within the Project Area.

National Park Service policy for wetlands (Director's Order 77-1, or DO 77-1) requires park staff to evaluate impacts from any management activity that could adversely impact wetland habitat and to follow procedures for protecting and restoring wetlands. DO 77-1 defines "wetlands" as those areas that are classified as wetlands in *Classification of Wetlands and Deepwater Habitats of the United States* (Cowardin *et al.* 1979).

In addition to complying with DO 77-1 at Prisoners Harbor, park managers must comply with section 404 of the federal Clean Water Act (CWA), which regulates discharge of dredged or fill material into "waters of the United States," including many wetlands. The US Army Corps of Engineers (USACOE or "Corps") administers section 404 of the CWA. The Corps defines "wetlands" as those areas that exhibit hydric soils, hydrophytic vegetation, and wetland hydrology, as described in the Corps' 1987 Manual for Wetland Delineation and the 2006 Arid West Supplement to the Manual. The Corps may decline to take jurisdiction over isolated wetlands that do not have a "significant nexus" to Traditionally Navigable Waters, as defined by recent US Supreme Court Decisions (see <http://www.usace.army.mil/cw/cecwo/reg/index.html> for up-to-date information on this evolving issue).

For purposes of environmental impact assessment, this memorandum provides a map of wetlands and deepwater habitats (as defined by Cowardin *et al.* 1979) that may be affected by activities within the Project Area. Subsequent compliance with DO 77-1 and Section 404 of the Clean Water Act would require a more formal wetland delineation as described in Section 4.1.2 of NPS Procedural Manual 77-1: Wetland Protection.

In addition to presenting a map of Cowardin wetlands protected under DO 77-1, this Memorandum provides a map of riparian areas, as defined by the USFWS in *A System for Mapping Riparian Areas in the Western United States* (USFWS 1997). In USFWS riparian areas the plant communities are "contiguous to and affected by surface and subsurface hydrologic features of perennial or intermittent lotic and lentic water bodies" (USFWS 1997); however these areas typically do not exhibit hydric soils or wetland hydrology, and may not support a preponderance of wetland vegetation.

The "Project Area" delineated on maps in this Memorandum is based on initial discussions between CHIS and WRD regarding the potential boundary of project actions and their impacts; this boundary is subject to revision. Any expansion of the boundary will create a need for additional field-based wetland mapping.

Soils at Prisoners Harbor and Lower Cañada del Puerto

Hydric soils are one of the three primary characteristics of wetland habitats. The 1987 Manual for Wetlands Delineation (Environmental Laboratory 1987) suggests evaluating existing soil maps before conducting in-field hydric soil investigations. For the Prisoners Harbor area, the most recent and complete soil map was created by the Natural Resources Conservation Service (NRCS), in cooperation with the Regents of the University of California and the National Park Service in 2007 (NRCS 2007). The soil map is at a broad landscape scale, and delineates only two types of soils - identified as Soil Type 160 and Soil Type 190 - within the Project Area (Figure 1).

Soil Type 160:

The report characterizes the shoreline at Prisoners Harbor as "Beaches - abaft complex 0 to 5 percent slope." This soil type is loamy sand in dunes, excessively drained, with a depth to impermeable layer of greater than 80 feet and a parent material of sandy alluvium from sandstone.

Soil Type 190:

"Typic xerofluvent - riverwash complex 0 to 8 percent slopes" found within the stream channel and its floodplain. This soil is somewhat excessively drained, also with depth to impermeable layer of greater than 80 feet, and a parent material of "extremely stony alluvium derived from volcanic and sedimentary rock." This soil type can exhibit a fine surface layer up to 2 inches deep of decomposing plant material, a coarser subsurface layer of 2-24 inches deep of sandy loam, and underlying horizons of extremely gravely sand (to 39 inches) and extremely cobbly sand (to 72 inches below the surface).

Because the 2007 NRCS soil map is at a broad scale, it does not identify small areas of wetland soil present within the Soil Type 190 mapping unit. WRD and park staff observed these soils during site characterization efforts in 2005 and 2008 at Prisoners Harbor and in lower Cañada del Puerto. These soils exhibit hydric characteristics such as accumulation of organic matter on the soil surface and mucky texture typical of hemic organic soils. These soils would probably also exhibit other indications of hydric conditions, such as redox concentrations, discolorations due to redox depletions, and gley coloration.

Soils mapped on the borders of the Project Area are all moderately-to-steeply sloped well-drained and rocky upland soils, including

- *Soil Type 262:* Halyard-Fantail association on 30 to 85 percent slopes,
- *Soil Type 263:* Starboard-Pachic Argixerolls Rock outcrop complex on 30 to 75 percent slopes,
- *Soil Type 272:* Topdeck-Starboard-Rock outcrop complex on 15 to 75 percent slopes, and
- *Soil Type 290:* Rock outcrop-Topdeck-Starboard complex, 30 to 80 percent slopes

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Full descriptions of these soil mapping units can be found in the soil map for the Channel Islands (NRCS 2007).



Figure 1: Soils Mapped in and around the Project Area (from NRCS)

Vegetation at Prisoners Harbor and Lower Cañada del Puerto

Another primary characteristic of wetland habitats is a preponderance of wetland - or "hydrophytic" - plants. The 1987 USACOE Wetlands Delineation Manual (Environmental Laboratory 1987) suggests evaluating existing vegetation maps of project areas before conducting in-field wetland delineations. The most recent and complete vegetation map of the Project Area was created for The Nature Conservancy in 2007

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(Aerial Information Systems, Inc. 2007). This map identified eight dominant vegetation communities within the Project Area (Figure 2). These are:

Eucalyptus Stands (Mapping Unit 1120)

This mapping unit is used for areas where *Eucalyptus* species are the sole component of the canopy. The Project Area supports stands of blue gum (*Eucalyptus globules*) and river red gum (*Eucalyptus camaldulensis*).

Coast Live Oak Alliance (Mapping Unit 2110)

In this mapping unit coast live oak (*Quercus agrifolia*) dominates the tree canopy, with 25% to 60% of the total tree cover. Within the Project Area this vegetation community occurs in a mesic riparian setting, with an understory of shrub species including coyote brush, sagebrush, mugwort, toyon, and young eucalyptus.

Lemonade Berry Alliance (Mapping Unit 3150)

This plant community appears in very limited extent in the northeast corner of the Project Area, on the slope above the Cañada del Puerto lagoon. The evergreen shrub lemonade berry (*Rhus integrifolia*) dominates the stand with a sparse canopy. Sagebrush provides a minor component to the canopy.

Mixed Arroyo Willow - Mule Fat (Mapping Unit 3401)

This unit was mapped in areas that support a mix of Arroyo willow (*Salix lasiolepis*) and mule fat (*Baccharis salicifolia*) in the top-most vegetation canopy. Within the Project Area the single polygon mapped as unit 3401 is very sparsely vegetated with mostly herbaceous and young woody plants. This unit appears to be frequently disturbed by scour from winter flows in Cañada del Puerto.

Arroyo Willow (Mapping Unit 3410)

This is the dominant native wetland and riparian plant community in the Project Area. Within the Project Area this community type is dominated by a moderate to dense canopy of arroyo willow (*Salix lasiolepis*), and in some areas the tree grows so densely to be virtually impenetrable. Arroyo willow can tolerate seasonally-saturated soils, but can also access deep groundwater during droughts. The herbaceous component under the tree/shrub canopy may fluctuate over time with changing groundwater availability – becoming more characterized by hydrophytic plants such as bulrush (*Scirpus californica*) during wet years, and reverting to more dry-adapted species, such as brome (*Bromus* spp.) and slender wild oats (*Avena barbata*) during dry years.

Within the northern portion of the Project Area this vegetation community's spatial extent may vary greatly over decadal time spans, depending on water availability.

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During drier periods this plant community may expand into areas that would normally have too-high groundwater to support arroyo willow. During wet periods, generally characterized by frequent winter storms, high flows on floodplains may remove young willows, and allow re-colonization of low-lying areas by more-hydrophytic plant communities, particularly bulrush-cattail.

Bulrush - Cattail (Mapping Unit 4101)

A small amount of acreage within the Project Area is occupied by a dominant canopy of bulrush (*Scirpus californicus* and *S. maritimus*), with a small subcomponent of cattail (*Typha dominguensis*). This vegetation community persists in the wettest portions of the Project Area that support a high groundwater table year round. This is a rare vegetation community on Santa Cruz Island, due to its aridity and generally small watersheds. Cañada del Puerto is the only watershed in the island to support a vegetation community dominated by obligate wetland vegetation, such as bulrush and cattail.

Fennel (Mapping Unit 4301)

Although many acres on Santa Cruz Island are heavily infested with this non-native plant, only a small percentage of the Project Area is mapped as dominated by fennel (*Foeniculum vulgare*). Fennel typically thrives on disturbed upland slopes and hillsides, although it can also invade drier portions of floodplains. Fennel stands on island the island typically co-exist with an herbaceous understory of *Avena* spp., *Bromus* spp., and *Hordeum* spp., and with native shrubs such as coyote bush (*Baccharis pilularis*).

Within the Project Area fennel stands persist on disturbed terraces above the primary Cañada del Puerto floodplain and stream channel. These units are not directly adjacent to the channel, but border on arroyo willow and eucalyptus stands.

Silver Beachbur - Beach Sand Verbena Alliance (Mapping Unit 4410)

This alliance was mapped on coastal dune and beach habitats where the sparse canopy is dominated by a mix of silver beachbur (*Ambrosia chamissonis*) and sand verbena (*Abronia maritima*), with minor components of sea rocket (*Cakile maritima*), and salt grass (*Distichlis spicata*). Of these four plants, only sea rocket and salt grass have been observed within the Project Area by park staff.

In addition, the 1997 vegetation map identified one non-vegetated mapping unit within the Project Area: Stream Beds and Flats (Mapping Unit 9430), and two highly-disturbed and managed mapping units: Built-up (Mapping Unit 9100) and Planted Trees and Shrubs (Mapping Unit 9600).

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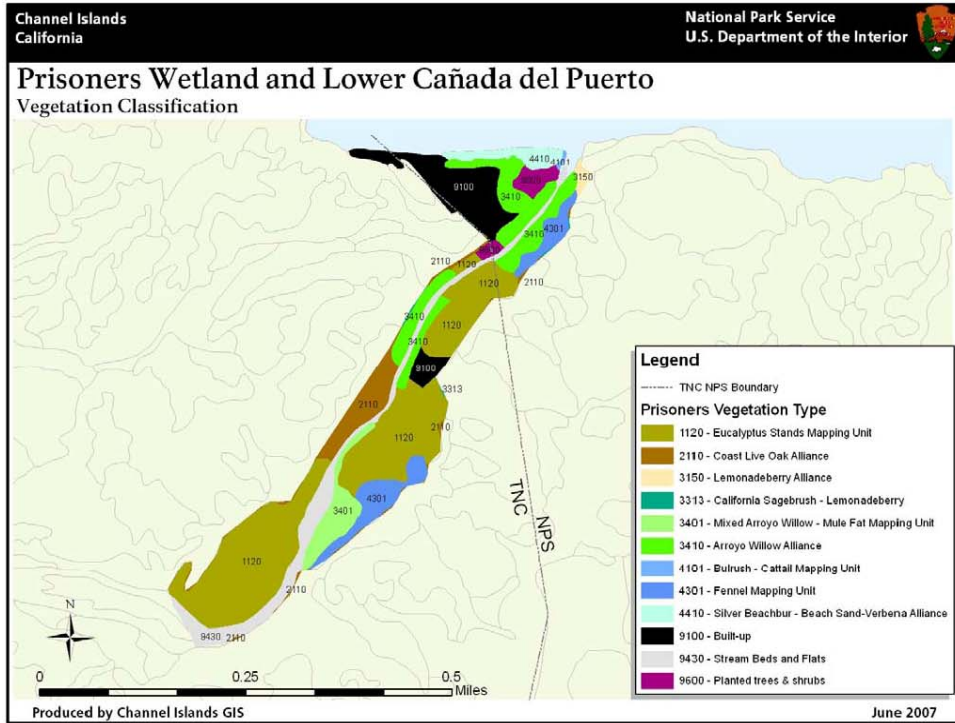


Figure 2: Plant Communities within the Project Area

Plant Species List for Prisoners Harbor

During the July 2008 site-characterization visit to Prisoners Harbor and lower Cañada del Puerto, park staff created a preliminary inventory (Appendix A) of plants observed within the lower portion of the Project Area (Figure 3). Park and WRD staff characterized plants on the list by their fidelity to wetland habitats (as given by Reed 1988), their endemism or rarity status, and/or their degree of threat to native ecosystems (for non-native plants). The purpose of this map is to show the general locations of observed plant species only, not to designate the boundaries of wetland or riparian habitat.



Figure 3: Habitats Identified during Inventory of Vegetation at Prisoners Harbor (for a list of plants found in these habitats see Appendix A of this Memorandum)

2008 Wetland and Riparian Area Map for Prisoners Harbor and Lower Cañada del Puerto

Between July 3rd and July 5th 2008 WRD and park staff visited Prisoners Harbor to conduct field surveys in order to create maps of Cowardin wetlands and riparian areas (Figure 4) within the potential Project Area.

The resulting Cowardin Wetland and Riparian Areas map for the Project Area shows three types of Cowardin wetlands - Palustrine Emergent Wetlands, Palustrine Forested Wetlands, and Riverine Intermittent Unconsolidated Bottom Wetlands. In addition the map shows four types of lotic (or stream-related) riparian habitat - Forested Deciduous, Forested Evergreen, Herbaceous, and Forested Mixed.

Palustrine Wetlands are freshwater wetlands that are typically dominated by trees, shrubs, or persistent herbaceous vegetation (commonly known as marshes or swamps). Though most palustrine wetland types are non-tidal, the palustrine system includes freshwater tidal wetlands (salinity < 0.5 ppt). These areas generally exhibit high year-round surface or groundwater and hydric soils.

Palustrine Emergent Wetlands are areas with high year-round ground or surface water that support herbaceous vascular plants at 30% or greater cover in most years, with a tree and shrub cover of less than 30%. Generally in the Project Area Palustrine emergent wetlands represent either the remnants of a backdune swale that was partially filled in the 19th and 20th centuries to support agriculture, vegetated areas bordering the outlet of Cañada del Puerto, or small polygons along Cañada del Puerto that may have high groundwater supported by artificial road-crossing structures.

Palustrine Forested Wetlands are areas with high year-round groundwater that support a tree canopy of 30% cover or more. In the Project Area these polygons are overwhelmingly represented by dense stands of Arroyo willow (*Salix lasiolepis*).

Riverine Wetlands are contained within a channel and exhibit sufficient water flow - at least seasonally - to maintain a bed and bank structure. These areas may support year-round surface water, seasonal surface water with a high year-round water table, or highly seasonal surface and groundwater.

Riverine Intermittent Unconsolidated Bottom Wetlands are non-tidal channelized systems containing flowing water for only part of the year, although surface water may persist in open pools year-round. These wetlands have a greater than 25% cover of rocky particles smaller than stones, and a vegetative cover of less than 30%. Within the Project Area this wetland type is found in the Cañada del Puerto channel. It supports a sparse cover (<5%) of opportunistic herbaceous vegetation in summer, and is scoured to sand and cobble during annual winter flooding.

Riparian Areas are a relatively recent addition to the US Fish and Wildlife Service (USFWS) wetland mapping program. USFWS personnel recognized a void in the

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Cowardin classification system for defining riparian habitat, which is not technically wetland, but is still particularly vital for biota in lands in the Western United States. To address this need, the USFWS service published *A System for Mapping Riparian Areas in the Western United States* (USFWS 1997). It defines riparian areas as plant communities contiguous to and affected by surface and subsurface hydrologic features (e.g., rivers, streams, lakes, or drainageways) but not exhibiting the frequency or duration of saturation or flooding necessary for classification as wetlands.

Field mapping protocols for riparian areas are not well established. The Southern California Coastal Water Research Project has published draft guidance on *Standards for Mapping Wetland and Riparian Habitats in Southern California Coastal Watersheds* (SCCWRP 2007), based in part on USFWS 1997, however this guidance focuses on remote-sensing based mapping on the landscape scale. The criteria used for mapping "riparian" areas for this effort are based on the USFWS 1997 riparian definition described in the previous paragraph, and are as follows:

Riparian areas have one or both of the following characteristics: 1) distinctively different vegetative species than adjacent areas, 2) species similar to adjacent areas, but exhibiting more vigorous or robust growth forms. Riparian areas are usually transitional between wetland and upland.

For this project, in general field observers delineated the higher-elevation boundary of the riparian polygons as either corresponding to the edge of the Project Area, corresponding to the edge of the dominant vegetation type (as mapped by The Nature Conservancy's vegetation map; Aerial Information Systems, Inc. 2007), or corresponding to an observed change in understory species within a larger vegetation polygon that indicated a fall-off in hydrologic influence on the vegetation community. Field observers delineated the lower-elevation boundary of the riparian polygons as corresponding with the TNC vegetation map's boundary of the Cañada del Puerto channel (Aerial Information Systems, Inc. 2007).

Riverine Lotic Emergent Areas are stream-side areas dominated by herbaceous plants. Within the Project Area these areas were mapped based on field observations and the TNC vegetation map for Santa Cruz Island, and generally corresponds with the vegetation map's 9600 unit - planted shrubs and trees and 3401 unit - mixed Arroyo willow and mule fat. Although these units are described in the TNC vegetation map as supporting substantial tree or shrub components, within the Project Area these units are dominated by herbaceous vegetation.

Riverine Lotic Forested Deciduous Areas are stream-side areas dominated by a canopy of deciduous trees. Within the Project Area these areas were mapped based on field observations and the TNC vegetation map for Santa Cruz Island, and generally corresponds with the vegetation map's 2110 unit - Coast live oak alliance.

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Riverine Lotic Forested Evergreen Areas are stream-side areas dominated by a canopy of evergreen trees. Within the Project Area these areas were mapped based on field observations and the TNC vegetation map for Santa Cruz Island, and generally corresponds with the vegetation map's 1120 unit - Eucalyptus stands.

Riverine Lotic Forested Mixed Areas are stream-side areas dominated by a mixed canopy of evergreen and deciduous trees. Within the Project Area these areas were mapped based on field observations and the TNC vegetation map for Santa Cruz Island, and generally corresponds with the vegetation map's 2110 unit - Coast live oak alliance.

In addition to mapping Cowardin wetlands and riparian areas, field observers identified areas that may be jurisdictional wetlands according to the US Army Corps of Engineers wetlands delineation manual (Environmental Laboratory 1987) and its supplement for mapping wetlands in arid areas in the Western United States (USACOE 2006). However, a formal wetland delineation was not completed. Areas mapped as Cowardin wetlands in Figure 4 below exhibit a preponderance of hydrophytic vegetation and indications of wetland hydrology. In order to confirm the boundaries of these wetland polygons for project permitting purposes, presence of hydric soils will need to be verified with excavation of small soil pits on or near the polygons' margins.

Furthermore, classification of lower Cañada del Puerto - a water of the United States - as either "relatively permanent" or not "relatively permanent" may need to be finalized in order to evaluate whether or not some of the wetlands mapped in Figure 4 below will fall under the regulatory jurisdiction of the US Army Corps of Engineers. Because guidance on this issue is currently evolving (USACOE 2008), resolution of the status of lower Cañada del Puerto should wait until the park applies for a Nationwide Permit under section 404 of the federal Clean Water Act.

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Santa Cruz Island
Prisoners Harbor Cowardin Wetland and Riparian Habitat Map July 2008

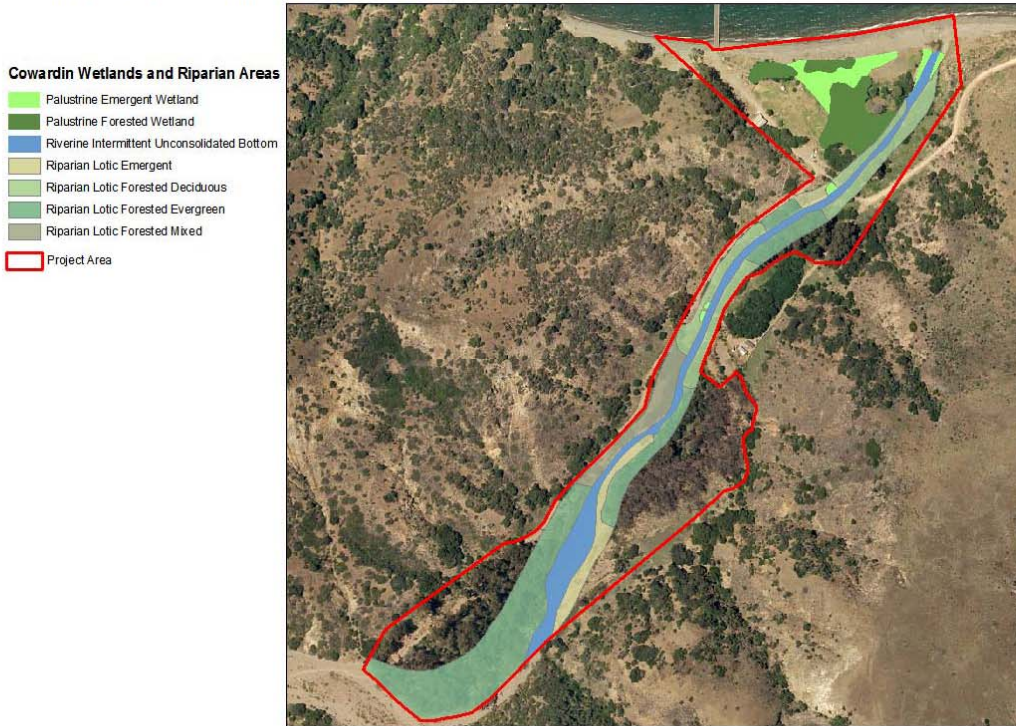


Figure 4: Cowardin Wetlands and Riparian Areas at Prisoners Harbor and Lower Cañada del Puerto

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This map is appropriate for use in evaluating potential impacts to wetland resources in the upcoming Environmental Impact Statement and Environmental Impact Report (EIS/EIR). However, depending on the final extent of the Project Area additional field surveys may be needed to cover areas that were not surveyed during the July 2008 visit.

Additional Wetland Mapping and Assessment Needs

In order to adequately evaluate potential impacts to wetlands in the EIS/EIR park staff will need to complete the following tasks:

- 1) Finalize the extent of the Project Area
- 2) For lands within the final Project Area that were not surveyed for wetlands or riparian areas in July 2008 (*i.e.*, outside of the boundaries of the "Project Area" identified on maps in this Memorandum), determine if there are any Cowardin wetland areas or riparian areas present.
- 3) Complete a functional assessment of existing wetlands (chemical, physical, and biological functions) to facilitate evaluation of adverse impacts on them from the alternatives.

The map in this Memorandum is not adequate for full compliance with section 404 of the Clean Water Act or DO 77-1. Before the park requests a permit from the Army Corps of Engineers to alter wetlands or other waters of the United States at Prisoners Harbor, or completes compliance with DO 77-1, park staff will need to complete the following tasks:

- 1) Finalize the extent of the Project Area
- 2) Conduct a formal wetland delineation for all wetlands in the project area, using procedures described in Section 4.1.2 of Procedural Manual 77-1 to satisfy both Corps and NPS regulatory requirements.

Note that formal delineation of wetlands will require excavation of small soil pits to confirm presence of hydric soils on the margins of the wetlands; this will likely require the on-site presence of an archeological monitor during field work.

An application to the Corps for a Nationwide Permit should include the following items:

- a) Wetland delineation map
- b) Data sheets (from the 2006 Arid West Supplement) documenting conditions at specific locations around the margins of the mapped wetlands describing soil types, dominant vegetation, and hydrology indicators; and
- c) Preliminary evaluation of the nexus of mapped wetlands to Traditionally Navigable Waters such as the Santa Barbara Channel, and to any relatively permanent waters such as - potentially - lower Cañada del Puerto.

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Appendix A: List of Plants Observed at Prisoners Harbor, July 3rd 2008

Field identification of plants by Channel Islands National Park staff Dirk Rodriguez and Clark Cowan
Nativity and Common Name from Junak *et al.* 1997
Wetland Indicator Status from Reed 1988

| Name | Common Name | Family | Native? | Special status or invasive? | Wetland Indicator Status | Location(s) observed |
|--|-----------------------|--------------|---------|-----------------------------|--------------------------|----------------------|
| <i>Avena barbata</i> | Slender wild oats | Poaceae | No | Invasive | - | Backdune Wetlands |
| <i>Baccharis douglasii</i> | Sticky baccharis | Asteraceae | Yes | | - | Backdune Wetlands |
| <i>Baccharis pilularis</i> | Coyote brush | Asteraceae | Yes | | - | Backdune Wetlands |
| <i>Conyza canadensis</i> | Horseweed | Asteraceae | Unknown | | FAC | Backdune Wetlands |
| <i>Cynodon dactylon</i> | Bermuda grass | Poaceae | No | Invasive | FAC | Backdune Wetlands |
| <i>Distichlis spicata</i> | Salt grass | Poaceae | Yes | | FACW | Backdune Wetlands |
| <i>Gnaphalium canescens</i> | Fragrant everlasting | Asteraceae | Yes | | - | Backdune Wetlands |
| <i>Heteromeles arbutifolia</i> | Toyon | Rosaceae | Yes | | - | Backdune Wetlands |
| <i>Lotus corniculatus</i> | Bird's foot trefoil | Fabaceae | No | | FAC | Backdune Wetlands |
| <i>Pennisetum clandestinum</i> | Kikuyu grass | Poaceae | No | Invasive | - | Backdune Wetlands |
| <i>Polygonum lapathifolium</i> | Willow smartweed | Polygonaceae | Yes | | OBL | Backdune Wetlands |
| <i>Polypogon monspeliensis</i> | Rabbitsfoot grass | Poaceae | No | | FACW | Backdune Wetlands |
| <i>Rumex crispus</i> | Curly dock | Polygonaceae | No | Invasive | FACW | Backdune Wetlands |
| <i>Rumex salicifolia</i> v. <i>salicifolia</i> | Willow dock | Polygonaceae | Yes | | OBL | Backdune Wetlands |
| <i>Salix lasiolepis</i> | Red willow | Salicaceae | Yes | | FACW | Backdune Wetlands |
| <i>Scirpus californicus</i> | California bullrush | Cyperaceae | Yes | | OBL | Backdune Wetlands |
| <i>Scirpus maritimus</i> | Shore bullrush | Cyperaceae | Yes | | OBL | Backdune Wetlands |
| <i>Sonchus asper</i> | Prickly sow-thistle | Asteraceae | No | | FAC | Backdune Wetlands |
| <i>Sonchus oleraceus</i> | Common sow-thistle | Asteraceae | No | | NI* | Backdune Wetlands |
| <i>Typha domingensis</i> | Narrow-leaved cattail | Typhaceae | Yes | | OBL | Backdune Wetlands |
| <i>Ambrosia</i> | Beach and Dunebur | Asteraceae | Yes | | - | Beach and Dune |

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| | | | | | | |
|---|----------------------|-----------------|---------|----------------------------|------|----------------|
| <i>chamissonis</i> | | | | | | |
| <i>Bromus diandrus</i> | Ripgut brome | Poaceae | No | - | | Beach and Dune |
| <i>Cakile maritima</i> | Sea rocket | Brassicaceae | No | FACW | | Beach and Dune |
| <i>Chenopodium californicum</i> | Soaproot | Chenopodiaceae | Yes | - | | Beach and Dune |
| <i>Cynodon dactylon</i> | Bermuda grass | Poaceae | No | FAC | | Beach and Dune |
| <i>Distichlis spicata</i> | Salt grass | Poaceae | Yes | FACW | | Beach and Dune |
| <i>Eriogonum grande grande</i> | Island buckwheat | Polygonaceae | Yes | Endemic to Channel Islands | - | Beach and Dune |
| <i>Eschscholtzia californica</i> | California poppy | Papaveraceae | Yes | - | | Beach and Dune |
| <i>Foeniculum vulgare</i> | Fennel | Apiaceae | No | Invasive | FACU | Beach and Dune |
| <i>Gnaphalium canescens</i> | Fragrant everlasting | Asteraceae | Yes | - | | Beach and Dune |
| <i>Heterotheca grandiflora</i> | Telegraph weed | Asteraceae | Unknown | - | | Beach and Dune |
| <i>Lamarckia aurea</i> | Goldentop | Poaceae | No | - | | Beach and Dune |
| <i>Lotus dendroideus v. dendroideus</i> | Island deerweed | Fabaceae | Yes | Endemic to Channel Islands | - | Beach and Dune |
| <i>Lupinus bicolor</i> | Dove lupine | Fabaceae | Yes | - | | Beach and Dune |
| <i>Medicago polymorpha</i> | Burclover | Fabaceae | No | - | | Beach and Dune |
| <i>Medicago sativa</i> | Alfalfa | Fabaceae | No | - | | Beach and Dune |
| <i>Plantago lanceolata</i> | English plantain | Plantaginaceae | No | FAC | | Beach and Dune |
| <i>Rhus integrifolia</i> | Lemonade berry | Anacardiaceae | Yes | - | | Beach and Dune |
| <i>Silene gallica</i> | Windmill pink | Caryophyllaceae | No | - | | Beach and Dune |
| <i>Anemopsis californica</i> | Yerba mansa | Saururaceae | Yes | OBL | | Corrals |
| <i>Artemisia douglasii</i> | Mugwort | Asteraceae | Yes | - | | Corrals |
| <i>Baccharis douglasii</i> | Sticky baccharis | Asteraceae | Yes | - | | Corrals |
| <i>Baccharis pilularis</i> | Coyote brush | Asteraceae | Yes | - | | Corrals |
| <i>Bromus carinatus</i> | California brome | Poaceae | Yes | - | | Corrals |
| <i>Bromus diandrus</i> | Ripgut brome | Poaceae | No | - | | Corrals |
| <i>Bromus diandrus</i> | Ripgut brome | Poaceae | No | - | | Corrals |
| <i>Cakile maritima</i> | Sea rocket | Brassicaceae | No | FACW | | Corrals |
| <i>Convolvulus</i> | Bindweed | Convolvulaceae | No | - | | Corrals |

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| | | | | | |
|------------------------------|---------------------|----------------|---------|----------|-------------------|
| <i>arvensis</i> | | | | | |
| <i>Conyza canadensis</i> | Horseweed | Asteraceae | Unknown | FAC | Corrals |
| <i>Distichlis spicata</i> | Salt grass | Poaceae | Yes | FACW | Corrals |
| <i>Foeniculum vulgare</i> | Fennel | Apiaceae | No | Invasive | FACU |
| <i>Heteromeles</i> | | | | | |
| <i>arbutifolia</i> | Toyon | Rosaceae | Yes | - | Corrals |
| <i>Hordeum murinum</i> | Foxtail | Poaceae | No | - | Corrals |
| <i>Lactuca serriola</i> | Prickly lettuce | Asteraceae | No | FAC | Corrals |
| <i>Lepidium draba</i> | Hoary cress | Brassicaceae | No | Invasive | Corrals |
| <i>Lolium multiflorum</i> | Italian ryegrass | Poaceae | No | - | Corrals |
| <i>Lotus corniculatus</i> | Bird's foot trefoil | Fabaceae | No | FAC | Corrals |
| <i>Melilotus indicus</i> | Yellow sweet-clover | Fabaceae | No | FAC | Corrals |
| <i>Pennisetum</i> | | | | | |
| <i>clandestinum</i> | Kikuyu grass | Poaceae | No | Invasive | - |
| <i>Plantago lanceolata</i> | English plantain | Plantaginaceae | No | FAC | Corrals |
| <i>Polypogon</i> | | | | | |
| <i>monspeliensis</i> | Rabbitsfoot grass | Poaceae | No | FACW | Corrals |
| <i>Rumex crispus</i> | Curly dock | Polygonaceae | No | Invasive | FACW |
| <i>Rumex salicifolia</i> v. | | | | | |
| <i>salicifolia</i> | Willow dock | Polygonaceae | Yes | OBL | Corrals |
| <i>Salix lasiolepis</i> | Red willow | Salicaceae | Yes | FACW | Corrals |
| <i>Scirpus californicus</i> | California bullrush | Cyperaceae | Yes | OBL | Corrals |
| <i>Sonchus oleraceus</i> | Common sow-thistle | Asteraceae | No | NI* | Corrals |
| <i>Ulmus x hollandica</i> | Dutch elm | Ulmaceae | No | - | Corrals |
| <i>Scirpus maritimus</i> | Shore bullrush | Cyperaceae | Yes | OBL | Lagoon |
| Narrow-leaved | | | | | |
| <i>Typha dominguensis</i> | cattail | Typhaceae | Yes | OBL | Lagoon |
| <i>Agrostis viridis</i> | Water bent | Poaceae | No | - | Riparian Corridor |
| <i>Anagallis arvensis</i> | Scarlet pimpernel | Primulaceae | No | FAC | Riparian Corridor |
| <i>Artemisia douglasii</i> | Mugwort | Asteraceae | Yes | - | Riparian Corridor |
| Spear-leaved | | | | | |
| <i>Atriplex triangularis</i> | saltbush | Chenopodiaceae | Yes | - | Riparian Corridor |
| <i>Baccharis pilularis</i> | Coyote brush | Asteraceae | Yes | - | Riparian Corridor |
| <i>Baccharis salicifolia</i> | Mulefat | Asteraceae | Yes | - | Riparian Corridor |
| <i>Brassica nigra</i> | Black mustard | Brassicaceae | No | Invasive | - |
| Riparian Corridor | | | | | |

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|---------------------------------------|----------------------|------------------|-----|----------|------|-------------------|
| <i>Bromus diandrus</i> | Ripgut brome | Poaceae | No | | - | Riparian Corridor |
| <i>Clarkia epilobioides</i> | Fireweed clarkia | Ongraceae | Yes | | | Riparian Corridor |
| <i>Cotula coronopifolia</i> | Brass buttons | Asteraceae | No | | FAC | Riparian Corridor |
| <i>Epipactis giganteum</i> | Stream orchid | Orchidaceae | Yes | | OBL | Riparian Corridor |
| <i>Equisetum laevigatum</i> | Smooth scouring rush | Equisetaceae | Yes | | FACW | Riparian Corridor |
| <i>Eucalyptus camaldulensis</i> | Red river gum | Myrtaceae | No | Invasive | | Riparian Corridor |
| <i>Foeniculum vulgare</i> | Fennel | Apiaceae | No | Invasive | FACU | Riparian Corridor |
| <i>Gnaphalium luteoalbum</i> | Weedy cudweed | Asteraceae | No | | FACW | Riparian Corridor |
| <i>Hirschfeldia incana</i> | Short-podded mustard | Brassicaceae | Yes | | - | Riparian Corridor |
| <i>Juncus bufonis</i> | Toad rush | Juncaceae | Yes | | FACW | Riparian Corridor |
| <i>Juncus xyphoides</i> | Iris-leaved rush | Juncaceae | Yes | | OBL | Riparian Corridor |
| <i>Lolium multiflorum</i> | Italian ryegrass | Poaceae | No | | - | Riparian Corridor |
| <i>Lotus corniculatus</i> | Bird's foot trefoil | Fabaceae | No | | FAC | Riparian Corridor |
| <i>Lotus purshianus v. purshianus</i> | Spanish clover | Fabaceae | Yes | | - | Riparian Corridor |
| <i>Lupinus bicolor</i> | Dove lupine | Fabaceae | Yes | | - | Riparian Corridor |
| <i>Lythrum hyssopifolia</i> | Common loosestrife | Loasaceae | Yes | | FACW | Riparian Corridor |
| <i>Malva parviflora</i> | Cheeseweed | Malvaceae | No | | - | Riparian Corridor |
| <i>Medicago polymorpha</i> | Burclover | Fabaceae | No | Invasive | - | Riparian Corridor |
| <i>Melilotus indicus</i> | Yellow sweet-clover | Fabaceae | No | | FAC | Riparian Corridor |
| <i>Mimulus cardinalis</i> | Scarlet monkeyflower | Scrophulariaceae | Yes | | OBL | Riparian Corridor |
| <i>Mimulus guttatus</i> | Common monkeyflower | Scrophulariaceae | Yes | | OBL | Riparian Corridor |
| <i>Paspalum distichum</i> | Knotgrass | Poaceae | Yes | | OBL | Riparian Corridor |
| <i>Pennisetum clandestinum</i> | Kikuyu grass | Poaceae | No | Invasive | - | Riparian Corridor |
| <i>Piptatherum miliaceum</i> | Smilo grass | Poaceae | No | Invasive | - | Riparian Corridor |
| <i>Plantago lanceolata</i> | English plantain | Plantaginaceae | No | | FAC | Riparian Corridor |
| <i>Polygonum</i> | Willow smartweed | Plantaginaceae | No | | OBL | Riparian Corridor |

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|------------------------------------|---------------------|------------------|-----|----------|-------|-------------------|
| <i>Iapathifolium</i> | | | | | | |
| <i>Polypogon interruptus</i> | Ditch beardgrass | Poaceae | No | | OBL | Riparian Corridor |
| <i>Polypogon monspeliensis</i> | Rabbitsfoot grass | Poaceae | No | | FACW | Riparian Corridor |
| <i>Rumex crispus</i> | Curly dock | Polygonaceae | No | Invasive | FACW | Riparian Corridor |
| <i>Salix lasiolepis</i> | Red willow | Salicaceae | Yes | | FACW | Riparian Corridor |
| <i>Silene gallica</i> | Windmill pink | Caryophyllaceae | No | | - | Riparian Corridor |
| <i>Solanum douglasii</i> | Douglas' nightshade | Solanaceae | Yes | | | Riparian Corridor |
| <i>Sonchus oleraceus</i> | Common sow-thistle | Asteraceae | No | | NI* | Riparian Corridor |
| <i>Trifolium</i> | | | | | | |
| <i>microcephalum</i> | Small-headed clover | Fabaceae | Yes | | FACU* | Riparian Corridor |
| <i>Trifolium willdenovii</i> | Tomcat clover | Fabaceae | Yes | | - | Riparian Corridor |
| <i>Veronica anagallis-aquatica</i> | Water speedwell | Scrophulariaceae | No | | OBL | Riparian Corridor |
| <i>Vicia bengalensis</i> | Purple vetch | Fabaceae | No | | - | Riparian Corridor |
| <i>Woodwardia</i> | | | | | | |
| <i>fimbriata</i> | Giant chain fern | Blechnaceae | Yes | | FACW | Riparian Corridor |
| <i>Albizia lophantha</i> | Plume acacia | Fabaceae | No | | - | Willow Thicket |
| <i>Bromus carinatus</i> | California brome | Poaceae | Yes | | - | Willow Thicket |
| <i>Bromus diandrus</i> | Ripgut brome | Poaceae | No | | - | Willow Thicket |
| <i>Foeniculum vulgare</i> | Fennel | Apiaceae | No | Invasive | FACU | Willow Thicket |
| <i>Pennisetum</i> | | | | | | |
| <i>clandestinum</i> | Kikuyu grass | Poaceae | No | Invasive | - | Willow Thicket |
| <i>Polypogon</i> | | | | | | |
| <i>monspeliensis</i> | Rabbitsfoot grass | Poaceae | No | | FACW | Willow Thicket |
| <i>Salix lasiolepis</i> | Red willow | Salicaceae | Yes | | FACW | Willow Thicket |
| <i>Sonchus oleraceus</i> | Common sow-thistle | Asteraceae | No | | NI* | Willow Thicket |

APPENDIX E—PLANT SPECIES SURVEY

PRISONERS HARBOR COASTAL WETLAND RESTORATION PROJECT AREA PLANT SPECIES LIST

A plant survey of the Prisoners Harbor Coastal Wetland Restoration project area was conducted on July 3 and July 25 – 29, 2008. The project area was previously classified by vegetation type by The Nature Conservancy (*Aerial Information Systems, Inc. March 31, 2007*). There are 12 vegetation types in the project area. Vegetation type polygons were downloaded to a Trimble GPS device and groups of two or three people were assigned one vegetation type polygon to survey. The survey was conducted by walking the entire vegetation type polygon and recording all plant species observed. If a plant was difficult to identify a sample was collected and keyed out to species later in the day.

Participants included NPS personnel: Paula Power, Dirk Rodriguez, Clark Cowan, James R. Roberts, Marie Denn; TNC Staff: Colleen Cory; and volunteer expert botanists: Ken Niessen and William Abbott.

The total number of species found on the site was 179. There were no federally listed species found in the project area. One state listed species was found in the main stream channel, Santa Cruz Island silver lotus (*Lotus argophyllus* ssp. *argenteus*). No unusual or unexpected plant species were identified.

The relative abundance of individual species is indicated by the following key:

D – dominant, C – common, O – occasional, R – rare

Some vegetation types were represented by more than one polygon. Where more than one polygon was surveyed for a given vegetation type, the higher overall abundance was used. In some cases a range was given, for example C – D, or if a species was more abundant locally this was noted as “C – edge” or “C – patch”.

The species acronyms used were taken from the CHIS species list for the park islands. Stands of Blue gum and Red gum eucalyptus were treated separately in the species list.

The Vegetation Types included in the survey are:

- 1120 – Eucalyptus Stands Mapping Unit. Column heading is 1120 Blue Euc or 1120 Red Euc
- 2110 – Coast Live Oak Alliance is 2110 QUAG allian on the list
- 3150 – Lemonadeberry Alliance is 3150 RHIN allian on the list
- 3313 – California Sagebrush – Lemonadeberry is 3313 RHIN/ARCA on the list
- 3401 – Mixed Arroyo Willow – Mule Fat Mapping Unit is 3401 SALA/BASA on the list
- 3410 – Arroyo Willow Alliance is 3410 SALA on the list
- 4101 – Bulrush – Cattail Mapping Unit is 4101 SCCA/TYDO on the list
- 4301 – Fennel Mapping Unit is 4301 FOVU on the list
- 4410 – Silver Beachbur – Beach Sand-Verbena Alliance is 4410 AMCH/ABMA on the list
- 9100 – Built up

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- 9430 – Stream Beds and Flats is Streambed-flat on the list
- 9600 – Planted trees and shrubs is Planted trees on the list

The vegetation map and vegetation classification are taken from:

Santa Cruz Island Photo Interpretation and Mapping Classification Report, The Nature Conservancy, Santa Cruz Island, Vegetation Map Final Report, Aerial Information Systems, Inc. March 31, 2007.

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Prisoners Wetland Project Area Plant Species Survey
 D- dominant C- common O- occasional R – rare

| SPECIES | VEGETATION TYPES | | | | | | |
|-------------------------------|------------------|------|---------|------|------|------|------|
| | 1120 | 1120 | 2110 | 3150 | 3313 | 3401 | 3410 |
| | BLUE | RED | | | | | |
| <i>Acacia melanoxydon</i> | O | | D in 10 | | | | |
| <i>Acourtia microcephala</i> | R | | | | | | |
| <i>Adiantum jordanii</i> | R | | | | | | |
| <i>Agave americana</i> | | | | | | | |
| <i>Agrostis viridis</i> | | | | | | | O |
| <i>Albizia lophantha</i> | | | | | | | |
| <i>Amaranthus albus</i> | R | | | | | | |
| <i>Ambrosia chamissonis</i> | | | | | | | R |
| <i>Amsinckia menziesii</i> | | | | | | | |
| <i>Anagallis arvensis</i> | | | | | | | R |
| <i>Anemopsis californicus</i> | | | R | | | | O |
| <i>Artemisia californica</i> | R | | | | | O | O |
| <i>Artemisia douglasiana</i> | C | C | O | | | O | C |
| <i>Asclepias fascicularis</i> | R | R | | | | | |
| <i>Atriplex leucophylla</i> | | | | | | | |
| <i>Atriplex semibaccata</i> | | | | | | | |
| <i>Atriplex prostrata</i> | R | | | | | | |
| <i>Avena barbata</i> | | | | | | | |
| <i>Avena fatua</i> | | | | | | | |
| <i>Baccharis douglasiana</i> | C | O | | | | | C |
| <i>Baccharis pilularis</i> | D | O | C | | | O | C |
| <i>Baccharis plummerae</i> | O | R | O | | | | O |

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|--|-------------|-------------|-------------|-------------|-------------|-------------|-------------|
| <i>Baccharis salicifolia</i> | C | O | O | | | C | D |
| | 1120 | 1120 | 2110 | 3150 | 3313 | 3401 | 3410 |
| <i>Brachypodium distachyon</i> | | | | | | R | |
| <i>Brassica nigra</i> | O | | R | | | R | O |
| <i>Brickellia californica</i> | O | | | | | O | O |
| <i>Bromus carinatus</i> | C | O | O | C | | R | C |
| <i>Bromus diandrus</i> | C | C | | C | | C | C |
| <i>Bromus hordeaceus</i> | O | | | O | | O | O |
| <i>Bromus madritensis</i> ssp. <i>rubens</i> | | | | | | | |
| <i>Cakile maritima</i> | R | | | | | | R |
| <i>Calystegia marcostegia</i> | C | | O | O | | | O |
| <i>Ceanothus arboreus</i> | O | | | | | | R |
| <i>Ceanothus megacarpus</i> | R | | | | | | R |
| <i>Centaurea melitensis</i> | R | | | | | | |
| <i>Centaurea solstitialis</i> | R | | R | | | | |
| <i>Cercocarpus betuloides</i> | O | | | | | R | |
| <i>Chenopodium ambrosioides</i> | | | | | | | |
| <i>Chenopodium californicum</i> | R | R | | | | | R |
| <i>Chenopodium murale</i> | | | | | | | |
| <i>Clematis ligusticifolia</i> | O | | | | | | |
| <i>Comarostaphylos diversifolia</i> | R | R | | | | | O |
| <i>Convolvulus arvensis</i> | O | | | | | | O |
| <i>Conyza bonariensis</i> | | | | | | R | O |
| <i>Conyza</i> | O | | | | | | R |

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|--|-------------|-------------|-------------|-------------|-------------|-------------|-------------|
| <i>canadensis</i> | | | | | | | |
| <i>Coreopsis gigantea</i> | | | | | | | |
| <i>Cotula coronopifolia</i> | | | | | | | |
| | 1120 | 1120 | 2110 | 3150 | 3313 | 3401 | 3410 |
| <i>Cynodon dactylon</i> | O | | O | | | | O |
| <i>Dichelostemma capitata</i> | R | | | C | | | |
| <i>Distichlis spicata</i> | | | | | | | O |
| <i>Dudleya candelabrum</i> | | | | C | | | |
| <i>Epilobium canum</i> | O | | | C | | R | O |
| <i>Epilobium ciliatum</i> | | | | | | | O |
| <i>Epipactis giganteum</i> | | | | | | | |
| <i>Equisetum laevigatum</i> | | O | O | | | | O |
| <i>Eremocarpus setigerus</i> | | | | | | | R |
| <i>Eriogonum arborescens</i> | O | | | | | C | O |
| <i>Eriogonum grande</i> var. <i>grande</i> | | | | C | | | O |
| <i>Erodium cicutarium</i> | | | | | | | |
| <i>Eschscholtzia californica</i> | | | | | | | |
| <i>Eucalyptus calmadulensis</i> | O | D | O | | | C | O |
| <i>Eucalyptus globulus</i> | D | | | | | | O |
| <i>Eucrypta chrysanthemifolia</i> | | | | | | | |
| <i>Foeniculum vulgare</i> | C TO D | C | C | | | C | O TO C |
| <i>Galium angustifolium</i> | | | O | | | R | |
| <i>Galium aparine</i> | O | R | | | | | |
| <i>Galium nuttallii insulare</i> | | | | | | | |

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|--------------------------------|-------------|----------------|-------------|-------------|-------------|-------------|-------------|
| <i>Gastrium ventricosum</i> | | | | | | | |
| <i>Gnaphalium californicum</i> | R | | | | | | O |
| <i>Gnaphalium canescens</i> | O | | | R | | O | O |
| <i>Gnaphalium luteo-album</i> | R | | R | | | | R |
| | 1120 | 1120 | 2110 | 3150 | 3313 | 3401 | 3410 |
| <i>Hazardia detonsa</i> | | | | | | | R |
| <i>Hazardia squarrosa</i> | | | | | | | |
| <i>Hedera helix</i> | C | R | | | | | |
| <i>Heteromeles arbutifolia</i> | C | C | O | O | | O | C |
| <i>Heterotheca grandiflora</i> | R | | | | | | |
| <i>Hirschfeldia incana</i> | R | R | | | | R | |
| <i>Hordeum murinum</i> | O | O | | | | | |
| <i>Hypochaeris glabra</i> | | | | | | O | |
| <i>Juncus bufonius</i> | | | | | | | |
| <i>Juncus mexicana</i> | | O | R | | | | R |
| <i>Juncus patens</i> | R | O | | | | | |
| <i>Juncus xyphoides</i> | | | | | | | |
| <i>Keckiella cordifolia</i> | O | | | | | | R |
| <i>Lactuca saligna</i> | | | | | | | |
| <i>Lactuca serriola</i> | O-ROAD | | | | | R | O |
| <i>Larmarckia aurea</i> | | | | | | | |
| <i>Lathyrus vestitus</i> | R | R | R | | | R | O |
| <i>Lepidium draba</i> | O | | | | | | O |
| <i>Lepidospartum squamatum</i> | | | | | | O | |
| <i>Leymus triticoides</i> | O | D - LOCALLY | | | | | |
| <i>Lolium multiflorum</i> | | | | | | | X |

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|--|-------------|-------------|-------------|-------------|-------------|-------------|-------------|
| <i>Lotus argophyllus</i> | | | | | | R | R |
| <i>Lotus corniculatus</i> | | | | | | O- EDGE | O |
| <i>Lotus dendroideus</i> | R | | | | | | |
| <i>Lotus grandiflorus</i> | | | | | | | |
| <i>Lotus purshianus</i> | R | | | | | | C |
| <i>Lupinus albifrons</i> | | | | | | | R |
| <i>Lupinus bicolor</i> | | | | | | | |
| | 1120 | 1120 | 2110 | 3150 | 3313 | 3401 | 3410 |
| <i>Lupinus hirsutissimus</i> | | | | | | | R |
| <i>Lythrum hyssopifolia</i> | | | | | | | R |
| <i>Madia sativa</i> | | | | C | | R | |
| <i>Malacothrix saxatilis</i> | | | | | | | |
| <i>Malva parviflora</i> | O | | | | | | O |
| <i>Marah macrocarpus</i> | O | O | O | | | | R |
| <i>Marrubium vulgare</i> | O | O | | | | R | R |
| <i>Medicago polymorpha</i> | | | | C | | O | O |
| <i>Medicago sativa</i> | | | | | | | |
| <i>Melilotus albus</i> | | | R | | | | |
| <i>Melilotus indicus</i> | R | | O | | | O- EDGE | O |
| <i>Mimulus cardinalis</i> | | | | | | | R-EDGE |
| <i>Mimulus guttatus</i> | | | | | | | |
| <i>Mimulus longiflorus</i> | O | O | O | | | O | O |
| <i>Nasella cernua</i> | | | | | | | |
| <i>Oenothera elata</i> ssp. <i>hirsutissima</i> | | | | | | R | |
| <i>Olea europaea</i> | | R | | | | | |
| <i>Opuntia littoralis</i> | | | | | | | |
| <i>Oxalis corniculata</i> | | R | | | | | |

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|---|-------------|-------------|-------------|-------------|-------------|-------------|-------------|
| <i>Paspalum distichum</i> | | | | | | | R |
| <i>Pennisetum clandestinum</i> | C-D | D | O | | | C-PATCH | C/D |
| <i>Phacelia ramossisima</i> | | | X | | | | |
| <i>Pholistoma auritum</i> | | | | | | | |
| <i>Pinus pinea</i> | | | | | | | R |
| <i>Piptatherum miliaceum</i> | C | C | O | | | C | O |
| <i>Plantago lanceolata</i> | C-ROAD | O | O | | | O | C |
| | 1120 | 1120 | 2110 | 3150 | 3313 | 3401 | 3410 |
| <i>Plantago major</i> | | | | | | | |
| <i>Platanus racemosa</i> | R | | | | | | R |
| <i>Polygonum arenastrum</i> | O-ROAD | | O | | | O-EDGE | O-ROAD |
| <i>Polygonum lapathifolium</i> | R | O | | | | | O |
| <i>Polypogon interruptus</i> | | R | | | | | O |
| <i>Polypogon monspeliensis</i> | R | | | | | | O |
| <i>Populus balsamifera</i> | | R | | | | | R |
| <i>Prunus illicifolia</i> ssp. <i>lyonii</i> | D | C | O | | | | R |
| <i>Quercus agrifolia</i> | C/D | O | D | | | R | C-LOCALLY |
| <i>Quercus x macdonaldii</i> | | | | | | | R |
| <i>Quercus pacifica</i> | O | O | | | | | R |
| <i>Raphanus raphinistrum</i> | | | | | | | |
| <i>Raphanus sativa</i> | | | | | | | |
| <i>Rhamnus californica</i> | O | O | | | | | |
| <i>Rhus integrifolia</i> | O | C | O | D | | O | O |
| <i>Rhus ovata</i> | | | | | | R | |
| <i>Robinia pseudoacacia</i> | R | | | | | | |

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|----------------------------------|---------------|----------------|-------------|-------------|-------------|-------------|-------------|
| <i>Rosa californica</i> | C- LOCALLY | O | | | | O | |
| <i>Rubus ursinus</i> | O | O-C PATCHES | | | | | R |
| <i>Rumex conglomeratus</i> | | | | | | | |
| <i>Rumex crispus</i> | O | O | | | | O | C |
| <i>Rumex pulcher</i> | O | O | | | | | R- EDGE |
| <i>Rumex salicifolius</i> | | O | | | | | |
| <i>Salix exigua</i> | | | O | | | | O |
| <i>Salix lasiolepis</i> | C-D | | O | | | C | C/D |
| | 1120 | 1120 | 2110 | 3150 | 3313 | 3401 | 3410 |
| <i>Scirpus californicus</i> | | | | | | | O |
| <i>Scirpus maritimus</i> | | | | | | | |
| <i>Silene laciniata</i> | | | | | | | |
| <i>Silybum marianum</i> | | O | R | | | | |
| <i>Silene gallica</i> | R | | | | | | R |
| <i>Solanum clokeyi</i> | | | | | | | |
| <i>Solanum douglasii</i> | C | C | O | | | O | R |
| <i>Sonchus asper</i> | R | | | | | | R |
| <i>Sonchus oleraceus</i> | O | O | | | | R | O |
| <i>Spergularia bocconii</i> | | | | | | | |
| <i>Stachys bullata</i> | O/C | C | R | | | O | O |
| <i>Stellaria media</i> | | | | | | | |
| <i>Stephanomeria cichoriacea</i> | | | | C | | | |
| <i>Symphoricarpos mollis</i> | | O | | | | | |
| <i>Tetragonia tetragonioides</i> | | | | | | | |
| <i>Toxicodendron diversiloba</i> | O/C | R | | | | R | R |
| <i>Trifolium microcephalum</i> | | | | | | | |

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|------------------------------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|
| <i>Trifolium willdenovii</i> | | | | | | | |
| <i>Typha domingensis</i> | | | | | | | |
| <i>Ulmus hollandica</i> | | | | | | | |
| <i>Urtica dioica</i> | C | O-C PATCHES | | | | | R |
| <i>Verbascum thapsis</i> | | | | | | | |
| <i>Verbena lasiostachys</i> | R | | | | | | |
| <i>Veronica anagallis-aquatica</i> | | | | | | | O |
| <i>Vicia benghalensis</i> | R | | | | | | |
| <i>Vicia sativa</i> | | | | | | | R |
| | 1120 | 1120 | 2110 | 3150 | 3313 | 3401 | 3410 |
| <i>Vinca major</i> | C/D | C | O | | | O | O |
| <i>Vulpia myuros</i> | | | | | | | |
| <i>Woodwardia fimbriata</i> | | | | | | | |

| | VEGETATION TYPES | | | | | |
|-------------------------------|-------------------------|-------------|-------------|-------------|-------------|-------------|
| SPECIES | 4101 | 4301 | 4410 | 9100 | 9430 | 9600 |
| <i>Acacia melanoxylon</i> | | | R | R | | |
| <i>Acourtia microcephala</i> | | | | | | |
| <i>Adiantum jordanii</i> | | | | | | |
| <i>Agave americana</i> | | | | | | O |
| <i>Agrostis viridis</i> | R | | | O | O | |
| <i>Albizzia lophantha</i> | R | | | R | | |
| <i>Amaranthus albus</i> | | | R | | O | |
| <i>Ambrosia chamissonis</i> | | | D | O | | |
| <i>Amsinckia menziesii</i> | | | | R | | |
| <i>Anagallis arvensis</i> | | | | C | O | |
| <i>Anemopsis californicus</i> | | | | C | | |
| <i>Artemisia californica</i> | | R | | O | R | O |

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| | | | | | | |
|---------------------------------|-------------|-------------|-------------|-------------|-------------|-------------|
| <i>Artemisia douglasiana</i> | | | | O | | |
| <i>Asclepias fascicularis</i> | | | | | | |
| <i>Atriplex leucophylla</i> | | | O | R | | |
| <i>Atriplex semibaccata</i> | | | O | O | | |
| <i>Atriplex triangularis</i> | C | | R | R | | C |
| <i>Avena barbata</i> | | | | O | R | |
| <i>Avena fatua</i> | | | | R | | |
| <i>Baccharis douglasiana</i> | C | | C | O | | O |
| <i>Baccharis pilularis</i> | | C-EDGE | O | O | | D |
| <i>Baccharis plummerae</i> | | R | | O | | O |
| <i>Baccharis salicifolia</i> | O | O | O | O | C | O |
| | 4101 | 4301 | 4410 | 9100 | 9430 | 9600 |
| <i>Brachypodium distachyon</i> | | | | | O | |
| <i>Brassica nigra</i> | | O | | O | O | |
| <i>Brickellia californica</i> | | O | | | O | O |
| <i>Bromus carinatus</i> | | C | R | O | | C |
| <i>Bromus diandrus</i> | | C | C | O | O | C |
| <i>Bromus hordeaceus</i> | | O | R | O | O | |
| <i>Bromus rubens</i> | | | O | | | |
| <i>Cakile maritima</i> | | | C | O | | |
| <i>Calystegia marcostegia</i> | | | R | | | O |
| <i>Ceanothus arboreus</i> | | | | | O | O |
| <i>Ceanothus megacarpus</i> | | | | | R | |
| <i>Centaurea melitensis</i> | | | | O | R | R |
| <i>Centaurea solstitialis</i> | | | | R | R | O |
| <i>Cercocarpus betuloides</i> | | | | | | |
| <i>Chenopodium ambrosioides</i> | | | R | | | |
| <i>Chenopodium californicum</i> | | R | | C | | O |
| <i>Chenopodium murale</i> | | | | R | | |
| <i>Clematis ligusticifolia</i> | | | | | | |

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|-------------------------------------|-------------|-------------|-------------|-------------|-------------|-------------|
| <i>Comarostaphylos diversifolia</i> | | | | | | |
| <i>Convolvulus arvensis</i> | | O | | O | R | |
| <i>Conyza bonariensis</i> | | | | O | | |
| <i>Conyza canadensis</i> | O | | R | O | | |
| <i>Coreopsis gigantea</i> | | | | R | | C |
| <i>Cotula coronopifolia</i> | C | | R | | | |
| <i>Cynodon dactylon</i> | C | | C | C | | |
| <i>Dichelostemma capitata</i> | | | | R | | |
| <i>Distichlis spicata</i> | C | | D | C | | |
| <i>Dudleya candelabrum</i> | | | R | R | | |
| <i>Epilobium canum</i> | | | | | O | C |
| | 4101 | 4301 | 4410 | 9100 | 9430 | 9600 |
| <i>Epilobium ciliatum</i> | | | | O | C | |
| <i>Epipactis giganteum</i> | | | | | R | |
| <i>Equisetum laevigatum</i> | | | | | | |
| <i>Eremocarpus setigerus</i> | | | | | R | |
| <i>Eriogonum arborescens</i> | | | | O | R | C |
| <i>Eriogonum grande grande</i> | | | O | O | | O |
| <i>Erodium cicutarium</i> | | | O | R | | |
| <i>Eschscholtzia californica</i> | | | R | | O | |
| <i>Eucalyptus calmadulensis</i> | | R | | R | O | |
| <i>Eucalyptus globulus</i> | | | | D | | O |
| <i>Eucrypta chrysanthemifolia</i> | | | | R | | |
| <i>Foeniculum vulgare</i> | | DDD | C | C | | C |
| <i>Galium angustifolium</i> | | | | | | |
| <i>Galium aparine</i> | | | | R | | |
| <i>Galium nuttallii insulare</i> | | | | | | |
| <i>Gastroidium ventricosum</i> | | R | | | | |
| <i>Gnaphalium californicum</i> | | | | R | | |
| <i>Gnaphalium canescens</i> | | R | R | R | C | R |

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| | | | | | | |
|--------------------------------|-------------|---------------|-------------|-------------|-------------|-------------|
| <i>Gnaphalium luteo-album</i> | | | | R | C | |
| <i>Hazardia detonsa</i> | | | | O | | |
| <i>Hazardia squarrosa</i> | | | O | | | |
| <i>Hedera helix</i> | | | | | | |
| <i>Heteromeles arbutifolia</i> | | | | R | | O |
| <i>Heterotheca grandiflora</i> | | | O | O | | |
| <i>Hirschfeldia incana</i> | | | O | C | | |
| <i>Hordeum murinum</i> | | | R | O | O | |
| <i>Hypochaeris glabra</i> | | | O | O | | |
| <i>Juncus bufonius</i> | | | | | | |
| <i>Juncus mexicana</i> | | | | | | |
| | 4101 | 4301 | 4410 | 9100 | 9430 | 9600 |
| <i>Juncus patens</i> | | | | C | | |
| <i>Juncus xyphoides</i> | | | | | R | |
| <i>Keckiella cordifolia</i> | | | | | | |
| <i>Lactuca saligna</i> | | | | | | |
| <i>Lactuca serriola</i> | | | | C | | |
| <i>Larmarckia aurea</i> | O | | | | R | |
| <i>Lathyrus vestitus</i> | | | | O | R | O |
| <i>Lepidium draba</i> | | O- LOCALLY | | O | | R |
| <i>Lepidospartum squamatum</i> | | | | R | C | |
| <i>Leymus triticoides</i> | | | | | | |
| <i>Lolium multiflorum</i> | | | O | R | O | |
| <i>Lotus argophyllus</i> | | | | | O | |
| <i>Lotus corniculatus</i> | | | R | R | | |
| <i>Lotus dendroideus</i> | | | C | R | O | |
| <i>Lotus grandiflorus</i> | | | | | R | |
| <i>Lotus purshianus</i> | R | | | | C | O |
| <i>Lupinus albifrons</i> | R | | | R | R | |

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|--------------------------------|-------------|-------------|-------------|-------------|-------------|-------------|
| <i>Lupinus bicolor</i> | | | O | | O | |
| <i>Lupinus hirsutissimus</i> | | | | | | |
| <i>Lythrum hyssopifolia</i> | | | | O | | |
| <i>Madia sativa</i> | | | | | | |
| <i>Malacothrix saxatilis</i> | | | | | R | |
| <i>Malva parviflora</i> | | | | C | R | |
| <i>Marah macrocarpa</i> | | O | | O | | C |
| <i>Marrubium vulgare</i> | | C | | | | |
| <i>Medicago polymorpha</i> | | | R | O | O | |
| <i>Medicago sativa</i> | | R | O | | | |
| <i>Melilotus albus</i> | | | | R | | |
| <i>Melilotus indicus</i> | O | | R | C | O | |
| | 4101 | 4301 | 4410 | 9100 | 9430 | 9600 |
| <i>Mimulus cardinalis</i> | | | | R | O | |
| <i>Mimulus guttatus</i> | | | | | O | |
| <i>Mimulus longiflorus</i> | | O | | R | | O |
| <i>Nasella cernua</i> | | | | | | O |
| <i>Oenothera elata hirsuta</i> | | | | R | | |
| <i>Olea europaea</i> | | | | | | |
| <i>Opuntia littoralis</i> | | | R | | | |
| <i>Oxalis corniculata</i> | | | | | | |
| <i>Paspalum distichum</i> | | | | | | |
| <i>Pennisetum clandestinum</i> | C/D | | C | D/C | | D |
| <i>Phacelia ramossisima</i> | | | | | | |
| <i>Pholistoma auritum</i> | | | | R | | R |
| <i>Pinus pinea</i> | | | | R | | |
| <i>Piptatherum miliaceum</i> | | | | O/C | | O |
| <i>Plantago lanceolata</i> | | R | C | C | | O |
| <i>Plantago major</i> | | | R | O | R | |
| <i>Platanus racemosa</i> | | | | | R | |

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|----------------------------------|-------------|-------------|-------------|-------------|-------------|-------------|
| <i>Polygonum arenastrum</i> | | | | C | | O |
| <i>Polygonum lapathifolium</i> | | | R | R | O | O |
| <i>Polypogon interruptus</i> | | | | | O | O |
| <i>Polypogon monspeliensis</i> | O | | C | C | C | O |
| <i>Populus balsamifera</i> | | | | | | |
| <i>Prunus illicifolia lyonii</i> | | | | | | R |
| <i>Quercus agrifolia</i> | | R | | R | | O |
| <i>Quercus x macdonaldii</i> | | | | | | |
| <i>Quercus pacifica</i> | | R | | | | |
| <i>Raphanus raphinastrium</i> | | | | O | | |
| <i>Raphanus sativa</i> | | | | O | | |
| <i>Rhamnus californica</i> | | | | | | |
| | 4101 | 4301 | 4410 | 9100 | 9430 | 9600 |
| <i>Rhus integrifolia</i> | | O | R | O | O | O |
| <i>Rhus ovata</i> | | | | | O | |
| <i>Robinia pseudoacacia</i> | | | | R | | |
| <i>Rosa californica</i> | | | | | | C |
| <i>Rubus ursinus</i> | | | | R | O | |
| <i>Rumex conglomeratus</i> | | | R | R | | R |
| <i>Rumex crispus</i> | O | | | C | O | |
| <i>Rumex pulcher</i> | | | | R | O | |
| <i>Rumex salicifolius</i> | | | | | O | |
| <i>Salix exigua</i> | | | | | O | C |
| <i>Salix lasiolepis</i> | C/D | | O | O | D- EDGE | D |
| <i>Scirpus californicus</i> | D | | C | R | | R |
| <i>Scirpus maritimus</i> | C | | O | | | |
| <i>Silene laciniata</i> | | | | R | | |
| <i>Silybum marianum</i> | | | | O | | O |
| <i>Silene gallica</i> | | | O | R | O | R |

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|------------------------------------|-------------|-------------|-------------|-------------|-------------|-------------|
| <i>Solanum clokeyi</i> | | | | | R | |
| <i>Solanum douglasii</i> | | | R | O | R | R |
| <i>Sonchus asper</i> | | | R | O | | O |
| <i>Sonchus oleraceus</i> | | R | R | O | O | O |
| <i>Spergularia bocconii</i> | | | R | | | |
| <i>Stachys bullata</i> | | C | | R | | O |
| <i>Stellaria media</i> | | | | R | | |
| <i>Stephanomeria cichoriacea</i> | | | | | | |
| <i>Symphoricarpos mollis</i> | | R | | | | |
| <i>Tetragonia tetragonioides</i> | | | | O | | |
| <i>Toxicodendron diversiloba</i> | | | | R | | |
| <i>Trifolium microcephalum</i> | | | | | R | |
| <i>Trifolium willdenovii</i> | | | | | R | |
| | 4101 | 4301 | 4410 | 9100 | 9430 | 9600 |
| <i>Typha dominguensis</i> | D | | | | | |
| <i>Ulmus hollandica</i> | | | | O | | |
| <i>Urtica dioica</i> | | | | R | | C |
| <i>Verbascum thapsis</i> | | | | | R | |
| <i>Verbena lasiostachys</i> | | | | | | |
| <i>Veronica anagallis-aquatica</i> | R | | | R | C | O |
| <i>Vicia benghalensis ?</i> | | | | | | |
| <i>Vicia sativa</i> | | | | R | | |
| <i>Vinca major</i> | | | | | | O |
| <i>Vulpia myuros</i> | | | | R | | |
| <i>Woodwardia fimbriata</i> | | | | | | |

APPENDIX F—EUCALYPTUS SURVEY

A Survey of Eucalyptus Trees in Prisoners Harbor and lower Cañada del Puerto September 24, 2008

Introduction

The genus *Eucalyptus* includes about 450 species and is native to Australia. During the late 19th century, it was widely planted throughout California, including 4 species on Santa Cruz Island (Junak, et al. 1995) where they were planted for ornamental and utilitarian purposes such as windbreaks and future pier pilings. Trees planted in a row along the base of the cliff at Prisoners Harbor have persisted from the ranching era to the present and are considered historic (NPS Cultural Landscape Inventory, 2004). The majority of eucalyptus trees at Prisoners Harbor and in Cañada del Puerto have spread unintentionally from seed, displacing native vegetation over time, and are not considered historic. This survey of eucalyptus trees was conducted to improve our understanding of the number, size, and distribution of eucalyptus trees in the Prisoners Harbor Coastal Wetland Restoration project area (Fig 1).

Eucalyptus Survey and Mapping in Cañada del Puerto

During August and September 2008, Paula Power, Clark Cowan, and Jim Roberts mapped and recorded the diameter at breast height (dbh) of eucalyptus trees greater than 6" dbh in the Prisoners Harbor and lower Cañada del Puerto area. For ease of data collection and mapping, the project area was subdivided into smaller areas and each area was assigned a letter designation. The total number of eucalyptus trees greater than 6" dbh in the project areas was approximately 1737. There are 741 trees with a dbh less than 12" (30 cm), 692 trees with a dbh between 12" and 24" (30 cm and 60 cm), and 304 trees with a dbh greater than 24" (60 cm) (Fig 2). Area G and H had the greatest number of trees and 82% of trees were less than 24" (60 cm) dbh (Fig 2; Table 1).

Area G and H had many trees that were downed either by strong winds or felled with a chainsaw to open the area for re-colonization by native plants (Fig 1). It was estimated that up to 25% of trees in area H were standing dead wood. Downed trees and standing dead wood were not included in the survey.

Example of eucalyptus removal on the mainland

The City of Port Hueneme completed a eucalyptus removal project near the Sea Bee base in Port Hueneme in 2008. Ninety-five 60'-80'tall mature trees were declared a hazard by an arborist due to fungus and rot and the trees were removed. Twelve men worked for 2½ to 3 weeks using 1 crane and chainsaws with long bars. The trees were first limbed, then a 30-ton crane was used to choke a trunk section, the section was cut and lowered, and a stump grinder ground the stump to 12" below grade. The crane was used to lower the cut trunk sections to the ground to avoid damaging existing infrastructure such as power lines, sidewalks, pavement, and underground utilities. A loader picked up large logs and placed them in "end dumps". Logs small enough to put through a chipper were chipped and distributed to avocado orchards for mulch. Large logs were cut into smaller pieces for use as fire wood.

Three vendors were used for tree removal, chipping, and firewood. Tree removal cost was \$1800.00/tree. The City of Port Hueneme contracted West Coast Arborist for the tree removal (www.wcainc.com; 2889 Bunsen Ave #P, Ventura, CA 93003, 805-644-2671). This is one of a number of local companies that are certified and equipped to remove large trees.

In 2008 the cost of disposing of material at Shoreline Organics, a green waste facility is \$27.00/ton or the City of Oxnard is \$43.00/ton.

Removing Eucalyptus trees on island

Trees could be disposed of using a number of methods. Trees with a dbh less than 12” (742 trees) could be chipped and the chipped material spread on the Central Valley and the Navy roads. The straightest trees with a dbh between 12” and 24” could be stock piled on island and eventually used in other repair or appropriate construction projects such as building a protective barrier around the archeological site and historic well, for future road work, or fire wood at the Main Ranch and the UC Field Station. There are fewer reasonable alternatives for disposing of trees with a dbh greater than 24”. Some can be burned or others used to create brush piles for habitat. Some could be transported off island.

The proposed fill disposal area for the wetlands restoration project is Area A, B, and C. The total number of eucalyptus trees in Area A, B, and C is 125 trees. One approach may be to remove the trees in phases beginning with area A, B, and C. Then remove additional trees in the remaining areas as funding becomes available.

The ecological cost of removing trees from the island would be the use of fossil fuels to transport equipment on and off the island, the use of fossil fuels to operate the hand-held and heavy equipment required to remove the trees, and the loss of habitat and carbon sequestration potential during the time the native plant community is recovering. The ecological benefit of removing the trees include opening the area for re-colonization by native plant species, restoring riparian oak woodland ecological function, increasing habitat diversity, improving habitat for many species of birds including the Island scrub-jay and other passerine birds known to breed in the area and animal species including the island fox.

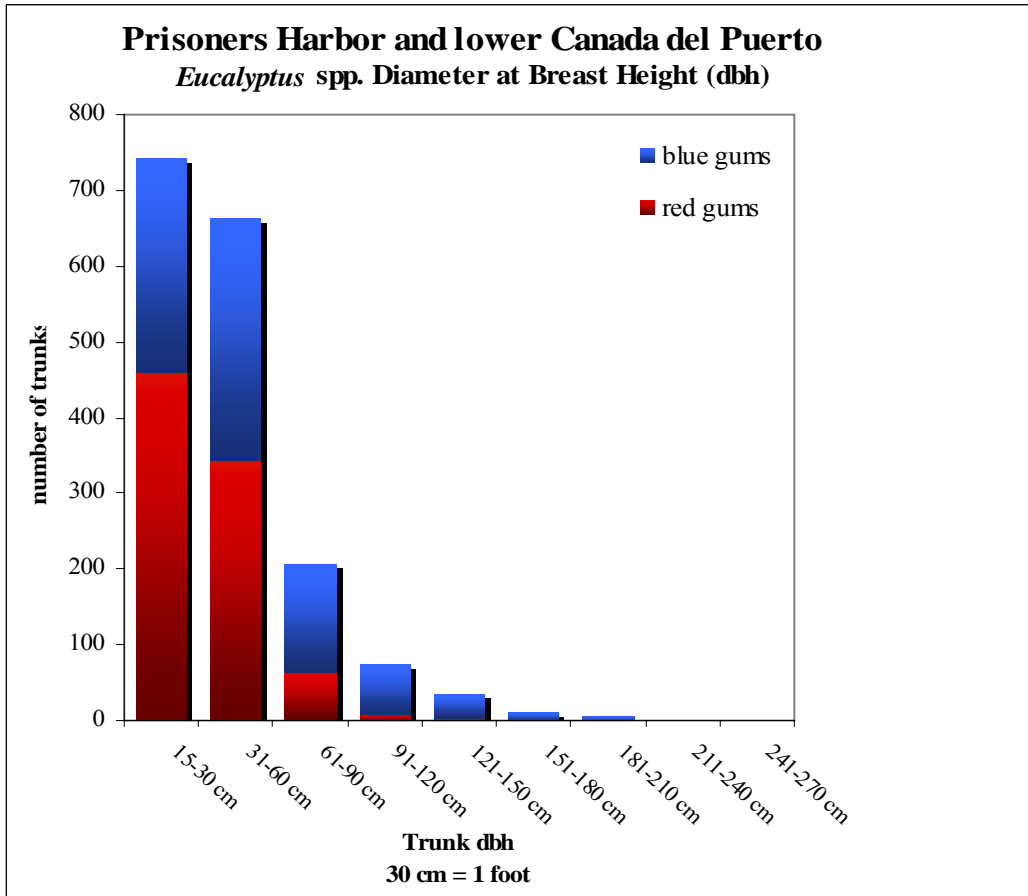


Figure 2. Red and blue gum eucalyptus diameter at breast height. 81% of trees have a dbh less than 60 cm (24"). The average dbh for red gum and blue gum eucalyptus was 34 cm (14") and 52 cm (21") respectively.

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Table 1. The greatest number of trees are located in area G and H with dbh less than 60 cm.

| Area | # of Trunks | | | | | | | | | Total |
|-------|-------------------|-------------------|-------------------|--------------------|---------------------|---------------------|---------------------|---------------------|---------------------|-------|
| | 15-30 (dbh cm) | 31-60 (dbh cm) | 61-90 (dbh cm) | 91-120 (dbh cm) | 121-150 (dbh cm) | 151-180 (dbh cm) | 181-210 (dbh cm) | 211-240 (dbh cm) | 241-270 (dbh cm) | |
| A | 2 | 3 | 2 | 2 | 0 | 1 | 0 | | | 10 |
| B | 3 | 4 | 8 | 5 | 0 | 1 | 1 | | | 22 |
| C | 19 | 60 | 8 | 5 | 1 | 0 | 0 | | | 93 |
| D | 0 | 0 | 4 | 2 | 0 | 0 | 0 | | | 6 |
| E | 1 | 4 | 2 | 1 | 0 | 0 | 0 | | | 8 |
| F | 5 | 6 | 12 | 8 | 4 | 2 | 1 | | | 38 |
| G | 259 | 295 | 93 | 42 | 27 | 4 | 0 | | | 720 |
| H | 451 | 311 | 53 | 5 | 1 | 1 | 1 | | | 823 |
| M | 1 | 9 | 7 | 0 | 0 | 0 | 0 | | | 17 |
| Total | 741 | 692 | 189 | 70 | 33 | 9 | 3 | | | 1737 |

Eucalyptus

| Area | 1°Sp | No. of trunks | Ave. DBH(cm) |
|------|------|---------------|--------------|
| A | Blue | 10 | 80 |
| B | Blue | 22 | 80 |
| C | Blue | 93 | 62 |
| D | Blue | 6 | 88 |
| E | Blue | 8 | 86 |
| F | Blue | 38 | 89 |
| G | Blue | 720 | 47 |
| H | Red | 823 | 34 |
| M | Blue | 17 | 57 |



Figure 1. Clusters of trees within the project area were assigned a letter designation to simplify the survey. The vast majority of trees were in area G and H. The proposed fill disposal area for the wetlands restoration is area A, B, and C. The total number of trees in these three areas is 125.

APPENDIX G—SHPO CONSULTATION

Consultation With State Historic Preservation Office

Prisoners Harbor Coastal Wetland Restoration Plan
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IN REPLY REFER TO:

United States Department of the Interior

NATIONAL PARK SERVICE
Channel Islands National Park
1901 Spinnaker Drive
Ventura, California 93001-4354

H4217- CHIS

April 15, 2008

Mr. Milford Wayne Donaldson, FAIA
State Historic Preservation Officer
Office of Historic Preservation
P.O. Box 942896
Sacramento, CA 94296-0001


Re: Early consultation regarding proposed wetlands restoration project on Santa Cruz Island,
Channel Islands National Park, and effects on historic resources

Dear Mr. Donaldson:

Channel Islands National Park, a unit of the National Park Service headquartered in Ventura, California, is proposing to restore a functional, self-sustaining ecosystem at a former 9-acre back barrier coastal wetland site known as Prisoners Harbor, and a 40-acre associated stream corridor in the lower Cañada del Puerto on Santa Cruz Island. Restoring ecosystem function will require removing fill from the former coastal wetland. The park is in the early stages of project planning in accordance with the provisions of the National Environmental Policy Act (42 U.S.C. 4321 et seq.).

We have identified several historic properties within the proposed area of potential effect. Archeological site SCrI-241, a contributing site within the National Register-listed Santa Cruz Island Archeological District, was bisected when the stream was channelized by the former island owners. The wetland restoration is being designed to provide greater protection to this important Chumash village site. Alternatives being considered in the draft environmental impact study call for the removal of all or a portion of the 1950s cattle corrals, in order to remove the fill and restore wetland conditions in that area. The cattle corrals are a contributing resource within the Santa Cruz Island Ranching District, which has been determined eligible for the National Register of Historic Places. In addition, eucalyptus trees along the stream corridor will be removed to reverse the negative impact of these invasive plants on wetland and riparian communities. While a number of these trees were planted at the turn of the 20th century and would therefore contribute to the historic ranching district, most of them have simply spread from seed and grown up in this area.

We would like to initiate consultation with your office at this early stage of project planning regarding the effects of this project on historic resources and compliance with Section 106 of the National Historic Preservation Act. We would be pleased to arrange a site visit to Santa Cruz Island for you and your staff or to meet with you at your earliest convenience.

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We have enclosed background information and photographs of the project area for your information. Please contact Ann Huston, Chief of Cultural Resources, at 805/658-5752 at your earliest convenience to coordinate a site visit or consultation meeting.

Sincerely,

/s/ Russell Galipeau

Russell E. Galipeau, Jr.
Superintendent

Enclosures (7)

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STATE OF CALIFORNIA - THE RESOURCES AGENCY

ARNOLD SCHWARZENEGGER, Governor

OFFICE OF HISTORIC PRESERVATION
DEPARTMENT OF PARKS AND RECREATION
P.O. BOX 942886
SACRAMENTO, CA 94296-0001
(916) 653-6624 Fax: (916) 653-9824
calshpo@ohp.parks.ca.gov
www.ohp.parks.ca.gov



2008 MAY 15 PM 1:13

*MS
Kate
Ann*

9 May 2008

Reply To: NPS080421A

Russell E. Galipeau, Jr., Superintendent
National Park Service
Channel Islands National Park
1901 Spinnaker Drive
Ventura, CA 93001-4354

Re: Section 106 Consultation for proposed restoration of wetlands on Santa Cruz Island, Channel Islands National Park, CA

Dear Mr. Galipeau:

Thank you for your letter of 15 April 2008 requesting my comment pursuant to the National Historic Preservation Act as amended and the implementing regulations codified at 36 CFR 800 with regards to the above undertaking. You are initiating consultation in the early project planning stages.

As I presently understand it, the undertaking involves restoring a functional, self-sustaining ecosystem at a former 9-acre back barrier coastal wetland site known as Prisoner's harbor. The site bisects a contributor within the Santa Cruz Island Archeological site. The site is a National Register listed site. Several historic era contributors to a ranching district on the site will be removed as well as several eucalyptus trees which have spread along the creek bed.

The NPS will continue consultation as the project planning moves forward.

I look forward to continued consultation on this project. If you have any questions, please contact Amanda Blosser of my staff at (916) 653-9010 or e-mail at ablosser@parks.ca.gov

Sincerely,

Lucas K Stratton for

Milford Wayne Donaldson, FAIA
State Historic Preservation Officer

MWD:ab

Prisoners Harbor Coastal Wetland Restoration Plan
Final Environmental Impact Statement



IN REPLY REFER TO:

United States Department of the Interior

NATIONAL PARK SERVICE
Channel Islands National Park
1901 Spinnaker Drive
Ventura, California 93001-4354

L7617-CHIS

October 24, 2008

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

Re: NPS080421A, Proposed Restoration of Wetlands on Santa Cruz Island, Santa Barbara County, Channel Islands National Park, CA


Dear Mr. Donaldson:

We are enclosing a binder with additional information regarding the above-referenced project to seek your concurrence with the Area of Potential Effect (APE) and our determination of effects on properties listed on and eligible for the National Register of Historic Places.

We have defined the APE as the area that will be affected by the construction activities and the changes in stream flow dynamics, shown as the shaded area on the enclosed map. This portion of the island is included within the Santa Cruz Island Archeological District (copy of National Register nomination enclosed). The archeological site CA-SCrI-240, believed to be the historic Chumash village of Xaxas, is located within the APE. In addition, this portion of the island is included within the National Register-eligible Santa Cruz Island Ranching District. The Prisoners Harbor Ranch and its contributing resources are described in the Cultural Landscape Inventory (CLI) for the Santa Cruz Island Ranching District (see enclosed list of contributing/non-contributing resources).

The proposed action alternatives will remove fill material from the former wetland, restoring it to one-third to two-thirds of its original size, remove an existing levee, and remove eucalyptus trees from the creek channel. The removed fill will be stockpiled for later use on the island.

The Chumash village site SCrI-240, which is located along both sides of the stream channel, has special significance to the Native American community and has yielded significant scientific data pertaining to the Late Prehistoric and Early Historic era (see enclosed archeological site form and excerpts from Dr. Jeanne Arnold's *Origins of a Pacific Coast Chieftdom*). The site was bisected in the late 1800s and was damaged again in the early 1900s when the stream was channelized, and has also been affected by subsequent erosion. Significant portions of the site remain, however, and recent hydrologic studies suggest that the re-creation of the wetlands and the removal of the levee will slow the dynamic water action that currently affects the site,

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Prisoners Harbor Coastal Wetland Restoration Plan Final Environmental Impact Statement

improving the site's long term survivability. The park proposes to protect this site by stabilizing it in a manner to deflect potential flood waters away from the culturally dense area of the site. These actions would not have an adverse effect on the archeological resources.

The historic cattle corrals built in the 1940s and 50s are located in the area that existed as wetlands until the early 20th century. All or a portion of the corrals would be removed along with the fill material in order to restore the wetland. The scale and scale-house would be moved to their previous location at Prisoners Harbor, as shown in the enclosed historic photographs. This action would have an adverse effect on the corrals, which are included as a contributing resource within the Santa Cruz Island Ranching District. The park has recorded the extant corrals with HABS-level photography and has mapped them through the CLI.

Approximately 9,000-17,000 cubic yards of fill material will be removed in order to restore the wetlands. The locations that are currently proposed for stockpiling the fill are along the east side of the stream channel. The location north of the road is part of SCrI-240. Portions of the stockpile location south of the road may also contain archeological materials. We have determined that covering the archeological site with fill materials will not have an adverse effect on the archeological resources.

Non-native tree plantings at Prisoners Harbor, including Italian stone pine, Dutch elm, and eucalyptus, are contributing resources within the Santa Cruz Island Ranching District. While many of the historic tree plantings can be identified through historic photographs (see enclosed), such as the row of eucalyptus to the west of the warehouse building, many others no longer exist. Most of the eucalyptus trees that are growing along the stream channel have spread extensively from the early plantings. At this time, the park is analyzing historic photographs, maps, and tree measurements to determine whether any of the eucalyptus and other trees along the stream channel were part of the late-19th century development (when the island tree planting campaign took place). We currently plan to remove all of the eucalyptus along the stream channel unless we are able to identify trees that were part of the historic planting scheme, and have determined that the tree removal will not have an adverse effect on the contributing resources within the historic district. The park will identify historic plantings in the APE that were not included in the CLI and consult further with your office regarding their status as contributing or non-contributing, and the appropriate treatment or mitigation for removal of these plantings.

The area south of the National Park Service and The Nature Conservancy boundary has not been systematically surveyed due to the dense underbrush and number of fallen trees, and it is not known whether archeological resources are located in the eucalyptus removal area. We anticipate that cutting, dragging, hauling, and vehicle operation associated with the eucalyptus removal will cause ground disturbance in this area. We plan to monitor these activities to ensure that archeological resources are not affected; therefore, we have determined that there will be no adverse effect on archeological resources as a result of these activities.

Historic photos and an 1892 map of Prisoners Harbor show a rock retaining wall several hundred feet in length that was built along the west side of the stream, presumably to prevent flooding of the ranch area. This wall was either destroyed by later stream modifications or is currently buried

Prisoners Harbor Coastal Wetland Restoration Plan
Final Environmental Impact Statement

beneath the existing levee. We plan to monitor the levee removal and any other ground-disturbing activity in this area to determine whether the wall or portions of it still remain. Should there be remaining portions that will be affected by this project, we will consult with your office to determine appropriate mitigation measures.

Other historic resources located within the Prisoners Harbor area include an 1887 stone and brick warehouse, a stone-lined well from the same era. These resources, which contribute to the National Register-eligible historic ranching district, will not be affected by the undertaking.

We seek your concurrence with the APE, as we have defined it. In addition, we seek your concurrence with our determination that the project will have "No Adverse Impact" on archeological resources that are listed on the National Register of Historic Places, and that the project will have an adverse impact on historic resources that contribute to the National Register-eligible Santa Cruz Island Ranching District.

We would like to request your assistance in developing mitigation measures for the adverse effects to historic resources and invite you and your staff to visit the project site to obtain a better understanding of the project alternatives and effects on historic resources.

Our consultant, Mangi Environmental, Inc., is preparing the first internal draft Environmental Impact Statement (EIS), to be completed by the end of this year. It would be very helpful to have your comments by the end of November, so that we can incorporate them into the internal draft and so that the draft EIS can be available for public comment in February 2009. Please contact Paula Power, Ecologist, at 805/658-5784 at your earliest convenience to coordinate a consultation meeting or site visit.

Sincerely,

/s/ Russell Galipeau

Russell E. Galipeau, Jr.
Superintendent

Enclosure

Prisoners Harbor Coastal Wetland Restoration Plan
Final Environmental Impact Statement



IN REPLY REFER TO:

H4217-CHIS

United States Department of the Interior

NATIONAL PARK SERVICE
Channel Islands National Park
1901 Spinnaker Drive
Ventura, California 93001-4354

JUN 23 2009

Ms. Susan Stratton
State Historic Preservation Office
Department of Parks and Recreation
P.O. Box 942896
Sacramento, CA 94296-0001

Re: NPS080421A, Proposed restoration of wetlands on Santa Cruz Island, Santa Barbara County,
Channel Islands National Park, CA

Dear Ms Stratton:

Following your site visit to the Prisoners Harbor project area on February 24, 2009 and our subsequent telephone conversation with you, the park identified a second fill disposal area for the Prisoners Coastal Wetland Restoration Plan, see the enclosed photograph. The 2.4-acre site is located upstream from the initial fill disposal site. It is overgrown with invasive fennel (*Feoniculum vulgare*) and is outside the 100-year floodplain. On June 15, 2009 the site was inspected by the park archaeologist, Kelly Minas, for cultural material. Mr. Minas examined the subsurface at four locations to a maximum depth of 60 cm and found no indication of cultural material. Dr. Lotus Vermeer, Director of The Nature Conservancy's Santa Cruz Island Project and a partner in this project, has agreed to the use of this site as an additional fill disposal area.

The park will continue consultation with the Chumash Tribe regarding treatment of the initial fill disposal site. If the Tribe agrees that capping the site would be an acceptable means of protecting the site, and approves the park's method of capping, the site would be covered with Coir geotextile, a natural product without chemical treatment or synthetic webbing. This layer would provide a demarcation between the existing soil layer and fill material. Fill material would be deposited to a depth of approximately 1 foot and a distance of 10' from the ordinary high water mark using a skid-steer loader bobcat beginning adjacent to the road and working across the site so that equipment is always operating on fill material.


We have determined that the alternative fill disposal site and capping of the initial fill disposal site, if acceptable to the Chumash Tribe, will result in no adverse effect to cultural resources. For further information please contact Paula Power, ecologist at 805/658-5784 or paula_power@nps.gov.

Sincerely,

/s/ Russell Galipeau

Russell E. Galipeau, Jr.
Superintendent

Enclosure

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Prisoners Harbor Coastal Wetland Restoration Plan
Final Environmental Impact Statement

STATE OF CALIFORNIA - THE RESOURCES AGENCY

ARNOLD SCHWARZENEGGER, Governor

OFFICE OF HISTORIC PRESERVATION
DEPARTMENT OF PARKS AND RECREATION

P.O. BOX 942896
SACRAMENTO, CA 94296-0001
(916) 653-8824 Fax: (916) 653-8824
calshpo@ohp.parks.ca.gov
www.ohp.parks.ca.gov



AUG 14 AM 10:50

12 August 2009

Reply In Reference To: NPS080421A

Russell E. Galipeau, Superintendent
National Park Service
Channel Islands National Park
1901 Spinnaker Drive
Ventura, CA 93001-4354

Re: Prisoners Harbor Coastal Wetland Restoration on Santa Cruz Island, Channel Islands National Park, Santa Barbara County, CA

Dear Mr. Galipeau:

Thank you for your June 23, 2009, letter providing additional information regarding a second fill disposal area and a methodology for placing fill in the initial identified disposal area for the Prisoners Coastal Wetland Restoration project. This second disposal area was identified and discussed in a telephone conversation between park staff and my staff with the intent of lessening the potential for impacts to cultural resources and to address concerns expressed by the Chumash tribe.

Park archaeologist, Kelly Minas, has surveyed the 2.4-acre proposed second fill disposal site for the presence of cultural resources. Due to the overgrown nature of the parcel with invasive fennel, shovel test probes were placed at four different locations to a maximum depth of 60 cm for purposes of examining the subsurface for the presence of cultural materials. No indication of cultural materials was found during the subsurface examination.

Regarding the initial fill disposal site, the park will continue consultation with the Chumash Tribe. The recommendation for this area involves capping the site by first placing Coir geotextile fabric on the surface prior to covering with fill materials. The geotextile fabric will provide a demarcation between the existing soil layer and fill material. The fill material would be deposited to a depth of approximately 1 foot and a distance of 10 feet from the ordinary high water mark using a skid-steer loader bobcat beginning adjacent to the road and working across the site so that the equipment is always operating on fill material. This method should provide adequate protection for the archaeological site.

You have determined that the alternative fill disposal site and capping of the initial fill disposal site, if acceptable to the Chumash Tribe, will result in no adverse effect to cultural resources. I concur with a finding of no adverse effect with conditions (36 CFR Part 800.5(b)), the condition being tribal agreement for the described methodology utilized for placing fill at the initial disposal site. If for some reason the Tribe does not agree with the proposed methodology, you will continue consultation with my office to discuss alternate means of fill disposal.

Prisoners Harbor Coastal Wetland Restoration Plan
Final Environmental Impact Statement

PAGE 2 of 2

Thank you for seeking my comments and considering historic properties as part of your project planning. If you have any questions or concerns, please contact Mark Beason, Project Review Unit historian, at (916) 653-8902 or mbeason@parks.ca.gov.

Sincerely,

Susan K Stratton for

Milford Wayne Donaldson, FAIA
State Historic Preservation Officer

Prisoners Harbor Coastal Wetland Restoration Plan
Final Environmental Impact Statement



IN REPLY REFER TO:
L7617-CHIS

United States Department of the Interior

NATIONAL PARK SERVICE
Channel Islands National Park
1901 Spinnaker Drive
Ventura, California 93001-4354

NOV 13 2009

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

Re: NPS080421A, Proposed Restoration of Wetlands on Santa Cruz Island, Santa Barbara County, Channel Islands National Park, CA

Dear Mr. Donaldson:

We are enclosing additional information regarding the above-referenced project to seek your concurrence with the Area of Potential Effect (APE), and a determination of no adverse effect on properties listed on and eligible for the National Register of Historic Places.

Following the site visit to the Prisoners Harbor project area on February 24, 2009, and evaluating suggestions made by the Office of Historic Preservation (OHP) staff, Susan Stratton and Mark Beason, the park consulted with the Tribe regarding treatment of the east side of the drainage. The Tribe agreed that capping the site on the east side of the drainage would help protect the site. The park supports the Tribe's suggestion for a mid-project evaluation (after tree removal) to determine the best solution for protecting the site. We have enclosed a copy of the letter provided by the Tribe for your information.

The park would like OHP to consider a proposal to use eucalyptus chips rather than geotextile coir as a demarcation layer when capping the site. The chips are readily available, do not require transportation to the island, and are a completely natural product. As per your staff's suggestion, the park would use a lightweight tractor beginning adjacent to the road to spread the demarcation layer and capping material.

The upstream, alternative fill disposal site located on property owned by The Nature Conservancy would be available for surplus fill material.

An archeological monitor would be on-site during all potential ground disturbing activities. In the case of an accidental find of cultural material or remains, the park will notify the State Historic Preservation Officer and the Tribe.


For further information please contact Paula Power, ecologist, at 805/658-5784 or paula_power@nps.gov.

Sincerely,

/s/ Russell Galipeau

Russell E. Galipeau, Jr.
Superintendent

Enclosure (1)

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Prisoners Harbor Coastal Wetland Restoration Plan
 Final Environmental Impact Statement

STATE OF CALIFORNIA – THE RESOURCES AGENCY

ARNOLD SCHWARZENEGGER, Governor

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

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RECEIVED
 CHANNEL ISLAND NATL. PK
 2010 JAN 22 PM 12:43

January 20, 2010

Reply in reference to: NPS080421A

Mr. Russell Galipeau, Jr.
 Superintendent
 Channel Islands National Park
 1901 Spinnaker Drive
 Ventura, CA 93001

| | | | |
|----------------------|------------------|------|---------|
| Channel Islands N.P. | Supt. | FILE | ACTION |
| | Admin. | | |
| | Cult. RM | | |
| | Interp. | | |
| | Maint. | FYI | |
| | Nat. RM (Fossil) | | RESPOND |
| | Protection | | |
| | Transp. | | |
| | Marine Sci. | | |
| | NBS - Terr. | | |
| | NBS - Mar. | | |

Re: Prisoners Harbor Coastal Wetland Restoration on Santa Cruz Island, Channel Islands National Park, Santa Barbara County, CA

Dear Mr. Galipeau:

Thank you for your November 13, 2009, letter documenting your consultation with the Santa Ynez Band of Chumash Indians and providing us a copy of their comments. To ensure protection of cultural resources, the park proposes to cap the portion of SCrl-240 on the east side of Cañada del Puerto creek. A demarcation layer composed of eucalyptus chips will separate original soil from capping material. An alternative fill stockpile area on The Nature Conservancy property will be available if needed. An archeological monitor will be on site during all potential ground-disturbing activities; in the event of an accidental discovery of cultural materials or human remains the park will stop work and consult with the SHPO and the Santa Ynez Band of Chumash Indians.

The Tribe has concurred with the proposal to cap the portions of archeological site SCrl-240 east of the drainage and the use of a lightweight tractor to place materials to cap the site. The Tribe has suggested a mid-project evaluation to determine the best solution for continued protection of the site, with which NPS is in accord.

I have previously concurred (letter of August 12, 2009) with the Channel Islands National Park's "no adverse effect" determination for the archeological resources. I have no objection to the use of eucalyptus chips forming the interface between the layer of fill and the archaeological site. I would also suggest considering the use of a semi-permeable geo-textile fabric for use as the demarcation layer between the fill and archaeological site. The geo-textile fabric would be longer lasting, less prone to breaking down and degradation caused by natural conditions.

Also within the undertaking's area of potential effect are historic resources including a circa 1950s corral complex, scale house, concrete water troughs, telephone poles, a 19th-century stone well, an 1887 masonry warehouse building, and blue gum eucalyptus plantings adjacent to the warehouse and in the Cañada del Puerto, which are all considered contributing resources within the National Register-eligible Santa Cruz Island Ranching District. The project is designed to protect the 19th-century stone well and warehouse building, the scale house and water troughs, while the corral system and telephone poles will be partially or completely removed and the eucalyptus trees in

Prisoners Harbor Coastal Wetland Restoration Plan
Final Environmental Impact Statement

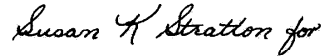
Page 2 of 2

NPS080421A

the Cañada del Puerto will be removed. I have determined that the undertaking will have no adverse effect on the Santa Cruz Island Ranching District.

Thank you for seeking my comments and considering historic properties as part of your project planning. If you have any questions or concerns, please contact Mark Beason, Project Review Unit historian, at (916) 653-8902 or mbeason@parks.ca.gov.

Sincerely,



Milford Wayne Donaldson, FAIA
State Historic Preservation Officer

Consultation with Santa Ynez Band of Mission Indians

Prisoners Harbor Coastal Wetland Restoration Plan
Final Environmental Impact Statement



IN REPLY REFER TO:

United States Department of the Interior

NATIONAL PARK SERVICE
Channel Islands National Park
1901 Spinnaker Drive
Ventura, California 93001-4354

H4217-CHIS

JUN 30 2009


Tribal Elders Council
Santa Ynez Band of Chumash Indians
P.O. Box 365
Santa Ynez, CA 93460

Re: Prisoners Harbor Coastal Wetland Restoration Plan

Dear Tribal Elders Council:

Channel Islands National Park has been in consultation with you regarding the restoration of the wetlands at Prisoner's Harbor on Santa Cruz Island and potential impacts to archeological resources in the project area. A draft Environmental Impact Statement has recently been submitted for public review and the Section 106 consultations with the State Historic Preservation Officer are in progress. While conducting a site visit at the Prisoners Harbor Coastal Wetland Restoration project area on February 24, 2009, questions were raised by Freddy Romero regarding the possible presence of Chumash burials in the proposed project fill disposal site 1 across the creek, which is within the recorded boundaries of the archaeological site (SCrI-240). Upon investigating further, we located the following references. According to Dr. Jeanne Arnold, author of *The Origins of a Pacific Coast Chieftdom*, human remains were exposed and removed in the 1920's when the Cañada del Puerto stream course was redirected. Other archaeologists have removed burials from the archeological site but the location descriptions have been vague. It is possible that remains may still be buried in the east-central portion of SCrI-240.

The park wishes to continue the consultation process with you regarding selection and treatment of the proposed fill disposal location. The wetlands restoration project would remove the eucalyptus trees that currently shield that portion of the archeological site, which will make the site more visible and accessible. The park believes that capping the archeological site on the east side of the drainage would help to protect that portion of the site. The park would cover it with coir geotextile, a natural product without chemical treatment or synthetic webbing, which would provide a demarcation between the existing soil layer and fill material. Fill material would then be deposited to a depth of approximately 1 foot and a distance of 10' from the ordinary high water mark using a skid-steer loader bobcat beginning adjacent to the road and working across the site so that equipment is always operating on fill material. The fill material would be covered with coir geotextile to prevent erosion and re-vegetated with native plants.

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Prisoners Harbor Coastal Wetland Restoration Plan
Final Environmental Impact Statement

The park has identified a second proposed fill disposal area for the Prisoners Coastal Wetland Restoration Plan (see the illustration below). The 2.4-acre site is located upstream from the initial fill disposal site 1. It is overgrown with invasive fennel (*Foeniculum vulgare*) and is outside the 100-year floodplain. No archaeological sites have been recorded at this location and the nearest recorded archaeological site is more than 250 meters away. On June 15, 2009, the new location was inspected by park archaeologist, Kelly Minas, for cultural material. The surface of the ground was not visible due to dense vegetation. He examined the subsurface at four locations using a soil auger to a maximum depth of 60 cm and found no indication of cultural material.

We would like to know your thoughts about capping the eastern portion of SCr1-240 or whether you prefer that all of the project fill material be disposed of on the alternative site. We look forward to hearing from you. Please feel free to contact Paula Power, Ecologist, at 805/658-5784 or by email at paula_power@nps.gov if you have any questions or comments.

Sincerely,

/s/ Russell Galipeau

Russell E. Galipeau, Jr.
Superintendent

Enclosure

Prisoners Harbor Coastal Wetland Restoration Plan
Final Environmental Impact Statement



SANTA YNEZ BAND OF MISSION INDIANS
Tribal Elders Council

P.O. Box 365 • Santa Ynez • CA • 93460
Phone: (805) 688-9446 • Fax: (805) 686-9579 • Email: elders@santaynezchumash.org

September 4, 2009

Mr. Russell Galipeau Jr.
Superintendent
Channel Islands National Park
1901 Spinnaker Drive
Ventura, California 93001-4354

Dear Superintendent Galipeau:

Thank you for your letter of June 30, 2009 wherein you describe the Channel Islands National Park Prisoner's Harbor wetlands restoration project on Santa Cruz Island and the efforts to ensure protection of potential cultural sites by analyzing two areas where fill may be deposited in the course of the project.

In that removal of the eucalyptus trees which currently shield a portion of the archaeological site (SCri-240) would make it more visible and accessible to park visitors, we agree that capping the site on the east side of the drainage would help protect that portion of the site. As it is unknown what potential cultural material may be discovered in the area of the tree removal, we suggest a mid-project evaluation (after tree removal) in order to determine the best solution to protect the site.

After mid-project evaluation and the absence of cultural material, your staff's solution of using a lightweight tractor beginning adjacent to the road to place one foot of fill at a distance of 10 feet from the ordinary high water mark on the area a little at a time in order to ensure that the tractor only drive on fill seems appropriate.

In that the second proposed fill disposal area (2.4-acre site located upstream from the initial fill disposal site 1) mentioned in your letter is further away from potential sites, and that no archaeological sites have been recorded at that location, the nearest recorded archaeological site is more than 250 meters away and testing for archaeological material done on June 15, 2009 by park archaeologist Kelly Minas (soil augur at four locations to a maximum depth of 80 cm) was negative, this seems like the preferred location for surplus fill material.

With regards to the removal of the berm located near the village area, what is the plan by NPS to prevent erosion of the site and loss of cultural material in the event of flooding?

We understand that an archaeological monitor will be present during this project in case there is an accidental find of cultural material or remains. If such a find occurs, please notify the Santa Ynez Band of Chumash Indians.

Sincerely,
Carmelita Cordero
Tribal Elders Council Chair
Santa Ynez Band of Mission Indians



APPENDIX H—FWS CONSULTATION

Prisoners Harbor Coastal Wetland Restoration Plan
 Final Environmental Impact Statement

L7617-CHIS

Mr. Roger Root
 U.S. Fish and Wildlife Service
 Ventura Field Office
 2493 Portola Road, Suite B
 Ventura, CA 93003

Reference: Channel Islands National Park, Santa Cruz Island
 Prisoners Harbor Coastal Wetland Restoration

Dear Mr. Root:

In compliance with the National Environmental Policy Act, the National Park Service is preparing an Environmental Impact Statement to evaluate possible alternatives for restoring the former coastal wetland at Prisoners Harbor and associated riparian corridor in the lower Cañada del Puerto. Please refer to the U.S. Geological Survey (USGS) quadrangle titled Santa Cruz Island C and the enclosed vicinity map. The project area extends over approximately 50 acres of land owned by Channel Islands National Park and The Nature Conservancy. Action is needed because prior modifications to the site, including filling the wetland, channelizing the stream, and introducing invasive species, degraded the ecosystem function of the coastal wetland and riparian corridor.

At this early stage in the planning, we wish to ensure that we are working with a complete list of species that should be considered under Section 7 of the Endangered Species Act and to solicit any early input or concerns that you may have regarding this proposed action. A search of the California Natural Diversity Database, herbarium specimens, and on-the-ground field surveys indicate that the federally listed species in the project area is the Santa Cruz Island fox (*Urocyon littoralis santacruzae*). The known listed species within the project action area, USGS quad *Santa Cruz Island C* are listed below.

Threatened and Endangered Species in USGS quad *Santa Cruz Island C*

| Scientific Name | Common Name | Federal | State | Anacapa | Santa Cruz | Santa Rosa | San Miguel | Santa Barbara |
|----------------------------------|-------------------------------|---------|-------|---------|------------|------------|------------|---------------|
| <i>Urocyon littoralis cruzae</i> | Santa Cruz Island fox | E | T | | C | | | |
| <i>Arabis hoffmannii</i> | Hoffmann's rock-cress | E | | A! | C | R | | |
| <i>Galium buxifolium</i> | Box-leaved bedstraw | E | | | C | | M | |
| <i>Helianthemum greenei</i> | Island rush-rose | T | | | C | R | | |
| <i>Malacothrix indecora</i> | Santa Cruz Island malacothrix | E | | | C | R | M | |
| <i>Malacothrix squalida</i> | Island malacothrix | E | | A | C | | | |

Prisoners Harbor Coastal Wetland Restoration Plan
 Final Environmental Impact Statement

| | | | | | | | | |
|--|------------------------------|---|--|--|---|--|--|--|
| <i>Thysanocarpus conchuliferus</i> | Santa Cruz Island lacepod | E | | | C | | | |
|--|------------------------------|---|--|--|---|--|--|--|

Legend

- E*** = ***Endangered***
T = ***Threatened***
(EE) = ***Single island endemic***
(E) = ***Endemic to the islands***
! = ***Extirpated (no longer occurs)***
******* = ***Thought to be extinct***
A, C, R, M, B = ***Island of occurrence***

We look forward to working with your office and the public as we proceed with the environmental planning process for this project. If you have any questions, please contact Paula Power, Ecologist, at 805/658-5784 or at paula_power@nps.gov

Sincerely,

Russell E. Galipeau, Jr.
 Superintendent

Enclosure

bcc: CHIS-File, K. Faulkner, P. Power
 CHIS:PPOWER:cl:07/29/08

Prisoners Harbor Coastal Wetland Restoration Plan
Final Environmental Impact Statement



IN REPLY REFER TO:
2008-SL-0577

United States Department of the Interior

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



Kate —
Paula —

Septembj- 11^2008

Russell E. Galipeau, Jr., Superintendent
Channel Islands National Park
1901 Spinnaker Drive
Ventura, California 93001-4354

Subject: Species List for Santa Cruz Island Prisoners Harbor Wetland Restoration, Santa Barbara County, California, L7617-CHIS

Dear Mr. Galipeau:

We are responding to your request, dated August 1, 2008, and received in our office on August 4, 2008, for information on endangered and threatened species that may occur at or near Prisoner's Harbor, Santa Cruz Island. The National Park Service (NPS) is preparing an environmental impact statement to evaluate possible alternatives for the restoration of the coastal wetland at Prisoner's Harbor and the associated riparian corridor in lower Canada del Puerto. The project area is approximately 50 acres in area and would occur on land owned by the NPS and The Nature Conservancy. We understand that the NPS is the lead Federal agency for this project and would assume responsibility under section 7 of the Endangered Species Act of 1973, as amended (Act).

This letter fulfills our requirements under section 7(c) of the Act. The NPS, as the lead Federal agency for the project, has the responsibility to review its proposed activities and determine whether any listed species may be affected. If the project is a construction project that may require an environmental impact statement¹, the NPS has the responsibility to prepare a biological assessment to make a determination of the effects of the action on the listed species or critical habitat. If the NPS determines that a listed species or critical habitat is likely to be adversely affected, it should request, in writing through our office, formal consultation pursuant to section 7 of the Act. Informal consultation may be used to exchange information and resolve conflicts with respect to threatened or endangered species or their critical habitat prior to a written request for formal consultation. During this review process, the NPS may engage in planning efforts but may not make any irreversible commitment of resources. Such a commitment could constitute a violation of section 7(d) of the Act.

"Construction project" means any major Federal action which significantly affects the quality of the human environment designed primarily to result in the building of structures such as dams, buildings, roads, pipelines, and channels. This includes Federal actions such as permits, grants, licenses, or other forms of Federal authorizations or approval which may result in construction.

Prisoners Harbor Coastal Wetland Restoration Plan
Final Environmental Impact Statement

Russell E. Galipeau

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Based upon our review of the species list enclosed with your request, records in our files, and the proposed project location, we believe the proposed project site could support the federally endangered Santa Cruz Island Fox (*Urocyon littoralis cruzae*). Furthermore, because the proposed project site is located in a previously disturbed canyon bottom, and the listed plant species in the vicinity of the project area occur on coastal bluffs, we do not believe any federally listed plant species occur in the area of the proposed restoration work.

Should you have any questions regarding this matter, please contact Robert McMorran at (805) 644-1766, extension 232.

Sincerely,



Chris Dellith Senior
Biologist

APPENDIX I—CALIFORNIA COASTAL COMMISSION

Prisoners Harbor Coastal Wetland Restoration Plan
Final Environmental Impact Statement



IN REPLY REFER TO:

L7617-CHIS

United States Department of the Interior

NATIONAL PARK SERVICE
Channel Islands National Park
1901 Spinnaker Drive
Ventura, California 93001-4354

MAR 12 2010


Mr. Mark Delaplaine
Federal Consistency Supervisor
California Coastal Commission
45 Fremont Street, Suites 1900 & 2000
San Francisco, California 94105-2219

Dear Mr. Delaplaine:

In accordance with the Federal Coastal Zone Management Act of 1972 as amended, Section 307c (1), the National Park Service (NPS) has determined that the restoration of the Prisoners Harbor coastal wetland and associated riparian corridor on Santa Cruz Island, Channel Islands National Park would have no effect upon coastal uses or resources and therefore, does not require a consistency determination. Santa Cruz Island is located 19 miles offshore in Santa Barbara County.

The NPS proposes to restore ecosystem function to the buried coastal wetland at Prisoners Harbor and the associated riparian corridor, improve hydrologic function and connectivity between the creek and floodplain, protect archeological resources in the project area, and improve the visitor experience. These goals will be accomplished by removing approximately 10,000 cubic yards of fill from the buried coastal wetland, removing non-native plant species, including eucalyptus trees (*Eucalyptus* spp.) and fennel (*Foeniculum vulgare*), removing a portion of the berm channelizing the creek, building a protective berm around the Chumash archeological site, and improving interpretation of the project area. Action is needed because prior modifications to the site degraded the ecosystem function of the coastal wetlands and riparian corridor. This resulted in diminished habitat quality for island species including the Santa Cruz Island fox, bald eagle, and the island scrub-jay; migratory waterfowl traveling the Pacific flyway and passerine birds.

Prisoners Harbor is the principal access point for 90% of Santa Cruz Island. Island residents, researchers, park staff, and visitors disembark at the Prisoners Harbor pier and travel on foot or by vehicle to the isthmus, central valley, and west end of the island. Restoring Prisoners Harbor coastal wetland will not affect access to Prisoners Harbor, beaches within the project area, or other island destinations (CCMP Chap 3, article 2, section 30210). Recreational opportunities will remain the same and will not be affected by this project (CCMP Chap 3, article 3, section 30220).

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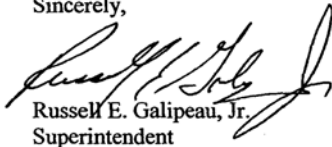
Project activities are focused on restoring ecosystem function of wetland and riparian communities and will not alter the seabed. Mitigation and Storm Water Pollution Control Plans will prevent discharge or deposit of material in the seabed during construction (CCMP Chap 3, article 4, section 30231 and 30233(6)).

The 60-acre project area occurs on land owned by the NPS and by The Nature Conservancy (TNC). The NPS and TNC have a cooperative agreement to manage the island as one ecological unit. See the enclosed maps (Figure 1.1 and 2.1) of the 60-acre project area and environmentally preferred alternative.

The NPS has prepared an Environmental Impact Statement (EIS) in accordance with the provisions of the National Environmental Policy Act (42 U.S.C. 4321 et seq.). The California Coastal Commission was notified of the availability of the draft EIS and the public comment period. All public comments received during the comment period were reviewed and responses to substantive comments were incorporated in the EIS, please see enclosed CD of the final draft EIS. There were no substantive comments regarding the coastal zone. The park consulted with the State Historic Preservation Office and the Santa Ynez Band of Mission Indians (Chumash) on possible impacts to cultural resources. After developing appropriate mitigation and avoidance measures, the NPS received concurrence on no adverse affect on cultural resources.

The NPS has determined that the restoration of the Prisoners Harbor coastal wetland and riparian corridor in the lower Cañada del Puerto would not affect public access, recreation, the marine environment, or the coastal zone. If you need additional information, or if you have any questions, please contact Paula Power, Ecologist, at 805/658-5784 or paula_power@nps.gov.

Sincerely,



Russell E. Galipeau, Jr.
Superintendent

Enclosures (3)

cc: P. Power, CHIS



Channel Islands National Park
1901 Spinnaker Drive
Ventura, CA 93001

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