ALCATRAZ ISLAND HISTORIC PRESERVATION AND SAFETY CONSTRUCTION PROGRAM

OCTOBER 2001

FINAL ENVIRONMENTAL IMPACT STATEMENT

Department of the Interior
National Park Service
Golden Gate National Recreation Area, California

ALCATRAZ

FINAL ENVIRONMENTAL IMPACT STATEMENT

LEAD AGENCY: National Park Service
PROJECT TITLE: Alcatraz Island Historic Preservation and Safety Construction Program
PROJECT LOCATION: Golden Gate National Recreation Area
San Francisco County, California

This Final Environmental Impact Statement (FEIS) describes and analyzes three alternatives for a structural repair and stabilization program needed on Alcatraz Island, a unit of the National Park System. The document includes additions and changes made to the Draft Environmental Impact Statement released to the public in March 2001 based on public comments and includes as an appendix responses to comments received. Consistent with the National Environmental Policy Act (NEPA) of 1969, as amended and National Park Service NEPA Guideline (DO-12), a 30-day no-action period will follow the Environmental Protection Agency's Notice of Availability of the FEIS.

The purpose of the proposed project is to protect the public health and safety of the more 1 million people who visit Alcatraz each year, preserve the National Historic Landmark District, and to implement the needed repairs in a manner that minimizes impacts to biological resources. The National Park Service has developed and incorporated as part of the proposed project, mitigation measures that will avoid or reduce the potential environmental effects associated the construction and repair activities. The proposed project is a construction/repair program, and no long-term changes in the land use or operational practices on the Island would occur as a result of this action. This FEIS evaluates three alternatives:

1. *Proposed Action* – The Proposed Action is the Alcatraz Historic Preservation and Safety Construction Program, which is comprised of two primary phases (Phase One and Subsequent Phases) and includes 10 individual repair/construction projects.

2. *Reduced Project Alternative* – This alternative would partially implement the needed repair activities identified under the Proposed Action. Repairs within areas that are currently open to the public would be implemented as described under the Proposed Action. In areas that are currently closed to visitors, only minimal repairs would be implemented.

3. *No Action Alternative* – Under this alternative, the National Park Service would manage the site with minimal actions to protect resources and provide for visitor safety. Ongoing routine maintenance would occur; however, no major stabilization or repair activities would be implemented.

Copies of this FEIS have been filed with the EPA and a notice of its availability published in the *Federal Register*. Additional copies of the FEIS are available for review at local libraries and can be ordered by contacting the National Park Service at:

Golden Gate National Recreation Area
Planning & Technical Services
Fort Mason, Building 201
San Francisco, CA 94123
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The fundamental purpose of all units of the National Park Service is to conserve the scenery and the natural and historic objects and the wildlife therein and to provide for the enjoyment of the same in such manner and by such means as will leave them unimpaired for the enjoyment of future generations.

—From National Park Service Organic Act, 1916, as amended 1988.

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LIST OF ACRONYMS

ACM	Asbestos Containing Material
ACOE	Army Corps of Engineers
ACHP	Advisory Council on Historic Preservation
APE	Area of Potential Effects
BAAQMD	Bay Area Air Quality Management District
BCDC	S.F. Bay Conservation and Development Commission
CEQ	Council on Environmental Quality
CFR	Code of Federal Regulations
CMP	Construction Management Plan
DCP	Alcatraz Development Concept Plan
EA	Environmental Assessment
EIS	Environmental Impact Statement
ESA	Endangered Species Act
FONSI	Finding of No Significant Impact
GGNRA	Golden Gate National Recreation Area
GMP	General Management Plan
GSA	General Services Administration
HABS	Historic American Buildings Survey
LTMS	Long Term Management Strategy (for the disposal of dredged material in S.F. Bay region)
NEPA	National Environmental Policy Act of 1969
NPS	National Park Service
NHPA	National Historic Preservation Act of 1966
NMFS	National Marine Fisheries Service
NOI	Notice of Intent
NO_2	nitrogen dioxide
NO_x	nitrogen oxides
NRHP	National Register of Historic Places
PA	Programmatic Agreement
PM_{10}	inhalable particulate matter
ROD	Record of Decision
ROG	reactive organic gases
RWQCB	Regional Water Quality Control Board
SHPO	State Historic Preservation Officer
SIP	State Implementation Plan
USACE	U.S. Army Corps of Engineers
VERP	Visitor Experience and Resource Protection

SUMMARY

This Environmental Impact Statement (EIS) evaluates the environmental effects of the proposed Alcatraz Historic Preservation and Safety Construction Program (the "Proposed Action"). The National Park Service is the project proponent and Lead Agency for the project. This EIS has been prepared in accordance with the requirements of the National Environmental Policy Act (NEPA), National Park Service NEPA Guidelines (DO-12), and NPS Management Policies 2001.

The purpose of the Proposed Action is to protect human health and safety, stabilize deteriorating historic structures to protect the National Historic Landmark, and implement these needed repairs in a manner that minimizes adverse biological effects. The repairs include replacement of badly deteriorated piles underneath the dock (the only access point to the Island), seismic retrofit of the Cellhouse (the primary visitor attraction on the Island), repair/stabilization of other historic structures to provide for public safety and historic preservation. No changes in the land use or long-term operation of the Island would occur as a result of the Proposed Action—the project is a construction program addressing critically needed repairs on the Island and is consistent with the appropriate management plan for the Island.

Project Overview

Three alternatives are evaluated in this EIS: the Proposed Action, the Reduced Project Alternative, and the No Action Alternative. Each of these alternatives is summarized below and described in detail in Chapter 2.

The Proposed Action consists of 10 repair/construction projects that would be implemented in two phases; Phase One and a Subsequent Phase. The National Park Service proposes to implement the needed repair/construction projects using an adaptive management approach that will use field monitors to enhance the mitigation measures identified in Chapter 2. Phase One projects would be implemented and monitored, and the information gained through this monitoring would be used to refine and improve implementation for both ongoing and subsequent projects of the Proposed Action (Refer to Appendix B for additional information on monitoring). The following is a list of the projects included in the Proposed Action (see Chapter 2 for detail).

Phase One:

- Dock Repair;
- Building 64 (Balconies Repair);
- Cellhouse Stabilization and Seismic Upgrade; and
- Sallyport Structural Repair and Seismic Upgrade.

Subsequent Phases:

- Water Tower Stabilization;
- Slope Stabilization;
- New Industries (Laundry) Building Stabilization and Seismic Upgrade;
- Building 64 (Seismic Upgrade);
- Quartermaster Building Stabilization and Seismic Upgrade; and
- Fuel Line Remediation.

The National Park Service has identified a variety of mitigation measures to avoid or minimize the effects of the proposed construction/repair activities. These measures, along with the adaptive management approach to

implementing the Proposed Action, will allow the park to achieve the most effective balance of resource protection and preservation, while providing safe public access to Alcatraz.

The Reduced Project Alternative would implement many of the safety and historic preservation actions identified under the Proposed Action. The repair and stabilization of three structures (the Water Tower, the New Industries Building, and the Quartermaster Building) on the north end of Alcatraz Island, located in or near a biologically sensitive area, however, would be minimal. The objective of this alternative is to reduce biological impacts, while providing for basic human health and safety and limited cultural resource stabilization.

Under the No Action Alternative, none of the proposed construction activities identified in the Alcatraz Historic Preservation and Safety Construction Program would be implemented. Minimal maintenance of the Island's cultural resources would occur, and current vegetation and wildlife management practices would continue. Threats to public health and safety would occur, leading to the closure of affected areas on the Island, and eventually precluding public access to the Island.

Environmental Consequences

IMPACTS ON BIOLOGICAL RESOURCES

Alcatraz Island supports a diverse group of plants and animals. In general, Alcatraz Island consists of grassland, shrubs, historic gardens, non-native trees, cliffs and other barren areas, and historic buildings and paved areas. The landscape vegetation consists of a diverse group of non-native ornamental shrubs and trees, and is considered part of the cultural resource on the Island. These provide most of the vegetative structure and habitat for wildlife on the Island.

Alcatraz Island has become a valuable natural habitat for colonial waterbirds due to its favorable currents and nearshore foraging areas. The Island supports the most diverse assemblage of marine and estuarine colonial nesting waterbirds in San Francisco Bay, an important wildlife resource within the Golden Gate National Recreation Area, and as many as 4,500 adults and chicks of seven different colonial nesting species may inhabit the Island during the nesting season each year. During much of the year, waterbirds are the most common wildlife species on Alcatraz Island. Although these species are not afforded special status by state or federal agencies, the waterbirds are protected under the Migratory Bird Treaty Act, are of interest in the San Francisco Bay area, and are addressed in this EIS. In addition to colonial waterbirds, several other bird species have been documented as breeding on the Island. The Alcatraz Bird Census (ABC) has been conducted yearly since 1993 to document birds using the Island during the fall and winter months. Eighty-nine species were identified during censuses conducted from September 1998 to January 1999.

In addition to birds, several other species are found on Alcatraz Island, including deer mouse (*Peromyscus maniculatus*), California slender salamander (*Batrachoseps attenuatus*), Norway rat (*Rattus norvegicus*), and bat species. Seals and sea lions haul out in small numbers on or near Alcatraz.

Implementation of the proposed repair/construction activities would impact biological resources. As described in Chapter 4 and Section 2.7, many of these effects would be minimized or avoided through mitigation. Although the impact of the Proposed Action would be reduced to a minor level for most species of plants and animals, there would be a greater impact on the eight species of breeding waterbirds that nest on the Island.

The impact analysis relied on a variety of sources, including professional judgment and knowledge of the Island's nesting birds (see Section 4.2.1). The impact analysis of the Proposed Action concluded that the impact on breeding waterbirds would vary by project location. The most substantial effects would include increased predation, potential reduction in the reproductive success of a particular species/subcolony, and in the most extreme cases possibly the temporary or long-term abandonment of individual subcolonies. No colony

abandonment (i.e., an entire population of an individual species of birds nesting on Alcatraz) and no impairment of biological resources would occur as a result of the Proposed Action. The National Park Service would employ a variety of protective measures and use of adaptive management to ensure the intensity and duration of the impact is reduced wherever feasible. If through ongoing monitoring, it is determined that additional impacts (beyond those disclosed in this EIS) occur, the National Park Service would take corrective actions to reduce the level of impact to at or below the level described in the EIS.

The biological impact of the Reduced Project Alternative construction/repair activities in areas currently open to the public would be the same as the Proposed Action. This alternative proposes minimal construction activity in areas currently closed to the public and is mostly limited to the non-breeding season. The reduced level of construction repair would similarly reduce the intensity of the impact on nesting wildlife. However, eventual failure of structures during the breeding season could directly impact breeding birds in the vicinity of the failure. The Reduced Project Alternative would have less impacts to waterbirds than the Proposed Action, yet neither would result in impairment to natural resource values.

Under the No Action Alternative, biological impacts associated with the proposed repair/construction activities would not occur. However, failure of structures during the breeding season could directly impact breeding birds in the vicinity of the failure.

IMPACTS ON CULTURAL RESOURCES

Alcatraz Island was included as a unit of the Golden Gate National Recreation Area in 1972 because of its historical significance. Alcatraz is of special importance to the history of the military, including the United States Coast Guard, the federal penal system, Native American rights movement, and the evolution of the National Park Service (NPS, 1993). Please refer to Section 1.1 for additional information on Alcatraz's historic significance.

The Proposed Action includes 10 individual repair projects requiring, in total, approximately five years to complete. The Proposed Action would correct serious public health and safety threats, including structural failure due to deterioration and/or seismic activity, spalling concrete and other hazards, and stabilize the historic structures contributing to the National Historic Landmark District. The Proposed Action would have a substantial, long-term, beneficial effect on cultural resources by stabilizing historic structures protecting the resource from impairment.

Under the Reduced Project Alternative, the three structures receiving minimal repairs include the Water Tower, New Industries Laundry Building, and Quartermaster Building. These structures are contributing features of the Alcatraz Island National Historic Landmark District and prominent landmarks on the north end of the Island. Without the necessary rehabilitation, these structures will eventually fail and be lost permanently. Other structures contributing to the landmark designation within this area are in similar deteriorated condition. Because the north end of Alcatraz can be closed to visitation if safety factors require it, a decision to consider only minimal safety projects for the three structures could possibly result in a similar loss of the associated contributing historic resources in the area. The loss of Water Tower including the Indian Occupation graffiti, the New Industries Laundry Building, the Quatermaster Building and possible loss of other contributing resources on the north end of the Island would lessen the integrity of the Alcatraz Island National Historic Landmark. The Reduced Project Alternative would have major adverse impacts on cultural resources. The cumulative loss of these cultural resources, located on the north end of the Alcatraz, resulting in the loss of the National Historic Landmark status, and considered impairment of the cultural resource values on Alcatraz.

Under the No Action Alternative, deterioration of the Island's cultural resources would continue, with only routine maintenance and repairs to ensure structural safety. No preservation, rehabilitation, restoration or other management program would be implemented, and adverse effects on cultural resources would occur. The impacts would include the irreparable deterioration of the National Historic Landmark and loss of the National

Historic Landmark Status. The effects on cultural resources would be greater than those expected under the Reduced Project Alternative or the Proposed Action. The cumulative effect of this benign neglect would be the deterioration of buildings and structures so that there would be an overall loss of integrity to the Alcatraz Island National Historic Landmark and eventually loss of the designation, and the permanent loss of an important historic resource for the nation. This irreparable damage would constitute impairment of the cultural resources and cultural resource values on Alcatraz.

IMPACTS ON VISITOR USE

Alcatraz Island became part of the Golden Gate National Recreation Area in 1972. Since that time, it has become an increasingly popular destination for visitors to the park. Today, over one million people visit Alcatraz each year. The Island offers a variety of trails, programs, and exhibits that interpret the Island's history and natural resources, while allowing visitors to explore Alcatraz at their own pace.

As a result of the Proposed Action, temporary recreation and visitor use impacts, including increased noise and visual intrusion of construction, would occur as a result of the proposed repair/construction activities. Following implementation, the Proposed Action would result in long-term major beneficial effect on the recreational and visitor use values on Alcatraz. The beneficial effect would result from the repair of critical health and safety hazards, allowing the Island to remain open for the visitor use, interpretation, and enjoyment by future generations.

Over the long term, the Reduced Project Alternative would have an adverse impact on the recreational and visitor use values on the Island. The impact would include the eventual loss of three important historic structures and corresponding reduction in the interpretive values and historic integrity of the Island. The loss of the Laundry Building could adversely effect future visitor access to the north side and lead to a greater potential for impairment of the resources and values that established the Alcatraz Island National Historic Landmark.

In the short term, the recreational values and visitor experience would be the same as existing with the No Action Alternative. The construction effects (noise and visual intrusion of construction activities) would be avoided. In the long term, escalating public health and safety concerns would lead to closure of individual buildings and subsequently closure of the entire Island to the visiting public when the Dock is deemed unsafe for public use, causing a major, adverse impact on recreation and visitor use. The precise timing of the closure(s) that would occur under the No Action Alternative would depend on the rate of deterioration and the ability of small-scale repair activities/routine maintenance activities to temporarily defer closure activities. Closure of the Island to the visiting public, however, would be inevitable under the No Action Alternative. The permanent closure of Alcatraz would be an impairment of the recreational and public use values of the Island.

IMPACTS ON AIR QUALITY

Alcatraz Island is located within San Francisco Bay Area Air Basin, consisting of San Francisco, San Mateo, Santa Clara, Alameda, Contra Costa, Napa, and Marin counties, as well as portions of Sonoma and Solano counties. The Island is located within San Francisco County, designated a federal nonattainment area for ozone and a state nonattainment area for ozone and particulate matter (PM_{10}). In general, Alcatraz's location allows for excellent air circulation, with very high quality air moving into the area from the Pacific Ocean. One of the primary sources of air pollution in the Bay Area region is automobile traffic—which is negligible on Alcatraz Island (i.e., an electric tram provides access for visitors, and one small truck is located on the Island).

Construction emissions associated with the Proposed Action would have minor, short-term, adverse effects with mitigation. Reduction in overall duration of the construction program associated with the Reduced Project Alternative would result in slightly less impacts to air quality compared to the Proposed Action. The No Action Alternative would result in eventual closure of the Island as a result of building and structure deterioration. This

closure would decrease energy generation and maintenance activities, resulting in minor, beneficial impacts to air quality.

IMPACTS ASSOCIATED WITH HAZARDOUS SUBSTANCES: HUMAN HEALTH, SAFETY, AND THE ENVIRONMENT

Construction activities associated with the Proposed Action have the potential to expose hazardous substances. Because structures on the Island were constructed prior to the banning of commercial use of lead-based paint and asbestos production, buildings and structures are assumed to contain these hazardous substances until proven otherwise. The extent of hazardous substances such as asbestos and lead-based paint that will be disturbed during rehabilitation and construction activities under the action alternatives will be determined prior to construction. The GGNRA will conduct surveys and sampling to identify, characterize, and quantify the nature the hazardous substances present in work areas and the extent that these materials will be disturbed by construction activity. Construction contracts for this project will include procedures for the sampling, identification, and cleanup of hazardous substances in accordance with applicable state and federal regulations. Construction activities and cleanup plans will conform to applicable federal and state laws and regulations.

Risks to human health, safety and the environment on Alcatraz Island would be related to releases of hazardous substances during construction activities to rehabilitate and stabilize deteriorating structures on the Island. The impacts associated with the Proposed Action would be short-term and negligible to minor with the implementation of mitigation measures. The shorter duration of the Reduced Project Alternative compared to the Proposed Action would result in slightly less potential impact from exposure of hazardous substances. Under both action alternatives, hazardous waste disposal and hazardous material storage would be conducted within applicable state and federal regulations; therefore, no adverse impacts would be anticipated. The No Action Alternative would lead to the closure of Alcatraz to the public and resulting in a reduced potential for exposure from construction activities. However, building decay may lead to uncontrolled releases of substances that are undetected.

Areas of Controversy

The primary area of controversy surrounding the Proposed Action is disturbance to breeding waterbird populations on the Island. Although these species are not given special status designation, they are protected by the Migratory Bird Treaty Act and represent a regionally important part of the San Francisco Bay waterbird population. Alcatraz has also been included in the Central California Coast International Biosphere Reserve. Potential impact to breeding waterbirds was identified early in the planning process as an issue of concern, and contributed to the National Park Service's decision to prepare an Environmental Impact Statement and generate extensive mitigation for the protection of waterbirds (Section 2.7). Protection of visitor and employee health and safety and preservation of the National Historic Landmark District and contributing features consistent with the requirements of the National Historic Preservation Act are also issues of substantial concern and are the stated purpose of the Proposed Action.

1.0 INTRODUCTION

This Environmental Impact Statement (EIS) has been prepared for the proposed Historic Preservation and Safety Construction Program for Alcatraz Island in accordance with the National Environmental Policy Act (NEPA) and National Park Service NEPA Guidelines (NPS-12). The National Park Service is the project proponent and Lead Agency under NEPA.

The historic preservation and safety construction program, herein referred to as the "Proposed Action," is necessary to provide for the safety of the more than 1 million annual visitors on the Island, and to stabilize the severely deteriorating historic structures that are part of a National Historic Landmark District, consistent with requirements of the National Historic Preservation Act.

This chapter addresses the following topics:

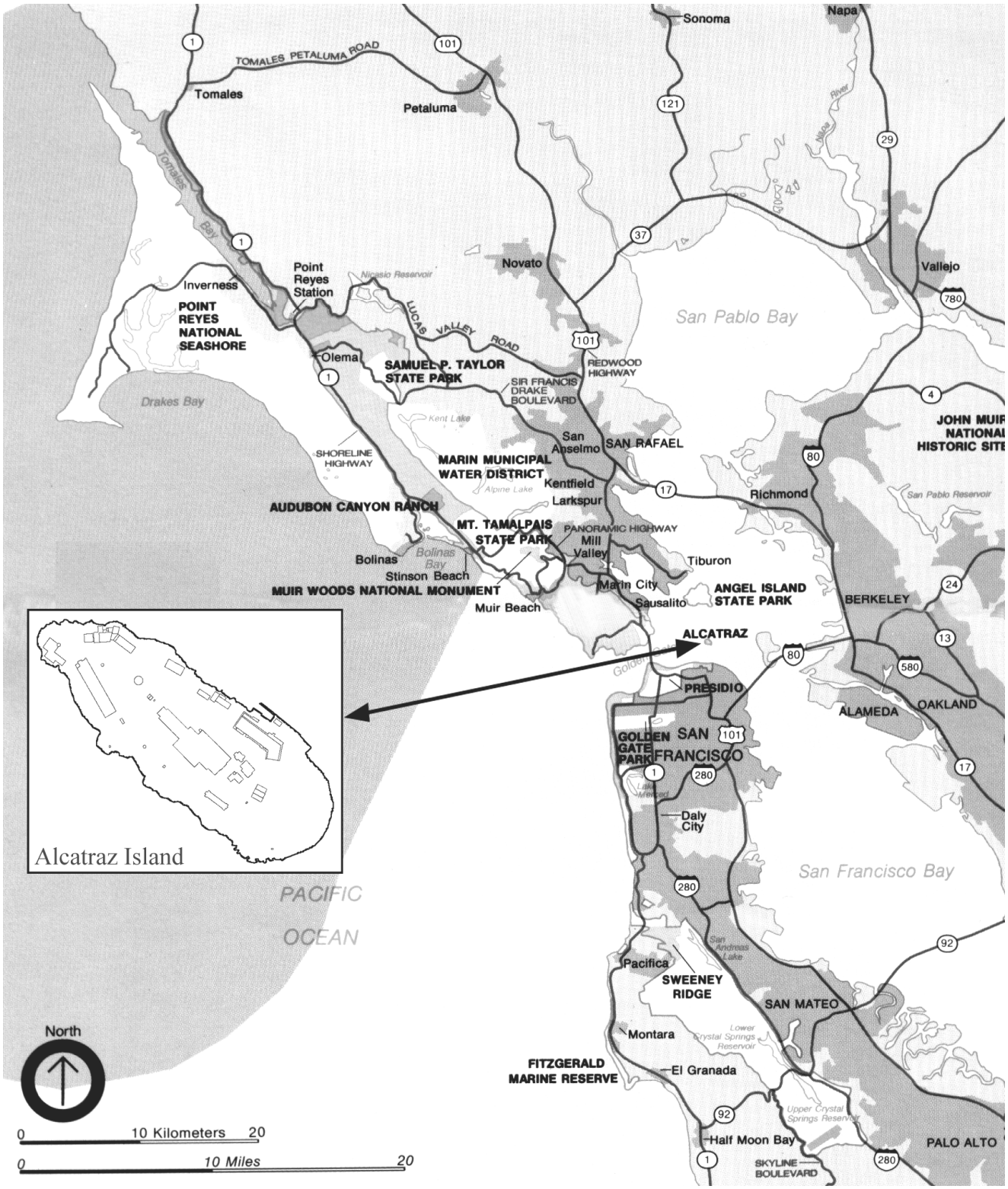
- Background on Alcatraz
  - Historic Significance
  - Wildlife Significance
  - National Park Service Management of Alcatraz Island
- Purpose & Need for Action
  - Project Objectives
- Decision to Prepare an EIS
  - Scope of EIS

1.1 Background on Alcatraz

Alcatraz Island is a 22-acre island in San Francisco Bay that was transferred to the National Park Service (NPS) in 1972 and opened to the public the following year. The Island is part of the Golden Gate National Recreation Area (GGNRA), a unit of the National Park System (see Figure 1-1). Alcatraz has important historic and natural resources values, as discussed below, and more than 1 million national and international visitors come to the Island each year. Figure 1-2 presents project locations on Alcatraz Island.

1.1.1 HISTORIC SIGNIFICANCE

Alcatraz was included in the Golden Gate National Recreation Area primarily because of its historic significance. The Island's rich and diverse history was recognized in 1986 when the Island was designated on the National Register of Historic Places as a National Historic Landmark. Evidence of the various historical layers can still be observed on the Island today. The earliest layers of construction on the Island began shortly after California was ceded from Mexico to the United States. The Island was reshaped at that time to become a major component of the Civil War–era fortifications that protected San Francisco Bay from potential attacks. Many of the gun emplacements, including the original citadel that was located on the top of the Island, currently serve as the foundations for later Island structures.



Source: NPS 2000

Figure 1-1 Regional Site Map

Placeholder for

Figure 1-2 Project Locations on Alcatraz Island

(color)

placeholder for back of color graphic

Shortly after the Civil War, the use of the Island changed from military fortification to military prison. Starting with only a few cells, the Island soon became the major military prison for the Department of War. The Main Cell Block still existing on the Island was actually constructed as a military prison in 1911 before it was turned over to the Federal Penitentiary system in the early 1930s. The history of Alcatraz as a maximum security penitentiary is perhaps the most recognized historic theme of the Island. The "Rock" as portrayed in numerous movies and television shows is now a symbol recognized throughout the world. The Island was host to some of the most notorious prisoners in the country from 1933 through 1963 when it finally closed.

The last important layer of history on Alcatraz Island has only recently been recognized. The Indian Occupation of Alcatraz Island from 1969 though 1971 was an event that awakened the country to the needs and concerns of indigenous peoples. Although the occupation lasted only eighteen months, it is recognized now as one of the primary catalysts for the Native American civil rights movement in the United States.

Elements of all the layers of history that occurred on Alcatraz are still visible throughout the Island. These important elements, the contributors to the Island's National Historic Landmark designation, must be preserved and protected by the NPS as the responsible federal agency.

1.1.2 WILDLIFE SIGNIFICANCE

The entire Golden Gate National Recreation Area, including Alcatraz Island, is included within the Central California Coast International Biosphere Reserve. Alcatraz Island has become a valuable natural habitat for colonial waterbirds due to its favorable currents and nearshore foraging areas. The evolution of the Island's landscape of crumbling ruins and abandoned, overgrown gardens has also fostered the recent increase in diversity and abundance of colonial waterbirds. Today, the Island supports the most diverse assemblage of marine and estuarine colonial nesting waterbirds in San Francisco Bay, and some of the most significant wildlife resources within the Golden Gate National Recreation Area. The colonial waterbirds of Alcatraz are regionally significant, and as many as 4,500 adults and chicks of seven different colonial nesting species may inhabit the Island during the nesting season each year.

The Island's black-crowned night-heron colony is one of the largest in the greater San Francisco Bay region. The Island supports significant colonies of pigeon guillemots and Brandt's and pelagic cormorants that usually breed along the outer coast and on offshore islands. The western gull colony is the largest in San Francisco Bay and represents a significant portion of its in-Bay breeding population. Colonial nesting waterbirds are often considered important biological monitors of the health of estuarine ecosystems, as they are high in the food web and may reflect contamination in a variety of ecosystem components. Alcatraz is the only San Francisco Bay island with large waterbird breeding colonies that is open to the public.

Although only night-herons and western gulls were known to nest on the Island and in much smaller numbers when the park's *General Management Plan* (GMP) was completed in 1980, the GMP called for protection of the Island's rocky cliffs and shoreline for wildlife resources (birds and marine organisms). The emphasis of the development concepts in the 1980 GMP was on historic preservation and visitor access. The Alcatraz Island Development Concept Plan (DCP), approved in 1993, amended the 1980 GMP and placed additional emphasis on protection of Alcatraz wildlife resources (see Section 1.1.3, below, for additional information on National Park Service management of the Island). A dramatic increase in the abundance and diversity of colonial breeding birds followed the 1993 approval of the DCP, probably in response to abundant food resources in San Francisco Bay, and evolution of the Island's landscape vegetation.

1.1.3 NATIONAL PARK SERVICE MANAGEMENT OF ALCATRAZ ISLAND

At the time Alcatraz became part of the National Park System, the Island was in a severe state of disrepair, having experienced substantial deterioration prior to as well as damage during the Native American Occupation of 1969–

1971 and the subsequent demolition work of the General Services Administration. A significant lack of funding during the intervening years prevented the National Park Service from performing the large-scale preservation, rehabilitation, and restoration projects that are essential to preserving the National Historic Landmark resource and providing a minimum level of human safety on the Island. Most historic structures on the Island were open and vulnerable to further deterioration from the elements. During these years, deterioration by wind, rain, and the marine environment have continued to erode the integrity of the historic resource and create public health and safety concerns requiring that large areas remain closed to the visiting public. However, the benign neglect of the historic resource coupled with the limited access and improved protection has resulted in the Island's evolution into a major waterbird nesting site. In areas that remain closed because of safety concerns, funding constraints, or wildlife protection, wildlife habitat has developed, often in association with overgrown historic gardens. Alcatraz Island currently provides significant bird habitat.

National Park Service plans relevant to the Proposed Action are discussed below.

The *Golden Gate General Management Plan* (GMP) for the Golden Gate National Recreation Area and Point Reyes National Seashore was the result of a six-year planning effort that began in 1974. The GMP was approved in 1980, and identified the long-term planning goals and land uses for all lands within the Golden Gate National Recreation Area and Point Reyes National Seashore. For Alcatraz Island, the GMP indicated that "From a strict resource management viewpoint, historic preservation will be the primary concern." At the time the GMP was prepared, the rocky cliffs and shoreline areas of the Island were also noted as important habitat for birds and marine organisms, and as such were designated to remain untouched. Following preparation and approval of the 1980 GMP, changes in natural resource values on the Island and increased demand for visitation by the public, prompted the National Park Service to undertake a planning effort specific to Alcatraz. The result of this effort was the *Alcatraz Development Concept Plan* and Environmental Assessment/Finding of No Significant Impact (Alcatraz DCP EA/FONSI) which was approved in September 1993 as an amendment to the 1980 GMP.

The 1993 Alcatraz DCP EA/FONSI provides the vision and framework for the long-term management of the Island, and identifies several improvements, including expansion of visitor access, habitat enhancements and protective measures for wildlife and cultural resources, improvements to interpretation and visitor amenities, and remediation of hazardous substances and other safety hazards. The DCP also defines a general historic preservation strategy for the Island that calls for a series of specific cultural resource management actions, including preservation, rehabilitation and restoration of historic buildings and structures. A discussion of the relationship between the Proposed Action and the 1993 DCP EA/FONSI is provided in Section 1.3 (Decision to Prepare an EIS), below.

In 1997, the National Park Service utilized the Visitor Experience and Resource Protection (VERP) framework to address visitor use management and carrying capacity issues on Alcatraz Island. VERP is an analytical and planning process that addresses problems related to the effects of visitor use on visitor experiences and park resources. This process provides a rationale for informed, defensible decisions about visitor use and a framework for cost-effectively coordinating planning, research, monitoring and management actions. The results of the study were reviewed and discussed by the National Park Service in 1998 and 1999, and indicated that an update to the 1993 DCP may be warranted.

1.2 Purpose and Need for Action

The purpose of the proposed Historic Preservation and Safety Program is to protect public health and safety and to stabilize the Island's National Historic Landmark structures against further deterioration. Recent incidents, including concrete falling from the side of buildings and onto the ground below without warning, are examples of the health and safety concerns. Although these incidents occurred when the Island was closed to visitors (or in areas where the public was not present), the unpredictability and risk to public health and safety is unacceptable and must be addressed. In addition to the public health and safety concerns, continued deterioration will result in

irreparable damage and loss of important historic resources. The need for the repairs being proposed was documented through a series of structural assessments that were recently completed for the majority of the buildings on the Island. Building condition is described in greater detail in Chapter 2. The conclusions of these studies raised serious concern over both the potential loss of integrity of the historic structures comprising the National Historic Landmark, and the safety of the more than 1 million people who visit the Island each year (see Chapter 7, References, for a complete list of studies).

1.2.1 PROJECT OBJECTIVES

The underlying goal of the Proposed Action is the fulfillment of the National Park Service mission, which states:

> *"The fundamental purpose of all units of the National Park Service is to conserve the scenery and the natural and historic objects and the wildlife therein and to provide for the enjoyment of the same in such manner and by such means as will leave them unimpaired for the enjoyment of future generations."*

National Park Service Management Policies (2001) require decision-makers to consider the impacts, and determine in writing, that a proposed activity will not lead to an impairment of park resources and values before approving the activity. National Park Service managers must seek to avoid, or to minimize to the greatest degree practicable, adverse impacts on park resources and values. As stated in National Park Service Management Policies, that while the National Park Service has been given the management discretion to ". . . allow certain impacts within parks, that discretion is limited by the statutory requirement (enforceable by the federal courts) that the Park Service must leave park resources and values unimpaired, unless a particular law directly and specifically provides otherwise." This responsibility helps to assure that park resources and values will continue to exist in a condition that will allow the American people to have present and future opportunities for enjoyment of them.

The National Park Service Management Policies (2001) state that, ". . . impairment that is prohibited by the Organic Act and the General Authorities Act is an impact that, in the professional judgment of the responsible National Park Service manager, would harm the integrity of park resources or values, including the opportunities that would otherwise be present for the enjoyment of those resources or values." In making this judgment, National Park Service managers must consider the particular resources and values that would be affected as well as the severity, duration and timing of direct, indirect, and cumulative impacts.

National Park Service Management Policies (2001) also asserts that an impact to park resources or values may constitute impairment, and provides specific guidance for National Park Service managers to use in analyzing whether a Proposed Action would result in impairment. The Policy states that ". . . an impact would be more likely to constitute an impairment to the extent that it affects a resource or value whose conservation is:

- Necessary to fulfill specific purposes identified in the establishing legislation or proclamation of the park;
- Key to the natural or cultural integrity of the park or to the opportunities for enjoyment of the park; or
- Identified as a goal in the park's general management plan or other relevant National Park Service planning documents.

An impact would be less likely to constitute an impairment to the extent that it is an unavoidable result, which cannot reasonably be further mitigated, of an action necessary to preserve or restore the integrity of park resources or values."

The National Park Service Management Policies provide guidance on what constitutes "park resources and values" which are subject to the "no-impairment standard." These resources and values include:

- "the park's scenery, natural and historic objects, and wildlife, including, to the extent present in the park: the ecological, biological and physical processes that created the park and continue to act upon it; scenic features; natural visibility, both in daytime and at night; natural landscapes; natural soundscapes and smells; water and air resources; soils; geological resources; paleontological resources; archeological resources; cultural landscapes; ethnographic resources; historic and prehistoric sites, structures, and objects; museum collections; and native plants and animals;

- the park's role in contributing to the national dignity, the high public value and integrity, and the superlative environmental quality of the national park system, and the benefit and inspiration provided to the American people by the national park system; and

- any additional specific values and purposes for which a particular park was established."

As with many of the management actions considered by National Park Service decision-makers today, the careful balance of sometimes competing park resources and values is an important component of the review and decision-making process. National Park Service Management Policies (2001) provide guidance in this regard by reaffirming that the "fundamental purpose" of the national park system begins with a mandate to conserve park resources and values. Although providing for the enjoyment of park resources and values by the people of the United States is also a National Park Service mandate, Congress has provided that when there is a conflict between conserving resources and values and providing for enjoyment of them, conservation is to be predominant.

Public Law 92-589 established the Golden Gate National Recreation Area in order to ". . . preserve for public use and enjoyment . . . outstanding natural, historic, scenic, and recreation values, and in order to provide for the maintenance of needed recreational open space necessary to urban environment and planning." In particular, Alcatraz Island was originally included within the Golden Gate National Recreation Area because of its historic significance. Recognition of Alcatraz's important historic value was reinforced in 1986 when the Island was designated a National Historic Landmark on the National Register of Historic Places. During the initial planning efforts for the Golden Gate National Recreation Area (1974-1980), the management policies for Alcatraz reflected the importance of the Island's historic resources by primarily focusing on cultural resource preservation and provision of visitor access. Although some wildlife values were recognized at that time, these areas were limited to the rocky cliffs and shoreline. Over the years, however, the environmental conditions of the Island changed, the 1993 DCP EA/FONSI recognized the change in wildlife values and provided for a higher level of protection. The management policies for operation and maintenance of Alcatraz also changed. Based on the guidance provided by NPS Management Policies (2001), the park resources and values on Alcatraz that are subject to the no-impairment standard include the cultural, natural, and visitor use values on the Island.

As previously described, the 1993 DCP provides the long-term land use vision and approach to management of the Island's resources. The Historic Preservation and Safety Construction Program was developed to be consistent with the DCP and fulfill relevant DCP objectives, which include:

> *"Cultural Resource Preservation* – To preserve the cultural landscape and the National Historic Landmark District, while adapting it for new uses.
>
> *Habitat Preservation and Enhancement* – To preserve and enhance the existing natural resources."
>
> –Alcatraz Development Concept Plan (1993)

Given the small size of the Island, presence of important cultural and natural resources, and the growing demand for visitation, the National Park Service is seeking a balanced approach to the preservation of multiple resource values and, as mandated by the Service's Organic Act, to leave these resources and values unimpaired for future generations. This approach is consistent with the National Park Service mission and DCP objectives presented above. Hence, the objectives of the Alcatraz Historic Preservation and Safety Construction Program are to:

- Protect the safety and health of visitors and employees on the Island;
- Stabilize and preserve the Island's National Historic Landmark structures;
- Protect and preserve the Island's important biological resources during the implementation of needed repairs; and
- Identify repair strategies that are economically feasible to implement.
- Assure actions proposed by this plan and ultimately approved will not impair park resources and values.

1.3 Decision to Prepare an EIS

When the National Park Service assumed the responsibility for the management of Alcatraz in 1972, the Island and its buildings were in need of substantial repair and stabilization. Although the National Park Service has attempted to maintain and stabilize these important historic resources, a significant lack of available funding has substantially constrained these efforts.

The 1993 DCP establishes the framework for future actions on Alcatraz that are consistent with the National Park Service mission, federal law, and its responsibilities to provide public access, while preserving natural and cultural resources. As such, the DCP recognized the need to implement repair and stabilization projects in order to protect historic resources, and provide for visitor safety. Among the projects identified in the DCP are repair and stabilization of the Dock (wharf), repair and stabilization of Building 64, and the New Industries (Laundry) Building (none of which have yet been implemented). The Environmental Assessment/Finding of No Significant Impact (EA/FONSI) for the DCP evaluated the effect of these actions and identified protective measures such as limiting work activities during the waterbird breeding season to avoid or minimize potential conflicts and adverse effects on the Island's biological resources. Since approval of the DCP and EA/FONSI, several conditions have changed, including the environmental conditions on the Island and the level and extent of repair activities needed to meet basic human health and safety requirements as well as historic preservation needs. A synopsis of these changes is provided below.

Since 1993, a series of structural analyses of the Island's major structures has been prepared. The studies raised serious concern over both the potential loss of integrity of the historic structures comprising the National Historic Landmark, and the safety of the more than 1 million people who visit the Island each year. These studies showed that a greater level of construction and repair than was previously assumed in the DCP would be needed to fulfill the National Park Service's obligations for resource protection, including compliance with the National Historic Preservation Act. The availability of funding to accomplish historic preservation and public safety projects has also changed significantly since the preparation of the DCP. During the entire history of National Park Service ownership of Alcatraz Island, funding for any type of resource project was available in relatively small increments. This resulted in a backlog of maintenance and forced a slow incremental approach to repairs. In the last few years, however, additional funding has become available from several different sources that would allow the National Park Service to begin carrying out long overdue work for public safety and bring the historic resources up to a stabilized and maintainable condition.

The structural condition assessments, along with the availability of funding, prompted the National Park Service to identify a more comprehensive program of historic stabilization and life safety repairs on Alcatraz. All projects

that are considered to have high priority for public safety and historic structure stabilization were identified. These projects collectively became the "Alcatraz Historic Preservation and Safety Construction Program" that is the subject of this EIS. The National Park Service reviewed the construction program within the context of the DCP EA/FONSI and current environmental conditions on the Island, and determined that additional environmental analysis was needed. This decision was based on the fact that the intensity of the construction/repairs currently needed would be greater than previously analyzed in the DCP EA/FONSI. The DCP EA/FONSI allows construction during the non-breeding season for nesting waterbirds, and conditionally during the breeding season (as described in detail in Chapter 2). Because the breeding season is seven months long and the non-breeding season coincides with inclement weather conditions (for construction purposes), the majority of the needed rehabilitation projects cannot be accomplished during the remaining five-month window. Phasing projects over a period of several years (i.e., several non-breeding seasons) significantly increases the costs of the work, and in some cases makes the projects infeasible. Because of limited space on the Island for staging and movement of equipment and materials, only three concurrent projects are feasible, with two concurrent projects more likely. The majority of repairs being phased over time to occur within the five-month non-breeding season would extend the duration of construction activities. Phasing of the projects could require more than 10 years to complete. In addition, the non-breeding season coincides with the inclement weather conditions for construction activities, potentially making some of the needed repairs impossible to implement. Consequently, the longer rehabilitation of historic structures takes the more deterioration will occur, leading to an increase in public health and safety threats and a reduction in the potential to stabilize/preserve historic structures in a successful and cost-effective manner. However, phasing was considered and recommended wherever feasible to avoid environmental impact, as described throughout this EIS. In addition to the increase in the extent of repairs needed on the Island since 1993, there has also been an increase in the abundance and diversity of waterbird species breeding on Alcatraz, as well as expansion of areas used for nesting and the duration of the breeding season. As a result, the National Park Service determined that full consideration of the proposed repair/construction program is warranted. This decision was reviewed and discussed with the public and interested environmental groups, and the National Park Service determined that an Environmental Impact Statement (EIS) would be the appropriate document to prepare.

1.3.1 SCOPE OF EIS

Consistent with Section 1500.4 of the Council on Environmental Quality's (CEQ) regulations implementing NEPA, issues that are not significant are only addressed briefly in this EIS. Section 1500.4 also encourages the use of the scoping process to ". . . not only identify significant environmental issues deserving of study, but also to de-emphasize insignificant issues, narrowing the scope of the environmental impact statement process accordingly."

Through the scoping process, the National Park Service received input from the public, other agencies and environmental organizations. The scoping comments received by the National Park Service are provided in Appendix A of this EIS. In general, the comments were focused on concerns related to biological effects (specifically colonial nesting waterbirds) of the proposed construction activities, including recommended mitigation measures, approaches for the impact analysis, and issues of concern. This information was reviewed and used during the preparation of this EIS.

The Proposed Action is a construction program, and the environmental effects associated with its implementation would be directly related to the construction activities. No changes in the land use, visitation or operational characteristics of the Island would occur as a result of the project. The purpose of the Proposed Action is to protect public health and safety, preserve the National Historic Landmark on Alcatraz consistent with the National Historic Preservation Act, and implement the needed repairs in a manner that minimizes impacts to biological resources. The scope of this EIS is appropriately focused on the construction impacts associated with the project and includes a discussion of the following resources:

- biological
- cultural
- recreation and visitor use
- air quality

No minority or low-income communities would be impacted by the proposed repair/construction activities, as no communities occupy the Island, and the Island is located at least 0.5 mile from the nearest shoreline. As a result, this EIS does not contain further discussion or analysis of environmental justice. The impacts in this EIS are discussed ". . . in proportion to their significance. There shall be only brief discussion of other than significant issues." [Section 1502.2 (b)]. Direct, indirect, and cumulative effects are analyzed. Section 2.6 presents the mitigation measures that have been incorporated into the Proposed Action by the National Park Service to minimize or avoid the adverse effects associated with the proposed construction/repair activities.

Changes have been made to the scope of the proposed repair/construction activities included within the Proposed Action since release of the Notice of Intent (NOI) in December 1998. The NOI identified a total of 12 potential projects for the Proposed Action. Two of these projects have been removed from the Proposed Action, and one project has been added. A brief explanation of these changes is provided below.

- **Guard Tower** – This project was originally identified as part of the Proposed Action in the NOI for this EIS. The National Park Service is proposing to sand and/or water blast the structure (which was recently rehabilitated), paint it and restore the access stairs. To implement these repairs, the tower would be removed from the Island, sand and/or water blasted and painted at a remote location, reinstalled on the Island, followed by stair repair. The removal and replacement of the tower would require approximately a day each to complete, and all work would be scheduled outside of the waterbird breeding season and would comply fully with the mitigation requirements set forth in the 1993 DCP EA/FONSI. It was therefore determined that additional review and consideration of this action was not necessary and it was removed from further discussion in this EIS. (See Section 4.1.2 – Cumulative Context – for additional discussion.)

- **Garden Greenhouse** – The NOI identified the proposed reconstruction of a historic greenhouse as part of the Proposed Action evaluated in this EIS. Upon further consideration, this project has been removed from the Proposed Action because it does not directly relate to the purpose and intent of the project to protect public health and safety and stabilize/preserve historic structures. Although reconstruction of the greenhouse would restore a historic feature, it was not considered a high priority action that is consistent with the purpose and need for the project. The National Park Service also determined that if considered in the future, this project would be implemented during non-breeding season for colonial nesting waterbirds consistent with mitigation requirements set forth in the 1993 DCP EA/FONSI, and would be reviewed for consistency with the National Historic Preservation Act.

- **Balconies Repair (Building 64)** – The NOI identified seismic repair of Building 64 as a component (project) of the proposed construction program to be evaluated in this EIS. Upon additional structural analysis of this building, and recent failure of a section of the exterior concrete, the repair of the exterior balconies of Building 64 is now identified as a separate project proposed for immediate implementation. This EIS identifies and evaluates the environmental effects of these two separate projects for Building 64 (Balconies Repair and Seismic Upgrade). The Balconies Repair project is included within Phase One of the Proposed Action, and the Seismic Upgrade is identified for implementation during the Subsequent Phases (see Chapter 2 for additional detail).

2.0 PROJECT DESCRIPTION

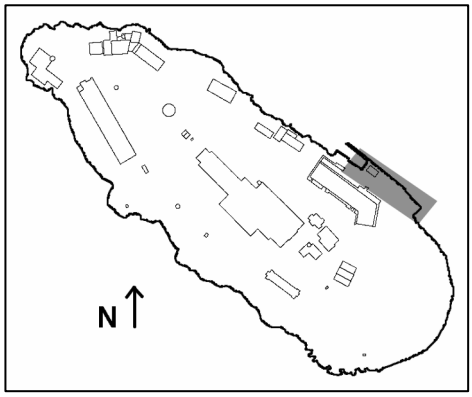
This chapter describes the Proposed Action and alternatives to the Proposed Action, including the "No Action" alternative and alternatives considered but rejected. A summary comparison of the environmental consequences of each alternative is provided (Section 2.5), and the chapter concludes with a description of the mitigation measures that have been incorporated into the Proposed Action by the National Park Service to reduce or avoid adverse environmental effects.

2.1 No Action Alternative

Under the No Action Alternative, none of the proposed construction activities identified in the Alcatraz Historic Preservation and Safety Construction Program would be implemented. Limited maintenance activities would continue similar to current practices (i.e., painting, minor roadway repairs, re-roofing, weatherization, and fence repairs, etc.). Threats to public health and safety would occur leading to the closure of affected areas on the Island, and eventually precluding public access to the Island—once the Dock is no longer safe for public use. Continued deterioration of these structures and facilities would also result in the irreparable loss of important historic resources, including structures that are contributing features to Alcatraz Island's listing on the National Register of Historic Places.

The following is an overview of the current condition of the structures and facilities addressed by the Proposed Action, and the future conditions that would occur under the No Action Alternative. In general, the ongoing deterioration of these structures/facilities would significantly adversely affect the Island's historic and cultural resources, and over time lead to the closure of the Island to the public because of health and safety threats.

2.1.1 DOCK



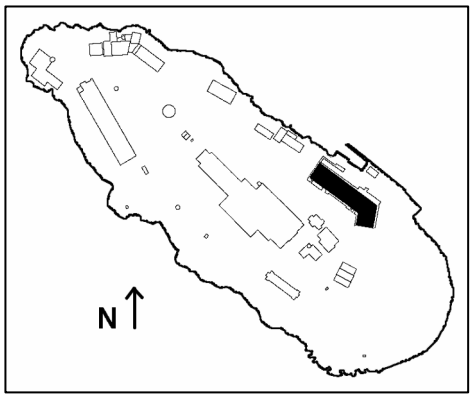
The Dock is located on the southeastern side of the Island (Figure 2-1) and provides the primary access to the Island for the public and Island staff. The original dock was completed in 1854 when the Island was a military fort. Through time, the timber dock has been modified and enlarged, and in 1907 it was strengthened using steel. Remnants of the 1906 steel "spider" piles are still visible beneath the dock. In 1934, the Bureau of Prisons replaced the timber dock with concrete and it remains essentially unchanged today. The piles beneath the dock were constructed 10 feet on center using rebar cast with a 16-inch steel pipe that was filled with concrete. After more than 60 years of use and exposure to the elements (turbulence, sand, wind, seawater and wave action), substantial deterioration of the underlying piles has occurred. In 1978, the U.S. Army Corps of Engineers inspected the dock and piles below. In 1989 following the Loma Prieta earthquake, another survey was completed which showed additional deterioration and evidence of cracking presumably caused by the recent earthquake. In 1997-1998, a seismic and structural analysis was conducted that reconfirmed and elevated the pressing need to implement individual pile repairs, as well as an overall seismic stabilization of the dock structure.

Placeholder for

Figure 2-1 Location of Project Sites, General Staging Areas & Potential Barge (off-load) Sites

Under the No Action Alternative, no major structural or seismic repairs would occur and the historic dock structure would continue to deteriorate. Although minor repairs may be implemented, the long-term effect would be a reduction in safe load capacity of the structure, eventually leading to its closure. As the primary access point on the Island, the dock's anticipated closure under the No Action Alternative would effectively result in the complete closure of Alcatraz to the public and the loss of an important historic resource.

2.1.2 BUILDING 64



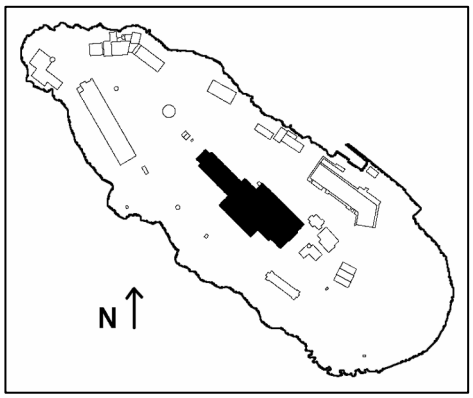
Building 64, also known as the Barracks (or Apartments), is located on the southeastern side of the Island adjacent to the dock (refer to Figure 2-1). The lower floor of the building currently houses National Park Service and Golden Gate National Parks Association (GGNPA—the National Park Service's non-profit partner) offices, a theater, a bookstore, and a series of interpretive exhibits on the Island's history. The upper three floors are currently unoccupied. The structure is a long narrow four-story unreinforced masonry building with a total floor area of about 90,000 square feet. The lower portion/fort was designed and constructed between 1865 and 1867 to house large guns in casemates and resist bombardment. The majority of the upper three stories were constructed in 1905. Significant concrete spalling and rusting of the steel reinforcement on the external balconies (which extend along the eastern and southern sides of the building) has been documented. Recently, a portion of concrete fell without warning into an area where the public is normally present. Although the event occurred after visiting hours, similar future events pose a serious public health and safety concern as well as further degradation of a historic resource. In addition to the deterioration of the external balconies, a 1999 study conducted by Wiss, Janney, Elstner Associates (1999a) assessed and documented the structural integrity of the entire building. The study found that although the exterior and interior walls of the bottom floor appear to be in good condition, the joints between the exterior and interior walls (and roof) and the interior walls themselves are in need of repair and seismic stabilization. Wood stair framing may also require work, and requires additional study.

Under the No Action Alternative, no major repairs to the exterior balconies or seismic stabilization of Building 64 would occur. It is likely that public access would be prohibited in the external areas beneath the balconies and covered passages would have to be provided to give the public safe access to the visitor center and other facilities located in the first floor of the building. Continued deterioration of the external balconies would further degrade the historic resource (a contributing feature of the National Historic Landmark District), and eventually leave the building in an irreparable condition. Under this alternative, no seismic stabilization of the interior joints and walls would be implemented, making the building unsafe for public use and resulting in closure of offices and public spaces located on the first floor.

2.1.3 CELLHOUSE

The Cellhouse is located on the upper level of the Island and is the primary visitor attraction on Alcatraz (see Figure 2-1). Constructed in 1901–1911, it is the largest building on Alcatraz Island. Through the years, various studies of the structural condition of the Cellhouse have been completed (Royston, Hanamoto, Beck & Abey and GFDS Engineers, 1979). Most recently, intermittent monitoring of its structural condition was conducted during February and May of 1997, and additional surveys were completed in October through December 1998 (Wiss, Janney, Elstner Associates, Inc., 1999b). A summary of the building's current condition and use is provided below.

The building is comprised of three wings: Administration, the Main Cell Block, and the Hospital. The first floor of the Administration wing houses the Golden Gate National Parks Association (GGNPA) bookstore and wing offices, and is the starting point for the audio-tours of the Cellhouse. The second floor of the Administration wing is not occupied and is not open to the public, with the exception of occasional ranger-led tours. The interior structural system of this wing is generally considered to be in acceptable condition, with the exception of a few reinforced concrete members that are experiencing corrosion and corrosion-related concrete cracking. The exterior windows and walls along the entire building exhibit varying degrees of damage.



The Main Cell Block contains six distinct cell block structures and is underlain by a basement that contains the Civil War–era Citadel and the water cisterns. The prison showers are located below the northernmost portion of the Main Cell Block. With the exception of the basement/Citadel area, the Main Cell Block is open to the public. The Main Cell Block structure has several major seismic deficiencies. The Cell Block was essentially constructed atop the existing floor, with no ties to the building's foundation or the rock below. Deterioration-related damage near the skylights, concrete spalling and corrosion around exterior windows, and deterioration near internal utility corridors (associated with past use of salt water in piping system) was identified.

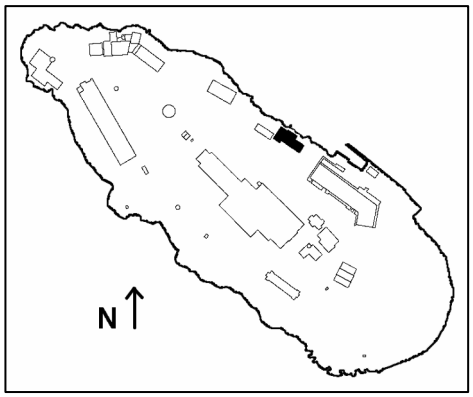
The Hospital wing is a three-story structure (including the basement). The basement is generally used for storage and on occasion is open to the public for audio-visual presentations. The main floor of the Hospital wing was historically used as the kitchen and dining area and is open to the public. The upper floor was used as the prison hospital and is generally closed to the public, except for an occasional ranger-led tour.

Under the No Action Alternative, no structural stabilization or seismic strengthening would be completed. The historic structure (a contributing feature of the National Historic Landmark District) would continue to deteriorate. In the short term, the Cellhouse would likely remain open to the public but only as safety permits. Eventually, the building would need to be closed to the public for safety purposes, and the neglect of needed stabilization activities would likely lead to the irreparable loss of the structure.

2.1.4 SALLYPORT

The Sallyport is located on the eastern portion of the Island, and visitors pass through it en route from the dock to the remaining areas of the Island (including the primary attraction, the Cellhouse, refer to Figure 2-1). Although another pedestrian route is available through Building 64 and China Alley, passage through the Sallyport represents the primary thoroughfare for visitors on the Island and is the only access for the electric tram, which provides wheelchair access to the Cellhouse.

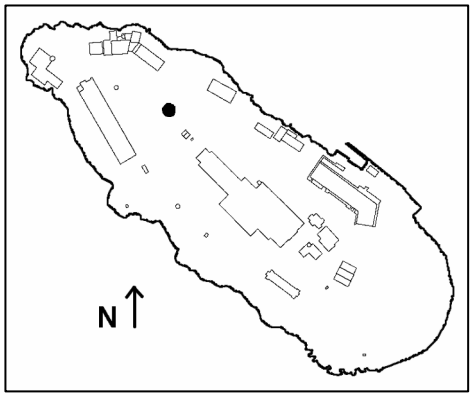
The Sallyport contains four basic sections, each of which was constructed at a different time in history. A description of each, along with its current condition (per a structural investigation conducted in 1997 by John Yadegar & Associates) is provided below. The Guard House/Moat/Defense Wall section was constructed during the Civil War–era using unreinforced concrete masonry (the Guard House is the oldest standing building on the Island). These structures appear to be in good condition and are supported on rock. The Sallyport section was constructed at the turn of the century, and contains two levels plus an attic; its ground floor provides the main thoroughfare for visitors. The upper floors



were constructed using conventional wood framing supported by unreinforced masonry perimeter walls. Numerous cracks and signs of mortar deterioration are visible on the brick walls of the Sallyport section. The third section of the Sallyport is the Military Chapel, a two-story structure constructed over the Guard House/Moat masonry walls in 1933. The exterior walls are of reinforced concrete and the upper floor has wooden joists supported by framed concrete beams. The concrete shell of the chapel shows signs of deterioration and is spalling in a number of locations, especially around the entry on the west wall. The fourth and final section of the Complex is the Boathouse. Constructed between 1915 and 1933, the Boathouse is a two-story wood-framed addition to the Sallyport. It was built over concrete beams and columns (the latter extends to the water line). It was poorly constructed and has deteriorating foundation system, which may be due to the proximity of the supporting columns and beams to the bay water. The deterioration of the Boathouse appears to be contributing to deterioration of the overall Complex.

Under the No Action Alternative, no major structural repairs to the Sallyport would occur. Public access through this primary thoroughfare would continue only as safety permits, and would eventually be closed as the deterioration of the complex progresses making passage no longer safe for the public and preventing access to the majority of the Island. The No Action Alternative would also result in the irreparable loss of this important historic structure (a contributing feature of the National Historic Landmark District).

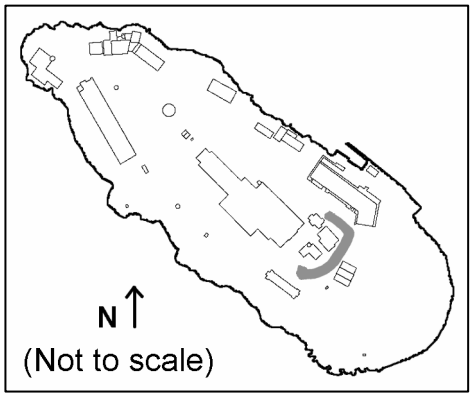
2.1.5 WATER TOWER



The Water Tower is a visually prominent structure located on the northern end of the Island (see Figure 2-1). This historic steel tower was constructed in 1954. The tower is an elevated steel tank located on six crossbraced steel legs anchored to concrete foundations. The tower is a contributing feature of the Island's National Historic District designation, and it contains culturally important Native American graffiti. The Water Tower is in disrepair due to lack of use and maintenance, and exposure to the marine environment. Corrosion and deterioration of the steel fabric is clearly evident, and several steel members are missing or in a state of disrepair.

Under the No Action Alternative, the tower would continue to degrade and without a major repair and stabilization effort, it is likely the National Park Service would need to close the areas surrounding the tower or take other management actions to protect visitors, workers and wildlife from its eventual failure. The No Action Alternative would also result in the irreparable loss of this historic structure (a contributing feature of the Island's National Historic Landmark District designation).

2.1.6 SLOPE STABILIZATION

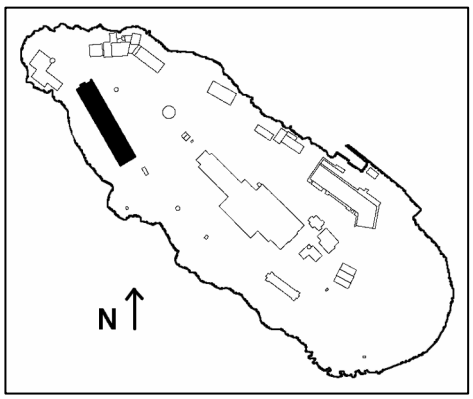


Alcatraz Island consists of three primary levels: the upper level where the Lighthouse, Warden's House, Cellhouse, and Water Tower are located; the middle level, which generally includes the Parade Ground, Quartermaster Building, and New Industries (Laundry) Building; and the lowest level, which includes the Dock and Building 64 (Figure 2-1). The upper level is believed to generally reflect the upper surface of the Island before the arrival of the United States government in 1853. The mid-level primarily represents a quarried surface, and there is a steep slope (nearly vertical in some areas) between the two upper levels. The slope located in the southern portion of the Island continues to slowly erode back and is threatening to undermine the Warden's House as

well as the terrace (and roadway) at the top of the slope. Although the slope itself is not used by visitors because it is approximately 70 feet high with a 70 to 80 degree angle, the walkway and structures above it and the Parade Ground below (during non-breeding season) are used by the visiting public, including special events such as the two annual "sunrise ceremonies" held by the International Indian Treaty Council. Observations by on-site personnel, and a geotechnical study for the National Park Service (Dames & Moore, 1982) have documented the ongoing deterioration of the slope. The 1982 study recommended a series of stabilization options. Under any recommended repair scenarios, a major work effort is necessary to stabilize the slope.

Under the No Action Alternative, no major repairs or stabilization of the slope would be implemented. As the slope continues to erode, the National Park Service would close affected areas to protect human health and safety. Such closures would eventually include the primary pedestrian and tram path at the top of the slope (near the Cellhouse) and would also likely result in the degradation or loss of the Warden's House adjacent to the path. Restrictions for public access on the Parade Ground would also be needed to protect public health and safety.

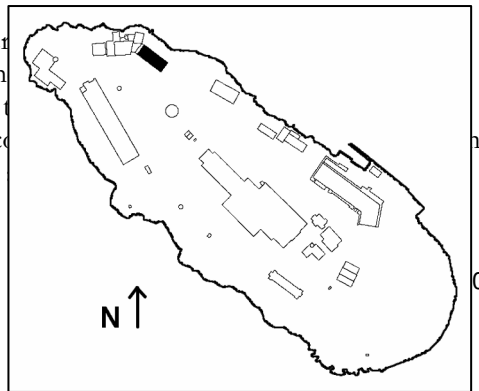
2.1.7 NEW INDUSTRIES (LAUNDRY) BUILDING



The New Industries (Laundry) Building, commonly referred to as the Laundry Building, is located atop the western cliffs of the Island on its northwestern end (Figure 2-1). Although it is located within an area identified in the 1993 DCP EA/FONSI for year round public access, the Laundry Building is currently closed to the visiting public, with some exceptions for ranger-led tours that occur on a limited basis during the non-breeding season. The Laundry Building is a two-story reinforced concrete structure, with large exterior windows along its entire western side. The exterior windows are badly deteriorated and the internal area of the building is directly exposed to the elements. This has resulted in severe rust, concrete spalling, cracks and general deterioration of the structure (Tennebaum-Manheim Engineers, 1998). Two pedestrian bridges extend from the southern end of the building: one from the second floor to the metal detector facility, and the other from the guard's gallery to the adjacent path. The latter is so deteriorated that it is not usable. A tunnel also extends from the first floor of the Laundry Building to the Power House Complex. Deficiencies in the configuration and strength of the building were identified during the 1998 seismic and structural analysis of the building (Tennebaum-Manheim Engineers, 1998). The primary deficiencies include exterior and interior wall deterioration, excessively narrow diaphragm design, inadequate slab-column connections, and unsafe pedestrian bridges. The structure is also located at the base of an old rock quarry. Rock falls and debris slides have knocked into the guard's gallery and spilled into the building.

Under the No Action Alternative, no major repairs or stabilization actions would be taken, resulting in the eventual loss of this important historic structure (a contributing feature of the National Historic Landmark District). Existing ranger-led tours would be prohibited as safety conditions worsen, and the irreparable loss of the building would foreclose future opportunities to allow visitors into this area (as envisioned in the *1993 Alcatraz Development Concept Plan*).

2.1.8 QUARTERMASTER BUILDING



The Quartermaster Building (Building 79) is located on the northeaster
Currently, the building is used only for storage of maintenance equipm
tram is stored directly adjacent to the building. The building is closed
reinforced concrete building constructed with a wood frame and stucc ng
abuts the Power Plant Complex. The building is deteriorating rapidly,

without significant sagging or other warning signs. A structural analysis conducted for the building in 1998 recommended that the building no longer be occupied by Island maintenance staff for safety reasons (Tennebaum-Manheim Engineers, 1998).

Under the No Action Alternative, the building would continue to deteriorate, which would eventually result in the irreparable loss of this important historic structure (a contributing feature of the National Historic Landmark District). Use of the building and its environs for storage would continue only as safety permits. The loss of this structure would also require the identification or construction of a new maintenance equipment storage facility.

2.1.9 FUEL LINE REMEDIATION

Two fuel lines are present on Alcatraz Island, one inactive and one active, which generally run along the eastern side of the Island from the Dock to the Power House Complex (see Figure 2-1). The inactive line is a 6-inch cast iron pipe that branches into several 6-inch lines and one 4-inch line. Because the Island is no longer used as a prison and does not require large quantities of power and steam, the 4-inch and 6-inch inactive lines are no longer necessary. Ongoing deterioration of the inactive lines has resulted in unforeseen fuel leaks, including some that have reached San Francisco Bay. The second, active line is a 1.5-inch copper diesel line used to power two small electrical generators used by the National Park Service for on-site power.

Under the No Action Alternative, the inactive lines would remain in place and the risk of periodic leaks/spills in the San Francisco Bay would continue. This would pose both a human and environmental health and safety threat.

2.2 Proposed Action

The Proposed Action is the Alcatraz Historic Preservation and Safety Construction Program. As described in Chapter 1 (Purpose and Need), the purpose of the project is to stabilize the ongoing loss of important historic resources and complete repairs to provide for public health and safety. The project is comprised of 10 individual repair/construction projects, and is divided into two basic phases: Phase One and Subsequent Phases. No changes in the land use, visitor use or operational characteristics of the Island would occur as a result of the Proposed Action. The program would be completed over a period of approximately 5 years. The precise cost of implementing the projects is not known; however, it is estimated that it could require at least $20 million.

The mitigation measures presented in Section 2.7 have been incorporated as part of the Proposed Action. These measures include required phasing of projects, restricted construction activity during biologically sensitive periods, protection of cultural resources during repair activities, and additional measures developed to achieve the greatest degree of environmental protection while allowing the repairs needed to protect human health and safety and preserve the cultural resources. The National Park Service is proposing to implement the needed repairs using an adaptive management approach. This approach will allow the park to monitor and evaluate the effectiveness of mitigation measures during Phase One, and apply this information to both ongoing and subsequent projects. The monitoring data collected during implementation of Phase One would be used to alter and improve (as needed) the approach to completing projects and protective measures implemented during the Subsequent Phases. Appendix B provides additional information on the proposed monitoring program and process used to refine future projects/mitigation requirements.

Phase One of the Proposed Action represents the projects that are proposed for immediate implementation. However, *all* projects identified are considered critical for the protection of human health and safety and preservation of historic resources. Phase One projects are furthest along in the design process, and therefore more detail of the proposed repairs is available. The projects listed under "Subsequent Phases" are presented in a general order of priority and probable timing. Actual implementation may vary, and the National Park Service would review each project on a case-by-case basis prior to implementation to verify consistency with the EIS.

Although future design work would be needed for these projects, the description provided in this EIS is based on structural assessments and preliminary/conceptual design and therefore represents the most reasonable assumption for the type, magnitude and total duration that would be required to stabilize or repair these facilities.

For the purposes of this analysis, it was assumed that some projects may be implemented concurrently. Given the constraints associated with working in an island environment (primarily limited space for staging), concurrent construction would be relatively limited. In Phase One, the Dock Repair project would be completed first to facilitate the safe transfer of construction materials and equipment for subsequent projects. Depending on the final scopes of work and the size of the staging area(s), the Cellhouse, Balcony Repair and Sallyport projects could occur either concurrently or sequentially. During subsequent phases, it is assumed that up to three projects may overlap, but the most likely scenario is two. The total budget request for the 10 projects listed under the Proposed Action would be approximately $20 million. The analysis provided in Chapter 4 considers the environmental effects associated with overlapping construction, which is particularly relevant for biological resources and visitor effects. This EIS evaluates the potential environmental effects of the entire program, as well as the cumulative impacts of other projects on and off the Island.

A list of all of the projects included in the Proposed Action is provided below, followed by a more detailed discussion of the actions proposed for each project. The description of the Proposed Action projects does not include the mitigation measures that would be implemented to reduce or avoid adverse environmental impacts associated with the implementation of these repair projects. The mitigation measures are described later in this chapter (see Section 2.7). Total estimated time for construction activities presented below represents active construction, and does not account for phasing that may be required as a mitigation measure. For a detailed description of the structures and facilities associated with each project, refer to Section 2.1, above.

Phase One:

- Dock Repair;
- Building 64 (Balconies Repair);
- Cellhouse Stabilization and Seismic Upgrade; and
- Sallyport Structural Repair and Seismic Upgrade.

Subsequent Phases:

- Water Tower Stabilization;
- Slope Stabilization;
- New Industries (Laundry) Building Stabilization and Seismic Upgrade;
- Building 64 (Seismic Upgrade);
- Quartermaster Building Stabilization and Seismic Upgrade; and
- Fuel Line Remediation.

2.2.1 PHASE ONE – PROPOSED ACTION

Four projects are included within Phase One of the Proposed Action. Although projects identified as part of the Proposed Action are considered critical for the protection of public safety and/or historic resource stabilization, the first four projects are recommended for immediate implementation.

DOCK REPAIR

Visitors and staff access the Island (with the exception of emergency helicopter landings) via the Dock. As described above for the No Action Alternative, the original dock structure was built in 1854 and has been rebuilt and expanded through the years, with the most substantial expansion occurring in 1934. Based on several

structural evaluations (also described above), severe damage and deterioration of pilings beneath the dock has occurred, and these critical structures are in need of immediate repair. In addition, seismic strengthening of the entire structure is necessary. These repairs are needed to provide for public health and safety and to preserve the historic resource.

Recent engineering reports indicate the dock is deteriorating and the GGNRA is concerned about possible failure of the structure. A seismic event or structural failure could result in collapse of the dock resulting in significant loss of life and property. A recent investigation conducted by W. B. Clausen Structural Engineers, inc. revealed that the current average load carrying capacity of the dock is 20% of the original design strength. There are areas on the dock where current loads exceed the safe load carrying capacity. The Accessibility Tram, that brings physically challenged visitors from the dock to the cellhouse level, exceeds structural loads. Due to the severe deterioration of the piles, the GGNRA was forced to restrict the tram to safe areas. These compounding problems of the dock cause serious concern for the safety of visitors and staff.

Based on engineering reports and recent investigation of the dock, GGNRA has determined that the condition of the dock poses a serious threat to public health and safety and will begin emergency repairs to the dock structure in fall 2001. This work will be completed using the mitigation measures outlined in section 2.7 with a monitoring program in-place. The work will begin with replacement of deteriorated piles in front of Building 64 and is associated with the first phase of the dock project as described below. After the bird nesting season (August 15, if nesting is completed), the work to replace piles will continue around Building 64 and is proposed for completion in December 2001.

Proposed Repairs

Under the Proposed Action, repair of the dock structure would be implemented in two phases. The first phase of repairs would address the most critically deteriorated piles ("priority 1" piles) and seismically retrofit the dock. The majority of the priority 1 piles are located in the southern and western one-third of the dock. Some of the critical piles are so badly deteriorated that only rebar remains. The seismic retrofit work would consist of tying back the dock structure to the Island bedrock in several critical places. Following completion of these repairs, the second phase would be implemented, which would include the repair/replacement of remaining piles.

Replacement of the deteriorated piles would be accomplished from the top side of the dock. Demolition and replacement would be done one pile at a time. Most of the piles are located 10 feet on center. An opening would be cut using a hydro-saw or other similar equipment, and the existing pile below would be removed and replaced with a pre-cast concrete pile. A support frame would be constructed on top of the deck prior to pile removal and replacement. The support frame would rely on the surrounding four piles for support during construction. A false bottom would be constructed beneath the deck to act as a debris catch. The existing piles extend approximately 3 feet below the bay floor. The replacement piles would be drilled 1 to 3 feet deeper, and would be constructed using forced grout to ensure that no mixing of seawater and concrete occurs. No pile driving would be required.

The proposed seismic upgrade would require the installation of a series of steel tie-backs. Steel rods (approximately 1.25 to 1.75 inches in diameter) would be drilled about 100 feet into the Island bedrock. The precise number of ties needed would be determined through further design and testing. The bedrock end would be grouted/capped and a steel beam structure would be connected to the opposite end, extending support and connection along the underside of the dock surface.

Staging

The staging areas for this project could include areas #2, #3 and #3a (see Figure 2-1). Equipment would be off-loaded from the barge to the concrete dock. Table 2-1 presents an overview of the major construction equipment needed for completion of this project.

Placeholder for

Table 2-1
Comparison of Construction Activities for the Proposed Action and Reduced Project Alternative

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Table 2-1
Alcatraz Island Historic Preservation and Safety Construction Program

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Duration/Timing

- Estimated Construction Time would take place up to fifteen months (total—including both phases)
- Work could occur during waterbird breeding season in compliance with mitigation measures presented in Section 2. 7

BUILDING 64 (BALCONIES REPAIR)

Building 64 is located at the Dock in an area heavily used by visitors and staff. As described under the No Action Alternative, significant concrete spalling and rusting of the steel reinforcement on the external balconies has occurred, including a recent incident when a portion of concrete fell without warning in a prominent public area (the incident occurred after visiting hours). The proposed repair and stabilization of the balconies is recommended for immediate implementation as part of Phase One of the Proposed Action. Areas of the building that are currently open to the public will remain open during construction. Additional repairs and overall seismic retrofit of the building are being proposed as part of a separate project under the "Subsequent Phases" of the Proposed Action as described below.

Proposed Repairs

Repair of the external balconies along the southern and eastern walls of the second and third stories of Building 64 is proposed. Spalling concrete, deteriorating steel members, and other structural repairs to the external balconies would be completed. The balconies would also be sand and/or water blasted and painted following repair. The balconies repair work would be done outside, and would require scaffolding along the southern and eastern sides of the building. The scaffolding would be built from the ground up and secured to the building. Falling object protection would be provided in areas where the public cannot be excluded: the store and ranger station and the entry to the casemates below Building 64. The contractor would perform work from the scaffolding or the balconies. The balconies repair would be accomplished mostly by hand work using small tools, air compressors, batch mixers for the patching concrete, and lifting equipment to get patching and repair materials up to the balcony levels. There could be some shotcrete applications and new topping slabs that would require a batch plant and pump truck to distribute the concrete.

Staging

Staging areas that could be used for this project include #2, #3 and #3a. Delivery of all materials and construction workers would be done from the adjacent dock. Refer to Table 2-1 for a list of the major equipment needs associated with this project.

Duration/Timing

- Estimated Construction Time for Balconies Repair = up to six months to complete.
- Work could occur during waterbird breeding season in compliance with the mitigation measures presented in Section 2.7.

CELLHOUSE STABILIZATION AND SEISMIC UPGRADE

The Cellhouse is the primary attraction for visitors on Alcatraz Island. As previously described under the No Action Alternative, a series of structural analyses has been conducted to evaluate its seismic safety. The most recent surveys conducted in 1999 (Wiss, Janney, Elstner Associates, Inc.) identified the most critical and immediate stabilization actions necessary to provide for public health and safety. These critical and immediate

repairs are being proposed for implementation, as summarized below. Public access to the building would be maintained during construction, with partial closure of areas when required for public health and safety reasons.

Proposed Repairs

Under the Proposed Action, interior and exterior construction activities would be implemented. The primary exterior work would involve the repair of corrosion-related cracking and concrete spalling. The repair would include removal of existing paint and spalled/exposed concrete, cleaning and treatment of corroded steel, patching (concrete) and repainting. Several of the exterior windows are badly damaged and would be repaired or replaced as necessary.

The majority of the interior work would consist of structural and seismic repair in the vicinity of the Cell Block and areas above and below, including the citadel and shower room. As with all seismic repairs included in the Proposed Action, the Cellhouse repairs are designed to meet the minimum life safety performance goal. Additional repairs would be necessary to bring the building to a higher seismic standard (i.e., one that would ensure that the building is repairable following a major seismic event). This type of higher repair is not being proposed at this time and this EIS evaluates the improvements associated with the minimum "life safety" repairs.

Proposed repairs include the installation of new reinforced concrete shearwalls (with new foundations) and collectors to transfer lateral load from the Cell Block. Some repair and replacement of utility corridor beams within the Cell Block would also be implemented and new steel trusses would be installed within these corridors to further support and stabilize the Cell Block during a seismic event. The columns located between the top of the Cell Block and the roof would be strengthened (by wrapping/confining the columns in place) to further support the roof.

In the citadel, existing concrete columns would be repaired; seriously damaged columns would be replaced. A number of structural elements in the shower room show evidence of corrosion-related distress and would be repaired or replaced.

On the exterior of the building, masonry repairs, replacement and repair of windows, and some skylight work would be done. Exterior repair work would require erection of scaffolding, and appropriate enclosure to ensure containment of potential lead paint debris. Exterior repair would be accomplished mostly by hand work using small tools; pneumatic chipping hammers; air compressors, sand blaster, and paint sprayer; batch mixers for the patching concrete; and lifting equipment to get patching and repair materials up to the crew on the scaffolding.

The most substantial repair and construction activities would take place inside the Cellhouse. A mobile batch plant could be set up to handle the concrete requirements of the new interior structural improvements. Smaller cement mixers can be used for mixing grout and other patching materials, and welding equipment and jackhammers would be needed. Construction would be staged to accommodate some visitor access to the Cellhouse, although it would be necessary to close some areas for health and safety reasons.

Staging

Staging areas could include #2, #3, #5, #14, and #15 (as possible barge/equipment off-load sites), and #1, #6, #7, #8, #10, #11, #12 and #13 for storage of materials and equipment (see Figure 2-1). In addition, the interior spaces of the Cellhouse would be used to store equipment and materials. The use of the various exterior staging areas would be restricted by the mitigation measures presented in Section 2.7.1, and would vary based on time of year. Table 2-1 presents an overview of the major construction equipment needed for completion of this project.

Duration/Timing

- Estimated Construction Time for the Cellhouse Project = approximately eighteen months.
- Work could occur during waterbird breeding season in compliance with mitigation measures presented in Section 2.7.

SALLYPORT STRUCTURAL REPAIR AND SEISMIC UPGRADE

The Sallyport is located along the primary roadway, and the majority of Island visitors pass through this structure en route to the Island's most popular attraction, the Cellhouse. As described above for the No Action Alternative, the Sallyport has a number of structural deficiencies that could, if unchecked, pose a serious threat to human health and safety, as well as the historic resource. Major construction activities on the passageway of the Sallyport would not occur during visiting hours to allow public access through this structure, although other portions of the complex may be temporarily closed to visitors.

Proposed Repairs

The purpose of the repairs described below is to protect public health and safety; and to preserve this historic resource. Under the Proposed Action, the Sallyport complex of buildings would be tied back to the slope on which they were constructed. Shear walls and interior bracing would be installed within the Sallyport structure to ensure its stability. Because of the severe deterioration of the Boathouse, and structural strain it is placing on the Sallyport structure, it may be considered for removal and would be subject to future detailed structural analysis.

The first phase of construction would include the demolition and removal and/or stabilization of the Boathouse. If demolition is determined to be necessary, the Boathouse would be deconstructed and removed via a barge and crane located in barge staging area #4. Once the demolition and/or stabilization of the Boathouse is complete, the structural upgrades and stabilization to the remaining structures in the Sallyport complex would be implemented. These repairs would consist of excavation for new grade beams or foundations and installing reinforcing steel components and structural grade lumber. Due to the amount of concrete required, a small portable batch plant would be mobilized, as well as small cement mixers for grouting.

Staging

The staging areas that could be used for this project include area #4, and potentially areas #2, #5, #14 or #15 (for equipment/material delivery) and areas #3a, #3, #8 and #11 for storage. Table 2-1 provides a list of the major equipment needs associated with this project.

Duration/Timing

- Estimated Construction Time for Sallyport Project = approximately six months.
- Work could occur during waterbird breeding season in compliance with mitigation measures presented in Section 2.7.

2.2.2 SUBSEQUENT PHASES – PROPOSED ACTION

The six projects described below collectively represent the "subsequent phases" of the Proposed Action. These projects are proposed for implementation following completion of Phase One of the Proposed Action as described above. As with all projects included under the Proposed Action, the purpose for the proposed repairs is to protect human health and safety and preserve historic resources. Information obtained during the

monitoring of Phase One projects, such as the effectiveness of mitigation measures in reducing or avoiding environmental effects and logistical considerations associated with construction activities on the Island, would be used by the National Park Service to refine and improve the implementation of the subsequent phases. For additional information on the proposed monitoring program and use of this "adaptive management" approach, please refer to Appendix B. The Subsequent Phase projects are presented in general order of priority/proposed implementation.

WATER TOWER STABILIZATION

Although the Water Tower itself is located in area that is currently closed to visitors, structural failure poses a serious threat to adjacent public areas and to wildlife. As discussed under the No Action Alternative, the tower has substantially deteriorated, and several of the steel members supporting the structure are badly damaged or missing.

Proposed Repairs

Under the Proposed Action, the Water Tower would be repaired and stabilized to protect human health and safety and preserve the historic resource. Missing or deteriorated steel members would be replaced and the structure would be seismically upgraded. Following repair, the tower would be sanded and repainted. In order to implement the proposed repairs, scaffolding would be erected around the perimeter of the tower. A detailed analysis of the seismic integrity of the structure would be completed following installation of the scaffolding. This evaluation would provide information needed to prepare design drawings for the repairs. As with all repair work on the Island, proper containment would be required to ensure that lead paint or other potentially hazardous substances are identified, sampled, contained, collected, and removed from the Island. Appropriate mitigation for the Native American graffiti would be developed and implemented based on consultation with relevant groups and individuals, including participants of the Indian Occupation (see Section 2.7, below, for additional detail).

Although this project is proposed for completion in eight continuous months under the proposed alternative, GGNRA will continue to look into possible ways to complete the work over two seasons or reduce the duration of work during bird-nesting season. However, phasing the project over two non-breeding seasons was not proposed for numerous reasons. Due the highly corrosive conditions associated with the marine environment, painting would be required immediately follow sanding and would need to be done in dry weather, restricting work during non-breeding season. In addition, the size of the Island restricts the number of contractors that can be mobilized at any one time and extensive coordination is required to organize the division and distribution of materials and equipment to appropriate staging areas. Extensive planning is required due to the number of staging areas (15) and the restrictions placed on staging and movement of equipment to protect the Island's waterbirds. Staging on the Island is severely limited to avoid sensitive nesting areas and to minimize disturbance of birds resulting from moving the equipment. Staging required to rehabilitate the Water Tower would disrupt other projects with equipment is left in place between non-breeding seasons or add additional expenses if it is shipped back and forth to the Island. It is estimated that the cost of phasing this project would increase costs by approximately 20-25%. The costs for mobilization/demobilization of construction equipment is estimated by the project manager to comprise approximately 17% of the total cost to rehabilitate the Water Tower if the project were phased over two non-breeding seasons. However, there would be additional costs associated with extending the project into the next non-breeding season that would increase the project time to nine months as opposed to eight months under a non-phased schedule. Extending the length of the project would require additional funds for further monitoring, rental equipment, and general construction costs such as worker salaries for at least an extra month of work.

Staging

Staging for this project could include areas #7, #8, #9 or #11 (see Figure 2-1). Materials and equipment would likely be delivered from one of the barge/staging areas north of the Sallyport complex (#5, #14 or #15); however, the dock (#2) may also be used. No materials storage or staging of any kind would be allowed in the cistern area adjacent and to the Water Tower during the breeding season, due to biological resource constraints (this is one of the two most important nesting habitats on Alcatraz for the western gull). Refer to Table 2-1 for a list of the major equipment needs associated with this project.

Duration/Timing

- Estimated Construction Time = approximately eight months.
- If complete avoidance of breeding season work is not possible, work could occur with mitigation as noted in Section 2.7.

SLOPE STABILIZATION

Located on the southern end of the Island, the slope starts at the Parade Ground and continues up past the Warden's House and continues to the Cellhouse. The slope is raveling back and is threatening to undermine the structures and pathways near the Cellhouse. As discussed under the No Action Alternative, above, several studies of this condition and subsequent stabilization alternatives have been prepared and are recommended for implementation as part of the Proposed Action.

Proposed Repairs

The proposed repairs would tie the slope back to the Island by drilling steel bolts through the existing slope and anchoring them into bedrock. Rock bolts would be installed in a regular pattern (the precise location, depth and required tension would be determined during design). At a minimum, the bolting would extend across the portion of the cliff closest to the Lighthouse. The retaining wall located in the garden below the Warden's House would also require stabilization. The purpose of these repairs is to protect public health and safety, and preserve the historic structures on top of the slope. A geologic hazard evaluation of this area was conducted to identify possible solutions. Implementation of slope stabilization in this area would be challenging given the topography, geologic conditions, and other site and environmental constraints.

Construction and staging for the slope stabilization effort would primarily occur at the toe of the slope, in the Parade Ground area; however, access from the top of the slope may also be necessary. Following placement of the rock bolts and wall stabilization, hydraulic testing of the tiebacks would be performed. The buildings, concrete berm and handrail directly off the top of the slope would be carefully monitored for cracking and movement. Additional geotechnical investigations and testing would be necessary prior to the final design of the proposed stabilization. Following completion of the tiebacks, the slope face would be stabilized through the application of gunite or shotcrete (a form of cement that can be sprayed onto the vertical slope). Although the materials used to cover the slope would be a color similar to that of the existing rock/slope face, there would be a substantial change in the visual appearance of the slope.

Staging

Staging would occur primarily in area #1, directly adjacent to the slope. Staging area #13 could also be used for this project. Materials and equipment would be delivered to the Island via barge from staging area #2 and transported with a crane to the Parade Ground or via area #5 and transported with forklifts or other vehicles to the Parade Ground. Table 2-1 provides a list of the major equipment needs associated with this project.

Duration/Timing

- Estimated Construction Time for Slope Stabilization = approximately eighteen months.
- Construction would be phased over a period of several years to avoid waterbird breeding season—see Section 2.7.

NEW INDUSTRIES (LAUNDRY) BUILDING STABILIZATION AND SEISMIC UPGRADE

The laundry building is located in an area that is currently closed to the public, with the exception of ranger-led tours. As described under the No Action Alternative, the exterior windows are severely deteriorated and the building is directly exposed to the elements. Other structural and stabilization concerns include spalling concrete, roof drainage, repair of a pedestrian bridge (currently unusable), overall seismic stabilization, and slope stability on the upland side of the building.

Proposed Repairs

To stabilize the historic resource and provide for its long-term preservation, as well as protect public health and safety, a series of repairs are proposed. The proposed repairs include the stabilization of the existing structure, replacement or repair of exterior windows, repair of spalling concrete and rusted steel, removal of rock fall material and installation of drainage at the quarry wall behind the building, and seismic upgrade.

Severely rusted reinforcement would be replaced. Other rusted reinforcement would be cleaned and a rust inhibitor applied. Spalled concrete would be replaced, and cracks would be grouted and surfaces sealed. Scaffolding would be erected along the exterior building walls in order to repair spalling concrete and steel, and to repair or replace deteriorated windows. The roof diaphragm would be strengthened. Steel beams, sheer walls and/or concrete infill on selected walls would be used to strengthen the structural integrity of the building. The debris (rock fall) behind the building would be removed, and drainage would be installed along the adjacent quarry wall.

Staging

Equipment and materials delivery for this project would likely originate from staging area #5 or possibly #14 or #15. On-island storage/staging could be accommodated at areas #8, #9 and #11 as well as the interior spaces of the laundry building. Table 2-1 provides a list of the major equipment needs associated with this project.

Duration/Timing

- Estimated Construction Time = approximately six months.
- Repair or replacement of all exterior windows and doors, or placement of barriers designed to minimize noise and visual contact with breeding birds would be completed prior to the breeding season as noted in Section 2.7.
- Work activities during the waterbird breeding season would be restricted to interior work with mitigation as noted in Section 2.7.

BUILDING 64 (SEISMIC UPGRADE)

Building 64 is located at the dock and is heavily used by visitors. Among the amenities provided by Building 64 are an Island visitor center, interpretive exhibits, a theater, bookstore, and staff offices. As described under the

No Action Alternative, a structural analysis of building 64 conducted in 1999a (Wiss, Janney, Elstner Associates, Inc.) identified several seismic deficiencies. Implementation of these repairs is included as part of the Proposed Action. The building would remain open to staff and the public with the potential for partial closure of some facilities during construction for public safety and health reasons.

Proposed Repairs

The purpose of the proposed repairs is to protect human health and safety and preserve the cultural resource. The proposed seismic upgrade of building 64 would include the construction of steel vertical beams built along the western wall from the first floor to the roof. The beams would provide connection on shear transfer beams that would be supported by the underlying brick arch piers (in the casemate below). Steel collector members at each floor level and the roof would extend along the entire width of the building. Midway between the second- and third-floor levels, three struts would be constructed to bolt the building through the adjacent retaining wall and into the bedrock in the hillside beyond. This connection would use concrete footings and damping elements to provide horizontal restraint and energy absorption to lessen the seismic motion of the building during an earthquake. The existing interior hollow clay tile walls would be retained and used as shear walls by filling the hollow cells and reinforcing the wall. New shear walls would be installed along existing stairwell. Grade beams would be added below the first floor level and a diaphragm would be added in the attic.

The majority of the proposed repairs would be done inside of building 64, requiring mobilization of an interior field office for the contractor's use, as well as inside and outside storage facilities as discussed below under "Staging Areas." Outside repair work would require the erection of scaffolding, and workers should be able to perform drilling and tie installation from the scaffold. Due to the amount of new grout and concrete that would be required, a cement mixer and small mobile batch plant would be needed on the site. The location of the ties and concrete foundations at the western side of the building would require that grout and concrete be pumped to this location or delivered by crane with a bucket. A high-pressure concrete pump truck could be mobilized, brought in by barge and tug, and set up on-grade at the east side of the building. A large amount of lumber would need to be delivered and stored on site to facilitate construction of the new walls and shear components, as well as form material for concrete work. The new steel frames would be welded on site, as needed.

Staging Areas

For this project, it is anticipated that the materials and equipment would be delivered and off-loaded at staging area #2. On-island storage and staging could be accommodated in area #3, #3a, and #13 and the interior spaces within Building 64. Staging area #1 could also be used during the non-breeding season on a limited basis if less visibility is desired. A list of the major equipment needed to complete this work is presented in Table 2-1.

Duration/Timing

- Estimated Construction Time for Seismic Upgrade = approximately eight months to complete (five months of interior work and three months of exterior work).

- If it is not possible to completely avoid working during the breeding season, work could occur with mitigation as noted in Section 2.7.

QUARTERMASTER BUILDING STABILIZATION AND SEISMIC UPGRADE

The Quartermaster Building is currently closed to the public. As previously described under the No Action Alternative, the structural analysis completed for the building recommended that the building no longer be occupied by Island maintenance staff (Tennebaum-Manheim Engineers, 1998). Currently, the building is used only for storage of maintenance equipment and other materials, and the electric tram is stored adjacent to the

building. Based on the 1998 structural analysis, a series of stabilization and seismic upgrades have been identified and are being recommended for implementation as part of the Proposed Action, as described below.

Proposed Repairs

The proposed repairs are needed to stabilize the historic building, as well as provide minimal seismic upgrade of the structure. Replacement or repairs of existing windows, doors and other openings would be completed to minimize intrusion by water and pests. The exterior concrete wall would be repaired as needed. Seismic improvements would include installation of a steel truss to enhance the strength of the roof diaphragm and reduce displacements at the top of the walls during a seismic event. Steel plates or new reinforced concrete shear walls inside existing walls would be used to provide further stabilization. A new foundation under new east wall elements would also be necessary. The drainage at this site will be evaluated and improvements may be required to protect the foundation work.

Both exterior and interior is work needed to complete this project. Outside work would require the erection of scaffolding. Interior work would be focused primarily on the seismic upgrades described above. Lumber would be needed for construction of shear wall components, and as form material for concrete work. The new steel frames would likely be welded on site as needed. Due to the amount of new grout and concrete that would be required, a cement mixer and small mobile batch plant would probably be necessary. Foundation and drainage improvements may require the use of rock excavation equipment.

Staging

Equipment and materials would likely be delivered to the Island from barge staging areas #5 or #2, or possibly #14 or #15 (during non-breeding season only). On-island staging could be accommodated at area #8, #11 and #9 (#9 could be used only during the non-breeding season). In addition, the interior spaces of the building would be used for additional storage. Refer to Table 2-1 for a list of the major equipment needs associated with this project.

Duration/Timing

- Estimated Construction Time = approximately eight months.
- Interior and limited exterior construction could occur in waterbird breeding season with mitigation as noted in Section 2.7.

FUEL LINE REMEDIATION

As described under the No Action Alternative, two fuel lines are present on Alcatraz Island, one line is inactive and one is active. Ongoing deterioration of the existing inactive lines has resulted in fuel leaks, including some that have reached San Francisco Bay. A description of the remedial activities included as part of the Proposed Action is provided below.

Proposed Repairs

The purpose of the fuel line remediation project is to protect public health and safety and the environment by removing or cleaning and permanently closing inactive fuel lines on the Island. Under the Proposed Action, inactive fuel lines would be removed, where environmentally feasible. In areas where removal could adversely affect cultural or natural resources, the lines would be drained, cleaned and left in place. [Note: small-scale fuel-line removal would be necessary as part of other individual projects (i.e., Dock Repair). This Subsequent Phase project focuses on island-wide remediation of the inactive 6- and 4-inch lines.]

Implementation of this project would require proper collection and containment of heavy oil. The liquid fluids can be either gravity drained to low points, or placed under pressure and pumped out. Rotary cleaning attachments can then be run through the lines, like a plumber's "snake", to remove the harder deposits. A final flushing can be achieved by the introduction of solvents or dispersing agents, with collection and proper disposal of the residue and waste. Excavation and removal of segments of the pipelines would be performed in those areas where biological and cultural resources would not be adversely affected. In areas where such treatment is not possible, the lines would be drained and cleaned as described above and permanently sealed. The proposed method of remediation would be delineated during future design.

Staging & Equipment

The following staging areas could be used during completion of this project: staging area #2, #3, #3a, #4, #5, #8, #10 and #12 (Figure 2-1). The equipment needs would mainly be comprised of tank/pump trucks, materials and equipment for handling hazardous waste, and equipment needed to conduct possible excavation (see Table 2-1).

Duration/Timing

- Estimated Construction Time for Fuel Remediation Project = approximately eight months.
- Work could occur during waterbird breeding season in compliance with mitigation measures presented in Section 2.7.

2.3 Reduced Project Alternative

The Reduced Project Alternative proposes repairs needed to protect human health and safety and stabilize cultural resources in areas of the Island that are currently open to visitors year-round. In areas that are closed to visitors, only those repairs that can be accomplished during the five-month non-breeding season for waterbirds would be implemented. As previously described, the five-month non-breeding season also coincides with the least desirable weather conditions for construction purposes. As a result, the type and magnitude of repairs that can be accomplished during this window would be further reduced.

The objective of this alternative is to reduce biological impacts, while providing for basic human health and safety and limited cultural resource stabilization. As a result, adverse historic and cultural resource impacts would be anticipated for several structures under this alternative and future impacts on visitor use and recreation may also occur (see Chapter 4 for a complete discussion).

Under the Reduced Project Alternative, the following projects would be implemented as described under the Proposed Action. Each of these structures and facilities is located in or directly impact areas that are heavily used by visitors on a year-round basis.

- Dock Repair;
- Building 64 (Balconies Repair);
- Cellhouse Stabilization and Seismic Upgrade;
- Sallyport Seismic Upgrade
- Slope Stabilization;
- Building 64 (Seismic Upgrade); and
- Fuel Line Remediation (6-inch and 4-inch inactive lines).

Repair and stabilization of the following structures (located in areas currently closed to the public) would be restricted to that which could be accomplished during the five-month non-breeding season (with one exception for the Water Tower as described in detail below):

- New Industries (Laundry) Building Stabilization;
- Water Tower Stabilization (repairs restricted to those necessary to prevent structural failure and avoid public health and safety threats); and
- Quartermaster Building Stabilization.

Due to the location, current condition, and complexity of stabilizing the Water Tower, it is anticipated that even basic safety repairs would take more than five months. The Water Tower is currently in a non-maintainable condition. The structure would require rehabilitation to reach a maintainable condition. The precise design and level of repair and stabilization required would not be determined until a detailed structural analysis has been completed. Because this type of analysis will require installation of scaffolding—in order to facilitate structural observation—detailed information on the type of repairs and duration of construction would not be available until that time. Once scaffolding is installed, the analysis and subsequent repair/stabilization activities would be worked on continuously to avoid having to scaffold more than once in this complicated and sensitive location. Under the Proposed Action, it is anticipated that repair of the tower to protect human health and safety and preserve the cultural resource would require up to eight months. The repair and replacement of critical steel supports and painting of the structure that would be required to rehabilitate the Water Tower would take longer than the five-month non-breeding season, so these actions would not be undertaken under the Reduced Project Alternative. Without rehabilitation, the Water Tower would eventually fail structurally. Under this alternative, only human health and safety would be addressed, and it is anticipated that repairs would take less than eight months but more than five months. Therefore some overlap with the waterbird breeding season would occur, as described and analyzed in Chapter 4.

Under the Reduced Project Alternative, ranger-led tours of the laundry building would continue only as long as safety permits. Repairs to the laundry building within a five-month waterbird non-breeding season would involve replacement and repair of exterior windows, partial repair of spalling concrete and steel, removal of rock fall material and installation of drainage at the quarry wall, and minor seismic upgrades. Repair of the Quartermaster Building during the five-month construction window would likely be adequate to allow continued use of the building for storage for the short term, but continued deterioration would eventually make the building unusable. Repair of exterior windows and doors, and repair of spalling exterior concrete on the Quartermaster Building could be accomplished within the five-month non-breeding season. Because the time for construction activity is limited under this alternative, partial installation of steel trusses, new steel plates and new concrete foundation at the east wall could be accomplished. However, because of timing constraints, neither structure (Laundry Building and Quartermaster Building) would receive repairs necessary to make the buildings safe for long-term occupancy or visitation. The costs for implementing this alternative would be similar (approximately $17 million) to but less than that discussed under the Proposed Action. This would not include actions that may be necessary due to incremental or sudden failure.

2.4 Alternatives Considered but Removed from Further Evaluation in the EIS

2.4.1 CLOSE ISLAND TO VISITORS DURING CONSTRUCTION

This alternative was identified during the scoping process as a potential alternative to minimize biological effects of the project. The recommendation was made based on the assumption that closing the Island to visitors would

allow expedited construction and therefore would reduce the overall duration of repair and construction activities. The National Park Service considered this alternative; however, it was not carried forward for further evaluation in this EIS because it would not appreciably advance the construction schedule. As explained below, the alternative would also have major economic impacts on the ferry concession, the GGNPA, the park, and local businesses.

Repair and construction activities require space—beyond the immediate work area—for the storage of equipment and materials (i.e., staging areas). Alcatraz is a small, 22-acre island with very limited open space that is level and considered usable for staging. Two of the largest potential staging areas (the Parade Ground and Model Industries Plaza) have been prohibited for use during the waterbird breeding season by the mitigation measures identified for the Proposed Action. The breeding season is defined as February 15 through August 15 or until young have fledged, which extends to mid-September in some areas in some years. Several other smaller staging areas are also restricted or prohibited for use during the breeding season. These constraints substantially reduce the available storage areas on the Island for year-round use. As a result, concurrent construction activities would be self-limiting based on available staging areas and the mitigation required by the National Park Service to protect breeding birds. Removing visitors from the Island would provide for less constrained construction to some extent. Although this would also potentially reduce the demand on the Island's limited roadway system (thereby allowing more freedom for the movement of equipment and materials), this action would provide minimal gain in terms of schedule. This is because there are several hours of daylight before and after visiting hours (varies by time of year) during which construction crews would be allowed to move large equipment and materials. This window provides adequate time to move equipment and materials. During visitor hours, the movement of smaller equipment and materials is possible; this has been done by the National Park Service in the past, for example during the recent construction of new restroom facilities near the Cellhouse. Construction of the restrooms occurred during summer 1999, concurrent with visitor use of the Island.

2.4.2 1993 ALCATRAZ DEVELOPMENT CONCEPT PLAN (DCP) MITIGATION ALTERNATIVE

At the time the Notice of Intent (NOI) to prepare this EIS was distributed, the National Park Service identified the "DCP Mitigation Alternative" as one of the alternatives to be considered in the Draft EIS. The ten construction projects described under the Proposed Action Alternative were proposed as part of the DCP Mitigation Alternative. However, under this alternative construction activities would be allowed to occur during the breeding season only in limited areas. This alternative would have required that the majority of the construction activity take place during the five-month non-breeding season. After additional scrutiny of the needed repairs and further development of the alternative, it became apparent the alternative could not meet the basic objectives of the Proposed Action for the reasons explained below. As a result, the DCP Mitigation Alternative was removed from further evaluation in the EIS.

As previously explained, since the approval of the 1993 DCP EA/FONSI, the diversity and abundance of breeding waterbirds has substantially increased on the Island. The deterioration of the Island's historic structures has also continued. Recent structural analyses have specifically identified the level of stabilization and repair that would be needed to be consistent with the National Park Service mandate to preserve the National Historic Landmark designation, the DCP's policies regarding cultural resource preservation, and the National Park Service's responsibility to protect human health and safety. (These repairs are described in detail under the Proposed Action.)

In defining the "DCP Mitigation Alternative," the National Park Service evaluated the needed repairs within the context of the EA/FONSI requirement of "no negative impact" on nesting wildlife to determine what repairs could be accomplished while meeting this requirement. This evaluation considered changes in the biological conditions on the Island occurring since 1993, as described above. Information related to the duration of proposed repairs, as well as the location and type of proposed repair activities, was evaluated.

The restrictions on the repair/construction program under the DCP Mitigation Alternative would substantially extend the length of the program, as explained below. The deferred implementation of needed repairs would severely restrict the National Park Service's ability to protect human health and safety, preserve the National Historic Landmark (as required by the National Historic Preservation Act), and identify/implement economically feasible repairs. As a result, human health and safety threats would lead to the partial or complete closure of the Island, irreparable damage to historic structures, and loss of the National Historic Landmark status. In addition, requirements to phase the program to avoid the breeding season entirely would substantially increase the cost and could jeopardize the overall feasibility of the repair program. The following is an overview of the factors considered in reaching the conclusion to remove the DCP Mitigation Alternative from further evaluation in this EIS.

- As discussed in Section 2.4.1, the Island has limited space for staging and movement of equipment and materials. Because of these limitations, it is anticipated that a maximum of three concurrent projects would be possible, with two projects being more likely. Requiring the majority of the needed repair projects to be phased over time (to occur entirely within the five-month breeding season) would substantially extend the duration of construction activities, conceivably requiring more than 10 years to complete. In addition, the five-month non-breeding season coincides with the least desirable weather conditions for construction activities, which could make needed repairs impossible to implement.

- The longer historic structures are left exposed to the elements, the more deterioration will occur, increasing public health and safety threats and reducing the potential to stabilize/preserve historic structures in a successful and cost-effective manner. If the repairs that are currently needed are not implemented in a timely manner, the National Park Service would be forced to conduct subsequent structural evaluations for all affected features/buildings to determine what additional repairs would be needed to save the structures—if repair/stabilization is possible. If the structures are deemed salvageable, a higher level of repair would be needed, costing more money and a longer period of time to implement.

- Because Alcatraz is an island, all materials and equipment are brought via barge, and labor is required to move materials and equipment to and from the barge to staging areas. This activity is referred to as mobilization and demobilization, and it is typically completed once per project. Each barge run can cost up to $20,000, with an additional cost of up to $10,000 in labor to move materials and equipment. The additional mobilizations and demobilizations extend the actual project work time by 20 to 25 percent. Project interruptions increase the risk of loss or damage of material and equipment if they are stored on site. Due to high employment in the construction trades in the Bay Area, it would be very difficult to attract qualified bidders for short-term projects. Contractors bidding on long-term projects with significant down time would likely include large contingency fees and inflation factors in their proposals. Hiring several contractors to sequentially perform work on a large project greatly increases the potential for aesthetic and performance inconsistencies.

Although the above factors limit the feasibility of phasing of the entire program to completely avoid the breeding season, opportunities to phase or use other mitigation measures for individual repair projects to minimize biological effects were carefully examined. As presented in Section 2.7 (mitigation measures), these actions and measures have been incorporated into the Proposed Action and Reduced Project Alternative.

2.5 Comparison of Environmental Consequences and Impairment Findings for All Alternatives

2.5.1 NO ACTION ALTERNATIVE

Under the No Action Alternative, visitor access areas would continue only as safety permits. Minimal maintenance of the Island's cultural resources would occur, and current vegetation and wildlife management practices would continue. The following is a summary of the anticipated environmental effects of the No Action Alternative:

- Biological impacts associated with the proposed repair/construction activities would not occur, although failure of structures during the breeding season could directly impact breeding birds in the vicinity of the failure.

- Deterioration of the Island's cultural resources would continue, with only routine maintenance and repairs to assure structural safety. No preservation, rehabilitation, restoration or other management program would be implemented, and adverse effects on cultural resources would occur. The impacts would include the irreparable deterioration of the National Historic Landmark and loss of the National Historic Landmark status. The effects on cultural resources would be greater than those expected under the Reduced Project Alternative or the Proposed Action.

- In the short term, the recreational values and visitor experience would be the same as currently exists. The construction effects (noise and visual intrusion of construction activities into the visitor experience) would be avoided. In the long term, escalating public health and safety concerns would lead to closure of areas and eventual closure of the entire Island (once the dock is deemed unsafe for public use), and would have a major adverse impact on recreation and visitor use.

- The minor construction-related air emissions associated with the proposed repair/construction activities would be avoided.

The No Action Alternative would continue the current practice of limited maintenance activities. This current practice has resulted in the benign neglect of the significant cultural resources. The cumulative effect of this benign neglect would be the deterioration of buildings and structures so that there would be an overall loss of integrity to the Alcatraz Island National Historic Landmark and eventually loss of the designation. Loss of the structures and associated status would constitute impairment of the cultural resources and cultural resource values on Alcatraz.

Over the long-term, serious public health and safety threats would result in the closure of individual buildings or areas, eventually leading to the closure of the Island to the visiting public (once the dock structure is deemed unsafe for public use). The precise timing of the closure(s) that would occur under the No Action Alternative would depend on the rate of deterioration and the ability of small-scale repair activities/routine maintenance activities to temporarily defer closure activities. Closure of the Island to the visiting public, however, would be inevitable under the No Action Alternative. The permanent closure of Alcatraz would be an impairment of the recreational and public use values of the Island.

2.5.2 PROPOSED ACTION

Through the environmental analysis, the National Park Service identified a broad range of mitigation measures to minimize the adverse effects associated with the Proposed Action. These measures are presented in Section 2.7. Implementation of these measures would substantially reduce the effects of the Proposed Action without

eliminating the necessary repairs. As a result, the National Park Service believes that the Proposed Action provides the best balance of protecting public safety and the National Historic Landmark district and protection of biological resources. Impacts that would occur following mitigation are briefly summarized below (refer to Chapter 4 for additional detail):

- The biological impact of the proposed construction/repair activities would be substantially reduced or avoided through mitigation. However, some impact, including disturbance of nesting waterbirds, would still occur as described in detail in Section 4.2.

- The Proposed Action would have a long-term, beneficial effect on the cultural resources on Alcatraz by providing for the stabilization and preservation of structures that are contributing features to the National Historic Landmark district.

- Temporary recreation and visitor use impacts, including increased noise and visual intrusion of construction, would occur as a result of the proposed repair/construction activities. However, the long-term effects would be beneficial including protection of public health and safety, preservation of important cultural resources that are integral to the recreational and interpretive values of the Island, and retention of public access to key destinations and points of interest on the Island.

- The Proposed Action would have minor short-term effects on air quality.

The Proposed Action includes ten individual repair projects that would require, in total, roughly five years for implementation. Following implementation, serious public health and safety threats (including structural failure due to deterioration and/or seismic activity, spalling concrete and other hazards) would be corrected, and historic structures contributing to the National Historic Landmark district would be stabilized. The Proposed Action would have a substantial long-term beneficial effect on cultural resources by providing for the stabilization of historic structures, protecting the resources.

Following implementation, there would be a major beneficial effect on the recreational and visitor use values on Alcatraz. The beneficial effect would result from the removal of existing critical health and safety hazards, allowing the Island to remain open for the safe use, interpretation and enjoyment for future generations.

Implementation of the proposed repair/construction activities would impact biological resources. As described in Chapter 4, many of these effects would be minimized or avoided through mitigation (also see Section 2.7). Although the impact of the Proposed Action would be reduced through mitigation, there would be a greater residual impact on breeding waterbirds (eight different species nest on the Island).

The impact analysis relied on a variety of sources, including professional judgment and knowledge of the Island's nesting birds (see Section 4.2.1). The impact analysis of the Proposed Action concluded that the impact on breeding waterbirds would vary by project location. The most substantial effects would include increased predation, potential reduction in the reproductive success of a particular species/subcolony, and in the most extreme cases, possible temporary or long-term abandonment of individual subcolonies. No colony abandonment (i.e., an entire population of an individual species on birds nesting on Alcatraz) would occur as a result of the Proposed Action. The National Park Service would employ a variety of protective measures and use adaptive management to ensure the intensity and duration of the impact is reduced wherever feasible. If through ongoing monitoring, it is determined that additional impacts (beyond those disclosed in this EIS) occur, the National Park Service would take corrective actions to reduce the level of impact to the level identified in this EIS.

As described in NPS Management Policies 2001, "An impact would be less likely to constitute an impairment to the extent that it is an unavoidable result, which cannot reasonably be further mitigated, of an action necessary to

preserve or restore the integrity of park resources or values." Substantial efforts to mitigate the impact on nesting birds has been made, and without the Proposed Action, there is greater potential for permanent impairment to those cultural resources contributing to the Island's National Historic Landmark status. Based on factors presented above and throughout the EIS analysis, the impact of the Proposed Action on nesting waterbirds is not considered an impairment of the natural resource values on Alcatraz.

2.5.3 REDUCED PROJECT ALTERNATIVE

The Reduced Project Alternative includes repairs needed to protect human health and safety and stabilize cultural resources in areas of the Island that are currently open to visitors. Structures that occur on the north end of the Island that are currently closed to the public (the Water Tower, New Industries [Laundry] Building, and the Quartermaster Building) would receive repairs that could be accomplished within the five-month non-breeding season. Below is a summary of the impacts following mitigation for the Reduced Project Alternative:

- The biological impact of the Reduced Project Alternative construction/repair activities in areas currently open to the public would be the same as for the Proposed Action. This alternative proposes minimal construction activity in areas currently closed to the public and limited mostly to the non-breeding season. Because construction duration and overlap with the breeding season is less in this alternative, the impacts would be less than described for the Proposed Action. However, eventual failure of structures during the breeding season could directly impact breeding birds in the vicinity of the failure.

- The loss of the Watertower, the New Industries (Laundry) Building, the Quartermaster Building, Indian Occupation Graffiti located on the Watertower, and possibly other Landmark contributing resources on the north end of the Island would lessen the integrity of the Alcatraz Island National Historic Landmark, resulting in a major adverse impact to cultural resources.

- Temporary recreation and visitor use impacts, including increased noise and visual intrusion of construction would occur as a result of the proposed repair/construction activities. Rehabilitation and stabilization of structures currently open to the public will provide in the long term, the same beneficial effects as described in the Proposed Action. However, eventual loss of three important historic structures and corresponding reduction in the interpretive values and historic integrity of the Island would have an adverse impact on visitor use and recreation.

- The slight reduction in the duration of the construction program under this alternative would result in slightly less construction-generated emissions and therefore less impact to air quality compared to the Proposed Action.

Under the Reduced Project Alternative, many of the safety and historic preservation actions identified under the Proposed Action would be implemented. The repair and stabilization of three structures located in or near a biologically sensitive area, however, would be minimal.

The three structures receiving minimal repairs under this alternative are: the Watertower, New Industries (Laundry) Building, and Quartermaster Building. These structures are contributing features of the Alcatraz Island National Historic Landmark District, and without the necessary rehabilitation, these structures will eventually fail. Other Landmark contributing structures exist within this area that are in similar deteriorated condition. The loss of these three cultural resources, including the Indian Occupation Graffiti located on the Watertower, and possible loss of other contributing resources on the north end of the Island would lessen the integrity of the Alcatraz Island National Historic Landmark. The Reduced Project Alternative would have major adverse impacts on the cultural resources. It is probable that the cumulative loss of these cultural resources, all concentrated on the north end of the Island, would result in the loss of the National Historic Landmark status, which would be considered impairment of the cultural resource values on Alcatraz.

The reduced level of repair (generally restricted to non-breeding season) would similarly reduce the intensity of the impact on nesting wildlife from construction, but the sudden or incremental failure of these structures could result in wildlife impacts. Even though these impacts would be reduced, impairment to natural resource values, including nesting wildlife, would not occur with or without implementation of a Reduced Project Alternative.

Over the long-term, the Reduced Project Alternative would have a negative impact on the recreational and visitor use values on the Island. The impact would include the eventual loss of three important historic structures and corresponding reduction in the interpretive values and historic integrity of the Island. The loss of the Laundry Building could adversely affect future visitor access to the north end and lead to a greater potential for impairment of resources and values for which the Alcatraz National Landmark was created.

Table 2-2 at the end of this chapter provides a comparison of impacts and alternatives.

2.6 Environmentally Preferred Alternative

The environmentally preferred alternative is the alternative that will promote the national environmental policy expressed in NEPA (Sec. 101 (b)). This includes alternatives that:

- Fulfill the responsibilities of each generation as trustee of the environment for succeeding generations.
- Ensure for all Americans safe, healthful, productive, and esthetically and culturally pleasing surroundings.
- Attain the widest range of beneficial uses of the environment without degradation, risk of health or safety, or other undesirable and unintended consequences.
- Preserve important historic, cultural, and natural aspects of our national heritage and maintain, wherever possible, an environment that supports diversity and variety of individual choice.
- Achieve a balance between population and resource use that will permit high standards of living and a wide sharing of life's amenities.
- Enhance the quality of renewable resources and approach the maximum attainable recycling of depletable resources.

An evaluation of the alternatives suggests that arguments can be made for both the Proposed Action and the Reduced Project Alternative as the environmentally preferred alternative. The reduced project alternative protects the bird species from the construction impacts on three failing historic structures. The Proposed Action, however, provides the greatest protection to arguably the most significant National Historic Landmark District in the Golden Gate National Recreation Area unit of the National Park Service. The NPS has endeavored to achieve a balance between these resources. The NPS NEPA Guidelines explain the environmentally preferred alternative as "the alternative that causes the least damage to the biological and physical environment; it also means the alternative which best protects, preserves, and enhances historic, cultural, and natural resources." As the explanation suggests, the environmentally preferred alternative seeks a balance between the resources at the site.

Based on the principles of Section 101 of the National Environmental Policy Act, the Proposed Action is identified as the environmentally preferred alternative. The Proposed Action maintains the National Historic Landmark District status of Alcatraz that could be lost under the Reduced Project Alternative. This meets an integral part of the environmentally preferred alternative guidelines that direct agencies to "preserve important historic, cultural, and natural aspects of our national heritage." It is not simply the landmark status that may be lost, more importantly, it is three historically significant structures that contribute to our national heritage. The

Proposed Action is also environmentally preferred because it attains the widest range of beneficial uses of the environment, biological and historic preservation and visitor safety and enjoyment, without degradation of resources. With mitigation, it is unlikely that degradation to natural resources will occur under the Proposed Action. The monitoring plan and adaptive management approach, stringent breeding season and staging restrictions lessen the potential impacts to breeding birds at the site and ensure modifications will be made should unforeseen impacts occur. Finally, earlier studies, including the 1993 DCP and the 1980 General Management Plan, identify the importance of the historic resources at the site. These studies provide a record of earlier trustee evaluation of the Island and provide direction for the present choice of alternatives.

2.7 Mitigation Measures

The National Park Service would implement the following measures to reduce or avoid the adverse environmental effects of the Proposed Action. These measures would be implemented as part of the Proposed Action for each project, and for each project in the Reduced Project Alternative *except*: the Water Tower Stabilization, New Industries (Laundry) Building Stabilization & Seismic Upgrade, and the Quartermaster Building Stabilization & Seismic Upgrade. For these three projects, the biological mitigation/construction restrictions described in Section 2.3 (Reduced Project Alternative) would supersede and replace the relevant "project-specific waterbird protection measures" described below.

2.7.1 BIOLOGICAL RESOURCES

SPECIES OF CONCERN IN SAN FRANCISCO BAY

Pacific Herring

In-water activities associated with the Dock Repair project to repair and replace failing steel and concrete pilings would likely occur year-round. Herring spawning occurs from December through March.

1. Prior to construction for the Dock Repair project, the Park Service obtained authorization from the U.S. Army Corps of Engineers (USACE),, a consistency determination from the San Francisco Bay Conservation and Development Commission (BCDC), authorization from the Regional Water Quality Control Board, and a determination from the National Marine Fisheries Service (NMFS). These agencies assisted in the development of appropriate measures to reduce potential effects to herring during the spawning period.. These protective measures could include a monitor and possible work stoppage for spawning herring, or measures to protect spawning herring from entering the construction area, such as silt curtains. Additionally, a false bottom would be constructed beneath the deck to act a debris catch reducing the potential for materials entering the water. These measures would be implemented by the National Park Service/contractor to ensure protection during herring spawning season.

Marine Mammals

The following mitigation measures will be implemented to avoid impacts to marine mammals (harbor seals and California sea lions).

1. Staging area #14 will only be used at tide heights greater than +2.5 feet msl to avoid disturbance to harbor seals hauled out on Little Alcatraz off the northwest end of Alcatraz Island.

2. Incidental observations indicate that fewer than 20 California sea lions may haul out year round on an infrequent and irregular basis below the north foghorn adjacent to the Model Industries Building. A monitoring program would be implemented to document use patterns at this haul-out. Response to potential off-island disturbances will be documented during the course of the monitoring, but will not be the focus of

monitoring. If it is determined that the north foghorn haul-out is used on a regular basis, the NPS would take appropriate measures to reduce the potential effects on marine mammals. The NPS may also choose to remove from use barge on- off-load area #15 under the Proposed Action.

GENERAL WATERBIRD PROTECTION MEASURES

The following mitigation measures would be applicable to construction activities associated with the Proposed Action. These measures include required phasing of projects, limiting exterior work where feasible during the breeding season, and other controls to minimize impacts on biologically sensitive areas. Following these general measures are additional project-specific mitigations that would also be implemented by the National Park Service to minimize biological impacts. As previously described in this chapter, the National Park Service proposes to implement Phase One of the project and monitor the effectiveness of these measures in minimizing or avoiding serious impacts through the Adaptive Management Program.. Information obtained during this monitoring would be used by the National Park Service to refine mitigation measures and the implementation of projects associated with the Subsequent Phases. In particular, the effects of increased activity at staging areas #7, #11, #12, and #13, and crane use at staging areas #2 and #5 would be closely monitored during the breeding season. Phase One monitoring results will be of limited application to Subsequent Phase projects on the north and northwest ends of the Island, including the New Industries and Water Tower projects, due to distant location from Phase One activities. If the effects are greater than anticipated in the EIS, the National Park Service would further restrict construction activity of the Subsequent Phase projects to minimize biological impacts. (Refer to Appendix B for additional information on monitoring and the proposed process to implement adaptive management.)

Staging/Barge Off-Loading Area Use

1. Use of the staging/barge off-loading areas from February 15 through August 15 would be in compliance with the following measures (see Figure 2-1 for location):

   Area #1: No access February 15 through August 15. Only storage would be allowed until all young in the area have fledged. Storage area limits would be defined and approved on-site by the National Park Service biologist prior to breeding season use.

   Area #2: No nighttime use (defined as a half hour after sunset and a half hour before sunrise). Crane use in this area would not be visible from the Parade Ground (i.e., crane height must be lower than the adjacent cliff; visual screens must be used; or other methods must be employed to avoid visual intrusion at the Parade Ground).

   Area #3: If nighttime use is proposed, lighting would be directed toward the work areas only and appropriately shielded. Lighting placement would be reviewed and approved by a National Park Service biologist and maintenance staff during initial staging operations.

   Area #3a: No nighttime use. Gull exclusion measures to prevent gull nesting would be implemented in this area to reduce conflicts between staging activities and nesting, if necessary.

   Area #4: No nighttime use.

   Area #5: No nighttime use. Use from February 15 through August 15 would be monitored, and could be further restricted in subsequent years during a portion of the peak sensitivity periods for black-crowned night-herons and western gulls (approximately April through June) if deemed necessary based on monitoring. Gull exclusion measures to prevent gull nesting may also be implemented in this area to reduce barge off-loading and nesting conflicts, if necessary.

Area #6: Prior to use, the site would be inspected by a National Park Service biologist. Up to three night-heron nests have occurred in this area in the past. If nests are found, protective screening would be installed.

Area #7: No nighttime use. A temporary visual barrier would be required along the northeastern periphery of the site to prevent visual intrusion into the cistern area. The barrier would be reviewed and approved by a National Park Service biologist and would be installed prior to the start of the breeding season. Staging area limits would be defined and approved on site by the National Park Service biologist prior to breeding season use.

Area #8: If nighttime use is proposed, lighting would be directed toward the work area only and appropriately shielded. Lighting placement would be reviewed and approved by a National Park Service biologist and maintenance staff during initial staging operations.

Area #9: No access during breeding season, from February 15 until all young in the area have fledged, including the cliffs below the Model Industries and Laundry Buildings, potentially until September 15. Storage area limits would be defined and approved on site by the National Park Service biologist prior to breeding season use.

Area #10: No nighttime use. Access and construction work from February 15 through August 15 would be limited to those activities that would be accomplished behind screening materials (installed prior to the start of the breeding season), which would be reviewed and approved by the National Park Service.

Area #11: No nighttime use. Staging area limits and the need for gull exclusion measures to prevent gull nesting would be determined by the National Park Service biologist prior to initial staging operations.

Area #12: No nighttime use. No crane use to transport materials into staging area #12 (Recreation Yard) would be allowed during breeding season. All equipment and materials must be contained within the walls of the yard and cannot be visible from outside ground level locations.

Area #13: No visual intrusion into the Parade Ground. The southeastern boundary of the site would be delineated by a National Park Service biologist prior to arrival of materials. A temporary visual barrier would be required at the entrance to the Parade Ground to prevent visual intrusion onto the Parade Ground. The barrier would be reviewed and approved by the National Park Service biologist and would be installed prior to March 1. Gull exclusion measures may also be required behind building 64 and on the adjacent slope to prevent gull nesting in the area.

Area #14: No access from February 15 to approximately September 15. Site may be used only during periods when tide height for the duration of use will be +2.5 feet msl or higher or the NPS would obtain a permit under the Marine Mammal Protection Act.

Area #15: No access from February 15 to approximately September 15. This barge location may be removed from use year-round if monitoring indicates California sea lions use the north foghorn haul-out on a regular basis, unless a Marine Mammal Protection Act permit is obtained by the National Park Service.

2. General Condition: Movement of equipment and materials to and from staging areas from February 15 through August 15 would be restricted to daylight hours to prevent moving lights (i.e., headlights) from disturbing sensitive areas. Nighttime construction would be allowed in interior spaces and some exterior spaces (in compliance with the mitigation measures throughout this section).

Other General Measures

The following conditions would apply to all construction activities occurring during the waterbird breeding season (February 15 to August 15):

3. Transport of materials to the Island by helicopter would be prohibited during the waterbird breeding season from February 15 until young have fledged (usually early September).

4. Night lighting for construction activities (in authorized areas) would be reduced to the minimum amount necessary to complete work, and it would be shielded and directed downward. The placement, intensity and direction of nighttime lighting would be reviewed and approved by a National Park Service wildlife biologist and maintenance staff during initial staging operations.

5. All construction workers would be provided with information on the biological resources of the Island, and the required mitigation measures. In addition, all construction workers would be required to attend an orientation on the sensitivity of the Island's natural resources and the requirements and mitigations to be implemented for resource protection. Attendance will also be required at periodic natural resource briefings throughout the breeding season. The required mitigation measures would be included in the construction contract documents and would be a binding requirement, and enforcement would be monitored by National Park Service staff through regular inspections by a qualified biologist and contract inspector.

6. Prior to implementation of each construction project, restricted areas would be identified and mapped by National Park Service staff. These areas would be delineated with input from resource specialists, interpretive, and maintenance/project management staff to ensure resource protection as well as adequate access for construction and Island operations. The areas would be clearly marked with temporary fencing or other signage prior to the arrival of materials and equipment, and would be enforced (as a contractual requirement) by the construction crew with monitoring by National Park Service staff.

Habitat Enhancement

The following habitat enhancement measure would be implemented during Phase One of the proposed project to mitigate for potential minor to moderate impacts to small subcolonies of black-crowned night-herons near many of the proposed projects as well as staging and barge activity locations.

7. Appropriate vegetation would be planted and established on the rubble piles on the southwestern side of the Parade Ground during Phase One of the Proposed Action to enhance and potentially expand black-crowned night-heron nesting habitat in an area more remote from construction activities associated with the Proposed Action.

PROJECT-SPECIFIC WATERBIRD MITIGATION MEASURES

Dock Repair

1. Pile replacement along the southeast side of Building 64 would occur August 15 through February 15. Other pile replacement and seismic stabilization would be allowed year-round, in compliance with other general measures in Section 2.7.

Building 64 (Balconies Repair)

2. Construction on the southeast side of building 64 would occur during the non-breeding season (August 15 through February 15), or in compliance with the following measures. Exterior work on the southeastern side

of the building could be completed during the breeding provided that a temporary visual barrier (i.e., dense netting) be installed to enclose the scaffolding/work area prior to the start of the breeding season. The placement and type of barrier would be reviewed and approved by a National Park Service biologist. Work along the eastern side of the building could be completed during the waterbird breeding season.

3. Netting or other exclusion devices would be installed prior to nesting to prevent western gulls from nesting on the balconies (i.e., within the immediate repair area) of the building.

Cellhouse Stabilization and Seismic Upgrade

4. Exterior work on the western side of the building could be completed during the breeding season provided that a temporary visual barrier (i.e., dense netting) be installed to enclose the scaffolding/work area prior to the start of the breeding season (February 15 through August 15). The placement and type of barrier would be reviewed and approved by a National Park Service biologist. All other exterior work could be implemented on a year-round basis, except as noted in the mitigation measures below. There will be no nighttime exterior work on the western side of the building and no exterior lighting during the breeding season.

5. Nighttime work along the exterior southern wall (Eagle Plaza) during the breeding season would be subject to the night lighting/shielding requirements to prevent illuminating the Parade Ground, as described under "General Condition."

6. Any work requiring access to, or work on, the Cellhouse roof would be restricted during breeding season to portions of the roof where activities would not be visible to the cormorant colonies along the western cliffs of the island or as adequately screened from those areas. The work area limits and method of delineating them would be reviewed and approved by the National Park Service biologist prior to work on the Cellhouse roof.

Sallyport Structural Upgrade

7. Prior to the breeding season, netting or other exclusion devices would be installed on the northeast perimeter trail below the Sallyport to prevent western gulls from nesting within the construction area.

8. No exterior nighttime construction during the breeding season (February 15 through August 15).

Water Tower Stabilization

9. The Water Tower Stabilization project would be completed within the non-breeding season or phased to avoid the waterbird breeding season to the greatest degree feasible. This project is located directly adjacent to the Cistern subcolony of western gulls—one of the largest gull populations on the Island. As described in Chapter 4, special attention to avoiding or mitigating impacts is provided for this project because construction activities during the breeding season in this location would have direct impacts to the Cistern subcolony of western gulls and indirect impacts to populations of other waterbird species, including those located along western cliffs of the Island, the Model Industries Plaza, and the Foghorn subcolony.

   If, based on future structural evaluations of the tower, complete avoidance of construction during the breeding season is not feasible through phasing or by other means; then the following measures would be implemented to minimize impacts:

Minimizing Construction Disturbance

10. Construction would be initiated in early August or later, and would conclude by mid-March (which provides the eight-month maximum window anticipated for this project). This timeline was identified based on a review of the most sensitive periods within the breeding season (see Figure 4.2-1) for each of the species potentially affected by this project.

11. Only daytime construction would be allowed during the breeding season (early-August through mid- to late-September and during February and March). Screening to minimize visual intrusion into the cistern area would be implemented, and would be reviewed and approved by a National Park Service biologist prior to the start of the breeding season.

12. Specialized resource sensitivity training would be required to construction crews (in addition to training described as a "General Condition.") This training would educate construction workers on how to minimize human-induced gull disturbance. Implementation of these measures would be a binding requirement for construction contractor(s) and would be enforced by National Park Service staff.

Habitat Enhancement

The following habitat enhancement or protective measures would be implemented to minimize the impact of construction disturbance and enhance overall reproductive success. Artificial habitat discussed below may remain in place after construction is completed. If the artificial habitat has not been used it will be removed after completion of the project.

13. Appropriate plantings or other shelter provisions would be provided prior to the start of breeding season in the cistern and Model Industries Plaza area to enhance reproductive success of western gulls. Reproductive success is generally lower in these exposed locations than on other parts of the Island.

14. Pigeon guillemot artificial nest boxes would be provided along the western cliffs of the Island in areas more remote from the project area to provide additional protection from potential elevated levels of human-induced gull and raven predation. Eleven artificial nest boxes for pigeon guillemot have been installed on the Farallon Islands. Occupancy ranges from 0 to 100 percent, with an average of 64 percent occupancy between 1995 and 1999.

15. In the event that impacts are greater than those predicted in Chapter 4, other artificial habitat (nest platforms) or social attraction measures (decoys and taped calls) may be implemented for Brandt's and pelagic cormorants, and pigeon guillemots (social attraction) on an experimental basis in less disturbed areas along the western cliffs and more remote from the project area. However, it is unknown whether these species would switch nest sites, use artificial habitat, respond to social attraction measures, or abandon the Island. Artificial habitat and social attraction measures for cormorants would not provide additional predator protection.

Enhanced Protection from Off-Island Disturbance

16. In addition to predation, the subcolonies located in the northern and western cliffs of the Island are constantly exposed to water-based disturbances that can directly impact reproductive success. Such activities include unauthorized landings on the Island, water-based tours that travel too close to the Island, shining lights or using amplified sound or other noise-generating activities. The National Park Service has been increasing public outreach and education to reduce these activities. To supplement this effort and provide further protection during the Water Tower stabilization project, additional protection from water-based disturbances would be implemented. These measures could include use of buoys to establish a closed area, focused outreach programs with relevant user groups, and increased enforcement activities.

Slope Stabilization

17. The Slope Stabilization project would be phased over multiple years to avoid construction-related impacts on breeding waterbirds. No construction would be allowed for this project from February 15 through August 15 (to be verified by a National Park Service biologist the year the construction is proposed).

New Industries (Laundry) Building

18. Exterior repair work at the New Industries (Laundry) Building would be prohibited during the waterbird breeding season (February 15 to August 15 or as determined by the National Park Service biologist). No nighttime exterior construction would be allowed at any time of the year.

Interior repairs would be allowed, as described below:

19. No nighttime construction would be allowed at any time of year to protect nesting and roosting seabirds along the western cliffs of the Island.

20. Access to the New Industries (Laundry) Building for interior repairs during the breeding season would be through the tunnel via the Power House Complex for the lower level, and via the northern entrance for the upper floor. A pickup truck, electric forklift (or forklift with a muffler), or other small vehicle would be used to transport materials to the entrance on the northern side. Transport of large equipment/materials to and from the New Industries (Laundry) Building would be completed *outside* the waterbird breeding season. Access to the southern entrance would be prohibited. A temporary visual barrier would be required between the access route to the New Industries (Laundry) Building and the Model Industries Plaza to minimize direct and indirect disturbance to breeding birds. The barrier would be reviewed and approved by the National Park Service biologist and would be installed prior to the start of the breeding season.

21. Prior to the waterbird breeding season, the exterior windows and doors on both floors of the northern, western and southern facing walls of the New Industries (Laundry) Building would either be repaired or replaced, or barriers would be provided to minimize noise and visual contact with breeding waterbirds on the cliffs below. If barriers are used (as an alternative to window repair/replacement), the design and placement shall be reviewed and approved by park resource specialists (biological and cultural). Complete visual barriers would only be needed in areas where construction or access is occurring that would be visible through the windows or doors (even if windows and doors are replaced). Biologists will require building access and ability to view through barriers for monitoring.

22. Prior to the breeding season, temporary fencing would be installed to prevent access by construction crews to adjacent sensitive areas, including the Model Industries Plaza and the lower level outside of the New Industries (Laundry) Building. These areas would be delineated and restrictions enforced as described above under "General Condition."

23. Specialized resource sensitivity training would be required for construction crews (in addition to training described as a "General Condition"). This training would educate construction workers on how to minimize human-induced gull disturbance and the importance of minimizing visual contact with nesting birds in the western cliffs below the work site. Implementation of these measures would be a binding requirement for construction contractor(s) and would be enforced by National Park Service staff.

Building 64 Seismic Retrofit

24. Exterior construction work would primarily involve the placement of seismic ties along the wall of the building (into adjacent bedrock). This work would be scheduled from August 15 through February 15 to the

greatest degree feasible, and no exterior work along the southern wall would be allowed. If exterior construction activities along the western wall cannot be phased to avoid the breeding season, such work would be screened from the Parade Ground. A temporary physical barrier would be placed at the southern limits of the walkway connecting to the Parade Ground to clearly define the allowable construction area, and provide screening (for light and visual intrusion). The precise location of the barrier would be determined in consultation with the National Park Service maintenance/project management staff and resource specialists to ensure adequate access and resource protection.

25. Prior to the breeding season, netting or other exclusion devices would be installed to prevent western gulls from nesting directly within the repair/construction area.

Quartermaster Building

26. During the breeding season, exterior repair work would be allowed along the first floor of the western wall. Netting to preclude night-herons from nesting directly below the building could be installed prior to the start of the breeding season to allow exterior work along the southern wall during the breeding season. If netting is proposed, the location and placement would be reviewed and approved by a National Park Service biologist. No other exterior work during the breeding season would be allowed. Nighttime construction at these locations would be allowed as described under "General" measures above. Interior repairs would be allowed year-round; however, prior to the waterbird breeding season exterior windows and openings would be repaired or replaced, or barriers would be provided to minimize noise, visual and light (if nighttime work is proposed) contact with breeding waterbirds in adjacent areas. If barriers are used, National Park Service resource specialists (biological and cultural) would review and approve the design and placement of these temporary features.

RATS

1. Bird-proof and tamper-proof rodent bait stations and traps would be maintained on barges and boats used for delivery of materials to the Island and at active staging areas to avoid transport of rats onto the Island. On-island traps would be designed and maintained in accordance with the National Park Service's Integrated Pest Management practices in order to minimize impacts to non-target species, including native deer mice and California slender salamanders, and to avoid secondary poisoning to gulls, ravens, raptors, herons and egrets that may feed on dead or dying rodents.

2. As part of the construction crew awareness program described under the general waterbird mitigation measures, construction crews would be advised to discard all garbage, food wastes, and recyclable materials into garbage and recycling receptacles. Trashcans would be placed at each project site and in some cases at staging areas during construction. Trashcans would be emptied daily. Designated eating areas and rodent-proof storage containers would be utilized to prevent spread of rats on the Island.

SPECIAL-STATUS BIOLOGICAL RESOURCES

Special-Status Plant Species

1. Prior to commencement of construction activities for the Water Tower, Slope Stabilization, exterior work on the western wall of the Cellhouse project, and use of staging area #10, a focused survey for San Francisco campion, a special-status plant species, would be conducted, by qualified National Park Service personnel during the blooming season (typically early April). If no campion is found during surveys, no further mitigation would be required.

2. If campion is found and can be avoided, the National Park Service would provide protective fencing around the population. At no time would fencing be moved to allow access of construction equipment to the population. Fencing would remain in place until construction is complete. Where avoidance is possible, signage would also be placed on the protective fence that identified the area as "RESTRICTED, Do Not Enter, This is a Protected Area."

3. If avoidance is not possible, a qualified botanist would collect seeds (typically in May/June) from the population and establish plant material in an appropriate location on the Island. Seeds would be collected and plant material would be grown in the park's native plant nurseries. Seedlings would be planted in areas that are approved by a National Park Service botanist.

Bats

4. Beginning at least one year prior to construction activities associated with the Sallyport Structural Upgrade, Quartermaster Building Stabilization and Building 64 Seismic Retrofit projects, bat surveys would be conducted at appropriate times of the year to determine if bats are utilizing these locations as roost sites. The surveys would determine species present, location of roost sites, type of roost (i.e., day, night, winter, etc.) and intensity of use. If special-status bat species are found during surveys, the National Park Service would develop and implement appropriate mitigation measures in consultation with CDFG and regional bat experts. Protective measures would be defined based on the species present, intensity of use, type of roost, etc., and would be developed consistent with the preservation of historic structures. Depending on the species and type of roost, such measures may include provisions for the ongoing use of the building by bats or the installation of alternative or replacement habitat at other locations on the Island.

Special-Status Fish Species and Essential Fish Habitat

An evaluation of the in-water dock repair activities determined that the action would not likely adversely affect listed salmonids or designated critical habitat, and no long-term impacts to Essential Fish Habitat would be anticipated. The replacement pilings will be pre-cast concrete and the installation methods are sensitive to the marine environment. Informal consultation with the National Marine Fisheries Service concurred with this determination (see discussion in Chapter 6, Consultation and Coordination).

WATERS OF THE UNITED STATES

Prior to construction for the Dock Repair project, the GGNRA obtained authorization from the U.S. Army Corps of Engineers (USACE) under Section 404 of the Clean Water Act and Section 10 of the Rivers and Harbors Act. The permitting process assisted in identifying appropriate measures to reduce effects to tidal waters from repair of the dock. Measures developed include the construction of a false bottom beneath the deck to act a debris catch reducing the potential for materials entering the water. The replacement piles would be constructed using a small amount of forced grout through the center of the pre-cast pile minimizing the potential for grout to contact seawater. In addition, the contractor will have a diver in place to ensure that forced grout is not being released into the bay. These protective measures would be included as conditions of the contractor's contract, and would be implemented by the National Park Service/contractor to ensure protection of the waters of the United States.

2.7.2 CULTURAL RESOURCES

The National Park Service has identified the following mitigation measures to lessen the impacts of the Proposed Action on cultural resources on Alcatraz Island. The mitigation measures have been incorporated into the Proposed Action, and are described below.

PROGRAMMATIC AGREEMENT

In 1992, the National Park Service signed a Programmatic Agreement with the California State Historic Preservation Officer and the Advisory Council on Historic Preservation for operation and maintenance undertakings of the historic properties within Golden Gate National Recreation Area (NPS, 1992). Alcatraz Island is a part of the Golden Gate National Recreation Area and is included in this Programmatic Agreement. Rehabilitation of historic buildings or structures that is consistent with the Secretary of the Interior's Guidelines is covered by Stipulation D.II.i. (Rehabilitation of Historic Structures) in the Programmatic Agreement. Health and safety activities are covered by Stipulation D.II.j. in the Programmatic Agreement. Projects associated with the Proposed Action are covered by the Programmatic Agreement, with the exception of the Sallyport (as described in Chapter 4). For the Sallyport stabilization, Section 106 (National Historic Preservation Act, amended) consultation will be initiated with the California State Historic Preservation Office and the Advisory Council on Historic Preservation outlined in the federal regulations 36 CFR Part 800. Since the stabilization of the Sallyport may require removal of the Boathouse that was constructed during the period of significance, a Memorandum of Agreement among the agencies will be required to describe how the effects of the undertaking will be taken into account.

THE SECRETARY OF THE INTERIOR'S GUIDELINES

The Secretary of the Interior's Standards for the Treatment of Historic Properties (36 CFR part 68) provides guidance for the protection of cultural resources. The Proposed Action would be consistent with the Secretary's Standards, with the exception of the Sallyport project, which would undergo additional reuse and compliance (see below).

The intent of the Secretary of the Interior's Standards is to assist the long-term preservation of a property's significance through the preservation of historic materials and features. The standards provide guidelines for making decisions related to a building's exterior materials, roofs, windows, entrances, structural system, interior features and finishes, mechanical systems, building site, and health and safety issues.

RECORDATION TO HISTORIC AMERICAN BUILDINGS SURVEY (HABS) STANDARDS

Prior to the demolition of the Boathouse at the Sallyport, the National Park Service would ensure that structure is recorded to Historic American Buildings Survey Standards. HABS recordation would provide information on the Boathouse using measured drawings, large format photographs, and written description and history prepared to archival standards.

SALVAGE OF HISTORIC MATERIALS

Several projects included in the Proposed Action would require the removal or demolition of historic features of the Alcatraz National Historic Landmark district. These actions are associated with the repair of the existing dock (removal of historic "spider" piles from beneath the dock), stabilization of the Sallyport (demolition of the wooden Boathouse), and remediation of the inactive fuel line system. These actions would be necessary to provide for public health and safety and to provide for the long-term preservation of historic structures. To minimize the loss of these historic materials, the National Park Service would determine if examples of the materials should be included in the Golden Gate National Recreation Area permanent museum collections, or reused for other on-island activities. Such activities may include interpretive exhibits on the Island displaying historic materials (i.e., "spider" piles), or potential reuse of the materials for another purpose (i.e., reuse of wood from the Boathouse) with interpretive signage.

INDIAN OCCUPATION GRAFFITI MITIGATION

Graffiti from the Indian Occupation (1969–1971) is located throughout the Island. The National Park Service would follow these mitigation procedures for projects that would have an impact on Indian Occupation Graffiti:

1. At the 50 percent design phase, the National Park Service would conduct an inspection of the project area with the Golden Gate National Recreation Area Cultural Resource's staff to identify all graffiti that would be impacted.

2. The Golden Gate National Recreation Area Cultural Resource's staff would contact the participants of the Indian Occupation to consult with them on the proposed project, the impacts to the graffiti, and treatment options.

3. A treatment option would be determined, with avoidance being the preferred treatment. In situations that avoidance is not possible, other treatments would be determined in consultation with the participants of the occupation. Treatments may include protection of the graffiti during construction (i.e., covering, etc.), removal of the wall or surface on which the graffiti is painted and placing the Golden Gate National Recreation Area museum collections, restoration, and/or recordation.

4. At the 90 percent design phase, the National Park Service would conduct a final inspection of the project area with the Golden Gate National Recreation Area Cultural Resource's staff to verify that graffiti has been identified and that a treatment option for impacted graffiti has been determined.

5. The necessary contract stipulations would be provided in the construction contract to insure that the treatment option is followed.

6. Training would be provided to the construction crew to explain to them the significance of the graffiti (and other cultural resources) and appropriate protection measures that must be followed during the construction activity.

7. The National Park Service would monitor construction activities to insure that the treatment measures are being followed.

ARCHEOLOGICAL TESTING, MONITORING AND PROTECTION

The National Park Service would identify areas on the Island that have historic archeological (Civil War– and Federal Penitentiary–era) resources that would be affected by individual projects, and would develop and implement an archeological testing, treatment and/or monitoring plan for these areas. The preferred treatment is to avoid the archeological resources. In situations where avoidance is not possible, a testing and monitoring plan would be developed that provides: 1) a qualified archeologist to prepare a testing plan according to National Park Service Regulations Cultural Resource Management Guidelines (DO-28); 2) a qualified archeologist on site during construction; and 3) procedures that provide for a work stoppage when archeological features are discovered and notification of the Golden Gate National Recreation Area archeologist. Training would be provided for the construction crew on the significance of archeological resources and correct procedures to follow when archeological resources are encountered. Monitoring would likely be required for the Quartermaster Building, Cellhouse, and Fuel Line Remediation projects.

SEISMIC TIES/MONITORING

Several of the repair projects included in the Proposed Action would require the installation of steel ties into adjacent bedrock. To minimize potential disturbance of adjacent features, the National Park Service would implement the following measures:

- A monitoring program, with contingency measures including thresholds that would require construction to stop, would be developed and implemented during the installation of rock bolts to protect adjacent and upper terrace structures from vibration and shaking.

SLOPE STABILIZATION MITIGATION

The National Park Service would undertake the following mitigation measures for the slope stabilization project:

- To minimize the effect of applying gunite/shotcrete to the slope face, the National Park Service would require that the new surface resemble the natural rock color, if the material is adequate to withstand the weather conditions on Alcatraz. Provisions to allow for the re-introduction of plant materials would be considered during the design development phase of the project and implemented where feasible. If deemed feasible, the Secretary of the Interior's Standards for the Treatment of Cultural Landscapes would be used to provide guidelines for the specifications for planting.

- Installation of a permanent interpretive exhibit at the base of the slope explaining the need to stabilize the slope, how mitigation measures were used to protect the resource, etc., would be provided.

CULTURAL LANDSCAPE PRESERVATION

The National Park Service would provide for protection, propagation, or replanting of plants that are part of the Island's cultural landscape. Invasive exotic vegetation would be removed. The *Landscape Stabilization and Maintenance Guidelines* (Eleey, 1998) would be used as a reference for identifying plants and specifying the appropriate treatment. The following is a list of plant species that could potentially be affected by the Proposed Action, and the treatment that would be required. Prior to implementation of the Sallyport Complex project or use of staging area #5, the Cultural Resources Division would be consulted to determine precise treatment and associated work plan.

Sallyport Complex

Immediate Propagation:

- *Pelargonium hortorum* ("Alphonse Ricard")
- Rosa 'Excelsa'
- Rosa 'Gardenia'
- Fuchsia SP2

Priority Removal (invasive):

- Vinca major
- Hedera helix

Sallyport/Staging Area #5

Immediate Propagation:

- Fuchsia 'Rose of Castile'

Priority Removal (invasive):

- Hedera helix
- Cluster of various invasive plants [see *Landscape Stabilization and Maintenance Guidelines* (Elli, 1998)].

2.7.3 RECREATION AND VISITOR USE

SAFETY

Construction activities would comply with relevant public health and safety requirements, including those set forth by the Occupation Safety and Health Administration (OSHA). The National Park Service would ensure that appropriate safety/buffer areas are clearly identified, and that protective barriers, overhangs, buffer areas and other measures are enforced and maintained by the construction contractors throughout the project. To the extent possible, public access to buildings/structures would be maintained during construction activities. However, some areas within the buildings may be temporarily closed to the public for safety reasons. These areas would be clearly defined. See Section 4.4 for the restrictions on visitor use for specific areas under the Proposed Action and Reduced Project alternatives. See also Section 2.7.4 Hazardous Substances for additional mitigation measures related to public health and safety.

INTERPRETATION

To minimize the adverse effect of construction activities on the visitor experience, the National Park Service would use the construction program as opportunity for education and interpretation. This approach has been successfully used at other locations within the National Park System, including the recent repair and rehabilitation of the Washington Monument. The interpretive program would include signage as well as ranger- or docent-provided information on the construction activities. Issues relating to the purpose and need for the project, the environmental considerations that went into its implementation (cultural and biological), and other National Park Service management considerations would be addressed in the program. An underlying theme of the program could be demonstration of the National Park Service mission at work. Using this theme would help provide Island visitors with insight on the multiple, and sometimes competing, demands placed on the National Park System today. Additional detail (including the precise content and design of the program) would be developed in the future as individual projects are implemented.

NOISE CONTROLS

The following noise control measures would be implemented for the control of *exterior* construction-generated noise levels:

1. Construction vehicles or equipment, fixed or mobile, will be equipped with properly operating and maintained mufflers and acoustical shields or shrouds, in accordance with manufacturers' recommendations. The use of exhaust mufflers and acoustical shields or shrouds can reduce equipment noise levels by approximately 10 dBA (EPA ,1971).

2. Prior to commencing construction, acoustic barriers would be constructed wherever feasible along the perimeter of the activity site to shield occupied building(s), exterior public visitation areas and nesting birds within close proximity of the construction site from construction-generated noise. Wooden barriers (or treatments of equivalent effect) would be constructed at a height of approximately 8 feet for shielding ground-level activities and loaded vinyl curtains (or treatments of equivalent effect) would be draped to enclose elevated scaffolding. The use of barriers and enclosures can reduce equipment noise levels by approximately 10 dBA (EPA, 1971).

3. To the degree feasible, stationary noise-generating construction equipment (e.g., generators, cranes, compressors, and mixers) would be centrally located within equipment staging areas at the greatest distance possible from occupied building(s), exterior public visitation areas, and nesting birds.

The following additional measures would be implemented for the control of *interior* construction-generated noise levels within Building 64 and the Cellhouse:

4. To reduce interior noise levels within occupied buildings, major noise-generating construction activities (e.g., jackhammers) would be limited to non-visitation periods of the day, to the maximum extent possible. Major noise-generating construction activities conducted within the interior areas of Building 64 and the Cellhouse during daytime visitation hours would be surrounded to shield other occupied areas of the building. The use of enclosures can reduce construction noise levels by approximately 10 to 20 dBA (EPA, 1971).

5. During public hours repairs to the exterior or interior areas of the Cellhouse and Building 64, interior noise levels would be monitored to ensure that individual noise exposure levels do not exceed unsafe levels (based on the exposure standards established by the Occupational Safety and Health Administration), as follows:

Duration/Day (hours)	Noise Level (dBA)
8	90
6	92
4	95
3	97
2	100
1.5	102
1	105
0.5	110
0.25 or less	115

Exposure of visitors and non-construction personnel to interior construction-generated noise would be controlled by limiting individual access to construction areas and enclosure of major noise-generating construction activities and equipment, as identified in Noise Control Measure 4, above. Interior noise reduction measures would be required during times when visitors were present.

2.7.4 AIR QUALITY

BAY AREA AIR QUALITY MANAGEMENT DISTRICT (BAAQMD) CONTROL MEASURES

To reduce construction-generated PM_{10} emissions, construction contractors would be required to implement BAAQMD "Basic Measures" for construction activities. BAAQMD PM_{10} requirements for testing and the requirement to ensure that PM_{10} emissions are minimized to the extent feasible, will be part of the construction contracts. A few of the measures that would be implemented are as follows:

- Dust control measures would be in place during ground disturbance activities.
- Paved access roads, parking areas and staging areas at construction sites would be swept daily as needed (i.e., if visible soil material is carried onto paved roadway).

2.7.5 HAZARDOUS SUBSTANCES: HUMAN HEALTH, SAFETY, AND THE ENVIRONMENT

HAZARDOUS SUBSTANCES MANAGEMENT

Construction and repair projects associated with the Proposed Alternative and the Reduced Project Alternative will be subject to applicable federal, state, and local hazardous materials storage and hazardous waste disposal regulations (see Chapter 3 Affected Environment for specific regulations and policies).

Measures to Manage Asbestos. In accordance with NPS policy, potential asbestos containing materials (ACM) would be sampled, identified, and removed from work areas prior to construction or repair. A survey will be conducted for the presence of ACM by an Asbestos Hazard Emergency Response Act (AHERA) certified inspector that will be employed to collect bulk and air samples, assess the condition of the potential ACM, and report the findings to the GGNRA. Areas with friable ACM will be posted and removal of any ACM will be accomplished in accordance with EPA and OSHA regulations. The GGNRA and its contractors are responsible for compliance with applicable federal and state asbestos regulations.

Before work is undertaken on the Slope Stabilization project potentially requiring the fracturing of serpentine rock, samples of the rock will be collected to analyze for naturally occurring asbestos. If a certified industrial hygienist determines it necessary, the contractor or GGNRA staff will implement measures to monitor, and control airborne asbestos from the rock during excavation. Visitors will be prevented from entering areas where rock is being removed and kept at a safe distance based on air sampling results. Off-site disposal of serpentine would comply with applicable regulations concerning asbestos-containing material.

MEASURES TO MANAGE LEAD

Lead compounds are a component of many historic paints. Lead-based paint was used extensively on wooden exteriors, interiors, varnishes, window glazing putty, and can be found in soil adjacent to buildings from chipping or wear to lead paint. The buildings and structures on the Island that are assumed to have lead-based paint and finishes until proven otherwise are Building 64, the Cellhouse, the Sallyport, the Water Tower, the Laundry Building and the Quartermaster Building. GGNRA and its contractors are responsible for compliance with applicable federal and state regulations regarding the removal and disposal of lead-based paint, finishes, or soils.

Workers employed in the removal of lead will be required by to use safe lead removal methods established by federal and state agencies to protect themselves from exposure. Warning signs will be posted to mark the boundaries of lead-contaminated work areas. These signs would warn about lead hazard, prohibit eating, drinking, and smoking in the area, and specify any personal protective equipment required. OSHA worker safety requirements for lead (26 CFR 1926.62) would be followed during lead-based paint related construction activities. The GGNRA will prepare a written plan outlining procedures to protect park employees, contractor personnel, and park visitors from lead-based paint exposure.

Handling hazardous lead-based paint wastes will be conducted in compliance with state and federal regulations regarding labeling and management. Disposal of lead-based paint wastes may consist of paint chips, lead contaminated dust or soil, and demolition debris. According to 40 CFR 261.24, a toxicity characterization leaching procedure test on waste or soil will be conducted to determine if the material is characterized as hazardous. An appropriately licensed contractor will transport hazardous and non-hazardous lead-based paint waste for disposal in a permitted hazardous or non-hazardous landfill, as appropriate based on the waste characterization.

Place holder

Table 2-2. Summary Comparison of Impacts of Alternatives

3.0 AFFECTED ENVIRONMENT

This chapter provides an overview of existing environmental conditions on Alcatraz, and establishes the baseline for the impact analysis presented in Chapter 4. Full references for documents cited in this EIS are provided in Chapter 7.

3.1 Biological Resources

3.1.1 RELEVANT REGULATIONS

This section provides an overview of relevant regulations, followed by a description of the existing biological resources on Alcatraz Island. The vegetation and wildlife species are presented first, followed by species of interest and species that have been listed by the State of California and/or federal government ("special status species"). The information presented in the section is based on a review of literature, including the results of on-going waterbird monitoring on Alcatraz Island. A complete list of the documents used in preparing this section, including those directly cited, is presented in Chapter 7.

3.1.1.1 FEDERAL LAWS, REGULATIONS AND POLICIES

Federal Endangered Species Act

Pursuant to the federal Endangered Species Act (ESA), USFWS and NMFS have authority over projects that may affect the continued existence of a federally listed species. If a federal action may result in the "take" of a federally listed species, a federal consultation under Section 7 of ESA is required. Under ESA, the definition of take includes kill, harm, or harass. USFWS has interpreted the definition of harm to include significant habitat modification.

Take of a federally listed species may be approved through a Section 7 consultation between USFWS and another federal agency, if the proposed project is sponsored by or under another federal agency's jurisdiction. Because the Alcatraz Island Historic Preservation and Safety Construction Program is a federal project with a federal lead agency, the National Park Service, Section 7 consultation would be applicable. If the proposed project would result in take of a federally listed species, the National Park Service would be required to initiate consultation with USFWS (and/or NMFS) and to provide them available information regarding the potential effect of the proposed project on a listed species. This procedure would require the National Park Service to prepare a biological assessment of the effect of the permit action (but not necessarily the effect of the entire project) on the listed species or critical habitat. The biological assessment, if required, for listed species or those with critical habitat within the project area (spring-run and winter-run chinook, central valley and central California coast steelhead) will be attached to the final EIS as an appended item. National Park Service, as the lead federal agency, will determine if the project would result in "no effect" to listed threatened or endangered species or critical habitat, "not likely to adversely effect", or if the project "may effect" these species. The NMFS (or USFWS) would either concur or disagree with the lead federal agency's determination. Initiation of formal or informal consultation or cessation of discussion on the issues would depend upon the lead agency's determination and concurrence/disagreement by NMFS or USFWS. If formal consultation is required, USFWS (and/or NMFS) will issue a biological opinion stating whether the permit action is likely to jeopardize the continued existence of the listed species. If the federal lead agency does not concur with the findings in the Biological Opinion, it may request further discussion to resolve the issues. If the proposed Historic Preservation and Safety Construction Program would impact a federally listed species, consultation under Section 7 of the ESA would be required.

Migratory Bird Treaty Act

The Migratory Bird Treaty Act (MBTA), first enacted in 1918, implements domestically a series of treaties between the United States and Great Britain (on behalf of Canada), Mexico, Japan, and the former U.S.S.R., which provide for international migratory bird protection and authorize the Secretary of the Interior to regulate the taking of migratory birds. MBTA provides that it shall be unlawful, except as permitted by regulations, "at any time, by any means, or in any manner, to pursue, take, or kill any migratory bird, or any part, nest or egg of any such bird, included in the terms of conventions" with certain other countries (16 U.S.C. 703). This includes direct and indirect acts, although harassment and habitat modification are not included unless they result in direct loss of birds, nests, or eggs. The current list of species protected by MBTA can be found in Title 50, Code of Federal Regulations §10.13, and includes some species of waterbirds that currently nest on Alcatraz Island. Loss of non-native species, such as house sparrows, European starlings, and rock doves, is not covered by this statute, whereas impacts to most other native non-game bird species are covered. This federal code offers no statutory or regulatory mechanism for obtaining an incidental take permit for the loss of non-game, migratory birds.

Marine Mammal Protection Act

The Marine Mammal Protection Act of 1972 (MMPA), most recently reauthorized in 1994, established a moratorium, with certain exceptions, on the taking of marine mammals in U.S. waters. The term "take" is statutorily defined to mean "to harass, hunt, capture, or kill, or attempt to harass, hunt, capture or kill any marine mammal." Harassment was defined under the 1994 amendments as any act of pursuit, torment, or annoyance which has the potential to injure a marine mammal in the wild, or has the potential to disturb a marine mammal in the wild by causing disruption to behavioral patterns, including, but not limited to, migration, breathing, nursing, breeding, feeding, or sheltering. Under the MMPA, the Secretary of Commerce is responsible for the conservation and management of pinnipeds and cetaceans. This authority has been delegated to the NMFS. The MMPA allows for incidental take for other than for scientific research and commercial fisheries only after an involved public process.

Magnuson-Stevens Fishery Management and Conservation Act

The Magnuson-Stevens Fishery Conservation and Management Act, as amended by the Sustainable Fisheries Act of 1996 (Public Law 104-267) requires all federal agencies to consult with NMFS on all actions, or proposed actions, permitted, funded, or undertaken by the agency, that may adversely affect Essential Fish Habitat (EFH). EFH is defined as "those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity." "Waters" include aquatic areas and their associated physical, chemical and biological properties. "Substrate" includes sediment underlying the waters. "Necessary" means the habitat required to support a sustainable fishery and the managed species' contribution to a healthy ecosystem. Spawning, breeding, feeding, or growth to maturity covers all habitat types utilized by a species throughout its life cycle. NMFS would provide recommendations on conserving EFH to federal or state agencies for activities that would adversely affect EFH. NMFS has determined that the San Francisco Bay Estuary provides EFH for coastal pelagic species and west coast groundfish. Specifically, for Central San Francisco Bay, this includes 18 fish species.

Clean Water Act

Section 404 of the Clean Water Act (CWA) establishes a requirement to obtain authorization or a permit prior to any activity that involves any discharge of dredged or fill material into "Waters of the United States," including wetlands. Waters of the United States include navigable waters of the United States, interstate waters, all other waters where the use or degradation or destruction of the waters could affect interstate or foreign commerce, tributaries to any of these waters, and wetlands that meet any of these criteria or that are adjacent to any of these waters or their tributaries. Pursuant to Section 404 of the CWA, the United States Army Corps of Engineers (USACE) regulates and issues authorization or permits for such activities. Nearly all surface waters and wetlands

in California meet the criteria for waters of the United States, including tidal waters and non-tidal waters. Activities that require authorization or a permit under Section 404 include placing fill or riprap, grading, mechanized land clearing, dredging, excavation and leveling. Any activity that results in the deposit of dredge or fill material within the "Ordinary High Water Mark" of waters of the United States usually requires a permit, even if the area is dry at the time the activity takes place.

The USACE also requires concurrence from the San Francisco Bay Conservation and Development Commission (BCDC) and the Regional Water Quality Control Board (RWQCB) prior to issuing a permit or authorization for work in the San Francisco Bay. The BCDC reviews the project to determine if the project is consistent with the Amended Coastal Zone Management Program for San Francisco Bay. The RWQCB regulates potential discharges and water quality in San Francisco Bay.

Rivers and Harbors Act

Under Section 10 of the Rivers and Harbors Act of 1899, the construction of structures in, over, or under, excavation of material from, or deposition of material into "navigable waters" are regulated by USACE. Navigable waters of the United States are defined as those waters subject to the ebb and flow of the tide shoreward to the mean high water mark or those that are currently used, have been used on the past, or may be susceptible to use to transport interstate or foreign commerce. A Letter of Permission or permit is required from USACE prior to any work being completed within a navigable water. USACE permit authority under the Rivers and Harbors Act of 1899 is not subject to EPA oversight or any other restrictions of the Clean Water Act and, in some cases, the Rivers and Harbors Act alone will apply to activities occurring in water of the United States.

Natural Resource Management Guidelines

National Park Service has developed specific guidelines for the management of natural resources (NPS-77). These guidelines provide for management of native and non-native plant and animal species. They are designed to assist parks in developing resource management plans and action plans for specific park programs in all park management zones: natural, cultural, park development, and special use zones as described in the National Park Service Management Policies and articulated in each park general management plan.

The National Park Service Management Policies (2001) direct the National Park Service to preserve natural resources, processes, systems, and values of units of the national park system in an unimpaired condition, to perpetuate their inherent integrity and to provide present and future generations with the opportunity to enjoy them. Natural resources will be managed to preserve fundamental physical and biological processes, as well as individual species, features, and plant and animal communities. The National Park Service will strive to understand, maintain, restore, and protect the inherent integrity of the natural resources, processes, systems, and values of the parks. The natural resources, processes, systems, and values that the National Park Service preserves are described generally in the 1916 NPS Organic Act and in the enabling legislation or presidential proclamation establishing each park.

3.1.1.2 STATE LAWS AND REGULATIONS

Although federal agencies are not required to comply with the State of California Fish and Game Code, the National Park Service would make every reasonable effort to conduct its actions consistent with relevant state laws and regulations.

California Endangered Species Act

Pursuant to the California Endangered Species Act (CESA; Fish and Game Code §2080 *et seq.*), which is administered by the California Department of Fish and Game (CDFG), state-listed Threatened or Endangered

species are protected from "take." Threatened and Endangered species are listed in Title 14, California Code of Regulations §§670.2 and 670.5. Section 2080 of CESA prohibits take of any of these species. The take of state-listed species incidental to otherwise lawful activities requires an incidental take permit, pursuant to §2081(b) of CESA.

State Fish and Game Code §3513—Adoption of MBTA

Section 3513 of the California Fish and Game Code provides for adoption of MBTA's provisions. It states, "It is unlawful to take or possess any migratory nongame bird as designated in the Migratory Bird Treaty Act or any part of such migratory nongame bird except as provided by rules and regulations adopted by the Secretary of the Interior under provisions of the Migratory Bird Treaty Act." As with MBTA, this state code also offers no statutory or regulatory mechanism for obtaining an incidental take permit for the loss of nongame, migratory birds.

3.1.2 VEGETATION AND WILDLIFE

3.1.2.1 VEGETATION

Before occupation by Europeans, Alcatraz Island was sparsely vegetated (Delgado and Associates, 1992). By 1853, trees and shrubs were planted and terraced gardens were cultivated (Pollack and Howell, 1991). This practice presumably continued until 1963 when the prison was closed (Lutsko Associates, 1992). Soils that were brought to the Island from the mainland and other islands in the San Francisco Bay contained seeds of native plants, including coyote brush (*Baccharis pilularis*), California poppy (*Eschcholzia californica*), and California blackberry (*Rubus ursinus*), which have since become established on the Island (Pollack and Howell, 1991).

Most of the vegetation on Alcatraz Island is dominated by non-native plant species, although approximately 5 percent of the Island has native coastal prairie or coastal scrub communities. Within these areas, certain native pioneer species, such as coyote brush, are becoming established in areas that were formerly cultivated. In general, Alcatraz Island consists of grassland, shrubs, historic gardens, non-native trees, cliffs and other barren areas, and historic buildings and paved areas.

The landscape vegetation consists of a diverse group of non-native ornamental shrubs and trees, and is considered part of the cultural resource on the Island. These provide most of the vegetative structure and habitat for wildlife on the Island. Shrubs are the most dominant plant form and include rose (*Rosa* spp.), mirrorbush (*Coprosma baueri*), fig (*Ficus carica*), blackberry (*Rubus* spp.), agave (*Agave* spp.), Australian tea tree (*Leptospermum laevigatum*), mimosa (*Albizia lophantha*), coyote brush, plume acacia (*Acacia* spp.), and ivy (*Hedera helix*). Tree species include eucalyptus (*Eucalyptus* spp.), Victorian boxwood (*Pittosporum crassifolium*), and Monterey cypress (*Cupressus macrocarpa*). A small stand of native grassland dominated by creeping wildrye (*Leymus triticoides*) is located along the Northeast Perimeter Trail near the Power House Complex; this is one of the largest grassland areas on the Island. Another smaller stand is present in the Cistern area. Ruderal vegetation occurs along the edges of walkways, buildings, and building remains. Dominant species found in these areas include wild oats (*Avena* spp.), wild radish (*Raphanus satina*), mustard (*Brassica* spp.), and cheeseweed (*Malva parviflora*). Rocky cliffs and bluffs are found primarily along the Island perimeter, and there is a small rock outcrop adjacent to the northwest corner of the Parade Ground. While some of the steeper cliffs on Alcatraz (e.g., between the Model Industries and New Industries Buildings) are barren of vegetation, the southwestern cliffs support various succulents, agave, sourgrass, sweet alyssum, wild radish, and large shrubs in the areas where Brandt's cormorants, western gulls and pigeon guillemots nest. These provide nesting material and protection for gulls, cormorants and guillemots (Thayer, pers. comm., 2000). An extensive grassy area occurs above the cliffs along the northeastern shore. The more gently sloping cliffs support a variety of introduced plants (Pollack and Howell, 1991).

3.1.2.2 ADDITIONAL WILDLIFE SPECIES

During much of the year, nesting waterbirds are the most common wildlife species on Alcatraz Island. Although these species are not afforded special status by state and federal agencies, they are protected under the Migratory Bird Treaty Act and are of interest in the San Francisco Bay area, and are addressed in this EIS. In addition to colonial waterbirds, several other bird species have been documented as breeding on the Island, including Canada goose (*Branta canadensis*), mallard (*Anas platyrhynchos*), common merganser (*Mergus merganser*), Anna's hummingbird (*Calypte anna*), common raven (*Corvus corax*), brown-headed cowbird (*Molothrus ater*), song sparrow (*Melospiza melodia*), white-crowned sparrow (*Zonotrichia leucophrys*), and house finch (*Carpodacus mexicanus*) (Hatch, pers. comm., 2000). A pair of Heerman's gulls (*Larus heermanni*) attempted unsuccessfully to nest in 1979 through 1982 (Boarman, 1989).

The Alcatraz Bird Census (ABC) has been conducted yearly since 1993 to document birds using the Island during the fall and winter months. Eighty-nine species were identified during censuses conducted from September 1998 to January 1999. The 10 most frequently identified species during these censuses, in descending order, were western gull (*Larus occidentalis*), white-crowned sparrow (*Zonotrichia albicollis*), song sparrow (*Melospiza melodia*), double-crested cormorant (*Phalacrocorax auritus*), common raven (*Corvus corax*), Anna's hummingbird (*Calypte anna*), black phoebe (*Sayornis nigricans*), fox sparrow (*Passerella iliaca*), European starling (*Sturnus vulgaris*), and yellow-rumped warbler (*Dendroica coronata*)(Carré, 1999). In addition to birds, several other vertebrates occur on Alcatraz Island, including deer mouse (*Peromyscus maniculatus*), California slender salamander (*Batrachoseps attenuatus*), Norway rat (*Rattus norvegicus*), and bat species. Seals and sea lions are protected under the Marine Mammal Protection Act. Small numbers of seals and sea lions haul out on or near Alcatraz. They are addressed further in Section 3.1.2.3. Deer mice are common and widespread across most of North America and are abundant on the Island. Mark/recapture studies indicated that the areas of highest mice concentrations were the rubble piles, the shrubbery west of the Cellhouse, and along the eastern shore (Pollack, no date). Howell has found that deer mice prefer grassland habitats on the Island.

Norway rats were first observed on the Island in 1998. This species is widespread and occurs in association with human habitation, as well as in natural environments. They are prolific, breeding more or less continuously when they reach breeding age (Jameson and Peeters, 1988). The presence of Norway rats on Alcatraz Island is of concern because of their potential as predators on waterbird eggs and chicks on the Island. Rats have also been known to reduce or eliminate native rodent populations on islands (Collins, 1979).

California slender salamanders are small, lungless salamanders that do not require water for breeding, although they lay their eggs in moist ground, usually under rotting logs (Stebbins, 1985). Preliminary surveys on Alcatraz Island have revealed that large populations of slender salamanders are present in the Dock area (in the adjacent hillside), in the northeast section of the Agave Path near the Dock, and near the Parade Grounds (Martin, pers. comm. referenced in LSA Associates, Inc., 1993). The northern end of the Island tends to have moister substrate and may support a higher concentration of salamanders than the rest of the Island. Neither the salamander nor its eggs can tolerate salt spray, so they are confined to upland areas of the Island. The Alcatraz population of slender salamander is dormant during dry summer months, spending this period in deep burrows. Populations on Alcatraz Island are either endemic to the Island or were introduced inadvertently with soil brought to the Island during construction projects (Martin and Lawson, 1991).

3.1.2.3 SPECIES OF INTEREST

This section discusses wildlife species that are considered to be of interest, but are not formally listed or otherwise afforded special status by state or federal resource agencies. These species include monarch butterfly (winter roost sites are CDFG special concern), Pacific herring (CDFG species of concern in the San Francisco Bay), harbor seal (*Phoca vitulina*), California sea lion *(Zalophus californicus*), and eight waterbird species (nesting populations on Alcatraz are considered regionally important). The waterbird species discussed below are those

that nest on the Island: Brandt's cormorant, pelagic cormorant (*Phalacrocorax penicillatus*), great egret (*Ardea alba*), snowy egret (*Egretta thula*), black-crowned night-heron (*Nycticorax nycticorax*), black oystercatcher (*Haematopus bachmani*), western gull (*Larus occidentalis*), and pigeon guillemot (*Cepphus columba*).

For each waterbird species, a description of habitat, regional population, historic and current population on Alcatraz, reproductivity and sensitivity to disturbance is provided. Table 3.1-1 provides an overview of the nesting seasons and peak sensitivity periods for these species. Peak sensitivity periods were determined based on review of available data on waterbirds from Alcatraz Island and elsewhere. The table provides graphic representation of the most sensitive time periods within the breeding season for each waterbird species on the Island. It should be emphasized that these are protected species that are sensitive throughout their breeding season, and that Table 3.1-1 is intended to highlight the periods of greatest vulnerability. The original intent was to use the table as a tool to predict and minimize the impact of construction activities through phasing. However, due to location of the proposed repairs, differences in peak sensitivity periods between species and the interrelationship among species during disturbance events, the majority of the breeding season (February–August) is considered sensitive. The location of nesting areas, population size and other relevant information is below.

Monarch Butterfly (winter roosting site). Monarch butterflies (*Danaus plexippus*) winter along the Pacific Coast in roost sites, from northern Mendocino County to Baja California, Mexico. These winter roost sites are of special concern to CDFG. They are usually located in wind-protected tree groves (e.g.,

Placeholder for

Table 3.1-1 Waterbird Nesting Seasons and Peak Sensitivity Periods on Alcatraz Island

eucalyptus, Monterey pine, cypress), with nectar and water sources nearby. Alcatraz Island is a small but significant site used briefly during fall migration by monarchs migrating to coastal areas to overwinter. Approximately 100 to 300 monarch butterflies have been reported by National Park Service staff during mid- to late September on vines on the east side of the Island, and approximately 500 monarch butterflies were observed on September 28, 1984, near the chapel. They are usually present for a 1- to 5-day period and may be observed flying over any portion of the Island (National Park Service file information). The eucalyptus and cypress trees present on the east side of the Island represent potential roost sites. Monarch butterflies do not appear to be adversely impacted by human activity and/or noise, provided there is no direct disturbance within the roost site vegetation (Monroe, pers. comm., 1999).

Pacific Herring. Pacific herring (*Clupea harengus pallasii*) spawn each year along the perimeter of Alcatraz Island. The normal spawning season in the San Francisco Bay occurs from October through April, although it begins in December along the perimeter of the Island (USACE et al., 1998). Although eelgrass beds provide the primary habitat for spawning and rearing of juvenile fish, herring utilize both natural and unnatural substrates for spawning. As a result, potential spawning habitat at Alcatraz Island includes the Dock area. However, this is a small portion of the spawning habitat available for Pacific herring in the San Francisco Bay.

Marine Mammals. Harbor seals (*Phoca vitulina*), California sea lions (*Zalophus californicus*) and occasional northern elephant seals (*Mirounga angustirostris*) are known to occur in San Francisco Bay. Incidental observations by Point Reyes Bird Observatory seabird biologists (Thayer, pers. comm., 2000) and from National Park Service files (Howell, NPS files, 1982-1990) indicate that California sea lions haul out on an infrequent and irregular basis year-round on the rocks below the foghorn on the northwest tip of the Island, below the Model Industries Building. A total of five incidental observations in 1998 and 1999 ranged from 10 to 16 animals at this site. Harbor seals haul out on an irregular basis on Little Alcatraz, a small rock just northwest of Alcatraz. The maximum number counted on Little Alcatraz was 14, with all observations occurring at a +1.5 foot (mean sea level [msl]) tide or less. One or two harbor seals haul out sporadically year-round on the rocks along the Agave Trail, and at the tidepools at the south end of the Island (Thayer, pers. comm., 2000). Harbor seals and California sea lions also frequent the waters around the island, and one immature northern elephant seal was observed offshore in 1998. On one occasion, a harbor seal raised a pup in the area of the Power House, although it is unknown if she gave birth to the pup on the Island (LSA Associates, Inc., 1993).

Brandt's Cormorant. Brandt's cormorants are restricted to marine and estuarine habitats, primarily coastal waters, but also large bays and occasionally estuaries and coastal lagoons. Breeding colonies are usually located on islands but are also found on the mainland near promontories and on isolated cliffs. Nests are built on the ground, usually in flat or gently sloping areas on the windward side of islands or on ledges of steep cliffs (Wallace and Wallace, 1998).

Regional Status. The nesting colony on Alcatraz Island is the only known existing Brandt's cormorant colony in the San Francisco Bay (Fairman et al., 1998), although 4 nests were recorded on Yerba Buena Island in 1990 (Carter et al., 1992). The number of nesting Brandt's cormorants on the Point Reyes National Seashore in 1979–1997 has ranged from 73 in 1985 to 1,200 in 1979 (McChesney et al., 1998). In general, 300 to 400 pairs have nested each year. Nesting cormorants on Año Nuevo Island in 1992–1999 ranged from 50 to 737, although 300 to 400 pairs nested in most years (Point Reyes Bird Observatory, preliminary data). The colony on the Farallon Islands is the largest in the region. In 1989, 7,600 nests were counted on Southeast Farallon Island and West End Island (Carter et al., 1992); 3,172 nests were estimated on these islands in 1999 (Mills et al., 1999). The Farallon Island population of Brandt's cormorants has declined significantly over the last decade, which has increased the importance of the coastal colonies at Point Reyes, Año Nuevo and Alcatraz.

Historic and Current Status of Alcatraz Population. The first confirmation of breeding on Alcatraz Island occurred in 1991, when 3 nesting pairs were observed. The number of nests increased to at least 231 in 1996, then decreased in 1997 and 1998 to 215 and 124, respectively. However, a peak number of 248 nests occurred in 1999. This

fluctuation between 1996 and 1999 was primarily due to changes in the North subcolony, which was occupied early in the breeding season but then abandoned in 1998, but was reoccupied by 63 nesting pairs in 1999 (Thayer et al., 1999; Point Reyes Bird Observatory, 1999, preliminary data). Abandonment of this subcolony in 1998 was probably influenced by oceanographic conditions brought on by El Niño (Thayer et al., 1999).

Brandt's cormorant nesting on Alcatraz Island occurs in up to five subcolonies on the west side of the Island referred to as the Model Industries, Laundry, North, South, and South Bricks subcolonies. Refer to Figure 3.1-1 for the location of Brandt's cormorant subcolonies on Alcatraz Island. Data for all subcolonies has been collected since 1997. From 1997 to present, 73 percent to 82 percent of all nests have been located in the North and South subcolonies. Model Industries was the smallest subcolony until 1999 when 30 nests were located there (Point Reyes Bird Observatory, 1999, preliminary data).

It should be noted that Brandt's cormorants use the cliffs south of the south subcolony extensively for roosting (Figure 3.1-1). Up to 300 birds, a number of which were immature individuals, have been counted on the cliffs during the first half of the season in both 1997 and 1998 (through mid-June). Only about 150 birds frequented this area in 1999, perhaps due to the increased use of a second roosting area below the north foghorn below the Model Industries Building. Groups of up to 70 cormorants were observed at the north foghorn roost in 1999, with up to 600 Brandt's and double-crested cormorants seen in feeding and bathing flocks directly off the north cliffs. Some courtship behaviors (e.g., advertising, billing) were observed among these birds.

In general, numbers of roosting birds seemed highest in the early morning, declined during midday and afternoon, and then increased substantially during the late afternoon. Attendance of roosting cormorants appeared to decline as the season progressed. Some of the birds roosting on these cliffs early in the season may have later bred at sites in the North, Laundry, and Model Industries subcolonies as timing of breeding in these areas was later than at the South subcolony. The south and north cliffs of Alcatraz may serve as important sites for Brandt's cormorants for resting and for development of breeding behaviors in young birds.

Late in the season, use of the South subcolony roosting area increased again, along with use of the seawall below the Laundry Building. Brandt's cormorant chicks continue to be fed by their parents after they have "fledged" (i.e., started wandering), and even for a period after they start to fly. As chicks grow older, they demand food from their parents more and more aggressively, often chasing their parents from the nest site and even from the subcolony. The South subcolony roosting area and the seawall became heavily used creching (gathering) sites during this period, where many parents returned to feed fledglings (Thayer, 1999).

The western and northern cliffs are also used as roosting areas by hundreds of Brandt's and double-crested cormorants during the fall and winter months, but on an unpredictable basis (Carré, 1999; Howell, NPS files).

Placeholder for

Figure 3.1-1 Brandt's Cormorant Nesting Subcolonies on Alcatraz Island

Reproduction on Alcatraz Island. The Brandt's cormorant nesting season on Alcatraz Island occurs from early March through September. Timing of egg laying has varied between years, but it begins as early as April, with pre-breeding courtship and nest building beginning in early March. Fledging was assumed when chicks were large enough to wander from their nests, and could no longer be assigned to a particular nest, but were not yet fully feathered or able to fly. This occurs as late as early September, although young may still be present in the colonies until late September. However, there has been a marked difference in timing of nesting between subcolonies and between years. In 1999, birds began laying eggs two to three weeks earlier in the South subcolony than in the Laundry and Model Industries subcolonies, and six weeks earlier than in the North subcolony. Consequently, the latest fledging dates occurred in late July in the Southern and Laundry subcolonies, mid-August at Model Industries, and early September in the North subcolony (Point Reyes Bird Observatory, 1999, preliminary data).

Productivity of Brandt's cormorants ranged from 1.61 to 2.34 chicks per nest between 1999 and 1998. Overall, the productivity of Brandt's cormorants on Alcatraz Island appears to be significantly higher than productivity rates on the outer coastal areas including Point Reyes National Seashore and the Farallon Islands. Brandt's cormorant productivity appears to be adversely affected by El Niño events, even within the San Francisco Bay environment.

Sensitivity to Disturbance. A monitoring program to assess the effects of disturbance on seabirds nesting on Alcatraz Island was conducted in April-July of 1997 and 1998 and March-August of 1999 (Fairman et al., 1998; Thayer et al., 1999; Point Reyes Bird Observatory, 1999, preliminary data). Results suggest that Brandt's cormorants are most sensitive to disturbance during the early stages of the nesting cycle. In 1998, two pairs building nests in the South subcolony were flushed by researchers monitoring night-heron subcolonies, and did not return to continue their nesting attempt. In addition, the North subcolony was entirely abandoned for the 1998 breeding season following a series of off-island disturbances in April through June. In 1999, the North subcolony was temporarily abandoned due to a two-day disturbance caused by a jet ski incident. Consequently, egg laying occurred four to six weeks later than in the other subcolonies. However, despite the large number of disturbances that caused numerous birds to flush, including mates of incubating or brooding birds, no incidents were observed that resulted in flushing actively incubating or brooding adults. This does not indicate, however, that flushing of incubating birds never occurs. Numerous disturbance incidents that resulted in flushing of adults have been observed from vantage points where the actual nests were not visible, although the adults could be seen when flushed. In April 2000, an inflatable zodiac approached within 130 feet of the south subcolony, stopped, then departed at a high rate of speed. At least 100 cormorants flushed from the active nesting area. Many adults attending nests were likely flushed, although the actual nests (and incubating birds) were not visible at the time. Throughout the breeding season, Brandt's cormorants may be less tolerant of island-based disturbance, particularly when visible to nesting birds. Visible island-based disturbances occur less frequently and may be in closer proximity to nesting colonies than water-based disturbances.

Brandt's cormorants may be more tolerant of island-based disturbance associated with elevated noise levels when it is not visible to nesting birds. During the 1997 nesting season, a video was filmed inside the Laundry Building. The filming took place over a few hours at mid-day. Music played in the Laundry Building did not seem to significantly disturb Brandt's cormorants nesting nearby. Researchers observed several cormorants look in the direction of the noises, but none were flushed from their nests (Fairman et al., 1998). This is probably a result of activity being confined to the building, so participants were not visible to the cormorants.

Based on results from disturbance monitoring, peak sensitivity for Brandt's cormorants on Alcatraz Island occurs early in the nest cycle, during courtship, nest building, and nest initiation. Apparently, Brandt's cormorants on Alcatraz Island are fairly tolerant of external disturbance while they are actively incubating eggs or brooding young (Thayer et al., 1999). The onset of the peak sensitivity period appears to correspond with the beginning of pre-breeding activities, which occurs as early as early March, and continues until the end of egg laying, which occurs as late as early July (Point Reyes Bird Observatory, 1999, preliminary data).

Pelagic Cormorant. Pelagic cormorants breed in rocky areas in a variety of near shore habitats including outer coast, bays, estuaries, harbors, and lagoons. They nest in loose colonies or solitarily on cliffs of forested, grassy, and rocky islands and headlands. They will also use human-made structures such as beacons, bridges, wharves, and abandoned towers. Pelagic cormorants prefer narrow ledges on high, steep inaccessible cliffs (Hobson, 1997).

Regional Status. Alcatraz Island is one of only a few locations in the San Francisco Bay where pelagic cormorants nest. Two nests were documented on Yerba Buena Island in 1990 (Carter et al., 1992), and nesting was confirmed at Brooks Island Jetty near Richmond in 1997 and 1998 (Spear, pers. comm., 1999). Data from other colonies include an estimated 133 nests on the Point Reyes National Seashore in 1989 (Carter et al., 1992) and 28 nests on Año Nuevo State Reserve in 1999 (Thayer et al., 1999). An estimated 400 nests were present on the southern Farallon Islands in 1987, and 111 nests were counted on Southeast Farallon Island and West End Island in 1999 (Carter et al., 1992, Mills et al., 1999). The Farallon Island pelagic cormorant population has declined significantly over the last decade, which has increased the importance of the coastal colonies at Point Reyes, Año Nuevo and Alcatraz.

Historic and Current Status of Alcatraz Population. Nesting pelagic cormorants were first observed on Alcatraz Island in 1986, when approximately six nests were located. Because most nest sites are not visible from the Island, boat surveys have been conducted since 1997 to obtain more accurate counts of breeding pairs. The number of pelagic cormorant nests were 20, 12, and 19 in 1997, 1998, and 1999, respectively. The majority of nests occurred on the northwest side of the Island, below the Model Industries and Laundry Buildings. Nesting has also occurred above Barker Beach. Refer to Figure 3.1-2 for the location of pelagic cormorant nesting subcolonies on Alcatraz Island.

Reproduction on Alcatraz Island. The pelagic cormorant nesting season on Alcatraz Island occurs from February through August. Pre-breeding activity has been observed as early as mid-February on the Island, and the first eggs are laid as soon as mid-April. The first chicks hatch in mid-May and the last chicks fledge as late as mid-August (Thayer et al., 1999; Point Reyes Bird Observatory, 1999, preliminary data). Unlike dates provided for Brandt's cormorants, these fledging dates refer to when young are fully feathered and able to fly.

Information on productivity is very minimal due to the difficulty of observing chicks during boat surveys. As a result, only nests visible from the Island can be used to provide information on productivity. In 1998, 3 nests were monitored, and all of them fledged at least one chick (Thayer et al., 1999). In 1999, 16 nests were monitored, and productivity was 1.94 chicks per nest (Point Reyes Bird Observatory, 1999, preliminary data).

Placeholder for

Figure 3.1-2 Pelagic Cormorant Nesting Subcolonies on Alcatraz Island

Sensitivity to Disturbance. There is no direct information from Alcatraz Island regarding when pelagic cormorants are most sensitive to disturbance. However, it is likely to be similar to that of Brandt's cormorants, which are most sensitive to disturbance during the early stages of the nesting cycle, prior to incubation. Consequently, the peak sensitivity period is expected to correspond with the beginning of pre-breeding activities, which may occur as early as mid-February, and continue until the end of egg laying, which occurs as late as mid-May (Point Reyes Bird Observatory, 1999, preliminary data).

Great Egrets. Great egrets nest primarily in habitat associated with marshes, swamps, tidal estuaries, and fresh- and brackish-water margins. They usually nest in colonies, although some nest in isolated pairs. Platform nests are made of sticks and built in shrubs and trees, generally within 40 feet of the ground but sometimes almost 100 feet up in a tree (Ehrlich et al., 1988).

Regional Status. Alcatraz Island is one of numerous nesting locations for great egrets in the San Francisco Bay Area. They were recorded nesting at six sites in the southern Bay in 1982–1997 and 17 sites in the northern Bay in 1991 (Kelly et al., 1993). Results from various monitoring programs suggest an average of 700 to 800 great egret nests per year in the Bay Area, and these populations appear to have been stable in recent years (Kelly, pers. comm., 2000).

Historic and Current Status of Alcatraz Population. Great egrets nested on Alcatraz in 1995–1997. Two nests were observed near the Dock night-heron subcolony in 1996, and one nest was found in this area in 1995. In 1997, one nest was found in the Bench night-heron subcolony. Since 1997, no great egrets have nested on Alcatraz.

Reproduction on Alcatraz Island. Information on great egret nesting on Alcatraz Island is available from only one nest, which was initiated unusually late, in early July, and fledged 2 young in October (Hatch, pers. comm., 1999). Data collected in 1967-1979 at a colony in coastal Marin County showed an overall mean nest initiation date of April 30, with annual means ranging from April 14 to May 25. The earliest nest initiation occurred March 15 and the latest the first nest was initiated was April 29 (Pratt and Winkler, 1985). Based on published incubation and nestling periods for great egret (Ehrlich et al., 1988), these nest initiation dates would result in hatching dates ranging from April 7 to June 20 and fledging dates ranging from May 19 to July 8.

Sensitivity to Disturbance. There is no direct information from Alcatraz Island regarding when great egrets are most sensitive to disturbance. However, based on data from other nesting sites, they are known to be most sensitive to disturbance early in the nesting season, prior to incubation (Kelly, pers. comm., 2000). Once great egrets are incubating, they become fairly resilient to disturbance and do not tend to flush easily. There is another sensitive period for the first month after the chicks hatch. During this time, the adults are more easily flushed, leaving unattended chicks vulnerable to opportunistic predation (Kelly, pers. comm., 2000). The peak sensitivity period corresponds with the onset of pre-breeding activities in early March and continues until egg laying is complete, which may occur as late as early June.

Snowy Egrets. Snowy egrets nest in habitat associated with marshes, lakes, ponds, and other shallow coastal waters. In general, they nest low in vegetation, 5 to 10 feet from the ground, although they will nest up to 30 feet above the ground and occasionally place nests on the ground in marsh vegetation (Ehrlich et al., 1988).

Regional Status. Alcatraz Island is one of several nesting locations for snowy egrets in the San Francisco Bay Area. They were recorded nesting at 7 sites in the southern Bay Area in 1982–1997 and 7 sites in the northern Bay Area in 1991–1997 (Kelly and Fischer, 1998; Ryan and Parkin, 1998). Results from various monitoring programs suggest an average of 500 to 600 snowy egret nests per year in the Bay Area in the mid-1990s. However, approximately 400 to 500 nests were present in the southern Bay Area alone in the mid-1980s. This is primarily a result of desertion of the Bair Island colony and a two-thirds reduction in the Mallard Slough colony (Ryan and Parkin, 1998). Desertion of the Bair Island colony may have been due to predation by red fox. These results suggest a recent decline in the southern Bay Area population and the San Francisco Bay Area as a whole.

Historic and Current Status of Alcatraz Population. Snowy egrets have nested on the Island each year since 1997. There were 3 nests in 1997, 11 nests in 1998, and 8 nests in 1999 (Hothem, 1999; Hothem, pers. comm., 1999). All of the nests have been located in the Tunnel Area, except for one nest in the Foghorn Area in 1999 (Hothem, pers. comm., 1999). Refer to Figure 3.1-3 for the location of nesting snowy egrets on Alcatraz Island.

Reproduction on Alcatraz Island. The snowy egret nesting season on Alcatraz Island occurs from late March to early July. In 1998 and 1999, dates of nest initiation ranged from late April to late May. Most chicks hatched in late May, although some hatched as late as mid-June. Nest outcome and fledge dates are only known for two nests, which fledged young in early June (Hothem, pers. comm., 1999). However, based on data collected elsewhere in the Bay Area (1989–1992), nest initiation can occur as early as late March and as late as mid-June, hatching dates range from late April to early July, and fledging occurs from mid-June to late August (Hothem, pers. comm., 2000). Two of the 3 snowy egret nests on Alcatraz hatched young in 1997, and 10 of the 11 nests hatched young in 1998. Six of 8 nests that were monitored in 1999 hatched one or more chicks, and 3 of them eventually fledged at least one chick (to 10 days of age). Two of the other nests failed before hatching: one was destroyed by a predator, and the other was not monitored long enough to determine its fate. Overall numbers of fledged young are unknown because most nests could not be revisited due to sensitive location (i.e., night-heron chicks were present in the area, and disturbance and subsequent predation by western gulls is highest after the gull chicks hatch in early June).

Sensitivity to Disturbance. There is little direct information from Alcatraz Island regarding when snowy egrets are most sensitive to disturbance, although it is expected to be similar to great egrets, which are most sensitive early in the nesting season, prior to incubation (Kelly, pers. comm., 2000). Point Reyes Bird Observatory biologists observed snowy egrets flushing as a result of disturbance during April (Thayer, pers. comm., 2000). Snowy egrets may also experience another sensitive period for the first two weeks after the chicks hatch, when the adults are more easily flushed, but the chicks should not be left alone. After two weeks of age, chicks may normally be left unattended, but are themselves sensitive to disturbance. At this age they become potential "runners" (not yet able to fly) and can be flushed dangerously far from their nests. They continue to be vulnerable to disturbance for at least a week after being left unattended by parents. Chicks begin flying at around four to five weeks of age (Kelly, pers. comm., 2000). The peak sensitivity period corresponds with the onset of pre-breeding activities in early March and continues until egg laying is complete, which may occur as late as mid-June.

Nesting colonies of snowy egrets and black-crowned night-herons on other islands in central and southern San Francisco Bay have been abandoned in recent years, following disturbance, or predation by non-native red fox and raptors (Kelly et al., 1995; Ryan and Parkin, 1998). Disturbance by humans (including tree trimming and other activities/disturbances within residential areas) has been associated with abandonment of at least 7 snowy egret/black-crowned night-heron colony sites in suburban areas of the northern San Francisco Bay region during the 1990s (Kelly, pers. comm., 2000).

Placeholder for

Figure 3.1-3 Snowy Egret Nesting Subcolonies on Alcatraz Island

Black-Crowned Night-Heron (rookery). Black-crowned night-herons are colonial breeders that nest in a variety of fresh, salt, and brackish water habitats, provided there is suitable wetland habitat nearby for foraging. Night-herons nest in a wide variety of habitats, including cattails, bulrush, and other emergent vegetation, islands with shrubs (including Alcatraz Island, Bair Island, West Marin Island, Brooks Island, Red Rock, and Lake Merritt in San Francisco Bay Area), trees in neighborhoods, in groves of trees tens to hundreds of feet off the ground up to several miles from water, and in areas with little or no vegetation (e.g., rubble piles at Alcatraz Island). Nests are built at a wide range of heights and on a variety of substrates, including deciduous and evergreen trees, vines, and cattails. Night-herons build platform nests constructed of sticks, twigs, or stems of whatever vegetation is available (Davis, 1993). On Alcatraz Island, night-herons construct nests in woody vegetation, including mirrorbush, fig, blackberry, ivy, Australian tea tree (*Leptospermum laevigatum*), rose, mimosa (*Albizia lophantha*), Victorian boxwood tree, and Monterey cypress, with the majority of nests built in mirrorbush.

Regional Status. Black-crowned night-herons nest at several colonies in the San Francisco Bay Area, but since at least 1990, Alcatraz Island has supported one of the largest colonies (Hothem, 1999). Night-herons nested at 7 sites in the southern Bay Area in 1982–1997 and 8 sites in the northern Bay Area in 1990-1995. Results from various monitoring programs suggest an average of 700 to 800 night-heron nests per year in the Bay Area in the mid-1990s. Apparently, however, there has been a notable decline in the southern Bay Area from nearly 600 nests in 1982 to 300 to 400 in the mid-1980s and 200 to 250 by the mid-1990s (Ryan and Parkin, 1998). Numbers of nests in the northern Bay Area do not appear to have decreased during the 1990s, ranging from an estimate of 377 in 1991 to 481 in 1998, with a peak of 729 in 1995. Although this is due in large part to the peak in the population on Alcatraz Island in the mid-1990s, the difference may partly reflect relatively greater detectability of hidden nests on Alcatraz, where observers directly entered nesting areas, than at other colonies which were monitored from the perimeter (Kelly, pers. comm., 1999). For example, in 1992, the boat survey of West Marin Island counted less than 50 night-heron nests, while the on-the-ground survey conducted by Roger Hothem located approximately 300 nests (Hothem, pers. comm., 2000). Actual numbers of night-herons counted during boat surveys represent gross estimates. Regional estimates, therefore, represent relative numbers due to the difficulty in detecting night-herons (Kelly et al., 1993; Ryan and Parkin, 1998).

Historic and Current Status of Alcatraz Population. The first reported nesting of black-crowned night-herons on Alcatraz Island occurred in 1975 (NPS files). Nests occur in 11 subcolonies on the Island: Auxiliary Dock, Dock, Bench, Rubble, Tunnel, Greenhouse, Recreation Yard, Foghorn, Power Plant, Wall, and Shower. In 1999, chicks were heard from at least one nest on the steep slope below the southwestern side of the Cellhouse. Because the site was inaccessible to the biologist, it was not possible to determine the exact number of nests, but one to three were estimated. The subcolonies are spread over the Island, yet the majority occur in the southern area. Refer to Figure 3.1-4 for the location of black-crowned night-heron subcolonies on Alcatraz Island. Nests in each subcolony have been monitored since 1990.

The total number of active night-heron nests has ranged from a low of 124 in 1991 to a high of 341 in 1996. These totals reflect the minimum number of nests, because late or replacement nesting attempts are not counted after early June if the subcolony is in close proximity to large numbers of western gulls. Since 1996, the number of nests has declined each year (Hothem, 1999), and there were only 163 nests in 1999 (Hothem, 1999, preliminary data). The vast majority of nests (83 percent) in 1999 were located on the south coast (i.e., Auxiliary Dock, Dock, Bench, Rubble, and Tunnel). Over the years of the study, there has been a general decrease in the percentage of nests in the central area (i.e., Greenhouse, Recreation

Placeholder for

Figure 3.1-4 Black-crowned Nigh-heron Nesting Subcolonies on Alcatraz Island

Yard, Wall, and Shower) and a general increase in the percentage of nests on the south coast. The main decrease has occurred at Greenhouse. It is believed that night-herons stopped utilizing this area, in part, as a result of the increase in fig stem density, making it difficult to penetrate the vegetation. The concurrent increase in nests on the south coast is likely due to the dramatic increase in vegetation in the Rubble and Tunnel subcolonies.

Reproduction on Alcatraz Island. The nesting season for black-crowned night-herons on Alcatraz occurs from early March through September. Courtship and nest building begin about one week prior to the first egg being laid (Palmer, 1962). The earliest date of nest initiation (the day the first egg is laid) has been fairly consistent, ranging between mid- and late March. Although night-herons only have one brood per season, they will re-nest if the first brood is unsuccessful. As a result, nest initiation has occurred as late as July 24 (Hothem, 1999). The latest dates for complete colony departure have varied substantially, ranging from August 10 to October 6, although in most years (6 of 9) it has occurred by mid-September (Hothem, 1999).

Nest success of night-herons on Alcatraz has fluctuated substantially between 1990 and 1999. Similar variations in productivity have been documented at other locations throughout the species' range. The reasons for fluctuation in productivity have not been documented and are unknown.

Sensitivity to Disturbance. Effects of disturbance to black-crowned night-herons associated with researchers entering colonies have been well documented. Little data, however, are available on disturbance impacts associated with visitors and construction-related activities. Research has shown that black-crowned night-herons are most sensitive to disturbance in the early stages of the nesting cycle, during courtship and nest construction when they are establishing territories (Tremblay and Ellison, 1979; Parsons and Burger, 1982; Erwin 1989). Disturbance during the pre-laying period may result in almost complete abandonment with less adverse impacts during the egg and chick period, although Tremblay and Ellison (1979) did observe abandonment and nestling mortality as a result of some post-hatching disturbance. Disturbance mortality may be the result of complete abandonment, breakage of eggs, as well as exposure of unprotected eggs and young to adverse temperatures and/or predation. It has been noted by Kelly (pers. comm.) that heron colonies are highly variable in their response to humans. Night-heron colonies at Napa and Santa Rosa, for instance, tolerate limited human presence while other colonies flush easily at the approach of people. Work by Erwin (1989) with mixed species colonies revealed that night-herons always flushed before other species of herons and egrets.

Based on monitoring conducted on Alcatraz Island, territory establishment and early breeding activities typically occur from March through May. The peak sensitivity period is expected to correspond with the beginning of pre-breeding activities, which may occur as soon as early March, and continue until the end of egg laying, which occurs as late as late July. In addition, night-heron chicks and adults on Alcatraz are susceptible to attack and predation by western gulls, particularly after most gull chicks hatch in early June. Disturbance to gulls and/or night-herons during this period increases attacks on night-herons. Night-heron eggs are also susceptible to predation by gulls and common ravens when eggs are left unattended as a result of disturbance. Nocturnal predation by great-horned owls on adult herons and egrets is also suspected on Alcatraz and may have caused some birds to abandon the Island during 2000.

Researchers and National Park Service staff have noted that response to disturbance on Alcatraz varies between subcolonies and may be attributable, in part, to density of vegetation and proximity to visitors. Acclimation of night-herons to people may reduce the effects of disturbance in subcolonies closer to the public, while more isolated subcolonies are more easily disturbed by human presence. Researchers and National Park Service staff have also noted that night-herons on Alcatraz and in Santa Rosa and Napa appear to be less sensitive to human presence beneath their colonies than when approached from above.

During activities related to a premiere for the movie "The Rock" in early June, night-heron behavior was monitored for response to crane operations at the Sallyport and Morgue areas, groups of visitors, public address systems on ferry boat tours, and aircraft overflights. The Wall and Power Plant night-heron subcolonies were

monitored during crane operations. Researchers observed a number of adults and chicks in alert postures, flight, normal chick "chattering," and alarm calling. Alarm calls occurred less often, usually when disturbance was loud or close to the individual. As activities increased in these areas the night-herons retreated into the vegetation and remained hidden and silent until activity stopped late at night. Immediately after work stopped and lights were turned off, night-heron chicks and adults resumed normal activity as observed prior to arrival and operation of the barge and crane. Observations indicated that large night-heron chicks habituated to heavy equipment operation and construction activities within one day (Hatch, 1996). The most visible, but unquantifiable, effect of the premiere activities appears to have been increased aggression of gulls directed toward fledgling night-heron chicks that were inexperienced flyers or still unable to fly. The timing of the premiere coincided with peak gull hatching, when gulls normally display increased aggression. The year following the premiere, both the Wall and Fog Horn night-heron subcolonies experienced a decline in numbers of nests. It is unknown whether the decline is directly attributable to the premiere event, or other off-site events occurring during that breeding season.

Nesting colonies of snowy egrets and black-crowned night-herons on other islands in central and southern San Francisco Bay have been abandoned in recent years, following disturbance, or predation by non-native red fox and raptors (Kelly et al., 1995; Ryan and Parkin, 1998). Disturbance by humans (including tree trimming and other activities/disturbances within residential areas) has been associated with abandonment of at least 7 snowy egret/black-crowned night-heron colony sites in suburban areas of the northern San Francisco Bay region during the 1990s (Kelly, pers. comm., 2000).

Black Oystercatcher (nesting). Black oystercatchers select territories on marine shorelines that provide both foraging and nesting sites. Although they avoid vegetated habitats, oystercatchers use a variety of nest sites, including mixed sand and gravel beaches, cobble beaches, exposed rocky shorelines, and offshore boulders. Nest structure ranges from bare rock or sod to a composite of rock flakes and shell fragments (Andres and Falxa, 1995).

Regional Status. The expansion of breeding black oystercatchers into the San Francisco Bay occurred in the mid-1980s. Nests were confirmed on Brooks Island in 1985, and there was one nest on Yerba Buena Island and Marin Island in 1990. In 1989, 3 nests were recorded on the Point Reyes National Seashore, 5 nests on Año Nuevo Island, and 15 nests on the southern Farallon Islands (Carter et al., 1992). In 1999, 3 nests on Año Nuevo Island and 15 nests on Southeast Farallon Island were confirmed (Mills et al., 1999; PRBO, 1999, preliminary data).

Historic and Current Status of Alcatraz Population. Black oystercatchers were first observed nesting on Alcatraz in 1995, when a nest was discovered above the seawall below the Laundry Building (Hatch, pers. comm.). Refer to Figure 3.1-5 for the location of the black oystercatcher nesting area. It is thought that Alcatraz Island can only support one pair of breeding oystercatchers, due to the small size of the Island and their highly territorial behavior. Nesting was confirmed in 1995–1998. One chick was presumed

Placeholder for

Figure 3.1-5 Black Oystercatcher Nesting Subcolonies on Alcatraz Island

fledged each year from 1995 to 1997, but no chicks fledged in 1998. In 1999, a pair was present in the same area during the pre-breeding season, but the site was abandoned in mid-April (see below) (Point Reyes Bird Observatory, 1999, preliminary data).

Reproduction on Alcatraz Island. The black oystercatcher nesting season on Alcatraz Island occurs from mid-February to August. Adults have been observed in the nesting area as early as mid-February, and eggs have been observed in late April. In 1997, chicks hatched in late May, while in 1998, small chicks were not observed until late June. In 1997, a fully feathered chick was observed in early July (Thayer et al., 1999, Fairman et al., 1998). The chicks present in 1998 did not fledge but if they had survived, they would not have been fully feathered until early August. Because the chicks observed in 1995–1997 were mostly to fully feathered, nesting attempts in those years are presumed to have been successful. The nest in 1998 was not successful and a nesting attempt was not confirmed in 1999 (Point Reyes Bird Observatory, 1999, preliminary data).

Sensitivity to Disturbance. There is no known information regarding when black oystercatchers are most sensitive to disturbance. Human disturbance is known to cause breeding pairs to abandon nest sites (Andres and Falxa, 1995), but there is no indication of when during the breeding period they are most sensitive to disturbance. In 1999, a pair of oystercatchers was present at the breeding site in March and early April, but they abandoned the area following an incident on April 17 when two jet skis moored to the Island in the breeding area. The oystercatchers continued to be seen and heard elsewhere on the Island, but did not return to the breeding area until June 13 (Point Reyes Bird Observatory, 1999, preliminary data). It is presumed they did not nest in 1999 as a result of this incident. Oystercatcher chicks are vulnerable to predation by gulls and ravens since they are precocial (born mobile, downy and follow the parents) but are unable to fly for at least 5 weeks.

Western Gull. Western gulls breed on islands along the Pacific coast. Nests are usually on offshore islands, although rocky islets, abandoned piers, and channel markers may also be used. Preference is given to dry, well-drained substrates in rocky or vegetated areas with cover for protection from predators and shelter from prevailing winds. Western gulls often nest in large colonies, but many pairs nest solitarily. The nest is a bowl-shaped depression scraped into the substrate, and is typically lined with vegetation and feathers (Pierotti and Annett, 1985).

Regional Status. Western gulls breed in numerous locations on the coast and within the San Francisco Bay. In 1990, Carter et al. (1992) estimated 1,636 nests at 59 sites within the bay, including 463 nests (28 percent) on Alcatraz Island. In 1989, an estimated 691 nests were present on the Point Reyes National Seashore and 11,123 on the southern Farallon Islands (Carter et al., 1992). In 1999, an estimated 9,883 were present on Southeast Farallon Island (Mills et al., 1999). Data from Año Nuevo Island include estimates of 691 nests in 1989, 637 in 1998 and 775 in 1999 (Carter et al., 1992; Point Reyes Bird Observatory, 1999, preliminary data).

Historic and Current Status of Alcatraz Population. Western gulls likely nested on Alcatraz Island before Europeans occupied the Island in the mid-1800s. In approximately 1973, western gulls re-colonized the Island (Pollack and Howell, 1991). Annual western gull surveys on Alcatraz were initiated in 1990 (Bell, 1990).

The number of gull nests observed was relatively consistent in 1995–1998, ranging from 455 to 541. In 1999, the number was considerably higher (699), but this may be due, in part, to additional areas being surveyed and a change in survey personnel. Nests are distributed across most of the Island, although a high proportion of nests occur on the southeastern section of the Island, primarily on the Parade Ground. In each year since 1995, this area has accounted for 22 percent to 27 percent of nests on the Island. The Cistern located on the northern portion of the Island has also had a relatively high proportion of nests, ranging from 10 percent to 13 percent (Brown, 1999; Point Reyes Bird Observatory, 1999, preliminary data). Both of these are primarily flat, concrete areas.

Reproduction on Alcatraz Island. The western gull nesting season on Alcatraz Island occurs from mid-April through August, however, pre-breeding activity starts as early as January when males return and begin to establish territories. The gulls begin nest building in mid-April and lay eggs from late April through early June, although they will lay a replacement clutch if the first is destroyed. The peak hatching period occurs in early June, and most chicks fledge from early July to late August (Annett and Pierotti, 1995; Point Reyes Bird Observatory, 1999, preliminary data).

Western gulls on Alcatraz generally produce 1 to 2 fledglings per year (Bell, 1991; Brown, 1998; Brown, 1999). This is considerably higher than western gulls on Southeast Farallon Island where productivity has declined drastically in the past decade (Mills et al., 1999).

Sensitivity to Disturbance. Of all the species on Alcatraz, western gulls are probably the least likely to abandon a nesting colony due to disturbance as they are highly adaptable and generally breed in the same location for their entire life. Western gulls are most sensitive to disturbance during the time between when their young hatch and fledge (Gillett et al., 1975; LSA Associates, Inc., 1993; Spear, pers. comm., 1999). Consequently, the peak sensitivity period for western gulls is early June to mid-August. If they are disturbed during this period, nestlings/fledglings are susceptible to being pecked by other gulls within the colony. When disturbed, chicks leave their nests and run through the colony. As a result, they may get lost or run into territories held by other gulls. Small chicks may be consumed outright by other gulls, while larger chicks may suffer severe pecking, often to death. Chicks are vulnerable to predation by ravens during the day and by owls at night. Nest loss contributes to mortality of young in other nests, because birds that have lost eggs or chicks often roost in the nesting area and may prey on eggs and chicks in the remaining nests during periods of disturbance (Hand, 1980; Spear, pers. comm., 1999). In addition, crushing of eggs and chicks in nests often occurs when adults land on them after being disturbed and caused to flush (Brown, 1996). Disturbance monitoring has also concluded that if gulls are disturbed during the chick-hatching and rearing period, they become more aggressive toward other nesting bird species.

There are some indications that continuous or more frequent human presence may be less disruptive to western gulls than sporadic bursts of traffic from irregular contact with researchers or visitors (Bell, pers. comm.). Western gull productivity on Alcatraz has been higher in some years in areas adjacent to constant visitor traffic, but this may be a function of nest sites that are more sheltered from exposure to the elements (Thayer, et al., 2000). Robert and Ralph (1975) found that western gulls habituated to regular intrusion by researchers on the Farallon Islands. However, western gull nests in close proximity to constant human traffic on Alcatraz create other problems, including aggressive attacks on people, harassment of gulls by visitors, as well as sanitation and disease concerns.

Western gull disturbance monitoring was conducted during activities associated with "The Rock" premiere, which coincided with the peak gull hatching period. Multi-level monitoring was conducted throughout this event to assess the impacts of increased human traffic, equipment noise, and exterior lighting on gull behavior and reproductive success (Brown, 1996). Results from censuses conducted prior to and following the disturbance showed that approximately 23 percent (approximately 100 nests) of the western gull nests were lost during the period of the event. However, almost half of this nest loss occurred on the Parade Ground, where activity from the event was limited; these losses are more likely due to disturbance from other unrelated incidents that occurred during the same week as the premiere.

Detailed monitoring of the Cistern subcolony, which was adjacent to the premiere activities, revealed several effects on nesting gulls (Brown, 1996). During the full showing of the film, approximately 60 percent of the birds were driven from their nests numerous times. In addition, after-hours exterior lighting frequently illuminated nesting areas throughout the event and resulted in temporary nest abandonment by most of the subcolony. Mortality rates appeared to be substantially higher than normal. Nest loss and mortality during the

event may have resulted from increased disturbance to nesting areas, including intrusion, elevated noise levels (movie soundtrack and crane operation), and excess lighting.

Pigeon Guillemot. Pigeon guillemots utilize rocky coastline with suitable nest sites near shallow water areas for foraging. They nest in burrows and cavities, often on small islands, and usually form small colonies, although they also nest in isolated pairs. Nests are built in existing cavities, but guillemots will also excavate burrows in earth or sand (Ewins, 1993).

Regional Status. Alcatraz Island is the only place in the San Francisco Bay where pigeon guillemots are known to nest. Outside the Bay in 1989, an estimated 308 nests were present on the Point Reyes National Seashore (Carter et al., 1992). On Año Nuevo Island, an estimated 8 nests were present in 1989 (Carter et al., 1992), 5 nests were confirmed in 1998, and 4 nests were confirmed in 1999 (Point Reyes Bird Observatory, 1999, preliminary data). On the southern Farallon Islands, estimates include 932 nests in 1989 and 234 nests in 1999 (Carter et al., 1992; Mills et al., 1999). The Farallon Island pigeon guillemot population has declined significantly over the last decade, which has increased the importance of the coastal colonies, including those at Point Reyes and Alcatraz.

Historic and Current Status of Alcatraz Population. Pigeon guillemots were first observed nesting on the Island in 1982, but monitoring of nesting birds has only been conducted since 1996. Nests are located along the southwest cliffs from the Model Industries Building to the cliffs above the tidepools. Refer to Figure 3.1-6 for the known and probable location of pigeon guillemot nests on Alcatraz Island. They are established in natural crevices, small holes between rocks, broken pipes, and man-made holes formed in the cliffs to hold support beams (Thayer et al., 1999). The nests are difficult to monitor from the Island because most of the crevices are in cormorant colonies or are out of reach, so boat surveys have been conducted since 1997. This has increased the ability to identify nest sites, but does not allow observation of their contents. A minimum of 17, 14, and 22 nests were located in 1997, 1998, and 1999, respectively. These are the numbers of sites that were confirmed as active nests by observation of chicks and/or delivery of fish to the site. These may be low estimates if some nests failed early, prior to chick hatching. Additional sites were considered probable nests, based on regular attendance by adults (Thayer et al., 2000; Point Reyes Bird Observatory, 2000, preliminary data). There were 4, 7, and 9 probable sites in 1997, 1998, and 1999, respectively. Four of the probable sites in 1999 were located on the northern side of the Island near the Power House, and in 2000 nesting was confirmed at the Power House location (Point Reyes Bird Observatory, 2000, preliminary data).

Reproduction on Alcatraz Island. The pigeon guillemot nesting season on Alcatraz Island occurs from early April through August. In 1999, the first guillemots were observed rafting on the water in early April and were first seen on the cliffs in mid-April. The first delivery of fish, indicating the presence of chicks, was observed in late May. Observations of chicks were very minimal, but several mostly feathered chicks were

Placeholder for

Figure 3.1-6 Pigeon Guillemot Nesting Locations on Alcatraz Island

observed at 2 nest sites in mid- to late July and a fully feathered chick was observed in late August. Due to the difficulty in monitoring guillemot nests on Alcatraz Island, no information is available on their productivity.

Sensitivity to Disturbance. There is no information regarding when pigeon guillemots on Alcatraz Island are most sensitive to disturbance. In general, they are known to abandon a breeding attempt if disturbed too frequently or if the adult is trapped, particularly during early incubation and early nestling periods (Ewins, 1993). This suggests their peak sensitivity to disturbance occurs from late April to late June. Additionally, in 2000 ravens were observed investigating occupied cavities and attempting to prey on chicks (Thayer, pers. comm.).

3.1.2.4 SPECIAL-STATUS BIOLOGICAL RESOURCES

The following is a description of relevant plant and wildlife species that have been afforded special recognition by federal and state agencies. This discussion is based on a review of previous biological studies, and has been updated with new state and federal listings, as described below. Special-status biological resources also include unique habitats or plant communities that are of relatively limited distribution, or are of particular value to wildlife. Sources used for the determination of biological resources status are as follows:

- **Plants** – *Special Plants List* (CDFG, 1999), *Rarefind: A database application for the use of the CDFG's Natural Diversity Database (*CNDDB, 1999), and *Inventory of Rare and Endangered Vascular Plants of California* (CNPS, 1994).
- **Wildlife** – *Special Animals List* (CDFG, 2000), and *Rarefind* (CNDDB, 1999)
- **Fish –** NOAA Essential Fish Habitat website (http:swr.ucsd.edu/).
- **Habitats** – *Rarefind* (CNDDB, 1999) and *Preliminary Descriptions of the Terrestrial Natural Communities of California* (Holland, 1986).

Electronic searches of the California Natural Diversity Database (CNDDB, 1999), and the California Native Plant Society's Database (CNPS, 1999) were conducted to identify special-status plant and wildlife species potentially occurring on Alcatraz Island. Table 3.1-3 provides a complete list of the special-status plant and wildlife species potentially occurring in the project vicinity. A total of 20 special-status plants and 18 special-status wildlife species were identified as potentially occurring in the project vicinity. Of these, only 1 plant and 11 wildlife species were identified as potentially occurring on Alcatraz Island. Special-status plant and wildlife species that are not expected to occur on Alcatraz Island are not discussed further in this document.

3.1.2.5 SPECIAL-STATUS PLANT SPECIES

One special-status plant species has the potential to occur on Alcatraz Island: San Francisco campion (*Silene verecunda* ssp. *verecunda*). This plant is a federal Species of Special Concern and is on the California Native Plant Society's 1B List (considered rare or endangered in California and elsewhere). San Francisco campion occurs in sandy, mudstone, shale, and serpentine soils in chaparral, grassland, and coastal scrub and prairie habitats. There is marginally suitable grassland and coastal scrub habitat present on the Island for this plant, but none were observed during surveys (Lutsko Associates, 1992).

3.1.2.6 SPECIAL-STATUS WILDLIFE SPECIES

Special-Status Fish

The project area includes four evolutionarily significant units of chinook (Central Valley spring-run and winter run) and steelhead trout (Central California Coast and California Central Valley) and designated critical habitat for chinook salmon (winter-run and Central Valley spring-run) and Central California coast steelhead.

Chinook Salmon (winter-run, Central Valley spring-run)

Distribution and Abundance. No specific information is available regarding the current status of winter-run or Central Valley spring-run chinook salmon within the Golden Gate National Recreation Area's management area. It is assumed that chinook within the vicinity of Alcatraz are present as migrating juveniles or adults. This assumption is based on recent data by Dr. Bruce MacFarlane, NMFS-Tiburon Labs, which indicate that most juvenile chinook salmon are using the Central Bay as a migratory corridor, with most captured fish found in high-energy environments rather than fine-grained depositional areas (MacFarlane, pers. comm., 2000). With respect to the Central Bay, most juvenile chinook using the Central Bay are moving along the northern corridor through Raccoon Strait and around the Tiburon peninsula (MacFarlane, pers. comm., 2000). High numbers of outmigrating chinook have been found around channels (e.g., Raccoon Strait) and few to none in low-energy environments such as at Crissy Field (San Francisco County) and China Camp (Marin County).

Adult Seasonality. There is some variability on the actual periods of adult and smolt movements in the Bay-Estuary reported in the literature. It is likely that the variation is due to differences in water year conditions during the evaluations. Winter-run chinook salmon reportedly enter San Francisco Bay from November through June enroute to spawning grounds on the Sacramento River (NMFS, 1997), although Herbold et al. (1992) indicate that this entry starts in January. Spring-run chinook salmon enter the Bay, as their name may suggest, between March and May (Moyle et al., 1989), although Herbold et al. (1992) report the migration period extending through July with the peak in June.

Juvenile Seasonality. Midwater trawl data by CDFG shows seasonal occurrence of chinook salmon smolts regularly between April and June with occasional catches from July through September within the Central Bay portion of the San Francisco Bay (Herbold et al., 1992). However, no distinction of stock is available. Peak movements of outmigrating winter-run juveniles occur between January through April (NMFS, 1997), although Herbold et al. (1992) report outmigration extending from mid-August through April. The general outmigration period for spring-run juveniles extends from mid-November through the end of May (CDFG, unpublished data, 1992).

Steelhead (Central California Coast and Central Valley ESUs)

Distribution and Abundance. It is assumed that juvenile or adult steelhead could also be present within the San Francisco Bay-Estuary near Alcatraz Island. The Bay is likely used as a migratory corridor between riverine habitat and the ocean. Unlike chinook salmon, there have been no occurrences of steelhead in beach seine surveys conducted by CDFG (data courtesy of CDFG Bay-Delta Stockton office) between 1980 and 1987 at Horseshoe Cove (Marin County) and Crissy Field (San Francisco County) or in midwater and otter trawls conducted for an U.S. Army Corps of Engineers study around Alcatraz Island (Bechtel, 1994). No information is available regarding movement corridors for either juvenile or adult steelhead.

Adult Seasonality. Adult steelhead have a prolonged period of entry into the Bay-Estuary (August through March) (CDFG, unpublished data, 1992).

Juvenile Seasonality. Juvenile emigration from the Bay-Estuary occurs from November through May (CDFG, unpublished data, 1992).

Essential Fish Habitat

Existing Physical Habitat. Water depths around Alcatraz Island range up to 75 feet (Bechtel, 1994). Rocky intertidal habitat encompasses most of the shoreline around Alcatraz. Developed areas, mainly on the eastern side of the island, contain typical bank protection such as rock riprap and docks. A study was conducted under contract to the U.S. Army Corps of Engineers to describe habitat and fish conditions around the designated Alcatraz dredged material disposal site. A single bottom core sample, roughly 750 feet from shore, in the vicinity of the east side of Alcatraz Island nearest the Dock, was described as containing "redistributed sands" and "dredged materials" (Bechtel, 1994).

Coastal Pelagic Species and West Coast Groundfish. The National Marine Fisheries Service has determined that the Central Bay portion of the San Francisco Bay Estuary (San Rafael Bridge to Golden Gate Bridge to Bay Bridge) provides essential fish habitat (EFH) for coastal pelagic species and west coast groundfish. Specifically, this includes 18 fish species (Table 3.1-2). To date, the National Park Service has not surveyed any sites within its jurisdiction to determine the status of either coastal pelagic or west coast groundfish. All data used by the National Park Service for these species comes from California Department of Fish and Game (Bay-Delta Office) and data collected under contract to the U.S. Army Corps of Engineers.

Table 3.1-2
Central San Francisco Bay Essential Fish Habitat Species Occurrence at Alcatraz

Common Name	Scientific Name	Lifestage	Fishery Management Plan (1)	Alcatraz Presence
Northern anchovy	*Engraulis mordax* (Girard)	E,L,J,A	CP	2,3
Jack mackerel	*Trachurus symmetricus*	E,L	CP	
Pacific sardine	*Sardinops sagax* (Jenyns)	J,A	CP	
English sole	*Parophrys vetulus* (Girard)	J,A	GF	3
Starry flounder	*Platichthys stellatus* (Pallas)	E,L,J,A	GF	
Brown rockfish	*Sebastes auriculatus* (Girard)	J,A	GF	3
Pacific sanddab	*Citharichthys sordidus* (Girard)	E,L,J,A	GF	
Lingcod	*Ophiodon elongatus* (Girard)	J,A	GF	
Sand sole	*Psettichthys melanostictus* (Girard)	L,J,A	GF	
Leopard shark	*Triakis semifasciata* (Girard)	J,A	GF	
Spiny dogfish	*Squalus acanthias* (Linnaeus)	J,A	GF	
Big skate	*Raja binoculata* (Girard)	J,A	GF	3
Pacific whiting (hake)	*Merluccius productus* (Ayres)	E,L	GF	
Kelp greenling	*Hexagrammos decagrammus* (Pallus)	J,A	GF	
Soupfin shark	*Galeorhinus zyopterus*	J,A	GF	
Curlfin sole	*Pleuronichthys decurrens* (Jordan and Gilbert)	J	GF	
Bocaccio	*Sebastes paucispinis*		GF	
Cabezon	*Scorpaenichthys marmoratus* (Ayres)	J,A	GF	
OTHER				
Pacific herring				2

KEY: CP=coastal pelagic, GF=West coast groundfish, E=eggs, L=larvae, J=juvenile, A=adult

1. Burczynski, J. 1991. Hydroacoustic survey of fish distribution and reaction to dredge disposal activities in San Francisco Bay. Final Report. 19 pp. February 1991.
2. Bechtel Corp. 1994. DRAFT Alcatraz Marine Habitat Study: Task 3 and 4, results of reconnaissance field study and quantitative field study design. 61 pp. May 1994.

3. No author. Fisheries Management Plan (FMP) species distributions in San Francisco, San Pablo and Suisun Bays. http://swr.ucsd.edu/hcd/loclist.htm

California Brown Pelican. California brown pelican (*Pelecanus californicus*) is a state and federally listed endangered species. Brown pelicans build nests on rocky or brushy slopes of undisturbed coastal islands (Cogswell, 1977). They are not known to nest north of Monterey County. They are present year-round in San Francisco Bay with peak numbers in occurring in summer and fall, after the breeding season is over, and small numbers in winter and spring (Hatch, pers. comm., 1999). Occasional observations of small numbers of brown pelicans roosting on the Island have been in the tidepool area on the southern shore and on the western cliffs. These locations are remote from proposed repair and construction activities. The brown pelican would not be affected by the Proposed Action or alternatives and is therefore not discussed further in this EIS.

Table 3.1-3
Special-Status Species Potentially Occurring in the Project Area

Species	USFWS	CDFG	CNPS	Habitat	Potential For Occurrence
Plants					
Adobe sanicle *Sanicula maritima*	FSC	–	1B	Chaparral, coastal prairie, meadows and seeps, valley and foothill grasslands	Unlikely to occur; assumed extinct at occurrence site (CNDDB, 1999).
San Francisco gumplant *Grindelia hirsutula* var. *maritima*	FSC	–	1B	Sandy or serpentine slopes and sea bluffs in coastal scrub, valley and foothill grasslands	Unlikely to occur. No serpentine soils on Alcatraz Island.
Beach layia *Layia carnosa*	FE	SE	1B	Sparsely vegetated coastal dunes	Unlikely to occur; presumed extirpated from occurrence site (CNDDB, 1999).
San Francisco lessingia *Lessingia germanorum*	FE	SE	1B	Open sandy soils and dunes in coastal scrub	Unlikely to occur; no suitable habitat.
Santa Cruz microseris *Stebbinsoseris decipiens*	FSC	–	1B	Open sandy, shaly, and serpentine areas	Unlikely to occur; no suitable habitat.
White-rayed pentachaeta *Pentachaeta bellidiflora*	FE	SE	1B	Open dry, rocky slopes and grassy areas in valley and foothill grasslands	Unlikely to occur; no suitable habitat.
San Francisco popcorn-flower *Plagiobothrys diffusus*	FSC	SE	1B	Clay flats and grassy areas in coastal prairie and valley and foothill grasslands	Unlikely to occur; no suitable habitat.
Hairless popcorn-flower *Plagiobothrys glaber*	–	–	1A	Alkaline meadows and coastal salt marsh	Unlikely to occur; no suitable habitat.
Marsh sandwort *Arenaria paludicola*	FE	SE	1B	Freshwater marsh	Unlikely to occur; no suitable habitat.
San Francisco Campion *Silene verecunda* ssp. *verecunda*	FSC	–	1B	Open sandy areas in coastal prairie and scrub, chaparral, valley and foothill grasslands	Potential habitat present in coastal scrub and grassland onsite.
Presidio manzanita *Arctostaphylos hookeri* ssp *ravenii*	FE	SE	1B	Open, rocky serpentine slopes in chaparral, coastal prairie and scrub	Unlikely to occur; no suitable habitat.
Franciscan manzanita *Arctostaphylos hookeri* ssp. *franciscana*	FSC	–	1A	Serpentine outcrops in chaparral	Unlikely to occur; extirpated from occurrence site (CNDDB 1999).
Alkali milk-vetch *Astragalus tener* var. *tener*	–	–	1B	Alkali flats in annual grasslands, vernal pools	Unlikely to occur; no suitable habitat.

Table 3.1-3
Special-Status Species Potentially Occurring in the Project Area

Species	USFWS	CDFG	CNPS	Habitat	Potential For Occurrence
Marin western flax *Hesperolinon congestum*	FT	ST	1B	Serpentine areas in chaparral, valley and foothill grasslands	Unlikely to occur; no suitable habitat.
Presidio clarkia *Clarkia franciscana*	FE	SE	1B	Serpentine outcrops in coastal scrub, valley and foothill grasslands	Unlikely to occur; no suitable habitat.
San Francisco bay spineflower *Chorizanthe cuspidata* var. *cuspidata*	FSC	–	1B	Sandy soil on terraces and slopes in coastal scrub, prairie, and dunes	Unlikely to occur; no suitable habitat.
Kellogg's horkelia *Horkelia cuneata* ssp. *sericea*	FSC	–	1B	Old dunes and coastal sandhills in closed-cone coniferous forest and coastal scrub	Unlikely to occur; no suitable habitat.
Round-headed Chinese houses *Collinsia corymbosa*	–	–	1B	Coastal dunes and prairie	Unlikely to occur; no suitable habitat.
San Francisco owl's clover *Triphysaria floribunda*	FSC	–	1B	Serpentine grasslands	Unlikely to occur; no suitable habitat.
Fragrant fritillary *Fritillaria liliacea*	FSC	–	1B	Usually serpentine or clay soils in coastal prairie and scrub, valley and foothill grasslands	Unlikely to occur; no suitable habitat.
INVERTEBRATES					
Mission blue butterfly *Icaricia icarioides missionensis*	FE	–	–	Coastal scrub; perennial lupines needed as host plants and for nectar	Unlikely to occur; no perennial lupines observed during plant surveys (Lutsko Associates, 1992).
Bay checkerspot butterfly *Euphydryas editha bayensis*	FT	–	–	Metamorphic soils, such as serpentine	Unlikely to occur; no suitable habitat.
FISH					
Central California coast steelhead & Critical Habitat *Oncorhynchus mykiss*	FT	–		Fresh and salt water	May occur in vicinity of island during migration
Central Valley steelhead *Oncorhynchus mykiss*	FT	–		Fresh and salt water	May occur in vicinity of island during migration
Spring-run chinook salmon & Critical Habitat *Oncorhynchus tshawytscha*	FT	ST		Fresh and salt water	May occur in vicinity of island during migration
Central Valley fall/late fall-run *Oncorhynchus tshawytscha*	FC	CSC		Fresh and salt water	May occur in vicinity of island during migration
Winter-run chinook salmon & Critical Habitat *Oncorhynchus tshawytscha*	FE	SE	–	Fresh and salt water.	May occur in vicinity of island during migration.
AMPHIBIANS					
California red-legged frog *Rana aurora draytonii*	FT	CSC	–	Streams and ponds with emergent or riparian vegetation	Unlikely to occur; no suitable habitat.
BIRDS					
Ashy storm-petrel (rookery) *Oceanodrama homochroa*	FSC	CSC	–	Nest on islands, in crevices beneath loosely piled rocks or driftwood or in caves	Potential nesting crevices on island but too much light present at night (Hatch, per.s comm.).
California brown pelican (nesting) *Pelecanus occidentalis californicus*	FE	SE	–	Coastal islands for nesting; forage just outside surf line	Winter visitor.

Table 3.1-3
Special-Status Species Potentially Occurring in the Project Area

Species	USFWS	CDFG	CNPS	Habitat	Potential For Occurrence
White-tailed kite (nesting) *Elanus Leucurus*	–	SP	–	Grasslands, meadows, and marshes for foraging; isolated trees for nesting	Uncommon visitor during migration; not expected to nest onsite.
Ferruginous hawk *Buteo regalis*	FSC	CSC	–	Grasslands, sagebrush flats, desert scrub	Uncommon visitor during migration; no nesting in CA.
Merlin *Falco columbarius*	–	CSC	–	Grasslands, foothills, marshes, open coast	Uncommon visitor during migration; no nesting in CA.
American peregrine falcon *Falco peregrinus anatum*	–	SE	–	Nests and roosts on protected cliff ledges, usually adjacent to lakes, rivers, or marshes for foraging	Occasional occurrences during migration and winter months; not expected to nest onsite.
California black rail *Laterallus jamaicensis coturniculus*	FSC	ST	–	Tidal salt, brackish, and freshwater marshes	Unlikely to occur; no suitable habitat.
Northern harrier (nesting) *Circus cyaneus*	–	CSC	–	Wetlands and open fields	Occasional occurences; not expected to nest onsite.
Burrowing owl *Athene cunicularia hypugea*	FSC	CSC	–	Grasslands and agricultural fields	Occasional occurrences; not expected to nest onsite.
Bank swallow (nesting) *Riparia Riparia*	–	ST	–	Banks and bluffs of sandy soil for nesting; meadows, prairies, marshes and open fresh water for foraging	Unlikely to occur; no suitable habitat.
MAMMALS					
Yuma myotis *Myotis yumanensis*	FSC	CSC	–	Roost sites include caves, mines, buildings, bridges and trees; maternity colonies occur in coast redwoods, Ponderosa pines, and oaks.	May roost on the site.
Southern sea otter *Enhydra lutris nereis*	FT	–	–	Near shore coastal areas with kelp	Unlikely to occur; no suitable habitat.

– not listed for this agency

U.S. Fish and Wildlife Service (USFWS) Federal Listing Categories:

FE Federal Endangered
FT Federal Threatened
FSC Federal Species of Special Concern

California Department of Fish and Game (CDFG) State Listing Categories:

SE California Endangered
ST State Threatened
SP California Fully Protected
CSC California Species of Special Concern

California Native Plant Society (CNPS) Categories:*

1B Plants rare, threatened, or endangered in California and elsewhere.
1A Plants presumed extinct in California.

* CNPS is a private non-profit organization that works closely with CDFG throughout the state. CNPS-developed information serves as an important source of data for consideration by CDFG and USFWS in recommendations for listing State or Federal threatened and endangered plant species.

Source: EDAW & NPS, 1999

Raptors. Several species of raptors have been observed on Alcatraz Island, including peregrine falcon (*Falco peregrinus*), white-tailed kite (*Elanus leucurus*), red-shouldered hawk (*Buteo lineatus*), ferruginous hawk (*Buteo regalis*), American kestrel (*Falco sparverius*), merlin (*Falco columbarius*), northern harrier (*Circus cyaneus*), and burrowing owl (*Athene cunicularia hypugea*). Peregrine falcon is a state-listed endangered species, white-tailed kite is fully protected by CDFG, and the remaining raptors are California Species of Special Concern. Although National Park Service is not required to comply with state regulations, it is National Park Service policy to comply with these regulations to the extent possible. Peregrine falcons nest on bridges in the San Francisco Bay and on the outer Marin coast. They are occasionally observed flying in the vicinity of the Island, but nesting has not been documented. White-tailed kite, ferruginous hawk, and merlin have been observed infrequently during migration, and red-shouldered hawk and American kestrel have been observed in winter (National Park Service file information). A single northern harrier was first seen on the Island in April 2000. Nesting has not been documented (Thayer, pers. comm., 2000). Burrowing owls have also been observed occasionally, but nesting has not been documented (AINHR, 1980-1999).

Bats. Eight special-status bat species are known or expected to occur in the Golden Gate National Recreation Area (GGNRA). A one-day bat survey was conducted on Alcatraz Island in 1992 (Pierson, 1992). Acoustic surveys detected a single pulse, possibly from a red bat (*Lasiurus borealis*) (not a species of concern) in the trees on the road to the Cellhouse, and one possible observation of a bat was recorded near the tunnel west of the Recreation Yard. Mist netting was conducted, but no bats were captured.

The factors most likely limiting bat activity on the Island are frequent winds and scarcity of prey. Although results of this one-day survey did not indicate use of the Island by species of concern, it should not be considered definitive in demonstrating their absence, because potential roost sites are present at the Sallyport, Building 64, and the rubble piles on the Parade Ground (Pierson, 1992). At the time of the survey, potential roost sites in the attic of Building 64 did not have suitable crevices and access to the attic was not available. However, these conditions may have changed since the survey was conducted, and accessible crevices may now be present. The rubble piles located in the Parade Ground would not be disturbed as a result of the Proposed Action or alternatives, and this particular site is therefore not addressed further in this EIS.

3.2 Cultural Resources

3.2.1 REGULATORY SETTING

The proposed activities on Alcatraz Island that involve cultural resources must comply with Sections 106 and 110 of the National Historic Preservation Act of 1966, as amended. As part of its ongoing compliance with Sections 106 and 110, the National Park Service has identified historic properties on Alcatraz Island:

- Alcatraz Island was listed in the *National Register of Historic Places* at the national level of significance in 1978 under criteria A and C with commerce, engineering, military, and social/humanitarian themes designated as the areas of significance.

- In 1986, the Alcatraz Island was designated a National Historic Landmark (NPS, 1993). Its period of significance was 1847–1971. In terms of the National Historic Landmarks Program, the history of the Island is nationally significant under: Theme 5 (political and Military Affairs), subtheme 5b (1830–1860), and subtheme 5c (1865–1914); Theme 7 (American at work), subtheme 7j (Engineering), facet 5 (Military Fortifications); Theme 9 (Society and Social Conscience), subtheme 6b (Social and Humanitarian Movements), facet 2 (Humanitarian Movements), and subfacet c (Prison Reform) (Haller, 1985).

Also as part of its ongoing Sections 106 and 110 responsibilities, the National Park Service has undertaken the following on Alcatraz Island:

- **Programmatic Agreement.** In 1992, the National Park Service signed a Programmatic Agreement with the California State Historic Preservation Officer and the Advisory Council on Historic Preservation for operation and maintenance undertakings the historic properties within Golden Gate National Recreation Area (NPS, 1992). Alcatraz Island is a part of the Golden Gate National Recreation Area and is included in this Programmatic Agreement.

- **Graffiti.** In 1979, the National Park Service prepared an inventory of the graffiti from the Indian Occupation of 1969–1971 (Noxon and Noxon, 1979). Subsequent efforts related to the preservation of the graffiti have included a conservation evaluation (Rosenthal, 1996) and subsequent treatment of the Free in the American Flag Shield over the Main Cellblock (Rosenthal, 1999), a supplementary inventory of the graffiti in 1997 (Salisbury, 1997), Historic American Buildings Survey photographic recordation (Grogan, 1998 and 1999), and ongoing discussions with Native Americans on the treatment and interpretation for the graffiti (Scolari, 2000).

- **Historic Landscape.** In 1992, the National Park Service drafted a cultural landscape report for Alcatraz Island that identified significant historic resources related to the historic landscape and made recommendations for preserving and protecting them (NPS, 1993). A report on *Landscape Stabilization and Maintenance Guidelines for Alcatraz Island* was prepared in 1998.

- **Development Concept Plan (DCP).** In 1993, the National Park Service prepared the *Alcatraz Development Concept Plan and Environmental Assessment* (NPS, 1993) that included cultural resource management treatments of preservation, rehabilitation, and restoration for the contributing features of the Alcatraz Island National Historic Landmark. The recommendations of the 1992 cultural landscape report were incorporated into the DCP.

- **Golden Gate National Recreation Area List of Classified Structures Management Category Summary.** In 1998, the National Park Service prepared a list of all structures within the Golden Gate National Recreation Area and listed the management category of each. This list included structures on Alcatraz Island.

In addition to the actions described above, the National Park Service has done the following as part of its specific Section 106 responsibilities related to the Proposed Action:

- **Initiated Public Involvement.** In December 1998, the National Park Service prepared a Scoping Announcement/Notice of Intent for the Alcatraz Historic Preservation and Safety Construction Program that provided the background and alternatives that were being considered as part of the project. Copies of scoping letters received are provided in Appendix A. No specific comments were received related to cultural resources.

- **Initiated Consultation with the State Historic Preservation Officer (SHPO).** In March 1999, the National Park Service sent a letter to the California Office of Historic Preservation to inform the SHPO about the project, and indicate that it was being reviewed under the Golden Gate National Recreation Area Programmatic Agreement. The letter stated that "While the National Park Service finds that the undertakings fall within the exclusions of the PA, it also finds that potential impacts to the natural environment require a process of environmental review under the National Environmental Policy Act (NEPA). All twelve undertakings are intended to have beneficial effect on the Island's historic resources. However, the majority of the undertakings are large-scale construction undertakings of lengthy duration due to the size, complexity and current state of deterioration of the Island's historic structures. Other proposed undertakings will involve historic resources that are located near areas of sensitive natural resource habitat. The environmental review process is intended to assess potential environmental impacts for the construction activities of the undertakings" (NPS, 1999). The California SHPO concurred that the proposed undertakings were in compliance with the guidelines of the Programmatic Agreement (California SHPO, 1999).

3.2.2 SIGNIFICANCE OF ALCATRAZ

Alcatraz Island was included as a unit of the Golden Gate National Recreation Area in 1972 because of its historical significance. Alcatraz is of special importance to the history of the military, including the United States Coast Guard, the federal penal system, Native American rights movement, and the evolution of the National Park Service (NPS, 1993). Please refer to Section 1.1 for additional information on Alcatraz's historic significance.

Alcatraz Island has been the site of events that have had an important impact on the nation as a whole from before the Civil War through the Native American occupation of 1969–1971. Its significance in the areas of military history, social history, and maritime commerce is enhanced by the integrity of the resource which follows from the fact that access to the Island has been strictly limited by the United States Government throughout its history. Maritime commerce was aided by the first U.S. lighthouse on the Pacific coast built here in 1854; its successor (built in 1909) still serves. By the start of the Civil War, Alcatraz was the key fort in the center of the most important Pacific port in nineteenth-century America. The fort mounted the first permanent cannons on the west coast of the United States, and featured a brick and masonry defensive barracks that may have been unique in the annals of American military architecture (Haller, 1985).

In the areas of modern military and social history, Alcatraz is noteworthy because it was the first official army prison in the nation. When it became a civilian penitentiary in 1934, it quickly gained nationwide attention due to its association with many of the most infamous criminals of the gangster era and the bloody escape attempts made from there. It is representative of the far end of the penological spectrum, since it was a prison designed for punishment and incarceration only, rather than rehabilitation. It is of national importance in this regard because of its use as the repository of incorrigibles throughout the federal prison system. It is certainly the best known prison in American history and, arguably, along with France's "Devil's Island," may be the most famous prison in the world (Haller, 1985).

Alcatraz again gained short-lived national attention when "Indians of all Tribes" occupied the Island on November 20, 1969, to gain attention for the needs of their people. A state of siege existed until June 1971 when

all of the remaining Indians were ejected (Haller, 1985). The Indian Occupation of Alcatraz Island from 1969 to 1971 was an event that awakened the country to the needs and concerns of indigenous peoples. While the occupation lasted only a short year and a half, it recognized now as one of the primary catalysts for the Native American civil rights movement in the United States.

3.2.3 CONTRIBUTING FEATURES OF ALCATRAZ ISLAND NATIONAL HISTORIC LANDMARK

The physical features of Alcatraz Island are a record of these significant aspects of the Island's history. The evolution of Alcatraz Island may be divided into five periods, each representing a major change in the pattern of use and development of the Island. These periods are Pre-Development (up to 1846), the Military Defense Era (1847–1907), the Military Prison Era (1907–1933), the Federal Penitentiary Era 1933–1963), and the Public Lands Era (1963–present) (NPS, 1993). The contributing features to the Alcatraz National Historic Landmark district can be broken down into the following sub-areas that reflect these five periods (DCP–NPS, 1993):

Wharf Complex. The wharf complex, located on northeast side of the Island, includes the Dock, Building 64, the guardhouse complex, remains of the Officer's Club, and a number of associated outbuildings. The Dock has historically been the point of entry onto the Island and remains so today (NPS, 1993).

Cellhouse and Lighthouse. The Cellhouse and the remains of the Lighthouse complex dominate the summit, or upper terrace, of the Island. They are surrounded by the shell of the Warden's House, the recreation yard, prisoner's morgue, and associated minor structures. These buildings and structures represent the Military Prison–era prison, which was modified by the Bureau of Prisons to be a federal penitentiary in 1933. The Civil War–era citadel and water cisterns are located underneath the basement of the Cellhouse (NPS, 1993).

Industries Complex. The Power House complex and Model Industries Building, located on the northern end of the Island, were built during the Military Prison era, and the Laundry Building was built by the Bureau of Prisons during the Federal Penitentiary era. This area also contains significant archeological remains of Military Defense–era fortifications located along the western side of the Island (NPS, 1993).

Parade Ground. The Parade Ground is located on the southern end of the Island, on the lower terrace. When the federal penitentiary closed in 1963, the Parade Ground was surrounded by Works Progress–era housing that created a community for prison staff and their dependents. Although all of the structures located on the Parade Ground were demolished in 1971 by General Services Administration (GSA) following the end of the Indian occupation, the remaining rubble piles confer a sense of spatial relationship of the structures and are a record of a tumultuous period of the Island's history (NPS, 1993).

Cultural Landscape. Located on the western and southern sides of the Island are the remains of the landscape features (paths, retaining walls, etc.) and plant materials that were planted and maintained by families during the era that the Island was a federal penitentiary (NPS, 1993). The cultural landscape features are located in the proximity of the Sallyport and Slope Stabilization projects.

Island-Wide Circulation System. The Island-wide circulation system of roads and pathways reflects the changing functions of the Island over time and tells the story of access on the Island and how it was curtailed (NPS, 1993).

Military Defense Structures. Many Military Defense–era structures and landforms remain on Alcatraz Island, both buried under and integrated into later development. These structures and landforms represent the first significant use of Alcatraz Island as a military defense installation and are located throughout the Island (NPS, 1993).

Small-Scale Features. Small-scale features from all eras of development on Alcatraz Island, such as retaining walls, planters, benches, light fixtures, and stairways, remain in the landscape and are located throughout the Island (NPS, 1993).

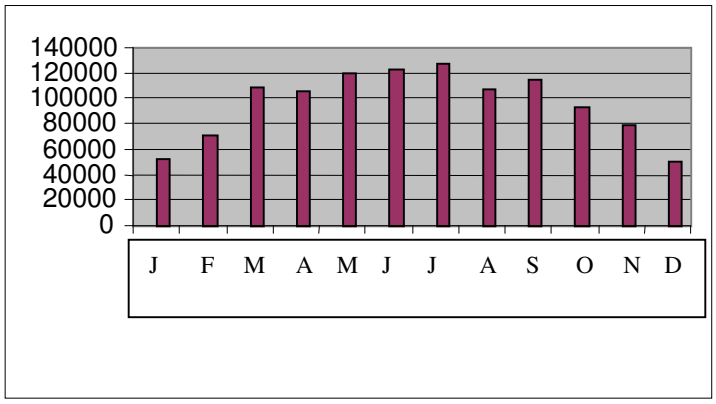
Fencing. Fencing was one of the primary landscape features used by the Bureau of Prisons to convert Alcatraz from a military prison into a federal penitentiary. In many locations the fencing fabric is gone, but fence standards remain in place, providing a sense of the extent and purpose of the Bureau of Prisons fencing (NPS, 1993). Also remaining is fencing installed by GSA immediately after the end of the Indian Occupation.

3.3 Recreation and Visitor Use

3.3.1 VISITOR USE AND INTERPRETATION

Alcatraz Island became part of the Golden Gate National Recreation Area in 1972. Since that time, it has become an increasingly popular destination for visitors of the park. Today, over 1 million people visit Alcatraz each year. Table 3.3-1 shows average monthly visitations, which is strong year-round, with peaks during the summer months.

Table 3.3-1
Average Monthly Visitation on Alcatraz (1996–1999)



Source: NPS Files, 2000

Over the years, the recreational and interpretive opportunities for Alcatraz visitors have continued to improve. During the early years as part of the National Park System, visitor use was primarily restricted to guided (i.e., ranger-led) tours, with a small museum that provided limited self-exploration opportunities. In 1987, the National Park Service completed an *Interpretative Prospectus* for the Island that redirected the approach to visitor use and interpretation. The prospectus envisioned opening the Island experience for visitors, including opportunities to enjoy the scenic beauty, and interpret the natural and cultural values of Alcatraz and currently guides the program uses on the Island along with the 1993 Development Concept Plan (DCP). The DCP identified which public access areas would be open year-round, open seasonally (during the non-breeding season) and closed year-round.

Today, the Island offers a variety of trails, programs, and exhibits that interpret the Island's history and natural resources, and allow visitors to explore Alcatraz at their own pace. The Island visitor center, which includes a theater, book store and exhibit space, is located at the Dock in the first floor of Building 64 (the Barracks). Regularly scheduled ranger-led tours of the Island are offered year-round. In the Cellhouse, self-guided audio tours and visitor bookstore are provided. Electric tram service is now provided, making the Island more accessible for all visitors.

In general, the southern half of the Island is open for public use and self-guided exploration with limitations during the seven-month breeding season for colonial waterbirds that nest on the Island. The Agave Trail provides scenic pedestrian access from the Dock along the southern end of the Island to the Parade Ground. The area along the trail and at the Parade Ground is a biologically sensitive area and is therefore closed to the general public during the breeding season (February through August). The primary attraction on Alcatraz is the Cellhouse, which is open year-round. The north end of the Island, although approved to provide year-round

access along a trail in the 1993 DCP, is currently closed to visitors year-round, with some exceptions for ranger- or docent-led tours. This access, however, is restricted to the non-breeding season.

In addition to the seasonal restrictions for biologic resource protection, several areas and portions of buildings are closed due to public health and safety concerns. Safety concerns include structural instability, presence of hazardous substances and other public health and safety issues. Several safety concerns (i.e., seismic stability, spalling concrete, etc.) have also been identified in areas that are currently open to the public, and if the necessary repairs are not implemented additional closure of specific areas and potentially the Island as a whole could be necessary in the future. Restricting public access to the Island inhibits the opportunities for use, enjoyment and interpretation of Alcatraz. A detailed description of the existing conditions, including the repairs and current safety issues in these public areas, is provided in Chapter 2 under the No Action Alternative and the Proposed Action project descriptions.

During the daytime hours, ambient noise levels on Alcatraz Island are influenced primarily by human voices. Secondary noise sources, including on-site electric tram, aircraft overflights, ship traffic in the bay, water ferries, and wildlife (birds) also contribute to the existing daytime noise environment. These secondary daytime noise sources dominate the evening and nighttime noise environment during the hours of the day when public visitation is limited (EDAW, 2000).

3.4 Air Quality

The following is a discussion of the applicable air quality regulations and the existing regional air quality conditions in the vicinity of Alcatraz Island.

3.4.1 REGULATORY FRAMEWORK

The federal Clean Air Act (42 USC 7401 et seq.) and the California Clean Air Act mandate the establishment of national and state ambient air quality standards, respectively, for six criteria pollutants: ozone, carbon monoxide (CO), nitrogen dioxide (NO_2), sulfur dioxide (SO_2), inhalable particulate matter (PM_{10}) and lead. Areas in which the standards are not met are known as nonattainment areas. Alcatraz Island is located within the San Francisco Bay Area, which is currently designated as a federal nonattainment area for ozone and a state nonattainment area for ozone and PM_{10}.

Both the Organic Act of 1916, as amended and the Clean Air Act require federal land managers to protect a park's air quality values from adverse impacts. Section 118 of the Clean Air Act requires that federal facilities comply with existing federal, state, and local air pollution control laws and regulations. The National Park Service must ensure that in-park activities meet existing laws and regulations and that external sources of air pollution are controlled to the extent possible to protect the air quality and resource values of the Golden Gate National Recreation Area, including Alcatraz Island.

3.4.2 AIR QUALITY POLLUTANTS AND AMBIENT AIR QUALITY STANDARDS

Both the State of California and the federal government have established ambient air quality standards for several pollutants. For some pollutants, separate standards have been set for different periods. Most standards have been set to protect public health. For some pollutants, standards have been based on other values (such as protection of crops, protection of materials, or avoidance of nuisance conditions). The pollutants of greatest concern in San Francisco County are CO, ozone and PM_{10}. Potential air emissions generated by the Proposed Action and alternatives are associated with construction activities. Construction-related emissions are generally short term in duration, but may still cause adverse air quality impacts. PM_{10} is the pollutant of greatest concern with respect to construction activities.

3.4.3 EXISTING AIR QUALITY CONDITIONS

Alcatraz Island is located within San Francisco Bay Area Air Basin, which consists of San Francisco, San Mateo, Santa Clara, Alameda, Contra Costa, Napa, and Marin counties, as well as portions of Sonoma and Solano counties. The Island is located within San Francisco County, which is designated as a federal nonattainment area for ozone and a state nonattainment areas for ozone and PM_{10}.

Winds at Alcatraz vary seasonally. Prevailing winds during the summer are westerly, while winter wind directions are more variable with northeast and west winds interrupted by periodic southeast gales. During storms, winds may reach speeds of 60 miles per hour or more. Generally, the location of Alcatraz allows for excellent air circulation, the air moving into the area is of very high quality. One of the primary sources of air pollution in the Bay Area region is automobile traffic—which is negligible on Alcatraz Island (i.e., an electric tram provides access for visitors, and one small truck is kept on the Island).

3.5 Hazardous Substances: Human Health, Safety, and the Environment

3.5.1 HAZARDOUS SUBSTANCES

The National Park Service Management Policies (2001), Chapter 9 Park Facilities, directs the parks to utilize the best management practices for all phases of construction activity. Under the direction of these policies, ground disturbance and site management will be carefully controlled to prevent undue damage to vegetation, soils, and archeological resources, and to minimize air, water, soil, and noise pollution. Protective fencing and barricades will be provided for safety, and to preserve natural and cultural resources. Effective storm water management measures specific to the site will be implemented, and appropriate erosion and sedimentation control measures will be in place at all times. Solid, volatile, and hazardous wastes will be stockpiled, transported, and disposed of, as appropriate, and in compliance with federal, state, and local laws and regulations. All materials will be recycled whenever possible.

Two hazardous substances that may be encountered during the repair and reconstruction projects on Alcatraz include asbestos and lead based paint. The GGNRA has the primary responsibility for identifying, managing, or removing hazardous substances on Alcatraz Island. Construction contracts for this project will include procedures for the sampling, identification, and cleanup of hazardous substances in accordance with applicable state and federal regulations.

Because buildings on the Island were constructed prior to 1978 when lead-based paint was banned for consumer use and before 1989 when the EPA imposed a ban on asbestos production and imports, buildings are assumed to contain these hazardous substances until proven otherwise. The extent of hazardous substances such as asbestos and lead-based paint that will be disturbed during rehabilitation and construction activities under the action alternatives will be determined prior to construction. The GGNRA will conduct surveys and sampling to identify, characterize, and quantify the nature the hazardous substances present in work areas and the extent that these materials will be disturbed by construction activity.

The GGNRA does not expect to encounter polychlorinated biphenyls (PCBs) during this project. A recent overhaul of the electrical system replaced the transformers containing PCBs while installing a new generator system on the Island. Some electrical lines will be replaced by the proposed action, yet no PCBs are anticipated because of the previous removal.

3.5.2 ASBESTOS

3.5.2.1 REGULATORY FRAMEWORK

The Environmental Protection Agency (EPA) and the Occupational Safety and Health Administration (OSHA) regulates ACM (containing more than one percent asbestos). The EPA regulates asbestos as a hazardous waste under the Toxic Substance Control Act (TSCA), the Comprehensive Environmental Response and Liability Act (CERCLA), and the National Emission Standards for Hazardous Air Pollutants (NESHAP).

OSHA also regulates asbestos, focusing on the workers and procedures for the removing asbestos. Training and notifications are necessary for any employee handling asbestos, including sampling and removal, regardless of friability. Safety and health standards pertaining to employee or worker exposure to asbestos dust are covered under OSHA regulation 29 CFR 1910.1001. Required work practices are covered in the Construction Standard for the Asbestos Industry (40 CFR 1926.1101 or CFR Title 8 Section 1529).

In addition, because both TSCA and CERCLA list asbestos as a hazardous material, the Department of Transportation (DOT) in Title 49 of the Code of Federal Regulations has additional requirements regarding labeling and transportation of asbestos. Under California's Hazardous Waste Control Law, the California Department of Toxic Substances Control monitors compliance with applicable hazardous waste packaging, labeling, manifesting, transportation, and disposal requirements. All California shippers or transporters of hazardous waste must comply with these requirements.

3.5.2.2 EXISTING CONDITIONS

Asbestos is a mineral-based material that includes six fibrous silicate minerals that occur naturally in the earth's crust and are heat and chemical resistant. Because of the insulating and fire retardant properties, asbestos has been used extensively in a variety of construction materials including pipe and duct insulation, floor tiles, ceiling tiles, wall board, and roof and floor mastics. Asbestos presents a health hazard when asbestos particulates become airborne and are inhaled. Long-term overexposure to airborne asbestos can result in asbestosis (scarring of the lungs), lung cancer, and mesothelioma (cancer of the lining of the lungs and gut cavity).

Asbestos containing materials are divided into two categories to aid in assessing its potential hazard, friable and non-friable. Friable asbestos containing materials are those that when dry, may be crumbled, pulverized, or reduced to powder by hand pressure. Non-friable asbestos containing materials are those that when dry, may not be crumpled, pulverized, or reduced to powder by hand pressure. Friable ACM releases airborne asbestos particulates more readily than non-friable ACM. Preliminary assessments of the work areas will be conducted to evaluate the extent of potential ACM such as thermal insulation, surfacing materials, asphalt, and vinyl flooring. Some asbestos work has been done including limited removal of asbestos in the Cellhouse, however, new investigations will be conducted for work areas. Preliminary investigations indicate that structures that may contain asbestos include the Cellhouse, Building 64, and the Laundry Building. In addition, utility lines adjacent to the fuel lines in the utility chases may be insulated with ACM, although the fuel lines themselves appear metal. Exposure and removal of the fuel lines may disturb adjacent insulation that may contain asbestos. As stated in Chapter 2, Mitigation Measures, asbestos in or adjacent to work areas will be sampled, identified, and removed prior to the start of repair work. Additionally, the Slope Stabilization project has the potential to disturb asbestos that may occur naturally in the Island rock. If areas of rock are to be disturbed including drilling and demolition, the rock slope will be sampled by a certified asbestos inspector to determine if asbestos is bound in the rock and if so, if the asbestos would be exposed by work activity. Work areas will be surveyed prior to construction activity for the presence and extent of asbestos containing material that may be disturbed.

3.5.3 LEAD

3.5.3.1 REGULATORY FRAMEWORK

Federal regulation 40 CFR 261-272 established identification, handling and disposal requirements for hazardous waste including lead containing wastes. The Residential Lead-Based Paint Hazard Reduction Act of 1992 (Title X of the Housing and Community Development Act) established various programs for reducing exposures to lead, principally in paint. Title X calls for the reduction of lead in housing that is federally supported and outlines the federal responsibility towards its own residential units and the need for disclosure of lead in residences. The Interim Final Regulations of Lead in Construction Standards (29 CFR 1926.62) issued by the Department of Labor, Occupational Safety and Health Administration (OSHA), established permissible exposure limits and associated health and safety requirements for workers involved in lead-based paint activities. It is based in part on air sampling to determine the amount of lead dust generated by various activities. The EPA also has jurisdiction for setting standards for lead abatement under the Toxic Substance Control Act Title IV. The EPA controls the handling and disposal of hazardous waste generated during a removal project. The National Park Service also provides guidance, "Health Hazards of Asbestos, Lead, and Radon Gas in NPS Housing", which provides specific policies and procedures concerning the management of lead-based paint at parks.

Under California's Hazardous Waste Control Law, the California Department of Toxic Substances Control monitors compliance with applicable hazardous waste packaging, labeling, manifesting, transportation, and disposal requirements. All California shippers or transporters of hazardous waste must comply with these requirements.

3.5.3.2 EXISTING CONDITIONS

Lead compounds were an important component of many historic paints. Lead, in the form of lead carbonate and lead oxides, had excellent adhesion, drying, and covering abilities. Lead-based paints were used extensively on wooden exteriors and interiors. Additionally, varnishes and window glazing putty used in the past contained lead compounds.

Lead presents a health hazard when fine dust or fume containing lead is inhaled or ingested. Lead dust and chips are generated by mechanical disturbance of lead paint, such as grinding or sanding. Welding or torch cutting surfaces with lead paint generates lead fume. Lead exposure by inhalation poses the greatest risk because lead fumes and fine dust are readily absorbed into the blood system. Most lead poisonings are the result of prolonged exposure, not a single event.

In 1978, lead-based paints sale for consumer use was banned. However, lead-based paint can still be found in historic buildings such as those on the Island. The Secretary of the Interior's Standards for the Treatment of Historic Properties, calls for removing, controlling, or managing the hazards rather than wholesale or even partial removal of the historic features or finishes. This is generally achieved through careful cleaning and treatment of deteriorating paint, friction surfaces and surfaces accessible to young children. Lead-based paint that is not causing a hazard is thus permitted to remain, and, in consequence, the amount of historic finishes features and trimwork removed from a property is minimized.

This EIS focuses on the handling and disposal of lead-based paint found in work areas that will be removed prior to construction and rehabilitation activities. The buildings and structures on the Island that are assumed to have lead-based paint and finishes until proven otherwise are Building 64, the Cellhouse, the Sallyport, the Water Tower, the Laundry Building and the Quartermaster Building. Additionally, lead may be found in the soil around the structures if extensive chipping or wear has occurred. Work areas will be surveyed prior to construction activity for the presence and extent of lead-based paint and finishes that may be encountered.

4.0 ENVIRONMENTAL CONSEQUENCES

4.1 Introduction

This chapter of the EIS provides an analysis of the environmental effects of the Proposed Action and alternatives, consistent with requirements of the National Environmental Policy Act (NEPA) and the National Park Service NEPA Guidelines. An explanation of the range of issues analyzed in this chapter is provided in Section 1.3. This chapter should be reviewed jointly with the Chapter 3 (which describes the baseline or existing conditions), and Section 2.7, describing the mitigation measures that would be implemented by the National Park Service to avoid or minimize the environmental effects of the Proposed Action. In addition, the impact analysis for each alternative is used as the basis for consideration of potential impairment to park resources and values, as required by National Park Service Management Policies and Director's Order 12. Chapter 1 of this EIS describes this requirement in more detail and its relevance to the objectives of the Construction Program. Chapter 2 provides a discussion of potential impairment to park resources and values for each alternative.

4.1.1 CHAPTER FORMAT

Chapter 4 is divided into sections—each devoted to a particular environmental topic (i.e., biological resources). Within each section, an overview of the methodology used to assess the impacts is provided (as necessary), followed by the impact analysis. The impact analysis describes environmental effects before and after mitigation. A summary statement of the residual effect of the Proposed Action after mitigation is presented in *italics* at the end of each impact discussion. The degree of impact can be quantified in some cases when data are obtainable. However, often only qualitative descriptions of impact are available. The following definitions are applied in this chapter for resources except nesting waterbirds, for which separate criteria were developed (see Section 4.2.1):

- Negligible – the impact is at the lower levels of detection
- Minor – the impact is slight, but detectable
- Moderate – the impact is readily apparent and has the potential to become major
- Major – the impact is severe, or if beneficial, has exceptionally beneficial effects.

An analysis of cumulative impacts is also provided in this chapter. Other NEPA requirements, including a discussion of the relationship between local short-term uses of the environment and the maintenance and enhancement of long-term productivity, irreversible or irretrievable commitments of resources, and unavoidable adverse impacts, are provided in Chapter 5.

4.1.2 CUMULATIVE CONTEXT

The Council on Environmental Quality (CEQ) regulations implementing NEPA define a cumulative impact as ". . . the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (federal or non-federal) or person undertakes such other actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time" (CEQ Section 1508.7).

The primary projects and actions that could contribute to the cumulative effects of the Proposed Action and alternatives are summarized below.

4.1.2.1 ON-ISLAND CUMULATIVE PROJECTS

General Island Operations

Alcatraz Island hosts more than 1 million visitors each year. Seven days a week, boats deliver park visitors to the Island, where they enjoy interpretive programs and explore its historic and natural features. In providing these opportunities, the National Park Service conducts a variety of support operations. These activities could contribute to the cumulative effects analyzed in this EIS, and a summary of the relevant operations is provided below.

Regular Maintenance and Ranger Patrols – Regular maintenance activities on the Island include painting, roof repair and replacement, fencing repair and replacement, roadway repairs, vegetation management, cleaning, and minor building repairs. Maintenance and minor repair of the electrical, water and other infrastructure systems are also conducted. National Park Service Rangers also conduct routine patrols in some closed areas of the Island to ensure visitor compliance with closures. Daily patrols are conducted to the Laundry Building at the north end of the Island, including during breeding season, by rangers trained to minimize bird disturbance. Emergency repairs (i.e., U.S. Coast Guard fog signal) can occur during the breeding season. Maintenance access is reviewed by the National Park Service wildlife biologist to minimize biological effects and normally requires a National Park Service biologist to accompany those entering particularly sensitive areas during breeding season.

Biological Monitoring and Scientific Research Activities – The National Park Service has been monitoring and conducting scientific research activities on Alcatraz Island for more than 10 years. These activities require monitoring personnel to access sensitive areas (i.e., areas that are closed to the public and other National Park Service personnel) to collect data on breeding population size and nesting success of colonial nesting birds on the Island. Disturbance associated with cormorant and pigeon guillemot monitoring is minor, because it is generally conducted from inside a bird blind or from inside buildings or from rooftops with minimal nesting activity. Occasionally a few cormorant eggs are collected for contaminant research, with the eggs collected at night and in areas where researchers are shielded from view to minimize disturbance. Most western gull monitoring is conducted from a distance using spotting scopes from locations that can be accessed with minimal disturbance. In the past, researchers conducting long-term studies within the Cistern gull colony entered the colony daily to weigh eggs and chicks, monitor environmental conditions at individual nest sites, and band chicks. Two island-wide gull censuses are conducted that require direct access to nesting areas to determine nest contents. These censuses create a greater level of disturbance, with gulls in the area often flushing from their nests and sounding alarm calls. Researchers move slowly and quietly, with only one or two people entering the colony area. Because of the proximity of the Parade Ground colony to night-heron subcolonies and Brandt's cormorants, Parade Ground gull censuses are conducted from the Lighthouse plaza with spotting scopes.

Night-heron monitoring is more disruptive than other routine monitoring, as the subcolonies must be entered directly in order to document the number of active nests and determine nest fate and reproductive success. Adult night-herons flush from the subcolony when researchers enter it. To reduce the impacts of these activities, monitoring is not started until nest initiation is well underway, subcolony visits are kept as short and quiet as possible, and visits for the year end when inter-specific competition could lead to elevated night-heron predation by gulls (after gull chick-hatching).

A National Park Service Research and Collecting permit, and review through the National Park Service's Project Review process for NEPA compliance, are required for research and monitoring activities on Alcatraz. Researchers and monitoring personnel are trained to minimize disturbance to nesting birds, although some disturbance does occur.

Delivery of Supplies and Materials – Once a month, the supplies and equipment needed for the day-to-day operations on the Island are delivered via barge. The barge typically arrives at 5:00 a.m. and off-loads from the

main Dock area. Materials/equipment are transferred to the Island using a small (15-ton) hydraulic crane. During the transfer, the Dock area and barge are lit and the transfer is normally completed within a few hours. These deliveries continue year-round, occurring during the breeding and non-breeding seasons.

Other On-Island Influences – The recent discovery of Norway rats on the Island is a concern for breeding birds, as these aggressive rodents are known to prey on adults, eggs and chicks of a wide variety of bird species. They are more likely to be a serious problem for, and could result in extirpation of, the Island's populations of native deer mice and California slender salamanders unless quickly controlled and eradicated. The National Park Service recently contracted with the Island Conservation and Ecology Group to conduct a site survey and develop a preliminary plan and strategy for Norway rat eradication and prevention of reintroductions during any future construction or other activities resulting in the delivery of materials to the Island. The preliminary plan includes measures to minimize impacts to non-target species including native deer mice, and to minimize the potential for secondary poisoning of gulls, herons, egrets, ravens and raptors. These protective measures would be tested prior to implementation of a full-scale rat eradication program, which would be subject to further review.

Other on-island influences include occasional visitors entering into closed areas. A few such incidents occur each year, and have the potential to cause major disturbance to breeding bird colonies. The presence of monitoring biologists and Island staff usually results in quick detection and resolution of these incidents.

Island Projects

In addition to the activities described above, several projects, recently implemented or reasonably foreseeable, could contribute to the cumulative impacts analysis provided in this EIS.

- **Upper Restrooms** – In the summer of 1999, new Americans with Disabilities Act (ADA)–compliant restrooms were constructed adjacent to the Cellhouse plaza and the Warden's House. This project was identified in the 1993 DCP EA as a recommended action. The construction took approximately four months to complete. The Upper Restrooms are located adjacent to the Cellhouse Plaza in a heavily used area that is open year-round to visitors. The project was performed in compliance with mitigation measures to minimize potential adverse effects to wildlife. Exclusionary gull netting had previously been installed in this area to minimize gull/human conflicts.

- **Cellhouse Plaza ADA Project** – During the winter of 2000, improvements were made to the Cellhouse Plaza (located on the southern portion of the Island adjacent to the Lighthouse). These improvements included concrete removal and replacement, railing replacement, and provision of a ramp and other features, to make the plaza accessible for all visitors. These improvements were designed in accordance with the ADA requirements. The plaza is located in a heavily used area that is open year-round to visitors and was performed in compliance with mitigation measures to minimize potential adverse effects to wildlife. Exclusionary gull netting had previously been installed in this area to minimize gull/human conflicts.

- **Photovoltaic Project** – The National Park Service is considering the installation of photovoltaic panels on the roof of a Federal Prison–era building on Alcatraz (potentially the New Industries Building or the Cellhouse). The panels would provide solar-generated power for use on the Island, consistent with the park's sustainable practices, and would remove total reliance on conventional generators. The installation would occur outside of the waterbird breeding season (or would be otherwise performed in compliance with mitigation measures as required by the DCP EA/FONSI and this EIS/ROD). This project, including protocols for repair and maintenance activities to minimize disturbance during the breeding season, will also be subject to review through the National Park Service's Project Review process for NEPA Compliance.

- **Guard Tower Restoration/Repair** – Repair and rehabilitation of the historic Guard Tower (located in the Dock area) was recently implemented. Future plans for the tower include its temporary removal from the Island for sand and/or water blasting and painting, and once reinstalled, additional rehabilitation of the stair structure would be implemented. This work would be done outside the waterbird breeding period to avoid biological impacts, consistent with the requirements of the DCP EA/FONSI and this EIS/ROD.

- **Gull Exclusion Project** – Prior to the 1998 breeding season, gull exclusion measures were implemented to prevent Western Gulls from nesting in areas of high human use where frequent conflicts between gulls and people occurred. Conflicts included harassment of gulls by visitors, feeding of gulls by visitors, gull attacks on people, unaesthetic conditions, and human health concerns related to avian diseases and accumulations of bird excrement. A few gulls do become accidentally entangled in the netting each year. They are disentangled and released as quickly as possible, usually unharmed. The gull exclusion netting and gull wire systems are maintained every year to ensure that gaps are closed, and proper tension is maintained to allow the devices to function properly. Approximately 25 western gull territories were affected by the exclusion measures. The following year, the Alcatraz breeding gull population was the highest ever. (Although slightly different monitoring methods were employed, this is not believed to account for the level of population increase observed.)

- **Power House Walkway –** The walkway leading past the officer's club and along the road adjacent to the Quartermaster's Building and up to the Power House entrance was opened year-round to the public in 1999, consistent with the DCP EA. Public access terminates where a closed paved trail leads up to the Cistern gull colony and one can overlook the Model Industries Plaza through chain-link fence. This path leads beneath the wall subcolony of black-crowned night-herons and ends adjacent to western gulls nesting on the slope below the cistern. Prior to the opening of this walkway, park staff accessed the Quartermaster Building with light vehicles. The accessible tram is parked at the Quartermaster Building at night. Visitation in this area is generally very light. Since opening of the walkway, some visitors inadvertently walk to the end of the walkway, thinking they are en route to the Cellhouse and may increase the potential for people to enter closed areas that are extremely sensitive during breeding season without being seen.

4.1.2.2 OFF-ISLAND

Because Alcatraz is an island, the primary cumulative influences on cultural resources and visitor use would be generated by on-island actions, as described above. The focus of the following discussion is on biological resources. (A discussion of the cumulative context for air quality impacts is provided in Section 4.5.)

Alcatraz wildlife is exposed to recurring disturbance from aircraft overflights, boats and maritime activities along the western cliffs, including permitted disposal of dredged materials, and unpermitted events and activities offshore. Additionally, environmental contaminants in the Bay, and the proposed removal of submerged rocks important for fisheries in San Francisco Bay, also pose threats to Alcatraz breeding bird populations. A brief summary of the primary off-island influences that could lead to a cumulative effect on colonial nesting waterbirds is provided below.

- **Nearshore or Air and Water-Based Disturbance** – The National Park Service controls regular visitor access to the Island; however, frequently uncontrolled and unauthorized activities, including shoreline access and off-shore occurrences, have directly impacted the breeding birds on the Island. These activities include recreational boating, commercial fishing, commercial boat tours, and aircraft overflights (including air tours) by helicopters, small planes, and permitted dredged material disposal (see below). In addition, oil spills and other contaminants in the Bay can have an adverse effect on the food supply (fisheries) for nesting seabirds on Alcatraz as well as the direct impact of oiling the birds or otherwise fouling their feathers, causing hypothermia and death.

- **Disposal of Dredged Materials** – The U.S. Army Corps of Engineers has designated three disposal sites for the placement of dredged materials within the San Francisco Bay region (Carquinez Strait, San Pablo Bay, and Alcatraz Island). Approximately 80 percent of dredged material in the region is disposed of at these three in-Bay sites. The Alcatraz Island site is located south of the Island (off-shore) and is the most heavily used, receiving nearly 4 million cubic yards (mcy) of sediment per year (USACE et al., 1998). According to USGS Multibeam Data, 8.8 million cubic yards of dredge spoil has accumulated in the Alcatraz area since 1894. This disposal site is located less than 800 feet from the Island (USGS, et al., 1998). According to the EIS prepared for the Long-Term Management Strategy (LTMS) for Disposal of Dredged Materials in the San Francisco Bay Region (USACE et al., 1998), disposal of dredged materials has the potential to contaminate the Bay. Dredged material may contain contaminants at elevated concentrations that may become mobilized after dredging and disposal. Fish may bioaccumulate the contaminants and birds and marine mammals eat the fish, with the ensuing potential for acute or chronic effects on adults and young that eat the fish, or upon reproductive success itself. In addition, dredged material is often deposited near, or within, foraging areas causing direct disturbance and disruption. Although this site is located off-shore from Alcatraz, disposal practices can effect fisheries resources, nesting seabirds on Alcatraz by impacting food supply, and cause subsequent effects associated with potential contaminates in the water column.

  Growing concern related to the capacity of existing disposal sites and the environmental and ecological effects associated with in-Bay disposal prompted federal and state agencies to consider changes to regulatory requirements. In 1990, these agencies joined together with navigation interests, fishing groups, environmental organizations, and the public in a cooperative effort to establish the LTMS for disposal of dredged material in the San Francisco Bay Region (USACE et al., 1998). The general goal of the LTMS is to distribute dredged material ". . . in a manner that minimizes environmental impacts and maximizes environmental benefits in an economically sound manner." In 1998, the Final EIR/EIS for the LTMS planning effort was released, identifying a preferred alternative. Under the preferred alternative, approximately 40 percent of dredged material would be disposed of in the ocean, 40 percent at upland/wetland reuse sites, and the remaining 20 percent would be disposed of at designated in-Bay sites. The goals of this alternative cannot be achieved immediately, and would require the availability of new upland/wetland reuse sites. During the transition between existing and future conditions, it is anticipated that in-Bay disposal would gradually be decreased to reach the balance identified in the LTMS preferred alternative.

- **Removal of Underwater Rocks** – Several underwater pinnacles are located off-shore from Alcatraz, near the northwestern end of the Island. These pinnacles are in close proximity to the confined shipping channels and considered a major hazard to ships, particularly deep draft oil tankers. As result, removal of these obstructions is currently being considered by the U.S. Army Corps of Engineers and California State Lands Commission. The primary reason for their removal is to reduce the possibility of a major oil spill resulting from a tanker striking one of the pinnacles. The pinnacles proposed for removal are Harding, Arch, Shag, and Blossom Rocks, an unnamed rock, and a portion of Alcatraz Shoal. These pinnacles are located approximately ½ to 1½ miles from the Island.

  The proposed project includes removal of the pinnacles by reducing the rock elevations to -55.0 feet Mean Lower Low Water (MLLW). Currently, the elevations of these rocks range from -35.2 to -49 feet MLLW. Rock removal would likely be accomplished by using explosives. The blasted rock would then be removed by a dredge and transported to a disposal area. Dredging operations would result in a temporary increase in turbidity of waters in the vicinity of the sites. The rocks are suspected to provide habitat for several fish species, including Pacific herring. Concern has been raised over the impacts pinnacle removal may have on fisheries, including mortality from blasting, loss of habitat, and loss of benthos that live on and beneath the surface of the pinnacles, affecting associated predator species, including fish and birds. In addition, there could be indirect impacts on waterbirds breeding on Alcatraz Island if they use the rocks as feeding areas.

- **Sand Dredging** – On July 10, 2000, the U.S. Army Corps of Engineers (USACE) announced it was considering a permit application for sand dredging. Olin Jones Sand Company has applied for a 10-year Department of Army permit to dredge sand from three tracts of land on Point Knox Shoal, near Angel Island in Central San Francisco Bay, Marin and San Francisco counties, California. The purpose of this dredging is to obtain commercial grade sand for sale. The sand would then be used for construction projects throughout the Bay Area.

  The applicant proposes to remove up to 400,000 cubic yards of sand annually from three tracts located north of Angel Island within Raccoon Strait; northwest of Angel Island, encompassing the area of Shag and Harding rocks; and south of Angel Island, near its shore. Sand would be removed from these tracts and transported by barge to established sand yards or other appropriate upland sites outside USACE jurisdiction.

  Sand mining has been occurring at nearby Point Knox and Alcatraz Shoals for more than 25 years. Department of the Army Permit 21258348, issued May 24, 1995, authorized the Olin Jones Sand Company to mine 200,000 cubic yards of sand at the Pt. Knox Shoals for a 5-year period. The applicant was granted authority on June 19, 1998 by the State Lands Commission, and on September 8, 1999 by BCDC to dredge 400,000 cubic yards of sand per year. On December 1, 1999 the applicant requested the USACE to renew the existing permit and modify the allowable dredging volume to 400,000 cubic yards of sand per year. The USACE has assessed the environmental impacts of the action proposed the permit application.

  The USACE Environmental Assessment concluded that the associated impacts of dredging operations on water quality variability would be adverse but short term and minor in magnitude. Impacts in the water column during dredging episodes would be short term, localized, and minor in magnitude and no potentially adverse effects to winter-run chinook salmon that may be near the dredging site are anticipated. No other listed species would be adversely affected according to the USACE..

  The EA also concluded that other resources and uses (aquatic species, recreational fishing, air quality) would experience only minor to moderate, short-term, adverse impacts. Comments on the proposal were received by several agencies, including the U.S. Fish and Wildlife Service, which recommended the permit be denied until the cumulative impacts are adequately addressed. As of February 26, 2001, the permit is still under review.

- **San Francisco Airport Runway Expansion** – Another off-island proposed project that may have cumulative effects in conjunction with the Proposed Action is the reconfiguration of the San Francisco International Airport (SFO) runways. Currently, studies are being conducted by the SFO to determine the extent of impacts to resources, but of primary relevance to the Alcatraz Island construction program are cumulative effects to seabirds, particularly night-herons and egrets, and related effects from associated dredging and disposal sites needed for the airport reconfiguration project. Release of the draft environmental impact statement/environmental impact report is projected for late 2001.

4.2 Biological Resources

4.2.1 METHODOLOGY

The primary biological resource concern associated with the Proposed Action and alternatives is the potential impact to the Island's breeding waterbird colonies. In preparation of this analysis, relevant scientific data was reviewed, including data related to the sensitivity of breeding waterbirds. Examples of these sources are:

- *Birds of North America* (Andres and Falxa, 1995; Davis, 1993; Ewins, 1993; Hobson, 1997; Pierotti and Annett, 1995; Wallace and Wallace, 1998);
- *A Review of Human Disturbance Effects on Nesting Colonial Waterbirds* (Carney and Sydeman, 1997);
- *Effects of Human Disturbance on Breeding of Black-Crowned Night-Herons* (Tremblay and Ellison, 1979);
- *Human Disturbance and Nestling Behavior in Black-Crowned Night-Herons* (Parsons and Burger, 1982); and
- *Human Disturbance in Western Gull (*Larus occidentalis livens*) Colonies and Possible Amplification by Intraspecific Predation* (Hand, 1980).

Past monitoring and data collection on Alcatraz was also reviewed, including:

- *Baseline Monitoring and Assessment of Effects of Disturbance to Seabird Populations on Alcatraz Island, California, 1997–1999* (Fairman et al., 1998; Thayer et al., 1999a; Thayer et al., 2000);
- *Alcatraz Island Colonial Waterbird Monitoring: Assessment of Impacts of "The Rock" Premiere on Colonial Nesting Birds, Excluding Western Gulls* (Hatch, 1996);
- *Western Gull Disturbance Monitoring, Alcatraz Island: Results from Monitoring During "The Rock" Premiere Event* (Brown, 1996); and
- *Reproductive Success of Black-Crowned Night-Herons (*Nyctocorax nycticorax*) at Alcatraz Island, San Francisco Bay, California, 1998* (Hothem, 1999; Hothem, 2000).

A complete list of sources is presented in Chapter 7. This body of information was reviewed and considered in the preparation of this analysis; however, documentation of the effects of construction activities on the species found on Alcatraz was not available. The "human disturbance" listed above primarily documents the effects of scientific monitoring (i.e., the presence of human monitors within active nesting areas) or other activities that would not occur—or are not relevant to—the Proposed Action and alternatives.

Section 1502.22 of the Council on Environmental Quality's Regulations implementing the National Environmental Policy Act (NEPA) requires an EIS identify information relevant to evaluating reasonably foreseeable significant adverse impacts that is not available, including an explanation of the effect upon the analysis.. Information was not available for the analysis of construction-related impacts on nesting waterbirds, and pursuant to Section 1502.22, a discussion of incomplete and unavailable information is provided below.

Detailed documentation of the relationship between construction activities and the impacts on the breeding waterbird species on Alcatraz as expressed in a reduction in reproductive success, size of breeding population, nest abandonment or other physical changes or indicators of the health of a particular species is not available. Without this type of scientific documentation, and in particular the noise levels, length of exposure or other tangible data on how birds respond to construction activity disturbance, it is difficult to conclusively predict the

impacts of the Proposed Action and alternatives. Limited information related to noise disturbance was available from a one-time monitoring event during "The Rock" movie premiere that occurred in the Recreation Yard of the Cellhouse, adjacent to the Cistern subcolony of western gulls. Although this was not a "construction project," large equipment was used over a period of 10 days. Information from this disturbance monitoring and other relevant disturbance data are summarized by species, in Section 3.1, and is referenced, as appropriate, in the impact analysis.

Of particular concern on Alcatraz is the cause and effect relationship between disturbance of western gulls and their subsequent disturbance of and/or predation on other waterbird species and their young. Existing scientific sources and past monitoring on Alcatraz indicates that there is a relationship; however, detailed documentation that is applicable to the project does not exist. This impact analysis therefore assumes that gull disturbance could lead to indirect impacts to other nesting birds. In addition, many outside factors can influence the health of particular species. For example, recent El Niño events had a direct impact on the availability of food sources for seabirds, and appeared to have affected the size of the breeding populations of several species of seabirds on Alcatraz for 1 to 2 years (as described in Chapter 3). In summary, predicting the impacts of the Proposed Action and alternatives on the Island's waterbird population is a complex endeavor. To provide a reasonable assessment, a combination of judgment by professional biologists, knowledge of the waterbird colonies on the Island, and review of relevant data (where available) was employed. Consistent with the requirements of NEPA and National Park Service NEPA Guidelines (NPS-12), the analysis focused on the context, intensity, and duration of the effect. The following factors were considered in defining these components of the analysis:

Context: The context was defined by evaluating:

- Existing human presence and level of use at the project site (i.e., whether the site is currently open to the visiting public, or human presence is minimal, the intensity of the current use, etc.).
- Proximity to waterbird subcolonies (and the diversity of species affected) and the relative size of the subcolonies in relation to the total Island population (i.e., whether the project is directly adjacent to one of the largest subcolonies on the Island, whether the project would affect several species, etc.).
- Regional importance of Alcatraz bird populations (i.e., does the affected subcolony constitute a large proportion of the San Francisco Bay population for that particular species).

Intensity: The type of construction activities (i.e., noise and activity level) and magnitude of disturbance on nesting birds.

Duration: The amount of time needed to complete the repairs/construction, and its relationship to the breeding season.

The following definitions apply to the impact analysis regarding waterbirds in this section:

- Negligible – the impact is at the lower levels of detection.
- Minor Impact: Waterbirds would be affected by localized disturbance and/or unnaturally elevated predation levels. Few species would be affected, potential for localized reduction in reproductive success and/or decline in size of small subcolonies.
- Moderate Impact: Waterbirds would be affected by disturbance and/or unnaturally elevated predation levels over a broader area of the island. More species would be potentially affected, there would be potential for long-term abandonment of small subcolonies, with moderate reduction in population size (less than 25 percent).

- Major Impact: Many waterbird species would be affected by continuous, prolonged disturbance and/or unnaturally elevated predation levels, including seabirds whose only San Francisco Bay breeding location is on Alcatraz. There would be potential for long-term subcolony or Island abandonment with significant reduction in population size (more than 25 percent).

The impact analysis presented in the following sections provides discussion of the impact before *and* after mitigation. Each impact discussion is concluded with a summary statement of the impact after mitigation (presented in *italics*). The full text of mitigation measures is presented in Section 2.7. Please refer to Chapter 2 for detailed descriptions of the construction activities and staging/barging areas defined for the projects associated with the action alternatives.

4.2.2 IMPACT ANALYSIS – PROPOSED ACTION

4.2.2.1 DISTURBANCE TO MONARCH BUTTERFLIES

Construction activities associated with the Proposed Action would occur in the vicinity of trees that are potential monarch butterfly roost trees. Cypress and eucalyptus trees that may be used as roost sites are present on the eastern side of the Island in the vicinity of the Cellhouse, Dock and Sallyport projects, and staging areas #6 and #3a. No trees would be removed in these areas as a result of the Proposed Action, and monarch butterflies are not known to be sensitive to disturbance that occurs near the periphery of roosting trees. In addition, the monarch does not appear to be adversely affected by human activity or noise. Implementation of the air quality control measures presented in Chapter 2 would minimize potential dust generation.

Following mitigation, the Proposed Action would have a minor impact on monarch butterflies.

4.2.2.2 DISTURBANCE TO MARINE MAMMALS

Barging and staging operations associated with the Proposed Action would occur in the vicinity of a small harbor seal haul out on a rocky outcrop known as Little Alcatraz just off the north end of the Island, and just east of the north foghorn and Model Industries Building. Small numbers of California sea lions occasionally haul out on the north end of the Island below the Model Industries Building.

To avoid or minimize potential impacts to marine mammals, the National Park Service would implement the mitigation outlined in Section 2.7.1. These mitigation measures include use of barge staging area #14 only when tide height exceeds 2.5 feet msl and Little Alcatraz does not provide suitable habitat for seal haul out.. Barge staging area #15 would only be used when California sea lions are not present below the Model Industries Building. These barge staging areas would be utilized on only a few occasions each year, generally for less than a day. These haul outs are not used for pupping, and a small proportion of the San Francisco Bay population would be minimally affected.

Following mitigation, the Proposed Action would have a minor impact on marine mammals.

4.2.2.3 DISTURBANCE TO PACIFIC HERRING

Repair and replacement of pilings as part of the Dock repair project could be implemented during the winter months and therefore may effect Pacific herring that spawn on substructures in the Bay.. Herring is not a state or federally listed species, but is a species of concern in the San Francisco Bay. Spawning habitat for this species is widespread in San Francisco Bay, and the Dock at the Island represents a very small portion of this habitat. Replacement piles are pre-cast concrete recommended by NMFS because it does not result in impacts from toxic coatings, anti-fouling materials, or other chemicals. Pile replacement would result in a short-term temporary

disturbance to potential spawning habitat for herring. Without use of protective measures to minimize these impacts, the Dock Repair project could impact spawning Pacific herring.

To minimize potential impacts to spawning herring from the Dock Repair project, the National Park Service will start work in the fall to avoid spawning season and still comply with the waterbird phasing mitigations. If the adaptive management monitor identifies an effect on spawning, measures included changing the work schedule or fencing the work area to prevent herring from entering may be adopted. Piles will be replaced individually, allowing herring to spawn on piles that are not under construction and minimizing the habitat that is disturbed at any one time.

Following mitigation, the Dock Repair project would have a minor impact on Pacific herring.

4.2.2.4 ADDITIONAL WILDLIFE

Construction activities associated with the Proposed Action could disturb habitat that may potentially be used by common wildlife species on Alcatraz Island, including, but not limited to, deer mice, California slender salamander, banana slug, common raven, songbirds, and mallards. Although the majority of projects to be implemented as part of the Proposed Action include repair of existing structures that do provide wildlife habitat, the Slope Stabilization project and use of staging area #10 would alter potential nesting habitat for common wildlife species including songbirds and mallards. The Slope Stabilization project would result in a new surface application (shotcrete) along an existing, nearly vertical hillside that supports intermittent pockets of vegetation. This action is needed to secure the rapidly deteriorating hillside and protect the pathway and historic structures located at the top of the slope. Although the new slope surface would be designed to accommodate vegetation, as feasible (see Cultural Resource mitigation, Section 2.7.2), loss of rocky, sparsely vegetated habitat in this location would occur. Many areas on the Island provide similar habitat opportunities, and this loss would have a minor impact on the Island's common wildlife species. Use of staging areas #6 and #7 and implementation of the Cellhouse project could temporarily disturb ravens nesting in the cypress trees nearby.

California slender salamanders and other additional wildlife also use the vegetated areas (i.e., tree and shrub habitats) on the slopes around the Dock and Building 64 and on the steep slopes southeast of the Dock area. Although the construction activities would not result in removal of any upland habitat, installation of seismic ties for the Building 64 seismic project would temporarily disturb small areas of potential habitat that could support salamanders and other additional wildlife. Use of staging area #10 would also result in the temporary disturbance of shrub habitat. The temporary disturbance of these sites would effect a small amount of the shrub habitat available on the Island, and would have a minor impact on additional wildlife species. Ground disturbance, long-term storage and subsequent movement of materials to and from staging and construction areas throughout the Island over the course of the projects would continually disrupt habitat for deer mice, slender salamanders and banana slugs. The majority of natural habitat for these species is remote from staging and project areas and would not be affected.

The Proposed Action would have a minor impact on additional wildlife species.

4.2.2.5 DISTURBANCE TO BREEDING WATERBIRDS

General

As described in Section 2.7.1, the National Park Service has identified a series of mitigation measures that would be implemented as part of the Proposed Action to minimize or avoid adverse impacts on waterbirds. These measures include restricted activities during the breeding season, required phasing of projects, limitations on exterior work and night lighting, and other measures to reduce disturbance. As described in more detail in Appendix B, a monitoring program would be implemented to document and measure the effectiveness of these

measures, beginning with Phase One of the Proposed Action. Information obtained through this monitoring would be used to improve the implementation of future projects and refine mitigation measures to ensure the greatest possible reduction in disturbance to the Island's waterbird populations. An analysis of the predicted impacts associated with each project, by phase, is presented below. A conclusion statement of the impact after mitigation is presented for each project, as well as a summary of the overall impacts associated with each phase (which considers the effects of simultaneous or overlapping construction activities).

Phase One

Four projects are included in Phase One of the Proposed Action: Dock Repair, Building 64 (Balconies), Cellhouse (Stabilization and Seismic), and Sallyport (Stabilization and Seismic). These projects are proposed for immediate implementation, and addressed individually below, followed by an overall conclusion of the potential effects of Phase One.

Dock Repair

The Dock is located on the southern end of the Island, and provides the only access to Alcatraz for visitors and staff. During visiting hours, ferries generally arrive every 30 minutes. Visitor and interpretive activities in this area include use of amplified sound for visitor orientation, an electric tram, and a visitor center on the first floor of Building 64 (located at the Dock area). In addition, the Dock is also central to Island operations because supplies are delivered to the Island via the Dock, using a barge and small crane. Supplies are generally delivered once a month, year-round. Extensive nighttime lighting is also present at this location. In summary, the Dock is a heavily used and open to the public all year.

Figure 4.2-1 depicts the general location of all nesting birds on the Island. Along its southwestern edge, the inland portion of the Dock is bounded by a steep, vegetated hillside that extends roughly 50 vertical feet from the surface of the Dock to the Parade Ground above. The hillside slope provides habitat for night-

Placeholder for

Figure 4.2-1 Nesting Bird Colonies on Alcatraz Island

(Only color graphic)

placeholder for rear of color graphic

herons. In the past, 1 to 2 great egret nests were located in the Dock subcolony, about 150 feet south of the project area. During the nest initiation phase of the breeding season, temporary barricades are installed in this area to keep visitors away from the cliff and to minimize disturbance to nesting birds, a mitigation requirement of the DCP EA. The night-heron subcolonies in this area (referred to as the Dock and Auxiliary Dock subcolonies) supported over 10 percent of the Island's population in 1999 and over the past 10 years, 324 nests, or 17 percent of the Island's total, were located within these two subcolonies. As with most areas of the Island, western gull nests are found scattered throughout the project location, including on the periphery of the night-heron subcolonies, on the steep slope above the Dock, on the periphery of the Dock Repair project area, and on the adjacent balconies and roof of Building 64.

The Parade Ground is located on top of the cliff and is not visible from the Dock. The Parade Ground contains one of the Island's largest concentrations of western gulls and provides habitat for the majority of the remaining night-heron nests on Alcatraz (the Rubble, Bench and Tunnel subcolonies). Nearly all of the Island's snowy egrets nest within the Tunnel night-heron subcolony. This area is considered very sensitive and is closed to visitors during the breeding season. The combined night-heron population of the Dock, Auxiliary Dock, Rubble Pile, Bench, and Tunnel subcolonies represent approximately 80 percent (from 1997–1999) of the total Alcatraz population (an increase from 39 percent in 1990). Although regional estimates for night-herons are relative numbers (due to difficulty in detecting nests), the Alcatraz population is estimated to represent up to 40 percent of the San Francisco Bay population and is considered regionally important. The snowy egret population on Alcatraz represents a very small proportion of the regional population. The Parade Ground subcolony of western gulls represents approximately one-fourth of the total Island population. Western gulls nest in many locations in San Francisco Bay, and the total Alcatraz breeding population is believed to contain roughly one-fourth of the in-Bay nesting population.

The waterbirds nesting in the areas directly adjacent to the Dock (i.e., on the steep slope and balconies above) would be directly exposed to increased noise and human activity associated with the construction activities described in Chapter 2. It is important to note that night-herons may be more sensitive to disturbance from above, rather than below (Farrel, pers. comm.; Kelly pers. comm.). However, the use of a large crane would extend the area of disturbance, potentially creating disturbance from above the nests on the adjacent hillside slope. More importantly, the use of a large crane (during the day and especially nighttime hours) during the breeding season could have a substantial impact by causing visual intrusion and disturbance at the Parade Ground. Direct disturbance of the gull subcolony and subsequent predation/disturbance by gulls and ravens of the Rubble, Bench and Tunnel night-heron and Tunnel snowy egret subcolonies would substantially increase the magnitude and extent of impact. It is also possible that the impact of gull and raven disturbance and secondary effects (i.e., predation by gulls on other waterbirds) could extend beyond the Parade Ground into the western cliffs of the Island, potentially disturbing additional species including Brandt's and pelagic cormorants and pigeon guillemots.

Without the use of protective measures to minimize these impacts, the Dock Repair project could directly and indirectly impact the majority of the nesting night-heron and snowy egret populations on Alcatraz, as well as a substantial concentration of western gulls, and potentially create indirect impacts on the seabird populations on the western cliffs. The impact to night-herons before mitigation would likely include a reduction in reproductive success due to increased predation as well as a reduction in parental care and feeding. A reduction in the size of the breeding population and abandonment of individual subcolonies of night-herons could potentially occur. Because the majority of the habitat for night-herons is within the Parade Ground area, opportunities for birds to relocate on the Island is limited, and disturbance of this entire area would be a major impact.

As described in Chapter 3, the western gull is an adaptable species, yet typically nests in the same location for its entire life. As a result, the effect of the Dock Repair project before mitigation would likely result in disturbance and potentially a temporary reduction in reproductive success and/or the number of western gulls nesting in this

area. However, gull nest abandonment would not be likely, because gulls are typically resilient and would be expected to continue to nest in this area.

To minimize the impact of this project, the National Park Service would implement the mitigation measures described in Section 2.7.1, which would reduce the overall disturbance associated with construction and greatly reduce the potential for disturbance of the Parade Ground. Among these measures is the requirement to phase the project so that pile replacement on the southeast side of Building 64 would occur outside of the waterbird breeding season. Protecting the Parade Ground from disturbance by restricting visual intrusion in this area (i.e., from large crane use) would substantially reduce the intensity and magnitude of the project's effect by reducing the number of nests exposed to disturbance and the number of species affected, including indirect effects associated with gull disturbance. Other requirements for phasing construction, restrictions on nighttime construction, use of buffer areas, resource training for construction crews and other measures (including noise controls) would also reduce the impact of construction on breeding waterbirds. The Dock Repair project would be one of the first projects implemented as part of the Proposed Action, and the National Park Service would closely monitor the effectiveness of these measures. The results of this monitoring would be used to refine measures or develop new ones, as needed, to ensure that maximum resource protection is provided (see Appendix B for additional information on monitoring and adaptive management).

Following mitigation, disturbance of the Parade Ground from the Dock project would be negligible.. Required phasing and other protective measures would substantially reduce the impact to the Dock and Auxiliary Dock night-heron subcolonies and western gull nests in this area, an area that is intensively used by visitors year-round. Although pile replacement in the area adjacent to the Dock and Auxiliary Dock subcolonies would be prohibited during breeding season (required mitigation measure), some disturbance could still occur resulting from use of staging area #3a (one of the few areas available for staging in this location). The actual effect on these small subcolonies is unknown; however, it could potentially include a reduction in night-heron reproductive success or breeding population size within these subcolonies, or temporary or long-term abandonment, particularly of the Auxiliary Dock subcolony. After mitigation, the Dock Repair project would have a minor to moderate impact on breeding waterbirds.

Building 64 (Balconies Repair)

Building 64 is located on the southern portion of the Island directly adjacent to the Dock in a heavily used area. Once visitors reach Alcatraz Island, they are greeted in front of Building 64 by a National Park Service ranger, where an orientation talk is given (using amplified sound). The bottom floor of the building serves as the visitor center and theater, and also includes interpretive exhibits and a bookstore. Tram service originates at the Dock, in front of Building 64.

Because of its location directly adjacent to the Dock, this project would affect similar species/subcolonies as described above for the Dock Repair project. In the immediate vicinity, the Auxiliary Dock and Dock subcolonies of night-herons nest on the vegetated slope that extends from the Dock to the Parade Ground above (see Figure 4.2-1). Scattered western gull nests are found on the balconies and roof of Building 64. Beyond the immediate work area is the biologically sensitive Parade Ground, which supports the largest gull population on the Island. This area is visible from the roof and partially visible from top floor balconies on the southern wall of Building 64. As discussed above, this area contains regionally significant populations of night-herons, approximately one-fourth of the Island's western gull population, and nearly all the nesting snowy egrets on the Island (which represent relatively small numbers).

The night-herons and gulls nesting adjacent to Building 64 would be directly exposed to increased noise and human activity. Visual intrusion into the Parade Ground (partially visible from southern wall/top floor balcony) could substantially increase the magnitude of impact, as described above for the Dock Repair project. To minimize or avoid the impact of this project, the National Park Service would implement the mitigation measures presented in Section 2.7.1. Among these measures is a requirement to either phase the project so that the southern balconies are repaired during the non-breeding season or use dense netting to effectively screen the

work areas. Implementation of these measures would substantially reduce the impact of this project by minimizing potential disturbance at the Parade Ground and isolating construction activities to an area that is heavily used by people year-round. To minimize the potential impact to gulls nesting in and around the balconies, exclusion netting or other devices would be installed prior to the start of the breeding season. This measure would preclude gulls from establishing nest sites within the immediate work area during that breeding season. Alternative nest sites for western gulls are plentiful on the Island; however, gulls exhibit high nest fidelity and the few gulls excluded from their traditional nest sites on the building may or may not relocate and breed during that season.

Following implementation of mitigation measures, western gulls would be prevented from nesting in work areas on the balconies of the building and negligible disturbance would occur to gulls, night-herons and snowy egret populations on the Parade Ground. Disturbance to the Auxiliary Dock and Dock subcolonies of night-herons located on the steep slope adjacent to Building 64 would also be avoided or substantially reduced by phasing work in the immediate area to avoid the nesting season or by use of screening, or both. However, some disturbance could occur within the Dock and Auxiliary Dock night-heron subcolonies resulting from use of staging area #3a (one of the few areas available for staging in this location). The actual effect on these small subcolonies is unknown; however, it could potentially include a reduction in night-heron reproductive success or breeding population size, or temporary or long-term subcolony abandonment, particularly of the Auxiliary Dock subcolony. After mitigation, the Balconies Repair project would have a minor to moderate impact on breeding waterbirds.

Cellhouse Stabilization and Seismic Upgrade

The Cellhouse is located on the upper terrace in the center of the Island, and is the main visitor attraction. Some exterior lighting is present at the south end of the building and along the main walkway to the Cellhouse. The area is used heavily year-round by visitors.

Black-crowned night-herons nest along the steep slope below the Cellhouse between the visitor path and the Recreation Yard, on the western side of the building (see Figure 4.2-1). Three other night-heron subcolonies (Greenhouse, Tunnel, and Shower) are present near the Cellhouse. The Greenhouse and Tunnel subcolonies are located west of the Cellhouse and the visitor path, and represented 25 percent of the Island's population in 1999, but supported 34 percent of the Island's population in 1990. The Shower subcolony is the smallest night-heron subcolony on the Island and has historically contained less than 1 percent of the Island's nesting night-herons. The Alcatraz Island population of night-herons represents up to 40% of the San Francisco Bay's population.

Portions of the northern and southern subcolonies of Brandt's cormorants, and their south roosting area, are directly visible from the Cellhouse roof. These subcolonies are some distance from, and well below, the Cellhouse, but support the majority of the Island's and San Francisco Bay's population of Brandt's cormorants. Pigeon guillemots also nest along the top of the western cliffs in locations visible from the Cellhouse roof.

Several western gulls nest in scattered locations around and on the roof of the Cellhouse. The Cistern subcolony located north of the Cellhouse is the second largest gull concentration on Alcatraz, containing approximately 15 percent of the total Island population. The Alcatraz Island population of western gulls is considered to be approximately one-fourth of the nesting population in the San Francisco Bay.

The black-crowned night-heron subcolonies on the steep slope west of the Cellhouse (Recreation Yard), and the Greenhouse, Tunnel, and Shower subcolonies, would be directly exposed to increased noise and human activity. Erection of scaffolding on the western side of the Cellhouse would require placement of scaffolding near nesting night-herons. This activity and exterior work associated with breeding season repair of the western wall of the Cellhouse would result in disturbance to night-heron subcolonies from above rather than from below. As discussed above, activities from above may have a greater disturbance on night-herons (Farrel, pers. comm.; Kelly, pers. comm.); however, most of the western Cellhouse wall is relatively distant from these night-heron subcolonies. As required by the mitigation measures described in Section 2.7.1, exterior work along the western

wall would either be phased to avoid the breeding season, or dense netting and other barriers would be installed to minimize visual and noise intrusion outside the immediate work area.

During monitoring of waterbird behavior for "The Rock" movie premiere, which included crane use, noise, night lighting and extensive human activity over a period of 10 days in early June, night-heron adults and chicks were observed in alert postures, "chattering" and alarm calling (Hatch, 1996). As activity, noise and lighting increased in this area, the night-herons retreated into the vegetation. After lights were turned off and activity stopped, the night-herons appeared to return to normal activity. The two closest night-heron subcolonies also declined in size the following year for unknown reasons. Based on these limited observations, it is anticipated that without the proposed mitigation measures the lighting, noise and human activity of the Cellhouse project, including use of staging areas, would result in disturbance to night-herons. This disturbance would likely result in decreased reproductive success and population size or abandonment of individual subcolonies.

Erection of scaffolding around the exterior walls of the Cellhouse could also result in disturbance to the western gull subcolony at the cistern. Disturbance of this subcolony would likely result in indirect disturbance, from gull aggression, of other breeding waterbird colonies on the Island. This could extend to the cormorants and pigeon guillemots on the western cliffs. Lighting for nighttime construction could also disturb the Cistern subcolony. Lighting used during "The Rock" premiere in the Recreation Yard resulted in temporary nest abandonment at the Cistern subcolony (Brown, 1996). Low frequency noise levels from "The Rock" movie premiere also resulted in gulls flushing from their nests at the Cistern subcolony (Brown, 1996).

Nighttime lighting on the exterior of the southern wall of the Cellhouse could illuminate the Parade Ground and disturb the nesting gull subcolony. The Parade Ground is approximately 200 feet from the southern end of the Cellhouse and approximately 70 feet below the location where lighting would be installed. Disturbance to the Parade Ground subcolony would be negligible ; however, if it were disturbed, affected gulls could disturb/prey upon other birds, resulting in indirect disturbance of several other waterbird subcolonies (as described under the Dock Repair project, above).

Without use of protective measures to minimize these impacts, the Cellhouse Stabilization project could directly and indirectly impact many of the waterbird subcolonies on the Island. Disturbance of the Cistern gull subcolony would result in indirect effects from gull aggression/predation on a number of other waterbird subcolonies, including the only nesting colony of pigeon guillemots and at least 90 percent of the nesting pelagic and Brandt's cormorants in San Francisco Bay, which could result in decreased reproductive success, population size or subcolony abandonment. The impact to night-herons would likely result in a reduction of reproductive success and population size of individual subcolonies. Disturbance of most of the island population of snowy egrets could result in a reduction of nesting success or population size of snowy egrets on the Island. Because western gulls are highly adaptable, disturbance to the Cistern and Parade Ground subcolonies would likely result in a short-term reduction of reproductive success and population size, but would not likely result in long-term abandonment. Please refer to the Dock Repair project for more information on the regional importance of these night-heron, egret, and western gull subcolonies.

To minimize the impact of this project, the National Park Service would implement the mitigation measures described in Section 2.7.1. These measures would reduce the overall disturbance of construction on breeding waterbirds and would reduce the potential for disturbance of the Cistern and Parade Ground gull subcolonies by prohibiting exterior work in sensitive locations during the breeding season and/or use of protective barriers to minimize disturbance outside of the immediate work area. As with other projects, reducing disturbance of the large gull subcolonies on the Island would substantially reduce the project's direct effects on other waterbird species. Other measures include restrictions on night lighting, placement of protective barriers, and other measures to reduce noise that would reduce disturbance to nesting waterbirds. Repair of the Cellhouse would be monitored to determine the effectiveness of these measures. If necessary, these measures would be refined and new ones would be developed through the Adaptive Management Program for the Subsequent Phase projects to

ensure that maximum resource protection is provided. Refer to Appendix B for additional information on monitoring and adaptive management.

Following mitigation, disturbance of the Parade Ground and Cistern gull subcolonies would be negligible or avoided. As discussed for other projects, reducing the potential for impact on gull subcolonies would substantially reduce the project's indirect effects on other breeding waterbird populations on the Island. Implementation of measures to reduce noise, visual intrusion, and human activity near the breeding populations would substantially reduce the effect of construction on night-herons and snowy egrets, as well as Brandt's cormorants and pigeon guillemots from activities on the Cellhouse roof; however, some disturbance to these species may still occur. Use of staging area #5 for barge on- and off-loading and various other staging areas on the Island may also result in some disturbance to adjacent western gulls or night-herons, with potential for reduced reproductive success, a decline in population size, or temporary or long-term subcolony abandonment, particularly of the Wall or Power Plant night-heron subcolonies (which have supported an average of 8 percent of the Island's population since 1990). Overall, this project is not expected to result in abandonment of the island by any species of nesting waterbirds on the Island; however, several small subcolonies of night-herons could potentially be abandoned. Following mitigation, the Cellhouse Stabilization project would have a moderate impact on breeding waterbirds.

Sallyport Structural Repair and Seismic Upgrade

The Sallyport Complex is located on the eastern side of the Island. Visitors walk through the Sallyport en-route from the Dock to the Cellhouse (the primary visitor attraction on the Island). Although alternate pedestrian access is available, this route is the most heavily used by visitors and is the only route available for the tram. The Sallyport complex is open year-round.

In general, the Sallyport is located in one of the least biologically sensitive areas on the Island. Waterbird species present in this area include the Power House and Wall subcolonies of black-crowned night-herons and scattered western gull nest sites (see Figure 4.2-1). The Power House and Wall subcolonies are both located north of the Sallyport and represented 7 percent of the total Island population in 1999, but have supported an average of almost 16 percent over the period from 1990 to 1999. Western gulls nest in scattered locations near the Sallyport, including west of the building on the steep vegetated slope above the visitor path and above the northeast perimeter along the water below the Sallyport. Less than 5 percent of the Island's western gulls nest in the vicinity of the building. Refer to the Dock Repair project of the Proposed Action for a discussion of the regional importance of night-herons and western gulls on Alcatraz Island.

Demolition of the Boathouse portion of the Sallyport complex would result in direct disturbance from increased noise and human activity to the Power Plant and Wall subcolonies of night-herons. Demolition of the Boathouse and exterior work along the eastern portion of the building would also result in disturbance to scattered individual gull nests on the northeast perimeter trail below the complex. Disturbance of these gulls could result in greater disturbance to the Wall and Power Plant night-heron subcolonies. Transport of material to staging areas #3 and #3a could disturb the Auxiliary Dock and Dock subcolonies of night-herons and transport of materials to staging area #8 and #11 could result in further disturbance to the Wall and Power Plant subcolonies. Common ravens nesting in the cypress trees above the Sallyport, along the trail to the Cellhouse, may also be directly disturbed by the project. Raven predation on night-herons may be exacerbated by disturbance visible from this nest site. There is also potential for disturbance to the pigeon guillemots nesting at the power plant, as well as the gulls on the Cistern and/or Model Industries Plaza near staging area #11. Disturbance to the gulls on the Cistern of Model Industries Plaza may cause further indirect impacts to other waterbird nesting throughout the north end of the Island.

Without protective measures to minimize these impacts, the structural upgrade and seismic repair of the Sallyport would likely result in decreased reproductive success and population size of individual night-heron subcolonies. This disturbance could result in a slight long-term reduction in the population on Alcatraz. Disturbance of gulls nesting in scattered locations near the Sallyport would likely result in a short-term reduction in reproductive success.

To minimize the impact of this project, the National Park Service would implement the mitigation measures described in Section 2.7.1. These measures would prevent disturbance of nesting gulls in the construction area along the northeast perimeter trail below the complex, and reduce direct disturbance from increased noise and human activity near the night-heron subcolonies. Preventing gulls from nesting within the construction area would reduce the project's effects on western gulls and the subsequent indirect effect on night-heron subcolonies. Other mitigation measures to reduce breeding season effects, including limiting crane use and material movement on barges to daylight hours, restricting movement of materials at staging areas #3, #8, and #11 to daylight hours, shielding lighting, and reducing ambient noise impacts, would substantially reduce disturbance of nesting waterbirds.

Activities associated with the stabilization and repair of the Sallyport may result in minor disturbance to pigeon guillemots in the power plant. Disturbance to western gulls adjacent to staging area #11 and to common ravens nesting near the project area may result in elevated disturbance or increased predation of night-herons or other species on the north end of the Island. The greatest effect of this project on nesting waterbirds would be associated with the barge use and demolition of the Boathouse, which are expected to last approximately one week and may occur outside of the breeding season, eliminating impact on nesting waterbirds. Implementation of the mitigation measures discussed above (and described in detail in Section 2.7.1) would reduce the intensity and magnitude of construction disturbance; however, a minor to moderate impact on the affected subcolonies could still occur depending on timeline of construction activities.

Phase One Summary Conclusion – Disturbance to Breeding Waterbirds

Implementation of Phase One of the Proposed Action would require construction activities on the Island for roughly a 2-year period. Repairs would be implemented in areas that are heavily used by visitors year-round. The Cellhouse project would require the most time to complete, approximately eighteen months. The Dock Repair project (approximately fifteen months), Building 64 Balconies project (up to six months), and the Sallyport project (approximately six months) would be implemented concurrently with the Cellhouse project. Implementation of the Dock Repair and Balconies project would not occur simultaneously due to space constraints for staging and construction activities in this area; however, it is possible that some concurrent mobilization and demobilization activities may take place. Such minor overlap in this area may include, for example, the staging and startup activities for the Balconies project at the end of the Dock Repair project.

Given the type, duration and location of the proposed repair work associated with Phase One, the primary overlap of potential disturbance would be in the Parade Ground. As previously described, the Dock/Balconies area is located roughly 50 feet below the Parade Ground. The southern wall of the Cellhouse is located roughly 70 feet above the Parade Ground, and is set back from the top of the cliff by approximately 200 feet. Although neither project site is visible from the Parade Ground, it is possible that construction activities would cause disturbance at the Parade Ground. The Parade Ground is considered very sensitive during the breeding season; directly because of diversity and abundance of nests in immediate area, and indirectly because of the potential for gull disturbance in this area to create additional impacts on other nesting birds within the Parade Ground and beyond (i.e., along western cliffs). Because of this sensitivity, the National Park Service identified a series of mitigation measures for each of the Phase One projects (i.e., restrictions on exterior work during breeding season, phasing requirements, and other protective measures) to avoid or substantially reduce potential disturbance of the Parade Ground. Because each project's impact on the Parade Ground would be individually reduced or avoided, implementation of concurrent projects is not anticipated to create additional disturbance in this area or increase the combined effects.

As discussed for the individual projects in Phase One of the Proposed Action, the National Park Service would monitor the effectiveness of mitigation measures through the Adaptive Management Program. The information obtained through this monitoring would be used by the National Park Service to refine, improve and modify measures, as needed, to achieve the most effective protection possible. For a more detailed discussion of the

proposed monitoring program and use of adaptive management in implementing the Proposed Action, please refer to Appendix B.

Subsequent Phases

Water Tower Stabilization

The Water Tower is located on the northern end of the Island (see Figure 4.2-1). The Water Tower can be seen from most areas on the northern portion of the Island, and is a visibly prominent feature from most off-site viewpoints. The tower is a steel tank elevated on six cross-braced steel legs anchored to a concrete foundation. The area immediately below the Water Tower, the cistern, is closed to public access for public safety and biological resource protection.

Several western gulls nest around the base of the Water Tower, and the second largest western gull subcolony on the Island (the Cistern subcolony) is directly adjacent (see Figure 4.2-1). Western gulls also nest on the roof of the Laundry Building and Model Industries Plaza, which are visible from the tower. These areas contain approximately 25 percent of the total western gull population on the Island. The Wall and Power Plant subcolonies of black-crowned night-herons are located approximately 100 to 150 feet northeast of the tower, and the Foghorn and Recreation Yard night-heron subcolonies are located near the Cistern, Model Industries Plaza and surrounding gull nesting areas. These night-heron subcolonies represent approximately 25 percent of the total Island population. One snowy egret nest was located in the Foghorn subcolony in 1999. Refer to the New Industries impact discussion for the regional importance of these colonies.

It is estimated that the Water Tower project could take up to eight months to complete and therefore repair/construction activities would overlap with the end and the beginning of the next breeding season. Total duration of construction activities during the breeding season would be approximately three months. Erecting scaffolding around and repairing the Water Tower during the breeding season would result in disturbance of the Cistern, Model Industries Plaza, and surrounding gull subcolonies and adjacent night-herons by visual intrusion, increased noise and human presence/activity. Disturbance of the gull subcolony could result in indirect disturbance to the Brandt's and pelagic cormorants, pigeon guillemots, and black oystercatchers on the western cliffs of the Island and to the Foghorn and Recreation Yard night-heron subcolonies. As discussed for the Cellhouse project, gulls at the Cistern flushed from their nests in response to low frequency noise and night lighting during "The Rock" movie premiere (Brown, 1996). The gulls in the Cistern subcolony are also poorly adapted to human presence and activity, because this area is closed to all but research and monitoring activities during the breeding season and only a small portion of the area is visible to the public. Transport of materials to the Island with a crane from staging area #5 could result in direct impacts to western gulls nesting below the northeast perimeter trail and to the Wall and Power Plant night-heron subcolonies.

Without protective measures, the proposed Water Tower Repair project would likely result in impacts to many of the Island's Brandt's and pelagic cormorants, and pigeon guillemots (which represent regionally significant numbers of these species), as well as black oystercatchers. The magnitude and intensity of the effect on pigeon guillemots by gull aggression would, however, likely be less when compared to the other species nesting on the Island's western cliffs, because as guillemots are cavity nesters and are therefore provided more protection against gull predation. In 2000, however, ravens were observed attempting to prey on pigeon guillemot chicks in cavities. Because the waterbirds are highly sensitive to disturbance during the breeding season, this disturbance could result in a long-term population decrease of Brandt's and pelagic cormorants, pigeon guillemots and black oystercatchers on the Island. The impact to night-herons would likely result in an decrease in reproductive success and breeding population size of individual subcolonies, and may result in a relatively small long-term reduction in the Alcatraz population.

To minimize the impact of this project, the National Park Service would, to the extent feasible, complete the Water Tower project in the non-breeding season or phase the project to occur during the non-breeding seasons over two years. However, phasing may not be feasible. Working in the marine environment requires that new steel or other exposed materials be quickly painted to prevent corrosion. Installing new steel supports and/or repairing supports must be immediately followed by painting. The delay of several days, let alone several months, can substantially reduce the longevity of these repairs In addition, the size of the Island restricts the number of contractors that can be mobilized at any one time and extensive coordination is required to organize the division and distribution of materials and equipment to appropriate staging areas. Extensive planning is required due to the number of staging areas (15) and the restrictions placed on staging and movement of equipment to protect the Island's waterbirds. Staging on the Island is severely limited to avoid sensitive nesting areas and to minimize disturbance of birds resulting from moving the equipment. Staging required to rehabilitate the Water Tower would disrupt other projects with equipment is left in place between non-breeding seasons or add additional expenses if it is shipped back and forth to the Island. It is estimated that the cost of phasing this project would increase costs by approximately 20-25%. The costs for mobilization/demobilization of construction equipment is estimated by the project manager to comprise approximately 17% of the total cost to rehabilitate the Water Tower if the project were phased over two non-breeding seasons. However, there would be additional costs associated with extending the project into the next non-breeding season that would increase the project time to nine months as opposed to seven to eight months under a non-phased schedule. Extending the length of the project would require additional funds for further monitoring, rental equipment, and general construction costs such as worker salaries for at least an extra month of work.

If it is determined, following a detailed structural evaluation of the tower, that construction cannot be completed within the breeding season or feasibly phased over two years, the National Park Service would implement the following measures to minimize the biological effects of this project. Based on a review of the breeding season peak sensitivity chart (see Table 3.1-1) and the species affected, the effect of breeding season construction could be reduced by requiring that construction start in early August or later and end by mid-March, avoiding the most sensitive periods of the breeding season. Refer to Section 2.7.1 for a complete discussion of mitigation measures to be implemented to reduce impacts to breeding waterbirds.

Following mitigation, the impact of construction during breeding season would be reduced; however, disturbance from noise, visual intrusion, and human activity would still occur if phasing to avoid the breeding season is not possible. Indirect effects from disturbance of the Cistern, Model Industries Plaza, and surrounding gull nesting areas would still occur to surrounding night-heron colonies and nesting waterbirds on the western cliffs. A reduction in reproductive success, population size on the Island, and temporary or long-term subcolony abandonment of the Island for affected species is possible. After mitigation, the Water Tower Repair project would have a moderate to major impact on breeding waterbirds.

Slope Stabilization

The Slope Stabilization project would occur in the southern portion of the Island on an approximately 70-foot-high slope between the Parade Ground and upper terrace of the Island (quarried surface). The upper terrace supports the Lighthouse, Warden's House, primary access trail, and other structures. (See Chapter 2 for a map of the precise location.) This area is currently eroding and is threatening to undermine the Warden's House as well as the roadway at the top of the slope. Visitors do not use this area, but the walkway and structures above it and the Parade Ground below (during non-breeding season) are used by visitors.

The Slope Stabilization project would occur adjacent to the Parade Ground, which is a biologically sensitive area that supports the Island's largest western gull subcolony and the majority of the night-herons and snowy egrets that nest on Alcatraz (see Figure 4.2-1). Refer to the Dock Repair project impact discussion, above, for additional details and the regional importance of these colonies.

Construction of this project during the breeding season would result in a substantial disturbance to the Parade Ground gull subcolony, as well as almost the entire population of night-herons and snowy egrets on the Island. In addition, disturbance of the gulls on the Parade Ground could result in further disturbance from gull aggression and gull and raven predation on the surrounding night-heron and snowy egret subcolonies, and potentially the seabirds nesting in the cliffs below. To avoid this impact, the National Park Service would prohibit construction during the breeding season, and require that the repairs be phased over a period of several years.

A few gulls are also known to nest on the slope to be stabilized. Following repair and stabilization, the slope surface would be covered in concrete (shotcrete). Although habitat opportunities would be provided where feasible on the new slope surface (see Section 2.7.2, Cultural Resource Mitigation), some habitat would be removed. Based on the widespread availability of alternative habitat for western gulls on the Island and the very small number of gulls currently using the slope face, this would be a minor impact. Because construction would not occur during the waterbird breeding season (February 15 through August 15 or until chicks in the vicinity of the Parade Ground have fledged), this project would avoid impacts to breeding waterbirds on Alcatraz Island. Following mitigation, the Slope Stabilization project would avoid impact to breeding waterbirds and result in a minor reduction in available nesting habitat for western gulls.

New Industries (Laundry) Building

The New Industries (Laundry) Building is located atop the western cliffs on the northern portion of Alcatraz Island. It is a two-story building with large exterior windows along the entire western side. Two pedestrian bridges extend from the southern end of the building: one from the second floor to the metal detector facility, and the other from the guard's gallery to the adjacent path. A tunnel also extends from the first floor of the building to the Power House complex. The New Industries Building is currently closed to the visiting public, with some exceptions for ranger-led tours, which occur on a limited basis during the non-breeding season only. The only currently approved activities in the building during the waterbird breeding season are ranger patrol and monitoring of nesting waterbirds.

The New Industries Building is located near nesting sites for 7 of the 8 waterbird species that breed on the Island, including the Model Industries, Laundry, and North subcolonies of Brandt's cormorants; the Model Industries subcolony of pelagic cormorants; the Foghorn subcolony of snowy egrets; the Foghorn and Recreation Yard subcolonies of black-crowned night-herons; and western gull, black oystercatcher and pigeon guillemot nesting areas (see Figure 4.2-1). This area is one of the most sensitive locations for waterbirds on the Island. The Brandt's cormorant subcolonies represent nearly half of the total Island population and are located on the cliffs below the building. The pelagic cormorant subcolony is also located on the western cliffs and represents nearly the entire Island and San Francisco Bay population. Approximately 25 percent of the Island and San Francisco Bay populations of pigeon guillemots also nest in this location. The night-heron subcolonies represent approximately 15 percent of the total Island population, and the Foghorn subcolony of snowy egrets is approximately 13 percent of the total population, although only one snowy egret nest has been identified within this subcolony as of 1999. The only black oystercatcher nesting area on the Island is located on a seawall below the building. The Cistern western gull subcolony is located north of the building and contains approximately 11 percent of the Island's nesting gull populations. Another 19 percent of the Island's western gulls nest in the immediate vicinity of the New Industries Building on the Model Industries Plaza, the roof of the New Industries Building, on the slope above the seawall, and on the areas surrounding the building. Alcatraz Island populations represent at least 90 percent of Brandt's and pelagic cormorants nesting in the San Francisco Bay and the only pigeon guillemots. Approximately 1 to 2 percent of the region's snowy egrets, 15 to 40 percent of the black-crowned night-herons and a quarter of the western gulls nest on the Island.

Because of its location, the project could have the greatest effect on the breeding waterbird populations if proper protective and other mitigation measures are not implemented. Exterior work on the southern and western walls of the building would likely result in direct disturbance to the Laundry, North and Model Industries subcolonies

of Brandt's cormorants, the North subcolony of pelagic cormorants, nesting pigeon guillemots on the western cliffs, the Recreation Yard subcolony of night-herons, oystercatchers breeding on the seawall (one nest), and western gulls breeding throughout the areas described above. Exterior work on the northern wall would likely result in disturbance to the Foghorn night-heron subcolony, that also supported one snowy egret nest, and numerous gulls nesting on the Model Industries Plaza and throughout the general area. Exterior work would likely result in disturbance to the Cistern gull subcolony from visual intrusion, possible night-lighting and increased human activity.

Monitoring of a one-time event (i.e., movie video) that took place inside the New Industries Building showed that Brandt's cormorants and western gulls along the western cliffs seemed to be tolerant of increased noise and human activity near their nest site (Fairman et al., 1998). Brandt's cormorants looked in the direction of the noise and western gulls seemed to be undisturbed by the noise and commotion (Fairman et al., 1998). Although this suggests that these two species are tolerant of increased noise and activity during the nesting season, the filming was a short-term event occurring entirely inside the second floor of the building, and is not representative of the construction activities and type of disturbances that would occur under the Proposed Action. As previously stated (in the Methodology section), no detailed documentation of the effects of construction or other similar activities on these species of breeding birds is available; therefore this EIS must rely on professional judgment, and knowledge of the Island and the breeding colonies on Alcatraz. It is anticipated that unmitigated construction activities in this location would have a substantial adverse effect on breeding waterbirds, as discussed below.

Disturbance of the Cistern, Model Industries Plaza, roofs and surrounding gull nesting areas would likely result in indirect impacts from increased aggression and predation by gulls and ravens on several night-heron subcolonies on the western portion of Alcatraz, including the Recreation Yard, Foghorn, Wall and Power Plant subcolonies. Direct and indirect disturbance to nesting gulls and increased gull and raven predation could also extend to the western cliffs, where Brandt's and pelagic cormorants, an oystercatcher, and pigeon guillemots nest. Transport of materials to staging areas and use of the tunnel and upper level entrance on the north side of the building would likely result in disturbance of waterbirds on the western cliffs, the Cistern and surrounding gull nesting areas and night-heron subcolonies.

Without the use of protective measures to minimize these impacts, waterbirds on the western cliffs, including oystercatchers and Brandt's and pelagic cormorants, would be directly and/or indirectly disturbed. Nearby night-heron subcolonies and a substantial concentration of gulls would be impacted. Disturbance of the gulls and ravens in this area could result in indirect impacts to most of the other nesting waterbirds on Alcatraz. The impact on Brandt's and pelagic cormorants could result in a decrease in reproductive success and population size on the Island or even subcolony or Island abandonment, which would have a substantial regional impact given the importance of these subcolonies in the San Francisco Bay Area. Disturbance of the night-heron subcolonies would likely result in a short-term reduction in reproductive success and population size within these individual subcolonies, and without proper mitigation, may result in a small long-term reduction of the night-heron population on the Island. Western gulls in the Cistern and surrounding nesting areas may also experience a short-term reduction in reproductive success and population size. Pigeon guillemots may experience a reduction in reproductive success and/or population size, although their nearly two-decade persistence on the Island and the dispersed nature of their individual nest sites makes Island abandonment unlikely.

To minimize the impacts of this project, the National Park Service would implement the mitigation measures described in Section 2.7.1, including limiting breeding season construction to interior, daytime only, requiring specialized resource training for construction crews, and other protection measures. These measures would reduce the potential for disturbance to breeding waterbirds on the western cliffs, night-heron subcolonies, and the Cistern and surrounding gull nesting areas. These measures include prohibiting exterior repairs during the breeding season, restricting access for interior repairs (during the breeding season) to the tunnel and upper level entrance on the north side (with additional controls), prohibiting access to staging area #9 (Model Industries

Plaza) during the breeding season, requiring fencing and a visual barrier to prevent intrusion in the Model Industries Plaza during the breeding season, prohibiting all nighttime construction (interior) during the breeding season, and placement of visual barriers in windows and doors on the southern, northern and western sides of the building during the breeding season.

Because of the sensitive location of this project, uncertainty of impact, and the potential for the project to impact significant numbers of birds and species of birds, this project could have a major adverse impact on nesting waterbirds on the Island. To reduce these effects, the National Park Service would implement protective measures, as described above. Following implementation of these mitigation measures and other measures to reduce noise, the disturbance on nesting birds would be substantially reduced. However, implementation of the New Industries (Laundry) Building Stabilization and Seismic Upgrade Project could still have a moderate to potentially major impact on the Island breeding waterbirds.

Building 64 Seismic Retrofit

As described for the Balconies Repair project, Building 64 is located in a heavily visited area that is open to the public all year. Please refer to the Building 64 Balconies Repair project described above in this chapter under Phase One for information on the use and location of this building, surrounding waterbird subcolonies, and the regional importance of these subcolonies.

Exterior work would only occur along the rear (western) side of the building, between the building and the upper terrace (which contains the Warden's House and Cellhouse). Before mitigation, the scattered gulls nests on the building, and in adjacent hillside would be affected, and these activities could potentially disturb the Parade Ground area (see Figure 4.2-1). As discussed for Phase One, the Parade Ground is a biologically sensitive area, and disturbance to gulls in this area could result in indirect aggression, and raven and gull predation on other nesting subcolonies of waterbirds in the immediate vicinity and beyond (to western cliffs).

To minimize the impact of this project, the National Park Service would implement the mitigation measures described in Section 2.7.1. These measures would reduce disturbance to breeding waterbirds during the nesting season. Requirements for phasing the project so that exterior work is conducted outside of the breeding season or use of screening and appropriate buffer areas, restriction on crane use at barge staging area #2, and requirements to implement gull exclusion netting in the work area prior to the start of the breeding season would substantially reduce the impact on breeding waterbirds. Other measures include restrictions on nighttime construction, ambient noise control, and measures to reduce disturbance from lighting.

Following mitigation, minor disturbance to nesting waterbirds would occur. The Parade Ground area would be protected from direct disruption. The potential moderate increase in gull disturbance may have short-term, indirect impacts on western gull and night-heron reproductive success, and may result in slightly elevated raven and gull predation. Long-term, adverse impacts are not expected to occur. The total duration of exterior work would be approximately three months. Following mitigation, the Building 64 Seismic project would have a minor impact on the Island's breeding waterbirds.

Quartermaster Building

The Quartermaster Building is located on the northern side of the Island, adjacent to the Power House Complex. This building is currently used for storing maintenance equipment and other materials, including the visitor tram. No public access is permitted.

The Power Plant subcolony of night-herons is located east of the Quartermaster Building, and the Wall subcolony is located to the west of the building (see Figure 3.1-4). These two colonies represent approximately 7 to 8 percent of the total Island population. Approximately 4 pairs of pigeon guillemots also nest adjacent to the Power House Complex. These nests represent approximately 20 percent of the total Island population of pigeon guillemots breeding in a given year.

The upper floors of the Quartermaster Building are visible to the western gull subcolony at the Cistern. Scattered western gulls also nest around the base of the building on the Quartermaster and adjacent Power House Complex roofs. This area of the Island supports approximately 25 percent of the total population of western gulls. Please refer to the New Industries Building impact discussion for information on the regional importance of these colonies.

Waterbirds nesting in areas directly adjacent to the Quartermaster Building would be directly exposed to increased noise and human disturbance. Structural repair and placement of scaffolding around the upper levels of the building would likely disturb the Wall and Power Plant night-heron subcolonies, nesting gulls at the Cistern and other nearby areas, as well as pigeon guillemots nesting in the Power House complex. Use of barge off-loading staging area #5 would also result in direct disturbance to the Power Plant and Wall night-heron subcolonies. As discussed for other projects, disturbance of gulls during nesting could result in indirect disturbance to other breeding waterbirds from increased gull aggression and/or increased gull and raven predation. Disturbance of gulls in the vicinity of the project could result in indirect impacts to the Brandt's and pelagic cormorants, pigeon guillemots, and black oystercatchers along the western cliffs of the Island. The Recreation Yard and Foghorn subcolonies of night-herons could also be indirectly affected. As discussed above for the Sallyport and Cellhouse projects, during "The Rock" movie premiere, low frequency noise levels at the Recreation Yard resulted in gulls flushing from their nests. Repair on the exterior of the Quartermaster Building could result in the Cistern gull subcolony flushing from their nests, causing a chain reaction in other nearby gull nesting areas.

Without the use of protective measures to minimize these impacts, this project would result in direct or indirect impacts or both to the Power Plant, Wall, Recreation Yard, and Foghorn subcolonies of night-herons, snowy egrets nesting in the Foghorn subcolony, western gulls nesting on the Cistern and throughout the north end of the Island, waterbirds nesting on the western cliffs and pigeon guillemots nesting on the Power House complex. The impacts to night-herons would likely result in reduced reproductive success and population size within the subcolonies and possible subcolony abandonment. Disturbance of the western gulls at the Cistern subcolony may cause a short-term reduction in reproductive success. Because gulls are a highly adaptable species, disturbance of this subcolony is not expected to result in a long-term decrease in reproductive success, or abandonment of the colony. Disturbance to waterbirds on the western cliffs by gulls and ravens could result in subcolony abandonment. As previously discussed, because pigeon guillemots are cavity nesters, the impact of predation by gulls would likely be less pronounced for this species, and only a short-term reduction in reproduction success is expected. However, ravens were observed attempting to prey on chicks in cavities in 2000.

To minimize the impact of this project, the National Park Service would implement the mitigation measures described in Section 2.7.1. These measures would include restricting exterior repair work during the breeding season to the first floor of the western wall to prevent visual intrusion into the Cistern area. Exterior windows and openings would be replaced/repaired prior to the breeding season, or a barrier would be installed to reduce noise, light, and visual disturbance from interior repairs. Protecting the Cistern subcolony from disturbance would substantially reduce the project's effects on other breeding waterbirds on Alcatraz.

Following mitigation, disturbance to the Cistern and north end gull nesting areas, and the indirect impacts of elevated disturbance and raven and gull predation on the seabirds along the western cliffs of the Island, would be substantially reduced. Window repair, use of protective barriers, and restricting most exterior work to the non-breeding season would reduce disturbance to the Power Plant and Wall subcolonies of night-herons, as well as the Power House complex of pigeon guillemots and gulls nesting close to the project location. A short-term reduction in reproductive success and population size within the night-heron and gull subcolonies would potentially occur. Some disturbance to these subcolonies could still occur with potential for a small, long-term reduction in population size on the Island. After mitigation, the Quartermaster Building Stabilization and Seismic Upgrade project would have a minor to moderate impact on nesting waterbirds.

Fuel Line Remediation

This project proposed the removal or draining and closure of inactive fuel lines on the Island. These lines are located primarily along the eastern side of the Island, extending from the Dock to the Power House Complex.

As discussed previously, several subcolonies of breeding waterbirds are present on the eastern side of the Island (see Figure 4.2-1 and 3.1-4). This includes the Dock, Auxiliary Dock, Wall, and Power Plant subcolonies of black crowned night-herons, pigeon guillemots, and scattered western gull nest sites. These black-crowned night-heron subcolonies represent up to 25 percent of the total Island population. The scattered gull nests on the eastern side of the Island represent approximately 10 percent of the Island's western gulls. Approximately 20 percent of the Island and San Francisco Bay's pigeon guillemot population is located within the Power House complex. Refer to the previously described projects (specifically the Dock, Sallyport and Quartermaster projects) for further information regarding these populations.

The majority of the areas where fuel lines are present are open all year and are extensively used by visitors and staff (i.e., Dock, Building 64, main thoroughfare to the Cellhouse through the Sallyport, etc.). Removal of fuel lines would occur in areas where excavation would not result in disturbance of cultural or biological resources. This would limit the potential for direct disturbance to nesting waterbirds from excavation. Without mitigation, use of a crane at barge staging area #2 could result in disturbance of gulls nesting on the Parade Ground, and the Dock and Auxiliary Dock night-heron subcolonies. As discussed for several other projects, disturbance of the Parade Ground could substantially increase the direct and indirect impacts of a project. Use of staging areas #5, #8 and #11 could also result in direct impacts to the Cistern gull subcolony and the Wall and Power Plant night-heron subcolonies. Use of staging area #9 during the breeding season would result in direct impacts to gulls nesting on the Model Industries Plaza and to black-crowned night-herons and snowy egrets in the Foghorn subcolony, as well as indirect impacts to seabirds breeding on the western cliffs.

Without the use of protective measures, the project could directly and indirectly affect many of the breeding waterbirds on Alcatraz Island. To minimize the impact of this project, the National Park Service would implement the mitigation measures described in Section 2.7.1. These include restricting the use of a large crane at staging area #2 during the breeding season, placement of barriers to prevent visual intrusion, restricted use of staging area #9 during the breeding season (used only for storage/no access), and other measures to reduces ambient noise and night lighting.

Following mitigation, disturbance of the Parade Ground and Cistern would be negligible . Restricting use of a large crane and measures to reduce ambient noise and lighting would substantially reduce both direct and indirect impact on night-herons and western gulls in the immediate project area. Although some disturbance would still occur, it is not expected to result in a long-term reduction in population size on Alcatraz Island. After mitigation, the Fuel Line Remediation project would have a minor impact on breeding waterbirds.

Subsequent Phases Summary Conclusion – Disturbance of Breeding Waterbirds

The above discussion provides a project-by-project analysis of potential impacts associated with each of the six projects in the Subsequent Phases of the Proposed Action, which are (in order of basic priority/proposed implementation): Water Tower Stabilization, Slope Stabilization, New Industries (Laundry) Building Stabilization and Seismic Upgrade, Building 64 Seismic Retrofit, Quartermaster Building Stabilization and Seismic Upgrade, and Fuel Line Remediation.

As discussed in Chapter 2, some concurrent repair/construction activities would occur. Based on the limited space and staging areas available on the Island, however, it is assumed that only three and more likely two projects would take place concurrently at any given time. Based on the order of project priority presented above, an assessment of the potential overlap and effect on nesting waterbirds is presented below. Information obtained

through the monitoring of Phase One would be applied to the Subsequent Phases of the Proposed Action to achieve enhanced environmental protection. (See Appendix B for additional information.) The Water Tower and Slope Stabilization projects would be the first two projects implemented. Because the Slope Stabilization project would be phased to avoid the breeding season, there would be no overlap of the two projects during nesting season. The Water Tower project would be performed in compliance with mitigation measures (see Section 2.7) to either avoid the breeding season—or if this is not feasible—to begin at a set time to achieve the least impact on breeding waterbirds. The next project that would be implemented is the Laundry Building repair and stabilization. Based on the biologically sensitive location of this project, mitigation measures have also been developed to restrict the type of activities occurring during the breeding season, including prohibiting exterior work. However, if implementation of the Water Tower and Laundry Building projects were to occur simultaneously, the overlap during the breeding season would be minimal in duration and intensity, as explained below.

Because the Water Tower project would, in compliance with mitigation measures, start and end at a specific time, repair/construction activities would overlap with the end and the beginning of the next breeding season. Total duration of construction activities during the breeding season would be approximately three months. The Laundry Building project has been restricted, through mitigation, such that no staging, exterior repairs, or delivery of major equipment/materials would be possible during the breeding season. Only interior work with limited access would be allowed during the breeding season. In addition, prior to the start of the breeding season the exterior windows of the Laundry Building would have to be repaired or replaced (or some type of approved temporary barrier installed) to minimize the potential noise and visual intrusion in the cliffs below the building. Although these measures would substantially reduce the effects of construction on breeding waterbirds, some disturbance would still occur at the Cistern and Model Industries Plaza. The effect of concurrent construction activities would be focused on the three-month period of overlap. The Water Tower project would have a more intense impact due to its location and the nature of the activities that would be undertaken there.

The remaining three projects in the Subsequent Phases are: Building 64 (Seismic), Quartermaster Building (Stabilization and Seismic), and Fuel Line Remediation. These projects are generally located along the eastern and northern side of the Island, and each would take up to eight months to complete. Building 64 is located at the Dock area and the western and southern walls are adjacent to the biologically sensitive Parade Ground. The proposed repairs would require roughly five months of interior work and three months of exterior work. Mitigation measures described in Section 2.7 for Building 64 (Seismic) project would restrict the location and type of exterior activities allowed during the breeding season in order to minimize potential disturbance of the Parade Ground. The Quartermaster Building is located north of Building 64 and no overlap of construction disturbance for a particular subcolony of nesting birds would occur. The potential exception would be use of staging area #2 (at the Dock) for off-loading materials and equipment. Use of staging area #2 would be unlikely, however, based on the proximity of staging area #5 (barge off-load site) to the Quartermaster Building, and because use of staging area #2 for off-loading would require passage through the Sallyport complex—which is narrow and could be problematic. Use of staging area #5 would bypass the Sallyport and materials and equipment would be delivered to area directly adjacent to the Quartermaster Building. If staging area #2 was used as part of the Quartermaster project, there could be potential overlap disturbance at the Parade Ground. The Parade Ground is located approximately 70 feet above the Dock (and staging area #2) and use of large crane could intrude into this area. Implementation of the mitigation measures for staging area #2 would prevent this disturbance during the breeding season by restricting the use of large cranes (or otherwise precluding visual intrusion into the Parade Ground). Therefore no overlapping impact/disturbance would be anticipated.

The final project to be implemented would be the remediation of inactive fuel lines (Fuel Line Remediation project). The inactive lines are generally located along the eastern side of the Island from the Power House complex in the north, to the Dock in the south. If this project is implemented concurrently with the Quartermaster project, there could be increased disturbance on breeding waterbirds, particularly the Wall and Power House subcolonies of night-herons. These subcolonies represent roughly 8 percent of the Island's total

night-heron population. Although mitigation measure identified in Section 2.7 would reduce the extent of disturbance (i.e., no night-time use of staging area #5, etc.), concurrent activities could lead to decreased reproductive success and population size, with potential abandonment of these small subcolonies.

4.2.2.6 DISTURBANCE FROM INCREASED RAT POPULATION

Islands are important to the conservation of biodiversity, but extremely vulnerable to anthropogenic extinction. The most significant cause of extinction and ecosystem perturbations on islands is introduced species, especially rats (*Rattus* spp.) (Tershy et al, 1997). Norway rats (*Rattus norvegicus*) were accidentally introduced to Alcatraz Island, likely during its years as a federal penitentiary. The transport of materials to the Island for implementation of the Proposed Action has the potential to transport black rats (*Rattus rattus*) and Norway rats. Although rats have already been introduced to the Island, an increase in their population could have substantial impacts on native wildlife species, including waterbirds, deer mice, and salamanders (Tershy et al., 1997). The National Park Service is in the process of developing an eradication plan for rats on Alcatraz (see cumulative context discussion in Section 4.1.2 for additional detail).

To minimize/avoid the transport of additional rats to the Island, the National Park Service would implement the mitigation measures described in Section 2.7.1. These measures include placement of bird and tamper-proof bait stations and traps on all barges/boats used to deliver materials to the Island, and at all active staging areas. All Island traps would be designed and maintained in accordance with the National Park Service's Integrated Pest Management practices. Following mitigation, the Proposed Action would have minor impacts on native wildlife species from the transport of rats to Alcatraz Island.

4.2.2.7 DISTURBANCE TO SPECIAL-STATUS PLANT SPECIES

Construction activities associated with the Slope Stabilization project and use of staging area #10 could disturb potential San Francisco campion habitat. This species is considered a federal Species of Special Concern and California Native Plant Society List 1B species. Although the San Francisco campion has not been found on the Island, its presence is possible based on the available habitat on the Island. If it is found, impacts could occur from direct removal of potential habitat associated with the Slope Stabilization project (i.e., shotcreting the slope) or from trampling and temporary disturbance associated with use of staging area #10.

The National Park Service would conduct pre-construction surveys to determine presence before implementation of the proposed Slopes Stabilization project or use of staging area #10. If San Francisco campion is found during surveys, the population would be avoided to the extent possible. However, if avoidance is not possible, the population would be transplanted by a qualified botanist to another area of suitable habitat on Alcatraz. The specific location would be approved by a National Park Service botanist. Refer to Section 2.7.1 for a complete description of mitigation. Following mitigation, the Proposed Action would have a minor impact on San Francisco campion.

4.2.2.8 DISTURBANCE TO SPECIAL-STATUS FISH AND ESSENTIAL HABITAT

To determine the effects of the Proposed Action on listed species and critical habitat, the National Park Service evaluated the Proposed Actions and all mitigation measures. Steelhead and chinook salmon migrate through the San Francisco Bay to and from their spawning grounds. Pile repair and replacement associated with the Dock Repair project could cause temporary behavioral disturbances. In-water activities would be of minor extent and are not likely to adversely affect listed salmonids or designated critical habitat. In addition, pilings to be installed are pre-cast concrete and would not result in any long-term impacts from toxic coatings, anti-fouling materials, or other chemicals.

1. The National Park Service requested concurrence from the National Marine Fisheries Service (NMFS) for the National Park Service's determination that the proposed action is "not likely to adversely affect" listed fish species or essential fish habitat. NMFS concurred with the finding (see Chapter 6) based on the type of

pile (pre-cast concrete) and the installation methods, including the exclusion of pile driving. In addition, the NPS would take appropriate measures to reduce potential effects to fish species including a monitor and possible work stoppage for spawning herring and a false bottom constructed beneath the deck to act a debris catch reducing the potential for materials entering the water.

Implementation of the Dock Repair project would result in minor in-water activities that would not likely adversely affect listed salmonids or designated critical habitat. The Dock Repair projects would therefore have a negligible effect on special-status fish species.

4.2.2.9 DISTURBANCE TO SPECIAL-STATUS BATS

A bat survey was conducted on Alcatraz Island in 1992. Although no special-status bats were detected during this survey, potential roost sites were identified at two locations that could be disturbed as a result of the Proposed Action—the Sallyport and Building 64. If roosting bats are present at the Sallyport, increased human activity and noise from construction activities associated with the structural upgrade project would likely result in disturbance to roosting bats.

At the time of the 1992 survey, access to the attic of Building 64 was not available for bats. However, changes in the conditions of the building since this survey may have removed this obstacle, and potential roost sites may occur. As a result, the proposed seismic upgrade of Building 64 may modify potential roosting sites. The Quartermaster Building may also support bat roosting sites. Increased human activity and noise from other construction activities associated with the Proposed Action would likely result in disturbance to roosting bats, if present. Although disturbance to roosting bats if present would be temporary, modification of potential roost sites may result in a long-term impact.

To minimize these impacts, the National Park Service would conduct a bat survey prior to construction activities. Based on results of surveys, the National Park Service would develop and implement measures to avoid or mitigate impacts. Refer to Section 2.7.1 for a description of these measures. Following mitigation, the Proposed Action's Sallyport Structural Upgrade, Building 64 (Seismic Upgrade) and Quartermaster Building Structural Upgrade projects would have minor impacts on special-status bats.

4.2.2.10 WATERS OF THE UNITED STATES

Replacement of pilings as part of Dock Repair project would require work below the Mean High Water Mark (MHWM) of tidal waters. Work below the MHWM of tidal waters is regulated by U.S. Army Corps of Engineers. *Prior to construction for the Dock Repair project, the GGNRA obtained authorization from the U.S. Army Corps of Engineers (USACE) under Section 404 of the Clean Water Act and Section 10 of the Rivers and Harbors Act. The permitting process assisted in identifying appropriate measures to reduce effects to tidal waters from repair of the dock. Measures developed include the construction of a false bottom beneath the deck to act a debris catch reducing the potential for materials entering the water. The replacement piles would be constructed using a small amount of forced grout through the center of the pre-cast pile minimizing the potential for grout to contact seawater. In addition, the contractor will have a diver in place to ensure that forced grout is not being released into the bay. These protective measures would be included as conditions of the contractor's contract, and would be implemented by the National Park Service/contractor to ensure protection of the waters of the United States. The Dock repair project will have a minor impact upon Waters of the United States.*

4.2.3 CUMULATIVE IMPACTS – PROPOSED ACTION

A variety of on-island and off-island projects and influences contribute cumulatively to the impact on biological resources on Alcatraz. As described above, after mitigation, the Proposed Action's effect on biological resources would be substantially reduced and considered minor for most species, including common and special status plants and wildlife. The impact on breeding waterbirds would also be reduced through mitigation; however, some impacts would still occur and would contribute cumulatively to the overall effect on the Island's waterbird

population. A discussion of the other cumulative influences is provided below, followed by a conclusion of cumulative impact.

Other on-island actions contributing cumulatively to waterbird effects include intrusion or disturbance by biological monitoring practices and occasional visitors in closed areas, predation by Norway rats, various island projects, and activities associated with the general operation of the Island (supply delivery, visitation, etc.). The intensity and impact of past and current effects vary, and overall the impact to breeding waterbirds does not appear to be major. Over the past 10 years, a dramatic increase in the abundance and diversity of nesting waterbirds on Alcatraz has occurred. Since 1990, the total number of colonial waterbird species nesting on the Island was four—today there are eight different species. Breeding population size fluctuates annually for each species in response to various environmental and anthropogenic factors. These factors are thought to include El Niño effects, intensity of predation by ravens and raptors, changes in conditions at other coastal and San Francisco Bay breeding colonies, changes in foraging resources, other undetected environmental factors, and isolated and/or cumulative human-caused disturbance events. Night-herons have shown a steady unexplained decline in numbers since 1996, when they abandoned other islands in San Francisco Bay. Western gull, Brandt's cormorant and pigeon guillemot numbers appear to show an increasing trend over the last decade. The stability of waterbird species and populations on Alcatraz, with the exception of western gulls, is uncertain and unpredictable over the long term.

Many of the Island's waterbird colonies have significantly higher reproductive success rates than other colonies of the same species. In summary, the past and current on-island operations are individually considered to have a relatively minor effect on long-term status of the waterbirds on Alcatraz. Anticipated future on-island projects (outside of the Proposed Action) are addressed below.

The recent recognition of Norway rats on the Island is a concern for breeding birds as these aggressive rodents are known to prey on adults, eggs and chicks of a wide variety of bird species. Rats also pose a serious threat to the Island's populations of native deer mice and California slender salamanders unless quickly controlled and eradicated. A preliminary plan and strategy for Norway rat eradication and prevention of reintroductions during any future construction or other activities resulting in the delivery of materials to the Island was recently prepared. The preliminary plan includes measures to ensure protection of native deer mice during rat eradication, and includes measures to minimize non-target and secondary poisoning. The National Park Service will consider implementation of this program as a separate action at an undetermined future date, and would require future construction/repair activities to comply with the provisions of the program to ensure that rats are not reintroduced to the Island (see Section 2.7.1—Mitigation). If implemented, the plan would have a cumulatively beneficial effect on deer mice, California slender salamanders and nesting waterbirds.

The National Park Service is considering installation of photovoltaic panels on the Cellhouse or the New Industries Building. This activity would likely occur outside of the waterbird breeding season or in conformance with other mitigation measures as required by the DCP EA or this EIS. If the installation of the panels on either building occurs in the non-breeding season, there would be no cumulative effect to the Island's waterbird species. Installation of these panels during the breeding season, even with mitigation measures outlined in Chapter 2 may cumulatively affect night-herons and snowy egrets, as well as Brandt's cormorants and pigeon gullimots, due to visual intrusion, noise and human activity. This project, in addition to the proposed construction activities, is not expected to result in colony abandonment of any species of nesting waterbird on the Island. Installation of these panels on the New Industries Building may have an adverse cumulative effect on the birds nesting in that area if work is conducted during the breeding season. As mentioned previously in this chapter, this building is in a sensitive location and there is potential to impact significant numbers of birds and species of birds.

Implementation of the Proposed Action in combination with the ongoing operation of the electric tram and visitor use along the primary roadway could have a cumulative effect on the small subcolony of night-herons nesting along the roadway on the eastern side of the Island. Implementation of the Sallyport, Fuel Line

Remediation and Water Tower projects and use of staging areas #5 and #8 could cumulatively contribute to disturbance of the Wall subcolony. The nearby Power Plant subcolony may also be affected; however, the impact to this subcolony would primarily associated with barge activities that were evaluated in the project-specific analysis above. Cumulatively, the Proposed Action would contribute to the disturbance of this subcolony. Although mitigation measures would be implemented to minimize the impact of the Proposed Action (see Section 2.7), the cumulative effect of disturbance in this area could decrease reproductive success and population size, with potential abandonment of this small subcolony.

Off-island, a variety of influences can directly and indirectly affect breeding waterbirds. These influences range from climate changes (i.e., El Niño) that directly influence fisheries (which are food supply for seabirds) and indirectly affect seabirds, to oil spills, and disturbance events during the breeding season. Examples of past disturbances include a commercial tour boat that fired a cannon just off-shore of the Island (flushing the majority of the nesting birds in the western and northern cliffs), a jet skier who landed on the western side of the Island after experiencing engine failure (resulting in temporary abandonment of a cormorant subcolony during the nest initiation phase), and kayakers who frequently travel too close to the Island, disturbing nesting birds. Although the National Park Service has taken action to discourage such activities through active enforcement and issuing citations and fines, media outreach, and an educational campaign, future occurrences are very likely and their frequency and magnitude of effect are unknown.

Four off-island projects, one approved but not yet implemented and three still under consideration, that when considered with the Proposed Action, could also contribute cumulatively to the effect on nesting waterbirds and fisheries. Implementation of the preferred alternative for the Long-Term Management Strategy (LTMS) for disposal of dredged materials would provide a long-term reduction in the use of the Alcatraz Island dredge disposal site. Currently, the Alcatraz disposal site is the most heavily used site within the Bay (see Section 4.1.2 for additional background). Although implementation is not expected to be immediate, it will have a long-term beneficial effect on water quality and fisheries resources in and around the Island. This action would subsequently have an indirect beneficial effect on the nesting seabird populations on Alcatraz by improving the environmental conditions of their food supply.

Another proposed project that would potentially have concerns similar to the Alcatraz disposal site is one currently under consideration by the U.S. Army Corps of Engineers (USACE) for a sand mining operation in the vicinity of Angel Island. Although the USACE has prepared a preliminary environmental assessment for the proposed operation, concerns have been raised by the U.S. Fish and Wildlife Service and other entities that cumulative effects, particularly on listed species and seabirds, be addressed adequately. The sand mining proposal could potentially have cumulative effects on water quality from increased turbidity, resulting in indirect effects to sight-feeding seabirds, particularly cormorants and possible impacts to fisheries that are the foraging resources for seabirds.

Another off-island project currently under consideration is the removal of rock formations that are considered a navigation hazard in the vicinity of Alcatraz. The project is being considered by the USACE and California State Lands Commission, and the environmental effects associated with this action are currently unknown; however, it is anticipated that both direct and indirect effects to nesting waterbirds could occur. Direct adverse effects would be anticipated if the removal action (i.e., use of explosives) was done during the breeding season. Although most of the formations are located more than 0.5 mile from the Island, several of the rocks (Alcatraz shoal) are located in relatively close proximity to the northern and western cliffs of the Island. This area of the Island is considered extremely sensitive during the breeding season. More importantly may be the direct impacts to fisheries and indirect effects to seabirds, as these formations are considered habitat for fisheries resources. Cormorants and gulls have been observed feeding in the area of the underwater rocks (Thayer, pers comm., 2000). The direct effect on fisheries would be loss of habitat, and given its proximity to the Island and feeding area for nesting seabirds, loss of this fisheries habitat including the benthos that live on and beneath the surface of the pinnacles would most likely have an adverse impact on seabirds.

There may also be cumulative effects from the proposed San Francisco Airport Expansion project. Studies are currently being conducted to address impacts from this project, but of concern to the Alcatraz Proposed Action are cumulative effects to night-heron and egret habitat on the South Bay, potential locations proposed for filling, and the dredging of sand from in-bay sources.

The Endangered Species Act Consultation Handbook (Parker, 1998) defines cumulative effects as "those effects of future State or private activities, not involving Federal activities, that are reasonably certain to occur within the action area of the federal action subject to consultation." The National Park Service is only aware of two non-Federal actions within the action area potentially affecting listed species. Recreational fishing boats may come close to Alcatraz Island during California Department of Fish and Game fishing season for salmon in the Bay (April 1 to October 31). The time window may allow for take of listed chinook and steelhead, although this is unlikely. However, to minimize such impacts, NMFS has proposed that the state develop an adequate Fishery Management and Evaluation Plan that contains specific management measures to limit take of listed steelhead (Fed. Reg. 64(250):73479-73506). The CDFG regulates commercial herring fisheries within the project area. No information is available about quantities and types of by-catch associated with harvest of herring. Any by-catch impacts from harvest activities would occur from December through March. Dredged disposal activities associated with the adjacent and overlapping Alcatraz Disposal Site (SF-11) require a Section 10/404 permit from the USACE and those activities would be subject to separate consultations with NMFS.

Cumulative Impact Conclusions

On a cumulative basis, there will be both beneficial and potential adverse effects on the Island's waterbirds. Disturbance from off-island actions, such as tour boats, would likely continue, as would the National Park Service's efforts to minimize the impact of these events (through increased enforcement and public education). On-island practices, including scientific monitoring of waterbirds, visitor use, and operation of the electric tram would continue. As previously described, the historic impact of these and other past actions affecting the Island's waterbird populations have not appeared to create long-lasting, adverse impacts, as is evidenced by the increasing diversity and relatively stable populations of waterbirds nesting on Alcatraz.

Implementation of the proposed Norway rat eradication program on the Island, and the LTMS preferred alternative (off-island) would contribute beneficially to the cumulative effects on waterbirds. These actions would decrease the potential for on-island predation of eggs and chicks, and improve food supplies for seabirds, respectively. The removal of underwater rock formations in the vicinity of Alcatraz (proposed future action) could have direct and indirect adverse effects on nesting waterbirds. The intensity of this impact is currently unknown. If installation of photovoltaic panels occurs during the breeding season on the roof of the Cellhouse or the New Industries Building, there may be a cumulatively adverse effect to the nesting waterbirds in the vicinity; however, impacts would be reduced with the implementation of mitigation measures.

The Proposed Action would result in many years of continual construction/repair activities on the Island. Through mitigation, the effects of this construction on breeding waterbirds would be reduced; however, some disturbance would still occur. The most substantial effect would occur during implementation of the Water Tower and New Industries stabilization projects during the subsequent phases of the Proposed Action, and the cumulative effect on the small Wall subcolony of nesting night-heron (resulting from tram operation, visitor use, and repair and staging activities included under the Proposed Action). On the whole, the disturbance associated with the Proposed Action would contribute cumulatively to the effects on breeding waterbirds over a period of many years.

The sand mining proposal could potentially have cumulative effects on water quality from increased turbidity, resulting in indirect effects to sight-feeding seabirds, particularly cormorants and possible impacts to fisheries that are the foraging resources for seabirds. However, impacts associated with the Proposed Action on fisheries are

considered minor because of their type (slight behavioral disruption) and duration (short-term duration of in-water activities); therefore, the Proposed Action would have no long-term cumulative effects on listed fish.

4.2.4 REDUCED PROJECT ALTERNATIVE

4.2.4.1 IMPACT ANALYSIS – REDUCED PROJECT ALTERNATIVE

The primary objective of the Reduced Project Alternative is to reduce biological impacts, while providing for basic human health and safety and limited cultural resource stabilization. Under the Reduced Project Alternative, the repair and stabilization projects in areas that are open to the public would be implemented as described under the Proposed Action. The mitigation measures prescribed under the Proposed Action would also apply, where relevant, under the Reduced Project Alternative. The difference between the Proposed Action and the Reduced Project Alternative lies in its treatment of the structures that are closed or located in areas that currently closed (year-round) to the public—specifically: New Industries (Laundry) Building, Quartermaster Building, and the Water Tower. Under the Reduced Project Alternative, only minor repairs would be implemented for these three structures.

The impacts on biological resources would be the same as described above (for the Proposed Action) for the following projects:

- Dock Repair;
- Building 64 (Balconies);
- Cellhouse;
- Sallyport;
- Slope Stabilization;
- Building 64 (Seismic); and
- Fuel Line Remediation.

As a result, impacts to the following resources would also be identical under this alternative and the reader is referred to the analysis above:

- Disturbance to Monarch Butterflies
- Marine Mammals
- Disturbance to Pacific Herring
- Common Wildlife
- Disturbance from Increased Rat Population
- Disturbance to Special-Status Plant Species
- Disturbance to Special-Status Fish and Essential Habitat
- Waters of the United States

Disturbance to special-status bats would also be similar, although could potentially be less as potential roosting habitat in Quartermaster Building may be avoided. However, implementation of the mitigation measures described in Section 2.7 would reduce the impact to a minor level.

Impacts on nesting waterbirds would be the same as the Proposed Action except for the effects created by the Water Tower, Laundry Building and Quartermaster Building stabilization projects. Because the Reduced Project Alternative prohibits repair/construction activities at the Laundry and Quartermaster Buildings during the breeding season, the impact on breeding waterbirds would be avoided. For the Water Tower project, it is anticipated that even the bare minimum repairs needed to prevent failure or otherwise protect public health and safety would require more time than provided by the five-month non-breeding season. Detailed information on the type of structural repair would not be available until a closer evaluation of the tower's current conditions is

completed. This evaluation is possible only through direct examination, which would require the installation of scaffolding. It is anticipated that the minimum safety repairs would require less time than the eight months projected under the Proposed Action, but possibly longer than the five-month non-breeding season. The mitigation requirements controlling the start and end times for these repairs, specialized training for construction crews, habitat enhancement and other protective measures described in Section 2.7 would apply to the Reduced Project Alternative. After mitigation, there could still be an impact on nesting waterbirds (as described above for the Proposed Action). However, construction duration and overlap with the breeding season would likely be less under this alternative, resulting in minor to moderate impacts.

Under the Reduced Project alternative, those structures on the northern end of the Island might ultimately be lost due to either minimal or no intervention and may suddenly or gradually collapse. For example, a structurally unsound Water Tower could be brought down by wind or seismic action. It could land on another structure or a colony of nesting birds. This may have adverse effects on waterbirds in the area if the event were to occur during the nesting season. The impacts of this type of event are difficult to assess and are dependent on the timing of the event and the species of bird and number of nests affected, therefore impacts could be minor to major.

4.2.4.2 CUMULATIVE IMPACTS – REDUCED PROJECT ALTERNATIVE

Cumulative impacts would be similar to the Proposed Action (see Section 4.2.3) for all resources except nesting waterbirds. Under the Reduced Project Alternative, the effect on nesting waterbirds would be less. The disturbances described under the Laundry and Quartermaster Buildings for the Proposed Action would be avoided. The effects associated with the Water Tower stabilization project would still occur, although the duration and intensity of the effect would be less on the northern end of the Island.

4.2.5 NO ACTION ALTERNATIVE

4.2.5.1 IMPACT ANALYSIS – NO ACTION ALTERNATIVE

The No Action Alternative does not include any of the construction activities identified in the Alcatraz Historic Preservation and Safety Construction Program. Under this alternative, only routine maintenance or other current repair practices would be implemented. Therefore, the construction-related disturbance to breeding waterbirds and other biological resources associated with the Proposed Action would be avoided.

It is possible that implementation of this alternative may actually have a long-term, beneficial effect on biological resources. Under the No Action Alternative, individual areas on the Island would be closed to the visiting public as safety concerns worsen and the areas are deemed unsafe for the public. Eventually it is anticipated that the entire Island would have to be closed to the public because of human health and safety concerns. As a result, the reduction in human presence and continued unmitigated growth of the Island's landscaping would provide greater habitat opportunities for biological resources. Similar to the Reduced Project Alternative, failure of structures due to either minimal or no intervention may have adverse effects on waterbirds in the area if it were to occur during the nesting season.

Under the No Action Alternative, none of the repair and stabilization projects identified as part of the Proposed Action or Reduced Project Alternative would be implemented. Although some minor repairs (associated with ongoing, routine maintenance) would occur, these actions would be minimal and would comply with the DCP EA/FONSI. Over the long-term, implementation of the No Action Alternative would eventually lead to the closure of the Island to the visiting public. This action would likely lead to increased habitat opportunities on the Island, which would be a beneficial effect for biological resources. Failure of structures during the breeding season under this alternative could directly impact breeding birds in the vicinity of the failure. The impacts of structural failure are difficult to predict, but could be minor to major depending on the species of bird and number of nests affected.

4.2.5.2 CUMULATIVE IMPACTS – NO ACTION ALTERNATIVE

Under the No Action Alternative, none of the construction/repair projects included in the Proposed Action would be implemented. Only routine maintenance and current operational practices would occur. For a detailed discussion of the effect of these and other cumulative projects/actions, refer to the analysis of cumulative impacts for the Proposed Action, above. From a biological resources perspective, the No Action Alternative would perpetuate the existing cumulative conditions on the Island and no new impact to biological resources would occur.

4.3 Cultural Resources

4.3.1 METHODOLOGY

This section of the EIS evaluates the effects of the Proposed Action, No Action Alternative, and Reduced Project Alternative on significant cultural resources (properties eligible for inclusion on the National Register of Historic Places) on Alcatraz Island. The following methods were to determine the significant cultural resources that would be impacted by the alternatives:

- **Review of existing documentation of significant cultural resources.** Significant cultural resources potentially affected by the project are the Alcatraz Island National Historic Landmark district. Existing documentation on the contributing features to the district was reviewed, including the Indian Occupation graffiti.

- **Field visits**. A field visit to Alcatraz Island was conducted to document the current status of the contributing features to the Alcatraz Island National Historic Landmark district. A separate field visit was conducted to identify the specific location of the Indian Occupation graffiti for Phase One projects.

The revised regulations of the Advisory Council on Historic Preservation (36 CFR Part 800) was also reviewed and considered during the impact analysis. In assessing the impacts, several steps were taken:

- The Section 106 process was initiated. This included establishing the undertaking and the Area of Potential Effect (APE), initiating contact with the California State Historic Preservation Officer, developing a plan to involve the public, and identifying consulting parties in the process. The APE is defined the entire Alcatraz Island National Historic Landmark district.

- The significant cultural resources were identified. These include the Alcatraz National Historic Landmark district as described in Sections 3.2.2 and 3.2.3 of this EIS.

- The extent and type of impact that the undertaking would have on the historic properties was assessed (see impact analysis below).

- Effects will be resolved under an existing Programmatic Agreement. The adverse effect of removing the Boathouse during stabilization of the Sallyport will be resolved through the development of a Memorandum of Agreement with the California State Historic Preservation Office to be filed with the Advisory Council on Historic Preservation.

Under the National Historic Preservation Act, a proposed undertaking is considered to have an *effect* on a cultural resource if it has the potential to change the characteristics that qualify the property for inclusion on the *National Register of Historic Places*. If the undertaking would alter, directly or indirectly, any of the characteristics of a historic property that qualify the property for inclusion on the National Register in a manner that would **diminish** the integrity of the historic property, it is considered to have an *adverse effect*. An adverse effect may occur later than the initial undertaking or at a distance from the undertaking. Adverse effects may also be cumulative. For the purposes of the National Environmental Policy Act (NEPA) impact analysis, an impact is considered to be major if would create an adverse effect as defined above.

4.3.2 IMPACT ANALYSIS – PROPOSED ACTION

4.3.2.1 PHASE ONE – PROPOSED ACTION

Dock Repair. Significant cultural resources within the APE for this project are the Alcatraz Wharf (AL211), a contributing feature of the Alcatraz Island National Historic Landmark district. Proposed improvements include removal of portions of the historic fabric of the structure (pilings, beams, and concrete deck) that are severely deteriorated, and pose a threat to the health and safety of the public. These structures would be replaced with new concrete pilings, beams, and decking, and the Dock structure would be seismically upgraded to provide for life health and safety. Some of the replacement structures would include portions of the remnants of the 1906 steel "spider" piles, which are still visible beneath the Dock. In is anticipated that approximately 20 percent of all piles would be rehabilitated during this project. The seismic upgrade would include the installation of steel ties into the Island bedrock. Installation of the steel ties would require drilling, and vibrations from drilling could potentially affect Building 64.

In addition to compliance with the stipulations of the Programmatic Agreement, the National Park Service would take the following steps to further minimize potential impacts to cultural resources: 1) select examples of the 1906 "spider" steel piles and place these in the Golden Gate National Recreation Area museum collections and/or in on-Island exhibits for preservation and future interpretation; and 2) provide for monitoring during installation of steel ties into the Island's bedrock that could potentially affect Building 64 (see Section 2.5.3).

The use of staging areas and equipment would have no impact on cultural resources. Implementation of the Proposed Action (including mitigation) would result in the rehabilitation and preservation of the Alcatraz Wharf, a contributing feature of the National Historic Landmark district, and would therefore have a beneficial impact. The Proposed Action falls under the Programmatic Agreement Stipulation D.II.i. Rehabilitation of Historic Structures (NPS, 1992). This work would be designed and carried out in keeping with the guidance in the Secretary of the Interior's Standards for Rehabilitation (36 CFR 67). The Standards provide guidelines for the protection and maintenance of features, repair, replacement, design for missing historic features, alterations, and health and safety concerns.

Building 64 Balconies. Significant cultural resources within the APE for this project are the Alcatraz Defense Barracks (AL064) or Building 64, a contributing feature of the Alcatraz Island National Historic Landmark district, and portions of the graffiti from the Indian Occupation located on the exterior of Building 64, also a contributing feature of the district. The proposed improvements would repair or replace portions of the exterior balcony supports, braces and columns supporting the balcony, balcony deck, and balcony railings. The deterioration of these features pose a threat to the health and safety of the public. The repaired/replaced decks would be sand and/or water blasted and painted. The exterior surface of the walls would only be touched where the balconies connect into the exterior wall. A site visit on March 16, 2000, that included the National Park Service's Project Manager and Golden Gate National Recreation Area Cultural Resources staff, identified the only graffiti within the project area is a portion of the wall that is painted red. No project actions are planned for this portion of the wall. The "red fist" is located on a the ground floor outside of the proposed repair area.

In addition to compliance with the stipulations of the Programmatic Agreement, the National Park Service would implement the mitigation procedures for the Indian Occupation Graffiti (see Section 2.7.2). The use of staging areas and equipment would have no impact on cultural resources. Implementation of the Proposed Action would result in the rehabilitation and preservation of the balconies on Building 64, a contributing feature of the National Historic Landmark district, and would therefore have a beneficial impact. The Proposed Action falls under the Programmatic Agreement Stipulation D.II.i. Rehabilitation of Historic Structures (NPS, 1992). This work would be designed and carried out in keeping with the guidance in the Secretary of the Interior's Standards for Rehabilitation (36 CFR 67). The Standards provide guidelines for the protection and maintenance of features, repair, replacement, design for missing historic features, alterations, and health and safety concerns.

Cellhouse Stabilization. Significant cultural resources within the APE for this project are the Alcatraz Cellhouse, composed of the Administration, the Main Cell block, and the Hospital; graffiti from the Indian Occupation (located on the exterior and interior of the Cellhouse); the remains of the Civil War–era Citadel (located beneath the basement of the main Cell Block); and water cisterns that are located underneath the basement of the Main Cell Block. All of these are contributing features to the Alcatraz Island National Historic Landmark district. The proposed improvements include repair of exterior concrete and window repair or replacement, as needed. Once exterior repairs have been completed, flaking or loose paint would be removed and the building would be painted. The bulk of the repairs associated with this project would be done within the interior spaces of the building in the vicinity of the main Cell Block. These include repair and reinforcement of the interior walls and the installation of new footings and shear collectors to improve the seismic safety of the building, which is the primary visitor attraction on the Island.

The interior seismic repairs would have a minor impact before mitigation on the interpretation of the Federal Penitentiary–era experience. The additions of shear collectors related to seismic work would: 1) result in removal of some pipe in the crawl space that is used to view and interpret the escape from Alcatraz and 2) the addition of shear collectors would block the view of the hole in the wall that was used for this escape. To minimize the impacts to the interpretation of the federal penitentiary, the National Park Service would undertake the following mitigation measures: 1) the view to the area in front of the hole in the cell wall that is used to interpret the escape from Alcatraz would be kept clear; and 2) any steel piping that is removed as part of the seismic repairs in front of the hole, that is used to interpret the escape from Alcatraz, would either be put back in place following construction or repaired/replaced in kind.

A site visit on March 16, 2000, that included the National Park Service's Project Manager and Golden Gate National Recreation Area Cultural Resources staff, identified that no graffiti was on the interior walls to be repaired, with one exception. In the Citadel, one wall with graffiti would be covered by the installation of a new shear wall. To minimize the impacts to the graffiti, the National Park Service would follow the mitigation procedures for the Indian Occupation Graffiti located within the areas adjacent to the project (see Section 2.7.2).

Following the implementation of the mitigation measures, potential effects to Indian Occupation Graffiti and interpretation of federal penitentiary era facilities would be minimized. Implementation of the Proposed Action would result in seismic repair and stabilization of the Cellhouse, a contributing feature of the National Historic Landmark district, and this would be a beneficial impact. The use of staging areas and equipment would have no impact on cultural resources. The Proposed Action falls under the Programmatic Agreement Stipulation D.II.i. Rehabilitation of Historic Structures (NPS, 1992). This work would be designed and carried out in keeping with the guidance in the Secretary of the Interior's Standards for Rehabilitation (36 CFR 67). The Standards provide guidelines for the protection and maintenance of features, repair, replacement, design for missing historic features, alterations, and health and safety concerns.

Sallyport Structural Upgrade. Significant cultural resources within the APE for this project include the Sallyport. The Sallyport contains four basic sections: 1) the Guard House/Moat/Defense Wall from the Civil War era; 2) the Sallyport contains two levels plus an attic and the ground floor provides the main thoroughfare for visitors; 3) the Military Chapel constructed in 1933; and 4) a two-story, wood-frame Boathouse built between 1913 and 1933. All of these are contributing features of the Alcatraz Island National Historic Landmark district. In addition to these features, a number of plants located on the east corner of the Sallyport been identified for propagation in the *Landscape and Maintenance Guidelines for Alcatraz Island* (NPS, 1998). These plants are part of the Island's cultural landscape.

Implementation of the Proposed Action would result in the stabilization and seismic retrofit of the Sallyport complex. As the primary passage way for pedestrians and the only passage for vehicles (including the tram service) to the remaining areas of the Island, the stabilization and seismic upgrade of this complex is an important health and safety and historic preservation project. Proposed actions include tying the building back to the slope on which it was constructed, and installation of shear walls and interior bracing to ensure the stability of the

structure. Numerous cracks and signs of mortar deterioration are visible on the brick walls of the Sallyport. The Boathouse is a two-story, wood-framed addition to the Sallyport. It was built over concrete beams and columns (the latter extends to the water line). It was poorly constructed and has a deteriorating foundation system, which may be due to the proximity of the supporting columns and beams to the Bay water. The deterioration of the Boathouse appears to be contributing to deterioration of the overall complex, and is proposed for removal to alleviate some of the structural deterioration.

Before mitigation, the demolition of the Boathouse would be a major impact due to the destruction of a contributing feature of the Alcatraz Island National Historic Landmark district. To minimize this impact, the National Park Service would provide recordation of the Boathouse to Historic American Buildings Survey (HABS) standards. Materials from the Boathouse would be salvaged and reused for interpretive or other uses (see Section 2.7.2). At the Sallyport, one of the two cannon ports and the dry moat are now obscured by the Boathouse. The Sallyport is the most important point in the entire Civil War defense system for the island and is one of the few structures on the island that has not been torn down or completely covered by later construction. Removal of the Boathouse will allow for better interpretation of the Civil War era of history on the island.

Potential use of staging and equipment off-load area #5 could impact plants associated with the cultural landscape in this area. To minimize the impacts to the cultural landscape, prior to any staging, demolition, or construction activities the National Park Service would follow the procedures outlined in Section 2.7.2 that include propagation of plants on the east corner of the complex, as identified in the *Landscape and Maintenance Guidelines for Alcatraz Island* (NPS, 1998).

Following implementation of the above mitigation measures, the potential effects associated with the demolition of the Boathouse structure and cultural landscape would be minimized. Implementation of the Proposed Action would result in the stabilization and seismic retrofit of the Sallyport complex, a contributing feature of the National Historic Landmark district. This would be a beneficial impact to cultural resources. The Sallyport stabilization project will be the subject of a Section 106 Consultation under the National Historic Preservation Act following the Advisory Council on Historic Preservation's regulations 36 CFR Part 800. The effects of the stabilization project, including the removal of the Boathouse, will be taken into consideration in a Memorandum of Agreement that will be the result of this Consultation.

4.3.2.2 SUBSEQUENT PHASES – PROPOSED ACTION

Water Tower Stabilization. Significant cultural resources within the Area of Potential Effect for this project include the Water Tower and graffiti from the Indian Occupation located on the Water Tower. Both are contributing features of the Alcatraz Island National Historic Landmark district. The proposed repairs include the repair/replacement of critical steel supports and painting of the structure, and fall under the Programmatic Agreement Stipulation D.II.i. Rehabilitation of Historic Structures (NPS, 1992). The proposed painting and repair work could result in the direct loss of some or all of the graffiti on the tower. Before mitigation, this would be a major impact. To minimize the impacts to the graffiti, the National Park Service would follow the mitigation procedures for treatment of the Indian Occupation Graffiti as outlined in Section 2.7.2.

The use of staging areas and equipment would have no impact on cultural resources. Following mitigation, the Proposed Action would result in the stabilization and preservation of the Water Tower, a contributing feature of the National Historic Landmark district. The repairs would be designed and revised through consultation with the participants of the Indian Occupation. Without repair, the tower would likely fall or be removed for safety reasons. Implementation of this project would therefore be a beneficial impact to cultural resources. The proposed repairs would be designed and carried out in keeping with the guidance in the Secretary of the Interior's Standards for Rehabilitation (36 CFR 67). The Standards provide guidelines for the protection and maintenance of features, repair, replacement, design of missing historic features, alterations, and health and safety concerns.

Slope Stabilization. Significant cultural resources within the APE for this project include the slope that exists between the upper and lower level of the south end of the Island. This slope was created as a result of past

quarrying activities. The slope and plants that are growing on the slope are part of the cultural landscape of the Island. Also included within the APE for this project would be the Lighthouse and the remains of Warden's House (located on the upper terrace atop the slope), both contributing features to the Alcatraz Island National Historic Landmark. The vibration associated with installation of rock bolts necessary to secure the slope could impact the upper terrace structures. In addition, the application of gunite or shotcrete to the slope face would impact the integrity of the slope through the loss of historic rock and plant materials. To minimize the impacts of the Proposed Action on the upper terrace structures and the loss of the historic integrity of the slope face, the National Park Service would implement several mitigation measures as discussed in Section 2.7.2. A monitoring program, with contingency measures including thresholds which would require construction to stop, would be developed and implemented during the installation of rock bolts to protect the upper terrace structures from vibration and shaking. To minimize the effect on the landscape associated with application of gunite/shotcrete to the slope face, the National Park Service would require that the new surface resemble the historic surface in color, form, texture, etc. Provisions to allow for the reintroduction of plant materials would also be considered during the design development phase of the project, and implemented wherever feasible. Placement of a permanent interpretive panel that explains the need to stabilize the slope in order to protect other resources would be installed.

The use of staging areas and equipment would have no impact on cultural resources. Following mitigation, the Proposed Action would result in the stabilization of the slope to provide for public health and safety and to insure that significant cultural resources located on the upper terrace (Warden's House and Lighthouse) are not structurally compromised by the failure of the slope. This would be a beneficial impact on cultural resources.

New Industries (Laundry) Building. Significant cultural resources within the APE for this project include the New Industries Building, a contributing feature of the Alcatraz Island National Historic Landmark district. The building is not currently used and is in a state of disrepair due to lack of use and a backlog of maintenance projects. Under the Proposed Action, the Laundry Building would be seismically upgraded and repaired to stabilize the historic resource. Seismic improvements would include strengthening of the exterior and interior walls, long narrow diaphragm, and slab-to-column connections. Other improvements would include repair of the two southern pedestrian bridges and replacement or repair of the exterior (west-facing) windows of the building. The windows are badly deteriorated and the internal area of the building is directly exposed to the elements which has resulted in severe rust, concrete spalling, cracks, and general deterioration of the structure. Necessary concrete repairs and painting would also be implemented as part of the Proposed Action. The building is located at the base of an old rock quarry, and rock falls and debris slides have knocked into the guard's gallery and spilled into the building. This debris would be removed as part of the Proposed Action.

The use of staging areas and equipment would have no impact on cultural resources. Implementation of the Proposed Action (including mitigation) would repair and protect a contributing feature of the National Historic Landmark district and would therefore have a beneficial impact on cultural resources. The Proposed Action falls under the Programmatic Agreement Stipulation D.II.i. Rehabilitation of Historic Structures (NPS, 1992). This work would be designed and carried out in keeping with the guidance in the Secretary of the Interior's Standards for Rehabilitation (36 CFR 67). The Standards provide guidelines for the protection and maintenance of features, repair, replacement, design of missing historic features, alterations, and health and safety concerns.

Building 64 Seismic. Significant cultural resources within the APE for this project include the Alcatraz Defense Barracks (AL064) or Building 64 and portions of the graffiti from the Indian Occupation, located on the exterior and interior of Building 64. Both are contributing features of the Alcatraz Island National Historic Landmark district.

The proposed seismic upgrade of Building 64 would include the installation of a series of grade beams and collectors to strengthen the joints between interior and exterior walls and the roof diaphragm. Midway between the second and third floor levels, three struts would be constructed to bolt the building through the adjacent

retaining wall and into the bedrock in the hillside beyond. The existing interior hollow clay tile walls would be retained and used as shear walls after filling the hollow cells and reinforcing them.

The proposed construction activities would potentially affect graffiti from the Indian Occupation, and portions of the graffiti could be lost due to repair of wall surface and/or painting of walls. To minimize the impacts to the graffiti, the National Park Service would follow the mitigation procedures for the Indian Occupation Graffiti, as outlined in Section 2.7.2).

The use of staging areas and equipment would have no impact to cultural resources. Following mitigation, the Proposed Action would result in the stabilization and seismic retrofit of Building 64, a contributing feature of the National Historic Landmark district, and therefore would be a beneficial impact to cultural resources. The Proposed Action falls under the Programmatic Agreement Stipulation D.II.i. Rehabilitation of Historic Structures (NPS, 1992). This work will be designed and carried out in keeping with the guidance in the Secretary of the Interior's Standards for Rehabilitation (36 CFR 67). The Standards provide guidelines for the protection and maintenance of features, repair, replacement, design of missing historic features, alterations, and health and safety concerns.

Quartermaster Building. Significant cultural resources within the APE for this project include the Quartermaster Building. Also the foundation of the south wall of the Quartermaster Building is Civil War–era gun placements. Both the Quartermaster Building and archeological resource of the gun placements are contributing features to the Alcatraz Island National Historic Landmark district.

Under the Proposed Action, the Quartermaster Building would be stabilized and seismically upgraded to provide for the minimum life safety standards. Proposed improvements include exterior repair of spalling concrete, and repair or replacement of existing doors, windows and other openings. The entire structure would be sand and/or water blasted and painted as part of this project. Seismic improvements would include installation of a steel truss to enhance the strength of the roof diaphragm, and installation of steel plates and/or new reinforced concrete shear walls inside existing walls. Some foundation repair would be necessary under the new east wall, with potential drainage improvements. To minimize potential adverse effects to the Civil War–era gun placements beneath the Quartermaster Building, the National Park Service would develop and implement a testing, monitoring and protection plan for construction activities (see Section 2.7.2 for a detailed discussion of this measure).

The use of staging areas and equipment of the Proposed Action would have no impact on cultural resources. Following mitigation, the Proposed Action would result in the stabilization of seismic upgrade of the Quartermaster Building, a contributing feature of the National Historic Landmark district and therefore would be a beneficial impact to cultural resources. The Proposed Action falls under the Programmatic Agreement Stipulation D.II.i. Rehabilitation of Historic Structures (NPS, 1992) that provide guidelines for the protection and maintenance of features, repair, replacement, design of missing historic features, alterations, and health and safety concerns.

Fuel Line Remediation. There are two primary fuel lines on Alcatraz Island, one inactive and one active line. The inactive line is a 6-inch cast-iron pipe that branches into several 6-inch lines and one 4-inch line. These lines are located along the eastern portion of the Island in between the Dock and the Power House Complex (directly adjacent to the Quartermaster Building). These lines are inactive and are no longer necessary to the operation of the Island. (The second line is active and is a 1.5-inch copper diesel line used to power two small electrical generators.)

The dates of the inactive cast-iron pipe are not known, but it is possible that these lines are contributing features to the Alcatraz Island National Historic Landmark district, and would therefore require treatment consistent with the provisions of the Programmatic Agreement. In addition, buried Civil War-era gun placements may potentially occur in the areas adjacent to the cast-iron pipelines. The construction activities could include ground disturbance that would be necessary if inactive cast-iron pipelines are removed (rather than drained and left in place). These Civil War–era gun placements are contributing features. To minimize impacts, the National Park

Service would identify the areas that have archeological resources or have a high probability for archeological resources. In these areas, the inactive lines would not be removed but would be drained, cleaned, and left in place. In areas where the inactive lines are approved for removal, the National Park Service would determine if examples of the cast-iron pipe should be included in the Golden Gate National Recreation Area museum collections.

The use of staging areas and equipment related to Proposed Action would have no impact on cultural resources. Following mitigation, the Proposed Action would have no impact on cultural resources. The Proposed Action falls under the Programmatic Agreement Stipulation D.II.j. Health and Safety Activities (NPS, 1992).

4.3.2.3 CUMULATIVE IMPACTS – PROPOSED ACTION

Alcatraz Island is part of the Golden Gate National Recreation Area and is administered by the National Park Service. Under the Proposed Action, the cultural resources (historic buildings/structures, historic landscape features, and archeological resources) at the Island would be stabilized and ongoing deterioration would be minimized. Because of this, the Proposed Action would have a beneficial cumulative impact on the National Park Service's efforts to preserve cultural resources and settings within the Golden Gate National Recreation Area.

4.3.3 IMPACT ANALYSIS OF REDUCED PROJECT ALTERNATIVE

4.3.3.1 IMPACT ANALYSIS – REDUCED PROJECT ALTERNATIVE

As described in Chapter 2, the Reduced Project Alternative includes the repairs and stabilization action identified under the Proposed Action for areas that are currently open to the public. The difference between the Reduced Project Alternative and the Proposed Action is in the treatment of structures located in areas that are closed to the public. As a result, the impacts to cultural resources described above for the Proposed Action would be identical for the following projects under the Reduced Project Alternative and the reader is referred to the analysis above:

Phase One:

- Dock Repair;
- Building 64 Balconies;
- Cellhouse Stabilization; and
- Sallyport Stabilization.

Subsequent Phases:

- Slope Stabilization;
- Building 64 Seismic Upgrade; and
- Fuel Line Remediation.

Under this alternative, in areas currently closed to the public, only minimal safety projects would be performed to provide for life safety but not preservation of the Water Tower, New Industries Building, and the Quartermaster Building.

Alcatraz Island is a historic property, which as a National Historic Landmark carries the nation's highest level of significance. The Reduced Project Alternative would result in adverse effects to the landmark district. This alternative describes reduced scale projects for three of the contributing structures (the Water Tower, the New Industries Building, and the Quartermaster Building) on the north end of Alcatraz. The three structures are in an

advanced state of deterioration. Work proposed in the preferred alternative is designed to bring these structures up to a maintainable condition. The Reduced Project Alternative would provide for life safety but not for the preservation of the historic resource. If implemented, Reduced Project Alternative would accomplish only safety projects on these structures and would result in an adverse effect through neglect as described in 36 CFR Part 800.5(a)(2)(vi). Following is a discussion of the direct effects of implementing this alternative on the three structures.

Water Tower Stabilization. Significant cultural resources within the Area of Potential Effect for this project include the Water Tower and graffiti from the Indian Occupation that is located on the Water Tower. Both are contributing features to the Alcatraz Island National Historic Landmark district. The proposed repairs under the Reduced Project Alternative would provide the minimal repairs needed to protect human health and safety and to stabilize the Water Tower. The specific actions required would be developed at a later date. However, the specific project actions would have to be accomplished within the five-month non-breeding season. The Water Tower is currently in a non-maintainable condition. The structure would require rehabilitation to reach a maintainable condition. However, the repair/replacement of critical steel supports and painting of the structure that would be required to rehabilitate the Water Tower would take longer than the five-month non-breeding season, so these actions would not be undertaken under the Reduced Project Alternative. Without rehabilitation, the Water Tower will eventually fail structurally. The loss of this structure due to either minimal or no intervention would have adverse effects on surrounding cultural resources. Those effects would derive from sudden or gradual collapse or partial or total demolition. For example, a structurally unsound Water Tower could be brought down by wind or seismic action and it could land on and damage another historic structure.

The loss of the Water Tower and the Indian Occupation Graffiti on the Water Tower would be a major impact due to the loss of these contributing features of the Alcatraz Island National Historic Landmark district. As mitigation, the National Park Service would provide recordation of the Water Tower and Indian Occupation Graffiti to Historic American Buildings Survey (HABS) standards. However, due to the cumulative impacts, as discussed in Section 4.1.3.3, this mitigation would not reduce the impacts to a less-than-significant level.

The use of staging areas and equipment would have no impact to cultural resources. The Reduced Project Alternative will be the subject of a Section 106 Consultation under the National Historic Preservation Act following the Advisory Council on Historic Preservation's regulations 36 CFR Part 800. The effects of the Reduced Project Alternative, including the loss of the Water Tower and graffiti, will be taken into consideration in a Memorandum of Agreement that will be the result of this Consultation. The Reduced Project Alternative would have a major, adverse impact on the cultural resource.

New Industries (Laundry) Building. Significant cultural resources within the APE for this project include the New Industries Building, a contributing feature of the Alcatraz Island National Historic Landmark district. The proposed repairs under the Reduced Project Alternative would provide the minimal repairs needed to protect human health and safety and to stabilize the New Industries Building. The specific actions required would be developed at a later date. However, the specific project actions would have to be accomplished within the five-month non-breeding season. The building is not currently used, is in a state of disrepair due to lack of use and a backlog of maintenance projects, and is currently in a non-maintainable condition. The building would require rehabilitation to reach a maintainable condition. However, the seismic upgrade and other repairs that would be required to rehabilitate the building would take longer than the five-month non-breeding season, and so these actions would not be undertaken under the Reduced Project Alternative. Without rehabilitation, the New Industries Building would eventually fail structurally and loss of this building due to either minimal or no intervention would have adverse effects on surrounding cultural resources as discussed above under Water Tower Stabilization.

The loss of the New Industries Building would be a major impact due to the loss of this contributing feature of the Alcatraz Island National Historic Landmark district. The National Park Service would provide recordation of the New Industries Building to Historic American Buildings Survey (HABS) standards. However, due to the

cumulative impacts, as discussed in Section 4.1.3.3, this mitigation would not reduce the impacts to a less-than-significant level.

The use of staging areas and equipment would have no impact to cultural resources. The Reduced Project Alternative will be the subject of a Section 106 Consultation under the National Historic Preservation Act following the Advisory Council on Historic Preservation's regulations 36 CFR Part 800. The effects of the Reduced Project Alternative, including the loss of the New Industries Building, will be taken into consideration in a Memorandum of Agreement that will be the result of this Consultation. The Reduced Project Alternative would have a major, adverse impact on the cultural resource.

Quartermaster Building. Significant cultural resources within the APE for this project include the Quartermaster Building. Also the foundation of the south wall of the Quartermaster Building is Civil War–era gun placements. Both the Quartermaster Building and archeological resource of the gun placements are contributing features to the Alcatraz Island National Historic Landmark district.

The proposed repairs under the Reduced Project Alternative would provide the minimal repairs needed to protect human health and safety and to stabilize the Quartermaster Building. The specific actions required would be developed at a later date. However, the specific project actions would have to be accomplished within the five-month non-breeding season. The Quartermaster Building is currently in a non-maintainable condition. The building would require rehabilitation to reach a maintainable condition. However, the seismic upgrade and other repairs that would be required to rehabilitate the building would take longer than the five-month non-breeding season, and so these actions would not be undertaken under the Reduced Project Alternative. Without rehabilitation the Quartermaster Building would eventually fail structurally and loss of this building due to either minimal or no intervention would have adverse effects on surrounding cultural resources, as discussed above under Water Tower Stabilization.

The loss of the Quartermaster Building would be a major impact due to the loss of this contributing feature of the Alcatraz Island National Historic Landmark district. The National Park Service would provide recordation of the Quartermaster Building to Historic American Buildings Survey (HABS) standards. However, due to the cumulative impacts, as discussed in Section 4.1.3.3, this mitigation would not reduce the impacts to a less-than-significant level.

The use of staging areas and equipment would have no impact to cultural resources. The Reduced Project Alternative will be the subject of a Section 106 Consultation under the National Historic Preservation Act following the Advisory Council on Historic Preservation's regulations 36 CFR Part 800. The effects of the Reduced Project Alternative, including the loss of the Quartermaster Building, will be taken into consideration in a Memorandum of Agreement that will be the result of this Consultation. The Reduced Project Alternative would have a major, adverse impact on the cultural resource.

Potential adverse effects would also be indirectly created by the Reduced Project Alternative. The three reduced-scope projects of the alternative are for structures that are located within a discrete area on the north end of the Island. Under this alternative, the area of the Island that would eventually be closed is about 35 percent of the overall land mass of the National Historic Landmark. The north end of the Island contains 16 (33 percent) of the 45 historic properties currently identified as contributing to the Landmark district. The other structures contributing to the Landmark district that are existing this area are in similarly deteriorated condition. Future preservation projects would be required to bring the other north end structures up to a maintainable condition. Preservation needs have been identified but not yet developed into preservation projects for these structures. Because the entire north end of Alcatraz can be closed to visitation if safety factors require it, it is possible to extrapolate that a decision to only consider safety projects for the three structures could result in a similar decision for all contributing resources in the area.

The loss of the three cultural resources discussed above, the Indian Occupation Graffiti located on the Water Tower, and possible loss of other contributing resources on the north end of the Island would lessen the integrity of the Alcatraz Island National Historic Landmark district. The Reduced Project Alternative would have major, adverse impacts on the cultural resources of the Island.

4.3.3.2 CUMULATIVE IMPACTS – REDUCED PROJECT ALTERNATIVE

Alcatraz Island is part of the Golden Gate National Recreation Area and is administered by the National Park Service. Under the Reduced Project Alternative, minimal repairs needed to protect human health and safety and to stabilize the cultural resources (historic buildings/structures, historic landscape features, and archeological resources) at the Island would be undertaken. The level of repairs to the Water Tower, New Industries Building, and Quartermaster Building would not bring these cultural resources to a maintainable level. Without the repairs that would result in a maintainable level, these structures would eventually collapse. The loss of these three cultural resources and the Indian Occupation Graffiti located on the Water Tower would lessen the integrity of the Alcatraz Island National Historic Landmark. It is probable that the cumulative loss of these cultural resources, all concentrated on the north end of the Island, would result in the loss of the National Historic Landmark status. This loss would have a major, adverse cumulative impact on the National Park Service's efforts to preserve cultural resources and settings within the Golden Gate National Recreation Area.

4.3.4 NO ACTION ALTERNATIVE

4.3.4.1 IMPACT ANALYSIS – NO ACTION ALTERNATIVE

The No Action Alternative would continue the current practice of limited maintenance activities. This current practice has resulted in the benign neglect of the significant cultural resources. The cumulative effect of this benign neglect would be the deterioration of buildings and structures so that there would be an overall loss of integrity of the Alcatraz Island National Historic Landmark district. This loss of integrity would threaten the National Historic Landmark eligibility status.

In addition many of the buildings and structures on the Island require actions in order to protect the health and safety of the public. The No Action Alternative would result in the need to close portions of the Island to the public, and eventually the entire Island (after the Dock is deemed unsafe for continued use) to protect them from unsafe conditions.

Under the No Action Alternative, major adverse impacts to the significant cultural resources of the Alcatraz Island National Historic Landmark that could not be mitigated would occur.

4.3.4.2 CUMULATIVE IMPACTS – NO ACTION ALTERNATIVE

The cumulative context for cultural resources is defined as Alcatraz Island. The cultural resources of the Island, its National Historic Landmark district and contributing features—including Civil War–era remnant structures, resources from the Military Defense era, resources from the Military Prison–era, Indian Occupation Graffiti, and Federal Penitentiary–era facilities—are specific to the Island. No off-island projects or activities would contribute to the cumulative effects on these resources and as such, the cumulative analysis focuses on past, present and reasonably foreseeable actions on Alcatraz Island.

Alcatraz Island is part of the Golden Gate National Recreation Area and is administered by the National Park Service. Under the No Action Alternative, the cultural resources (historic buildings/structures, historic landscape features, and archeological resources) at the Island would experience continued deterioration of buildings and structures so that there would be an overall loss of integrity to the Alcatraz Island National Historic. As a result, the No Action Alternative would have a major adverse cumulative impact on the National Park Service's efforts to preserve cultural resources and settings within the Golden Gate National Recreation Area.

4.4 Recreation and Visitor Use

The analysis below considers the temporary effects associated with implementation of the project as well as the long-term effects on recreational values and visitor use of Alcatraz Island. Three alternatives are evaluated in the EIS: Proposed Action, Reduced Project Alternative, and No Action Alternative. Temporary effects on recreation and visitor use are those associated with the proposed repair/construction activities, and include increased noise and visual prominence/intrusion of construction activities on the visitor experience. The proposed repairs would require approximately 5 years to complete. Visitor access would be maintained to all currently open areas to the maximum extent possible; however, some areas within buildings may be closed while under construction for safety reasons. Alcatraz visitors coming to the Island during implementation of the proposed repairs would be exposed to construction-generated nuisances during their one-day visit to the Island. All construction activities would be implemented in accordance with relevant safety laws and regulations to ensure public and worker safety.

Over the long term (i.e., following implementation), each alternative has the potential to affect the recreational values and visitor use of the Island. As explained in Chapter 1, the Proposed Action is a repair/construction program—and no changes in the land use, visitation, programmatic or other operational aspects of the Island would occur. However, if the Proposed Action is not implemented, there could be a change (reduction) in the future visitor use and access on the Island as a result of serious public health and safety threats. The potential long-term effects on the recreational values and visitor use are also analyzed for each alternative.

As part of the analysis, a technical noise study was conducted to evaluate the projected noise levels associated with the proposed repairs/construction activities. The study identified a series of noise reduction measures, that have been incorporated into the mitigation presented in Section 2.77. The basic conclusion of the study is that there would be an increase in the ambient noise levels on the Island (see below) and that off-island noise would be negligible. The latter conclusion is based on the distance of the Island from surrounding land uses (at least 0.5 mile), the intensity of the anticipated noise, and the principles of noise attenuation. The study provides background information on the noise principles and descriptors (including an explanation of the units used to measures noise and other technical information), and an overview of existing noise regulations. As explained in the study, a series of guidelines have been developed by federal, state and local agencies to protect citizens from adverse physiological and social effects of noise. However, there are no standardized federal or state criteria for assessing temporary, construction-related noise.

In general, noise regulations focus on transportation noise, land use compatibility, and occupational noise control. Because the Proposed Action is a repair and construction program, these type of standards would not be applicable. However, local noise ordinances often establish additional noise standards and restriction to ensure land use compatibility with noise generating sources for the control of nuisance noise, including temporary construction noise. The guidance provided in local ordinance (City and County of San Francisco) was used in the analysis for exterior noise, as well as the federal Occupational Safety and Health Administration's standards for interior noise. In summary, the analysis found that after mitigation, none of the relevant guidelines or standards would be exceeded for any of the proposed repair/construction activities. Ambient noise levels on the Island would be increased throughout construction; however, no unsafe levels would occur. A copy of the report is provided as Appendix C of this EIS.

4.4.1 Impacts of the Proposed Action

As described in Chapter 2, the purpose of the Proposed Action is to protect public health and safety and preserve and stabilize deteriorating historic structures, and to implement the needed repairs while minimizing impacts to biological resources. Implementation of the needed repairs would have a long-term, beneficial effect on the recreational values and visitor use on Alcatraz Island. Without these repairs, a major adverse impact on recreation and visitor use would occur (see No Action Alternative discussion, below). Construction activities associated with these repairs would, however, generate temporary nuisances, such as increased noise, and

construction activities and equipment would be visually prominent on and off the Island (i.e., scaffolding, large cranes, etc.) throughout implementation of the Proposed Action. Although visitor access to Alcatraz would be provided throughout the implementation of the Proposed Action, certain areas may be restricted for public health and safety reasons during construction.

4.4.1.1 PHASE ONE – PROPOSED ACTION

Phase One of the Proposed Action includes four repair projects: Dock Repair, Building 64 (Balconies Repair), the Cellhouse Stabilization and Seismic Upgrade, and the Sallyport Seismic Upgrade. These projects are located in areas of high visitor use. The Dock serves as the primary access point for all visitors (the only other access would be via helicopter during life-threatening emergencies). Upon arrival to the Island via the Dock, visitors gather in front of Building 64 adjacent to and below the external balconies proposed for repair, where they are provided with a brief orientation. The first floor of Building 64 houses the Island visitor center, theater, a bookstore, several interpretive exhibits, and staff offices. From the Dock/Building 64 area, most visitors (and the electric tram) pass through the Sallyport complex enroute to the Island's major attraction, the Cellhouse. During implementation of the proposed Phase One repairs, visitors would be exposed to increased noise and restricted/reduced access, and construction activities would be visually prominent. A brief description of these effects is provided below.

The Dock and Balconies projects are located directly adjacent to each other (see Figure 2-1) in an area that is heavily used by visitors. Serious public health and safety concerns in this area include falling concrete from the external balconies/walls of Building 64 and the failure of the Dock structure. Based on structural analyses of these features, immediate repair is proposed. The Balconies project would require the installation of scaffolding along the exterior walls of Building 64 that face the Dock and is anticipated to take up to six months to complete. A safety/buffer area below the scaffolding would be established to protect visitors from potential falling debris during construction/repair activities. Access to the bottom floor of Building 64 (which includes the Island visitor center, theater, etc.) would likely be provided through covered walkways.

The proposed repair of the Dock would include the individual replacement of damaged support structures and piles (beneath the Dock), and seismic retrofit of the entire Dock structure. The project is anticipated to require up to fifteen months to complete. Pile replacement would occur one at a time, and the work would be done from the topside of the Dock (piles are located approximately 10 feet on center). A wooden barricade would be constructed around the work area to prevent visitors from inadvertently entering the construction zone and to attenuate noise generated by the construction activities. The seismic upgrade of the Dock would require the installation (drilling) of steel ties into the adjacent bedrock, however, pile driving is not required. The equipment needed to complete both of these repair projects would include a large drill, crane, cement mixer, and other smaller tools. There would be a noticeable increase in the ambient noise levels in this area of the Island.

The Cellhouse is the primary visitor attraction on Alcatraz. The proposed repair and stabilization activities would stabilize the historic resource and provide necessary protection of visitor health and safety during a seismic event. Implementation of these repairs would require both exterior and interior work. The National Park Service would maintain access to this important visitor site throughout construction, with partial (temporary) closure of specific areas to protect visitor safety. Repair/construction activities are anticipated to require up to eighteen months to complete.

Exterior walls of the Cellhouse would be covered with scaffolding, and safety/buffer areas would be established around the periphery of the work area in locations where the public is present. Access to the Cellhouse would be provided under the scaffolding, through covered walkways. The exterior work would primarily involve the repair of spalling concrete and repair/replacement of exterior windows, and would require the use of small hand tools, as well as cement mixer and equipment necessary to transport cement and new windows to and from the scaffolding. Interior work would primarily occur in and around the Cell Block, within the Cellhouse and would

require the use of jackhammers, welding equipment, as well as smaller hand tools. Sporadic increases in interior and exterior noise levels would occur throughout construction. The increase in ambient noise could cause intermittent speech interference within the Cellhouse. Partial closure of areas within the Cellhouse would likely be necessary during the implementation of these repairs. Construction would be visually prominent throughout the life of the project on the Island, and potentially from off-Island viewpoints.

As previously noted, the Sallyport is located on the eastern portion of the Island, along the primary thoroughfare and the majority of visitors pass through the complex en-route from the Dock to the Cellhouse. Although alternative pedestrian access is possible through Building 64, and seasonally via the Agave Trail, the road through the Sallyport is the only access for the electric tram service and it is the primary route used by visitors. The proposed repairs would include the seismic stabilization and reinforcement of the structure, and could potentially include the demolition and removal of the badly deteriorated wooden boathouse. Passage through the Sallyport is narrow and major construction activities would not occur during visiting hours. Some repair work may occur while the public is present, and intermittent increases in the ambient noise would occur during those times. The proposed stabilization and seismic upgrades would require approximately six months to complete.

During implementation of Phase One, there would be a noticeable increase in ambient noise levels, slight reduction in areas accessible to the public (for safety purposes during construction), and construction equipment and activities would be visually prominent in areas that are heavily used by the visiting public. Construction activities at the Dock/Building 64 area would be ongoing for up to 2 years, up to eighteen months at the Cellhouse and approximately six months at the Sallyport complex. Although construction activities would impact the visitor experience and recreational use of the Island, the adverse effects would be minimized through the use of noise reduction, and safety measures, as well as implementation of an interpretive program for the construction activities.

Implementation of Phase One of the Proposed Action would result in the repair and stabilization of structures that are central to the continued access and use of the Island by the public, and would address serious public health and safety concerns. Without these repairs, visitor access would be permanently restricted in areas deemed unsafe and the entire would Island eventually be closed to visitors—as soon as the Dock structure is deemed unsafe for further use. As a result, implementation of Phase One would have a long-term, beneficial effect on recreation and visitor use.

4.4.1.2 SUBSEQUENT PHASES – PROPOSED ACTION

The Subsequent Phases of the Proposed Action includes the six remaining repair/stabilization projects: Water Tower, Slope Stabilization, New Industries Laundry Building, Quartermaster Building, Building 64 (Seismic), and Fuel Line Remediation.

The Water Tower is located adjacent to the Cellhouse and above the roadway/pedestrian path adjacent to the Quartermaster Building below (which is open to visitors during the non-breeding season). The Water Tower is a visually prominent structure on the Island, as well as from off-Island view points. Implementation of any type of repair would require installation of scaffolding around the entire structure, which would similarly be visually apparent from vantage points. Repair of the steel members supporting the tower (some of which have completely deteriorated), other general stabilization actions, and seismic strengthening are proposed. Following the repair activities, the tower would be painted to seal and protect the steel. Construction-generated noise would be somewhat attenuated by the use of screening along the scaffolding; however, the ambient noise levels surrounding the tower would increase. Based on the visual prominence of the tower, scaffolding and repair activities would similarly be apparent to visitors throughout implementation of the proposed repairs.

The Slope Stabilization project is located in the southern portion of the Island along the nearly vertical slope that extends between the Parade Ground and the upper terrace of the Island (which contains a primary roadway, the Warden's House, Lighthouse and adjacent Cellhouse). The slope between the Parade Ground and the upper terrace is rapidly eroding and small-scale rock falls are common. This deterioration is jeopardizing the stability and safety of the structures and roadway above. The proposed stabilization would include the installation of rock

bolts (steel ties) into the bedrock of the Island, followed by a surface treatment of concrete along the face of the slope.

Due to the biological sensitivity of the Parade Ground area, the area is currently closed to visitors for the majority of the year (generally from February through August). The proposed repairs would require up to eighteen months to complete. In order to protect biological resources, the National Park Service would implement the needed repairs in phases, avoiding the peak biological sensitivity period. Repairs would be implemented during the five-month non-breeding season (which is the only time the Parade Ground is open to visitors) and would therefore require several years to complete. The non-breeding generally coincides with a period of lower visitation, especially in the months of November through February (see Table 3.3-1). Large areas within the Parade Ground (surrounding the active work areas) would be closed to visitors during construction. Some access would be maintained (as safety permits), which would be particularly important for use of the Agave Trail. The Agave Trail is a scenic pedestrian trail extending from the Dock along the southern end of the Island, up to the Parade Ground (and upper terrace beyond). Visitor use of the Parade Ground is relatively minor in comparison to the Dock and Cellhouse, and is only open from September to February. Visitors present at the Parade Ground during construction would be exposed to increased noise. Because the surrounding public areas (i.e., Dock below and Cellhouse above) are not within the line of site of the construction, noise levels would be substantially less; however, there would still be a noticeable increase in these areas.

The New Industries Laundry Building is located in the northern end of the Island—an area that is currently closed year-round to the public. Although the north end is closed to the general public (for safety and biological reasons), occasional ranger-led tours of the Laundry Building take place during the non-breeding season. Implementation of the proposed repair/construction activities in this location would therefore not directly impact visitors, although the construction activities may be visible and construction noise may be audible in surrounding areas where the public is present year-round. Over the long term, implementation of these repairs, including the repair and replacement of windows (to prevent exposure of the building to the corrosive marine environment), would preserve and stabilize this important historic structure (a contributing feature of the National Historic Landmark District). Like most of the proposed repairs, if these actions are not taken in the near future, the building would be irreparably damaged. As discussed in Section 4.1, the 1993 DCP for the Island approved expansion of visitor access to the north end.

The Quartermaster Building is not open to the public, and its use has been limited (for safety reasons) to storage of maintenance materials. The roadway adjacent to the Quartermaster Building is seasonally open to visitors (during non-breeding season), with access ending at the gate just beyond the Quartermaster Building at the entrance to the Model Industries Plaza (i.e., the north end of the Island). Implementation of the repairs would therefore occur in an area that is seasonally open to visitors. This dead-end roadway spur is not heavily used by visitors, and has been used by the National Park Service for storage of materials during prior repair/construction activities (i.e., new restrooms construction in summer 2000). It is possible that a portion of this seasonally open roadway (along dead-end spur) may be closed during construction for safety purposes.

Implementation of the seismic upgrade of Building 64 would require both interior and exterior construction activities. Unlike the Balconies project proposed during Phase One, the exterior work would occur primarily on the western side of the building (away from the Dock) in a less publicly prominent area. The exterior work would primarily be associated with the installation of steel ties into the bedrock of the Island, and would require approximately three months to complete. The majority of the seismic work would be completed within the interior spaces of the building, and would include the installation of sheer collectors and reinforcement of the internal walls, requiring approximately five months to complete (total project duration is eight months).

The first floor of the building contains staff offices, the Island visitor center, theater, a bookstore, and exhibit space, and is heavily used by visitors. The upper floors are currently vacant. Because of the public presence in this building, the most intensive repairs would likely be done during the early morning and evening hours when

the public is not present. However, some construction would occur during public visiting hours, and there would be sporadic increases in the ambient noise levels in and around the building and potentially partial closure of the public-serving facilities within the structure. Increases in the interior noise levels could cause intermittent speech interference within the visitor center and other public spaces on the first floor. Based on the monitoring and information learned during implementation of the interior repairs at Cellhouse (during Phase One), the National Park Service would refine the noise and nuisance-reduction practices for this project. Even after mitigation, however, there would be a noticeable increase in noise as well as potential reduction in access (for safety purposes during construction).

The inactive fuel lines proposed for removal are located along the eastern side of the Island, extending from the Dock, past the Sallyport Complex and Post Exchange to the Power House Complex. The fuel lines generally parallel the roadway (sometimes within the actual right-of-way). As previously described, this roadway serves as the primary pedestrian access for the Island and the only access/passage for the electric tram. During the waterbird breeding season, the roadway is closed at the Post Exchange, just beyond the turn leading uphill to the Cellhouse. During the non-breeding season, the roadway is open up to the Power House Complex where a permanent gate marks the northernmost access area for the public on this side of the Island. This project would involve cleaning (draining and containment) of any remnant fuels. The lines would be excavated and taken off the Island. In more sensitive locations, the lines would be cleaned and permanently capped (and left in place). Regardless of the method, an increase in ambient noise and visual presence of construction activities would affect the visitor experience. Continual access to the roadway leading up to the Cellhouse would be provided throughout construction, and this project would introduce similar construction-related effects as described. Over the long term, all of the projects included in the Subsequent Phases of the Proposed Action would have a beneficial effect on visitor safety and recreational values on Alcatraz.

During implementation of the Subsequent Phases, there would be a noticeable increase in ambient noise levels, a slight reduction in areas accessible to the public (for safety purposes during construction), and construction equipment and activities would be visually prominent in areas that are heavily used by the visiting public. In total, construction activities on the Island would be ongoing for roughly three years. Although construction activities would affect the visitor experience and recreational use of the Island, the adverse effects would be minimized through the use of noise reduction and safety measures, as well as implementation of an interpretive program for the construction activities.

Implementation of the Subsequent Phases of the Proposed Action would result in the repair and stabilization of important Island structures, including the Island's visitor center (in Building 64). These later projects would address serious public health and safety concerns, including the potential collapse of the Water Tower, slope stabilization and other actions which are necessary to ensure the ongoing use and enjoyment of Alcatraz. Without these repairs, visitor access would be permanently restricted in areas deemed unsafe and historic structures would be lost. As a result, implementation of the Subsequent Phases would have a long-term, beneficial effect on the recreation and visitor use.

Summary Impact Conclusions – Proposed Action

Implementation of Phase One of the Proposed Action would take approximately two years to complete, and would have the most direct and concentrated impact on the recreational values and visitor experience based on the location of the proposed projects in highly visible and publicly used areas. The Subsequent Phases would take several years (approximately three) to complete, and the effect on the recreational value and visitor experience would vary by project (as described above). Information learned through monitoring Phase One projects would be used by the National Park Service to improve mitigation and further reduce impacts to visitors during the Subsequent Phases of the project.

Overall, the Proposed Action would generate increased noise and other nuisances associated with construction activities, and construction equipment would be visually prominent throughout the Island (staging areas and work sites). Although the Island would remain open throughout the Proposed Action, access would be periodically

limited in certain areas (as described above). However, no major closures (i.e., of an entire building) or other large areas that are currently open to visitors would occur. The National Park Service would implement the mitigation measures identified in Section 2.7.3 to provide for public safety, minimize noise and other construction nuisances, and an interpretive program for the construction activities. These actions would minimize the adverse effects on visitors. Over the long term, implementation of the Proposed Action would have a beneficial effect on the recreational and visitor use values on the Island by providing for public health and safety and the preservation of important historic resources. These resources contribute substantially to the interpretive and recreational value of the Island.

4.4.1.3 CUMULATIVE IMPACTS – PROPOSED ACTION

Alcatraz Island is located within the Golden Gate National Recreation Area (GGNRA), which provides the public with a broad diversity of recreational, interpretive and visitor use opportunities. Because of its proximity to a highly urban area, the importance of the open space and recreational values offered by the Golden Gate National Recreation Area cannot be overstated. Within the Golden Gate National Recreation Area, Alcatraz is a unique location—and its unique geography, history, and cultural and natural features provide visitors with recreational and interpretive values that are truly individual to the site. As a result, the cumulative context for the recreational and visitor use impact analysis is defined as the Island.

As described in Section 4.1.2 (Cumulative Context), the National Park Service implements regular maintenance activities and small-scale construction projects, including the recent construction of new accessible restroom facilities adjacent to the Cellhouse, painting, roof repairs, etc. These activities generate minor, short-term nuisances and generally provide improved visitor conditions over the long term. Implementation of the Proposed Action would substantially increase the amount of repair/construction activities occurring on the Island. As a result, there would be a cumulative increase in construction-generated noise and the visual prominence of construction activities on the Island.

Over the long term, the Proposed Action would have a substantial beneficial effect on the recreational values and visitor use of the Island by addressing critical public health and safety concerns and by preserving/stabilizing the cultural resources on the Island. Preservation of the cultural resources would provide for the long-term enjoyment of these values for the public.

Individually, implementation of the Proposed Action would have a substantial beneficial effect on the recreational and visitor use values. (Without the Proposed Action, the Island would eventually be closed to visitors for safety purposes.) Implementation of the Proposed Action, in combination with the other small-scale improvements, additional interpretive exhibits and programs, or other possible future action would have cumulatively beneficial impacts on recreational and visitor use values of Alcatraz.

4.4.2 REDUCED PROJECT ALTERNATIVE

4.4.2.1 IMPACT ANALYSIS – REDUCED PROJECT ALTERNATIVE

Under the Reduced Project Alternative, there would be similar construction-related effects as described in detail above for the Proposed Action. The Reduced Project Alternative proposes the same repair/construction activities in areas that are currently open to the public. As a result, the effects on recreational values and visitor use (temporary and long term) described for Phase One of the Proposed Action would be identical under the Reduced Project Alternative. The effects described above for the following Subsequent Phases projects: Slope Stabilization, Building 64 (Seismic) and Fuel Line Remediation would also be identical under the Reduced Project Alternative and Proposed Action. The difference between the Proposed Action and the Reduced Project Alternative lies in its treatment of the structures located in areas that are currently closed to the public year-round, specifically: New Industries (Laundry) Building, Quartermaster Building, and the Water Tower. Under the Reduced Project Alternative, only minor repairs would be implemented for these three structures.

The following is a discussion of the temporary and long-term effects of the Reduced Project Alternative on recreation and visitor use on Alcatraz. For those impacts that are identical to the Proposed Action (as explained above), the analysis is not repeated here and the reader is referred to the text of the Proposed Action analysis in Section 4.4.1. Only a summary statement (in italics) of these identical impacts is provided at the end of this section.

Under the Reduced Project Alternative, all repair activities of the Laundry and Quartermaster buildings would be restricted to the five-month non-breeding waterbird season (generally defined in this area as mid-September through mid-February). These projects would take six and eight months, respectively, under the Proposed Action. The precise amount of time needed to provide the minimum safety actions for the Water Tower structure is unknown; however, it is anticipated that it would require slightly more than the five-month non-breeding season—but less than the eight months identified under the Proposed Action. The purpose of the Water Tower repairs under the Reduced Project Alternative would be to prevent the structure from falling down and injuring the public, with no provisions for the preservation of the historic or cultural integrity of the tower.

Under the Reduced Project Alternative, the temporary construction-generated effects on recreation and visitor use would be very similar to the Proposed Action. For the roughly 5-year period it would take to implement the repairs, construction activities and related noise and other effects would be apparent for all visitors. There would be a slight reduction in the duration and extent of repair activities at the Water Tower, Laundry Building and Quartermaster Building. Based on the more remote location of these structures (from the visiting public) and the difference in construction duration (a few months less of total construction under this alternative), the reduction in construction-generated noise and other visitor effects would be only slightly less than the Proposed Action.

Over the long term, the Reduced Project Alternative would have an adverse impact on the recreational and visitor use values on the Island. As discussed in Section 4.3, this alternative would result in the irreparable loss of important historic structures (which are contributing features to the National Historic Landmark district). This loss would reduce the interpretive values and historic integrity of the Island. The loss of the Laundry Building could also play a role in the planned expansion of visitor access in the north end area (as approved in the 1993 DCP). [Note: The extent and type of future access in this area will be reviewed as part of the planned DCP Update—see Section 4.1 for additional information.] Under any circumstance, loss of the Laundry and Quartermaster buildings would forego opportunities for future public use and interpretation of these features.

Implementation of the Reduced Project Alternative would generate similar—although slightly less—construction-related effects than the Proposed Action. Visitors traveling to the Island during the roughly five-year construction period would be exposed to increased noise levels and construction activities would be visually prominent on the Island. The mitigation measures presented in Section 2.7 to reduce noise, provide for visitor safety and interpret construction activities would be implemented for both the Proposed Action and this alternative.

Over the long term, the Reduced Project Alternative would allow access to the Island to continue (through implementation of the Dock and other repair projects) and would meet the human health and safety needs in areas that are currently open to the visiting public. However, there would be an adverse impact/loss of important historic resources, which would indirectly and adversely, affect the recreational and interpretive values provided on the Island. Loss of these buildings would also foreclose opportunities for ranger-led tours or other future access in these locations due to safety constraints and therefore would not allow north-island access in the approved DCP to be implemented. Loss of these structures would preclude visitor use and interpretation at the north end of the Island, which would be a major impact to visitor experience and opportunities in those areas. Overall, the Reduced Project Alternative would provide more protection of the recreational values and visitor use of the Island than the No Action Alternative but less than the Proposed Action.

4.4.2.2 CUMULATIVE IMPACTS – REDUCED PROJECT ALTERNATIVE

As described in Section 4.4.1.3, the cumulative context for the analysis of recreational and visitor use impacts is defined as Alcatraz Island. This decision is based on the unique recreational and interpretive opportunities provided on Alcatraz.

As described in Section 4.1.2 (Cumulative Context), the National Park Service implements regular maintenance activities and small-scale construction projects, including the recent construction of new accessible restroom facilities adjacent to the Cellhouse, painting, roof repairs, etc. These activities generate minor, short-term nuisances and generally provide improved visitor conditions over the long term. Implementation of the Reduced Project Alternative would substantially increase the amount of repair/construction activities occurring on the Island. As a result, there would be a cumulative increase in construction-generated noise and the visual prominence of construction activities on the Island. This increase would be slightly less than the increase projected under the Proposed Action, but substantially more than would occur under the No Action Alternative.

Over the long term, the Reduced Project Alternative would have some beneficial effect on the recreational values and visitor use of the Island by addressing critical public health and safety concerns and by preserving/stabilizing the cultural resources on the Island. This protection, however, would be limited to areas that are currently open to the public. Under the Reduced Project Alternative, the Laundry Building, Quartermaster Building and Water Tower would receive only minimal repairs and adverse impact to the historic resource would occur, including the irreparable damage of the contributing features to the National Historic Landmark district. Cumulatively, this alternative may have additional adverse effects on future recreational and visitor use values by foreclosing opportunities to open the Laundry Building to the visiting public (as envisioned in the approved 1993 DCP). Loss of the Laundry Building could potentially influence future management actions regarding the treatment of other north end structures and historic features, including the Model Industries Building, Model Industries Plaza, the roadway, historic fences, and other features in this area.

Individually, implementation of the Reduced Project Alternative would have limited beneficial effects on the recreational and visitor use values in areas that are currently open to the public, and would allow continued access to the Island (as a result of the Dock Repair project). Minimal repairs to the Laundry and Quartermaster buildings proposed under this alternative would lead to the irreparable loss of important historic structures. Cumulatively, this loss could influence/inhibit future public access in the north end area (as envisioned in the 1993 DCP) and potentially influence management actions related to the treatment of other structures in the north end. If the deterioration of the north end continues, the likelihood for future public use and enjoyment of this area would be severely restricted, if not eliminated entirely.

4.4.3 NO ACTION ALTERNATIVE

4.4.3.1 IMPACT ANALYSIS – NO ACTION ALTERNATIVE

Under the No Action Alternative, only regular maintenance activities would occur, such as painting, roof repair, vegetation management, weatherization or other small-scale projects as described in Section 4.1.2 (Cumulative Context). No large-scale structural repairs would be implemented, and none of the repair projects identified under the Proposed Action would be completed. As a result, the temporary effects of increased noise, visual prominence/intrusion of construction activities in visitor experience, and other construction-related nuisances associated with the Proposed Action and Reduced Project Alternative would be avoided under this alternative.

Section 2.1 provides an overview of the existing condition of the structures proposed for repair and the projected outcome of the No Action Alternative if major repairs are not implemented. Examples of the safety concerns addressed by the Proposed Action include spalling concrete (including incidents where concrete has fallen without warning), rock falls at the Parade Ground, deterioration of the support structures under the Dock, and the seismic stability of the many of the major and frequently visited structures on the Island. Over the long term,

these serious public health and safety threats would result in the closure of individual buildings or areas, eventually leading to the closure of the Island to the visiting public (once the Dock structure is deemed unsafe for public use). The precise timing of the closure(s) that would occur under the No Action Alternative would depend on the rate of deterioration and the ability of small-scale repair activities/maintenance activities to temporarily defer closure activities. Closure of the Island to the visiting public, however, would be inevitable under the No Action Alternative.

In addition to significant health and safety concerns, the irreparable loss of historic structures would directly and adversely affect the opportunities for visitors to interpret the history of Alcatraz (while the Island is still open to the public).

Under the No Action Alternative, the temporary construction-related effects of the Proposed Action and Reduced Project Alternative would be avoided. However, this alternative would have a long-term, major, adverse impact on the recreational and visitor use values on Alcatraz resulting from serious public health and safety concerns, loss of important historic resources, and subsequent closure of the Island to visitors.

4.4.3.2 CUMULATIVE IMPACTS – NO ACTION ALTERNATIVE

As previously described, the cumulative context for the analysis of recreational and visitor use values is defined as the Island. The No Action Alternative would individually and cumulatively result in a major, adverse impact on recreational and visitor use values on Alcatraz. Under the cumulative conditions, only minor repairs and regular maintenance operations would occur and there would be a substantial deterioration in the majority of the Island's historic structures, including the Dock that provides access to the Island for the visiting public.

The No Action Alternative would lead to the eventual closure of the Island and the irreparable loss of the National Historic Landmark district designation. Although some cumulative actions (i.e., regular maintenance/small-scale repairs) may temporarily defer closure of the Island, the effect of this alternative would overwhelmingly influence the cumulative outcome—which would be closure of the Island to the visiting public. The loss of public access to this nationally recognized recreational and interpretive destination would be major and adverse.

4.5 Air Quality

The Proposed Action is a repair/construction program intended to stabilize badly deteriorating historic structures and provide for public health and safety. The Proposed Action would generate emissions only during construction/implementation. No changes in the operation of the Island or other actions that would generate long-term (i.e., increased energy use) or regional emissions would occur as a result of the Proposed Action. Therefore this analysis focuses on construction-related emissions.

Because Alcatraz is an island, increased emissions associated with construction vehicle trips would not occur. The movement of equipment and materials would be primarily from a barge to the staging area, with additional transport using small vehicles (forklift or small pickup truck) along the existing paved roadway on the Island. Therefore, this analysis focuses on construction emissions.

In preparation of the analysis, the Bay Area Air Quality Management District's (BAAQMD) *California Environmental Quality Act (CEQA) Guidelines, Assessing the Air Quality Impacts of Projects and Plans* (1996) was reviewed. State implementation plan (SIP) conformity based on the methodology provided in BAAQMD CEQA Guidelines and in 40 CFR §51.853 was also reviewed.

4.5.1 IMPACT ANALYSIS – PROPOSED ACTION

Construction-related emissions are generally short-term in duration, but may still cause adverse air quality impacts. PM_{10} is the pollutant of greatest concern with respect to construction activities. While construction equipment emits CO and ozone precursors, these emissions are included in the emissions inventory that is the basis for regional air quality plans, and are not expected to impede attainment of ozone or maintenance of CO standards in the Bay Area. PM_{10} emissions can result from a variety of construction activities, including excavation, grading, building removal, vehicle travel on paved and unpaved surfaces, and vehicle and equipment exhaust (BAAQMD, 1996).

Because the Proposed Action is repair program for existing historic features located on an Island, these types of activities would be minimal. The BAAQMD does not require that construction emissions be quantified. Rather, the magnitude and intensity of construction emissions are determined based on the feasibility of implementing BAAQMD's control measures for the proposed construction activities. Applicable BAAQMD control measures are feasible and would be implemented reducing construction emissions to a minor level. In the case of the Proposed Action, the National Park Service would require the use of applicable BAAQMD control measures as discussed in Section 2.7.

Following implementation of these measures, the Proposed Action and associated construction emissions would have a minor, short-term, adverse effect on ambient air quality.

4.5.2 IMPACT ANALYSIS – REDUCED PROJECT ALTERNATIVE

Implementation of the repair and construction activities included under the Reduced Project Alternative would have similar effects as described above for the Proposed Action. The primary difference between the Proposed Action and this alternative is the treatment of structures that are not currently open to the public. For these structures, a minimal level of repair would be implemented. As a result, there would be a slight reduction in the overall duration of the construction program under this alternative, resulting in slightly less construction-generated emissions.

4.5.3 IMPACT ANALYSIS – NO ACTION ALTERNATIVE

Under the No Action Alternative, none of the proposed repair/construction projects would be implemented, and current air quality would not change. Ongoing, routine maintenance activities would continue as currently practiced. Over the long-term, the No Action Alternative would lead to the closure of Alcatraz to the public. Closure of Alcatraz to the visiting public would decrease energy generation and maintenance activities on the Island, which would have a minor, beneficial effect on air quality.

4.5.4 CONFORMITY WITH STATE IMPLEMENTATION PLANS

The Clean Air Act Amendments of 1990 require federal agencies ensure that actions are consistent with the Clean Air Act and with federally enforceable air quality management plans (e.g., state implementation plan). The conformity assessment process is intended to ensure that federal agency actions occurring within nonattainment or maintenance areas: 1) will not cause or contribute to new violations of National Ambient Air Quality Standards (NAAQS); 2) will not increase the frequency or severity of any existing violations of ambient air quality standards; and 3) will not delay the timely attainment of ambient air quality standards. Pursuant to 40 CFR 51.853, no conformity determination is required for projects that do not exceed the following emissions levels: 50 tons per year (tpy) for ROG, 100 tpy for NO_x, and 100 tpy for CO. The Proposed Action and alternatives would not exceed these levels, and therefore a conformity determination would not be necessary. Consequently, total direct and indirect increases in emissions associated with the Proposed Action, including long-term operational emissions, are not anticipated to result in new violations of ambient air quality standards, contribute substantially to future violations of ambient air quality standards within the region, nor interfere with the future maintenance of ambient air quality standards.

4.5.5 CUMULATIVE IMPACTS

The BAAQMD recommends that an analysis of a project's cumulative air quality impacts be based on the project's consistency with the projected emissions inventory contained in the air quality plan. The emissions inventory contained in the BAAQMD is based, in part, on projected increases in population and motor vehicle use derived from adopted land uses plans within the region. In accordance with the BAAQMD guidelines, a project would be deemed to have a major cumulative impact if the proposed use, in comparison to previously adopted land use plans, would result in a long-term increase in regional operational emissions that would interfere with the maintenance or attainment of air quality standards. The *Golden Gate National Recreation Area and Point Reyes National Seashore General Management Plan* (GMP) (NPS, 1980) and *Alcatraz Island Development Concept Plan* (DCP) (LSA Associates and NPS, 1993) are the approved land use plans pertaining to Alcatraz Island. The Proposed Action would not change the land use or operational characteristics of the Island, and therefore no change in the long-term regional emissions would occur.

The Proposed Action would generate small amounts of construction-related emissions. The National Park Service would implement the BAAQMD's feasible control measures for PM_{10} and dust emissions, as described in Section 2.7 (Mitigation). As a result, the Proposed Action would have a minor, short-term effect on air quality and would not exceed the projected emission inventory for the region. The Proposed Action would have a negligible cumulative effect on air quality.

In addition, a cumulative impact could also occur if the proposed project would contribute to impacts to nearby sensitive receptors due to odorous, toxic, or hazardous emissions (BAAQMD. 1996). Implementation of the Proposed Action would not result in the emission of major sources of odorous, toxic, or hazardous pollutants, and long-term cumulative impacts to nearby sensitive receptors would not occur (see Section 4.6).

As described above in Section 4.2.7.1, construction emissions of ROG, NO_x, and CO are included in the emissions inventory that is the basis for regional air quality plans and, as a result, are not expected to conflict with

the BAAQMD CAP. Furthermore, no long-term cumulative impacts to nearby sensitive receptors would result from implementation of the Proposed Action.

4.6 Hazardous Substances: Human Health, Safety, and the Environment

Under both action alternatives, construction to stabilize and rehabilitate structures on the Island to provide for public health and safety would potentially expose hazardous substances, such as asbestos and lead-based paint, that will be disturbed during construction activities. The GGNRA will conduct surveys and sampling to identify, characterize, and quantify the nature the hazardous substances present in work areas and the extent that these materials will be disturbed by construction activity. The GGNRA has the primary responsibility for identifying, managing, or removing hazardous substances on Alcatraz Island. Construction contracts for this project will include procedures for the sampling, identification, and cleanup of hazardous substances in accordance with applicable state and federal regulations. Construction activities and cleanup plans will conform to applicable federal and state laws and regulations. These laws require construction activities and cleanup programs to be protective of human health and environment.

4.6.1 IMPACT ANALYSIS -PROPOSED ACTION

Risks to human health, safety and the environment on Alcatraz Island would be related to releases of hazardous substances during construction activities to rehabilitate and stabilize deteriorating structures on the Island. As stated in Chapter 3, Affected Environment, asbestos was a commonly used material in buildings constructed prior to 1989 because of the insulating and fire retardant properties. Asbestos presents a health hazard when asbestos particulates become airborne and are inhaled. Long-term overexposure to airborne asbestos can result in asbestosis (scarring of the lungs), lung cancer, and mesothelioma (cancer of the lining of the lungs and gut cavity). The projects associated with this alternative that may expose asbestos containing materials are the Cellhouse, Building 64, the Laundry Building and the Fuel Line Remediation. Additionally, the Slope Stabilization project has the potential to disturb asbestos that may occur naturally in the Island rock.

Although lead-based paint was banned from commercial sale in 1978, it can still be found in historic buildings such as those on the Island. The buildings and structures on the Island that are assumed to have lead-based paint and finishes are Building 64, the Cellhouse, the Sallyport, the Water Tower, the Laundry Building and the Quartermaster Building. As stated in the Affected Environment chapter, lead presents a health hazard when fine dust or fume containing lead is inhaled or ingested. Lead exposure by inhalation poses the greatest risk because lead fumes and fine dust are readily absorbed into the blood system. Most lead poisonings are the result of prolonged exposure, not a single event. Lead is a neurotoxin that particularly affects the brains of children, causing decreased intelligence, impaired decision making, lapses in concentration, and certain cancers such as kidney, lung and bone. Lead is hazardous to birds and animals, accumulating in the bones.

Building demolition or rehabilitation under this alternative might pose potential health risks because of exposure to asbestos and lead. Potential impacts to human health, safety and the environment are uncertain at this time because extensive sampling has not occurred; however, with mitigations outlined in section 2.7.4, the short-term risks would be reduced to negligible to minor levels. No long-term effects are anticipated.

Hazardous material storage and hazardous waste disposal would be conducted within applicable regulations; therefore, no adverse impacts are anticipated.

4.6.2 IMPACT ANALYSIS – REDUCED PROJECT ALTERNATIVE

Implementation of the repair and construction activities under this alternative would have similar effects as described for the Proposed Action. This alternative would implement minimal level of repairs to structures that are currently closed to the public. As a result, there would be a slight reduction in the overall duration of the construction program under this alternative, and less potential exposure of hazardous substances.

4.6.3 IMPACT ANALYSIS – NO ACTION ALTERNATIVE

None of the proposed repair/construction projects would be implemented under the No Action Alternative. Ongoing, routine maintenance activities would continue as currently practiced. The No Action Alternative would lead to the closure of Alcatraz to the public resulting in A reduced potential for exposure from construction activities. However, building decay may lead to uncontrolled releases of substances that are undetected.

4.6.4 CUMULATIVE IMPACTS

The specific cumulative impacts of the exposure of hazardous substances associated with the action alternatives are unknown at this time because the extent of contamination and clean-up plans have not been finalized. The short-term cumulative impacts would be negligible to minor with implementation of mitigation measures outlined in section 2.7.4 and adherence to applicable state and federal laws regarding disposal. Removal and proper disposal of asbestos and lead-based paint would have a beneficial cumulative impact on human health and the environment.

CHAPTER 5

AREAS FOR FUTURE CONSIDERATION

Original fieldwork, qualitative and quantitative observation, and visitor profiles suggest a broad range of policy and planning directions that could be pursued in the transportation management plan for the Marin Headlands and Ft. Baker. Study results indicate areas that are not only opportunities for change and improvement but also that many aspects of the existing system already complement the Park's local and regional transportation needs. In fact, 81% of survey respondents reported that they did not encounter any transportation problems reaching their destinations within the study area; however, this type of survey did not reach the transit-dependent (e.g., one-third of the population of San Francisco) who cannot get to the Park.

In this section, the major concepts and specific findings that emerge from the study are discussed along with their relevance to the next phase of the project's planning process, the development of alternatives.

MULTI-MODAL ACCESS

An overwhelming majority of current park visitors, 88% of our survey respondents, reported that they arrived to the study area by automobile. However, there are also many reasons to believe that alternative transportation strategies are not only desirable but also viable in the Marin Headlands and Ft. Baker.

- Transit service is limited, but 26 Golden Gate Transit lines pass directly *through* the study area on Highway 101 and Muni's 76 Line on Sundays and holidays frequently attracts a high number of riders. The success of this service suggests opportunities for providing transit stops at key destinations in the study area.

- Once visitors are within the park boundaries, their usage of other modes of travel increases considerably. Twenty-two percent of survey respondents reported walking or hiking and 8% reported bicycling as ways of traveling between destinations in the Park.

- The pedestrian and bicycle access on the Golden Gate Bridge offers a popular link between San Francisco and the study area. The connections between the northern terminus of the Golden Gate Bridge and the Trailhead lot creates a bicycle and pedestrian connection between Vista Point and the Marin Headlands.

- Particularly on weekends, bicycles are a popular mode of access. Among survey respondents, bicycles were used as the *primary* mode of access twice

as much on Sunday than on Saturday and 5 times as much on Sunday than on Thursday.

- More than one-third of survey respondents began their trip to the study area from San Francisco, a city with rich transit services and connections to Marin County-bound Golden Gate Transit routes. San Franciscans are also three times more likely to bicycle within the Park than visitors arriving from somewhere else.

- Given the possibility of a "Car Free Day", 70% of survey respondents indicated that they would try some form of alternative transportation mode to access the Park. Thirty-five percent of respondents indicated their willingness to drive to a central parking lot and take a shuttle to the Park.

- Nine of the 10 Park Partners surveyed would like to see improvements in public transportation or the implementation of a shuttle service in the study area.

- Eight of the 10 organizations surveyed suggested that housing be evaluated as one solution to address transportation issues.

A variety of alternative transportation strategies could be considered including the enhancement of transit connections, especially from San Francisco and also from Marin County. The implementation of an internal shuttle service could eliminate the need to drive within park boundaries and also encourage the use of alternative access to the Park itself if appropriately designed with connections to other alternative modes.

The bike and pedestrian connections to the study area via the Golden Gate Bridge and the popularity of biking and hiking within the study area suggest that strong attention should be given to making roads such Alexander Avenue, East Road and Bunker Road more accommodating to a multiplicity of modes. Particularly from Vista Point, bike connections deserve careful attention, especially given the proximity of Vista Point to Ft. Baker and the access available to the Marin Headlands through the pedestrian underpass.

However, the success of any alternative access program needs to acknowledge the many users who may not be familiar with either the study area or their travel options. (41% of park users are first time visitors and almost 1/3 of the visitors are from outside the Bay Area) Thus, encouraging visitors to travel in ways other than the automobile will depend not only on the quality of the transportation provided but also on the clarity and availability of travel service information to the full range of potential users.

For destinations such as the Bay Area Discovery Museum where a large number of visitors arrive with young children and related gear, alternative modes may not appear practical to the visitors. For employees and volunteers working within the park boundaries, private transportation holds a particular utility. Among recreationalists, it is

interesting to note that walkers said they would avoid the Park on "car free days" at a rate *eight* times that of the cyclists.

ROADWAY SUPPLY

The roadway network was designed and built by the military for their limited use, not the general public to enjoy a national park. The narrow and winding nature of park roads such as Conzelman suggests that existing road widths are not sufficient to accommodate vehicles, bicyclists and pedestrians. Particularly around popular destination areas such as Battery Spencer, there are many conflicts between users of different modes. However, the vast majority of the park road network is actually underutilized with two lane roads and gravel shoulders frequently serving only very few vehicles – even during peak periods and times.

Although congestion may be an issue during special events, peak times, and at popular destinations, certain parts of the Park's vehicular road network are actually at overcapacity.

- The stretch of Bunker Road west of the Barry-Baker tunnel has total segment widths of at least 40 feet including 25 feet of paved roadway and 15 feet of gravel shoulders. Bunker Road is a road frequently chosen by bicyclists because of its level grade and the striped bike lanes in the one-way Barry Baker tunnel.

- Five of the 7 intersections in the study area operated at a Level of Service "A" during weekend peak hours. The exceptions are Conzelman Road/ Alexander Avenue –US 101 Southbound On-Ramp (LOS "E") and Alexander Avenue/US 101 Northbound ramp (LOS "C"). *None* of the intersections within park boundaries perform below a Level of Service "A."

- The number of vehicles entering the Marin Headlands on a weekday was almost half as many that enter on a Sunday during the peak summer period.

The openness of the Park's internal road network, however, is in clear contrast with congestion in the surrounding regional network where peak period queues and delays on the Golden Gate Bridge, US 101, and Alexander Avenue created by non-park destined traffic compromise access to the Headlands via the Conzelman Road and Barry Baker Tunnel entrances.

Addressing the issue of road supply in the study area will require dual approaches, carefully distinguishing between the congestion of the regional network from the capacity of park roads. Regional network solutions will require the cooperation of others, including members of the Parklands Transportation Task Force. At the same time, a variety of strategies might be considered which address both networks including modifications to the two-way travel patterns at the entrances to the Headlands, installation of appropriate signage directions, and maximum car reduction strategies inside park boundaries.

PARKING SUPPLY

Even during overcast summer weekdays, parking spaces along Conzelman Road at Battery Spencer and Hawk Hill are in high demand. The competition for spaces results in potential safety risks to the bicyclists and pedestrians who are sharing limited road space with automobiles backing out, waiting, and pulling into spaces. During special events at the Bay Area Discovery Museum and at the Marin Headlands Center for the Arts, parking is also in high demand.

However, in the vast majority of the study area, parking spaces are in abundant supply and within close walking distance of popular destinations. Similar to the Park's roadway capacity, this study suggests that certain portions of parkland may be inefficiently allocated to parking capacity.

- None of the parking areas *ever* reached capacity except Battery Spencer where there are also the highest rates of turnover.

- During a sunny weekend summer day, parking utilization exceeded 75% at only four locations: the Bay Area Discovery Museum, Battery Spencer, Battery Mendell & the Trailhead Lot (Conzelman west of Highway 101). In 9 of the 15 parking areas surveyed throughout the study area, utilization was less than 50%.

- One of the study area's largest parking areas, the Battery Alexander lot with a total capacity of 75 cars, held 6 cars at its maximum utilization during a peak summer day.

- Even in areas with high parking utilization, high turnover suggests that park visitors do not have much trouble parking. For example, at the Bay Area Discovery Museum, while peak utilization exceeded 75%, three fourths of the vehicles parked for less than two hours. The same high levels of turnover are true at other sites with high parking utilization.

- Almost none of the survey respondents reported a lack of parking as a transportation problem they encountered in the study area.

Where parking is in undersupply such as at Battery Spencer or during special events, one approach may be to provide clearly marked information on alternative parking facilities near the desired destination.

WAYFINDING

The Marin Headlands are difficult to find whether entering from San Francisco or Marin County (from the north). Even for visitors familiar with the internal and surrounding road networks, the absence of appropriate street signs and directionals makes it difficult to access park entrances and find major destinations inside the park boundaries.

- Access to Ft. Baker and the Bay Area Discovery Museum is especially compromised by the absence of directional signs and consistently named streets inside and outside of park boundaries.

- The irregularity of the street network in the study area makes street signage particularly important to all park visitors.

- Of the survey respondents who encountered transportation problems, 30% identified poor signage as a problem in the study area.

Improved signage could alleviate the confusion of the park visitor and also reduce the amount of time cars spend aimlessly driving around the study area, including the congested regional roadways. Particularly on Highway 101, signage in both directions could better alert visitors to the appropriate Alexander Avenue exit to the Marin Headlands and Ft. Baker. Signage could also indicate some of the more popular destinations such as the Bay Area Discovery Museum, which is not always known to be within the boundaries of Ft. Baker, if Caltrans can make an exception to standard policies on signs for landmarks and attractions.

Signage need not be an intrusive element in the landscape. The directional signage at the Presidio of San Francisco has been cited as an example. With careful attention to size and design, signs could serve directional, aesthetic, and interpretive functions in transitional spaces such as the Golden Gate Bridge pedestrian underpass.

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6.0 CONSULTATION AND COORDINATION

This chapter describes the consultation and coordination efforts conducted by the National Park Service in preparation of this Draft and Final EIS. Opportunity for public and agency input was be provided during the 60-day public comment period on the Draft EIS, that included two public meetings before the Golden Gate National Recreation Area Advisory Commission, consultation with regulating agencies, and meetings with interested groups. The chapter concludes with a list of the authors and persons contributing to the preparation of the Draft and Final EIS.

6.1 EIS Process and Public Review

Consistent with the requirements of the National Environmental Policy (NEPA) and Section 1506.6 of the Council on Environmental Quality's Regulations implementing NEPA, public involvement was an integral part of the preparation of the Draft and Final EIS. A summary of the public involvement and agency consultation and coordination completed to date is provided below.

6.1.1 SCOPING

The National Park Service made diligent efforts to involve the public in preparing and implementing the NEPA procedures for this project. A Notice of Intent (NOI) was released in December 1998 announcing the decision to prepare an EIS and solicit early input into the scope and range of issues to be analyzed in the document. The following is a summary of the scoping activities. Please refer to Section 6.1.3 for additional information.

Two public meetings (announced in Federal Register NOI):

- 12/11/98 – meeting and field trip to the Island with interested groups/individuals.
- 12/11/98 – afternoon/evening Open House at Fort Mason Park Headquarters.

One followup meeting with individuals identified through initial scoping:

- 1/12/99 – meeting with project team and interested environmental organizations.

In addition to verbal input during these meetings/field trips, the National Park Service received written comments on the scope of the EIS. Copies of the scoping comment letters received are provided in Appendix A of this EIS. During the early phases of the environmental review process, the National Park Service also consulted with a variety of interested environmental organizations (see Section 6.1.3).

6.1.2 CONSULTATION WITH REGULATORY AGENCIES

CALIFORNIA STATE OFFICE OF HISTORIC PRESERVATION

In June 1992, the National Park Service, California State Office of Historic Preservation, and Advisory Council on Historic Preservation (ACHP) entered into a Programmatic Agreement (PA) regarding the operation and maintenance activities within the Golden Gate National Recreation Area including Alcatraz Island (Refer to Sections 3.2 and 4.3 for additional information on the PA.). On March 1, 1999, the National Park Service sent the State Office of Historic Preservation written notification of the Proposed Action and the environmental review process. The National Park Service indicated that the proposed repairs and stabilization projects included in the Proposed Action fall within the exclusions of the PA. On April 6, 1999, the State Office of Historic Preservation sent written notification that it concurred with the National Park Service's conclusion.

NATIVE AMERICAN CONSULTATION

In October 1997, the National Park Service sponsored an Alcatraz Powwow event celebrating the completion of an interpretive documentary about the Indian Occupation. During the event, NATIONAL PARK SERVICE Historian and American Indian Liaison Paul Scolari spoke with approximately 15 participants of the occupation about the graffiti on Alcatraz. Questionnaires seeking information about the creation of the graffiti and the importance to participants were completed. Although this event occurred prior to the scoping process for this EIS, it marked the beginning of the National Park Service's effort to consult with the participants and begin to establish a framework for future preservation and treatment of graffiti. Since that time, additional informal discussions have occurred. As described in Section 2.7.2 (mitigation), the National Park Service will continue to consult with the participants as individual projects are proposed for implementation.

UNITED STATES ARMY CORPS OF ENGINEERS

Through the scoping process, the U.S. Army Corps of Engineers (USACE) indicated that the Proposed Action might be subject to Section 404 of the Clean Water Act and Section 10 of the Rivers and Harbors Act of 1899. The Draft EIS acknowledged this requirement (refer to Sections 3.1 and 4.2). The GGNRA has consulted with the USACE and received authorization to begin work on the dock (see Appendix E).

In addition, GGNRA consulted with the San Francisco Bay Conservation and Development Commission (BCDC) and the Regional Water Quality Control Board (RWQCB) concerning the dock project. The BCDC issued a consistency determination and the RWQCB issued a waiver of waste discharge requirements (see Appendix E).

NATIONAL MARINE FISHERIES SERVICE

The National Park Service consulted with the National Marine Fisheries Service (NMFS) in compliance with the Endangered Species Act and the Magnuson-Stevens Fishery Management and Conservation Act. The Draft EIS was submitted to the NMFS with a letter requesting concurrence with the National Park Service determination that the proposed project along with mitigation measures is not likely to adversely effect listed species or essential fish habitat. The NMFS concurred with the determination (see Appendix E)..

6.1.3 COORDINATION WITH RESOURCE ORGANIZATIONS

The National Park Service held several public meetings with interested environmental and historic preservation groups as part of the scoping process, and during the preparation of the Draft and Final EIS. These meetings included field visits to the Island to discuss the Proposed Action and alternatives, and issues of concern. Among the groups consulted during were:

- National Parks and Conservation Association,
- Marin Audubon Society,
- Golden Gate Audubon Society,
- National Trust for Historic Preservation,
- San Francisco Architectural Heritage, and
- American Institute of Architects, Committee for Historic Preservation.

6.1.4 PUBLIC INVOLVEMENT

The Draft EIS was released for public comment in March 2001, for a 60-day public review period that ended on June 11, 2001. The project was presented at the March 27 and April 24 meetings of the GGNRA Advisory Commission and public comments were accepted at the April 24th meeting. Subsequent to the release of the

Draft EIS, discussions were held with resource agencies and organizations concerning the scheduling of the dock project.

Comments were received, including 9 letters, and verbal comments (1 included in response table) from the March 27 and April 24 GGNRA Advisory Commission meetings. Appendix D provides a summary of the substantive issues and concerns expressed during the public comment period, as well as responses to those comments. This final environmental impact statement will be released to the public for a minimum of 30 days prior to action on approving the record of decision necessary to implement the plan.

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Roger Hothem, Wildlife Biologist (Research)

AUDUBON CANYON RANCH – CYPRESS GROVE RESEARCH CENTER

John Kelly, Research Director

6.3 List of Those Entities Receiving the Final Environmental Impact Statement

Field Supervisor
Section 7 Coordinator
United States Fish & Wildlife Service

Mr. Stephen Hill
S.F. Bay Regional Water Quality Control Board

Planning Director
San Francisco Planning Department

Chief, U.S. Environmental Protection Agency,
Federal Action Branch

Chief, U.S. Army Corps of Engineers
District Engineer

City of San Francisco Department of
Environmental Review
Planning Office

Department of Fish & Game
Environmental Services Division

San Francisco BCDC

California State Clearing House
The Resources Agency

Ms. Nora Kleybow
AIA, San Francisco Chapter

Ms. Holly Fiala
Director, National Trust for Historic Preservation,
Western Region

Mr. David Balman
Director, The Foundation for S.F.'s Architectural
Heritage

Marin County Community Development Agency,
Planning Division

Mr. Mike Lozeau
Baykeeper

Ms. Karol Raymer
Environmental Forum of Marin

Ms. Barbara Salzman
Marin Audobon Society

Marin Conservation League

Point Reyes Bird Observatory

Sierra Club, Marin Group

Mr. Daniel Murphy
Golden Gate Audobon Society

Ms. Leslie Flint
Sequoia Audobon Society, Inc.

Mr. Brian Huse
Director, National Parks & Conservation
Association
Pacific Region

Ms. Anne Merrifield

G. Emmons Cohn

Mr. Chris Mobley
Section 7 Coordinator
National Marine Fisheries Service

Mr. Larry Fahn
Sierra Club

Ms. Christina Sum
Gensler

Mr. Michael Buhler
Field Representative
National Trust for Historic Preservation, Western Office

Mr. James Hines

Mr. Thomas Escher
Red and White Fleet

Mr. Michael Alexander

Ms. Susan Giacomini Allan

Mr. Richard Bartke

Mr. Gordon Bennett

Ms. Anna-Marie Booth

Ms. Betsey Cutler

Mr. Redmond Kernan

Ms. Yvonne Lee

Ms. Amy Meyer

Mr. Doug Nadeau

Mr. Trent W. Orr

Lenore L. Roberts

Mr. Dennis J. Rodoni

Mr. Fred Rodriguez
Stein & Lubin LLP

Mr. Doug Siden

Mr. John Spring

Dr. Edgar Wayburn

Mr. Ric Borjes
National Park Service

Mr. Paul Scolari
National Park Service

Ms. Marien Coss
Golden Gate National Parks Assoc.

Ms. Nancy Hornor
National Park Service

Ms. Wendy Poinsot
National Park Service

Ms. Mary Scott
National Park Service

Mr. Jon Gervais
National Park Service

Ms. Mai-Liis Bartling
National Park Service

Mr. Craig Glassner
National Park Service

Mr. Rich Weideman
National Park Service

Mr. Don Mannel
National Park Service

Ms. Daphne Hatch
National Park Service

Mr. Henry Espinoza
National Park Service

Ms. Bonita Mueller
Denver Service Center – PDS

Ms. Sarah Bransom
Denver Service Center, NPS

Mr. Jim Kren
National Park Service

Mr. Alan Hopkins
Golden Gate Audubon Society

Mr. Arthur Feinstein
Golden Gate Audubon Society

Ms. Courtney Cuff
Director, National Parks Conservation Association, Pacific Region

Mr. Larry Spear
H.T. Harvey & Associates

Timberly Bellish
Archives & Records Center

Mr. Alan Schmierer
National Park Service

Heather Pribyl

Jean Lewis

Ms. Pip Ellis
Blue & Gold Fleet

Gulf of the Farallones National Marine Sanctuary
The Presidio of San Francisco

The Presidio Trust

National Marine Fisheries Service
Southwest Region

California Department of Parks & Recreation

U.S. Coast Guard 11th District

U.S. Department of the Interior

California Coastal Commission

California Coastal Conservancy

California Department of Fish & Game, Marine Region

California Department of Transportation, District 4

Association of Bay Area Governments

Bay Area Quality Management District

Marin County Board of Supervisors

Metropolitan Transportation Commission

Berkeley Public Library

Corte Madera County Branch Library

Dr. King Main Library

Marin City Library

Mill Valley Public Library

Napa City-County Library

Oakland Public Library

San Mateo Library

Sausalito Library

Sonoma County Library

Belvedere-Tiburon Library

San Francisco Public Library

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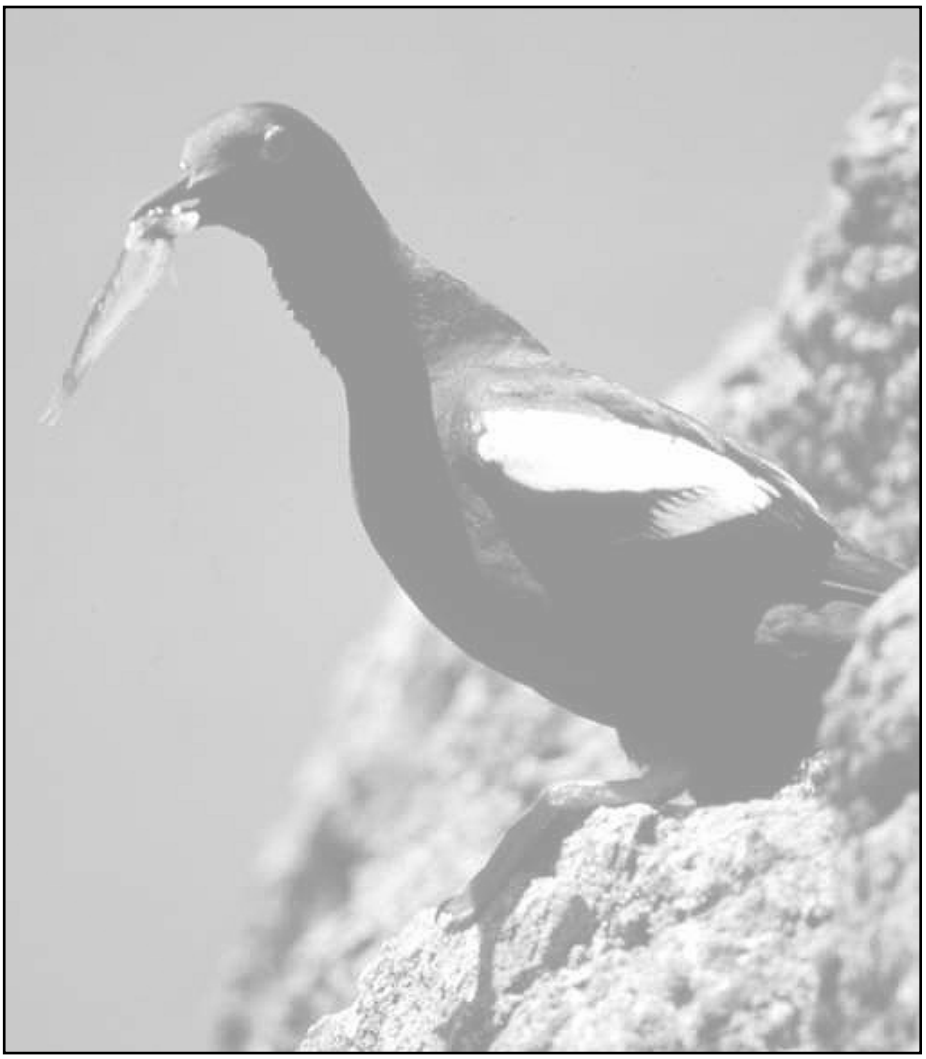
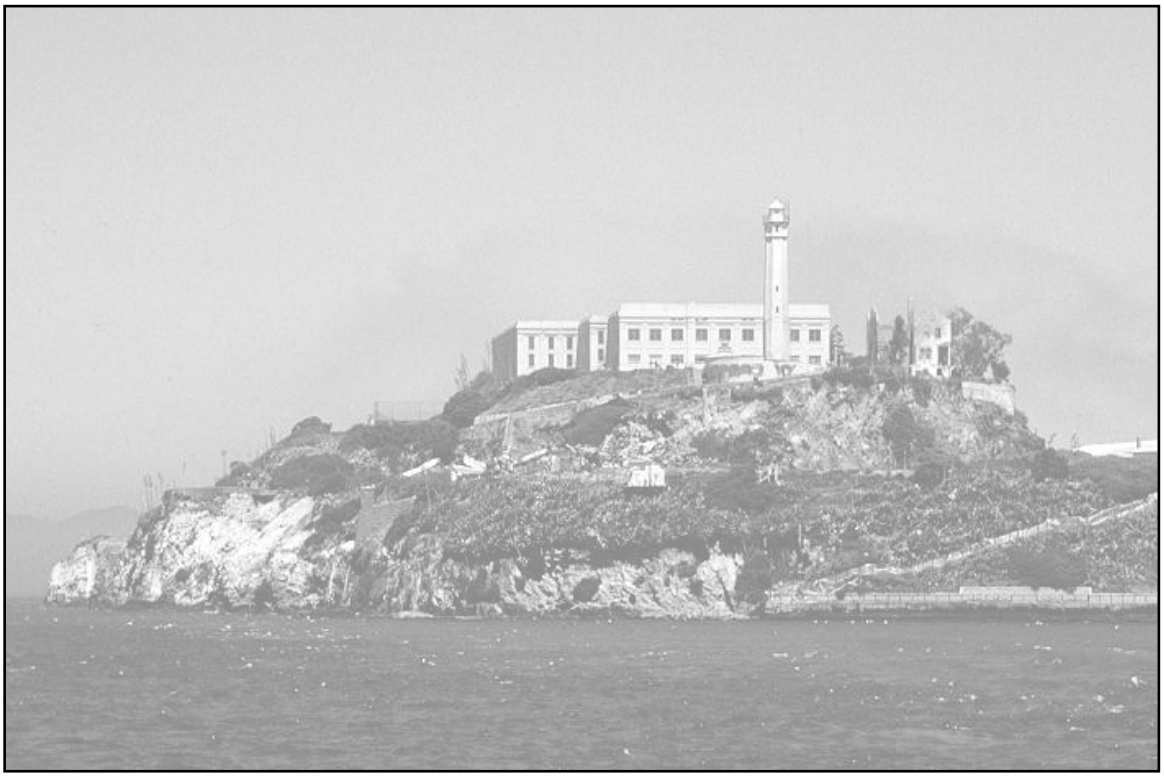


CHAPTER 3: AFFECTED ENVIRONMENT

CHAPTER 4: ENVIRONMENTAL CONSEQUENCES



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ALCATRAZ HISTORIC PRESERVATION AND SAFETY CONSTRUCTION PROGRAM

MONITORING PROGRAM

MONITORING PROGRAM

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Monitoring Program

The National Park Service is proposing to implement the Alcatraz Historic Preservation and Safety Construction Program (the proposed action) using an adaptive management approach. The proposed action is comprised of 10 separate construction/repair projects that would be implemented over a period of roughly 5 years. The National Park Service would monitor the effectiveness of mitigation measures in reducing the effects of construction activities. Monitoring results from the initial projects (Phase One) would be used to adapt and improve the implementation of the later projects both in Phase One and the Subsequent Phase of the program.

Section 2.7 of the FEIS presents a complete list of the mitigation measures that would be implemented as part of the proposed action. Several of these measures include requirements for "monitoring" to ensure that measures are implemented and enforced (i.e., for natural resource protection). Through this monitoring, new or improved methods of protection would be identified and incorporated into the implementation of the next project(s). If monitoring observes impacts at or exceeding those described in the FEIS, the mitigation measures can be adapted, modified, or expanded based on situations that arise, to reduce those impacts. Adaptive management will be guided by the same minor, moderate and major impact criteria defined in the EIS in section 4.2.1 (see text for complete definitions). Disturbance monitoring protocols will be developed and implemented by a biologist that is on-site on a regular basis when construction work occurs during the breeding season (February 15 through August 15, or until breeding activity is complete). The Adaptive Management Plan will outline the process by which mitigation measures may be modified or augmented, and identify targeted action to reduce an impact. Through on-site monitoring, and communication with biologists conducting long-term waterbird monitoring on the Island, the project biologist will evaluate impacts related to construction activities and impacts resulting from non-construction related human activity or naturally occurring events. Based on the information collected through monitoring, the project biologist will have the ability to modify, enhance, or expand mitigation measures for both ongoing and subsequent projects to be implemented under this EIS.

The Environmental Consequences section (Chapter 4) of the EIS draws conclusions regarding the potential impact to waterbirds of each project following mitigation (Section 4.2.2.5). For most projects, the conclusion covered a range of potential impacts, for example, minor to moderate, or moderate to major. The impacts were evaluated during the EIS process and represent the best available knowledge concerning impact levels and thresholds. If monitoring indicates that impacts are approaching the upper threshold of the anticipated impacts, the Adaptive Management Plan will modify, enhance, or expand the mitigation measures to reduce the impact. Adaptive management is designed to respond immediately to impacting construction activities with solutions based on the mitigation measures. The EIS identifies the extent of mitigations that can be identified at this time and the Adaptive Management Plan uses those measures to protect the Island's resources. If potentially major impacts cannot be adequately mitigated, the park will consider whether to delay the project until outside the peak sensitivity period for the affected species.

Based on early public comment, there is a particular concern for the effects of the proposed action on the Island's colonial nesting waterbird colonies. As described in Section 4.2.1, there is currently a lack of scientific data relating to construction effects on breeding waterbirds. As a result, the biological impact analysis provided in this EIS relied on combination of professional judgement, knowledge of the Island, existing scientific data (where available), and past monitoring activities on Alcatraz to predict the impacts of the proposed action. Because of the lack of relevant scientific data, the National Park Service is proposing to implement a comprehensive monitoring program for waterbird impacts to verify the accuracy of the impact analysis and effectiveness of mitigation measures. Additional discussion of the purpose and intent of the program and its use by the National Park Service is provided below. This information is being presented in the EIS to allow the

public, other agencies, the scientific community and environmental organizations to review and provide input into the development of this future program.

WATERBIRD MONITORING

The National Park Service has been monitoring the size of the breeding population and nesting success of colonial nesting birds on Alcatraz Island for more than 10 years. The National Park Service intends to continue this monitoring program and expand it to provide additional monitoring of the proposed construction activities analyzed in this EIS. The following is an overview of the existing monitoring and reporting program, and conceptual information on the proposed construction monitoring. Additional detail, including monitoring protocols, for construction activities will be developed and refined in the future and will consider input received the public review.

OVERVIEW OF EXISTING PROGRAM

The following is a species-by-species overview of the type of monitoring that is conducted on Alcatraz Island by the National Park Service. Annual reports documenting the results of these monitoring activities are prepared, and the National Park Service maintains and updates a geographic information system (GIS) database. This data was reviewed and used in the preparation of this EIS.

- Cormorant monitoring is conducted up to 4 days a week from a bird blind or from the interior of buildings, using binoculars and spotting scopes, resulting in minimal bird disturbance.

- Black-crowned Night-heron and egret monitoring has been conducted since 1990, on roughly a weekly basis from April through June. Night-heron monitoring is particularly disruptive since the birds nest concealed within shrubbery on the Island, and monitoring is conducted as quickly and quietly as possible. Night-heron/egret subcolonies isolated from western gulls are monitored through the month of June, while those adjacent to concentrations of western gulls are monitored until late May or early June.

- Western gulls are monitored up to 4 days a week. Nests in the most sensitive locations are monitored from a distance using binoculars and spotting scopes. Two Island-wide censuses are also conducted just prior to and at the time of peak chick-hatching to determine the total island population size. These surveys have been conducted annually since 1990, with some modifications to reduce monitoring impacts.

- In addition, off-shore boat surveys are conducted every two weeks during the breeding season. Observations of nests not visible from the Island are made by trained observers from a distance, using binoculars or photo-monitoring. Boat surveys create less disturbance than island-based surveys as observers are further away from nesting birds. Species monitored during these surveys include the seabirds nesting in the cliffs.

PROPOSED CONSTRUCTION MONITORING

The existing monitoring program would be expanded to include additional, focused disturbance monitoring associated with the proposed construction activities. The purpose of this monitoring would be to:

1. measure and monitor the effect of construction disturbance;

2. assess effectiveness of mitigation;

3. build existing data on the cause and effect relationship of construction disturbance on breeding waterbirds on Alcatraz and help fill the existing void of scientific information on this subject; and

4. use this information as the basis for adaptive management and implementation of future repair projects needed on the Island.

Examples of the type of monitoring and observations that would be made include:

- Behavioral observations of parental care, feeding, flushing, etc.
- Raven predation in relation to construction-induced disturbance
- Gull predation on Night-herons before, during and after construction
- Use of control area/population on Alcatraz, but outside of the construction disturbance area in order measure and compare the relative effect of construction disturbance.
- Effectiveness of construction worker training, use of barriers, and other mitigation measures.

Monitoring activities would rely on the same basic protocols used for the existing program on Alcatraz, including access to sensitive areas and documentation. Efforts to minimize the potential disturbance of nesting waterbirds during monitoring would be implemented.

As described in Chapter 4 of this EIS, Phase One of the proposed action [Dock Repair, Balconies Repair (Building 64), Cellhouse (Stabilization and Seismic), and Sallyport (Stabilization and Seismic projects)] is not anticipated to have a major adverse effect on breeding waterbirds. These initial projects are located in areas that are not particularly sensitive and/or where avoidance or minimization of impact would be possible through the implementation of the mitigation measures described in Chapter 2. The National Park Service has committed to implementing these mitigation measures, and would monitor their effectiveness through the program described in this Appendix.

This monitoring program would contribute to and enhance the body of information available for disturbance cause and effects on Alcatraz, and would be used by the National Park Service to manage and minimize potential effects associated with future projects on the Island. The effects of Phase One would be carefully documented and reviewed by National Park Service wildlife biologists. Based on this review, a summary of the conclusions and any recommendations for the refinement and/or development of new mitigation measures would be prepared. It is anticipated that the process used to review, approve and apply these recommendations would be through the through the park's existing project review process (a bi-weekly formal review that includes representatives from divisions within the park, including natural resources, cultural resources, maintenance, interpretation, planning, law enforcement, etc.).

Alcatraz Island waterbird monitoring reports are available to the public upon request. Results are also summarized each year in the Investigator's Annual Report that will be posted on the NPS web site, www.nature.science.gov. The project biologist will be required to prepare an annual report documenting construction monitoring related activities and results, including a summary of mitigation measures and adaptive management actions implemented, and recommendations for adaptive management measures for subsequent years and/or projects. This document will be provided to interested parties for review and comment on an annual basis.

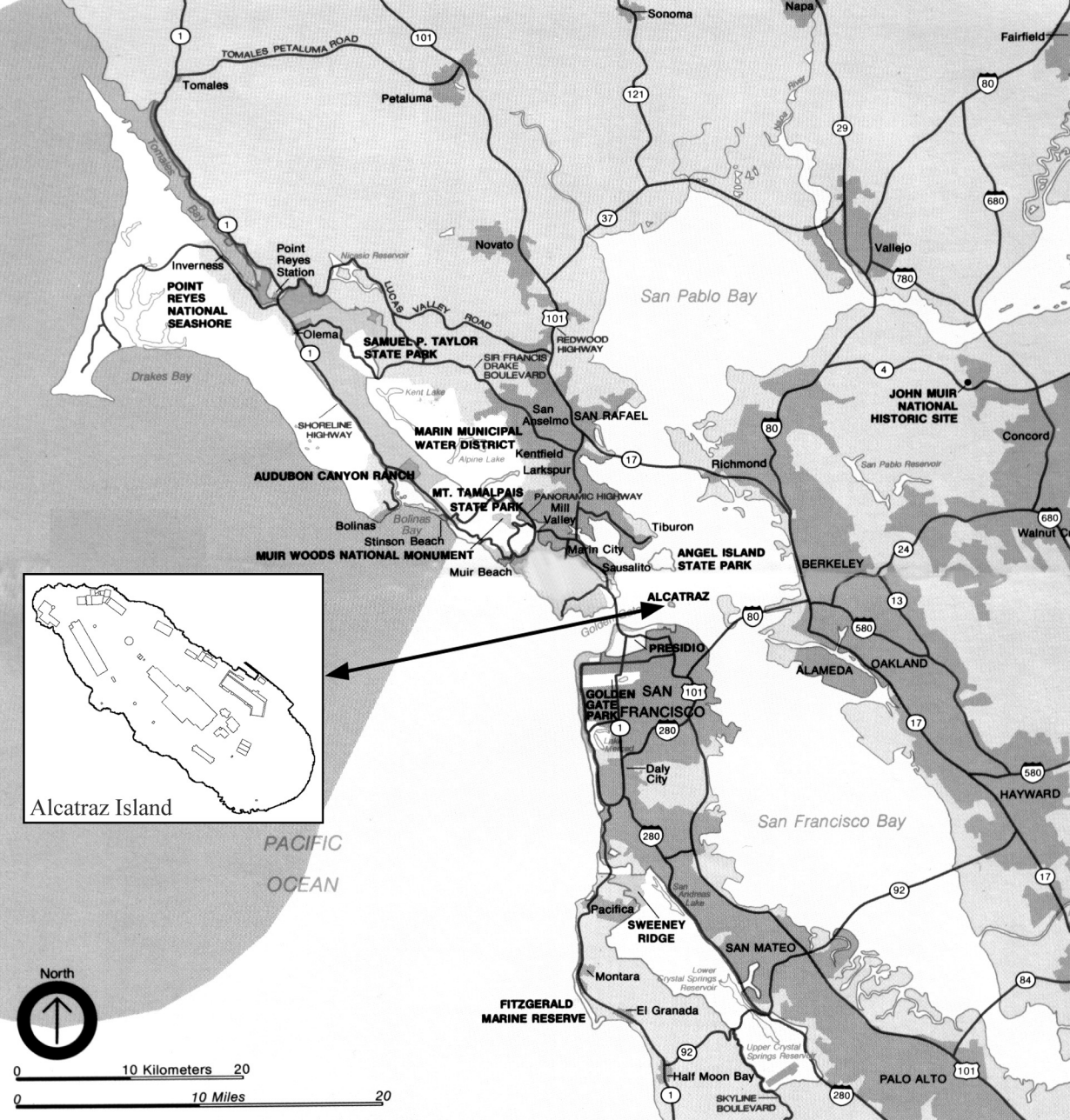
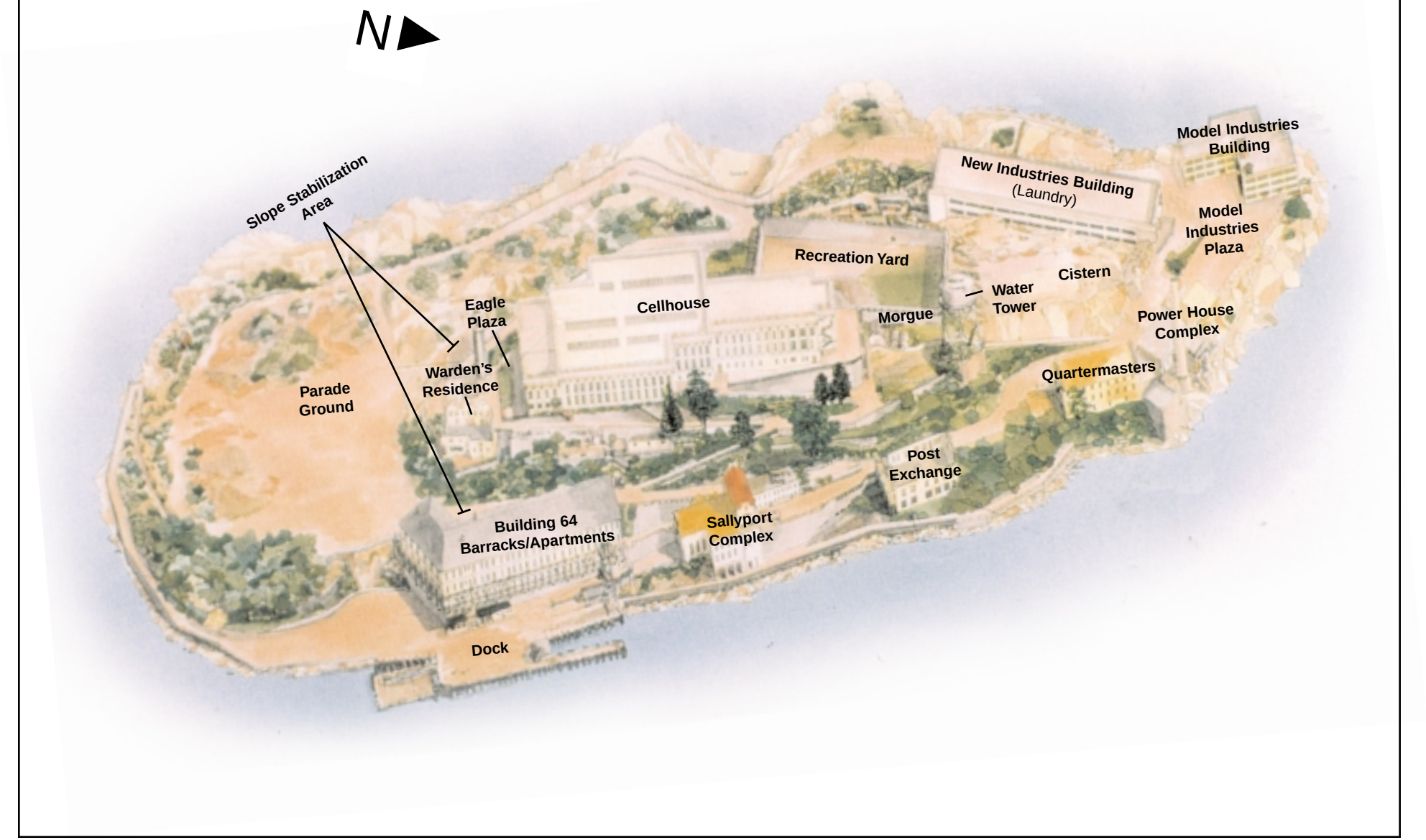
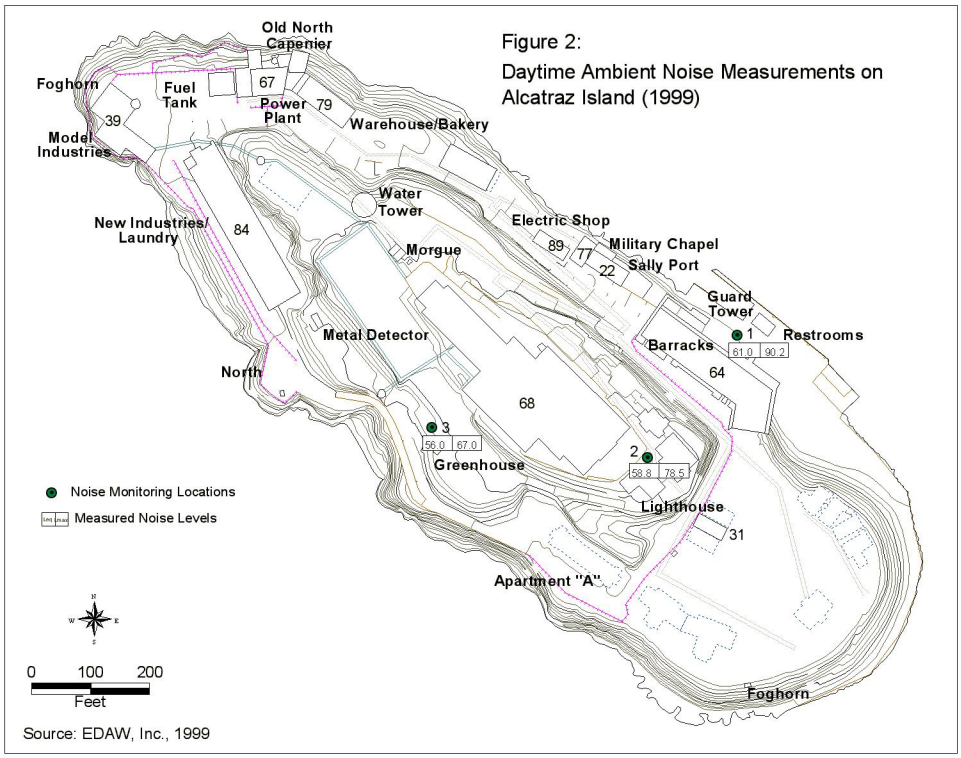

Sonoma
Napa
Fairfield
TOMALES PETALUMA ROAD
Tomales
Petaluma
Tomales Bay
Inverness
POINT REYES NATIONAL SEASHORE
Point Reyes Station
Nicasio Reservoir
Novato
LUCAS VALLEY ROAD
Olema
SAMUEL P. TAYLOR STATE PARK
REDWOOD HIGHWAY
SIR FRANCIS DRAKE BOULEVARD
Drakes Bay
Kent Lake
SHORELINE HIGHWAY
San Anselmo
SAN RAFAEL
MARIN MUNICIPAL WATER DISTRICT
Alpine Lake
Kentfield
Larkspur
AUDUBON CANYON RANCH
MT. TAMALPAIS STATE PARK
PANORAMIC HIGHWAY
Mill Valley
Bolinas
Bolinas Bay
Stinson Beach
MUIR WOODS NATIONAL MONUMENT
Muir Beach
Tiburon
Marin City
Sausalito
ANGEL ISLAND STATE PARK
San Pablo Bay
Vallejo
JOHN MUIR NATIONAL HISTORIC SITE
Concord
Richmond
San Pablo Reservoir
Walnut Creek
BERKELEY
ALCATRAZ
Golden Gate
PRESIDIO
ALAMEDA
OAKLAND
GOLDEN GATE PARK
SAN FRANCISCO
Lake Merced
Daly City
HAYWARD
San Francisco Bay
Alcatraz Island
PACIFIC OCEAN
Pacifica
SWEENEY RIDGE
San Andreas Lake
SAN MATEO
Montara
Lower Crystal Springs Reservoir
El Granada
FITZGERALD MARINE RESERVE
Upper Crystal Springs Reservoir
Half Moon Bay
PALO ALTO
SKYLINE BOULEVARD
North
0 10 Kilometers 20
0 10 Miles 20

Figure 1-2:

Project Locations on Alcatraz Island





Source: EDAW, Inc., 1999

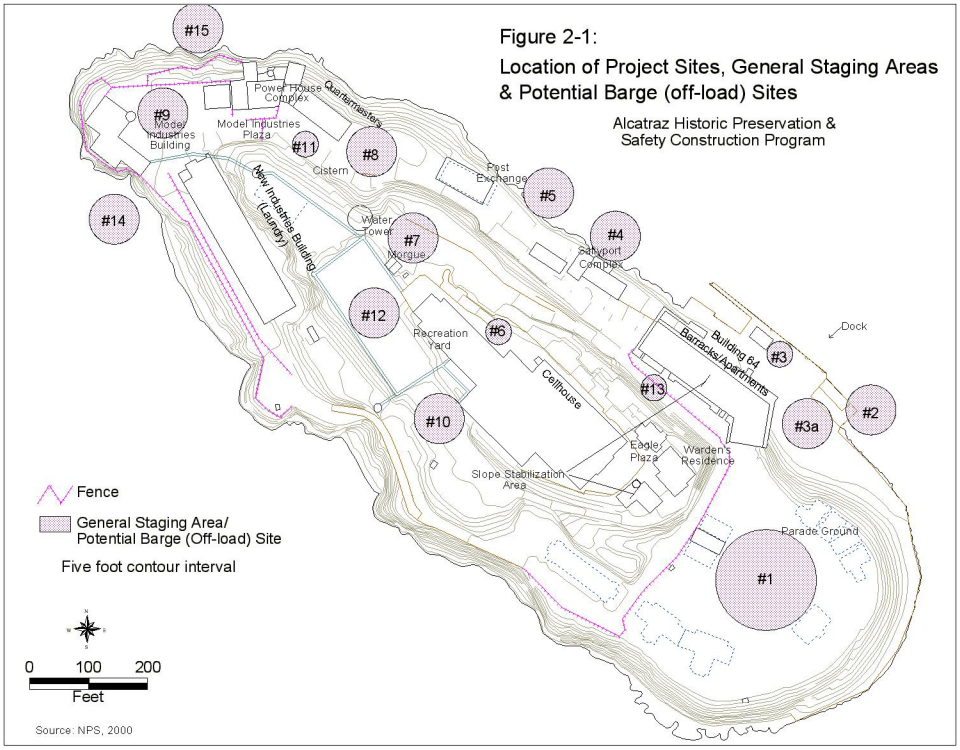


Figure 2-1:
Location of Project Sites, General Staging Areas & Potential Barge (off-load) Sites
Alcatraz Historic Preservation & Safety Construction Program
#15
#9
Model Industries Building
Model Industries Plaza
Power House Complex
Quartermasters
#11
#8
Cistern
Post Exchange
#5
#14
New Industries Building (Laundry)
Water Tower
#7
Morgue
#4
Sallyport Complex
#12
Recreation Yard
#6
Cellhouse
Building 64 Barracks/Apartments
#3
Dock
#13
#10
#3a
#2
Eagle Plaza
Warden's Residence
Slope Stabilization Area
Parade Ground
#1
Fence
General Staging Area/ Potential Barge (Off-load) Site
Five foot contour interval
0
100
200
Feet
Source: NPS, 2000

Table 2-1
Comparison of Construction Activities for the Proposed Action and Reduced Project Alternative[1]

Proposed Action				Reduced Project Alternative		
Project Name	**Summary of Proposed Repairs**	**Primary Equipment Needs**	**Approximate Duration of Project**	**Summary of Proposed Repairs**	**Primary Equipment Needs**	**Approximate Duration of Project**
PHASE ONE						
Dock Repair	Repair members (piles) under concrete dock and seismically retrofit structure with steel tie-back into bedrock. Piles would be replaced from the topside of the dock.	Crane Jack hammer Cement/small batch mixer Air compressors Drill Saw cutting (concrete) Generator	Up to fifteen months	Same as Proposed Action	Same as Proposed Action	Same as Proposed Action
Building 64 (Balconies Repair)	Repair spalling concrete, restore steel (rust removal and treatment), as needed, replace guard rails, and paint.	Crane/Lift Concrete mixer Pump truck Scaffolding Pneumatic chippers Sand blasting Saws Air compressor Paint sprayer Generator	Up to six months	Same as Proposed Action	Same as Proposed Action	Same as Proposed Action

[1] Projects are listed in basic order of priority/implementation, with the first three projects proposed for immediate implementation.

Table 2-1
Comparison of Construction Activities for the Proposed Action and Reduced Project Alternative[1]

Proposed Action				Reduced Project Alternative		
Project Name	**Summary of Proposed Repairs**	**Primary Equipment Needs**	**Approximate Duration of Project**	**Summary of Proposed Repairs**	**Primary Equipment Needs**	**Approximate Duration of Project**
Cell House Stabilization & Seismic Upgrade	Repair spalling concrete on exterior walls and replace/repair windows as needed. Seismically retrofit structure to meet minimum life safety requirements. Seismic (interior) work would include installation of new shearwalls, collectors, wall base repair and new footings.	Concrete mixer/batch plant Crane Forklift/trucks Jack hammers Welding equipment Scaffolding (outside) Pneumatic chipping hammers Generators Air compressor Sand blaster Paint sprayer	Eighteen months	Same as Proposed Action	Same as Proposed Action	Same as Proposed Action
Sally Port Structural Repair Seismic Upgrade	Tie end walls of chapel into bedrock and install plywood shear walls. Tie gun gallery floor to civil war era walls with angle iron. Install cross bracing in selected window openings. Remove wooden boathouse structure (from waterside/via barge).	Welding equipment Hammer drill Saws Generator Forklift Crane/Barge	Six months	Same as Proposed Action	Same as Proposed Action	Same as Proposed Action

Table 2-1
Comparison of Construction Activities for the Proposed Action and Reduced Project Alternative[1]

	Proposed Action			Reduced Project Alternative		
Project Name	**Summary of Proposed Repairs**	**Primary Equipment Needs**	**Approximate Duration of Project**	**Summary of Proposed Repairs**	**Primary Equipment Needs**	**Approximate Duration of Project**
SUBSEQUENT PHASES						
Water Tower Stabilization	Replace damaged or missing steel members. Sand blast and paint tower.	Welding equipment Sandblasting equipment Painting equipment Crane Scaffolding	Up to eight months	Replace damaged or missing steel members.	Welding equipment Crane Scaffolding	Five to eight months
Slope Stabilization	Stabilize existing slope by installing steel ties into existing bedrock, and cover slope surface with shotcrete.	Shotcrete pump Cement mixer Generator air compressor Large drills	Up to eighteen months total (Phased over several years.)	Same as Proposed Action	Same as Proposed Action	Same as Proposed Action
New Industries (Laundry) Building Stabilization and Seismic Upgrade	Repair/replace exterior windows and spalling concrete, remove rock debris behind the building and stabilize slope, provide seismic upgrade.	Truck/forklift Concrete mixer Hammer drills Jack hammers Saws Concrete pump Scaffolding	Six months	Repair/replace exterior windows and partial repair of spalling concrete and steel, remove rock debris behind the building and stabilize slope, provide minimum seismic upgrades.	Same as Proposed Action	Five months
Building 64 (Seismic Upgrade)	Tie floor structures into the cliff/adjacent bedrock using steel beams and collector beams. Install shear walls, reinforce and strengthen interior walls and other seismic upgrades to meet minimum life safety requirements.	Crane Cement mixer Jack hammer Saws Hammer drill	Up to eight months	Same as Proposed Action	Same as Proposed Action	Same as Proposed Action

Table 2-1
Comparison of Construction Activities for the Proposed Action and Reduced Project Alternative[1]

Proposed Action				Reduced Project Alternative		
Project Name	**Summary of Proposed Repairs**	**Primary Equipment Needs**	**Approximate Duration of Project**	**Summary of Proposed Repairs**	**Primary Equipment Needs**	**Approximate Duration of Project**
Quartermasters Stabilization and Seismic Upgrade	Install a shear wall and steel support to meet life safety requirements. Repair/replace exterior windows and doors, repair spalling concrete and paint exterior.	Truck/forklift Concrete mixer Hammer drills Saws Hammers Scaffolding Welding equipment	Eight months	Partial installation of steel supports and trusses. Partial installation of the foundation at east wall. Repair/replace exterior windows and doors, repair spalling concrete and paint exterior.	Same as Proposed Action	Five months
Fuel Line Remediation	Remove 6-inch and 4.5-inch inactive fuel lines.	Air compressors Fuel containment equipment Excavation equipment Generator Truck/forklift	Up to eight months - with several phases (dependent on condition of existing fuel lines)	Same as Proposed Action	Same as Proposed Action	Same as Proposed Action

Table 2-2
Summary Comparison of Impacts of Alternatives

Topic	Source of Impact	No Action	Proposed Action	Reduced Project Alternative
BIOLOGICAL RESOURCES				
Monarch Butterfly				
	Impacts from Construction	No impact	Disturbance to Cyprus and eucalyptus trees used, as roosting sites would not occur. Negligible impacts	Same as Proposed Action
Marine Mammals				
	Impacts from Construction	No impact	Use of Barge staging area #14 only at high tide exceeds 2.5 feet and use of barge staging area #15 when sea lions are not present will result in minor impacts	Same as Proposed Action
Pacific Herring				
	Impacts from Construction	No impact	Pile replacement during Dock Repair may result in short-term temporary disturbance of potential spawning sites which is a very small amount of the regional habitat; work complies with a authorization measures identified in Chapter 4; no adverse impact	Same as Proposed Action
Common Wildlife				
	Impacts from Construction	No impact from construction activities; beneficial long-term impacts as unsafe conditions would close the Island to visitors and unmitigated growth of the Island's landscaping would provide greater habitat for some species.	Slope Stabilization project and staging area #10 may permanently or temporarily remove small areas of potential habitat for songbirds and mallards however other areas of the Island support similar habitat; staging areas 6 and 7 and the Cellhouse project could disturb ravens; Building 64 seismic project would temporarily disturb small areas of potential California Slender Salamander habitat; storage and construction activities throughout the Island may disrupt deer mice, slender salamanders and banana slugs; impacts are considered to be minor	Same as Proposed Action
	Impacts from increased rat populations during construction	No impact	Use of bird and tamper proof bait stations and traps on barges and at staging areas would reduce the number of rats entering the Island and reduce predation on birds and their eggs, native rodents, and California slender salamanders; minor impact	Same as Proposed Action

Table 2-2
Summary Comparison of Impacts of Alternatives

Topic	Source of Impact	No Action	Proposed Action	Reduced Project Alternative
Waterbirds				
	Dock Repair	No impact from construction activities; beneficial long-term impacts as unsafe conditions would close the Island to visitors and unmitigated growth of the Island's landscaping would provide greater habitat; for some species failure of structure from benign neglect could have a minor impact on western gulls.	Reduced disturbance to western gull nests and night-herons subcolonies in or near the area after mitigation; Potential reduction in western gull and night-heron reproductive success and/or subcolony population size, or temporary or long-term subcolony abandonment from use of staging area 3A; impacts would be minor to moderate with mitigation	Same as Proposed Action
	Building 64 (Balconies Repair)	No impact from construction activities; beneficial long-term impacts as unsafe conditions would close the Island to visitors and unmitigated growth of the Island's landscaping would provide greater habitat; for some species failure of structures from benign neglect could have minor to major impacts on western gulls.	Mitigation measures would reduce disturbance to western gulls, night-herons and snowy egret populations in or near the area; potential reduction in western gull and night-heron reproductive success and/or subcolony population size, or temporary or long-term subcolony abandonment from use of staging area 3A; impacts would be minor to moderate with mitigation	Same as Proposed Action

Table 2-2
Summary Comparison of Impacts of Alternatives

Topic	Source of Impact	No Action	Proposed Action	Reduced Project Alternative
	Cellhouse Stabilization and Seismic Upgrade	No impact from construction activities; beneficial long-term impacts as unsafe conditions would close the Island to visitors and unmitigated growth of the Island's landscaping would provide greater habitat; for some species failure of structure from benign neglect could have minor to moderate impacts depending upon the number and type of species affected	Noise, visual intrusion, human presence during repair activities may disturb night-herons, snowy egrets, Brandt's cormorants, pigeon gulliemots; use of barge/staging area 5 may disturb western gulls and night-herons with potential for reduced reproductive success, decline in population size, or temporary or long-term subcolony abandonment; abandonment of the Island by any species of water bird is not expected; impacts would be minor to moderate with mitigation	Same as Proposed Action
	Sallyport Structural Repair Seismic Upgrade	No impact from construction activities; beneficial long-term impacts as unsafe conditions would close the Island to visitors and unmitigated growth of the Island's landscaping would provide greater habitat; for some species failure of structure from benign neglect could have minor to moderate impact on western gulls	Use of staging area 11 could result in indirect impacts on night-herons from disturbed gulls and ravens; noise and human activity associated with barge use may disturb night-heron subcolonies, a few pigeon guillemot nests, and individual gull nests; minor to moderate impacts	Same as Proposed Action

Comment [PC1]: How would they be impacted?

Table 2-2
Summary Comparison of Impacts of Alternatives

Topic	Source of Impact	No Action	Proposed Action	Reduced Project Alternative
	Water Tower Stabilization	No impact from construction activities; beneficial long-term impacts as unsafe conditions would close the Island to visitors and unmitigated growth of the Island's landscaping would provide greater habitat; for some species failure of structure from benign neglect could have minor to major impacts depending upon the number and type of species affected	Construction activity in a biologically sensitive area may result in reduction in reproductive success and/or population size for species on the north end of the Island; impacts with mitigation would be moderate to major	Duration of construction activity will be reduced compared to the Proposed Action; impacts from construction with mitigation will be similar to but less adverse than the Proposed action; failure of structures from benign neglect could have minor to major impacts depending upon the number and type of species affected
	Slope Stabilization	No impact from construction activities; beneficial long-term impacts as unsafe conditions would close the Island to visitors and unmitigated growth of the Island's landscaping would provide greater habitat; for some species failure of the slope from benign neglect could have minor to moderate impacts depending upon the number and type of species affected	Construction activities would occur in the non-breeding season and would avoid impacts to breeding waterbirds on the Island; minor impacts	Same as Proposed Action

Table 2-2
Summary Comparison of Impacts of Alternatives

Topic	Source of Impact	No Action	Proposed Action	Reduced Project Alternative
	New Industries (Laundry) Building Stabilization and Seismic Upgrade	No impact from construction activities; beneficial long-term impacts as unsafe conditions would close the Island to visitors and unmitigated growth of the Island's landscaping would provide greater habitat; for some species failure of structure from benign neglect could have minor to moderate impacts depending upon the number and type of species affected	Construction in a biologically sensitive area potential to impact a significant number of nesting waterbirds and species of waterbirds; impacts with mitigation could be moderate to major	No impacts as construction activity would not take place during the breeding season; failure of structures from benign neglect could have minor to major impacts depending upon the number and type of species affected
	Building 64 (Seismic Upgrade)	No impact from construction activities; beneficial long-term impacts as unsafe conditions would close the Island to visitors and unmitigated growth of the Island's landscaping would provide greater habitat; for some species failure of structures from benign neglect could have minor to moderate impacts on western gulls and night-herons	Short-term indirect effect from gull disturbance on western gull and night-heron reproductive success; potential increase in gull and raven predation on night-herons; minor impacts with mitigation	Same as Proposed Action

Table 2-2
Summary Comparison of Impacts of Alternatives

Topic	Source of Impact	No Action	Proposed Action	Reduced Project Alternative
	Quartermaster Stabilization and Seismic Upgrade	No impact from construction activities; beneficial long-term impacts as unsafe conditions would close the Island to visitors and unmitigated growth of the Island's landscaping would provide greater habitat; for some species failure of structures from benign neglect could have minor to major impacts depending upon the number and type of species affected	With mitigation indirect impacts of disturbance to gulls resulting in predation on waterbirds would be substantially reduced; short-term reduction in reproductive success and/or population size of night-herons and gull subcolonies; small long-term reduction in Island population size could occur; minor to moderate impacts	No impacts as construction activity would not take place during the breeding season; failure of structures from benign neglect could have minor to major impacts depending upon the number or type of species affected
	Fuel Line Remediation	No impact from construction activities; beneficial long-term impacts as unsafe conditions would close the Island to visitors and unmitigated growth of the Island's landscaping would provide greater habitat; for some species failure of structures from benign neglect could have minor to major impacts depending upon the number and type of species affected	Mitigation measures would reduce the direct and indirect disturbance of night-herons and western gulls in the area; no long-term reduction in population size of these species is expected; impacts would be minor with mitigation	Same as Proposed Action
	Impacts from increased rat population during construction	No impact from construction activities; beneficial long-term impacts as unsafe conditions would close the Island to visitors and unmitigated growth of the Island's landscaping would provide greater habitat for some species	Use of bird and tamper proof bait stations and traps on barges and at staging areas would reduce or avoid the transport of rats to the Island and reduce predation on waterbird eggs and chicks; minor impact	Same as Proposed Action

Table 2-2
Summary Comparison of Impacts of Alternatives

Topic	Source of Impact	No Action	Proposed Action	Reduced Project Alternative
Special Status Plant: Campion				
	Construction	No impact from construction activities; unknown long-term impacts as unsafe conditions would close the Island to visitors and unmitigated growth of the Island's landscaping may reduce habitat	Staging area #10 could disturb campion habitat; if plants are found and can't be avoided, the population would be transplanted; minor impact	Same as Proposed Action
Special Status Fish and Essential Habitat				
	Dock Repair	No impact from construction activities; unknown long-term impacts as unsafe conditions would close the Island to visitors reducing disturbance from the ferry but failure of the structure may reduce available habitat	Due to the small amount of activity in the water, impacts are expected to be minor	Same as Proposed Action
Special Status Bats				
	Construction	No impact from construction activities; unknown long-term impacts as unsafe conditions would close the Island to visitors reducing disturbance of artificial habitat but failure of structures may reduce potential habitat	Temporary modification of potential roosting sites at the Sallyport, Building 64 and Quartermaster building; disturbance to roosting bats from noise and human activity if bats are present, however no bats are known to occupy these sites; minor impact	Similar to Proposed Action but less as potential roosting sites in the Quartermaster building would not be affected
Waters of the United States				
	Dock Repair	No impact	Replacement of pilings below MHWM, with mitigation and authorization under Section 404 of the Clean Water Act and Section 10 of the Rivers and Harbors Act, is expected to have minor impacts	Same as Proposed Action

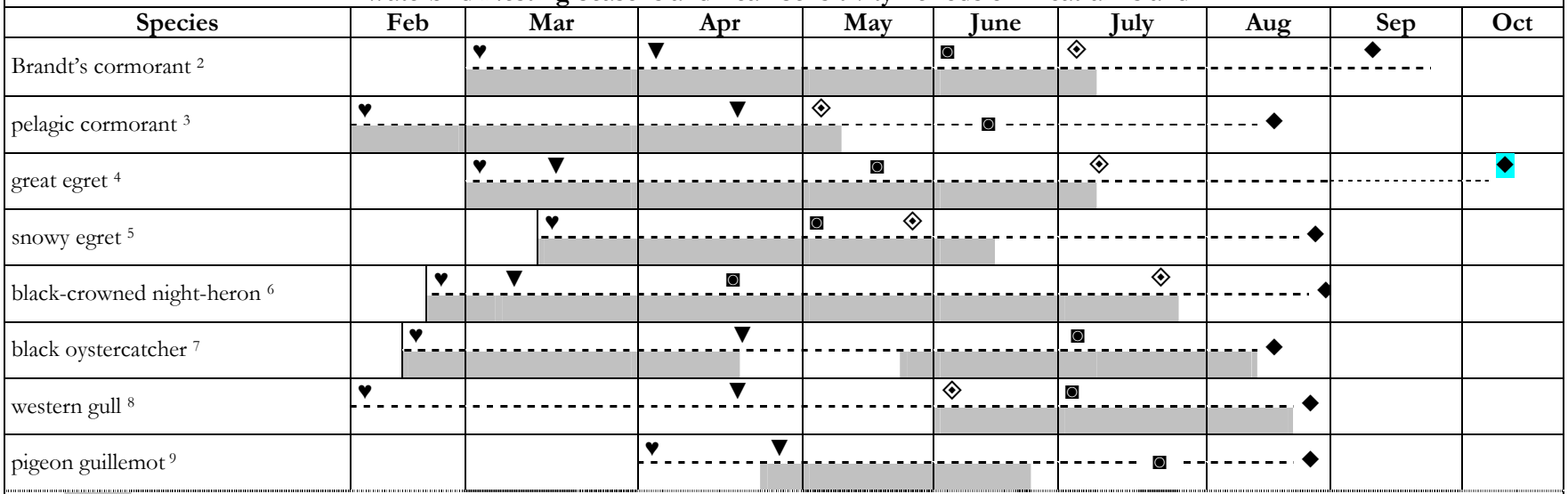
Table 2-2
Summary Comparison of Impacts of Alternatives

Topic	Source of Impact	No Action	Proposed Action	Reduced Project Alternative
Cultural Resources				
	Impacts of Phase One Construction	Major adverse impacts resulting from benign neglect would cause deterioration of structures and buildings leading to overall loss of integrity to the Alcatraz Island National Historical Landmark	No impact from staging areas and equipment; beneficial impact from rehabilitation and preservation of the Alcatraz Wharf and Building 64 Balconies, and seismic stabilization of the Cellhouse	Same as Proposed Action
	Impacts of Subsequent Phase Construction	Major adverse impacts resulting from benign neglect would cause deterioration of structures leading to overall loss of integrity to the Alcatraz Island National Historical Landmark	Impacts from demolition of the boathouse structure and cultural landscape would be minimized with mitigation; beneficial impact from preservation and repair of Water Tower and New Industries Building, protection of cultural resources with Slope Stabilization, seismic retrofit and stabilization of the Sallyport complex, Building 64, and the Quartermaster Building; No impact from Fuel Line Remediation	Impacts would be adverse from loss of Water Tower, Quartermaster Building and New Industries Building and would be a major impact, particularly on the north end where these and other contributing features would be affected. The impacts would result in the loss of the National Historic Landmark designation and consequently a major impact to long-term protection of cultural resources on the Island.

Table 2-2
Summary Comparison of Impacts of Alternatives

Topic	Source of Impact	No Action	Proposed Action	Reduced Project Alternative
Recreation and Visitor Use				
	Impacts of construction	No impacts from construction related activities; long-term major adverse impacts to recreational and visitor use from public health and safety concerns, loss of historic structures and subsequent closure of the Island.	Temporary minor adverse impact from noise and restrictions to areas for safety purposes; repair and stabilization of culturally important structures would result in long-term beneficial impacts to visitor experience and public safety	Same as Proposed Action except for eventual loss of the Quartermaster Building, the Water Tower and the New Industries Building would preclude visitor use and interpretation, which would be a moderate to major impact to visitor experience and opportunities in those areas
Air Quality				
	Impacts of construction	Eventual closure of the Island as a result of building and structure deterioration would decrease energy generation and maintenance activities; minor beneficial impact	Construction emissions would have minor short-term adverse effect with mitigation	Reduction in overall duration of construction program will result in slightly less impacts compared to the Proposed Action
Hazardous Substances: Human Health, Safety, and the Environment				
	Impacts of construction	Eventual closure of the Island as a result of building and structure deterioration and a reduced potential for exposure from the lack of construction activities. However, building decay may lead to uncontrolled releases of substances that are undetected.	Building demolition or rehabilitation pose potential health risks from exposure of asbestos and lead. Potential impacts are uncertain at this time because extensive sampling has not occurred; however, with mitigations, the short-term risks would be reduced to negligible to minor levels. No long-term effects are anticipated.	Reduction in overall duration of construction program will result in slightly less potential impacts compared to the Proposed Action

Table 3.1-1
Waterbird Nesting Seasons and Peak Sensitivity Periods on Alcatraz Island [1]



1 These periods are based primarily on data from Alcatraz, supplemented by data from colonies elsewhere in the Bay Area and published information on nesting periods. Peak sensitivity is the period during which nesting birds are most susceptible to disturbance.

2 Thayer et al. 1999, PRBO Preliminary Data; fledging dates are based on when chicks are large enough to wander, but not fully feathered or able to fly.

3 Thayer et al. 1999, PRBO Preliminary Data.

4 Hothem pers. comm. 1999; Pratt and Winkler, 1985, Ehrlich et al. 1988; no data available for courtship and nest building, this is assumed to begin approximately two weeks prior to nest initiation. Based on data from one Alcatraz nest and Audubon Canyon Ranch (Pratt and Winkler, 1985). Chicks are vulnerable for about one month after hatching.

5 Hothem pers. comm., 1999, 2000; Kelly, pers. comm., 2000; no data available for courtship and nest building, this is assumed to begin approximately two weeks prior to nest initiation. Based on data collected throughout San Francisco Bay. Chicks are vulnerable for three to four weeks after hatching.

6 Hothem 1999, Hothem Preliminary Data. Chicks are vulnerable for three to four weeks after hatching.

7 Thayer et al. 1999, PRBO Preliminary Data; Fairman et al. 1998; Hatch, pers. comm., 2000; data based on observation of a single pair in 1997–1999. Chicks are vulnerable from hatching until they can fly at 35 days.

8 PRBO 2000.

9 PRBO 2000.

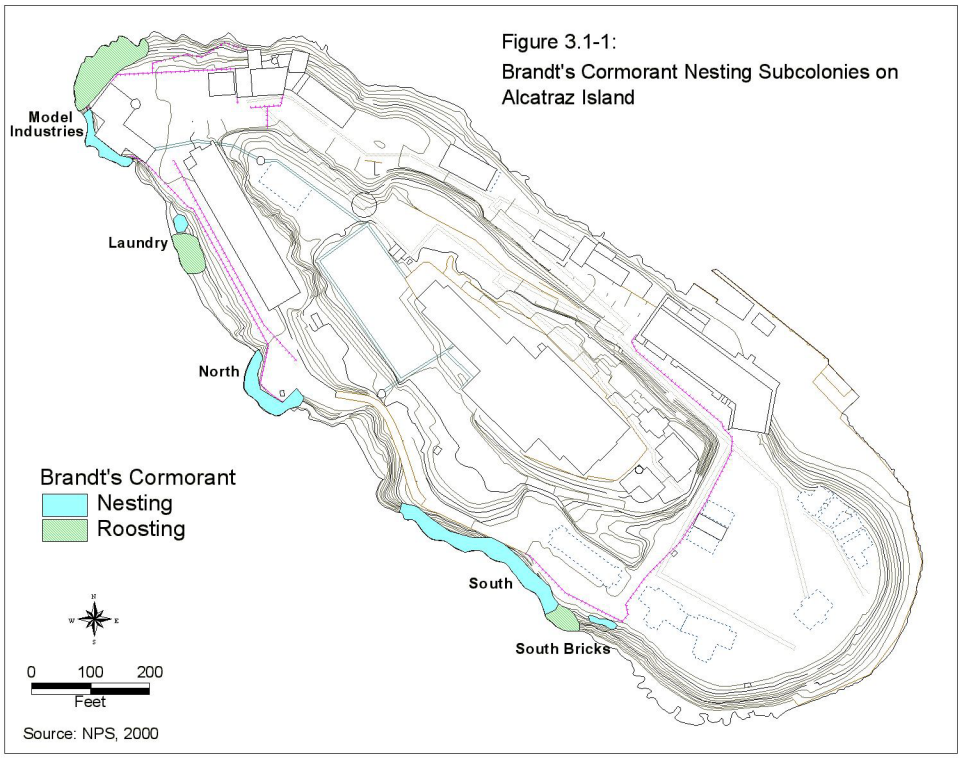


Figure 3.1-1:
Brandt's Cormorant Nesting Subcolonies on Alcatraz Island
Model Industries
Laundry
North
South
South Bricks
Brandt's Cormorant
Nesting
Roosting
0
100
200
Feet
Source: NPS, 2000

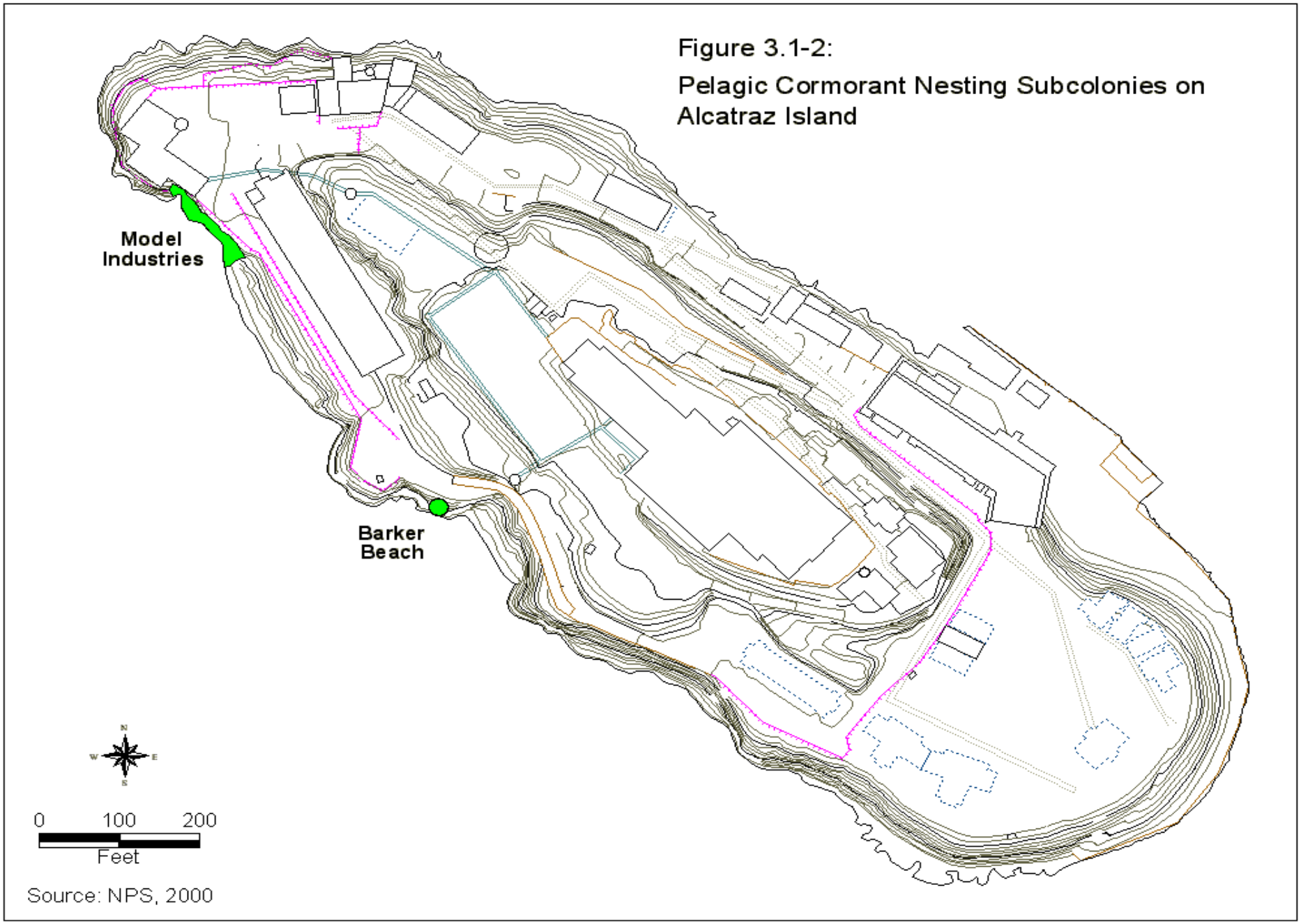


Figure 3.1-2:
Pelagic Cormorant Nesting Subcolonies on Alcatraz Island
Model Industries
Barker Beach
0
100
200
Feet
Source: NPS, 2000

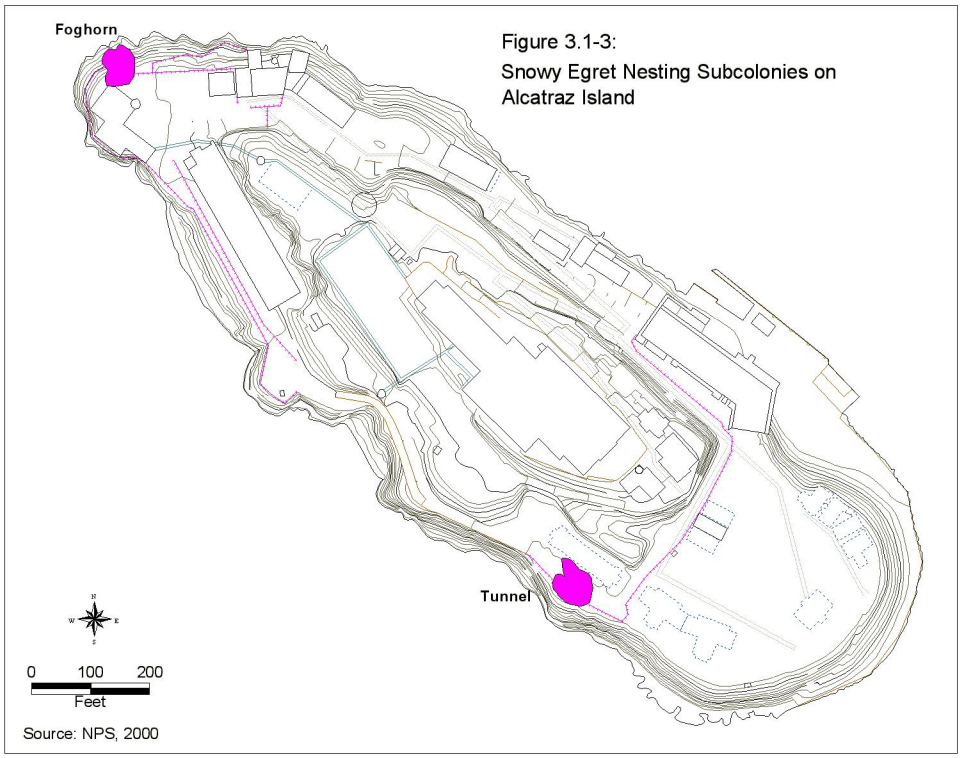


Figure 3.1-3:
Snowy Egret Nesting Subcolonies on Alcatraz Island

Source: NPS, 2000

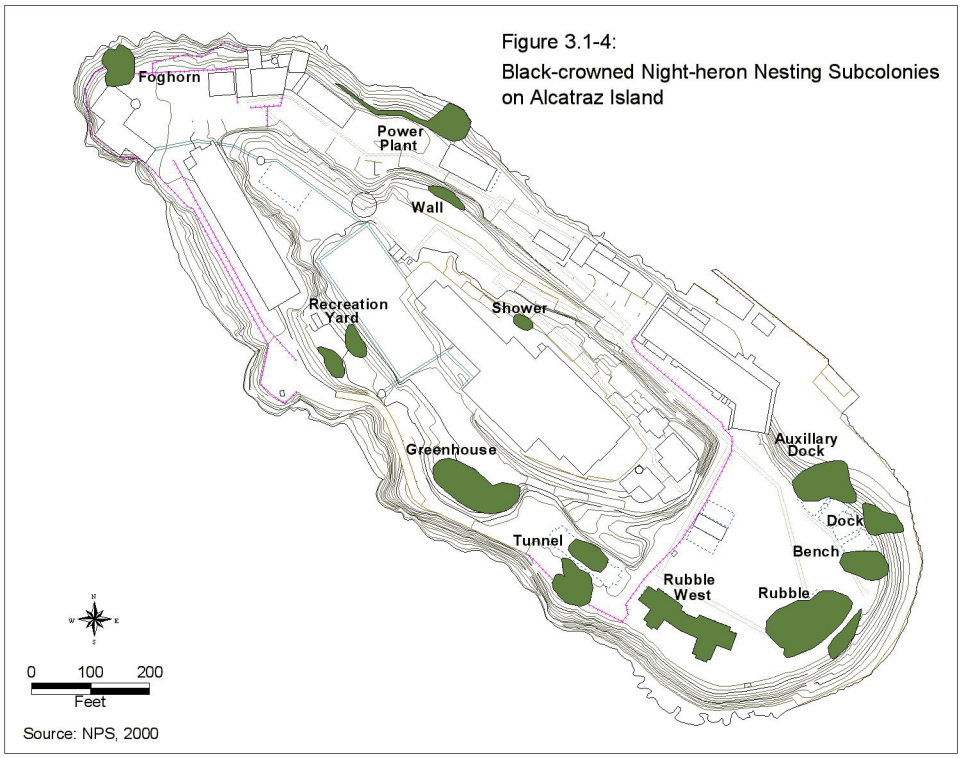


Figure 3.1-4:
Black-crowned Night-heron Nesting Subcolonies on Alcatraz Island

Source: NPS, 2000

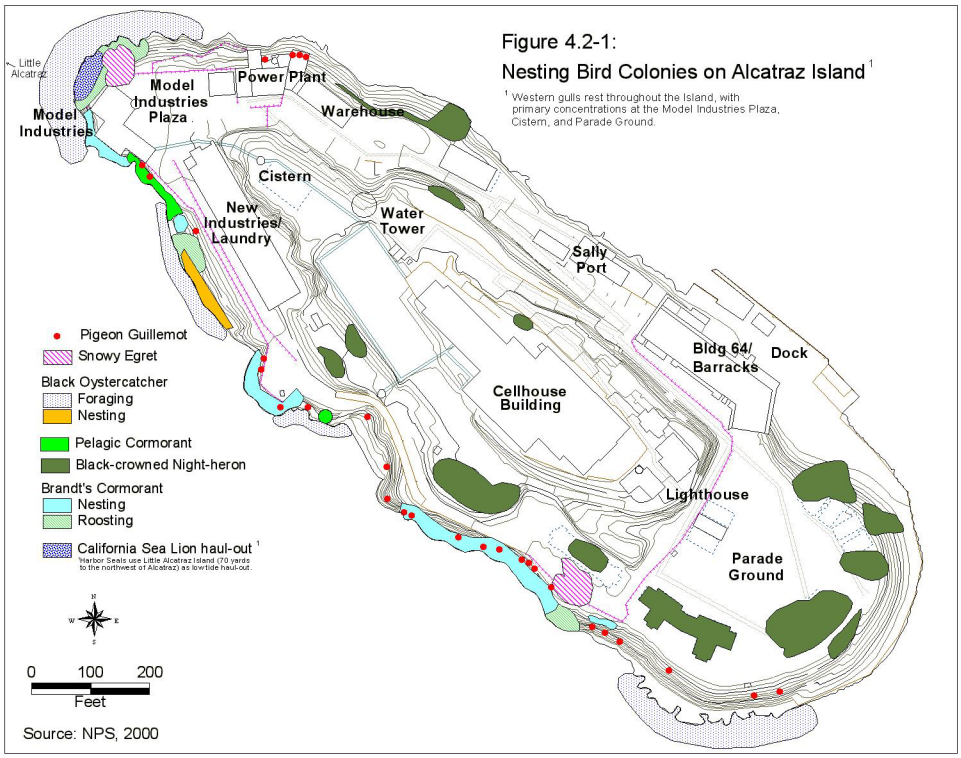


Figure 4.2-1:
Nesting Bird Colonies on Alcatraz Island [1]
[1] Western gulls rest throughout the Island, with primary concentrations at the Model Industries Plaza, Cistern, and Parade Ground.
Little Alcatraz
Model Industries
Model Industries Plaza
Power Plant
Warehouse
Cistern
New Industries/ Laundry
Water Tower
Sally Port
Bldg 64/ Barracks
Dock
Cellhouse Building
Lighthouse
Parade Ground
Pigeon Guillemot
Snowy Egret
Black Oystercatcher
Foraging
Nesting
Pelagic Cormorant
Black-crowned Night-heron
Brandt's Cormorant
Nesting
Roosting
California Sea Lion haul-out [1]
[1]Harbor Seals use Little Alcatraz Island (70 yards to the northwest of Alcatraz) as low tide haul-out.
N
W
E
S
0
100
200
Feet
Source: NPS, 2000

APPENDIX D: DEIS Comment Letters and Response Table

Response to Comments

This section of the final EIS presents comments received on the Draft EIS, followed by the NPS's response to each substantive comment. Comments were presented to the NPS during the 60-day public review period for the Draft EIS that closed on June 11, 2001. Comments include written letters and oral-testimony given during meetings of the Advisory Commission for the Golden Gate National Recreation Area and Point Reyes National Seashore on March 27, 2001 and April 24, 2001. A total of 9 letters and verbal comments (1 included in the response table) were received from individuals, public agencies, and organizations during the comment period.

At the close of the comment period, a content analysis of public responses to the Draft EIS began. Each document was read and sorted in terms of its subject matter and content. A number was assigned to each letter and verbal testimony given at public hearings. The document number was used for tracking purposes and is located on the letters presented in this chapter and it is used to correlate the responses to comments to the appropriate letter. Each comment within a letter or oral testimony was given an alphabetic code. This number/letter combination is used to identify each comment and is presented next to each comment in the table below along with a description of where in the letter the comment can be located. For example, the second comment presented in letter #2 would be numbered "2-B". Comments taken from oral testimony are presented in the table below, however the transcripts from the public meetings are not presented in this section but are available from Golden Gate National Recreation Area.

After each document was coded, a series of steps were taken to determine whether the individual comment was substantive or nonsubstantive, according to the criteria set forth in the Council on Environmental Quality regulations. Substantive comments are those that raise an issue regarding law or regulation, agency procedure or performance, compliance with stated objectives, validity of impact analyses, or other matters of practical or procedural importance. Nonsubstantive comments are those that offered opinions or provided information not directly related to issues or impact analyses. Substantive comments require a response or a corresponding revision in the environmental impact statement text; nonsubstantive comments are used as background information for the EIS team, but do not require a formal response.

The purpose of reading, coding and analyzing the contents of the comment letters was to assist the National Park Service in determining if the substantive issues raised by the public warranted further modification and study of the alternatives, issues, and impacts. With the information provided in through the review process, the environmental impact statement text has been changed where applicable and is indicated in the response to comments.

List of Commentors with Substantive Comments

INDIVIDUAL

Christian Hellwig (1)
Jeanne Cohn (2)

ORGANIZATION

Golden Gate Audubon Society (3)
Marin Audubon Society (4)
National Parks Conservation Association (5) (Oral Comment, see Response Table)
National Trust for Historic Preservation (6)
San Francisco Architectural Heritage (7)

PUBLIC AGENCY

Environmental Protection Agency Region IX (8)
Caltrans (9)
California State Clearinghouse (10)

Public Comment Letters

Individual – Christian Hellwig	
1-A Paragraph 1	**Comment**: Does the slope necessarily need to be covered in concrete? This is a non-porous material that will result in more run-off during rainstorms. How will run-off be directed?
	Response: Other materials can be looked at during the design phase. No run- off water is being contained or directed.
1-B Paragraph 2	**Comment**: The concrete will remove vegetative habitat and forage for various species of Island birds such as the Western Gull, sparrows, and Anna's hummingbirds.
	Response: The Slope Stabilization project will remove some vegetative habitat used by a relatively small number of western gulls, and foraging habitat for sparrows, hummingbirds and other land birds. However, the majority of the slope is too steep to support vegetation or provide bird nesting or foraging habitat. The project will be designed to remove the minimum amount of habitat necessary to adequately stabilize the slope. It may be possible to design the slope with features that allow nesting. This will be analyzed during the design phase.
1-C Paragraph 3	**Comment**: The aesthetic value of the cliff will be greatly reduced by covering the natural surface with concrete. Plants will not be encouraged to take root and flourish on such a substrate.
	Response: As stated in the DEIS text (pg. 2-43), the NPS would require that the new surface resemble the natural rock color to minimize the effects on the aesthetic and cultural value of the area. It may be possible to include plant material into the design of the slope, however, plant materials could affect the stability and life of the shotcrete. This issue can be analyzed during the design phase of the project.
Individual - Jeanne Cohn	
2-A Paragraph 3	**Comment**: The docking area should be repaired for safety but I do not feel any other construction should occur on the Island as it would interfere with the native birds
	Response: To fulfill the purpose, need, and objectives of this environmental impact statement, including protecting public health and safety and stabilizing National Historic Landmark structures on the Island from further deterioration, construction and rehabilitation of the other historical structures outlined in the EIS is required.

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Organization - Golden Gate Audubon Society (Arthur Feinstein)	
3-B Page 1, paragraph 6	**Comment**: We are disturbed by conclusions on DEIS pages 4.23 (Water Tower Repair) and 4.26 (New Industries Building Stabilization and Seismic Upgrade) that after mitigation there will still be or potentially be major impacts to waterbirds. We do not believe that it is acceptable for this project to have major impacts on the Island breeding waterbirds after mitigation.
	Response: Some commentors expressed concern that allowing moderate to major impacts is in conflict with the NPS mission of preserving natural resources. We understand the commentors concerns regarding impacts to natural resources, in particular breeding waterbirds and through mitigation, detailed in the DEIS (chapters 2 and 4), will attempt to reduce or avoid impacts. Through mitigation and an Adaptive Management Plan, adjustments will be made to construction activities to reduce impacts to breeding waterbirds based on monitoring results. It is the goal of park managers to always seek ways to avoid, or minimize to the greatest degree practicable, adverse impacts on park resources and values. However, even with mitigation and adaptive management, there is a slight potential for major impacts to waterbirds associated with the Water Tower and the New Industries "Laundry" Building projects. Because of a lack of site-specific knowledge as to the effects of construction activity on the waterbirds, impacts may still occur. Allowing actions to take place that may result in major impacts does not violate NEPA guidance. The GGNRA prepared an EIS, in compliance with NEPA requirements, based partly on the reasoning that there might be a moderate to major impact on breeding waterbirds as a result of the proposed construction activity. However, to fulfill the purpose, need, and objectives of the EIS the water tower and laundry must be repaired to protect human health and safety and to stabilize the Island's National Historic Landmark structures against further deterioration. The longer rehabilitation of these historic structures takes the more deterioration will occur, leading to an increase in the threat to public health and safety and a reduction in potential to preserve the historic structures.
3-C Page 2, paragraphs 1, 2 and 4	**Comment**: We cannot imagine, with modern engineering know-how wherein the work on the Water Tower or the New Industries (Laundry) building could not be phased over several non-breeding season. For example, the Water Tower could be stabilized during one non-breeding season and then sanded and painted in the next non-breeding season. Measures could be taken such as applying a primer coat to the tower to reduce further corrosion between non-breeding seasons and until the next construction period begins. Can increased work hours and increased resources solve the problem? Can one of the projects, Water Tower or New Industries Building, be put off for a year or two in order to allow for increased spending and increased man-hours on the project that is to be immediately implemented in Phase II? What are the time constraints for these projects?

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	Response: To minimize the impact of this project, the National Park Service would, to the extent feasible, complete the Water Tower project in the non-breeding season or phase the project to occur during the non-breeding seasons over two years. However, phasing may not be feasible. Working in the marine environment requires that new steel or other exposed materials be quickly painted to prevent corrosion. Installing new steel supports and/or repairing supports must be immediately followed by painting. The delay of several days, let alone several months, can substantially reduce the longevity of these repairs. In addition, the size of the Island restricts the number of contractors that can be mobilized at any one time and extensive coordination is required to organize the division and distribution of materials and equipment to appropriate staging areas. Extensive planning is required due to the number of staging areas (15) and the restrictions placed on staging and movement of equipment to protect the Island's waterbirds. Staging on the Island is severely limited to avoid sensitive nesting areas and to minimize disturbance of birds resulting from moving the equipment. Staging required to rehabilitate the Water Tower would disrupt other projects with equipment is left in place between non-breeding seasons or add additional expenses if it is shipped back and forth to the Island. It is estimated that the cost of phasing this project would increase costs by approximately 20-25%. The costs for mobilization/demobilization of construction equipment is estimated by the project manager to comprise approximately 17% of the total cost to rehabilitate the Water Tower if the project were phased over two non-breeding seasons. However, there would be additional costs associated with extending the project into the next non-breeding season that would increase the project time to nine months as opposed to seven to eight months under a non-phased schedule. Extending the length of the project would require additional funds for further monitoring, rental equipment, and general construction costs such as worker salaries for at least an extra month of work. The project is being proposed to be completed within the non breeding season although work would start within the last part of the breeding season and the completion of the work is projected for completion within the first part of the start of the next breeding season. The proposed work on the Laundry Building is being phased to protect sensitive waterbirds in the area. Exterior work is prohibited during the breeding season in areas that would effect nesting birds. Prior to interior work on the building that may occur in the breeding season, doors and windows will be repaired or replaced and barriers will be positioned to minimize visual contact and noise.
3-D Page 2, paragraph 3	**Comment**: To phase the projects of the Water Tower and the New Industries buildings would increase costs but the preservation of the Bay's most important waterbird breeding sites warrants that expenditure. If the only reason for not implementing a phased non-breeding season construction schedule is cost, that should be made clear and the various costs should be specified.

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	Response: As stated in response to 1-C, the work schedule on the Laundry is phased to protect the sensitive waterbirds in the area. Phasing the Water Tower repairs would involve stopping work during nesting season increasing project cost. A preliminary cost estimate was prepared by GGNRA to assess the costs of phasing the Water Tower project. However, because of government contracting regulations, the cost estimates can not be made available to the public until the project is awarded. It is estimated that the cost of phasing this project would increase costs by approximately 20-25%. The costs for mobilization/demobilization of construction equipment is estimated by the project manager to comprise approximately 17% of the total cost to rehabilitate the Water Tower if the project were phased over two non-breeding seasons. However, there would be additional costs associated with extending the project into the next non-breeding season that would increase the project time to nine months as opposed to seven to eight months under a non-phased schedule. Extending the length of the project would require additional funds for additional monitoring, rental equipment, and general construction costs such as worker salaries for the extra one to two months worth of work. As stated above, the GGNRA will continue to look into possible ways to accomplish the project over two seasons or reduce the duration of the project, decreasing work during bird-nesting season.
3-E Page 2, paragraph 6	**Comment**: If there are structural engineering or other physical reasons why the Water Tower and the New Industries Building projects can not be phased over several non-breeding seasons these should be disclosed in the final EIS.
	Response: As stated above, it is difficult to phase the Water Tower project because the size of the Island restricts the number of contractors that can be mobilized on the Island at any one time. In addition, the materials and equipment must be divided and distributed to appropriate staging areas. This requires extensive planning due to the number of staging areas (15) and the restrictions placed on staging and movement of equipment to protect the Island's waterbirds. Staging on the Island is severely limited to avoid sensitive nesting areas and to minimize disturbance of birds resulting from moving the equipment. For example, during breeding season contractors have no access to 4 of the 15 staging areas, there is no nighttime use of 8 of the 11 remaining staging areas, and the remaining 3 areas will need to shield the lighting. Additionally, screening or gull exclusion is required at 7 of the 11 staging areas, equipment would be moved only during daylight hours, and there will be no helicopter use to move equipment. Additionally, the staging required to do rehabilitate the Water Tower would be very expensive whether the equipment is left in place between non-breeding seasons or it is shipped back and forth to the Island.
3-F Page 3, paragraphs 2, 3 and 4	**Comment**: It is specified in the text that if Phase I actions create significant impacts to waterbirds then construction activity would be restricted in Phase II. Yet, later in the text it is stated that Phase II may result in major impacts to breeding waterbirds and that such impacts are acceptable. This seems to be a discrepancy in the text. If major impacts are allowed, please explain how that decision agrees with NPS Guidance on preserving natural resources in national parks.

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	Response: We understand the commentors concerns regarding impacts to natural resources, in particular breeding waterbirds and through mitigation, detailed in the DEIS, will attempt to reduce or avoid impacts. It is the goal of the Adaptive Management Plan and the mitigation measures outlined in section 2.7 to reduce or eliminate impacts to breeding waterbirds. If monitoring observes impacts at or exceeding those described in the EIS, the mitigation measures can be adapted, modified, or expanded based on the situations that arise during the construction activity to reduce those impacts. Because of a lack of site-specific knowledge as to the effects of construction activity on the waterbirds, impacts may still occur. However, with mitigation and the Adaptive Management Plan it is expected that there is only a slight potential for major impacts. See also response to 1-G. Allowing actions to take place that may result in major impacts does not go against NPS guidance. The park prepared an environmental impact statement in compliance with NEPA (sec 102 (2)(C)) requirements based partly on the reasoning that there might be a "significant" impact on the breeding waterbirds as a result of the proposed construction activity. Although as park managers we are directed to always seek ways to avoid, or minimize to the greatest degree practicable, adverse impacts on park resources and values, the laws (Organic Act and General Authorities Act, as amended) do give the NPS the management discretion to allow impacts to park resources and values when necessary and appropriate to fulfill purposes of a park, so long as the impact does not constitute impairment of the affected resources and values.
3-G Page 3, paragraph 5	**Comment**: One of the critical elements of your natural resource protection plan mitigation measures as described in Section 2.7.1 (Biological Resources; General Waterbird Protection Measures) and Section 4.2.2.5 (Disturbance to Breeding Waterbirds) is "Adaptive Management". The use of this approach requires clear definitions and criteria. What signifies a minimum, moderate or major impact? What level of impact will trigger a change of practice under the Adaptive Management program? What tools are available for Adaptive Management? We ask that the FEIS specifically define adaptive management criteria and tools. The tools available must be ones that will actually reduce or eliminate impacts.
	Response: Mitigation measures are tools used by the Adaptive Management Plan to reduce the potential effects of the construction activities on natural and cultural resources. If monitoring observes impacts at or exceeding those described in the EIS, the mitigation measures can be adapted, modified, or expanded based on situations that arise, to reduce impacts. Adaptive management will be guided by the same minor, moderate and major impact criteria defined in the DEIS on page 4-10 (see text for complete definitions). Disturbance monitoring protocols will be developed and implemented by a biologist that is on-site on a regular basis when construction work occurs during the breeding season (February 15 through August 15, or until breeding activity is complete). The Adaptive Management Plan will outline the process by which mitigation measures may be modified or augmented, and identify targeted action to reduce an impact. Through on-site monitoring, and communication with biologists conducting long-term waterbird monitoring on the Island, the project biologist will evaluate impacts related to construction activities and impacts resulting from non-construction related human activity or naturally

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	occurring events. The Environmental Consequences Chapter (4) of the EIS drew conclusions regarding the potential impact to waterbirds from each project following mitigation (Section 4.2.2.5). For most projects, the conclusion covered a range of potential impacts, for example, minor to moderate, or moderate to major. The impacts were evaluated during the EIS process and represent the best available knowledge concerning impact levels and thresholds. If monitoring indicates that impacts are approaching the upper threshold of the anticipated impacts, the Adaptive Management Plan will modify, enhance, or expand the mitigation measures to reduce the impact. Adaptive management is designed to respond immediately to impacting construction activities with solutions based on the mitigation measures. The EIS identifies the extent of mitigations identifiable at this time and the Adaptive Management Plan adapts those measures to protect the Island's resources. If potentially major impacts cannot be adequately mitigated, the park will consider whether to delay the project until outside the peak sensitivity period for the affected species.
3-H Page 3, paragraph 6; continued on Page 4	**Comment**: The DEIS provides a monitoring program in Appendix B, however there is no mention of providing the monitoring information to the public either as it is collected or even when Phase I is done. As stated in the DEIS (page B-3), the process used to review, approve and refine the mitigation measures based on knowledge gained in Phase I would be done through the park's existing project review process. The public is evidently not to be informed of or given the opportunity to comment on what additional mitigation/adaptive management measures may be necessary. We don't think this is appropriate. There should be a mechanism for public input into the Adaptive Management process.
	Response: Alcatraz Island waterbird monitoring reports are available to the public upon request. Results are also summarized each year in the Investigator's Annual Report that will be posted on the NPS web site, www.nature.science.gov. The project biologist will be required to prepare an annual report documenting construction monitoring related activities and results, including a summary of mitigation measures and adaptive management actions implemented, and recommendations for adaptive management measures for subsequent years and/or projects. This document will be provided to interested parties for review and comment on an annual basis. The DEIS reflects numerous comments and suggestions that were provided in meetings and site visits held during the scoping process. In the same spirit, GGNRA staff would be available to meet with those interested in further exchange on the results of monitoring and the adaptive management approach.
Organization - Marin Audubon Society (Barbara Salzman)	
4-B Page 1, paragraph 3	**Comment**: The EIS should discuss what nesting occurred on Alcatraz prior to establishment of the prison.

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	Response: No historical information regarding breeding birds on Alcatraz Island prior to establishment of Civil War era fortifications or the penitentiary has been located. The Island is believed to have been barren rock, possibly with coastal grasslands and scrub, and would likely have supported nesting gulls and cormorants. All currently utilized habitat for herons, egrets and pigeon guillemots is related to human use of the Island.
4-C Page 1, paragraph 3	**Comment**: Colonial nesting colonies should be identified as part of our natural heritage and therefore incorporated into its description as a National Historic Landmark.
	Response: The colonial nesting colonies are not listed as contributing to the National Historic Landmark designation of Alcatraz Island. Listings on the National Register of Historic Places including properties designated as Landmarks are sites, structures, or objects that embody an important significance in American history, architecture, archeology, engineering, and culture. In order for a plant or animal community to be listed within a National Register or National Historic Landmark District, that "Biotic Cultural Resource" must contribute to the historic significance of the district. During the period of significance of Alcatraz Island (i.e. from the beginning of construction of the Civil War Fortifications through closure of the Federal Penitentiary), historic documentation shows that birds were actively excluded from the Island. With this evidence, the colonial nesting colonies, while indeed a part of our natural heritage, are not part of the cultural history of Alcatraz Island and thus do not contribute to the National Historic Landmark District. With reference to the Island's history prior to European contact. There is no record or remaining evidence of prehistoric usage of Alcatraz Island by Indian Tribes. Documentation of such prehistoric usage, meeting the National Register Criteria for Evaluation, would be required before this period in the Island's history could be considered for entry into the National Register.
4-D Pages 1-2, Waterbird Protection Measures	**Comment**: on the discussion on page 2.32 indicates that monitoring of the effectiveness of measures in Phase I would be used to refine mitigation measures for subsequent phases. This is not acceptable. If a mitigation measure is not effective in avoiding impacts, the activity should be stopped immediately and the mitigation changed or replaced with another measure. If a measure is not working to mitigate an identified impact, changing it later for some other project would change the level of impact for the original project to major. The analysis in section 4 regarding levels of impact are all based on mitigation measures being effective. To remedy this deficiency, a plan should be developed that outlines steps to be taken to stop work and remedy the inadequacies of the proposed mitigation. There should also be a clear definition of what constitutes a minor, moderate and major impact. It is not sufficient for construction workers to be provided with information on the resources, mitigation measures and conduct regular inspections. An on-site supervisor who will monitor construction worker activities and who has the authority to stop work and redirect activities is needed. There should be specific descriptions of impacts that would trigger terminating an activity or take specified remedial actions which should be identified as much as possible in advance.

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	Response: See response to 1-G
4-E Page 2, Waterbird Protection Measures Paragraph 2	**Comment**: To mitigate noise impacts, loud talking or yelling, which occurs frequently on construction sites, should be prohibited.
	Response: Biological sensitivity training of the construction workers which is included as a mitigation measure, will address this issue.
4-F Page 2, Pacific Herring	**Comment**: We don't agree that spawning habitat for Pacific Herring is widespread in San Francisco Bay, nor should protective measures outlined in an USACE permit suffice as adequate mitigation for purposes of this EIS. It is not clear whether an USACE permit would be needed for dock repair. Potential impacts and mitigation measures should be identified and discussed in the EIS.
	Response: The Dock Repair project is currently proposed for completion outside the herring-spawning season. Herring are a commercially harvested species in San Francisco Bay and do not have special status. If it becomes necessary to work into herring spawning season the biological monitor could assess the situation using the Adaptive Management Plan and determine if implementation of other measures is necessary to protect the herring.
4-G Page 2, Marine Mammals	**Comment**: Regarding the use of barge staging area #15 only when California sea lions are not present. What if sea lions haul up when the barge is on its way or already landed? A clear direction must be written that the barge would not land if it is on its way and would not move from the staging area while sea lions are present. We object to seeking a permit to authorize disturbance under the Marine Mammal Protection Act as the mitigation for potential impacts. Seeking a permit would authorize impacts, not mitigate them.
	Response: Although seeking a permit was identified in Section 2.7 Mitigation Measures, it was not meant to imply that the permit was a mitigation measure itself. If the National Park Service obtained a permit under the Marine Mammal Protection Act, the permit itself may contain required mitigation measures. However, the permit language was removed from the EIS. Potential impacts to marine mammals would be extremely limited given how infrequently sea lions haul out on Alcatraz Island. Barge and crane activities are costly and require scheduling well in advance due to their limited availability for work in the bay. It is difficult to divert or reschedule these activities on short notice.

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4-I Page 2, Brandt's Cormorants	**Comment**: Does the early March nesting period for Brandt's Cormorants stated in the EIS take into account the south subcolony's egg-laying which occurs 2-3 weeks earlier than the other colonies?
	Response: Yes.
4-J Page 3, Pelagic Cormorant	**Comment**: Since no evidence is presented concerning the sensitivity of Pelagic Cormorants, it seem wiser to assume that the sensitivity period extends at least into the early incubation period if not the entire incubation period instead of stopping at the end of the egg laying period.
	Response: The sensitivity periods for seabirds are based on recommendations of seabird biologists at Point Reyes Bird Observatory. Evidence indicates that the courtship and nest initiation phase are the most sensitive periods for these species. Although Table 3.1-1 shows periods of peak sensitivity for informational purposes, restrictive dates for construction project activities extend over a much longer period of time, e.g. exterior work on the Laundry Building and use of Barge locations #14 and #15 is restricted until approximately September 15, depending on when breeding activity ends in that area.
4-K Page 3, Snowy Egrets	**Comment**: The peak sensitivity period of snowy egrets is identified as prebreeding until egg laying is complete. Yet the discussion also states that during the first two weeks of age, "adults are more easily flushed and chicks should not be left alone." This two-week period should be added to the peak sensitivity period.
	Response: Because so few snowy egrets nest on Alcatraz Island, the snowy egret information in Table 3.1-1 is based on hatching dates of over 300 snowy egret nests throughout San Francisco Bay. The mean hatching date for 329 nests was May 20. The peak sensitivity period extends for three weeks past the mean hatching date to encompass the majority of chicks less than two weeks old. Although Table 3.1-1 shows periods of peak sensitivity for informational purposes, restrictive dates for construction project activities extend over a much longer period of time.
4-L Page 3, Black Crowned Night Heron	**Comment**: Why does the peak sensitivity period of Black Crowned night herons not include the early weeks after hatching when hatchlings are more vulnerable to predation?

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	Response: The peak sensitivity period identified for Black-Crowned Night-Herons in Table 3.1-1 includes a period of over 3 months after the first chicks hatch. While the vast majority of young fledge during this period, a small percentage of young hatch late in the season and fall outside the peak sensitivity period shown in table 3.1-1, which is sensitive for the majority of nesting Night-Herons.
4-M Page 3, Black Oystercatcher	**Comment**: It appears that Black Oystercatchers are highly vulnerable in view of abandonment after one intrusion from jet skis. What steps will be taken to sign the Island against boat landing and to enforce restrictions?
	Response: The personal watercraft incident was related to an emergency landing on the Island and was not likely preventable. The National Park Service has explored posting signage on the Island to deter boaters from disturbing nesting birds. Signage is problematic because text needs to be very large in order to be read. Overly large signs from an appropriate distance have visual impacts and may conflict with the National Historic Landmark status of the Island. The park is currently considering establishing a closed area extending approximately 100-200 yards offshore to protect nesting birds. Buoy markers may be considered as an alternative to signs to demarcate the closed area. The park currently cites boats documented to be disturbing wildlife in violation of the Code of Federal Regulations. In addition, flyers are distributed to local marinas and boating/kayak organizations, and information posted on local web sites informing boaters of the sensitivity of the Island's wildlife.
4-N Page 3, Western Gull	**Comment**: Describe the evidence noted on page 3-23, paragraph 5, that more frequent human presence, as opposed to sporadic, may be less disruptive to western gulls.
	Response: Point Reyes Bird Observatory biologists conducted a study for the National Park Service to assess the impacts of the Alcatraz evening program on waterbirds (Murray, et al., 1998). Their report concluded that western gulls exposed to minimal daytime visitor traffic reacted strongly to the arrival of researchers in the area, suggesting they have a low tolerance for disturbance or human presence, as compared to gulls exposed to heavy human visitation all day long, that exhibited no reaction to the presence of researchers. Additionally, reproductive success was highest in heavily visited areas, intermediate in minimally visited areas, and lowest in areas closed to public access. Some of the difference between sites may also be explained by microclimatic differences, e.g. the area with the heaviest visitation is also the most sheltered from the wind.
4-O Page 3, Pigeon Guillemot	**Comment**: Because Alcatraz is the only place Pigeon Guillemots nest in San Francisco Bay, and the lack of knowledge about sensitivities of this species, maximum protections including timing to avoid nesting season should be required.

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	Response: The two projects in closest proximity to nesting pigeon guillemots are the New Industries "Laundry" Building and the Quartermaster Building stabilization projects. Mitigations established for both projects prohibit exterior work during the breeding season in areas that would effect nesting birds. Additionally, prior to interior work doors and windows must be repaired or replaced or barriers must be placed to minimize visual contact and noise. The Sallyport is some distance from guillemot nesting areas. The dispersed nature of guillemot nesting on the Island also serves to limit the degree of impact to this species.
4-P Page 3, Dock	**Comment**: To achieve minor to moderate impacts associated with crane use on the dock repair, the crane must be blocked from view of the birds on the Parade Ground. How would the crane be shielded? Is there a potential for impacts to marine mammals along the shoreline with work done on the dock area? How would this be mitigated?
	Response: The Dock Repair project is scheduled to occur in fall 2001, almost entirely outside the breeding season. If work begins prior to the end of the breeding season, it will be restricted to the area east of Building 64, which provide adequate shielding from the Parade Ground. The National Marine Fisheries Service informal consultation regarding the Dock Repair project concluded that the project is not likely to "take" (including harass) marine mammals due to the low likelihood of marine mammal presence in or near the project area (see Appendix E).
4-Q Page 3, Building 64	**Comment**: The DEIS should state the circumstances under which phasing or screening would be used during construction of Building 64. What determines the type of screening? If screening is used, what number of nests of all species would be prohibited and therefore have to relocate? If screening materials are not effective in preventing nesting impacts what recourse is taken? The EIS should identify the level of disturbance that will be tolerated and the point at which activity would be terminated. How could potential impacts to night herons as a result of the staging area be reduced? Could the staging area be blocked from view or moved?
	Response: Exclusionary netting or screening of the Building 64 balconies will be required if work is to be conducted on the balconies during the nesting season. The type of screening will likely be opaque nylon screen. Work on the southeastern side of the building would also require visual screening (which could also serve to exclude nesting gulls) during the breeding season to minimize impacts to night-herons nesting on the slope above the dock. Approximately 7 to 10 western gull pairs would be prevented from nesting if exclusionary netting or screening were installed over the balconies. To the extent feasible, western gulls will only be excluded from those portions of the balconies were work is planned during the breeding season, in order to minimize the number of western gulls affected. Staging for this project will be in the dock area and subject to the mitigation measures identified in Section 2.7.1 Biological Resources, General Waterbird Protection Measures, Staging/Barge Off-Loading Area Use. Birds nesting in the dock area are generally adapted to intense human activity as this

Public Comment Letters

	is the most heavily used area on the Island year round. To the extent feasible, given Island operations and concurrent projects, staging of activities in staging area #3a and in front of Building 64 will be considered for use during the breeding season. See response 1-G above for discussion of implementation of mitigation measures and adaptive management to address unanticipated impacts to night-heron nesting on the adjacent slope or to western gulls.
4-R Page 4,Cellhouse Stabilization	**Comment**: Potential impacts to cormorants and guillemots and the large colony on Parade Ground are major concerns. Could the effectiveness of visual barriers (dense netting) be tested in advance? If this barrier does not prove effective in reducing impacts, the work should be stopped and only continue during non-nesting season in this critical location. We recommend strict adherence to working in non-breeding season only. Protective barriers (scaffolding around the Cellhouse) should be erected and completely covered with material that would block views or workers and that muffles noises to avoid sound disturbances. The discussion that some impacts to cormorants and pigeon guillemots would still occur and that these are expected to be moderate. It seems to us that it could be major, if there is nest abandonment of the smaller colonies of seabirds.
	Response: Mitigation measures for breeding season work on the Cellhouse which includes placement of barriers designed to minimize noise and visual contact with breeding birds are discussed in Section 2.7.1. Complete visual barriers are required in active work areas. The current design includes a covering that absorbs sound to reduce the potential disturbance from work. These barriers will be installed prior to the breeding season and their effectiveness approved by a NPS biologists. Impact criteria and trigger points that would lead to a modification of work activity or enhancement of mitigation measures as part of the Adaptive Management Plan are discussed in response 1G above. These measures, along with adaptive management, will adequately protect the identified species.
4-S Page 4, Sallyport	**Comment**: We recommend that the Sallyport be demolished during the non-breeding season to avoid impacts. If demolition occurs during the breeding season, impacts should be identified that would trigger cessation of work. Disturbance to the pigeon guillemots nesting at the power plant is a particular concern along with other species that would have repercussions on other nesters. It is not clear what mitigation measures would benefit the pigeon guillemot during Sallyport construction activity. Would all or just a few of the mitigation measures noted on page 4-20 be implemented? While the greatest potential impact is identified as coming from the barge use and boathouse demolition, it is only stated that these activities may occur during the non-breeding season. These activities should absolutely only occur during the non-breeding season.

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	Response: Demolition of the Sallyport boat house is expected to take approximately one week using a crane and will occur during the non-nesting season. The Sallyport is some distance from pigeon guillemots nesting at the Power Plant, where one to four nests have been located, or less than 20% of the Island's population. Scheduling of the demolition work outside of the peak sensitivity period for Black-crowned Night-Herons and pigeon guillemots would further reduce the impacts to these species.
4-T Page 4, Water Tower Stabilization	**Comment**: What structural conditions would render doing work on the Water Tower during the non-breeding season infeasible (page 2-36)? Why is phasing of this project impossible? Phasing to avoid breeding season must be required for work in this area. The potential risks to the breeding population are too high. Would it be more effective to build nest boxes, habitat platforms and attraction measures (mitigation measure 14) during the non-breeding season before impacts occur?
	Response: The habitat enhancement mitigation measures for western gulls and pigeon guillemots outlined in #13 and 14 on page 2-37 of the DEIS would be implemented prior to any breeding season construction activities. For a discussion of phasing the Water Tower project, please see responses to comments 1-C, 1-D and 1-E.
4-U Page 5, Slope Stabilization	**Comment**: The EIS needs to define what a minor reduction in nesting habitat for western gulls means as a result of the Slope Stabilization project. How many gulls have nested on the slope recently? How expensive would it be to add nesting sites to the area? Does shotcrete actually prevent erosion?
	Response: The proposed repairs would tie the slope back to the Island by drilling steel bolts through the existing slope and anchoring them into bedrock. Following completion of the tiebacks, the slope face would be stabilized through the application of shotcrete. The application of shotcrete along with the tiebacks will stabilize the slope increasing the protection of public health and safety, and preserving the historic structures on top of the slope. Up to 20 western gull pairs may be affected by the Slope Stabilization project at its maximum extent. The feasibility of adding nesting ledges and vegetation to the stabilized slope to mitigate for habitat impacts will be considered during the design phase of the project. The cost of adding nest sites is not known at this time.

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4-V Page 5, New Industries Building	**Comment**: Work on this building is the major concern for nesting cormorants and guillemots and other nesting colonies. This is the most biologically sensitive project site on the island. Even interior work near windows through which birds could see people should be restricted to the non-breeding season. Only interior work away from windows and from which no noise impacts occur, should be allowed in the daytime during the breeding season. We note that even if the proposed mitigation measures are implemented successfully, the potential impact could be major. There should be specific descriptions of impacts that would trigger termination of work activity in the non-breeding season.
	Response: Section 2.7.1 Mitigation Measures for Biological Resources, page 2-38, #21 identifies mitigation measures for breeding season work on the New Industries "Laundry" Building, including repair or replacement of all exterior windows and doors, or placement of barriers designed to minimize noise and visual contact with breeding birds to be completed prior to the breeding season. Complete visual barriers are required in active work areas. Impact criteria and trigger points that would lead to a modification of work activity or enhancement of mitigation measures as part of the Adaptive Management Plan are discussed in response 1G above.
4-W Page 5, Building 64	**Comment**: While recommending phasing to avoid the breeding season, mitigation 24 indicates that work would be scheduled from February 15 through August 15 to the greatest extent feasible. Doesn't this encompass the breeding season? Exterior work should be restricted to non-breeding season. It isn't clear why it couldn't be. How would the decision be made whether to restrict exterior work to non-breeding season or use screening and buffer area? There is no information provided about the size and nature of the buffer area.
	Response: The statement in mitigation 24 for the Building 64 Seismic Retrofit project in the DEIS was in error and has been changed in the FEIS to reflect that work will be scheduled outside of the February 15 through August 15 breeding season to the greatest extent feasible, with no exterior work permitted along the southern wall during this period.
4-X Page 5, Fuel Line Repair	**Comment**: The fuel-line repair project has the potential to adversely impact many of the Island's breeding waterbirds and there seems to be no reason why this project could not be undertaken in the non-breeding season and together with other jobs.

Public Comment Letters

	Response: The construction time for this project is estimated for eight months and may include work in bird nesting season. The majority of areas where fuel lines are present are open all year and are extensively used by visitors and staff, including the Dock, Building 64, and the main thoroughfare from the Cellhouse to the Sallyport (DEIS pg. 4-28). In addition, the removal of fuel lines would only occur in areas where excavation would not result in disturbance to cultural or biological resources. This would limit the potential for direct disturbance to nesting waterbirds from excavation. These measures along with mitigation adequately address the potential impacts to waterbirds and allow for work during nesting season.
4-Z Pages 5-6, MAS Preferred Alternative	**Comment**: It is unclear why the Water Tower, New Industries Building, and Quartermaster building would be lost under the reduced project alternative but it seems they would decline over a longer time period before repairs could be made. It seems the reduced project alliterative could be modified to take measures to protect these structures. The disadvantages of having construction only occur during the non-breeding seasons would be an increase in cost and it would take more time.
	Response: The Reduced Project Alternative does include basic maintenance to these structures. However, it is likely that the time period required for obtaining the necessary compliance outside of this EIS would lead to irrevocable damage to these structures. It is probable that the cumulative loss of these cultural resources, all concentrated on the north end of the Island, would result in the loss of the National Historic Landmark status, which would be considered impairment of the cultural resource values on Alcatraz.
Organization - National Trust for Historic Preservation (Holly Harrison Fiala)	
6-B Paragraph 2	**Comment**: We agree that current maintenance standards need to be upgraded to safeguard these historic properties, which contribute to the Alcatraz National Historic Landmark.
	Response: Thank you for the comment.
Organization - San Francisco Architectural Heritage (Charles Edwin Chase)	
7-B Paragraph 2	**Comment**: We concur that upgrading to normal maintenance standards is the appropriate treatment of these buildings which contribute to the Alcatraz National Historic Landmark.
	Response: Thank you for the comment.

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Public Agency - Environmental Protection Agency Region IX (Lisa Hanf)	
8-A Page 1, paragraph 3	**Comment**: We have rated the DEIS as EC2 - Environmental Concerns - Insufficient information. The rating is based on concerns that the NPS ensure protection of human health and the environment from lead-based paint, asbestos, and polychlorinated biphenyls, if they would be disturbed during renovation and demolition. We recommend additional information in the FEIS regarding the potential impacts of releases of these materials into the environment and mitigation measures to avoid releases.
	Response: The text in Chapter 2 (section 2.7.4) has been updated to include a discussion of mitigation measures that will be implemented to reduce impacts to the environment and public health and safety as a result of the potential exposure of hazardous substances during construction. GGNRA is committed to adhering to federal and state regulations and policies concerning the identification, evaluation, and removal of these substances. . Text has been added in Chapter 3, the Affected Environment, section 3.5, and also to Chapter 4, Environmental Consequences, analyzing the impacts of hazardous substances.
8-B Page 1, paragraph 3	**Comment**: The EPA recommends additional information regarding avoidance, minimization, and mitigation of impacts to water quality and habitat from dock repairs, as well as clarification of mitigation measures to reduce particulate emissions.
	Response: The NPS has obtained authorization from the US Army Corp of Engineers (USACE), a consistency determination from the San Francisco Bay Conservation and Development Commission (BCDC) and a waiver of waste discharge requirements from the Regional Water Quality Control Board (RWQCB). The GGNRA also consulted with the National Marine Fisheries Service (NMFS) that issued a finding of no effect to listed fish species (see Appendix E in the FEIS). Consultation with these agencies provided measures that are designed to reduce the potential for impacts from the dock project. Appendix E includes the letters from these agencies along with the requirements for implementation. The GGNRA will adhere to the requirements of these regulating agencies.
8-C Page 3, Lead-based Paint	**Comment**: The FEIS should describe the potential environmental impacts from removal of lead-based paint or demolition of structures with lead-based paint under the proposed action and alternatives. The discussion should include impacts to water quality and sediments, air, soil, construction workers, park visitors, and wildlife.
	Response Removal of lead base paints will be done in accordance with the applicable sections of the Federal, State, or local regulations as it applies to the abatement and disposal. Abatement and disposal actions will be mindful of protecting the environment as well as worker and visitor safety. If water is used in the abatement process, it will be contained, stored and disposed of in the appropriate manner as specified by the regulations. The text has been updated, see Chapter 4,

Comment [TB1]: Jon what is this acronym

Public Comment Letters

	Environmental Consequences, section 4.6, Hazardous Substances: Human Health, Safety, and the Environment. The text identifies the structures included in the Proposed Action that are assumed to contain lead paint and the measures that will be implemented to protect workers and the visiting public.
8-D Page 3, Lead-based Paint	**Comment**: The FEIS should describe the measures that would be taken to properly remove and dispose of (a) toxic lead-based paint stripped, water blasted, or sand blasted from buildings, and (b) structures containing lead-based paint which are proposed for demolition.
	Response: The sampling, evaluation, containment, and abatement of lead paint will be completed in accordance with state and federal mandates. Provisions of the mandates will be drafted as a requirement into GGNRA contracts. The drafting of these requirements will be done by certified firms experienced with lead paint abatement. The abatement and disposal will be completed by state certified contractors licensed for lead paint removal. The text has been updated to further describe the management of hazardous substances associated with construction activities (Chapter 2 section 2.7.4 and Chapter 3 section 3).
8-E Page 3, Lead-based Paint	**Comment**: The FEIS should include a clearance program to ensure against residual lead levels that could pose human health or environmental risks on Alcatraz after renovation/demolition activities are completed.
	Response: A certified industrial hygienist will clear the areas after abatement and before staff and the public are allowed to return.
8-F Page 3, Polychlorinated Biphenyls	**Comment**: It is unclear whether renovation activities would involve removal of electrical lines or transformers that contain polychlorinated biphenyls (PCBs). The FEIS should indicate whether any PCBs are in the project area and, if so, whether they would be disturbed or removed during renovation activities. If PCBs are disturbed or removed, appropriate provisions to protect the public, worker health and safety, and the environment should be included in the FEIS.
	Response: The GGNRA does not expect to encounter polychlorinated biphenyls (PCBs) during this project. A recent overhaul of the electrical system replaced the transformers containing PCBs while installing a new generator system on the Island. Some electrical lines will be replaced by the proposed action, yet no PCBs are anticipated because of the previous removal.

Public Comment Letters

8-G Page 3, Asbestos	**Comment**: The FEIS should indicate whether structural material containing asbestos would be removed or disturbed during renovation or demolition activities. If so, the FEIS should describe measures that would be taken to properly remove and dispose of asbestos-containing structural materials to avoid accidental release of friable asbestos during the project, and include a clearance program that would be conducted to ensure against residual asbestos that could pose human health or environmental risks on Alcatraz after renovation/demolition activities are completed.
	Response: The text has been updated to include a discussion of hazardous substances including asbestos. See Chapter 2 section 2.7.4 and Chapter 3 section 3.5 for further discussion of the mitigation measures and regulations and policies associated with hazardous substances. Asbestos Containing Material (ACM) would be abated during the renovation and demolition activities. Bulk and air sampling, evaluation, abatement, and disposal would be completed in compliance with Federal, State and local codes. An Industrial hygienist would be contracted with to ensure that abated areas are asbestos free and safe for visitation and use.
8-H Page 4, Dock Repair	**Comment:** The FEIS should describe how dock design and construction activities would avoid or minimize impacts to aquatic habitats and water quality in the dock area. It should also discuss any mitigation measures that would be undertaken to offset any unavoidable adverse impacts. If available at the time of printing, the FEIS should present permit conditions that will be included in the Department of Army's Section 10/404 permit.
	Response: See response to 15-B above.
8-I Page 4, Air Quality	**Comment**: It is unclear from the discussion in sections 2.7.4 and 4.5 in the DEIS whether all of the Bay Area Air Quality Management District's (BAAQMD) PM10 (particulates smaller that ten microns) "Basic Measures" for construction activities would be implemented under the proposed project. The FEIS and ROD should include all BAAQMD's Basic Measures as requirements for contractors conducting the proposed work on Alcatraz to ensure that PM10 emissions are minimized to the extent feasible.
	Response: BAAQMD PM_{10} requirements for testing and minimization of PM10 emissions to the extent feasible, will be part of GGNRA construction contracts.
Public Agency – Caltrans	
9-A	**Comment**: Caltrans did not have comments on the project.
	Response: Thank you for responding

Public Comment Letters

Public Agency – California State Clearinghouse	
10-A	**Comment**: California State Clearinghouse distributed the DEIS to state agencies that did not have comments on the project.
	Response: Thank you for responding

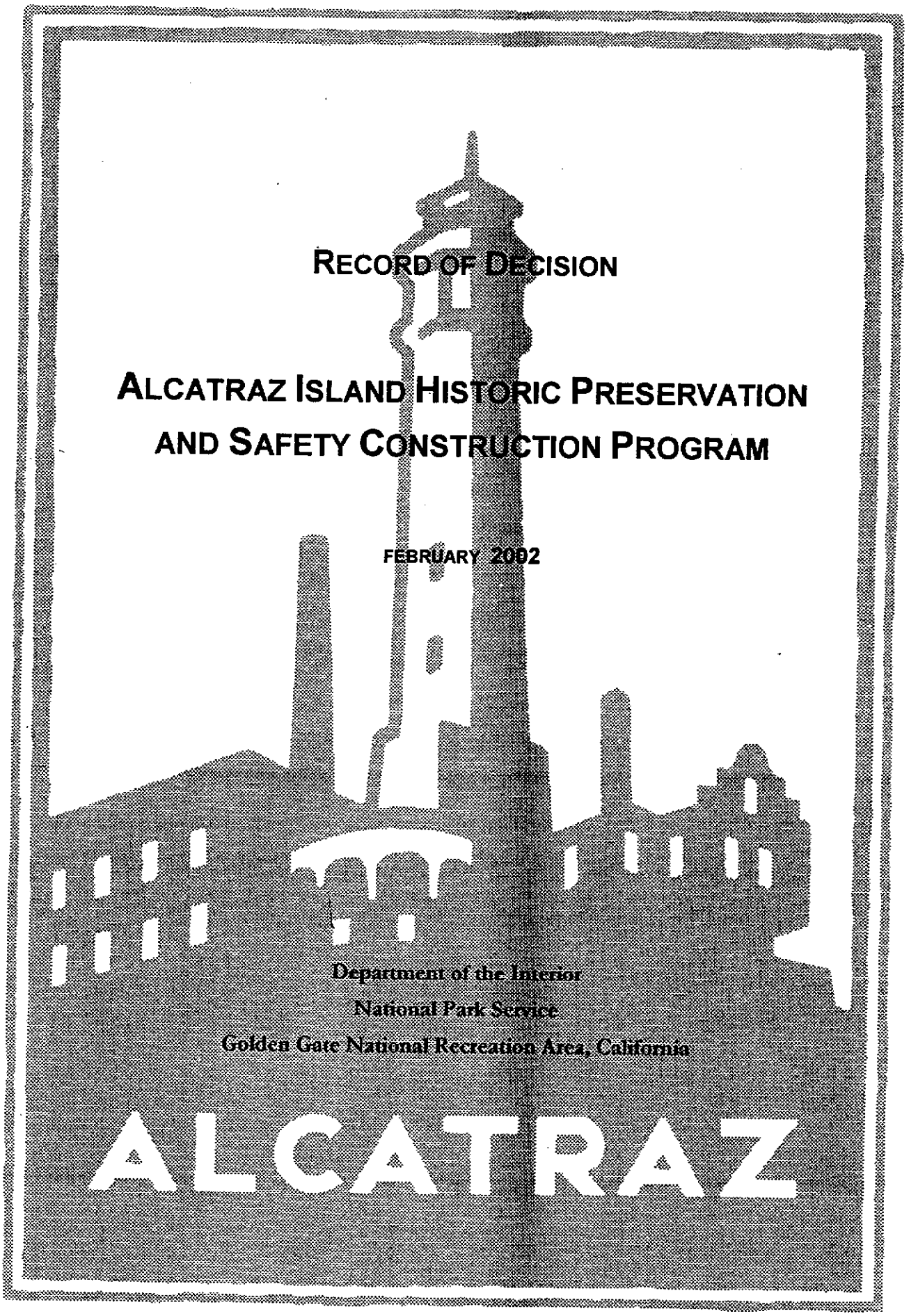
Oral Comments Taken from Public Meetings

Organization – National Parks Conservation Association (Stephen Krefting)	
5-A	**Comment**: The text may be incorrect in stating that none of the bird species on the Island are listed, as the Brandt's Cormorant is a state-listed species.
	Response: The California Natural Diversity Database list of Special Animals, January 2001, identifies the Double-crested Cormorant as a California species of special concern at rookery sites. Double-crested cormorants roost, but do not breed on Alcatraz Island. Brandt's cormorants have no special state or federal status.
5-B	**Comment**: Disagrees with the statement in the DEIS regarding the 5 month non-breeding season being the worst weather during the year. Believes that three of these five months are some of the best construction periods of the year.
	Response: Wet weather causes delays and affects the ability of construction crews to operate. Equipment is more challenging to operate, health and safety concerns increase, stormwater must be appropriately handled, and material protection become increasingly important. The winter often includes rough conditions on San Francisco Bay and may limit the ability of barge access. Summer in San Francisco does not include these conditions and is thus a more desirable construction period.

RECORD OF DECISION

ALCATRAZ ISLAND HISTORIC PRESERVATION AND SAFETY CONSTRUCTION PROGRAM

FEBRUARY 2002



Department of the Interior
National Park Service
Golden Gate National Recreation Area, California

United States Department of the Interior

NATIONAL PARK SERVICE
Pacific West Regional Office
1111 Jackson Street, Suite 700
Oakland, California 94607
(510) 817-1300

IN REPLY REFER TO:

L7617 (PGSO-PP)

MAR 1 2002

Memorandum

To: Chief, Administrative Services Division, National Park Service
ATTN: Federal Register Coordinator

From: Regional Director, Pacific West Region

Subject: Notice of Approved Record of Decision for Final Environmental Impact Statement for Alcatraz Island Historic Preservation and Safety Contruction, Golden Gate National Recreation Area

Attached are the original and three copies of the subject Notice for publication in the *Federal Register*. Also attached is a DI-1 to cover charges for the Notice, a diskette of the file, and a cover memorandum to the Director, Office of Federal Register, certifying this diskette is a true copy--as well as a Briefing Sheet highlighting status since the last publication.

Timely notification of the projected date when the Notice will be published would be greatly appreciated. Our contact is Regional Environmental Coordinator Alan Schmierer, who can be reached at (510) 817-1441.

John J. Reynolds

Attachments:8

CC w/atch:
GOGA-Supt
WASO-EQ
PWR-C

U.S. DEPARTMENT OF THE INTERIOR

NATIONAL PARK SERVICE

FINAL ENVIRONMENTAL IMPACT STATEMENT

ALCATRAZ ISLAND HISTORIC PRESERVATION AND SAFETY CONSTRUCTION

GOLDEN GATE NATIONAL RECREATION AREA, CALIFORNIA

NOTICE OF APPROVAL OF RECORD OF DECISION

Summary: Pursuant to §102(2)(C) of the National Environmental Policy Act of 1969 (P.L.91-190, as amended) and the regulations promulgated by the Council on Environmental Quality (40 CFR Part 1505.2), the Department of the Interior, National Park Service has prepared and approved a Record of Decision for the Final Environmental Impact Statement for the Alcatraz Island Historic Preservation and Safety Construction Program, Golden Gate National Recreation Area. The no-action period was initiated October 26, 2001, with the U.S. Environmental Protection Agency's Federal Register (V66, N208, P54241) notification of the filing of the Final Environmental Impact Statement (FEIS).

Decision: As soon as practical the National Park Service will begin to implement the historic preservation and safety construction program described as the *Proposed Action* alternative contained in the FEIS, issued in October, 2001. This alternative was deemed to be the "environmentally preferred" alternative, and it was further determined that implementation of the selected actions will not constitute an impairment of park values or resources. This course of action and two additional alternatives were identified and analyzed in the Final and Draft Environmental Impact Statements (the latter was distributed in March, 2001). The full range of foreseeable environmental consequences were assessed, and appropriate mitigation measures identified.

Copies: Interested parties desiring to review the Record of Decision may obtain a copy by contacting the Superintendent, Golden Gate National Recreation Area, Building 201, Fort Mason, San Francisco, CA 94123; or via telephone request at (415) 561-4936.

Signed:

John J. Reynolds

Regional Director, Pacific West Region

2.25.02

Date

NOTICE BRIEFING STATEMENT

Unit: Golden Gate National Recreation Area (GOGA)

Title: Notice of Approved Record of Decision (ROD), Alcatraz Island Historic Preservation and Safety Construction Program

Congressional Districts:

California:	8th District	Nancy Pelosi
	U.S. Senate	Diane Feinstein
	U.S. Senate	Barbara Boxer

Alcatraz Island is one of Golden Gate National Recreation Area's most popular destinations, offering a close-up look at a historic and infamous federal prison long off-limits to the public. Visitors to the island in San Francisco Bay can explore the remnants of the prison, learn about the Native American occupation of 1969 - 1971, early military fortifications, and the West Coast's first (and oldest operating) lighthouse.

Project Description

The project is comprised of ten repair and construction projects on Alcatraz Island, designed to seismically upgrade and restore the historic structures on "the rock". These structures are badly in need of repair in order to retain safe public access for visitors to Alcatraz and preserve the National Historic Landmark. The construction will take approximately 5 to 7 years and is consistent with the visitor use and operational characteristics of the Island as identified in the General Management Plan. The project includes repair of the dock, rehabilitation of the cellhouse, stabilization of the Water Tower, and the restoration of other prominent structures on Alcatraz.

Purpose of the Project

The purpose of the project is to protect public health and safety and to stabilize Alcatraz Island's National Historic Landmark structures against further deterioration. The need for the repairs was documented through a series of structural assessments recently completed for the majority of the buildings. The conclusions of these studies raised serious concern over both the potential loss of integrity of the historic structures comprising the National Historic Landmark and the safety of the more than 1.4 million people who visit the Island each year.

Process

Consistent with the requirements of the National Environmental Policy Act (NEPA) and Section 1506.6 of the Council on Environmental Quality's Regulations implementing NEPA, public comment was an integral part of the preparation of the plan, its goals and objectives, and the mitigation measures presented in the FEIS. A Notice of Intent (NOI) was published in the Federal Register on December 10, 1998 announcing the decision to prepare an EIS and solicit early input on the scope and range of issues to be analyzed. A public open house, Golden Gate National Recreation Area (GGNRA) Advisory Committee briefings, and site visits were held with representatives from environmental groups, historic preservation groups, and concerned individuals identified through initial scoping. The scoping comments received focused on concerns related to biological effects of the proposed construction activities, mitigation

measures, and approaches for impact analysis.

The Draft Environmental Impact Statement (DEIS) for the Alcatraz Island Historic Preservation and Safety Program was released for public comment in March 2001, for a 60-day public review period that ended on June 11, 2001. The DEIS was mailed to interested parties, agencies, businesses, and organizations, and distributed to state agencies through the California State Clearinghouse. In addition, the DEIS was presented at two public meetings of the GGNRA Advisory Commission. The repair and construction work specific to the Cellhouse and Building 64, in the first phase of the Proposed Action, was also presented and has been approved by the NPS Development Advisory Board (DAB).

During the public review period for the DEIS, 15 responses were received including nine letters and verbal comments. The National Park Service reviewed and responded to substantive comments in the FEIS, which was release in October 2001. Comments and the agency's responses to those comments are in Appendix D of the FEIS. Additional analysis of issues of concern and new and/or more refined mitigation measures were developed and included in the FEIS in response to public review and comment.

A staff report on the FEIS, including a summary of the comments received and responses, was presented at a public meeting of the GGNRA Advisory Commission on July 24, 2001. The Commission passed a motion to accept the report. Following release of the FEIS, the NPS has not received any written public comments.

Issues

- Potential impacts to nesting non-listed waterbirds from construction activities. The FEIS includes mitigation measures to reduce potential impacts to waterbirds, including phasing of construction activities to avoid nesting season, installation of screens and barriers, and an Adaptive Management Plan to monitor construction and adapt mitigation.
- Support was expressed by historic preservation groups for the proposed action, noting that it would have a substantial, long-term, beneficial effect on cultural resources by providing for the stabilization and restoration of the Island's unique historic structures that contribute to the National Historic Landmark, protecting this resource from long-term impairment.
- Removal of hazardous materials and waste generated from project activities. The GGNRA provided detailed information in the FEIS concerning the sampling, identification, and removal of hazardous substances that may be encountered during construction.

Contacts: John Reynolds, Regional Director, Pacific West Region, (510) 817-1301
Brian O'Neill, Superintendent, Golden Gate National Recreation Area, (415) 561-4720
Jonathan Gervais, NEPA Project Manager, Golden Gate National Recreation Area, (415) 561-4936

UNITED STATES DEPARTMENT OF THE INTERIOR
NATIONAL PARK SERVICE

RECORD OF DECISION

ALCATRAZ ISLAND HISTORIC PRESERVATION AND SAFETY CONSTRUCTION PROGRAM AND FINAL ENVIRONMENTAL IMPACT STATEMENT

GOLDEN GATE NATIONAL RECREATION AREA

INTRODUCTION

Pursuant to §102 (2)(C) of the National Environmental Policy Act of 1969, Public Law 91-190, as amended, and the regulations promulgated by the Council on Environmental Quality (40 CRF 1505.2), the Department of the Interior, National Park Service (NPS) has prepared the following Record of Decision on the *Alcatraz Island Historic Preservation and Safety Construction Program Final Environmental Impact Statement* (FEIS).

This document is a concise statement of the decisions that were made, the alternatives considered (including identification of the environmentally preferred alternative), the basis for the decision, and the mitigating measures developed in order to avoid or minimize environmental impacts. It also provides background information on the project and the public involvement process that was employed to develop and refine the proposed plan and alternatives.

DECISION

The NPS will implement the Proposed Action that includes ten repair and construction projects designed to protect public health and safety and stabilize Alcatraz Island's National Historic Landmark structures against further deterioration in a manner that protects and preserves the natural resources on the Island. The construction is scheduled to take approximately 5 to 7 years and will not change the visitor use or operational characteristics of the Island. The project includes repair of the dock that provides the only access to the Island for visitors and staff, rehabilitation of the cellhouse, stabilization of the Water Tower, and the restoration of other prominent structures on Alcatraz. Details of the Proposed Action are provided below in the Alternatives Considered section of this document.

BASIS FOR DECISION

This section provides the rationale for selecting the Proposed Action as the decision and the basis for the *Alcatraz Island Historic Preservation and Safety Construction Program.* In arriving at this decision, a detailed analysis of effects for the range of alternatives that would govern repair and construction activities on the Island was considered, including how each alternative responds to the purpose and need, improves existing conditions on the Island, and meets NPS management policies. Each alternative was evaluated for the degree that it protected park resources and values and their enjoyment by future generations and the potential for adverse impacts or impairment.

During the planning process, the NPS, working with the public, established goals and objectives that were used as a framework for evaluating alternate construction plans to rehabilitate and preserve structures and sites contributing to the Island's National Historic Landmark status. The goals and objectives were

developed based on NPS Management Policies 2001, the 1980 GGNRA General Management Plan and 1993 Alcatraz Development Concept Plan, public input, current knowledge about the Island, and an understanding of Alcatraz Island's national park values. The project objectives are presented in the Purpose and Need (Section 1.2) of the FEIS, and are as follows:

- Protect the safety and health of visitors and employees on the Island;
- Stabilize and preserve the Island's National Historic Landmark structures;
- Protect and preserve the Island's important biological resources during the implementation of needed repairs;
- Identify repair strategies that are economically feasible to implement, and;
- Assure proposed and approved actions will not impair park resources and values.

The basis of the decision to adopt the "Proposed Action" is its ability to successfully fulfill the goals and objectives of the project. The Proposed Action provides the most desirable combination of fulfilling the National Park mission: preserving the Island's resources for the enjoyment of future generations. The Reduced Project Alternative did not meet the criteria set forth because it lacked adequate protection for the historic resources located on Alcatraz.

The Proposed Action will preserve and enhance Alcatraz Island's cultural, natural, and recreational values and minimize environmental impacts. It includes:

- Protecting visitors and staff from potential health and safety risks associated with the deteriorating condition of buildings and structures;
- Preserving historic buildings and structures which contribute to the National Historic Landmark;
- Preserving and enhancing appropriate public uses including the continued access to historic structures on the Island which would be lost without the proposed rehabilitation and stabilization efforts;
- Mitigation measures to avoid or minimize environmental impacts associated with construction activity on natural resources including nesting waterbirds, cultural resources, and recreation and visitor use.
- NPS interpretation of the Historic Preservation and Safety Construction Program through interpretive programs, signing, and exhibits;
- Incorporating principles of sustainability in design, construction and operation of the site.

PROJECT BACKGROUND AND PUBLIC INVOLVEMENT

Project Purpose

Public Law 92-589 established the Golden Gate National Recreation Area in order to ". . . preserve for public use and enjoyment . . . outstanding natural, historic, scenic, and recreation values, and in order to provide for the maintenance of needed recreational open space necessary to urban environment and planning..." (16 usc 460bb). Alcatraz Island was originally included within the Golden Gate National Recreation Area because of

its historic significance. Recognition of the significant historic value of Alcatraz was reinforced in 1986 when the Island was designated a National Historic Landmark on the National Register of Historic Places.

When the National Park Service assumed the responsibility for the management of Alcatraz in 1972, the Island and its buildings were in need of substantial repair and stabilization. Although the NPS has attempted to maintain and stabilize these important historic resources comprising the National Historic Landmark, a significant lack of available funding has substantially constrained these efforts. Since the park's inception, the integrity of the historic structures has continued to deteriorate, creating public health and safety concerns and requiring that large areas of the Island remain closed to the visiting public. The benign neglect of the historic resource coupled with the limited access has resulted in the Island's evolution into a major waterbird-nesting site.

In 1993, the National Park Service developed the Alcatraz Development Concept Plan (DCP) as an amendment to the 1980 General Management Plan. The DCP establishes the framework for future actions on Alcatraz that are consistent with the NPS mission, federal law, and responsibilities to provide public access, while preserving natural and cultural resources. As such, the DCP recognized the need to implement repair and stabilization projects in order to protect historic resources, and provide for visitor safety. The Environmental Assessment/Finding of No Significant Impact (EA/FONSI) for the DCP evaluated the effects of construction and rehabilitation actions and identified protective measures such as limiting work activities during the waterbird breeding season to avoid or minimize potential adverse effects on the Island's biological resources. Since approval of the DCP and EA/FONSI, several conditions have changed, including the environmental conditions on the Island and the level and extent of repair activities needed to meet basic human health and safety requirements as well as historic preservation needs.

Since 1993, a series of structural analyses have been conducted for the Island's major structures. The studies raised serious concern over both the potential loss of integrity of the historic structures comprising the National Historic Landmark, and the safety of the more than one million people who visit the Island each year. These studies showed that a greater level of construction and repair than was previously assumed in the DCP would be needed to fulfill the NPS's obligations for resource protection, including compliance with the National Historic Preservation Act.

The structural condition assessments, along with the availability of funding, prompted the NPS to identify a comprehensive program of historic stabilization and life safety repairs on Alcatraz. Each project in the Alcatraz Historic Preservation and Safety Construction Program has a high priority for public safety and historic structure stabilization.

Given the small size of the Island, presence of important cultural and natural resources, and the growing demand for visitation, the NPS is seeking a balanced approach to the preservation of multiple resource values and, as mandated by the Service's Organic Act, to leave these resources and values unimpaired for future generations. The National Park Service must also comply with the requirement of the National Historic Preservation Act and thoroughly evaluate the effect of projects on historic properties. In keeping with these authorities, Section 1.2 of the FEIS states that the purpose of the program is to protect public health and safety and stabilize Alcatraz Island's National Historic Landmark structures against further deterioration.

Public Involvement

Consistent with the requirements of the National Environmental Policy Act (NEPA) and Section 1506.6 of the Council on Environmental Quality's Regulations implementing NEPA, public comment was an integral part of the preparation of the plan, its goals and objectives, and the mitigation measures presented in the FEIS. A Notice of Intent (NOI) was published in the Federal Register on December 10, 1998 announcing the decision to prepare an EIS and solicit early input on the scope and range of issues to be analyzed. A

public open house, Golden Gate National Recreation Area (GGNRA) Advisory Committee briefings, and site visits were held with representatives from environmental groups, historic preservation groups, and concerned individuals identified through initial scoping. The scoping comments received focused on concerns related to biological effects of the proposed construction activities, mitigation measures, and approaches for impact analysis.

The Draft Environmental Impact Statement (DEIS) for the Alcatraz Island Historic Preservation and Safety Program was released for public comment in March 2001, for a 60-day public review period that ended on June 11, 2001. The DEIS was mailed to interested parties, agencies, businesses, and organizations, and distributed to state agencies through the California State Clearinghouse. In addition, the DEIS was presented at two public meetings of the GGNRA Advisory Commission. The repair and construction work specific to the Cellhouse and Building 64, in the first phase of the Proposed Action, was also presented and has been approved by the NPS Development Advisory Board (DAB).

During the public review period for the DEIS, 15 responses were received including nine letters and verbal comments. The National Park Service reviewed and responded to substantive comments in the FEIS, which was release in October 2001. Comments and the agency's responses to those comments are in Appendix D of the FEIS. Additional analysis of issues of concern and new and/or more refined mitigation measures were developed and included in the FEIS in response to public review and comment.

A staff report on the FEIS, including a summary of the comments received and responses, was presented at a public meeting of the GGNRA Advisory Commission on July 24, 2001. The Commission passed a motion to accept the report. Following release of the FEIS, the NPS has not received any written public comments.

ALTERNATIVES CONSIDERED

A range of reasonable alternatives was developed to meet the purpose and need of the action, protecting public health and safety and stabilizing the Island's National Historic Landmark structures against further deterioration. Given this purpose and need, the NPS identified five objectives of the Alcatraz Historic Preservation and Safety Construction Program to evaluate and screen each alternative before it could be considered a reasonable alternative.

The FEIS fully examined three alternatives, a "No Action Alternative" and two action alternatives. The action alternatives analyzed in the FEIS were developed and refined through the two year public planning and environmental review process and include: the Proposed Action and the Reduced Project Alternative. Following are summaries of the three alternatives.

No Action Alternative (FEIS pp. 2-1 to 2-8)

Adopting this alternative would continue current management of Alcatraz Island. Under the No Action Alternative, the proposed construction activities identified in the Alcatraz Historic Preservation and Safety Construction Program would not be implemented. Minimal maintenance of the Island's cultural resources would occur, and current vegetation and wildlife management practices would continue. Threats to public health and safety would increase, leading to the closure of affected areas on the Island, and eventually precluding public and management access to the Island.

Proposed Action (FEIS pp. 2-8 to 2-24)

The Proposed Action is a construction program designed to address serious public health and safety threats and stabilize important historic structures that contribute to the Island's National Historic Landmark status. The Proposed Action includes ten individual repair projects that would require, in total, approximately 5 to 7 years to complete. The repairs include replacement of badly deteriorated piles supporting the dock, the only visitor access point to the Island, seismic retrofit of the Cellhouse, and repair/stabilization of other historic structures, some dating from the Civil War era, to provide for public safety and historic preservation. The projects would be implemented in Phase One and a Subsequent Phase. Figure 2-1 provides the location of project sites on the Island, the staging areas, and potential barge sites for materials delivery. The following lists the projects included in the Proposed Action and Table 1 provides a description of repair and construction activities and an approximate duration of construction.

Phase One:

- Dock Repair; done
- Building 64 (Balconies Repair); done
- Cellhouse Stabilization and Seismic Upgrade; and ½ done
- Sallyport Structural Repair and Seismic Upgrade. the item project - ~~[illegible]~~ underbid

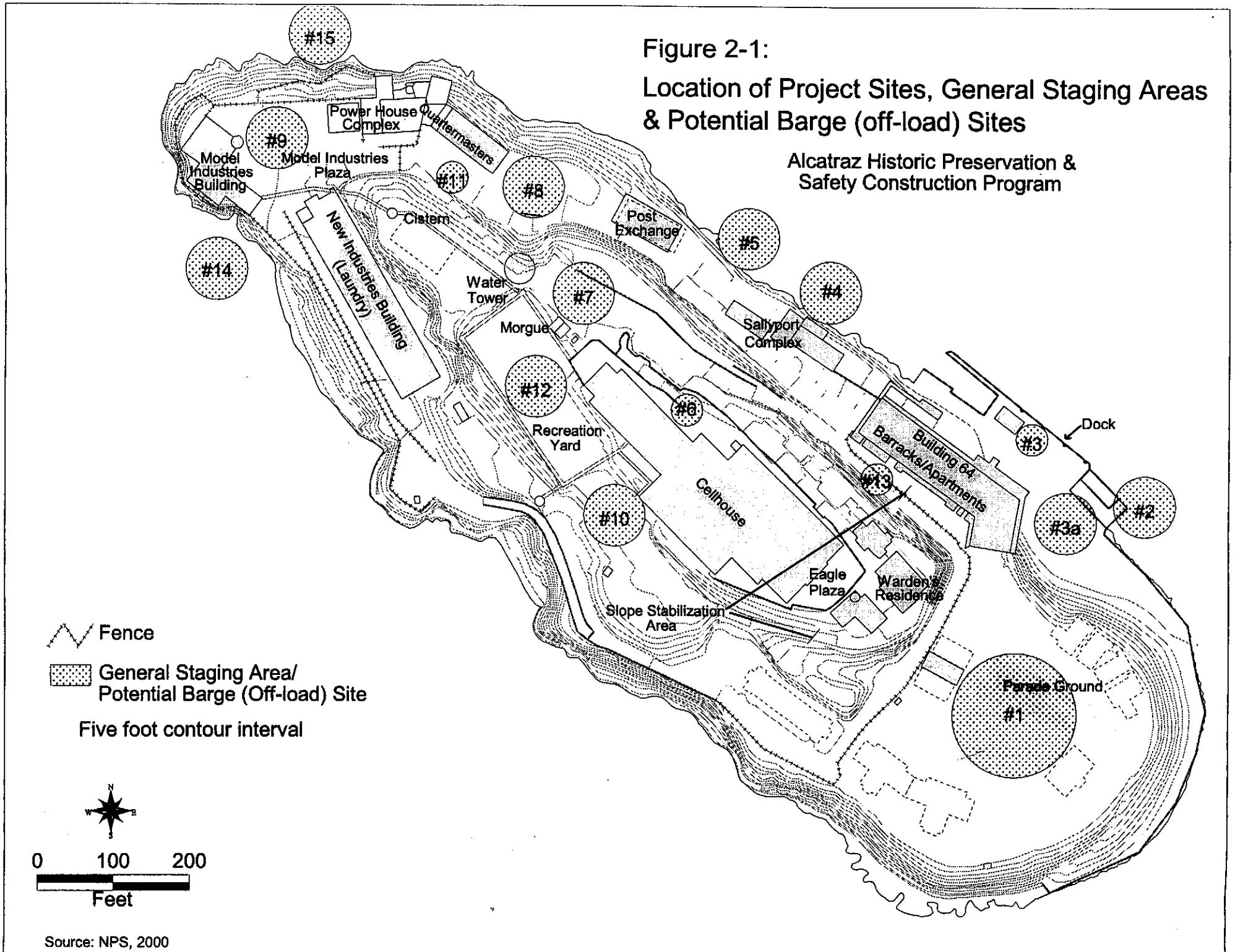
Subsequent Phase:

projects are done in order of priority: safety

- Water Tower Stabilization; } fee demo
- Slope Stabilization; } fee demo
- New Industries (Laundry) Building Stabilization and Seismic Upgrade;
- Building 64 (Seismic Upgrade);
- Quartermaster Building Stabilization and Seismic Upgrade; and
- Fuel Line Remediation.

The National Park Service proposes to implement the needed repair and construction projects using an adaptive management approach that will employ field monitors to evaluate and, if required, improve the mitigation measures identified in Section 2.7 of the FEIS and appended to this Record of Decision (Appendix A). Using an adaptive management approach, the NPS will evaluate the monitoring data collected during implementation of Phase One to alter and improve (as needed) the approach to completing projects and protective measures implemented during remaining activities under Phase One and Subsequent Phase. Appendix B in this Record of Decision contains a description of the monitoring program.

The National Park Service has identified a variety of mitigation measures to avoid or minimize the effects of the proposed construction and repair activities. These measures, along with the adaptive management approach to implementing the Proposed Action, will allow the park to achieve the most effective balance of resource preservation, while providing safe public access to Alcatraz Island.



Source: NPS, 2000

Table 1. Alcatraz Island Historic Preservation and Safety Construction Program[1]

Project Name	Summary of Proposed Repairs	Primary Equipment Needs	Staging Areas	Approximate Duration of Project
PHASE ONE				
Dock Repair	Repair members (piles) under concrete dock and seismically retrofit structure with steel tie-back into bedrock. Piles would be replaced from the topside of the dock.	Crane Jack hammer Cement/small batch mixer Air compressors Drill Saw cutting (concrete) Generator	Staging at 2, 3, and 3a; materials/equipment delivery at dock.	Up to fifteen months
Building 64 (Balconies Repair)	Repair spalling concrete, restore steel (rust removal and treatment), as needed, replace guard rails, and paint.	Crane/Lift Concrete mixer Pump truck Scaffolding Pneumatic chippers Sand blasting Saws Air compressor Paint sprayer Generator	Staging at 2, 3, and 3a; materials/equipment delivery at dock.	Up to six months
Cell House Stabilization & Seismic Upgrade	Repair spalling concrete on exterior walls and replace/repair windows as needed. Seismically retrofit structure to meet minimum life safety requirements. Seismic (interior) work would include installation of new shearwalls, collectors, wall base repair and new footings.	Concrete mixer/batch plant Crane Forklift/trucks Jack hammers Welding equipment Scaffolding (outside) Pneumatic chipping hammers Generators Air compressor Sand blaster Paint sprayer	Areas 2, 3, 5, 14 and 15 as possible barge/equipment off-load sites; 1, 6, 7, 8, 10, 11, 12, and 13 for storage of materials and equipment.	Eighteen months

[1]Projects are listed in basic order of priority/implementation, with the first three projects proposed for immediate implementation.

Project Name	Summary of Proposed Repairs	Primary Equipment Needs	Staging Areas	Approximate Duration of Project
Sally Port Structural Repair Seismic Upgrade	Tie end walls of chapel into bedrock and install plywood shear walls. Tie gun gallery floor to civil war era walls with angle iron. Install cross bracing in selected window openings. Remove wooden boathouse structure (from waterside/via barge).	Welding equipment Hammer drill Saws Generator Forklift Crane/Barge	Staging at 4 and potentially 2, 5, 14 or 15 for equipment/material delivery; 3, 3a, 8 and 11 for storage.	Six months
SUBSEQUENT PHASE				
Water Tower Stabilization	Replace damaged or missing steel members. Sand blast and paint tower.	Welding equipment Sandblasting equipment Painting equipment Crane Scaffolding	Staging at 7, 8, 9, or 11; materials/equipment delivery at 5, 14, or 15 and possibly 2.	Up to eight months although GGNRA will continue to look into possible ways to accomplish the project over two seasons or reduce the duration of the project to further decrease work during bird-nesting season
Slope Stabilization	Stabilize existing slope by installing steel ties into existing bedrock, and cover slope surface with shotcrete.	Shotcrete pump Cement mixer Generator Air compressor Large drills	Staging at 1 and possibly 13; materials/equipment delivery at 2 with possible use of 5 for transport to Parade Ground.	Up to eighteen months total (Phased over several years.)
New Industries (Laundry) Building Stabilization and Seismic Upgrade	Repair/replace exterior windows and spalling concrete, remove rock debris behind the building and stabilize slope, provide seismic upgrade.	Truck/forklift Concrete mixer Hammer drills Jack hammers Saws Concrete pump Scaffolding	Materials/equipment delivery at 5, 14 or 15. Staging/storage at 8, 9, and 11.	Six months
Building 64 (Seismic Upgrade)	Tie floor structures into the cliff/adjacent bedrock using steel beams and collector beams. Install shear walls, reinforce and strengthen interior walls and other seismic upgrades to meet minimum life safety requirements.	Crane Cement mixer Jack hammer Saws Hammer drill	Materials/equipment delivery at 2; storage/staging at 3, 3a, and 13. Possible staging at 1 during non-breeding season.	Up to eight months

Project Name	Summary of Proposed Repairs	Primary Equipment Needs	Staging Areas	Approximate Duration of Project
Quartermasters Stabilization and Seismic Upgrade	Install a shear wall and steel support to meet life safety requirements. Repair/replace exterior windows and doors, repair spalling concrete and paint exterior.	Truck/forklift Concrete mixer Hammer drills Saws Hammers Scaffolding Welding equipment	Materials/equipment at 5, 2, 14, or 15 (during non-breeding season only); staging at 8, 11, and 9 with 9 only used during non-breeding season.	Eight months
Fuel Line Remediation	Remove 6-inch and 4.5-inch inactive fuel lines.	Air compressors Fuel containment equipment Excavation equipment Generator Truck/forklift	Staging at 2, 3, 3a, 4, 5, 8, 10 and 12.	Up to eight months - with several phases (dependent on condition of existing fuel lines)

Reduced Project Alternative (FEIS pp. 2-24 to 2-25)

The Reduced Project Alternative includes repairs needed to protect human health and safety and stabilize cultural resources in areas of the Island that are currently open to visitors year-round. As a result, adverse historic and cultural resource impacts would be anticipated for several structures outside the currently open areas. Future impacts on visitor use and recreation may also occur.

In areas that are closed to visitors, only those repairs that can be accomplished during the five-month non-breeding season for waterbirds would be implemented. The repair and stabilization of the Water Tower, the New Industries Building (Laundry), and the Quartermaster Building on the north end of the Island, located in or near biologically sensitive areas would be minimal. Replacement of missing steel supports of the Water Tower would occur under this alternative for the protection of public health and safety because without rehabilitation, the structure will eventually fail. However, sand blasting and repainting to protect the water tower against future corrosion would not occur under this alternative because of cost and engineering problems with conducting this work in the rainy season. Repairs to the New Industries Building (Laundry) within a five-month waterbird non-breeding season would be limited to replacement and repair of exterior windows, partial repair of spalling concrete and steel, removal of rock fall material and installation of drainage at the quarry wall, and minor seismic upgrades. Repair of exterior windows and doors, and repair of spalling exterior concrete on the Quartermaster Building could be accomplished under this alternative. Because the time for construction activity is limited under this alternative, partial installation of steel trusses, new steel plates and new concrete foundation at the east wall could be accomplished. However, neither structure (Laundry Building and Quartermaster Building) would receive repairs necessary to make the buildings safe for long-term occupancy or visitation because limitations on the construction period present significant engineering and cost challenges.

Under the Reduced Project Alternative, repairs of the Dock, Building 64, Cellhouse, Sallyport, Slope, and the Fuel Line would be implemented as described under the Proposed Action (see Table 1). Each of these structures and facilities is located in or directly adjacent to areas that are currently heavily used by visitors on a year-round basis.

FINDINGS

The FEIS evaluated and disclosed the environmental effects of the actions summarized in this Record of Decision. The effects on park resources and values evaluated in the FEIS included the following:

Impacts on Biological Resources

Implementation of the proposed repair and construction activities will impact biological resources. Many of these effects would be minimized or avoided through mitigation as described in the FEIS and Appendix A of this document. The Proposed Action will have the greatest impacts on the eight species of breeding waterbirds that nest on the Island, with impacts varying by project location. The most substantial effects may include increased predation, potential reduction in the reproductive success of a particular species/subcolony, and in the most extreme cases the temporary or possibly long-term abandonment of individual subcolonies. No complete abandonment (i.e., an entire population of an individual species of birds nesting on Alcatraz) and no impairment of biological resources will occur as a result of the Proposed Action. The NPS will employ a variety of protective measures and use of adaptive management to ensure the intensity and duration of potential impacts is reduced wherever feasible. If through ongoing monitoring, it is determined that additional impacts (beyond those disclosed in the FEIS) occur, the NPS would take corrective actions to reduce the level of impact to at or below the level described in the FEIS or initiate supplemental NEPA analysis to address those impacts.

In addition to waterbirds, the Proposed Action will result in negligible impacts to Monarch butterflies and use of barging areas 14 and 15 may result in minor adverse effects on marine mammals. Pile replacement during dock repair may result in minor impacts to pacific herring by disturbing spawning habitat. However, work is proposed outside the spawning season to reduce these effects. Construction activities may temporarily disturb small areas of habitat for songbirds, mallards, and the California Slender Salamander, and displace other animals, such as deer mice and banana slugs, to similar habitats elsewhere on the Island resulting in minor impacts to these species. The Proposed Action may disturb San Francisco Campion habitat, a federal species of special concern. Construction areas will be surveyed and plants will be flagged and avoided. However, if plants cannot be avoided, they would be transplanted to another suitable location on the Island as described in Appendix A. The potential for minor adverse effects to special status bats exists from noise and activity during construction at the Sallyport, Building 64, and Quartermaster building. Surveys for bat habitat will occur prior to construction and mitigation measures in Appendix A describe measures to reduce effects.

Impacts on Cultural Resources

The Proposed Action will correct adverse effects to historic structures contributing to the National Historic Landmark District by preventing structural failure due to deterioration or seismic activity and repairing spalling concrete and other hazards. The Proposed Action will have a substantial, long-term, beneficial effect on cultural resources by stabilizing historic structures and protecting the resource from potential impairment.

Impacts on Visitor Use

The construction activities will result in temporary visitor use impacts, including increased noise, visual intrusion, and closure of work areas during construction. Following implementation, the Proposed Action will result in long-term major beneficial effect on the recreational and visitor use values on Alcatraz. Repairing critical health and safety hazards will allow the Island to remain open for visitor use, interpretation, and enjoyment by future generations.

Impacts on Air Quality

The Island is located within San Francisco County, designated a federal nonattainment area for ozone and a state nonattainment area for ozone and particulate matter (PM_{10}). In general, the location of Alcatraz allows for excellent air circulation, with very high quality air moving into the area from the Pacific Ocean. Construction emissions associated with the Proposed Action will be reduced by mitigation, yet will have minor, short-term, adverse effect on air quality.

Impacts Associated with Hazardous Substances: Human Health, Safety, and the Environment

Because structures on the Island were constructed prior to the banning of commercial use of lead-based paint and asbestos production, Alcatraz Island structures are assumed to contain these hazardous substances until proven otherwise. The National Park Service will conduct surveys and collect samples to identify, characterize, and quantify the nature of the hazardous substances present in work areas and evaluate if these substances will be disturbed by construction activity. Risks to human health, safety, and the environment may result from the potential release of hazardous substances during construction activities. The impacts associated with the Proposed Action are expected to be short-term and negligible to minor with the implementation of mitigation measures, including removal of hazardous substances prior to the start of work. Construction activities and cleanup plans will conform to applicable federal and state laws and regulations governing hazardous substances control and removal.

Impairment of Park Resources and Values

In addition to determining the environmental consequences of the Proposed Action and other alternatives, NPS Policy (Management Policies 2001) requires an analysis of potential effects to determine whether or not the Proposed Action will impair park resources. Implementation of the Proposed Action will not produce major, adverse impacts on park resources or values whose conservation is:

(1) Necessary to fulfill specific purposes identified in the establishing legislation of the park;

(2) Key to the natural or cultural integrity of the park or opportunities for enjoyment in the park; or

(3) Identified as a goal in the park's general management plan or other NPS planning documents.

Consequently, there will be no impairment of Alcatraz Island's resources or values.

MEASURES TO MINIMIZE HARM

During preparation of the Alcatraz Island Historic Preservation and Safety Construction Program, the NPS incorporated measures designed to minimize the adverse effects of construction activity associated with the Proposed Action. In response to public input on the DEIS, additional measures were developed and existing mitigation measures were refined to be more protective in the FEIS. Additional mitigation measures were incorporated into the FEIS as recommended by the public or other agencies, or were developed by the NPS in response to issues of concern. For example, based on comments from the Environmental Protection Agency, mitigation measures were added to reduce the adverse effects of hazardous substances that may be encountered during construction. In total, more than 70 mitigation measures have been identified and are included in the FEIS. The full text of the FEIS mitigation measures (Section 2.7) is hereby incorporated by reference and is appended in table format to this Record of Decision (Appendix A).

Consistent with, and expanding on the mitigation measures identified in Appendix A, the NPS is committed to implementing a program to monitor the success of mitigation measures in reducing the effects of construction activities. Employment of an Adaptive Management Plan will allow the NPS to gain experience and knowledge from the monitoring program, make adjustments to mitigation measures, and identify actions to reduce impacts. The full text of the FEIS monitoring program (FEIS Appendix B) is hereby incorporated by reference and is appended to this Record of Decision (Appendix B). The National Park Service is specifically committed to continuing communications with the local conservation groups such as the Golden Gate and Marin chapters of the Audubon Society and other interested parties to further exchange of information pertaining to the results of monitoring and the Adaptive Management Plan.

All practical means have been adopted to avoid or minimize environmental effects from the Proposed Action. As part of the mitigation, the NPS is committed to monitoring construction activities, improving identified mitigations, and scheduling construction to the greatest extent feasible to avoid impacts.

CHANGES TO THE FEIS

After receiving public comment on the DEIS, the NPS made changes to the text of the FEIS. Two types of changes were made: the first were editorial changes that served to correct punctuation, formatting, and phrasing to make the document easier to read; the second were changes to the substance of the text that reflected issues brought up by the public and agency review of the DEIS. The following describes the substantive changes made in the FEIS.

- A Hazardous Substances analysis was added to the document in response to comments from the Environmental Protection Agency (EPA). The potential for encountering asbestos, lead paint, and PCBs during the construction work was analyzed and mitigation measures were added to ensure that workers and the public are protected from exposure.

- The document was updated based on the results of the permitting process that occurred during the time period between the DEIS and the FEIS, including the addition of Appendix E (Dock Consultation Letters). An evaluation of the in-water dock repair activities by the National Marine Fisheries Service determined that the action would not likely adversely affect listed salmonids or designated critical habitat, and no long-term impacts to Essential Fish Habitat would be anticipated. NPS received authorization from the U.S. Army Corps of Engineers (USACE) under Section 404 of the Clean Water Act and Section 10 of the Rivers and Harbors Act, a consistency determination from the San Francisco Bay Conservation and Development Commission, and authorization from the Regional Water Quality Control Board.

- The text of the Mitigation Measures for the Pacific Herring (page 2-32 to 2-33) was changed in response to public comment. The acquisition of a U.S. Army Corp of Engineers (USACE) permit was removed as mitigation. It was thought the permit would contain specific measures to protect spawning Herring, however the permit did not and the acquisition of a permit does not constitute mitigation.

ENVIRONMENTALLY PREFERRED ALTERNATIVE

The environmentally preferred alternative is defined as the alternative(s) that best meet the criteria set out in Section 101 of the National Environmental Policy Act. The Council on Environmental Quality defines the environmentally preferred alternative as the alternative that "...causes the least damage to the biological and physical environment; it also means the alternative which best protects, preserves, and enhances historic, cultural, and natural resources" *(Forty Most Asked Questions Concerning Council on Environmental Quality's (CEQ) National Environmental Policy Act Regulations)*.

An evaluation of the alternatives suggests that arguments can be made for both the Proposed Action and the Reduced Project Alternative as the environmentally preferred alternative. The reduced project alternative protects the bird species from the construction impacts on three failing historic structures at the detriment of those structures. The Proposed Action, however, provides the greatest protection to arguably the most significant National Historic Landmark District in the GGNRA unit of the NPS. Therefore, the Proposed Action is identified as the environmentally preferred alternative. This meets an integral part of the environmentally preferred alternative guidelines that direct agencies to "preserve important historic, cultural, and natural aspects of our national heritage." It is not simply three historically significant structures that would be adversely effected, more importantly, the Landmark status of the Island, and integral component of our national heritage, would be lost. The Proposed Action also attains the widest range of beneficial uses of the environment, biological and historic preservation and visitor safety and enjoyment. Field monitoring and adaptive management, stringent breeding season and staging restrictions, rodent control, and habitat enhancement will lessen the potential impacts to breeding birds at the site and ensure modifications will be made should unforeseen impacts occur.

CONCLUSION

The above factors and consideration warrant implementing the final Alcatraz Island Historic Preservation and Safety Construction Program (identified as the Proposed Action in the DEIS and FEIS). The Proposed Action described in this Record of Decision provides the most effective method among the alternatives considered for rehabilitating and stabilizing structures on Alcatraz Island that contribute to the Island's National Historic Landmark Status while preserving natural resources and providing for public health and safety. The selection of the Proposed Action as reflected in the analysis contained in the environmental impact statement, would not result in the impairment of park resources and will allow the National Park Service to preserve park resources and provide for their enjoyment for future generations. The 30-day no action period ended November 26, 2001.

APPROVED: _____ DATE: 2.25.02

John J. Reynolds
Regional Director, Pacific West Region

RECOMMENDED: _____ DATE: 2-08-02

Brian O'Neill
Superintendent, Golden Gate National Recreation Area

APPENDIX A

ALCATRAZ HISTORIC PRESERVATION AND SAFETY CONSTRUCTION PROGRAM

MITIGATION MEASURES

Mitigation Measures

The National Park Service will implement the following measures to reduce or avoid the adverse environmental effects of the Proposed Action. These measures will be implemented as part of the Proposed Action for each project. Measures will be regularly evaluated and monitored by the NPS to determine their effectiveness. If monitoring observes impacts at or exceeding those described in Chapter 4 of the FEIS, the mitigation measures can be adapted, modified, or expanded based on situations that arise, to reduce those impacts. Using an adaptive management approach, the NPS will evaluate the monitoring data collected during implementation of Phase One to alter and improve (as needed) the approach to completing projects and protective measures implemented during remaining activities under Phase One and Subsequent Phase.

The NPS will have the primary and full responsibility for coordinating the specific elements of each mitigation measure, including those that involve cooperation or approval of other agencies. The NPS would be responsible also for ensuring that each mitigation measure has been implemented as specified in the document.

Mitigation Measures Included As Part of the Proposed Action (taken from FEIS text pages 2-32 to 2-48)

Topic	Project	Mitigation	Permits/Compliance /Consultation	Responsible Party
BIOLOGICAL RESOURCES				
Pacific Herring	**Dock Repair**	1. A monitor and possible work stoppage for spawning herring: or 2. Measures to protect spawning herring from entering the construction area, such as silt curtains. 3. A false bottom would be constructed beneath the deck to act a debris catch reducing the potential for materials entering the water.	An evaluation of the in-water dock repair activities by the National Marine Fisheries Service determined that the action would not likely adversely affect listed salmonids or designated critical habitat, and no long-term impacts to Essential Fish Habitat would be anticipated NPS received authorization from the U.S. Army Corps of Engineers (USACE) under Section 404 of the Clean Water Act and Section 10 of the Rivers and Harbors Act NPS received a consistency determination from the San Francisco Bay Conservation and Development Commission NPS received authorization from the Regional Water Quality Control Board	Implemented by the National Park Service and contractor to ensure protection during herring spawning season.

Topic	Project	Mitigation	Permits/Compliance /Consultation	Responsible Party
Marine Mammals	**General**	1. Staging area #14 will only be used at tide heights greater than +2.5 feet msl to avoid disturbance to harbor seals hauled out on Little Alcatraz off the northwest end of Alcatraz Island. 2. A monitoring program would be implemented to document use patterns at California sea lion haul-out below the north foghorn adjacent to the Model Industries Building. If it is determined that the north foghorn haul-out is used on a regular basis, the NPS would take appropriate measures to reduce the potential effects on marine mammals. The NPS may also choose to remove from use barge on- off-load area #15 under the Proposed Action.		National Park Service
Waterbirds (General Measures)	**Staging/Barge Off-Loading Area Use**			
		1. Use of the staging/barge off-loading areas from February 15 through August 15 would be in compliance with the following measures (see Figure 2-1 for location):		National Park Service
		Area #1: No access February 15 through August 15. Only storage would be allowed until all young in the area have fledged.		Storage area limits would be defined and approved on-site by the National Park Service biologist prior to breeding season use.
		Area #2: No nighttime use (defined as a half-hour after sunset and a half-hour before sunrise). Crane use in this area would not be visible from the Parade Ground (i.e., crane height must be lower than the adjacent cliff; visual screens must be used; or other methods must be employed to avoid visual intrusion at the Parade Ground).		National Park Service
		Area #3: If nighttime use were necessary, lighting would be directed toward the work areas only and appropriately shielded.		Lighting placement would be reviewed and approved by a National Park Service biologist and maintenance staff during initial staging operations.
		Area #3a:No nighttime use. Gull exclusion measures to prevent gull nesting would be implemented in this area to reduce conflicts between staging activities and nesting, if necessary.		National Park Service

Topic	Project	Mitigation	Permits/Compliance /Consultation	Responsible Party
		Area #4: No nighttime use.		National Park Service
		Area #5: No nighttime use. Use from February 15 through August 15 would be monitored, and could be further restricted in subsequent years during a portion of the peak sensitivity periods for black-crowned night-herons and western gulls (approximately April through June) if deemed necessary based on monitoring. Gull exclusion measures to prevent gull nesting may also be implemented in this area to reduce barge off-loading and nesting conflicts, if necessary.		National Park Service
		Area #6: Prior to use, the site would be inspected by a National Park Service biologist. Up to three night-heron nests have occurred in this area in the past. If nests were found, protective screening would be installed.		National Park Service
		Area #7: No nighttime use. A temporary visual barrier would be required along the northeastern periphery of the site to prevent visual intrusion into the cistern area. The barrier would be reviewed and approved by a National Park Service biologist and would be installed prior to the start of the breeding season.		Staging area limits would be defined and approved on site by the National Park Service biologist prior to breeding season use.
	windows	Area #8: If nighttime use were proposed, lighting would be directed toward the work area only and appropriately shielded.		Lighting placement would be reviewed and approved by a National Park Service biologist and maintenance staff during initial staging operations.
	windows	Area #9: No access during breeding season, from February 15 until all young in the area have fledged, including the cliffs below the Model Industries and Laundry Buildings, potentially until September 15.		Storage area limits would be defined and approved on site by the National Park Service biologist prior to breeding season use.
		Area #10: No nighttime use. Access and construction work from February 15 through August 15 would be limited to those activities that would be accomplished behind screening materials (installed prior to the start of the breeding season).		Screening materials would be reviewed and approved by the National Park Service.
	windows	Area #11: No nighttime use. Staging area limits and the need for gull exclusion measures to prevent gull nesting would be determined by the National Park Service biologist prior to initial staging operations.		National Park Service

Topic	Project	Mitigation	Permits/Compliance /Consultation	Responsible Party
		Area #12: No nighttime use. No crane use to transport materials into staging area #12 (Recreation Yard) would be allowed during breeding season. All equipment and materials must be contained within the walls of the yard and cannot be visible from outside ground level locations.		National Park Service
		Area #13: No visual intrusion into the Parade Ground. The southeastern boundary of the site would be delineated by a National Park Service biologist prior to arrival of materials. A temporary visual barrier would be required at the entrance to the Parade Ground to prevent visual intrusion onto the Parade Ground. Gull exclusion measures may also be required behind building 64 and on the adjacent slope to prevent gull nesting in the area.		The barrier would be reviewed and approved by the National Park Service biologist and would be installed prior to March 1.
		Area #14: No access from February 15 to approximately September 15.		National Park Service
		Area #15: No access from February 15 to approximately September 15.		National Park Service
		2. General Condition: Movement of equipment and materials to and from staging areas from February 15 through August 15 would be restricted to daylight hours to prevent moving lights (i.e., headlights) from disturbing sensitive areas. Nighttime construction would be allowed in interior spaces and some exterior spaces (in compliance with the mitigation measures throughout this section).		National Park Service
	Other General Measures	**These measures would apply to all construction activities occurring during the waterbird breeding season (February 15 to August 15)**		
		3. Transport of materials to the Island by helicopter would be prohibited during the waterbird-breeding season from February 15 until young have fledged (usually early September).		National Park Service
	windows?	4. Night lighting for construction activities (in authorized areas) would be reduced to the minimum amount necessary to complete work, and it would be shielded and directed downward.		The placement, intensity and direction of nighttime lighting would be reviewed and approved by a National Park Service wildlife biologist and maintenance staff during initial staging operations.

Topic	Project	Mitigation	Permits/Compliance /Consultation	Responsible Party
		5. All construction workers would be provided with information on the biological resources of the Island, and the required mitigation measures. In addition, all construction workers would be required to attend an orientation on the sensitivity of the Island's natural resources and the requirements and mitigations to be implemented for resource protection. Attendance will also be required at periodic natural resource briefings throughout the breeding season.		The required mitigation measures would be included in the construction contract documents and would be a binding requirement, and enforcement would be monitored by National Park Service staff through regular inspections by a qualified biologist and contract inspector.
		6. Prior to implementation of each construction project, restricted areas would be identified and mapped by National Park Service staff. These areas would be delineated with input from resource specialists, interpretive, and maintenance/project management staff to ensure resource protection as well as adequate access for construction and Island operations. The areas would be clearly marked with temporary fencing or other signage prior to the arrival of materials and equipment.		Enforcement of restricted areas (as a contractual requirement) will be done by the construction crew with monitoring by National Park Service staff
		Habitat Enhancement		
		7. Appropriate vegetation would be planted and established on the rubble piles on the southwestern side of the Parade Ground during Phase One to enhance and potentially expand black-crowned night-heron nesting habitat in an area more remote from construction activities associated with the Proposed Action.		National Park Service
Waterbirds (Project Specific Measures)				
	Dock Repair	1. Pile replacement along the southeast side of Building 64 would occur August 15 through February 15. Other pile replacement and seismic stabilization would be allowed year-round, in compliance with other general measures.		National Park Service

Topic	Project	Mitigation	Permits/Compliance /Consultation	Responsible Party
	Building 64 (Balconies repair)	2. Construction on the southeast side of building 64 would occur during the non-breeding season (August 15 through February 15), or in compliance with the following measures. Exterior work on the southeastern side of the building could be completed during the breeding provided that a temporary visual barrier (i.e., dense netting) be installed to enclose the scaffolding/work area prior to the start of the breeding season. Work along the eastern side of the building could be completed during the waterbird-breeding season.		The placement and type of barrier would be reviewed and approved by a National Park Service biologist.
		3. Netting or other exclusion devices would be installed prior to nesting to prevent western gulls from nesting on the balconies (i.e., within the immediate repair area) of the building.		National Park Service
	Cellhouse Stabilization and Seismic Upgrade	4. Exterior work on the western side of the building could be completed during the breeding season provided that a temporary visual barrier (i.e., dense netting) be installed to enclose the scaffolding/work area prior to the start of the breeding season (February 15 through August 15). All other exterior work could be implemented on a year-round basis, except as noted in the mitigation measures below. There will be no nighttime exterior work on the western side of the building and no exterior lighting during the breeding season.		The placement and type of barrier would be reviewed and approved by a National Park Service biologist.
		5. Nighttime work along the exterior southern wall (Eagle Plaza) during the breeding season would be subject to the night lighting/shielding requirements to prevent illuminating the Parade Ground, as described under "General Condition."		National Park Service
		6. Any work requiring access to, or work on, the Cellhouse roof would be restricted during breeding season to portions of the roof where activities would not be visible to the cormorant colonies along the western cliffs of the island or as adequately screened from those areas.		The work area limits and method of delineating them would be reviewed and approved by the National Park Service biologist prior to work on the Cellhouse roof.
	Sallyport Structural Upgrade	7. Prior to the breeding season, netting or other exclusion devices would be installed on the northeast perimeter trail below the Sallyport to prevent western gulls from nesting within the construction area.		National Park Service

Topic	Project	Mitigation	Permits/Compliance /Consultation	Responsible Party
		8. No exterior nighttime construction during the breeding season (February 15 through August 15).		National Park Service
	Water Tower Stabilization	9. The Water Tower Stabilization project would be completed within the non-breeding season or phased to avoid the waterbird-breeding season to the greatest degree feasible. If, based on future structural evaluations of the tower, complete avoidance of construction during the breeding season is not feasible through phasing or by other means; then the following measures would be implemented to minimize impacts:		National Park Service
		Minimizing Construction Disturbance		
		10. Construction would be initiated in early August or later, and would conclude by mid-March (which provides the eight-month maximum window anticipated for this project).		National Park Service
		11. Only daytime construction would be allowed during the breeding season (early August through mid- to late-September and during February and March). Screening to minimize visual intrusion into the cistern area would be implemented.		Screening would be reviewed and approved by a National Park Service biologist prior to the start of the breeding season.
		12. Specialized resource sensitivity training would be required for construction crews (in addition to training described as a "General Condition.") This training would educate construction workers on how to minimize human-induced gull disturbance.		Implementation of these measures would be a binding requirement for construction contractor(s) and would be enforced by National Park Service staff
		Habitat Enhancement		
		13. Appropriate plantings or other shelter provisions would be provided prior to the start of breeding season in the cistern and Model Industries Plaza area to enhance reproductive success of western gulls. Reproductive success is generally lower in these exposed locations than on other parts of the Island		National Park Service
		14. Pigeon guillemot artificial nest boxes would be provided along the western cliffs of the Island in areas more remote from the project area to provide additional protection from potential elevated levels of human-induced gull and raven predation.		National Park Service

Topic	Project	Mitigation	Permits/Compliance /Consultation	Responsible Party
		15. In the event that impacts are greater than those predicted in Chapter 4, other artificial habitat (nest platforms) or social attraction measures (decoys and taped calls) may be implemented for Brandt's and pelagic cormorants, and pigeon guillemots (social attraction) on an experimental basis in less disturbed areas along the western cliffs and more remote from the project area.		National Park Service
		Enhanced Protection from Off-Island Disturbance		
		16. The National Park Service has been increasing public outreach and education to reduce water-based disturbance. To supplement this effort and provide further protection during the Water Tower stabilization project, additional protection from water-based disturbances would be implemented. These measures could include use of buoys to establish a closed area, focused outreach programs with relevant user groups, and increased enforcement activities.		National Park Service
	Slope Stabilization	17. The project would be phased over multiple years to avoid construction-related impacts on breeding waterbirds. No construction would be allowed for this project from February 15 through August 15 (to be verified by a National Park Service biologist the year the construction is proposed).		National Park Service
	New Industries (Laundry) Building	18. Exterior repair work at the New Industries (Laundry) Building would be prohibited during the waterbird-breeding season (February 15 to August 15 or as determined by the National Park Service biologist). No nighttime exterior construction would be allowed at any time of the year.		National Park Service
		Interior Repairs:		
		19. No nighttime construction would be allowed at any time of year to protect nesting and roosting seabirds along the western cliffs of the Island.		National Park Service
		20. Access to the New Industries (Laundry) Building for interior repairs during the breeding season would be through the tunnel via the Power House Complex for the lower level, and via the northern entrance for the upper floor. A pickup truck, electric forklift (or forklift with a muffler), or other small vehicle would be used to transport materials to the entrance on the northern side. Transport of large equipment/materials to and from the New Industries (Laundry) Building would be completed *outside* the waterbird-breeding season. Access to the southern entrance, of the Laundry, would be prohibited. A temporary visual barrier would be required between the access route to the New Industries (Laundry) Building and the Model Industries Plaza to minimize direct and indirect disturbance to breeding birds.		The barrier would be reviewed and approved by the National Park Service biologist and would be installed prior to the start of the breeding season.

Topic	Project	Mitigation	Permits/Compliance /Consultation	Responsible Party
		21. Prior to the waterbird breeding season, the exterior windows and doors on both floors of the northern, western and southern facing walls of the New Industries (Laundry) Building would either be repaired or replaced, or barriers would be provided to minimize noise and visual contact with breeding waterbirds on the cliffs below. If barriers are used (as an alternative to window repair/replacement), the design and placement shall be reviewed and approved by park resource specialists (biological and cultural). Complete visual barriers would only be needed in areas where construction or access is occurring that would be visible through the windows or doors (even if windows and doors are replaced). Biologists will require building access and ability to view through barriers for monitoring.		National Park Service
		22. Prior to the breeding season, temporary fencing would be installed to prevent access by construction crews to adjacent sensitive areas, including the Model Industries Plaza and the lower level outside of the New Industries (Laundry) Building. These areas would be delineated and restrictions enforced as described above under "General Condition."		National Park Service
		23. Specialized resource sensitivity training would be required for construction crews (in addition to training described as a "General Condition"). This training would educate construction workers on how to minimize human-induced gull disturbance and the importance of minimizing visual contact with nesting birds in the western cliffs below the work site.		Implementation of these measures would be a binding requirement for construction contractor(s) and would be enforced by National Park Service staff.
	Building 64 Seismic Retrofit	24. Exterior construction work would be scheduled from August 15 through February 15 to the greatest degree feasible, and no exterior work along the southern wall would be allowed. If exterior construction activities along the western wall cannot be phased to avoid the breeding season, such work would be screened from the Parade Ground. A temporary physical barrier would be placed at the southern limits of the walkway connecting to the Parade Ground to clearly define the allowable construction area, and provide screening (for light and visual intrusion).		The precise location of the barrier would be determined in consultation with the National Park Service maintenance/project management staff and resource specialists to ensure adequate access and resource protection.
		25. Prior to the breeding season, netting or other exclusion devices would be installed to prevent western gulls from nesting directly within the repair/construction area.		National Park Service

Topic	Project	Mitigation	Permits/Compliance /Consultation	Responsible Party
	Quartermaster Building	26. During the breeding season, exterior repair work would be allowed along the first floor of the western wall. Netting to preclude night-herons from nesting directly below the building could be installed prior to the start of the breeding season to allow exterior work along the southern wall during the breeding season. No other exterior work during the breeding season would be allowed. Nighttime construction at these locations would be allowed as described under "General" measures above. Interior repairs would be allowed year-round; however, prior to the waterbird breeding season exterior windows and openings would be repaired or replaced, or barriers would be provided to minimize noise, visual and light (if nighttime work is proposed) contact with breeding waterbirds in adjacent areas.		If netting were proposed, the location and placement would be reviewed and approved by a National Park Service biologist. If barriers were used, National Park Service resource specialists (biological and cultural) would review and approve the design and placement of these temporary features.
Rats	**General**	1. Bird-proof and tamper-proof rodent bait stations and traps would be maintained on barges and boats used for delivery of materials to the Island and at active staging areas to avoid transport of rats onto the Island. On-island traps would be designed and maintained in accordance with the National Park Service's Integrated Pest Management practices in order to minimize impacts to non-target species, and to avoid secondary poisoning to gulls, ravens, raptors, herons and egrets that may feed on dead or dying rodents.		National Park Service and Contractor
		2. As part of the construction crew awareness program described under the general waterbird mitigation measures, construction crews would be advised to discard all garbage, food wastes, and recyclable materials into garbage and recycling receptacles. Trashcans would be placed at each project site and in some cases at staging areas during construction. Trashcans would be emptied daily. Designated eating areas and rodent-proof storage containers would be utilized to prevent spread of rats on the Island.		National Park Service

Topic	Project	Mitigation	Permits/Compliance /Consultation	Responsible Party
Special-Status Biological Resources				
Plant Species	**Water Tower, Slope Stabilization, exterior work on the western wall of the Cellhouse project, and use of staging area #10**	1. Prior to commencement of construction activities, a focused survey for San Francisco campion would be conducted by qualified National Park Service personnel during the blooming season (typically early April). If no campion were found during surveys, no further mitigation would be required.		National Park Service
		2. If campion is found and can be avoided, the National Park Service would provide protective fencing around the population. At no time would fencing be moved to allow access of construction equipment to the population. Fencing would remain in place until construction is complete. Where avoidance is possible, signage would also be placed on the protective fence that identified the area as "RESTRICTED, Do Not Enter, This is a Protected Area."		National Park Service
		3. If avoidance were not possible, a qualified botanist would collect seeds (typically in May/June) from the population and establish plant material in an appropriate location on the Island. Seeds would be collected and plant material would be grown in the park's native plant nurseries. Seedlings would be planted in areas that are approved by a National Park Service botanist.		National Park Service

Topic	Project	Mitigation	Permits/Compliance /Consultation	Responsible Party
Bats	**Sallyport Structural Upgrade, Quartermaster Building Stabilization and Building 64 Seismic Retrofit projects**	Beginning at least one year prior to construction activities, bat surveys would be conducted at appropriate times of the year to determine if bats are utilizing these locations as roost sites. If special-status bat species are found during surveys, protective measures would be defined based on the species present, intensity of use, type of roost, etc., and would be developed consistent with the preservation of historic structures. Depending on the species and type of roost, such measures may include provisions for the ongoing use of the building by bats or the installation of alternative or replacement habitat at other locations on the Island.	The National Park Service would develop and implement appropriate mitigation measures in consultation with California Department of Fish and Game and regional bat experts	National Park Service
Fish and Essential Fish Habitat	**Dock Repair**	An evaluation of the in-water dock repair activities determined that the action would not likely adversely affect listed salmonids or designated critical habitat, and no long-term impacts to Essential Fish Habitat would be anticipated. The replacement pilings will be pre-cast concrete and the installation methods are sensitive to the marine environment.	Informal consultation with the National Marine Fisheries Service concurred with the not likely to affect determination (see FEIS Appendix E).	National Park Service
Waters of the United States	**Dock Repair**	Measures developed include the construction of a false bottom beneath the deck to act a debris catch reducing the potential for materials entering the water. The replacement piles would be constructed using a small amount of forced grout through the center of the pre-cast pile minimizing the potential for grout to contact seawater. In addition, the contractor will have a diver in place to ensure that forced grout is not being released into the bay. These protective measures would be included as conditions of the contractor's contract.	Prior to construction for the Dock Repair project, the National Park Service obtained authorization from the U.S. Army Corps of Engineers under Section 404 of the Clean Water Act and Section 10 of the Rivers and Harbors Act.	The National Park Service/contractor would implement measures.

Topic	Project	Mitigation	Permits/Compliance /Consultation	Responsible Party
CULTURAL RESOURCES				
Programmatic Agreement	**General**	In 1992, the National Park Service signed a Programmatic Agreement with the California State Historic Preservation Officer and the Advisory Council on Historic Preservation for operation and maintenance undertakings of the historic properties within Golden Gate National Recreation Area (NPS, 1992). Alcatraz Island is a part of the Golden Gate National Recreation Area and is included in this Programmatic Agreement. Rehabilitation of historic buildings or structures that is consistent with the Secretary of the Interior's Guidelines is covered by Stipulation D.II.i. (Rehabilitation of Historic Structures) in the Programmatic Agreement. Health and safety activities are covered by Stipulation D.II.j. in the Programmatic Agreement. Projects associated with the Proposed Action are covered by the Programmatic Agreement, with the exception of the Sallyport (as described in Chapter 4).	For the Sallyport stabilization, Section 106 (National Historic Preservation Act, amended) consultation will be initiated with the California State Historic Preservation Office and the Advisory Council on Historic Preservation outlined in the federal regulations 36 CFR Part 800. Sallyport stabilization may require removal of the Boathouse that was constructed during the period of significance, a Memorandum of Agreement among the agencies will be required to describe how the effects of the undertaking will be taken into account.	National Park Service
The Secretary of the Interior's Guidelines	**General**	The Secretary of the Interior's Standards for the Treatment of Historic Properties (36 CFR part 68) provides guidance for the protection of cultural resources. The Proposed Action would be consistent with the Secretary's Standards, with the exception of the Sallyport project, which would undergo additional reuse and compliance (see below).		National Park Service

Topic	Project	Mitigation	Permits/Compliance /Consultation	Responsible Party
Recordation to Historic American Buildings Survey (HABS) Standards	**General**	Prior to the demolition of the Boathouse at the Sallyport, the National Park Service would ensure that structure is recorded to Historic American Buildings Survey Standards. HABS recordation would provide information on the Boathouse using measured drawings, large format photographs, and written description and history prepared to archival standards.		National Park Service
Salvage of Historic Materials	**Dock Repair, Sallyport Boathouse Demolition, Fuel Line Remediation**	To minimize the loss of these historic materials, the National Park Service would determine if examples of the materials should be included in the Golden Gate National Recreation Area permanent museum collections, or reused for other on-island activities. Such activities may include interpretive exhibits on the Island displaying historic materials (i.e., "spider" piles), or potential reuse of the materials for another purpose (i.e., reuse of wood from the Boathouse) with interpretive signage.		National Park Service
Indian Occupation Graffiti Mitigation	**General**	1. At the 50 percent design phase, the National Park Service would conduct an inspection of the project area with the Golden Gate National Recreation Area Cultural Resource's staff to identify all graffiti that would be impacted.		National Park Service
		2. The GGNRA Cultural Resource's staff would contact the participants of the Indian Occupation to consult with them on the proposed project, the impacts to the graffiti, and treatment options.		National Park Service
		3. A treatment option would be determined, with avoidance being the preferred treatment. In situations that avoidance is not possible, other treatments would be determined in consultation with the participants of the occupation. Treatments may include protection of the graffiti during construction (i.e., covering, etc.), removal of the wall or surface on which the graffiti is painted and placing the GGNRA museum collections, restoration, and/or recordation		National Park Service
		4. At the 90 percent design phase, the National Park Service would conduct a final inspection of the project area with the GGNRA Cultural Resource's staff to verify that graffiti has been identified and that a treatment option for impacted graffiti has been determined.		National Park Service

Topic	Project	Mitigation	Permits/Compliance /Consultation	Responsible Party
		5. The necessary contract stipulations would be provided in the construction contract to insure that the treatment option is followed.		National Park Service
		6. Training would be provided to the construction crew to explain to them the significance of the graffiti (and other cultural resources) and appropriate protection measures that must be followed during the construction activity.		National Park Service
		7. The National Park Service would monitor construction activities to insure that the treatment measures are being followed.		National Park Service
Archeological Testing, Monitoring and Protection	**General**	The National Park Service would identify areas on the Island that have historic archeological (Civil War– and Federal Penitentiary–era) resources that would be affected by individual projects, and would develop and implement an archeological testing, treatment and/or monitoring plan for these areas. The preferred treatment is to avoid the archeological resources. In situations where avoidance is not possible, a testing and monitoring plan would be developed that provides: 1) a qualified archeologist to prepare a testing plan according to National Park Service Regulations Cultural Resource Management Guidelines (DO-28); 2) a qualified archeologist on site during construction; and 3) procedures that provide for a work stoppage when archeological features are discovered and notification of the GGNRA archeologist. Training would be provided for the construction crew on the significance of archeological resources and correct procedures to follow when archeological resources are encountered. Monitoring would likely be required for the Quartermaster Building, Cellhouse, and Fuel Line Remediation projects.		National Park Service
Seismic Ties and Monitoring	**General**	A monitoring program, with contingency measures including thresholds that would require construction to stop, would be developed and implemented during the installation of rock bolts to protects adjacent and upper terrace structures from vibration and shaking		National Park Service

Topic	Project	Mitigation	Permits/Compliance /Consultation	Responsible Party
Slope Stabilization Mitigation	**Slope Stabilization**	1. To minimize the effect of applying gunite/shotcrete to the slope face, the National Park Service would require that the new surface resemble the natural rock color, if the material is adequate to withstand the weather conditions on Alcatraz. Provisions to allow for the re-introduction of plant materials would be considered during the design development phase of the project and implemented where feasible. If deemed feasible, the Secretary of the Interior's Standards for the Treatment of Cultural Landscapes would be used to provide guidelines for the specifications for planting.		National Park Service
		2. Installation of a permanent interpretive exhibit at the base of the slope explaining the need to stabilize the slope, how mitigation measures were used to protect the resource, etc., would be provided.		National Park Service
Cultural Landscape Preservation	**General**	The National Park Service would provide for protection, propagation, or replanting of plants that are part of the Island's cultural landscape. Invasive exotic vegetation would be removed. The *Landscape Stabilization and Maintenance Guidelines* (Eleey, 1998) would be used as a reference for identifying plants and specifying the appropriate treatment. Prior to implementation of the Sallyport Complex project or use of staging area #5, the Cultural Resources Division would be consulted to determine precise treatment and associated work plan.		National Park Service

Topic	Project	Mitigation	Permits/Compliance /Consultation	Responsible Party
RECREATION AND VISITOR USE				
Safety	**General**	The National Park Service would ensure that appropriate safety/buffer areas are clearly identified, and that protective barriers, overhangs, buffer areas and other measures are enforced and maintained by the construction contractors throughout the project. To the extent possible, public access to buildings/structures would be maintained during construction activities. However, some areas within the buildings may be temporarily closed to the public for safety reasons. These areas would be clearly defined.	Construction activities would comply with relevant public health and safety requirements, including those set forth by the Occupation Safety and Health Administration (OSHA).	National Park Service and Contractor
Interpretation	**General**	To minimize the adverse effect of construction activities on the visitor experience, the National Park Service would use the construction program as opportunity for education and interpretation. The interpretive program would include signage as well as ranger- or docent-provided information on the construction activities. Issues relating to the purpose and need for the project, the environmental considerations that went into its implementation (cultural and biological), and other National Park Service management considerations would be addressed in the program. An underlying theme of the program could be demonstration of the National Park Service mission at work. Additional detail (including the precise content and design of the program) would be developed in the future as individual projects are implemented.		National Park Service
NOISE CONTROLS				
	Exterior Construction	1. Construction vehicles or equipment fixed or mobile, will be equipped with properly operating and maintained mufflers and acoustical shields or shrouds, in accordance with manufacturers' recommendations.		Contractor
		2. Prior to commencing construction, acoustic barriers would be constructed wherever feasible along the perimeter of the activity site to shield occupied building(s), exterior public visitation areas and nesting birds within close proximity of the construction site from construction-generated noise. Wooden barriers (or treatments of equivalent effect) would be constructed at a height of approximately 8 feet for shielding ground-level activities and loaded vinyl curtains (or treatments of equivalent effect) would be draped to enclose elevated scaffolding.		Contractor

Topic	Project	Mitigation	Permits/Compliance /Consultation	Responsible Party
		3. To the degree feasible, stationary noise-generating construction equipment (e.g., generators, cranes, compressors, and mixers) would be centrally located within equipment staging areas at the greatest distance possible from occupied building(s), exterior public visitation areas, and nesting birds.		Contractor
	Interior Construction	4. To reduce interior noise levels within occupied buildings, major noise-generating construction activities (e.g., jackhammers) would be limited to non-visitation periods of the day, to the maximum extent possible. Major noise-generating construction activities conducted within the interior areas of Building 64 and the Cellhouse during daytime visitation hours would be surrounded to shield other occupied areas of the building.		National Park Service
		5. During public hours repairs to the exterior or interior areas of the Cellhouse and Building 64, interior noise levels would be monitored to ensure that individual noise exposure levels do not exceed unsafe levels (based on the exposure standards established by the Occupational Safety and Health Administration).		Contractor
AIR QUALITY				
	General	To reduce construction-generated PM_{10} emissions, construction contractors would be required to implement BAAQMD "Basic Measures" for construction activities. BAAQMD PM_{10} requirements for testing and the requirement to ensure that PM_{10} emissions are minimized to the extent feasible, will be part of the construction contracts. A few of the measures that would be implemented are as follows: 1. Dust control measures would be in place during ground disturbance activities. 2. Paved access roads, parking areas and staging areas at construction sites would be swept daily as needed (i.e., if visible soil material is carried onto paved roadway).		Contractor

Topic	Project	Mitigation	Permits/Compliance /Consultation	Responsible Party
HAZARDOUS SUBSTANCES MANAGEMENT				
Asbestos	**General**	In accordance with NPS policy, potential asbestos containing materials (ACM) would be sampled, identified, and removed from work areas prior to construction or repair. A survey will be conducted for the presence of ACM by an Asbestos Hazard Emergency Response Act (AHERA) certified inspector that will be employed to collect bulk and air samples, assess the condition of the potential ACM, and report the findings to the GGNRA. Areas with friable ACM will be posted and removal of any ACM will be accomplished in accordance with EPA and OSHA regulations.	National Park Service and contractors are responsible for compliance with applicable federal and state regulations regarding the removal and disposal of asbestos containing materials.	National Park Service and Contractor
	Slope Stabilization	Before work is undertaken potentially requiring the fracturing of serpentine rock, samples of the rock will be collected to analyze for naturally occurring asbestos. Visitors will be prevented from entering areas where rock is being removed and kept at a safe distance based on air sampling results. Off-site disposal of serpentine would comply with applicable regulations concerning asbestos-containing material		If a certified industrial hygienist determines it necessary, the contractor or National Park Service staff will implement measures to monitor, and control airborne asbestos from the rock during excavation.

Topic	Project	Mitigation	Permits/Compliance /Consultation	Responsible Party
Lead	**Building 64, Cellhouse, Sallyport, Water Tower, New Industries Building, and Quartermaster Building**	Workers employed in the removal of lead will be required by to use safe lead removal methods established by federal and state agencies to protect themselves from exposure. Warning signs will be posted to mark the boundaries of lead-contaminated work areas. These signs would warn about lead hazard, prohibit eating, drinking, and smoking in the area, and specify any personal protective equipment required. OSHA worker safety requirements for lead (26 CFR 1926.62) would be followed during lead-based paint related construction activities. Handling hazardous lead-based paint wastes will be conducted in compliance with state and federal regulations regarding labeling and management. Disposal of lead-based paint wastes may consist of paint chips, lead contaminated dust or soil, and demolition debris. According to 40 CFR 261.24, a toxicity characterization leaching procedure test on waste or soil will be conducted to determine if the material is characterized as hazardous. An appropriately licensed contractor will transport hazardous and non-hazardous lead-based paint waste for disposal in a permitted hazardous or non-hazardous landfill, as appropriate based on the waste characterization.	National Park Service and contractors are responsible for compliance with applicable federal and state regulations regarding the removal and disposal of lead-based paint, finishes, or soils.	National Park Service will prepare a written plan outlining procedures to protect park employees, contractor personnel, and park visitors from lead-based paint exposure to be carried out by the contractor.

APPENDIX B

ALCATRAZ HISTORIC PRESERVATION AND SAFETY CONSTRUCTION PROGRAM

MONITORING PROGRAM

Monitoring Program

The National Park Service is proposing to implement the Alcatraz Historic Preservation and Safety Construction Program (the proposed action) using an adaptive management approach. The proposed action is comprised of 10 separate construction/repair projects that are scheduled to be implemented over a period of approximately 5 to 7 years. The National Park Service would monitor the effectiveness of mitigation measures in reducing the effects of construction activities. Monitoring results from the initial projects (Phase One) would be used to adapt and improve the implementation of the later projects both in Phase One and the Subsequent Phase of the program.

Appendix A of this Record of Decision and Section 2.7 of the FEIS presents a complete list of the mitigation measures that would be implemented as part of the proposed action. Several of these measures include requirements for "monitoring" to ensure that measures are implemented and enforced (i.e., for natural resource protection). Through this monitoring, new or improved methods of protection would be identified and incorporated into the implementation of the next project(s). If monitoring observes impacts at or exceeding those described in the FEIS, the mitigation measures can be adapted, modified, or expanded based on situations that arise, to reduce those impacts. Disturbance monitoring protocols will be developed and implemented by a biologist that is on-site on a regular basis when construction work occurs during the breeding season (February 15 through August 15, or until breeding activity is complete). NPS Natural Resources staff will develop an Adaptive Management Plan to outline the process by which mitigation measures may be modified or augmented, and identify targeted action to reduce an impact. Through on-site monitoring, and communication with biologists conducting long-term waterbird monitoring on the Island, the project biologist will evaluate impacts related to construction activities and impacts resulting from non-construction related human activity or naturally occurring events. Based on the information collected through monitoring, the project biologist will have the ability to modify, enhance, or expand mitigation measures for both Phase I and subsequent projects to be implemented under the FEIS.

The Environmental Consequences section (Chapter 4) of the FEIS draws conclusions regarding the potential impact to waterbirds of each project following mitigation (Section 4.2.2.5). For most projects, the conclusion covered a range of potential impacts, for example, minor to moderate, or moderate to major. The impacts were evaluated during the EIS process and represent the best available knowledge concerning impact levels and thresholds. If monitoring indicates that impacts are approaching the upper threshold of the anticipated impacts, the Adaptive Management Program will modify, enhance, or expand the mitigation measures to reduce the impact. Adaptive management is designed to respond immediately to impacting construction activities with solutions based on the mitigation measures.

Based on early public comment, there is a particular concern for the effects of the proposed action on the Island's colonial nesting waterbird colonies. As described in Section 4.2.1, there is currently a lack of scientific data relating to construction effects on breeding waterbirds. As a result, the biological impact analysis provided in the FEIS relied on combination of professional judgement, knowledge of the Island, existing scientific data, and past monitoring activities on Alcatraz to predict the impacts of the proposed action. Because of the lack of relevant scientific data, the National Park Service is proposing to implement a comprehensive monitoring program for waterbird impacts to verify the accuracy of the impact analysis and effectiveness of mitigation measures. Additional discussion of the purpose and intent of the program and its use by the National Park Service is provided below.

Waterbird Monitoring

The National Park Service has been monitoring the size of the breeding population and nesting success of colonial nesting birds on Alcatraz Island for more than 10 years. The National Park Service intends to continue this monitoring program and expand it to provide additional monitoring of the proposed construction activities analyzed in the FEIS. The following is an overview of the existing monitoring and reporting program, and conceptual information on the proposed construction monitoring. Additional detail, including monitoring protocols, for construction activities will be developed and refined in the future and will consider input received during public review of the DEIS.

Overview of Existing Program

The following is a species-by-species overview of the type of monitoring that is conducted on Alcatraz Island by the National Park Service. Annual reports documenting the results of these monitoring activities are prepared, and the National Park Service maintains and updates a geographic information system (GIS) database. Cormorant monitoring is conducted up to 4 days a week from a bird blind or from the interior of buildings, using binoculars and spotting scopes, resulting in minimal bird disturbance.

- Black-crowned Night-heron and egret monitoring has been conducted since 1990, on roughly a weekly basis from April through June. Night-heron monitoring is particularly disruptive since the birds nest concealed within shrubbery on the Island, and monitoring is conducted as quickly and quietly as possible. Night-heron/egret subcolonies isolated from western gulls are monitored through the month of June, while those adjacent to concentrations of western gulls are monitored until late May or early June.

- Western gulls are monitored up to 4 days a week during the breeding season. Nests in the most sensitive locations are monitored from a distance using binoculars and spotting scopes. Two Island-wide censuses are also conducted just prior to and at the time of peak chick-hatching to determine the total island population size. These surveys have been conducted annually since 1990, with some modifications to reduce monitoring impacts.

- In addition, off-shore boat surveys are conducted every two weeks during the breeding season. Nests not visible from the Island are observed from a distance, by trained observers using binoculars or photo-monitoring. Boat surveys create less disturbance than island-based surveys as observers are further away from nesting birds. Species monitored during these surveys include the seabirds nesting in the cliffs.

Proposed Construction Monitoring

The existing monitoring program would be expanded to include additional, focused disturbance monitoring associated with the proposed construction activities. The purpose of this monitoring would be to:

1. Reduce the potential adverse effects of construction projects on natural resources, particularly to nesting waterbirds

2. Measure and monitor the effect of construction disturbance;

3. Assess effectiveness of mitigation;

4. Build existing data on the cause and effect relationship of construction disturbance on breeding waterbirds on Alcatraz and help fill the existing void of scientific information on this subject; and

5. Use this information as the basis for adaptive management and implementation of future repair projects needed on the Island.

Examples of the type of monitoring and observations that would be made include:

- Behavioral observations of parental care, feeding, flushing, etc.
- Raven predation in relation to construction-induced disturbance
- Gull predation on Night-herons before, during and after construction
- Use of control area/population on Alcatraz, but outside of the construction disturbance area in order measure and compare the relative effect of construction disturbance.
- Effectiveness of construction worker training, use of barriers, and other mitigation measures in compliance with contract conditions and construction area and activity restrictions.

Monitoring activities would rely on the same basic protocols used for the existing program on Alcatraz, including access to sensitive areas and documentation. Efforts to minimize the potential disturbance of nesting waterbirds during monitoring would be implemented.

As described in Chapter 4 of the FEIS, Phase One of the proposed action [Dock Repair, Balconies Repair (Building 64), Cellhouse (Stabilization and Seismic), and Sallyport (Stabilization and Seismic projects)] is not anticipated to have a major adverse effect on breeding waterbirds. These initial projects are located in areas that are not particularly sensitive and/or where avoidance or minimization of impact would be possible through the implementation of the mitigation measures described in Chapter 2. The National Park Service has committed to implementing these mitigation measures, and would monitor their effectiveness through the program described in this Appendix.

This monitoring program would contribute to and enhance the body of information available for disturbance cause and effects on Alcatraz, and would be used by the National Park Service to manage and minimize potential effects associated with future projects on the Island. The effects of Phase One would be carefully documented and reviewed by National Park Service wildlife biologists. Based on this review, a summary of the conclusions and any recommendations for the refinement and/or development of new mitigation measures would be prepared. It is anticipated that the process used to review, approve and apply these recommendations would be the park's existing project review process (a bi-weekly formal review that includes representatives from divisions within the park, including natural resources, cultural resources, maintenance, interpretation, planning, law enforcement).

Alcatraz Island waterbird monitoring reports are available to the public upon request. Results are also summarized each year in the Investigator's Annual Report that will be posted on the web at http://science.nature.nps.gov. The project biologist will be required to prepare an annual report documenting construction monitoring related activities and results, including a summary of mitigation measures and adaptive management actions implemented, and recommendations for adaptive management measures for subsequent years and/or projects. This document will be provided to interested parties for review and comment on an annual basis.