National Park Service • U.S. Department of the Interior

Golden Gate National Recreation Area
Muir Woods National Monument

Draft General Management Plan/Environmental Impact Statement

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INTRODUCTION

The National Environmental Policy Act requires that environmental documents discuss the environmental impacts of a proposed federal action, feasible alternatives to that action, and any adverse environmental effects that cannot be avoided. In this case, the proposed federal action would be the adoption of a general management plan for Golden Gate National Recreation Area and Muir Woods National Monument. This part analyzes the potential environmental impacts on natural resources, cultural resources, visitor use and experience, the social and economic environment, transportation, and NPS operations and management that could result from implementing the four alternatives.

Because of the general, conceptual nature of the actions described in the alternatives, the impacts of these actions are analyzed in general, qualitative terms. Thus, this environmental impact statement should be considered a programmatic analysis. For the purposes of analysis, it is assumed that all of the specific actions proposed in the alternatives would occur during the life of the plan.

This environmental impact statement generally analyzes several actions, such as the development of recreational facilities (including trails and trailheads), the construction of facilities for visitor orientation and NPS operations, and the maintenance or restoration of natural and cultural resources. If and when proposed site-specific developments or other actions are ready for implementation following the approval of the general management plan, appropriate detailed environmental and cultural compliance documentation would be prepared. This compliance would be in accordance with the National Environmental Policy Act of 1969 and the National Historic Preservation Act of 1966, both as amended, and would meet requirements to identify and analyze each possible impact for the resources affected.

This part begins with a description of the methods and assumptions used for each impact topic. Impact analyses are organized by impact topic and then by alternative. The existing conditions for all of the impact topics that are analyzed were identified in Part 8 of this document. All of the impact topics retained for detailed analysis are assessed for each alternative.

The analysis of the no-action alternative (continue current management) identifies the future conditions at Golden Gate National Recreation Area and Muir Woods National Monument if there are no major changes to facilities or NPS management direction other than those included in existing approved plans; the no-action alternative assumes implementation of existing approved plans. The three action alternatives are then compared to the no-action alternative to identify the incremental changes that would occur as a result of changes in park facilities, uses, and management. Impacts of recent decisions and approved plans, such as those identified in Part 1 of this document, are not evaluated as part of this environmental analysis, except as part of cumulative impact analysis when appropriate. Although these actions would occur during the life of the general management plan, they have been (or would be) evaluated in other environmental documents.

The key impacts of each alternative are briefly summarized in volume 1 of this document. When this project is considered in conjunction with other projects and actions occurring in the region, impacts can become cumulative. The discussion of cumulative

impacts is presented separately in “Part 11: Other Analysies and Statutory Considerations.”

METHODS AND ASSUMPTIONS FOR ANALYZING POTENTIAL IMPACTS

The planning team based the impact analysis and the conclusions in this part mostly on the review of existing literature and studies, other environmental documentation completed for the park, information provided by experts in the National Park Service and in other agencies, and staff insights and professional judgment. The team's method of analyzing impacts is further explained below. It is important to remember that all the impacts have been assessed assuming that mitigative measures will be implemented to minimize or avoid impacts (see volume I, part 7 for mitigative measures). If mitigative measures were not applied, the potential for resource impacts and the magnitude of those impacts would increase.

The environmental consequences for each impact topic were identified and characterized based on impact type (adverse or beneficial), intensity, context, and duration. Cumulative effects are discussed in Part 10.

Impact intensity refers to the degree or magnitude to which a resource would be beneficially or adversely affected. Each impact was identified as negligible, minor, moderate, or major, in conformance with the definitions for these classifications provided for each impact topic. Because this is a programmatic document, the intensities were expressed qualitatively.

Context refers to the setting within which an impact may occur, such as the affected region or locality. In this document most impacts are either localized (site-specific) or parkwide.

Impact duration refers to how long an impact would last. The planning horizon for this plan is approximately 20 years. Unless otherwise specified, in this document the following terms are used to describe the duration of the impacts:

Short-term: The impact would be temporary in nature, lasting one to three years or less, such as the impacts associated with construction and/or disruption of visitor use to an area of the park.

Long-term*:* The impact would last more than three years and could be permanent in nature, such as the loss of soil due to the construction of a new facility. Although an impact may only occur for a short duration at one time, if it occurs regularly over a longer period of time the impact may be considered to be a long-term impact. For example, the noise from a vehicle driving on a road would be heard for a short time and intermittently, but because vehicles would be driving the same road throughout the 20-year life of the plan, the impact on the natural soundscape would be considered to be long term.

Effects also can be direct or indirect. Direct effects are caused by an action and occur at the same time and place as the action. Indirect effects are caused by the action and occur later or farther away, but are still reasonably foreseeable. This document discloses and analyzes both direct and indirect effects, but does not differentiate between them in the discussions.

Discussion of the impacts of the action alternatives describe the difference between implementing the no-action alternative and implementing the action alternatives. To

understand a complete "picture" of the impacts of implementing any of the action alternatives, the reader must also take into consideration the impacts that would occur in the no-action alternative.

NATURAL RESOURCES

The analysis of natural resources was based on research, knowledge of the area's resources, and the best professional judgment of planners and resource specialists, who have experience with similar types of projects. The definitions for impact intensity of all impact topics are included in this section under the impact topics; additional considerations used in characterizing the severity or intensity, as well as the duration, of certain impact topics are also discussed.

Impacts are determined by comparing projected changes resulting from the action alternatives (alternatives 1, 2, and 3) to the no-action alternative (continue current management). For all impact topics the analysis and conclusion sections are conducted at the parkwide level supported by discussion specific to the counties or to individual planning areas/sites where the impacts differ from those identified at the parkwide level. For example, for vegetation and wildlife, a parkwide analysis of the impacts of the alternatives would appear first, followed by specific discussions for Marin County and at two sites, Stinson Beach and Rodeo Valley, where impacts to vegetation and wildlife differ from those described at the parkwide level. A description of the impacts at the county level or at individual planning areas or sites would occur only when they differ from the parkwide analysis and conclusions.

Carbon Footprint and Air Quality

The park's contribution to global climate change is evaluated by assessing the relative production of greenhouse gases (CO_2) for each of the alternatives. Certain actions included in the alternatives of the plan would have an effect on the parks' total greenhouse gas emissions, known as the carbon footprint. Because some of the actions, such as the construction of new facilities could increase CO_2 emissions, and other actions, such as providing alternative transportation and reducing visitors' dependency on personal automobiles, could reduce CO_2 emissions, it is important to evaluate the impact that these actions could have on global warming. Although the National Park Service would pursue sustainable practices whenever possible in all decisions regarding operations, facilities management, and development in the parks, and the parks' focus on using renewable energy is a continuation of current management trends, the changes in energy consumption, energy availability, or costs compared to current conditions is of interest to NPS managers and the public.

The analysis of the effects of the actions contained in this plan on the parks' carbon footprint is based on a comparison with existing conditions. The baseline that is used for comparison is the carbon footprint of the no-action alternative, which is included in the "Natural Resources – Golden Gate National Recreation Area" section of Part 8. The park staff inventoried its emissions in 2006 as part of their *Climate Change Action Plan* using the NPS and EPA CLIP tool. The CLIP tool converts emissions of various greenhouse gases into a common "metric tons of carbon equivalent" unit, which provides a basis for

comparison among gases and simplifies reduction tracking. The conversion of a greenhouse gas to metric tons of carbon equivalent is based upon how strongly that particular gas contributes to the greenhouse effect, and how many tons of carbon emission would have the same effect.

The carbon footprint of each action alternative was calculated using the CLIP tool. National Park Service staff input energy consumption information (gallons of diesel fuel used, kilowatt hours per year, miles driven) into the CLIP tool based on assumptions made for facility use (square footage of building space), NPS operations, and recreational demand. Actions that had attributing emissions were assessed in comparison to existing conditions. The CLIP tool produces quantitative measures of gross emissions, measured as MTCE. This data provides a measurement of the carbon footprint. While the gross emissions of the alternatives are expressed numerically, the impact analysis (especially for effects on park resources) is general and qualitative. Overall, the goal of the analysis was to assist park managers with evaluating carbon footprint as part of their decision-making process.

The thresholds to determine the impact intensity for carbon footprint are defined as follows:

Negligible*:* The action would result in a change in total greenhouse gas emissions, but the change would be at the lowest level of detection, or not measurable. Impacts would not result in a change to local air quality.

Minor: The action would result in a slight, but detectable, change in total greenhouse gas emissions. Impacts could result in a change to local air quality, but the change would be so slight that it would not be of any measurable or perceptible consequence.

Moderate*:* The action would result in a modest change in total greenhouse gas emissions, which could result in a change to local air quality.

Major*:* The action would result in a substantial change in total greenhouse gas emissions, which could result in a change to local air quality.

Soils and Geologic Resources and Processes

The effects of the alternatives on soils and geologic resources (including shoreline and coastal processes) are analyzed based on the possibility of impacts resulting primarily from facility development and visitor use.

The thresholds to determine the impact intensity for these resources are defined as follows:

Negligible: The impact is barely detectable and/or would result in no measurable or perceptible changes to soils and geologic resources or processes. The effects on soil character and stability, and natural shoreline or coastal processes would be slight. Disruptions to geologic processes would not be perceptible.

Minor: The impact is slight but detectable, and/or would result in small but measurable changes to soils and geologic resources; the effect would be localized. There could be changes in soil character and stability in a relatively small area, but the change would not noticeably increase the potential for erosion. Disruptions to natural shoreline or coastal processes would be within the natural range of variability.

Moderate: The impact is readily apparent and/or would result in easily detectable changes to soils or geologic resources; the effects would be localized. The effect on soil productivity and natural shoreline or coastal processes would be apparent. The potential for erosion to remove small quantities of additional soil would noticeably increase or decrease. Disruptions to geologic processes are expected to be within the natural range of variability, but could be perceptible in the short term.

Major: The impact is severely adverse or exceptionally beneficial and/or would result in appreciable changes to soils or geologic resources; the effect would be regional in scale. There would be a strong likelihood that erosion would remove large quantities of additional soil or erosion would be substantially reduced. Disruptions to natural shoreline or coastal processes are expected to be outside the natural range of variability and may be permanent.

Water Resources and Hydrologic Processes

Terrestrial and freshwater resources (including stream character, water quantity and quality, watershed processes, wetlands, and floodplains) are analyzed together in this section because of the similarities of these resources, their interrelationship with each other, and their collective effect on the overall integrity of hydrologic systems. For example, terrestrial sediment inputs shape the character of streams: sediment-starved streams incise, while sediment-rich streams often result in aggradation and widening. Healthy riparian vegetation can also filter pollutants before reaching a creek; this in turn affects water quality. In addition, many riparian areas are often classified as wetlands, depending in part on their duration of saturation each year. Together, all of these elements affect hydrologic processes that can influence the condition of a watershed. Marine and estuarine resources/systems are discussed with a focus on water quality and ocean stewardship. Although impacts to terrestrial/freshwater and marine/estuarine resources and systems are discussed and analyzed separately, one conclusion is presented for water resources as a whole.

The following impact thresholds have been developed for analyzing water resources:

Negligible*:* Stream character, water quality, watershed processes, wetlands, and floodplains would not be impacted, or the impacts would be undetectable, or if detectable, the effects would be considered slight, localized, and short term. Any measureable changes would be within the natural range of variability.

Any impacts to marine/estuarine water quality and ocean resources would be slight, localized, and mostly inconsequential.

Minor*:* Impacts (chemical, physical, or biological) to stream character, water quality, watershed processes, wetlands, and floodplains would be small, short term, and localized. Natural processes, functions, and integrity would be temporarily affected, but would be within the natural range of variability. The impacts would only affect a few individuals of plant or wildlife species dependent on one or more of these water-related resources. Any changes would require considerable scientific effort to measure and have barely perceptible consequences.

Any impacts to marine/estuarine water quality and ocean resources would be noticeable and would be short term, requiring considerable scientific effort to measure and having barely perceptible consequences.

Moderate*:* Impacts (chemical, physical, or biological) to stream character, water quality, watershed processes, wetlands, and floodplains would be readily apparent, long term, and localized. Natural processes, functions, and integrity would be affected, but would be only temporarily outside the natural range of variability. The impacts would have a measurable effect on plant or wildlife species dependent on one or more of these water-related resources, but all species would remain indefinitely viable within the park and monument.

Any impacts to marine/estuarine water quality ocean resources would be noticeable and might be long term.

Major*:* Impacts (chemical, physical, or biological) would have drastic and permanent consequences for stream character, water quality, watershed processes, wetlands, and floodplains that could not be mitigated. Species dependent on one or more of these water-related resources would be at risk of extirpation from the park. Changes would be readily measurable, would be outside the natural range of variability, would have substantial consequences, and would be noticeable on a regional scale.

Any impacts to marine/estuarine water quality and ocean resources would be readily noticeable and long term, and would cause permanent damage or benefit.

Habitat (Vegetation and Wildlife)

Vegetation and wildlife are addressed together in this section, because an analysis of potential impacts to wildlife typically involves a discussion of wildlife habitat, which consists of various vegetation and aquatic communities found within the park and monument. Soils and substrates, topography, microclimates, and landscape configuration also affect habitats, but these elements are addressed in separate sections within the natural resources section of the environmental consequences part. Threatened and endangered species associated with these resources are discussed under a separate impact topic as well. The effects of the alternatives on marine resources and habitat are analyzed based on the possibility of impacts resulting primarily from facility development and visitor use.

The thresholds to determine impact intensity for these resources are defined as follows:

Negligible*:* There would be no observable or measurable impacts to the spatial extent of native species or their habitats, or the natural processes sustaining them. There would be no discernable change in native habitat integrity. Native and nonnative species richness and abundance would remain the same. Impacts would be of short duration and well within natural fluctuations.

Minor: Impacts would be detectable, but they would not be expected to be outside the natural range of variability and would not be expected to have any long-term effects on native species, their habitats, or the natural processes sustaining them. Any changes in native habitat integrity and native and nonnative species richness and abundance would be minimal.

Population numbers, population structure, genetic variability, and other demographic factors for species might have small, short-term changes, but long-term characteristics would remain stable and viable. Disturbance of some individuals could be expected, but without interference to reproduction or other factors affecting population levels.

Key ecosystem processes might have short-term disruptions that would be within natural variation. Habitat integrity would be maintained to support species' needs. Impacts would be outside critical reproduction periods for sensitive native species. Improvements to habitat quality may be detectable, but would not result in measurable improvements in ecosystem resiliency.

Alcatraz waterbirds would be affected by localized disturbance and/or unnaturally elevated predation levels. Few species would be affected, with potential for localized reduction in reproductive success and/or localized decline in size of subcolonies.

Moderate*:* Impacts on native species, their habitats, or the natural processes sustaining them would be detectable, and they could be outside the natural range of variability for short periods of time. Population numbers, population structure, genetic variability, and other demographic factors might experience short-term changes, but would be expected to rebound to pre-impact numbers and to remain stable and viable in the long term. Frequent responses to disturbance by some individuals could be expected, with some negative impacts to feeding, reproduction, or other factors affecting short-term population levels.

Breeding animals of concern are present; animals are present during particularly vulnerable life-stages, such as migration or juvenile stages; mortality or interference with activities necessary for survival can be expected on an occasional basis, but is not expected to threaten the continued existence of the species in the park and monument.

Key ecosystem processes might have short-term disruptions that would be outside natural variation (but would soon return to natural conditions). Habitat integrity would be maintained to support species' needs. Some impacts might occur during critical periods of reproduction or in key habitat for sensitive native species. Improvements to habitat quality would be detectable and could result in measurable improvements in ecosystem resiliency.

Alcatraz waterbirds would be affeced 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 subcolonies, with moderate reduction in population size (less than 50%).

Major: Impacts on native species, their habitats, or the natural processes sustaining them would be detectable, and they would be expected to be outside the natural range of variability for long periods of time or be permanent. Population numbers, population structure, genetic variability, and other demographic factors might have large, short-term declines, with long-term population numbers significantly depressed. Frequent responses to disturbance by some individuals would be expected, with negative impacts to feeding, reproduction, or other factors resulting in a long-term decrease in population levels.

The impact is severely adverse or exceptionally beneficial or would result in appreciable changes to wildlife resources and habitat; the effect would be regional in scale. Impacts would result in a reduction in species numbers, alteration in behavior, reproduction,

migration, or survival. Severe adverse impacts would alter or destroy habitat in a way that would prevent biological communities that inhabited the area prior to the action from re-establishing themselves. These impacts are expected to be outside the natural range of variability and may be permanent.

Key ecosystem processes might be disrupted in the long term or permanently. Loss of habitat integrity might affect the viability of at least some native species. Improvements to habitat quality would be detectable and permanent and would result in substantial improvements in ecosystem resiliency.

Many Alcatraz waterbird species would be affected by continuous, prolonged disturbance and/or unnaturally elevated predation levels. There would be potential for long-term subcolony or Island abandonment with significant reduction in Island population size (greater than 50%).

Special Status Species

Federal and state listed threatened and endangered species are addressed together in this section, because many of these species 1) have dual federal and state special status, 2) occur together in the same habitats, or 3) would be impacted similarly under each alternative. The environmental consequences for federal threatened and endangered species are described in such a way that meets the requirements of the National Environmental Policy Act and the Endangered Species Act. Definitions for impact conclusions required for Section 7 Endangered Species Act consultation are presented below:

No effect: When a proposed action would not affect a federal listed species, candidate species, or designated critical habitat.

May affect, not likely to adversely affect: Effects on federal listed or candidate species are discountable (i.e., extremely unlikely to occur and not able to be meaningfully measured, detected, or evaluated) or are completely beneficial.

May affect, likely to adversely affect: Adverse effects to a federal listed or candidate species may occur as a direct or indirect result of proposed actions and the effects are either not discountable or completely beneficial.

Likely to jeopardize proposed species or adversely modify proposed critical habitat (***impairment***)***:*** The appropriate conclusion when the National Park Service or the U.S. Fish and Wildlife Service identifies situations in which the proposal could jeopardize the continued existence of a federal listed or candidate species or adversely modify critical habitat to a species within or outside park boundaries.

The following impact threshold definitions are used to describe the severity and magnitude of changes to federal and state listed species under each of the alternatives. Each threshold definition references the Endangered Species Act determinations previously described.

Negligible: Impacts would be imperceptible or not measurable (undetectable). For federal listed species, this impact intensity would equate to a determination of “no effect.”

Minor: Impacts would be slightly perceptible and localized in extent; without further actions, adverse impacts would reverse and the resource would recover. Adverse impacts may include disturbance to individuals or avoidance of certain areas. Beneficial impacts would include slight increases to viability of the species in the park as species-limiting factors (e.g., habitat loss, competition, and mortality) are kept in check. For federal listed species, this impact intensity would equate to a determination of "may affect, not likely to adversely affect."

Moderate*:* Impacts would be readily measurable (apparent) and extend farther geographically than a minor impact; localized in extent; adverse impacts would eventually reverse and the resource would recover. Adverse impacts may include disturbance, injury, or mortality of individuals, but the long-term viability of the population would be maintained. For federal listed species, this impact intensity would equate to a determination of "may affect, likely to adversely affect." Beneficial impacts would include increases to viability of the species in the park as species-limiting factors (e.g., habitat loss, competition, and mortality) are kept in check. For federal listed species, this impact intensity would equate to a determination of "may affect, not likely to adversely affect."

Major*:* Impacts would be substantial, highly noticeable, and affecting a large geographic area; changes would be irreversible with or without active management. Adverse impacts may include disturbance, injury, or mortality of individuals to the point that the long-term viability of the population would be compromised. In extreme adverse cases, effects would be irreversible and populations may be extirpated from the park. For federal listed species, this impact intensity would equate to a determination of "may affect, likely to adversely affect." Beneficial impacts would include increases to viability of the species in the park as species-limiting factors (e.g., habitat loss, competition, and mortality) are substantially reduced and species resilience is enhanced by greatly improving habitat integrity. For federal listed species, this impact intensity would equate to a determination of "may affect, not likely to adversely affect."

CULTURAL RESOURCES

Methodology

In this assessment, environmental impacts to cultural resources are described in terms of type (adverse or beneficial), context, duration (short-term, long-term, or permanent), and intensity (negligible, minor, moderate, major), which is consistent with the regulations of the Council on Environmental Quality that implement the National Environmental Policy Act. These impact analyses are intended, however, to comply with the requirements of both the National Environmental Policy Act and Section 106 of the National Historic Preservation Act. In addition to including Section 106 findings in this document, the National Park Service intends to submit an independent Finding of Effect to the California state historic preservation office on the final preferred alternative (which will constitute the "undertaking" for Section 106 purposes). See "Part 12: Consultation, Coordination, and Preparation" for more information on the Section 106 consultation with the state historic preservation office. In accordance with the Advisory Council on Historic Preservation's regulations implementing Section 106 of the National Historic

Preservation Act (36 CFR Part 800, *Protection of Historic Properties*), impacts to cultural resources were also identified and evaluated by 1) determining the area of potential effects; 2) identifying cultural resources present in the area of potential effects that are either listed in or eligible to be listed in the National Register of Historic Places; 3) applying the criteria of adverse effect to affected, national register-listed or national register-eligible cultural resources; and 4) considering ways to avoid, minimize, or mitigate adverse effects. Cultural resources that could be affected under this project were identified by consulting with park cultural resources staff, reviewing previous studies and reports, reviewing site inventories and maps, conducting field visits to sites where actions may occur, and overlaying proposed actions on top of maps of known resources to identify potential direct and indirect impacts.

In accordance with 36 CFR 800, for historic properties in the area of potential effects that are listed in or eligible for listing in the National Register of Historic Places, the results are either *no historic properties affected* (either there are no historic properties present or there are historic properties present but the undertaking will have no effect upon them), or *historic properties affected* (there are historic properties that may be affected by the proposed action.) In addition, a determination of either *adverse effect* or *no adverse effect* must be made for affected national register-listed or national register-eligible cultural resources. A determination of *no adverse effect* means there is an effect, but the effect would not diminish the characteristics of the cultural resource that qualify it for inclusion in the national register. The ACHP regulations (36 CFR 800.5) define an adverse impact to a historic property as one that may

> *alter, directly or indirectly, any of the characteristic of a historic property that qualify it for inclusion in the National Register in a manner that would diminish the integrity of the property's location, design, setting, materials, workmanship, feeling, or association. Consideration shall be given to all qualifying characteristics of a historic property, including those that may have been identified subsequent to the original evaluation of the property's eligibility for the national register. Adverse effects may include reasonably foreseeable effects caused by the undertaking that may occur later in time, be farther removed in distance, or be cumulative (*36 CFR 800.5, Assessment of Adverse Effects*).*

Council on Environmental Quality regulations and the National Park Service's *Conservation Planning, Environmental Impact Analysis and Decision Making* (Director's Order #12) also call for a discussion of mitigation, as well as an analysis of how effective the mitigation would be in reducing the intensity of a potential impact, e.g., reducing the intensity of an impact from major to moderate or minor. Any resultant reduction in intensity of impact due to mitigation, however, is an estimate of the effectiveness of mitigation under the National Environmental Policy Act only. It does not suggest that the level of effect as defined by Section 106 is similarly reduced. Cultural resources are nonrenewable resources and adverse effects generally consume, diminish, or destroy the original historic materials or form, resulting in a loss in the integrity of the resource that can never be recovered. Therefore, although actions determined to have an adverse effect under Section106 may be mitigated, the effect remains adverse.

In addition, special consideration must be given to national historic landmarks during the planning process. Section 110(f) of the NHPA requires that a federal agency, to the maximum extent possible, minimize harm to a national historic landmark that may be

directly and adversely affected by an undertaking. When there is an adverse effect on a national historic landmark, the agency shall request the ACHP to participate in any consultation to resolve adverse effects. The agency shall also notify the Secretary of the Interior of any consultation and invite the Secretary to participate in the consultation where there may be an adverse effect. When this happens, the ACHP shall report the outcome of the Section 106 process to the President, the Congress, the Secretary of the Interior and the head of the lead federal agency, and provide written comments or any memoranda of agreement to which it is a signatory as a result of this consultation.

A Section 106 summary is included in the conclusion for each alternative's impact analysis sections. The Section 106 summary is an assessment of the effect of the undertaking (implementation of the alternative), based upon the criteria of effect and criteria of adverse effect found in the Advisory Council's regulations.

Historic Structures, Districts, and Cultural Landscapes

The following impact thresholds have been developed for analyzing impacts to historic structures and districts and cultural landscapes:

Negligible: Impacts would be at the lowest levels of detection, barely measurable with neither adverse nor beneficial consequences. Historic structures, districts, and cultural landscapes would incur no change or barely perceptible changes to the defining features that contribute to the resource's national Register eligibility. For purposes of Section 106, the determination of effect would be *no adverse effect*.

Minor: Adverse Impact: Impacts would not affect the character-defining features of a historic structure, district, or cultural landscape listed or eligible for the National Register. Impacts would be measurable or detectable but would be slight and would not diminish the overall integrity of the resource. For purposes of Section 106, the determination of effect would be *no adverse effect.*

Beneficial Impact: Historic features of the structure, district, or landscape would be stabilized and preserved in accordance with the Secretary of the Interior's *Standards for the Treatment of Historic Properties*, thus maintaining the integrity of the resource. For purposes of Section 106, the determination of effect would be *no adverse effect*.

Moderate: Adverse Impact: Impacts would alter a character-defining feature(s) of a significant historic structure, district, or cultural landscape and would result in measurable and perceptible effects. These changes to one or more of the characteristics that qualify the resource for inclusion in the National Register could diminish the overall integrity of the resource but would not jeopardize its national register eligibility. For purposes of Section 106, the determination of effect would be *adverse effect.*

Beneficial Impact: Preservation and rehabilitation of the historic structure, district, or cultural landscape and its contributing features would be in accordance with the Secretary of the Interior's *Standards for the Treatment of Historic Properties*. For purposes of Section 106, the determination of effect would be *no adverse effect*.

Major: Adverse Impact: Impacts would result from substantial and highly noticeable changes that would alter the character-defining features of a historic structure, district, or cultural landscape. These impacts would be substantial, noticeable, and permanent. The action would severely change one or more characteristics that qualify the resource for the

National Register of Historic Places, and would diminish the overall integrity of the resource to the extent that it would no longer be eligible to be listed in the national register. For purposes of Section 106, the determination of effect would be *adverse effect.*

Beneficial Impact: The character-defining features of a historic structure, district, or landscape would be maintained and restored in accordance with the Secretary of the Interior's *Standards for the Treatment of Historic Properties*. For purposes of Section 106, the determination of effect would be *no adverse effect*.

Archeological Resources

The following impact thresholds have been developed for analyzing impacts to archeological resources:

Negligible: Impact is at the lowest level of detection. Impacts would be measurable but with no perceptible consequences. For purposes of Section 106, the determination of effect would be *no adverse effect.*

Minor: Disturbance of a site results in little loss of integrity. The determination of effect for Section 106 would be *no adverse effect*.

Moderate: A site is disturbed but not obliterated. The determination of effect for Section 106 would be *adverse effect.*

Major: A site is obliterated. The determination of effect for Section 106 would be *adverse effect.*

Ethnographic Resources

The following impact thresholds have been developed for analyzing impacts to ethnographic resources:

Negligible: Impacts would be at the lowest levels of detection and barely perceptible. Impacts would neither alter resource conditions, such as traditional access or site preservation, nor alter the relationship between the resource and the affiliated group's body of practices and beliefs. For purposes of Section 106, the determination of effect would be *no adverse effect.*

Minor: Impacts would be slight but noticeable and would neither appreciably alter resource conditions, such as traditional access or site preservation, nor alter the relationship between the resource and the group's body of beliefs and practices. For purposes of Section 106, the determination of effect would be *no adverse effect.*
Moderate: Impacts would be apparent and would alter resource conditions or interfere with traditional access, site preservation, or the relationship between the resource and the affiliated group's beliefs and practices, even though the group's practices and beliefs would survive. For purposes of Section 106, the determination of effect would be *adverse effect.*

Major: Impacts would alter resource conditions. Proposed actions would block or greatly affect traditional access, site preservation, or the relationship between the resource and the group's body of beliefs and practices to the extent that the survival of a group's

beliefs and/or practices would be jeopardized. For purposes of Section 106, the determination of effect would be *adverse effect.*

Park Collections

Park collections (prehistoric and historic objects, artifacts, works of art, archival documents, and natural history specimens) are generally ineligible for listing in the National Register of Historic Places. As such, Section 106 determinations of effect are not provided. The following impact thresholds have been developed for analyzing park collections:

Negligible: Impact(s) would be at the lowest levels of detection – barely measurable with no perceptible consequences, either adverse or beneficial, to park collections.

Minor: Impact(s) would affect the integrity of a few items in the park collection but would not degrade the usefulness of the collection for future research and interpretation.

Moderate: Impact(s) would affect the integrity of many items in the park collection and diminish the usefulness of the collection for future research and interpretation.

Major: Impact(s) would affect the integrity of most items in the park collection and destroy the usefulness of the collection for future research and interpretation.

VISITOR USE AND EXPERIENCE

This impact analysis considers various aspects of visitor use and experience at Golden Gate National Recreation Area and Muir Woods National Monument, including the effects on diversity of recreation opportunities and national park experiences; visitor understanding, education, and interpretation; safe and enjoyable access and circulation to and within the park; and visitor safety.

The analysis is primarily qualitative rather than quantitative due to the conceptual nature of the alternatives. Impacts on visitor use and experience were determined considering the best available information. Information on visitor use and opinions were taken from the public scoping information for this plan and surveys of visitors and nonvisitors conducted by various researchers. Other information that was considered in the analysis includes the parks' annual reporting of visitor use levels, including overnight stays, to the National Park Service's Public Use Statistics Office, and local and regional travel and tourism data.

Primarily, visitors expressed interest in preserving and educating visitors about the unique natural and cultural resources of the park and monument, continuing to provide high-quality trail opportunities, exploring improved transportation and access to the park lands and better preserving the scenic beauty of the park's setting.

Impacts on visitor use and experience are described in terms of the effect on the following components:

- Diversity of recreation opportunities and national park experiences
- Visitor understanding, education, and interpretation

- Safe and enjoyable access and circulation to and within the park (see also transportation section)
- Visitor safety

The duration of a short-term impact would be less than one year. A long-term impact would last more than one year and would be more permanent in nature.

Adverse impacts are those that most visitors would perceive as undesirable. Beneficial impacts are those that most visitors would perceive as desirable.

The thresholds to determine impact intensity are defined as follows:

Negligible: Most visitors would likely be unaware of any effects associated with implementation of the alternative.

Minor: Changes in visitor opportunities and/or setting conditions would be slight but detectable, would affect few visitors, and would not appreciably limit or enhance experiences identified as fundamental to the park's purpose and significance.

Moderate: Changes in visitor opportunities and/or setting conditions would be noticeable, would affect many visitors, and would result in some changes to experiences identified as fundamental to the park's purpose and significance.

Major: Changes in visitor opportunities and/or setting conditions would be highly apparent, would affect most visitors, and would result in several changes to experiences identified as fundamental to park purpose and significance.

SOCIAL AND ECONOMIC ENVIRONMENT

When assessing the potential impacts to the social and economic environment, several impact parameters must be analyzed for each action alternative. First, the *type* of impact must be determined (i.e., whether the impact is beneficial or adverse). The beneficial and adverse impacts to the social and economic environment are determined by comparing the anticipated changes resulting from implementing any of the action alternatives to the results of continuing current management (i.e., the no-action alternative). Once it is determined if an impact is beneficial or adverse, the other impact attributes can be assessed, such as *context*, *duration*, and *intensity*.

Context: The context refers to the setting or geographic scope of the impact to the social and economic conditions. In this analysis, impacts will be measured relative to the following three context levels (when applicable):

- Local gateway communities (immediate proximity to park sites)
- Three adjacent counties (Marin, San Francisco, and San Mateo)
- Bay Area (nine-county region)

Intensity: The intensity refers to the significance or degree of the impact to the social and economic conditions. The thresholds are defined as follows:

- **Negligible:** No effects occur or the effects on social and economic conditions would be unnoticeable. The action would not yield any noticeable or measureable changes to quality of life, the population demographic, and local economy.
- **Minor:** The effects on social and economic conditions would be detectable, but only slight and limited to a small portion of the surrounding community and local economy. The action would minimally influence the quality of life, the population demographic, and/or local economy.
- **Moderate:** The effects on social and economic conditions would be readily apparent and would influence multiple segments of the community or local economy. The action would yield changes that are noteworthy or modest to the quality of life, the population demographic, and/or local economy.
- **Major:** The effects on social and economic conditions would be very apparent, significant, and/or widespread throughout the community and local economy. The action would yield considerable changes to the quality of life, the population demographic, and/or local economy.

In the discussion of impacts to the social and economic environment, an analysis section and conclusion section are included for each alternative for Golden Gate National Recreation Area including Alcatraz Island and Muir Woods National Monument, including the no-action alternative. Also, the analysis begins with a section that addresses the impacts from actions that are common to all action alternatives for both Golden Gate National Recreation Area and Muir Woods National Monument.

TRANSPORTATION

Planning alternatives for Golden Gate National Recreation Area and Muir Woods National Monument were developed for park lands in San Mateo, Marin, and San Francisco counties. For each of the three counties, as well as for Muir Woods National Monument, the proposed alternatives are discussed with respect to their qualitative effect on visitor access and circulation related to roadways, parking, bicycle access, pedestrian access, transit service, and access to transit. Muir Woods National Monument has been the subject of more detailed transportation analysis in recent years, enabling this section to include more quantitative analysis than the other areas.

Transportation impacts for the no-action alternative and the three action alternatives are discussed for park lands for each county and separately for Muir Woods National Monument.

- Marin County – southeast coastal area, southwest coastal area, Marin Headlands, and the Stinson Beach area
- San Francisco – Upper Fort Mason, China Beach, Lands End, East and West Fort Miley, Ocean Beach, and Fort Funston
- San Mateo County – multiple sites
- Muir Woods National Monument

Other than continuing and expanding shuttle service to Muir Woods National Monument, changes in transit service that would be provided by agencies other than the National Park Service, are not modeled.

Impacts on visitor access and on the transportation system are described in terms of their effect in the following areas, as applicable:

Multimodal Visitor Connections to Park Sites and Communities

- Access by land, including roads, public transit, tour buses, trails, and bicycles
- Access by water, including ferries, water taxis, or other water transit

Functionality of the Transportation System

- Land transportation, including traffic flow, congestion, and circulation; parking availability; transit service availability; transit facility capacity; amenities and condition; and public safety
- Water transportation, including facility capacity and condition, multimodal access, and public health and safety
- Connectivity, including number and capacity of connections, and availability of modes of travel
- Directional and park site identification signs and wayfinding information

For this analysis, equestrian activity is considered recreational and is not included as part of the transportation system.

Definitions

Type: The impact is determined to be either beneficial or adverse. The beneficial and adverse impacts to the transportation system are determined by comparing the anticipated changes resulting from implementing any of the action alternatives to the results of continuing current management (i.e., the no-action alternative).

Intensity: The intensity refers to the significance or degree of the impact to the transportation system. The thresholds are defined as follows:

Negligible*:* Most visitors would likely be unaware of any effects associated with implementation of the alternative.

Minor*:* Changes in visitor access/circulation would be slight but detectable, would affect few visitors, and would not appreciably limit or enhance visitors' ability to visit park sites or move within park sites.

Moderate*:* Changes in visitor access/circulation would be noticeable, would affect many visitors, and would result in some changes to visitors' ability to visit park sites or move within park sites.

Major*:* Changes in visitor access/circulation would be highly apparent, would affect most visitors, and would result in many changes to visitors' ability to visit park sites or move within park sites.

In addition to the aforementioned terms, four terms are used to describe the seasonality of transportation impacts:

Peak season: The impact would occur primarily from Memorial Day through Labor Day.

Shoulder season: The impact would affect transportation in April and May in the spring, and in September in the fall.

Low visitation or offseason: The impact would occur primarily from October 1 through April 30.

Year-round: The impact would affect visitor experiences for much of the year, especially if adverse effects during peak months had the effect of spreading visitation more evenly throughout the year.

PARK MANAGEMENT, OPERATIONS, AND FACILITIES

The impact analysis evaluated the effects of the alternatives on Golden Gate National Recreation Area and Muir Woods National Monument operations, including staffing, infrastructure, maintenance, visitor facilities, and services.

The analysis focused on how operations and facilities might vary with the different management alternatives. The analysis is qualitative rather than quantitative because of the conceptual nature of the alternatives. Consequently, professional judgment was used to reach reasonable conclusions as to the intensity, duration, and type of potential impact.

The following impact thresholds have been developed for analyzing park management, operations, and facilities:

Negligible: The effect would be at or below the lower levels of detection, and would not have an appreciable effect on park operations and management

Minor: The effects would be detectable, but would be of a magnitude that would not have an appreciable effect on park operations and management.

Moderate: The effects would be readily apparent and would result in a change in park operations and management in a manner noticeable to staff and the public.

Major: The effects would be readily apparent and would result in a substantial change in park operations and management in a manner noticeable to staff and the public. The change would produce conditions that would be markedly different from existing operations.

IMPAIRMENT OF PARK RESOURCES

In addition to determining the environmental consequences of implementing the alternatives, NPS *Management Policies 2006* (section 1.4) requires analysis of potential effects to determine whether alternatives would impair the park's resources and values.

The fundamental purpose of the national park system, established by the Organic Act and reaffirmed by the General Authorities Act, as amended, begins with a mandate to conserve resources and values. National Park Service managers must always seek ways to avoid, or to minimize to the greatest degree practicable, adverse impacts on resources and values. Although Congress has given the National Park Service the management discretion to allow certain impacts within a unit, that discretion is limited by the statutory requirement that the National Park Service must leave resources and values unimpaired unless a particular law directly and specifically provides otherwise.

The prohibited impairment is an impact that, in the professional judgment of the responsible NPS manager, would harm the integrity of resources and values, including the opportunities that otherwise would be present for the enjoyment of those resources or values (NPS *Management Policies 2006* section 1.4.5). An impact would be more likely to constitute impairment if it 1) results in a moderate or major adverse affect on a resource or value whose conservation is necessary to fulfill specific purposes identified in the establishing legislation or proclamation of the area; 2) is key to the natural or cultural integrity of the area or to opportunities for enjoyment of the area; or 3) is identified as a goal in the area's general management plan or other relevant NPS planning documents.

A determination on impairment is made in the "Conclusion" section for each required impact topic related to the park's resources and values. An evaluation of impairment is not required for topics related to visitor use and experience (unless the impact is resource based), the social and economic environment, or NPS operations. When it is determined that an action or actions would have a moderate to major adverse effect, an explanation is presented of why this would not constitute impairment. Impacts of negligible or minor intensity would not, by definition, result in impairment. The impairment analysis for each of the impact topics, found later in this part, has determined that none of the alternatives presented in this plan would result in impairment of park resources.

COMMON TO ALL ALTERNATIVES AT GOLDEN GATE NATIONAL RECREATION AREA AND MUIR WOODS NATIONAL MONUMENT

NATURAL RESOURCES

Analysis

The goals and strategies that are common to all action alternatives include policy guidance on a variety of topics that would have an impact on natural resources. These topics include park boundaries, climate change, ocean stewardship, partnerships, Redwood Creek Vision, Sharp Park, transportation, trails, and park collections. In general, all of the guidance that is included would have a beneficial impact on natural resources.

For example, the park boundaries policy (see Volume I, Part 3) contains goals for science-based land and water acquisition that would improve the integrity of natural resources. It also includes the proposed acquisition of several parcels of land and water in San Mateo County as well as potential future boundary adjustments across the park.

The policy on climate change includes goals for greenhouse gas emissions reduction and responding to the effects of climate change on natural resources. The management approach that is included seeks to reduce environmental stressors, maintain biological diversity, and develop adaptation responses to build resiliency in natural systems and species.

The ocean stewardship policy includes management strategies and objectives that would help to protect ocean resources through improved research and collaborative management with other state and federal agencies.

The partnerships policy would assist the National Park Service in developing collaborative arrangement with other park partners whose programs have shared goals, including preservation of natural resource management.

The Native American engagement policies could have minor, adverse impacts on vegetation and wildlife impacts due to the collection of natural materials. Coordination between Native Americans and park staff would ensure that habitat integrity would be maintained.

The transportation policy includes goals for multimodal and alternative transportation, which would assist the National Park Service in reducing its carbon footprint and air quality concerns in the Bay Area.

The trails policy includes goals on sustainable trail design and best management practices, which would assist the National Park Service in improving habitat quality and integrity by reducing impacts from erosion, exotic and invasive species, and habitat fragmentation.

The park collections policy would benefit natural resources by ensuring that natural resource specimens (whether geologic, botanical, etc,) are properly protected and managed.

Conclusion

Overall, impacts to natural resources resulting from these policies would be long term, beneficial, and would range from negligible to moderate, throughout Golden Gate National Recreation Area and Muir Woods National Monument.

CULTURAL RESOURCES

Analysis

Development of new or improved maintenance hubs, a public safety hub, satellite maintenance offices, and parking areas, as well as expanding the park's trail system and improving connectivity and accessibility, could adversely impact the park's archeological resources, historic structures, and cultural landscapes. As appropriate, archeological surveys and/or monitoring would precede any ground disturbance. National register eligible or national register listed archeological resources would be avoided to the greatest extent possible. If such resources could not be avoided, an appropriate mitigation strategy would be developed in consultation with the California state historic preservation office and, if necessary, associated American Indian tribes. If during construction, previously unknown archeological resources were discovered, all work in the immediate vicinity of the discovery would be halted until the resources could be identified and documented; if the resources could not be preserved *in situ*, an appropriate mitigation strategy would be developed in consultation with the state historic preservation office and associated American Indian tribes. Because national register eligible or national register listed archeological resources would be avoided to the greatest extent possible, any adverse effects would be expected to be minor to moderate in intensity and permanent.

Archeological resources adjacent to or easily accessible from trails and developed areas could be vulnerable to surface disturbance, inadvertent damage, and vandalism. A loss of surface archeological materials, alteration of artifact distribution, and a reduction of contextual evidence could result. However, continued ranger patrol and emphasis on visitor education would help to discourage vandalism and inadvertent destruction of cultural remains, and any adverse impacts would be expected to be negligible to minor.

Every effort would be made to establish new or improved maintenance hubs, a public safety hub, satellite maintenance offices, and parking facilities in existing developed areas or in rehabilitated historic buildings whose architectural values are protected and preserved. Careful design of new facilities would ensure that new structures would minimally affect the scale and visual relationships among existing landscape features or circulation patterns and features. In addition, the topography, native vegetation patterns, and land use patterns would remain largely unaltered. Any adverse impacts would be long term and of minor intensity. Improved maintenance facilities and programs would enable the park to conduct more comprehensive cultural resource preservation and maintenance programs and thus enhance protection of the park's cultural resource values—a beneficial impact.

Inclusion of the San Mateo County properties (Gregerson Property adjacent to Rancho Corral de Tierra, Vallemar Acres, and Highway Frontage in the West Cattle Hill vicinity) and potential future boundary adjustments (the Marin City Ridge, Pacifica Conservation

Area, Montara Mountain Complex, San Mateo County gateway, and Bolinas Lagoon) would result in enhanced identification, protection, and interpretation of archeological resources, historic structures, and cultural landscape values in those areas per NPS cultural resource policies, but only if appropriate funding and FTEs were to be expended on them.

Implementation of the park's climate change policy and action plan would result in 1) an understanding of how to protect and preserve the park's archeological resources, historic structures, and cultural landscapes by reducing current stressors to such resources, 2) assisting in development of triage criteria for prioritizing preservation treatments and other management actions for cultural resources, such as relocation coupled with sustainable mitigation efforts for shoreline resources, and 3) guiding managed retreat programs when the triage process indicated that preservation treatment or relocation was not a feasible option.

Establishing a curatorial and research facility that meets NPS standards and can accommodate the majority of the park collection will have a long-term beneficial impact to the preservation of the collections. Strengthening the collection policy and implementing actions to connect people with the park's museum will have a beneficial impact by increasing public stewardship opportunities, access to the park's history, and integration of the park collections into the park's visitor experience.

Implementation of the park's Ocean Park Stewardship Policy would result in improved identification, understanding, protection, and preservation of the park's archeological (i.e., submerged) resources.

Ongoing NPS efforts to establish and foster effective partnerships would result in beneficial impacts on the park's archeological resources, historic structures, and cultural landscapes because partnerships 1) create appreciation and support for the park's resources and 2) increase avenues through which communities and visitors can engage with the park to preserve and enhance those resources.

Implementation of the Redwood Creek Vision would result in enhanced collaborative efforts to identify, protect/preserve, and interpret archeological resources, historic structures, and cultural landscapes in the Redwood Creek watershed.

Ongoing and enhanced Native American engagement programs and protocols by the park with the Federated Indians of Graton Rancheria and Ohlone tribes and individuals would result in improved cultural resource management of archeological and ethnographic sites, collaborative interpretation and education activities, and revitalization of Native American communities, traditions, and heritage.

Additionally, improving ferry access to Alcatraz Island and establishing ferry routes to other park sites within San Francisco Bay would result in better preservation of the cultural resources by minimizing transportation impacts to its cultural landscape values.

Execution of implementation plans for Alcatraz, such as preparation of a cultural landscape report, historic resource study, and baseline inventory and Historic American Buildings Survey recovery plan, would provide the National Park Service with the knowledge to better preserve and more effectively interpret the multiple layers of historic development associated with the island's significant archeological resources, ethnographic sites, historic structures, and cultural landscapes.

Conclusion

Because national register eligible or national register listed archeological resources would be avoided to the greatest extent possible, any adverse effects would be expected to be minor to moderate in intensity and permanent. A loss of surface archeological materials, alteration of artifact distribution, and a reduction of contextual evidence could result. However, continued ranger patrol and emphasis on visitor education would discourage vandalism and inadvertent destruction of cultural remains, and any adverse impacts would be expected to be negligible to minor. Careful design of new facilities would ensure that new structures would minimally affect the scale and visual relationships among existing landscape features or circulation patterns and features. In addition, the topography, native vegetation patterns, and land use patterns would remain largely unaltered. Any adverse impacts would be long term and of minor intensity. Improved maintenance facilities and programs would enable the park to conduct more comprehensive cultural resource preservation and maintenance programs and thus enhance protection of the park's cultural resource values—a beneficial impact.

Actions common to all alternatives would generally have beneficial impacts on the protection and preservation of archeological resources, ethnographic sites, historic structures, and cultural landscapes in Golden Gate National Recreation Area including Alcatraz Island. Any adverse effects to archeological resources and ethnographic resources would be expected to be negligible to moderate in intensity and permanent. Any adverse impacts to cultural landscape resources (including historic structures) would be long term and of minor intensity.

Concerning the actions common to all alternatives, the Section 106 determination of effect on archeological resources, ethnographic sites, historic structures, and cultural landscapes in Golden Gate National Recreation Area including Alcatraz Island is *adverse effect.*

Because there would be no major, adverse impacts to a resource or value whose conservation is 1) necessary to fulfill specific purposes identified in the establishing legislation or proclamation of Golden Gate National Recreation Area; 2) key to the natural or cultural integrity of the park; or 3) identified as a goal in the park's general management plan or other relevant NPS planning documents, there would be no impairment of Golden Gate National Recreation Area's resources or values.

VISITOR USE AND EXPERIENCE

Analysis

In addition to the specific proposals in the action alternatives, some of the recommendations and policies that are common to all action alternatives would have a beneficial impact on visitor use and experience at both Golden Gate National Recreation Area and Muir Woods National Monument. Several of the proposed boundary adjustments would provide new lands for recreation, expanding the diversity of settings, and new lands for access purposes, facilitating better access options to various park sites; both of these would have a beneficial impact on visitor use and experience. The recommendations for educating visitors on climate change and ocean stewardship would

have a beneficial impact on visitor experience by providing visitors with direct access to the latest research and knowledge, providing increased awareness and inspiration regarding these important subjects. Actions that improve the preservation and visitor access to the park collection would strengthen the park's interpretive and education programs. The new public safety office proposed at Shelldance Nursery would have a beneficial impact on visitor safety by providing shorter response times and a constant NPS presence in the southern portion of Golden Gate National Recreation Area. The partnership strategy will ensure that NPS partnerships continue to serve the needs of visitors with high-quality services, facilities, and opportunities. If the park ends up owning or managing portions of Sharp Park that are contiguous to lands managed by the National Park Service, visitors would benefit from additional trail-based recreation and educational opportunities. These actions would have a long-term, moderate beneficial impact on the visitor experience to the park.

The transportation strategy emphasizes the goal of providing sustainable, multimodal access to many park sites, which would benefit visitors by reducing traffic congestion and use conflicts, and facilitating more efficient access to and between park sites. Finally, the trails strategy emphasizes the goal of providing an enduring trail system that serves as a sustainable network of access within and between park sites. Trails provide one of the most important ways that visitors experience and enjoy the park and discover its diverse settings. Providing a long-term strategy to perpetuate a coordinated and sustainable trail and transportation system would result in a long-term, moderate, beneficial impact to the visitor experience.

Conclusion

The recommendations and policies that are described in the actions common to all alternatives will have a long-term, moderate, beneficial influence on the visitor experience at the park. Visitors would be provided enhanced access throughout the park by improved trails and transportation systems, increased opportunities for interpretation and education supported by the park collections and new programs related to climate change and ocean stewardship. Strengthening the park partnership programs and preservation of park resources by potential expansion of park boundaries and expanded increased public safety facilities would contribute to improvements to the visitor experience.

SOCIAL AND ECONOMIC ENVIRONMENT

Analysis

The improvement of community connectivity to Golden Gate National Recreation Area park sites via an expanded transportation system, multimodal opportunities, and enhanced regional trail network could improve the quality of life of residents in the area. More residents of local communities would be able to visit the park to exercise, enjoy the natural coastal settings, participate in outdoor recreational activities, educational and stewardship programs, or simply have a place to escape the urban environment. These improved community connections with the park could result in an impact that is long

term, minor to moderate, and beneficial for the local gateway communities and adjacent counties.

In addition, a comprehensive education and stewardship program would be developed to engage the public in natural and cultural stewardship issues and educate them about park resources and the threats to their preservation. With more and more residents of the community becoming more aware and engaged in these important issues, communities could benefit as residents and organizations take actions that move toward sustainability, decrease waste and pollution, and other measures that could contribute to improvements to the community's quality of life. This education and stewardship effort would be pursued in all alternatives, resulting in an impact that could be long term, minor, and beneficial in the context of the local gateway communities and three adjacent counties.

All actions that are common to all alternatives would continue to improve the National Park Service's efforts at maintaining a healthy and productive relationship with Native American communities in the area. These efforts would codify and continue the park's policy to work with Coast Miwok and Ohlone communities in activities related to cultural resource management, interpretation and education, and the revitalization of community and tradition. This effort to maintain and improve communication with the Native Americans in the region would be pursued in all alternatives, resulting in an impact that would be long term, minor, and beneficial for the local gateway communities, adjacent counties, and the Bay Area as a whole.

The actions common to all alternatives maintain a strong commitment and strategy for using park partnerships as a tool to provide park programs, preservation activities, and community engagement in park issues while also contributing to the success of the park partner organizations and agencies. For the National Park Service, this commitment would provide a cost-effective way to enhance park services, improve visitor opportunities, and engage the community. For the various partners, this commitment and strategy would help build and expand organization success and outreach. This emphasis on partnerships would also increase programs and opportunities for the public to enjoy, which could increase the quality of life for local residents. This effort would be maintained and improved in all alternatives, resulting in an impact that would be long term, moderate, and beneficial for the local gateway communities. The impact would be long term, minor to moderate, and beneficial for the three adjacent counties.

In addition to the actions described in the section "Actions Common to All Alternatives," each alternative also includes a proposed action that would ultimately close the Shelldance Nursery (a commercial operation in Pacifica). This may be considered an adverse impact to quality of life for some community members who have actively visited the nursery in the past. In addition, this closure could be considered an adverse impact to local economy due to job loss, sales tax revenue loss, and the loss of the multiplier effect of the business monies and its employee salaries. The collective result would be an impact that is long term, minor, and adverse for the local gateway communities. The impact to the three adjacent counties would be negligible. However, it should be noted that the programs and facilities that may eventually replace the nursery would likely offset some of these impacts by creating employment and community involvement opportunities.

Conclusion

The overall impact to the social and economic environment from actions that are common to all alternatives could be long term, minor to moderate, and beneficial with an affected area that ranges from the local gateway communities to the overall Bay Area. The beneficial impacts would result from the policies and guidance for boundary changes, climate change, ocean stewardship, museum collections, and partnership strategy. Improved parkland accessibility via multimodal transportation and regional trail systems would also yield beneficial impacts by enhancing connections between communities and the park. The park staff commitments to the Native American community and park partners increase the connections and opportunities in preserving park resources and providing visitor opportunities. All these actions contribute to improving the quality of life and local economy.

The closure of Shelldance Nursery would have a long-term, minor, adverse impact to the local gateway community.

TRANSPORTATION

Analysis

Common to all areas are improved wayfinding systems that include effective directional signs, site identification, and other wayfinding signs that would facilitate safe and efficient access by all modes of transportation.

Marin County

In terms of transportation improvements, actions that are common to all alternatives would pursue multimodal transportation access opportunities to additional park sites. One example of this pursuit is the National Park Service collaboration with the Water Emergency Transportation Authority in developing multiple park access points to this Bay Area ferry system (e.g., between Fort Baker, Fort Mason, and the Presidio and potentially other park sites).

In the southwest coast area (Muir Beach to Point Bonita), beach and trail access to Muir Beach would be improved while preserving the area's natural setting. Regional trail connections would be enhanced; where possible, trail improvements would connect to the California Coastal Trail. Cumulatively, these measures would provide a long-term, minor to moderate, beneficial impact on visitor access to the park through improved trails.

Increased transit, including increased Muir Woods Shuttle service, would reduce congestion, minimize impacts on natural resources, and provide a way to get to the beach without a car. A new and increased transit service could also reduce parking demand within park locations, increasing it at transit access points adjacent to or outside of park lands. Increased transit would yield a long-term, moderate, beneficial impact to transportation by increasing the number and capacity of connections and availability of non-auto modes of travel.

The park staff would also continue to work with the community and Marin County to manage parking and reduce traffic in Stinson Beach using congestion management tools. In the developed beach area, the parking lot would be replaced by a more sustainable

parking facility. This would have a long-term, minor to moderate, beneficial impact on visitor access to the park, depending on the success of the congestion management efforts. Also at Stinson Beach, the park staff would explore ways to improve non-auto access to the beach, such as promoting public transportation on weekends during the peak season.

Park managers would work with Marin County and state parks to explore realignment of Muir Woods Road to reduce impacts to Redwood Creek. A realignment of Muir Woods Road would have a short-term, moderate, adverse effect on access to the monument for the duration of construction activities.

San Francisco County

All action alternatives for San Francisco County include the following transportation measures:

Trails would be improved to China Beach and Fort Funston. Safer and more direct trail access to East Fort Miley would be created. The trail system in Lands End would be improved to provide access to the shoreline and vistas, as well as connections to the community and adjacent park areas. All of these measures, both individually and cumulatively, would result in a long-term, minor, beneficial impact on circulation both to and within these park areas.

At Upper Fort Mason the visitor circulation and wayfinding improvements would be implemented in response to new adjacent bus transit and ferry connections. This would have a long-term, minor, beneficial impact on connecting people arriving by transit to this site.

At Ocean Beach the park would collaborate with the City of San Francisco to enhance the Ocean Beach corridor with improved amenities including improved parking facilities. This may have a long-term, minor, beneficial impact on the transportation system by increasing parking availability.

San Mateo County

All action alternatives for San Mateo County would include improvements to connect park lands to local communities, improve trails between and within park sites, and add trailheads and parking with improved wayfinding. Specific common improvements include new or improved trails provided along the beach, dunes, and cliffs extending from San Francisco's Fort Funston south to Mussel Rock. Also, modest visitor access facilities (trails, trailheads) to beaches, scenic overlooks, and along the California Coastal Trail between Thornton State Beach to south of Mussel Rock, would be added. Possible trail improvement at Milagra Ridge could include connections to Oceana Boulevard, the Pacific Coast, Skyline Boulevard, and Sweeney Ridge. The Shelldance Nursery site would transition from a commercial nursery to an area providing a variety of visitor services including possible enhanced trailhead parking serving Sweeney Ridge and Mori Point. Access from State Route 1 and the trail connection to Mori Point would be improved. The developed portion of Picardo Ranch would see trailhead and parking improvements.

Trailheads and trails would be developed and enhanced to improve accessibility and connections to the California Coastal Trail and adjacent public lands.

From Phleger Estate, trail connections to adjacent lands and the regional trail system would be pursued in collaboration with San Mateo County and San Francisco Public Utilities Commission. These connections would include the Bay Area Ridge Trail and a potential multiuse trail connection between Cañada Road and Skyline Boulevard north of Phleger Estate.

All of these measures would provide, individually and cumulatively, a long-term, moderate, beneficial impact on accessibility of these remote sites by trails connected to neighborhoods and to larger regional trails. Improved and new trailheads, trailhead parking, and improved directional signs, site identification, and wayfinding signs would also add considerable benefits. Long-term, minor, beneficial effects would be gained through slightly increasing parking at Shelldance Nursery and Sweeney Ridge.

Conclusion

Throughout Golden Gate National Recreation Area, there would be long-term, minor to moderate, beneficial effects on visitor connections to the park sites by land through improved and enhanced trail systems. The potential to increase the transit frequency to park sites in Marin and San Mateo counties would have a long-term, minor to moderate, beneficial impact on connectivity by transit. In San Francisco and San Mateo counties, there would be a long-term, minor to moderate, beneficial enhancement of transportation functionality through slightly increased parking for San Francisco sites and moderately increased parking for San Mateo sites. In Marin County, parking management tools, in connection with increased transit services, could result in a long-term, moderate, beneficial effect on improving access to Tennessee Valley and Stinson Beach, especially for those who do not have access to a car.

PARK MANAGEMENT, OPERATIONS, AND FACILITIES

Analysis

There are many proposed changes indentified in the “actions common to all actions alternatives” section that would influence park management, operations, and facilities. While designed to contribute to the protection of resources and the enhancement of visitor opportunities, the proposed changes will achieve these ends only if staffing and operating funds are increased in accordance with the expanded services and management required to implement the alternatives. If funding and needed staffing levels are not made available when these actions are implemented, the following proposed actions would have long-term, moderate, adverse effects on park operations:

- Proposed boundary changes: Currently staff is unable to meet all of the needs of the existing land base. Additional land will require an increase in the number of park staff and an increase in facility management funds.
- Implementation of the climate change policy and the Ocean Stewardship Program: These changes would require additional staff and funds for baseline information, monitoring, and adaptive management actions; new infrastructure for alternative energy production (although some of these initial costs would result in lower costs in the long run); and additional funding and staff to implement the education aspect of these programs.

- Transportation goals and trail planning and development: water shuttle, ferry, and Bay Trail proposals would require extensive inter-agency collaboration and potential development related to access; these actions would require additional long-term staffing and funding increases. The park's trail goals also would require increased staffing, coordination with partners, and funding for trails and maintenance.

Many of the proposed changes indentified in the "actions common to all actions alternatives" would address problems associated with operations and maintenance and thereby have a positive, long-term, minor to moderate, beneficial effect on park management, operations, and facilities:

- The removal of facilities not contributing to the mission of the park would have a long-term, minor to moderate, beneficial effect on park operations. While removal of properties would require additional staff time during demolition, the long-term effect would be a reduced need for maintenance and other staff attention.
- Implementation of the park collections policy, and particularly the introduction of a curatorial and research facility for park collections, would benefit park operations. Collections would be consolidated from 15 current locations, improving access for both park staff and the public and preservation of the collections. Development of the proposed park collection facility would result in long-term, moderate, beneficial impact to park operations.
- The proposed new maintenance hubs in the Capehart residential area and in the Presidio of San Francisco would allow for reuse of existing buildings and would consolidate some maintenance needs. This would achieve noticeable efficiencies. On the other hand, the Capehart location has a potential to conflict with neighboring residents and would also cause the loss of some of the park housing units, unless the units are replaced by other housing in the park. Development of the maintenance hubs would result in long-term, moderate, beneficial impacts to operations.
- The establishment of a public safety hub at Fort Baker would allow for faster multi-agency response to locations north of the Golden Gate Bridge. The hub would preserve an existing historic building and would meet space, size, function, mobility, and security requirements not currently met by available facilities. Development of the public safety hub would result in long-term, moderate, beneficial impacts to park operations.
- The park's commitment to working with partners would have a continued impact on the park's ability to complete projects and programs in all areas of park operations. Facility rehabilitation and restoration, and even maintenance, could not be accomplished at the current level without partner funding and volunteer efforts. This continued commitment would result in long-term, moderate, beneficial impacts to the operations of the park.
- Collocating offices with San Mateo County would improve efficiencies in interpretation and education as well as facility use. Collocated offices would provide a long-term, moderate, beneficial impact to the operations.

- At Alcatraz Island, the expanded maintenance area within the Quartermaster Warehouse would improve the ability to accomplish maintenance work on the island. The expansion and improvement to the maintenance area would result in a long-term, moderate, beneficial impact to operations.
- At Muir Woods National Monument, moving the maintenance operations from the Old Inn and Lower Conlon Avenue to a new facility in Kent Canyon, pending an interagency agreement, would improve efficiencies with both the monument and state park operations, reduce site impacts at Muir Woods National Monument, and provide for a more modern facility from which to base maintenance activities at the monument. The shared facility would moderately benefit operations over the long term.

Conclusion

Many of the actions common to all alternatives would result in moderate, beneficial impacts to park management, operations, and facilities. However, if funding and staffing levels are inadequate, other actions would result in long-term, major, adverse effects to park management, operations, and facilities.

GOLDEN GATE NATIONAL RECREATION AREA, INCLUDING ALCATRAZ ISLAND

NATURAL RESOURCES – PHYSICAL RESOURCES

Carbon Footprint and Air Quality

No-action Alternative

Analysis

The continuation of current conditions and management would continue to result in adverse impacts to air quality/carbon footprint. Baseline greenhouse gas (GHG) emissions (2008) for Golden Gate National Recreation Area (park lands in Marin and San Francisco counties only; no data is available for San Mateo County) are estimated at 5,249 MTCE. Emissions from mobile combustion represent about 50% of gross emissions.

At Alcatraz Island, mobile combustion associated with the operation of the ferry concession would continue to be the largest contributor of island GHG emissions. Stationary combustion associated with power generation using diesel generators would be eliminated and converted to conventional power supply from the mainland and onsite generated renewable energy, thereby reducing total emissions. Total GHG emissions for Alcatraz Island under the no-action alternative would be 1,675 MTCE.

Total gross emissions of the entire Golden Gate National Recreation Area/Alcatraz Island (excluding San Mateo) would be 6,924 MTCE.

Greenhouse Gas emissions from visitors and NPS operations do contribute to elevated ozone and other air quality concerns. The National Park Service would continue to reduce greenhouse gas emissions by reducing energy consumption and replacing high-emitting apparatus with green technology—a beneficial impact.

Overall, when compared to background levels of air pollution and GHG emissions in the region or the nation (estimated at 6 billion in 2007), impacts to air quality from the no-action alternative would be long term, adverse, and negligible.

Conclusion

Total gross emissions of the entire Golden Gate National Recreation Area and Alcatraz Island (excluding San Mateo) would be 6,924 MTCE, resulting in long-term, minor to moderate, adverse impacts to the park's carbon footprint. Overall, when compared to background levels of air pollution and GHG emissions in the region or the nation (estimated at 6 billion in 2007), impacts to air quality from the no-action alternative would be long term, adverse, and negligible.

No impairment of air resources would result from this alternative.

Alternative 1: Connecting People with the Parks (NPS Preferred Alternative for Park Sites in Marin, San Francisco, and San Mateo Counties)

Analysis

Although visitor opportunities would be expanded and enhanced under alternative 1, the levels and patterns of visitor use and travel within the park under alternative 1 would remain substantially the same as under the no-action alternative; consequently, the impacts to air quality/carbon footprint resulting from visitor use at Golden Gate National Recreation Area would be the same as under the no-action alternative.

Impacts to air quality/carbon footprint from new recreational development under alternative 1 would result in short-term, minor, adverse impacts due to emissions associated with construction activities. Long-term, adverse impacts on air quality/carbon footprint would also be expected due to increases in energy consumption and related emissions attributed to these new facilities.

Beneficial impacts would occur from the removal of a modest number of facilities and structures that use energy for their operation and maintenance, resulting in long-term reductions in air quality emissions and the carbon footprint. Short-term adverse impacts to air quality would occur as a result of the construction activities needed to remove the facilities and reclaim the disturbed sites.

Under alternative 1, gross emissions for the three-county area of Golden Gate National Recreation Area would be reduced by 3% to 5,104 MTCE.

At Alcatraz Island, visitor opportunities would be expanded and there would be access to more areas on the island, resulting in increased ferry transportation and visitor use. This would result in slightly increased emissions associated with the ferry concession (mobile combustion) and wastewater treatment. Emissions associated with energy use would also increase due to increases in facility usage and energy demand. Gross emissions for Alcatraz Island under alternative 1 could increase by about 15% to 1,936 MTCE.

The combined effect of the actions included in alternative 1 would increase the gross emissions of the entire park (the three-county area and Alcatraz Island) by 2% to 7,040 MTCE. This would result in long-term, minor, adverse impacts on the Park Service's carbon footprint. As in the no-action alternative, impacts to air quality (when compared to background levels of air pollution in the region and nation) would be negligible.

Conclusion

The combined effect of the actions included in alternative 1 would increase the gross emissions of the entire park (the three-county area and Alcatraz Island) by 2% to 7,040 MTCE. This would result in long-term, minor, adverse impacts on the National Park Service's carbon footprint. As in the no-action alternative, impacts to air quality (when compared to background levels of air pollution in the region and nation) would be negligible.

No impairment of air resources would result from this alternative.

Alternative 2: Preserving and Enjoying Coastal Ecosystems

Analysis

Although visitor opportunities would be expanded and enhanced under alternative 2, the levels and patterns of visitor use and travel within Golden Gate National Recreation Area would remain substantially the same as under the no-action alternative; consequently, the impacts to air quality/carbon footprint resulting from visitor use would be the same as under the no-action alternative.

Impacts to air quality/carbon footprint from new recreational development under alternative 2 would result in short-term, minor, adverse impacts due to emissions associated with construction activities. Long-term, adverse impacts on air quality/carbon footprint would also be expected due to increases in energy consumption and related emissions attributed to these new facilities.

Beneficial impacts would occur from the removal of certain facilities and structures that use energy for their operation and maintenance, resulting in long-term reductions in air quality emissions and the carbon footprint. Short-term adverse impacts to air quality would occur as a result of the construction activities needed to remove the facilities and reclaim the disturbed sites.

Under alternative 2, gross emissions for the three-county area of Golden Gate National Recreation Area would be reduced by 10% to 4,708 MTCE, the lowest of all of the alternatives for the three-county area.

At Alcatraz Island, visitor opportunities would be expanded and would result in increased ferry transportation and visitor use on the island. This would result in slightly increased emissions associated with the ferry concession (mobile combustion) and wastewater treatment. Emissions associated with energy use would also increase due to increases in facility usage and energy demand. Gross emissions for Alcatraz Island under alternative 2 would increase by about 7% to 1,798 MTCE, the lowest of the three action alternatives for Alcatraz Island.

The combined effect of the actions included in alternative 2 would reduce the gross emissions of the entire park (the three-county area and Alcatraz Island) by 6% to 6,506 MTCE, the lowest of all of the alternatives. This would result in long-term, minor, beneficial impacts on the park's carbon footprint. As in the no-action alternative, impacts to air quality (when compared to background levels of air pollution in the region and nation) would be negligible.

Conclusion

The combined effect of the actions included in alternative 2 would reduce the gross emissions of the entire park (the three-county area and Alcatraz Island) by 6% to 6,506 MTCE, the lowest of all of the alternatives. This would result in long-term, minor, beneficial impacts on the park's carbon footprint. As in the no-action alternative, impacts to air quality (when compared to background levels of air pollution in the region and nation) would be negligible.

No impairment of air resources would result from this alternative.

Alternative 3: Focusing on National Treasures (*NPS Preferred Alternative for Alcatraz Island*)

Analysis

Although visitor opportunities would be expanded and enhanced under alternative 3, the levels and patterns of visitor use and travel within the park under alternative 1 would remain substantially the same as under the no-action alternative; consequently, the impacts to air quality/carbon footprint resulting from visitor use would be the same as under the no-action alternative.

Impacts to air quality/carbon footprint from new recreational development under alternative 3 would result in short-term, minor, adverse impacts due to emissions associated with construction activities. Long-term, adverse impacts on air quality/carbon footprint would also be expected due to increases in energy consumption and related emissions attributed to these new facilities.

Beneficial impacts would occur from the removal of certain facilities and structures that use energy for their operation and maintenance, resulting in long-term reductions in air quality emissions and the carbon footprint. Short-term adverse impacts to air quality would occur as a result of the construction activities needed to remove the facilities and reclaim the disturbed sites.

Under alternative 3, gross emissions for the three-county area of the park would be reduced by 9% to 4,799 MTCE.

At Alcatraz Island, visitor opportunities would be expanded and would result in increased ferry transportation and visitor use on the Island. This would result in slightly increased emissions associated with the ferry concession (mobile combustion) and wastewater treatment. Emissions associated with purchased electricity would also increase due to increases in facility usage and energy demand. Gross emissions for Alcatraz Island under alternative 3 would increase by about 8% to 1,810 MTCE.

The combined effect of the actions included in alternative 3 would reduce the gross emissions of the entire park (the three-county area and Alcatraz Island) by 5% to 6,609 MTCE. This would result in long-term, minor, beneficial impacts on the park's carbon footprint. As in the no-action alternative, impacts to air quality (when compared to background levels of air pollution in the region and nation) would be negligible.

Conclusion

The combined effect of the actions included in alternative 3 would reduce the gross emissions of the entire park (the three-county area and Alcatraz Island) by 5%, to 6,609 MTCE. This would result in long-term, minor, beneficial impacts on the park's carbon footprint. As in the no-action alternative, impacts to air quality (when compared to background levels of air pollution in the region and nation) would be negligible.

No impairment of air resources would result from this alternative.

Soils and Geologic Resources and Processes

No-action Alternative

Analysis

Under the no-action alternative, the presence and maintenance of existing facilities (including structures, roads, and trails) would continue to cause parkwide impacts to soils and geologic resources due to the permanent loss and function of these resources and from erosion associated with unsustainable trails and roads (including road cuts and gullies along Conzelman Road, Milagra Ridge, and State Route 1). The impact of these activities would be long term, minor, adverse, and localized, but would occur throughout the park.

Coastal geologic resources and processes would continue to be affected by the presence of facilities and structures located in geologically sensitive areas, such as at Stinson Beach (parking lot and dune interface) and Slide Ranch in Marin County, Ocean Beach (seawall and infrastructure) and Fort Funston in San Francisco County, and at Devil's Slide (road infrastructure) in San Mateo County. The facilities and land uses present at these areas, as well as NPS management activities to protect infrastructure, would continue to inhibit natural shoreline processes. The impact of these activities would be long term, moderate, adverse, and localized.

Projects to improve natural habitat values and ecosystem function, such as those at Big Lagoon (estuarine restoration), Lower Redwood Creek (wetland restoration), Marin Headlands (gully repair), in off-shore marine areas (sand deposits and management), and at Land's End and Mori Point (trail/road removal and repair), would have beneficial effects on soils and geologic resources and processes because they would improve or restore the functionality of natural processes—the impact would be long term, minor to moderate, beneficial, and localized.

Recreational use would continue to cause compaction and erosion of soils, resulting in long-term, minor, adverse, localized impacts throughout the park.

Park Service efforts to provide educational and participatory stewardship programs would continue to have a beneficial effect on geologic resources and soils due to increased public understanding and support for resource protection and management—the impact would be long term, minor, beneficial, and parkwide.

At Alcatraz Island, the presence and maintenance of existing structures on Alcatraz Island would continue to destabilize slopes and affect natural erosion and geologic processes. The National Park Service would continue to implement building stabilization techniques that would result in long-term, minor, adverse, localized impacts to soils and geologic resources and processes.

Conclusion

Overall, the impact to geologic resources and soils from the no-action alternative would be long term, range from minor adverse to moderate beneficial, and be localized and parkwide. Adverse impacts would occur from the presence and maintenance of existing facilities and visitor use. Beneficial impacts would occur from restoration and education and stewardship activities.

No impairment of geologic resources would result from this alternative.

Alternative 1: Connecting People with the Parks (NPS Preferred Alternative for Park Sites in Marin, San Francisco, and San Mateo Counties)

Analysis

Under alternative 1, a variety of management zones would be used that would assist in the protection of soils and geologic resources and processes. Approximately 77% of the park would be zoned using the Natural and Sensitive Resources management zones.

Alternative 1 would reduce soil erosion by eliminating unsustainable trails and roads, resulting in long-term, minor, beneficial, localized impacts.

The removal of facilities or structures, and the reclamation of disturbed building sites (such as at the Capehart housing area and Tennessee Valley in Marin County; Fort Miley and Fort Funston in San Francisco County; and Milagra Ridge, Mori Point, and Phleger Estate in San Mateo County); dune restoration at Fort Funston; managed retreat from sea level rise at Ocean Beach; and creek restoration at Eastkoot Creek, Capehart Creek, and Lower Redwood Creek in Marin County where about 8 acres would be improved and restored to natural conditions, and at Rancho Corral de Tierra in San Mateo County would improve soil function and integrity and restore natural geologic processes. The impact of these activities would be long term, minor to moderate, beneficial, and localized. Short-term, minor, adverse impacts (such as increased erosion or compaction in adjacent areas) would occur during construction activities.

Visitor access and use at specific park sites would be expanded under alternative 1, resulting in increased soil compaction and erosion; however, compared to use patterns under the no-action alternative, only slight adverse impacts would be expected. Most impacts would be contained within defined visitor use areas and on trails. The impact, especially in areas off-trail, would be long term, minor, adverse, and localized. This impact would occur in areas throughout the park.

New recreational development would have long-term, adverse, localized impacts on soils and geologic resources throughout the park due to the permanent loss of soil function and integrity resulting from new development and increased erosion from facility construction and maintenance. The intensity of the impact would range from negligible to moderate. In some areas (such as at Upper Fort Mason, Fort Miley, China Beach, and Fort Funston in San Francisco County and Shelldance Nursery and Devil's Slide in San Mateo County) adverse impacts would be negligible to minor because the development would occur in previously developed or disturbed sites. In other areas (such as at Stinson Beach, Kirby Cove, Forts Barry and Cronkhite, Slide Ranch, Golden Gate Dairy, Tennessee Valley, and Marin City Ridge/Gerbode Valley and along State Route 1, Conzelman, McCullough, and Bunker Roads in Marin County and at Sweeney Ridge and Rancho Corral de Tierra in San Mateo County) new development would cause minor to moderate adverse impacts to soils and geologic resources because these areas are undeveloped and the impacts would be new.

Impacts from NPS educational and stewardship programs would generally be the same as those described in the no-action alternative.

At Alcatraz Island, the existing structures would be rehabilitated, which would require additional stabilization measures that would impact natural geologic processes. This would result in long-term, minor, adverse, localized impacts.

Conclusion

The elimination of unsustainable roads and trails would reduce soil erosion, resulting in long-term, minor, beneficial, localized impacts to soils. The removal of facilities and structures would result in long-term, minor to moderate, beneficial, localized impacts, although new recreational development would have long-term, adverse, localized impacts on soils and geologic resources. During the removal or construction period, short-term, minor, adverse impacts (such as increased erosion or compaction in adjacent areas) would occur.

Overall, adverse impacts would occur from new recreational development and expanded visitor use. Beneficial impacts would occur from trail and road maintenance, the restoration of disturbed sites and creeks, and improved resource understanding and public support.

No impairment of geologic resources would result from this alternative.

Alternative 2: Preserving and Enjoying Coastal Ecosystems

Analysis

Under alternative 2, a variety of management zones would assist in the protection of soils and geologic resources and processes. Approximately 92% of the park—the largest amount in any of the alternatives—would be zoned using the Natural and Sensitive Resources management zones.

Alternative 2 would reduce soil erosion by eliminating unsustainable trails and roads and removing and restoring unneeded management roads, resulting in long-term, minor to moderate, beneficial, localized impacts.

Beneficial impacts to soils and geological resources and processes from the removal of facilities/structures and restoration of natural areas would be greater than under the no-action alternative. In addition to the actions included in alternative 1, the National Park Service in alternative 2 would 1) remove portions of and restore the Capehart housing area to a natural setting, 2) relocate Slide Ranch out of a sensitive geologic hazard area, 3) work with Marin County to realign the highway and minimize impacts to Redwood Creek, and 4) work with Caltrans to further protect geologic processes on the coast of Marin County, including the potential abandonment of a small segment of State Route 1. These activities would restore soil function, integrity, and natural geologic processes; when combined with those actions included in alternative 1, would result in long-term, moderate, beneficial, and localized impacts.

Impacts from visitor access and use at specific park sites would be the same as those described in alternative 1, resulting in long-term, minor, adverse, and localized impacts.

The type of adverse impacts associated with new recreational development under alternative 2 would be the same impacts as described in alternative 1 although the amount and distribution of proposed facilities is reduced, resulting in minor, adverse, localized impacts to soils and geologic resources.

Impacts from NPS educational and stewardship programs would generally be the same as those described in the no-action alternative.

At Alcatraz Island, the existing structures would be stabilized, but coastal erosion processes would be allowed to evolve naturally. This would result in long-term, minor, beneficial, localized impacts to geologic resources and processes.

Conclusion

The elimination of unsustainable trails and roads and the removal and restoration of unneeded management roads, would reduce soil erosion, resulting in long-term, minor to moderate, beneficial, localized impacts.

The removal of facilities/structures and restoration of a large number of natural areas would result in long-term, moderate, beneficial, and localized impacts.

Overall, adverse impacts would occur from new recreational development and expanded visitor use. Beneficial impacts would occur from trail and road maintenance, and the restoration of disturbed sites and creeks.

No impairment of geologic resources would result from this alternative.

Alternative 3: Focusing on National Treasures (*NPS Preferred Alternative for Alcatraz Island*)

Analysis

Under alternative 3, a variety of management zones would be used that would assist in the protection of soils and geologic resources and processes. Approximately 88% of the park would be zoned in the Natural and Sensitive Resources zones.

Impacts to soils from reducing soil erosion would be the same as described in the alternative 1, resulting in long-term, minor, beneficial, localized impacts.

Impacts to soils and geologic resources and processes from the removal of facilities and structures and the reclamation of disturbed building sites under alternative 3 would be the same as those described in alternative 1, resulting in long-term, minor to moderate, beneficial, and localized impacts.

Impacts from visitor access and use at specific park sites would be the same as those described in alternative 1, resulting in long-term, minor, adverse, and localized impacts.

Impacts from new recreational development under alternative 3 would generally be the same as those described in alternative 1. Although the distribution of new development may be slightly different, the resulting impact to soils and geologic resources and processes would remain long term, minor to moderate, adverse, and localized.

Impacts from NPS educational and stewardship programs would generally be the same as those described in the no-action alternative.

At Alcatraz Island, the existing structures would be rehabilitated, which would require additional stabilization measures that would impact natural geologic processes. This would result in long-term, minor, adverse, localized impacts.

Conclusion

The reduction in soil erosion and the reclamation of disturbed building sites would result in long-term, minor to moderate, beneficial, localized impacts. Impacts from new recreational development would be long term, minor to moderate, adverse, and localized.

Overall, beneficial impacts would occur from trail and road maintenance, the restoration of disturbed sites and creeks, and improved resource understanding and public support. Adverse impacts would occur from new recreational development and expanded visitor use.

No impairment of geologic resources would result from this alternative.

Water Resources and Hydrologic Processes

No-action Alternative

Analysis

Under the no-action alternative, the presence and maintenance (or lack of maintenance in some cases) of existing facilities (including structures, roads, and trails) would continue to cause localized impacts to water quality due to pollution from urban runoff and turbidity from soil erosion. The impact of these activities would be long term, minor to moderate, adverse, and localized, but would occur throughout the park.

Structures would remain in the 100-year floodplains of several creeks resulting in adverse impacts. In Marin County, park facilities at Stinson Beach (parking lots and picnic areas) and Muir Beach (parking lot and Pacific Way) would continue to affect floodplain function along Easkoot Creek and Redwood Creek. In San Mateo County, horse stables located in the lower portion of the Rancho Corral de Tierra property are located in the San Vicente Creek floodplain and would continue to affect floodplain function. Retention of these facilities would continue to slightly affect the flow of water during floods and the capacity of the floodplain to store floodwaters. The impact would be long term, minor, adverse, and localized.

Projects to improve natural habitat values and ecosystem function, such as those at Big Lagoon (estuarine restoration), Lower Redwood Creek (wetland restoration), Marin Headlands (gully repair), and Land's End and Mori Point (trail/road removal and repair), would have beneficial effects on water resources and hydrologic processes because they would improve and restore the function and integrity of natural hydrologic systems—the impact would be long term, minor to moderate, beneficial, and localized.

Recreational use would continue to cause erosion of soils resulting in turbidity. Vehicle use at parking areas and on roadways throughout the park would continue to affect water quality from runoff that contains chemical contaminants. These activities would result in long-term, minor, adverse, localized impacts to water quality throughout the park.

Park Service efforts to provide educational and participatory stewardship programs would continue to have a beneficial effect on water resources and hydrologic processes due to increased public understanding and support for resource protection and management—the impact would be long term, minor, beneficial, and parkwide.

At Alcatraz Island, visitor use and NPS operations (including the cleaning of bird guano) would continue to contribute nutrients and sediment to the adjacent marine waters through runoff. Runoff from impervious surfaces on the island, such as existing structures, would also contribute to this issue. Vessels, primarily the passenger ferry, traveling to the island would impact water quality by introducing hydrocarbons and other chemicals into the Bay, as well as increasing turbidity near the docking station on the

island. These activities would result in long-term, minor, adverse, localized impacts to water quality.

Conclusion

The continued existence of structures and facilities in some areas of the park would have long-term, minor to moderate, adverse, and localized impacts on water resources and hydrologic processes.

Projects to improve natural habitat values and ecosystem function would have long-term, minor to moderate, beneficial, and localized impacts on water resources and hydrologic processes.

Generally, adverse impacts would occur from the continued presence and maintenance of existing facilities, the continued presence of the existing volume of vehicular traffic, and continued patterns of visitor use. Beneficial impacts would occur from restoration of natural areas and from education and stewardship activities.

No impairment of water resources would result from this alternative.

Alternative 1: Connecting People with the Parks (NPS Preferred Alternative for Park Sites in Marin, San Francisco, and San Mateo Counties)

Analysis

Under alternative 1, a variety of management zones would be used that would assist in the protection of water resources and hydrologic processes. Approximately 77% of the park would be zoned using the Natural and Sensitive Resources zones.

Impacts to water-related resources from the continued presence and maintenance of existing facilities (including structures, roads, and trails) under alternative 1 would be less than the no-action alternative because impacts to water quality caused by erosion from unsustainable trails and roads would be reduced. Alternative 1 would develop a sustainable trail system and remove and restore unneeded and unsustainable roads and trails, as well as maintain all trails and roads. These activities would result in long-term, minor to moderate, beneficial, localized impacts on water quality. Short-term, minor, adverse impacts to water quality could occur from sedimentation and runoff during construction activities.

The removal of facilities and structures and the reclamation of disturbed building sites (such as at the Capehart housing area and Tennessee Valley in Marin County) and dune restoration at Fort Funston would improve natural hydrologic processes. The impact of these activities would be long term, minor to moderate, beneficial, and localized.

Beneficial effects on stream character, water quality, wetlands, floodplains, and watershed processes would occur from creek restoration at Stinson Beach (Eastkoot Creek), Rancho Corral de Tierra, and in the Lower Tennessee Valley. At Stinson Beach, restoration projects would included the removal of nonnative invasive vegetation and the restoration and enlargement of riparian habitat. In Lower Tennessee Valley, creek projects would include the restoration of riparian habitat, improvements to hydrologic functions, and the removal of the dam at Tennessee Pond. At Rancho Corral de Tierra, projects would include extensive removal of nonnative invasive vegetation, riparian habitat restoration, and possibly more extensive creek channel restoration that could reconnect steelhead habitat with the ocean and restore many functional components of the

natural hydrologic regime. However, these more substantial creek restoration efforts at Ranch Corral de Tierra would likely be dependent on the success of park partnerships, since other entities have proprietary interests in portions of the creek channel and water rights. If these more substantial efforts are accomplished, the overall stream character and function would be improved by creating a more natural watercourse that would reduce the potential for erosion, re-create floodplain connectivity, restore wetland functions, and contribute to improvements in restoring watershed processes and water quality. Overall, the impact of these creek restoration activities would be long term, minor to moderate, beneficial, and localized.

Impacts to floodplains would be the same as those described in the no-action alternative.

Visitor access and use would be expanded throughout the park under alternative 1, potentially resulting in some increase in erosion along trails and at primary visitor use areas that could have impacts on water quality—the impact would be long term, negligible to minor, adverse, and localized.

New and/or improved recreational development—including new visitor facilities and amenities at 1) Stinson Beach, Kirby Cove, Forts Barry and Cronkhite, Slide Ranch, Golden Gate Dairy, Tennessee Valley, and Marin City Ridge / Gerbode Valley along State Route 1 and Conzelman, McCullough, and Bunker Roads in Marin County; at 2) Upper Fort Mason, Fort Miley, China Beach, and Fort Funston in San Francisco County; and at 3) Milagra Ridge, Sweeney Ridge, Phleger Estate, and Rancho Corral de Tierra in San Mateo County—would have short-term, negligible to minor, adverse, localized impacts on water quality from increased erosion and sedimentation, and the potential for chemical contamination resulting from inadvertent chemical spills from heavy equipment at construction sites. Similar impacts to water quality could occur over the long term due to the increased potential for urban pollutants to runoff from parking lots and other developed features.

In some areas (such as at Shelldance Nursery and Devil's Slide in San Mateo County) adverse impacts would be negligible to minor because the development would occur in previously developed or disturbed sites. In other areas (such as at Rancho Corral de Tierra in San Mateo County), adverse impacts to water resources would be minor to moderate because new development would occur in undisturbed sites.

Impacts from NPS educational and stewardship programs would generally be the same as those described in the no-action alternative.

At Alcatraz Island, impacts from visitor use and NPS operations (including the cleaning of bird guano) would be greater than those described in the no-action alternative because greater emphasis would be placed on visitor access and the cleaning of more primary use areas, resulting in increased potential for water quality impacts such as nutrient and sediment inputs into marine waters. Turbidity and chemical contamination may also increase due to increased vessel traffic in the Bay. Impacts from these activities would result in long term, minor to moderate, adverse, localized impacts to water quality.

Conclusion

The removal and reclamation of facilities and structures, the re-creation of natural hydrologic regimes, and restoration of watershed processes would result in long-term minor to moderate, beneficial impacts to water quality, while the construction,

maintenance or removal of trails and facilities would have short-term, minor to moderate, adverse impacts to water quality.

There would be long-term minor to moderate, adverse, localized impacts to water quality on Alcatraz Island resulting from cleaning of primary visitor use areas and increased vessel traffic in San Francisco Bay.

Generally, adverse impacts would occur from new recreational development and expanded visitor use. Beneficial impacts would occur from trail and road maintenance and the restoration of disturbed sites and creeks.

No impairment of water resources would result from this alternative.

Alternative 2: Preserving and Enjoying Coastal Ecosystems

Analysis

Under alternative 2, a variety of management zones would be used that would assist in the protection of water resources and hydrologic processes. Approximately 92% of the park would be zoned using the Natural and Sensitive Resources zones.

Alternative 2 would reduce impacts to water quality by eliminating erosion from unsustainable trails and unneeded management roads, resulting in long-term, minor to moderate, beneficial, localized impacts. Short term, minor, adverse impacts to water quality could occur from sedimentation and runoff during construction activities.

The magnitude of beneficial impacts associated with the removal of facilities/structures and the reclamation of disturbed building sites would be greater than under the no-action alternative. In alternative 2, in addition to the actions included in alternative 1, the National Park Service would completely remove and restore the Capehart housing area; work with Marin County to realign the highway and minimize impacts to Redwood Creek; and could remove or relocate all horse stable stables from the Rancho Corral de Tierra property. These activities would improve natural hydrologic processes; when combined with the actions included in alternative 1, they would result in long-term, moderate, beneficial, and localized impacts on water resources and hydrologic processes.

Beneficial effects on stream character, water quality, wetlands, floodplains, and watershed processes would occur from creek restoration at Stinson Beach (Eastkoot Creek) and especially at Rancho Corral de Tierra. Incised creek banks that adversely impact floodplain function by restricting creek sinuosity would be restored, thereby expanding and enhancing wetlands and improving water quality. The overall stream character and function would be improved by creating a more natural watercourse that would reduce the potential for erosion, re-create the natural hydrologic regime, and contribute to improvements in restoring watershed processes and regional water quality. Collaborating with municipalities to increase water storage would benefit water resources by increasing water quantity with park streams. The impact of these activities would be long term, moderate, beneficial, and localized.

Impacts to floodplains would be less than those described in the no-action alternative because the removal of the lower horse stable from the 100-year floodplain of San Vicente Creek at Rancho Corral de Tierra would improve floodplain function and integrity—resulting in a long-term, minor, beneficial, localized impact.

Impacts from visitor access and use would be the same as those described in alternative 1, resulting in long-term, minor, adverse, and localized impacts.

The magnitude of adverse impacts associated with new recreational development under alternative 2 would be less than under alternative 1 because the amount and distribution of proposed facilities is reduced. However, the types of impacts would generally be the same and would result in minor, adverse, localized impacts to water quality and water resources.

Impacts from NPS educational and stewardship programs would generally be the same as those described in the no-action alternative.

At Alcatraz Island, impacts from visitor use and NPS operations would be less than those described in the no-action alternative because greater portions of the island would be left to natural reclamation and the focus on maintaining visitor use areas (including the cleaning of bird guano) would be reduced. Therefore, nutrient and sediment inputs into marine waters would be reduced. Water quality impacts associated with vessel traffic would be expected to be the same as in the no-action alternative. These actions would result in long-term, minor, beneficial, localized impacts to water quality.

Conclusion
The removal of unsustainable trails and unneeded management roads, removal of facilities and structures, creek restorations, realignment of small sections of roadway, and the relocation of horse stables away from adjacent creeks would result in long-term, minor to moderate, beneficial impacts to water resources, wetlands, floodplains, and overall hydrologic processes. However, the construction, maintenance, or removal activities associated with these changes would have short-term, minor to moderate, adverse impacts to water quality.

Leaving greater portions of Alcatraz Island to natural reclamation and reducing the visitor use area on the island would result in long-term, minor, beneficial, localized impacts to water quality The visitor use area would be reduced providing for a larger area of the island to naturally reclaim and thereby reduce water quality impacts caused by human use.

Generally, adverse impacts would occur from new recreational development and expanded visitor use. Beneficial impacts would occur from trail and road maintenance, and the restoration of disturbed sites, creeks, and floodplains.

No impairment of water resources would result from this alternative.

Alternative 3: Focusing on National Treasures (*NPS Preferred Alternative for Alcatraz Island*)

Analysis
Under alternative 3, a variety of management zones would be used that would assist in the protection of water resources and hydrologic processes. Approximately 88% of the park would be zoned using the Natural and Sensitive Resources zones.

As described in alternative 1, impacts to water quality from reducing erosion from unsustainable trails and roads would be reduced when compared to the no-action alternative, resulting in long-term, minor to moderate, beneficial, localized impacts. Short

term, minor, adverse impacts to water quality could occur from sedimentation and runoff during construction activities.

As described in alternative 1, the removal of facilities/structures and the reclamation of disturbed building sites would result in long-term, minor to moderate, beneficial, and localized impacts to water resources and hydrologic processes.

As described in alternative 1, creek restoration would result in enhanced wetlands, improved water quality, and overall improvements to stream character and function. The impact of these activities would be long term, moderate, beneficial, and localized.

Impacts to floodplains would be the same as those described in the no-action alternative.

Visitor access and use would be expanded under alternative 3, potentially resulting in some increase in erosion along trails and at primary visitor use areas that could have impacts on water quality—the impact would be long term, negligible to minor, adverse, and localized.

Impacts from new recreational development would generally be the same as described in alternative 1, resulting in short-term, negligible to minor, adverse, localized impacts on water quality from increased erosion and sedimentation, and the potential for chemical contamination resulting from inadvertent chemical spills from heavy equipment at construction sites. Similar impacts to water quality could occur over the long term due to the increased potential for urban pollutants to runoff from parking lots and other developed features.

Impacts from NPS educational and stewardship programs would generally be the same as those described in the no-action alternative.

At Alcatraz Island, impacts from visitor use and NPS operations (including the cleaning of bird guano) would be greater than those described in the no-action alternative because greater emphasis would be placed on visitor access and the cleaning of more primary use areas, resulting in increased potential for water quality impacts such as nutrient and sediment inputs into marine waters. Water quality impacts, such as turbidity and chemical contamination, from increased vessel traffic in the Bay may also increase. Additional impacts associated with the scale of historic structure rehabilitation and facility improvements under alternative 3 could result in increased impacts to water quality. Impacts from these activities would result in long-term, minor to moderate, adverse, localized impacts to water quality.

Conclusion

The removal and natural restoration of unsustainable trails and unneeded management roads, the removal of facilities and structures, and creek restoration efforts would result in long-term, minor to moderate, beneficial impacts to water resources and hydrologic process. However, the construction, maintenance, or removal of trails and facilities would have short-term, minor to moderate, adverse impacts to water quality.

The scale of historic structure rehabilitation and facility improvements on Alcatraz Island could result in increased impacts to water quality. The cleaning of the primary visitor use areas and the increased vessel traffic in San Francisco Bay would result in long-term minor to moderate, adverse, localized impacts to water quality on Alcatraz Island.

Adverse impacts would occur from new recreational development and expanded visitor use. Beneficial impacts would occur from trail and road maintenance and the restoration of disturbed sites and creeks. No impairment of water resources would result from this alternative.

No impairment of water resources would result from this alternative.

NATURAL RESOURCES – BIOLOGICAL RESOURCES

Habitat (Vegetation and Wildlife)

No-action Alternative

Analysis

Under the no-action alternative, the presence and maintenance (or lack of maintenance in some cases) of existing facilities (including structures, roads, and trails) would continue to cause localized impacts to vegetation and wildlife habitat by fragmenting natural areas and increasing the potential for exotic plant species to displace native species and affect native habitat. Maintaining facilities and structures in coastal interface areas would continue to disrupt natural shoreline habitat values resulting in impacts to species that depend on these areas and diminished biodiversity in general. The impact of these activities would be long term, minor to moderate, adverse, and localized, but would occur throughout the park.

Projects to improve natural habitat values and ecosystem function, such as those at Big Lagoon (estuarine restoration), Lower Redwood Creek (wetland restoration), Marin Headlands (gully repair), Kirby Cove (45 acres of exotic plant removal), Fort Funston (20 acres of exotic plant removal), in off-shore marine areas (sand deposits and management), and at Land's End and Mori Point (trail/road removal and repair), would have beneficial effects on vegetation, wildlife, and wildlife habitat because they would reduce the impacts of exotic plant species, improve or restore the functionality of natural processes, and improve specific habitat components that are required by the affected species. These kinds of activities would reduce environmental stressors and increase the resiliency of species and systems to the effects of climate change. Rehabilitating disturbed sites would improve the integrity and diversity of habitats available to aquatic and terrestrial organisms. Ongoing vegetation management and monitoring of plants and wildlife allows the National Park Service to improve native habitat conditions. The use of spatial and temporal closures would continue to protect wildlife and wildlife habitat. The impact of these activities would be long term, minor to moderate, beneficial, and localized.

Recreational use would continue to reduce habitat integrity by trampling plants, introducing and increasing the spread of exotic species, causing disturbance (flushing and displacement) to animals, and increasing the potential for human-wildlife conflict resulting from habituation due to the presence of humans and the introduction of unnatural food sources. Recreational use also generates noise and unnatural light sources that affect wildlife. These activities would result in long-term, minor to moderate, adverse, localized impacts throughout the park.

Park Service efforts to provide educational and participatory stewardship programs would continue to have a beneficial effect on vegetation and wildlife habitat due to increased public understanding and support for resource protection and management—the impact would be long term, minor, beneficial, and parkwide.

At Alcatraz Island, waterbirds would continue to be affected by visitor use (day use, special events, etc.) and NPS operations, including managing gulls and other waterbirds in visitor use areas. Boat traffic in the marine waters adjacent to the island would continue to cause disturbance to nesting birds. These activities would result in long-term, minor, adverse, localized impacts. At the same time, the National Park Service would continue to protect nesting habitat and bird use areas on the Island using seasonal closures, especially the preferred habitats on the western perimeter of the island. This would result in long-term, moderate, beneficial, localized impacts to waterbird populations. Given the combined effects of disturbance and protective actions, the numbers of breeding pairs of waterbirds on the Island have steadily increased over the last decade. This trend is expected to continue. Collectively, impacts to waterbirds as a result of the no-action alternative would be long term, minor to moderate, adverse, and localized.

Conclusion

The conditions related to existing facilities would continue to cause fragmentation of habitat and the potential for exotic plant species to displace native species. The continuation of current recreational use also would reduce habitat integrity. The impacts would be long term, minor to moderate, adverse, and localized but would occur throughout the park.

Habitat restoration efforts and educational and participatory stewardship programs would result in long-term, minor to moderate, beneficial impacts that would occur both at the local level (habitat restoration) and parkwide(stewardship programs).

Impacts to waterbirds would be long term, minor to moderate, adverse, and localized.

Generally, adverse impacts would occur from the presence and maintenance of existing facilities and visitor use. Beneficial impacts would occur from restoration and ongoing management and monitoring activities.

No impairment of vegetation or wildlife resources would result from this alternative.

Alternative 1: Connecting People with the Parks (NPS Preferred Alternative for Park Sites in Marin, San Francisco, and San Mateo Counties)

Analysis

Under alternative 1, a variety of management zones would be used that would assist in the protection of vegetation and wildlife habitat. Approximately 77% of the park would be zoned as a Natural and Sensitive Resources zone.

Sensitive Resource zones at Bird Island and Point Bonita Cove would serve to protect seabirds and pinnipeds, a beneficial impact when compared to the no-action alternative.

The impacts to vegetation and wildlife from the continued presence and maintenance of existing facilities (including structures, roads, and trails) under alternative 1 would be less than the no-action alternative because impacts to vegetation and wildlife habitat caused

by erosion from unsustainable trails and roads would be reduced. Alternative 1 would develop a sustainable trail system and eliminate unneeded and unsustainable roads and trails, as well as maintain all trails and roads. Impacts to native habitat from fragmentation and exotic species would be reduced. These activities would result in long-term, minor, beneficial, localized impacts on vegetation and wildlife.

The removal of facilities/structures and the reclamation of disturbed building sites (such as at the Capehart housing area and Tennessee Valley in Marin County); dune restoration at Fort Funston; vegetation restoration on old roads and trails at Phleger Estate; and extensive exotic plant removal at Ranch Corral de Tierra. Creek restoration at Stinson Beach (Eastkoot Creek), and especially at Rancho Corral de Tierra would improve vegetation and wildlife habitat by improving habitat structure and the diversity of habitats available to support various species' needs. These kinds of activities would reduce environmental stressors and increase the resiliency of species and systems to the effects of climate change. The impact of these activities would be long term, moderate, beneficial, and localized.

Visitor access and use would be expanded under alternative 1, potentially resulting in additional impacts to vegetation (trampling) and wildlife (disturbance) along trails and at primary visitor use areas—the impact would be long term, minor, adverse, and localized.

New and/or improved recreational development including new visitor facilities and amenities at 1) Stinson Beach, Kirby Cove, Forts Barry and Cronkhite, Slide Ranch, Golden Gate Dairy, Tennessee Valley, and Marin City Ridge / Gerbode Valley along State Route 1 and Conzelman, McCullough, and Bunker Roads in Marin County; at 2) Upper Fort Mason, Fort Miley, China Beach, and Fort Funston in San Francisco County; and at 3) Milagra Ridge, Sweeney Ridge, Phleger Estate, and Rancho Corral de Tierra in San Mateo County would have long-term, minor, adverse, localized impacts on vegetation and wildlife due to the permanent loss of plants and wildlife habitat. Short-term, minor, adverse impacts to vegetation would also occur from injury or loss of plants during construction activities; however, the area would be replanted with native plants and the natural habitat would be reclaimed. Similarly, short-term adverse impacts to wildlife, such as disturbance, would occur during construction. The rehabilitation and use of Pier 4 at Fort Mason would result in impacts (habitat disturbance during construction) to marine resources—the impact would be short term, minor, adverse, and localized.

Impacts from NPS educational and stewardship programs would generally be the same as those described in the no-action alternative. Similarly, impacts from vegetation and wildlife management and monitoring activities under alternative 1 would be the same as those described in the no-action alternative. However, the establishment of a native plant nursery would provide additional capacity to improve native vegetation and wildlife habitat and expand stewardship efforts—resulting in a beneficial impact.

At Alcatraz Island, adverse impacts to waterbirds under alternative 1 would be greater than those described in the no-action alternative because new visitor amenities (namely food service, modest overnight accommodations, and special events) would cause increased disturbance to nesting waterbirds and human-wildlife conflict. Additionally, historic restoration of the Parade Grounds and removal of the rubble piles would cause habitat loss and disturbance to waterbird populations. Expanded visitor use of the Agave Trail would affect use of the tidepools by foraging birds. As in the no-action alternative, the National Park Service would continue to protect nesting and roosting habitats and

initiate habitat enhancements in other areas of the island where possible—resulting in beneficial impacts. The marine waters within the vicinity of the colonial nesting birds would be closed to boating during the breeding season, resulting in beneficial impacts. Given the combined effects of disturbance and protective actions, the numbers of breeding pairs of waterbirds on the island could decrease over time depending on the frequency and intensity of expanded visitor activity. Collectively, these activities would result in long-term, moderate, adverse, localized to regional impacts to waterbirds on the island.

Conclusion

The development of a sustainable trail system and elimination of unneeded and unsustainable roads and trails, the removal of facilities/structures with reclamation of disturbed building sites, and habitat restoration efforts would result in long-term, minor to moderate, beneficial, localized impacts on vegetation and wildlife.

The expansion of visitor access and use and the development of new or improved recreational facilities would result in long-term, minor, adverse, and localized impacts. The construction activities related to these developments would result in short-term, minor, and adverse impacts.

Impacts from NPS educational and stewardship programs would generally be the same as those described in the no-action alternative. Similarly, impacts from vegetation and wildlife management and monitoring activities under alternative 1 would be the same as those described in the no-action alternative. However, the establishment of a native plant nursery would provide additional capacity to improve native vegetation and wildlife habitat and expand stewardship efforts—a beneficial impact.

Habitat restoration efforts and educational and participatory stewardship programs would result in long-term, minor to moderate, beneficial impacts that would occur both at the local level (habitat restoration) and parkwide (stewardship programs). An additional beneficial impact would result from the establishment of a native plant nursery.

Impacts to waterbirds would be long-term, moderate, adverse, and localized to regional.

Generally, adverse impacts would occur from the presence and maintenance of existing facilities and visitor use. Beneficial impacts would occur from natural resource restoration and ongoing management and monitoring activities.

No impairment of vegetation or wildlife resources would result from this alternative.

If it becomes evident that implementation of the actions in alternative 1 at both the Parade Ground and at the north end of the island (in the vicintity of the New Industries/Model Industries Buildings) are having substantial adverse effects and would result in long-term or permanent loss of waterbird nesting colonies, the park staff would use adaptive management techniques and take the necessary measures to ensure the continued viability of breeding populations of these species on the island. These steps could include allowing only nonbreeding season access to the Parade Ground or limiting the types and scale of uses in the north end of the island during nesting seasons. These actions would ensure that adverse impacts do not exceed the moderate intensity threshold, and thereby avoid impairment of park resources.

Alternative 2: Preserving and Enjoying Coastal Ecosystems

Analysis

Under alternative 2, a variety of management zones would be used that would assist in the protection of vegetation and wildlife habitat. Approximately 92% of the park would be zoned using the Natural and Sensitive Resources zones.

Sensitive Resource zones at Bird Island and Point Bonita Cove would serve to protect seabirds and pinnipeds, a beneficial impact when compared to the no-action alternative.

The impacts to vegetation and wildlife from the continued presence and maintenance of existing facilities (including structures, roads, and trails) under alternative 2 would be less than the no-action alternative because impacts to vegetation and wildlife habitat caused by erosion from unsustainable trails and roads would be reduced. Alternative 2 would develop a sustainable trail system and eliminate and rehabilitate unneeded trails and management roads, as well as maintain all trails and roads. Impacts to native habitat from fragmentation and exotic species would be reduced. These activities would result in long-term, minor, beneficial, localized impacts on vegetation and wildlife.

The magnitude of beneficial impacts associated with the removal of facilities/structures and the reclamation of disturbed building sites, as well as from creek restoration, would be greater than under the no-action alternative. In alternative 2, in addition to the actions included in alternative 1, the National Park Service would completely remove and restore the Capehart housing area; work with Marin County to realign the highway and minimize impacts to Redwood Creek; remove structures and restore about 10 acres at Slide Ranch, as well as convert about 3.5 acres of existing farmland to native habitat; restore about 18 acres of uplands at Golden Gate Dairy; remove the nonnative forest and improve natural habitat conditions at Fort Miley; and improve or remove all horse stable stables from the Rancho Corral de Tierra property. These kinds of activities would reduce environmental stressors and increase the resiliency of species and systems to the effects of climate change. These activities would also improve habitat structure and the diversity of habitats available to support various species' needs, and when combined with those actions included in alternative 1, would result in long-term, moderate, beneficial, and localized impacts.

Visitor access and use would be expanded under alternative 2, potentially resulting in additional impacts to vegetation (trampling) and wildlife (disturbance) along trails and at primary visitor use areas—the impact would be long term, minor, adverse, and localized.

The type of adverse impacts associated with new recreational development under alternative 2 would be the same impacts as described in alternative 1 although the number and distribution of proposed facilities is reduced resulting in minor, adverse, localized impacts to vegetation and wildlife habitat.

Impacts from NPS educational and stewardship programs would generally be the same as those described in the no-action alternative, with one exception. Partnering with other agencies to manage visitor access and promote restoration and habitat management as part of the UNESCO Biosphere Reserve would elevate this issue and could result in benefits to vegetation and wildlife habitat. Impacts from vegetation and wildlife management and monitoring activities under alternative 2 would be the same as those described in the no-action alternative. The establishment of a native plant nursery would

provide additional capacity to improve native vegetation and wildlife habitat and expand stewardship efforts—resulting in a beneficial impact.

At Alcatraz Island, adverse impacts to waterbirds under alternative 2 would be fewer than those described in the no-action alternative because waterbird nesting and use areas would be allowed to expand and conflicts with visitor use and NPS operations would be reduced. Visitor use areas would be expanded and visitor activities would be highly controlled on the Island. The Model Industries Building and New Industries Building would be stabilized and would provide additional habitat to nesting birds. Park operations near the Power Plant would be modified to reduce conflicts with nesting birds. The marine waters within the vicinity of the colonial nesting birds would be closed to boating during the breeding season, resulting in beneficial impacts. The allowance of modest overnight accommodations on the Island would increase the potential for human-wildlife conflict, an adverse impact. As in the no-action alternative, the National Park Service would continue to protect nesting and roosting habitats and initiate habitat enhancements in other areas of the Island where possible—resulting in beneficial impacts. Given the combined effects of disturbance and protective actions, the numbers of breeding pairs of waterbirds on the Island would be expected to be maintained or increase over time. Collectively, these activities would result in long-term, moderate, beneficial, localized impacts to waterbirds on the island.

Conclusion

The development of a sustainable trail system and the elimination of unneeded roads, and the removal of a large number of structures and the restoration of natural vegetation in these areas would result in long-term, minor, beneficial, localized impacts on vegetation and wildlife.

The expansion of visitor access and use and the development of new or improved recreational facilities would result in long-term, minor, adverse, and localized impacts. The construction activities related to these developments would result in short-term, minor, and adverse impacts.

Habitat restoration efforts and educational and participatory stewardship programs would result in long-term, minor to moderate, beneficial impacts that would occur both at the local level (habitat restoration) and parkwide (stewardship programs). Additional beneficial impacts would result from the establishment of a native plant nursery and partnering with other agencies to manage visitor access and promote restoration and habitat management as part of the UNESCO Biosphere Reserve.

Impacts to waterbirds on the island would be long term, moderate, beneficial, and localized.

Generally, adverse impacts would occur from the presence and maintenance of existing facilities and visitor use. Beneficial impacts would occur from restoration and ongoing management and monitoring activities.

No impairment of vegetation or wildlife resources would result from this alternative.

Alternative 3: Focusing on National Treasures (NPS Preferred Alternative for Alcatraz Island)

Analysis

Under alternative 3, a variety of management zones would be used that would assist in the protection of vegetation and wildlife habitat. Approximately 88% of the park would be zoned using the Natural and Sensitive Resources zones.

The impacts to vegetation and wildlife from the continued presence and maintenance of existing facilities (including structures, roads, and trails) under alternative 3 would be less than the no-action alternative because impacts to vegetation and wildlife habitat caused by erosion from unsustainable trails and roads would be reduced. Alternative 3 would develop a sustainable trail system and eliminate and rehabilitate unneeded and unsustainable roads and trails, as well as maintain all trails and roads. Impacts to native habitat from fragmentation and exotic species would be reduced. These activities would result in long-term, minor, beneficial, localized impacts on vegetation and wildlife.

Natural resource restoration includes the dune restoration that involves the removal of 30 acres of European beach grass at Fort Funston; restoration of a large tract of second-generation redwood forest at Phleger Estate; and extensive exotic plant removal at Ranch Corral de Tierra. The managed retreat from sea level rise at Ocean Beach would improve the integrity of natural habitats and processes. Creek restoration at Stinson Beach (Eastkoot Creek), and especially at Rancho Corral de Tierra would improve vegetation and wildlife habitat by improving habitat structure and the diversity of habitats available to support various species' needs. These kinds of activities would reduce environmental stressors and increase the resiliency of species and systems to the effects of climate change. The impact of these activities would be long term, moderate, beneficial, and localized.

Visitor access and use would be expanded under alternative 3, potentially resulting in additional impacts to vegetation (trampling) and wildlife (disturbance) along trails and at primary visitor use areas—the impact would be long-term, minor, adverse, and localized.

New and/or improved recreational development including new visitor facilities and amenities at 1) Stinson Beach, Kirby Cove, Forts Barry and Cronkhite, Slide Ranch, Golden Gate Dairy, Tennessee Valley, and Marin City Ridge / Gerbode Valley and along State Route 1 and Conzelman, McCullough, and Bunker Roads in Marin County; at 2) Upper Fort Mason, Fort Miley, China Beach, and Fort Funston in San Francisco County; and at 3) Milagra Ridge, Sweeney Ridge, Phleger Estate, and Rancho Corral de Tierra in San Mateo County would have long-term, minor, adverse, localized impacts on vegetation and wildlife due to the permanent loss of plants and wildlife habitat. Short-term, minor, adverse impacts to vegetation would occur from injury or loss of plants during construction activities; however, the area would be replanted with native plants and the natural habitat would be reclaimed. Similarly, short-term adverse impacts to wildlife, such as disturbance, would occur during construction.

Impacts from NPS educational and stewardship programs would generally be the same as those described in the no-action alternative. Similarly, impacts from vegetation and wildlife management and monitoring activities under alternative 3 would be the same as those described in the no-action alternative. The establishment of a native plant nursery

would provide additional capacity to improve native vegetation and wildlife habitat and expand stewardship efforts—a beneficial impact.

At Alcatraz Island, adverse impacts to waterbirds under alternative 3 would be greater than those described in the no-action alternative because new visitor amenities (namely food service, modest overnight accommodations, and special events) would cause increased disturbance to nesting waterbirds and human-wildlife conflict. The utilization of Pier 4 at Fort Mason as the primary point of embarkation for visitor transportation to the Island would result in additional impacts to seabirds caused by the proximity of vessel traffic and increased garbage and marine debris. Gulls would be more highly managed in primary visitor use areas, which would take up more of the island under alternative 3, resulting in disturbance and displacement of gulls. Additionally, the level of historic restoration to the Island (i.e., Parade Ground, building restoration, and adaptive reuse) would cause habitat loss and disturbance to waterbird populations. As in the no-action alternative, the National Park Service would continue to protect nesting and roosting habitats and initiate habitat enhancements in other areas of the island where possible; these actions would result in beneficial impacts. The Model Industries Building and New Industries Building, both of which are proximate to sensitive waterbird breeding areas, would be managed in a way that minimizes human-induced disturbance and predation by western gulls and protects the waterbird breeding colonies on the north end of the island. The marine waters within the vicinity of the colonial nesting birds would be closed to boating during the breeding season, resulting in beneficial impacts. Given the combined effects of disturbance and protective actions, the numbers of breeding pairs of waterbirds on the island could change over time depending on the frequency and intensity of expanded visitor activity, but minimum numbers of nesting pairs would support the maintenance of viable populations. Collectively, these activities would result in long-term, moderate, adverse, localized to regional impacts to waterbirds on the island.

Conclusion

The development of a sustainable trail system and the elimination of unneeded roads and the restoration of natural vegetation in these areas would result in long-term, minor, beneficial, localized impacts on vegetation and wildlife.

The expansion of visitor access and use and the development of new or improved recreational facilities would result in long-term, minor, adverse, and localized impacts. The construction activities related to these developments would result in short-term, minor, and adverse impacts.

Natural resource restoration would result in long-term, moderate, beneficial, and localized impacts.

Habitat restoration efforts and educational and participatory stewardship programs would result in long-term, minor to moderate, beneficial impacts that would occur both at the local level (habitat restoration) and parkwide (stewardship programs).

Impacts to waterbirds on the island would be long term, moderate, adverse, and localized to regional.

Generally, adverse impacts would occur from the presence and maintenance of existing facilities and visitor use. Beneficial impacts would occur from restoration and ongoing management and monitoring activities.

No impairment of vegetation or wildlife resources would result from this alternative.

If it becomes evident that implementation of the actions in alternative 3 at both the Parade Ground and at the north end of the island (in the vicintity of the New Industries/Model Industries Buildings) are having substantial adverse effects and would result in long-term or permanent loss of waterbird nesting colonies, the park staff would use adaptive management techniques and take the necessary measures to ensure the continued viability of breeding populations of these species on the island. These steps could include allowing only nonbreeding season access to the Parade Ground or limiting the types and scale of uses in the north end of the island during nesting seasons. These actions would ensure that adverse impacts do not exceed the moderate intensity threshold, and thereby avoid impairment of park resources.

Special Status Species (Federal and State Threatened and Endangered Species)

No-action Alternative

Introduction

In general, many of the impacts to vegetation and wildlife previously described in the habitat section would apply to special status species. For example, visitor use and new development would result in changes that would have adverse impacts to listed species and their habitats. Likewise, vegetation management and creek restoration would result in beneficial impacts to listed species and their habitats. Keeping this in mind, the analysis provided below generalizes about the effects of land management priorities and, where possible, focuses on the impacts that specific actions included in the alternatives may have on listed species and their habitats.

Federal Threatened and Endangered Species

California red-legged frog (*Rana aurora draytonii*). Wetland restoration and management, such as the project completed at Mori Point, would continue to improve habitat for the frog—resulting in a beneficial impact. Creek restoration in Marin County would improve wetlands and riparian habitat that could serve as potential future habitat for the frog. Exotic plant removal, especially in riparian and wetland areas, could also improve the structure and condition of vegetation that supports frogs. All of these activities should improve and protect breeding and foraging habitat by improving conditions for emergent riparian vegetation and other vegetation conditions preferred by the California red-legged frog, such as dense, shrubby riparian areas. Controlling and managing visitor use would reduce impacts to frogs, such as habitat alteration and direct impacts from recreational use and development; however, some adverse impacts would continue. Long-term park operations and short-term project specific construction impacts to the species may occur. These may involve "take" associated with removal and translocation of individuals outside construction areas or impacts of existing roadways/trails and their maintenance. The National Park Service would continue to monitor frog populations and survey potential habitat. The primary threat to the frog would continue to be habitat loss – an adverse impact associated with increased urbanization of the region. There has not been any designated critical habitat in Marin or San Mateo counties managed by Golden Gate National Recreation Area (Federal Register 71: 19244–19346). Collectively, impacts to the California red-legged frog resulting from NPS actions that are part of the no-action alternative (the continuation of current

management and trends) would be long term, beneficial, minor, and localized. The determination of effect under Section 7 of the Endangered Species Act would be "*may affect, likely to adversely affect*" for project specific actions in the short term, and "*may affect, not likely to adversely affect"* for land use and park management over the long term. Consultation for specific projects would occur as necessary.

Mission blue butterfly (*Icaricia icaroides missionensis*). Coastal scrub habitat and grassland restoration, including exotic plant removal and vegetation management, in the Marin Headlands and at Milagra Ridge and Sweeney Ridge in San Mateo County, would continue to improve conditions for lupine plants that support Mission blue butterflies. The *Marin Headlands-Fort Baker Plan* being implemented in cooperation with the Federal Highways Administration would cause some adverse impacts and loss of habitat (which is being mitigated) in the vicinity of Conzelman and Bunker Roads due to construction; however, it would result in long-term benefits to butterfly habitat. The use of prescribed fire, an action analyzed under the park's fire management plan / EIS, would also continue to have short-term adverse effects on butterflies and butterfly habitat with long-term beneficial effects. Conditions at park lands in San Mateo County, such as the widespread presence of exotic plants, would continue to cause adverse impacts to potential butterfly habitat. Controlling and managing visitor use in known habitat areas throughout the park would reduce impacts to butterflies, such as the trampling of host and nectar plants and direct impacts to larvae and pupae from recreational use and development; however, some adverse impacts would continue. The National Park Service would continue to monitor butterfly populations and survey potential habitat. The primary threat to the butterfly would continue to be habitat loss—resulting in an adverse impact associated with increased urbanization of the region. Collectively, impacts to the Mission blue butterfly resulting from NPS actions that are part of the no-action alternative (the continuation of current management and trends) would be long term, beneficial, minor, and localized. The determination of effect under Section 7 of the Endangered Species Act would be "*may affect, likely to adversely affect"* for project specific actions in the short term, and "*may affect, not likely to adversely affect"* for land use and park management over the long term. Consultation for specific projects would occur as necessary.

Tidewater goby (*Eucyclogobius newberryi*). Because tidewater gobies are currently only found in Rodeo Lagoon within the planning area, impacts would be restricted to this location. Park Service management of Rodeo Lagoon is compatible with tidewater goby activities and requirements. Throughout its range, the primary threats to gobies include loss and modification of habitat, water diversions, predatory and competitive introduced fish species, habitat channelization, and degraded water quality. National Park Service activities, such as vegetation management, wetland enhancement, and efforts to improve water quantity and quality within the watershed near Rodeo Creek would have beneficial impacts on maintaining appropriate habitat characteristics that support gobies in Rodeo Lagoon. The National Park Service would continue to monitor goby populations and habitat and inventory potential habitat. Collectively, impacts to the tidewater goby resulting from NPS actions that are part of the no-action alternative (the continuation of current management and trends) would be long term, beneficial, minor, and localized. The determination of effect under Section 7 of the Endangered Species Act would be "*may affect, likely to adversely affect*" for project specific actions in the short term, and

"*may affect, not likely to adversely affect*" for land use and park management over the long term. Consultation for specific projects would occur as necessary.

San Francisco garter snake (*Thamnophis sirtalis tetrataenia*). Because San Francisco garter snakes are currently restricted to localities in San Mateo County (the only documented occurrence is at Mori Point / Sharp Park). Two other locations within the planning area (Milagra Ridge and Rancho Corral de Tierra) appear to have suitable habitat to support breeding populations of San Francisco garter snakes (Swaim Biological Inc. 2006). In addition, two other sites (Sweeny Ridge and Cattle Hill) can provide connectivity between known snake populations or between high-quality aquatic habitats that potentially support San Francisco garter snakes (Swaim Biological Inc. 2006). Therefore, impacts would be restricted to these locations. Because California red-legged frogs are an important prey item for this species, effects on red-legged frogs are expected to have cascading effects on the snake.

Wetland restoration and management at Mori Point could have short-term adverse impacts on California red-legged frogs and the San Francisco garter snake, but would result in long-term habitat improvements – a beneficial impact. Some types of exotic tree removal would also improve the structure and condition of habitat that supports snakes. Controlling and managing visitor use would reduce impacts to snakes, such as habitat alteration and direct impacts from recreational use and development; however, some adverse impacts would continue. The National Park Service would continue to monitor snake populations and survey potential habitat – resulting in a beneficial impact. The primary threat to the snake would continue to be habitat loss and alteration – an adverse impact associated with increased urbanization of the region. Collectively, impacts to the San Francisco garter snake resulting from NPS actions that are part of the no-action alternative (the continuation of current management and trends) would be long term, beneficial, minor to moderate, and localized. The determination of effect under Section 7 of the Endangered Species Act would be "*may affect, likely to adversely affect"* for project specific actions in the short term, and "*may affect, not likely to adversely affect"* for land use and park management over the long term. Consultation for specific projects would occur as necessary.

San Bruno elfin butterfly (*Callophrys mossii bayensis*). Because the San Bruno elfin butterfly is currently only known to occur at Milagra Ridge within the planning area, impacts would be restricted to this location. Other suitable habitat may be present at other locations in San Mateo County.

Exotic plant removal and vegetation management would continue to improve conditions for *Sedum spathulifolium*, the succulent plant that hosts butterfly larvae. Controlling and managing visitor use in known habitat areas would reduce impacts to butterflies, such as the trampling of host plants and direct impacts to larvae and pupae from recreational use and development; however, some adverse impacts would continue. The National Park Service would continue to monitor butterfly populations and survey potential habitat – resulting in a beneficial impact. The primary threat to the butterfly would continue to be habitat loss – an adverse impact associated with increased urbanization of the region. Collectively, impacts to the San Bruno elfin butterfly resulting from NPS actions that are part of the no-action alternative (the continuation of current management and trends) would be long term, beneficial, minor, and localized. The determination of effect under

Section 7 of the Endangered Species Act would be "*may affect, not likely to adversely affect."*

Coho salmon, Central California Coast (*Oncorhynchus kisutch*) and steelhead trout, Central California Coast (*O. mykiss*). These two listed salmonid species are analyzed together because of the similarities in their life characteristics, habitat requirements, and the effects of impacts on the two species.

Coho salmon are restricted to Redwood Creek and Eastkoot Creek in Marin County, estuarine sites such as Bolinas Lagoon, as well as the nearshore waters of the Pacific Ocean. Steelhead trout are restricted to Redwood Creek and the drainages to Bolinas Lagoon and Rodeo Lagoon in Marin County and West Union Creek, a tributary to San Francisquito Creek, in San Mateo County. Therefore, impacts would be restricted to these locations.

National Park Service activities, such as vegetation management, creek restoration, and efforts to improve water quantity and quality within the Redwood Creek watershed would have beneficial impacts on maintaining habitat characteristics that support anadromous fish. Projects in Marin County at the Lower Redwood Creek property (floodplain restoration), Big Lagoon (estuarine and wetland restoration), Stinson Beach (stream and wetland restoration) and Muir Woods National Monument (vegetation management) would have beneficial impacts on habitat parameters required by the two species. These projects would improve riparian vegetation and in-stream habitat complexity – resulting in improvements to spawning, rearing, and migratory habitats. Critical habitat would be affected by restoration activities. Within the immediate project area, short-term, minor, adverse, localized impacts to nearly all essential features of critical habitat (substrate, water quality, water quantity, water temperature, water velocity, cover/shelter, food, riparian vegetation, space, and safe passage conditions) would be expected. However, these short-term impacts would be outweighed by the beneficial impacts expected to occur over the long term. The National Park Service would continue to monitor coho and steelhead populations and inventory potential habitat.

Controlling and managing visitor use would reduce impacts to coho and steelhead, such as habitat alteration and direct impacts from recreational use and development; however, some adverse impacts would continue. The primary threats to coho and steelhead would continue to be loss and modification of habitat, water diversions, habitat channelization, sedimentation, and degraded water quality—adverse impacts associated with increased urbanization of the region. Collectively, impacts to coho salmon and steelhead trout resulting from NPS actions that are part of the no-action alternative (the continuation of current management and trends) would be long term, beneficial, minor, and localized. The determination of effect under Section 7 of the Endangered Species Act would be "*may affect, likely to adversely affect"* for project specific actions in the short term, and "*may affect, not likely to adversely affect"* for land use and park management over the long term. Consultation for specific projects would occur as necessary.

Western snowy plover (*Charadrius alexandrines nivosus*). The western snowy plover nests in coastal Marin County at Point Reyes National Seashore and Dillon Beach. Nonbreeding snowy plovers regularly use habitat within the planning area at Ocean Beach. Snowy plovers are occasionally observed at Rodeo Beach, though these birds tend

to remain only for short periods. Therefore, impacts would be restricted to these locations.

Seasonal visitor use restrictions requiring dogs to be on leash on a portion of Ocean Beach would continue to assist in the protection of plovers—resulting in a beneficial impact. However, visitor use (especially dogs off-leash) would continue to disturb foraging or roosting birds resulting in long-term, minor, adverse, localized impacts. The National Park Service would continue to restrict park management activities in plover habitat and provide guidance for beach patrol activities and is currently developing a shorebird plover docent program—all of which assist with plover protection and provide beneficial impacts. The National Park Service would continue to monitor plover populations and survey potential habitat. The primary threat to the plover within the region would continue to be habitat loss—an adverse impact associated with increased urbanization of the region and the loss or alteration of beach habitat. Collectively, impacts to the western snowy plover resulting from NPS actions that are part of the no-action alternative (the continuation of current management and trends) would be long term, minor, adverse, and localized. The determination of effect under Section 7 of the Endangered Species Act would be "*may affect, likely to adversely affect.*"

Northern spotted owl (*Strix occidentalis caurina*). Suitable habitat for northern spotted owls includes all evergreen forested habitat north of State Route 1 in Marin County. Within the planning area, known spotted owl populations are currently limited to Muir Woods National Monument, Homestead Valley, and the Bolinas Lagoon watershed. Therefore, impacts would be restricted to these locations.

Vegetation management actions designed to protect and enhance coniferous forest, including old-growth, second growth and remnant stands, would provide potential roosting, feeding, and nesting habitat for the owl—resulting in a beneficial impact. The National Park Service would continue to monitor owl populations and survey potential habitat. Visitor use in the area would continue to disturb owls. Barred owls would also likely continue to invade preferred spotted owl habitats—an adverse impact. Ongoing actions to reduce human-created noise and light at Muir Woods National Monument would result in improvements to habitat conditions. The primary threat to the northern spotted owl in the region would continue to be the loss of habitat—an adverse impact associated with increased urbanization of the region. Other threats include expansion in the range of the barred owl, West Nile virus, changes in habitat due to Sudden Oak Death, and recreational pressure. Locally, in Muir Woods National Monument, the primary threat is from barred owls. Collectively, impacts to the northern spotted owl resulting from NPS actions that are part of the no-action alternative (the continuation of current management and trends) would be long term, minor, beneficial and localized. The determination of effect under Section 7 of the Endangered Species Act would be "*may affect, not likely to adversely affect.*"

San Francisco lessingia (*Lessingia germanorum*). Vegetation management, including exotic plant removal, would continue to improve conditions for the San Francisco lessingia. Restoration projects at Fort Funston (about 20 acres of ice plant removal) in areas that should contain open sandy soils and dunes would reduce competition with nonnative vegetation. Since the lessingia does not currently occur there, these actions at Fort Funston would result in a beneficial impact if a new population of lessingia is reintroduced there, as proposed in the U.S. Fish and Wildlife Services' *Recovery Plan for*

Coastal Plants of the Northern San Francisco Peninsula. Controlling and managing visitor use in known habitat areas would reduce impacts to the lessingia, such as the trampling of plants; however, some adverse impacts would continue. The National Park Service would continue to monitor lessingia populations and survey potential habitat—resulting in a beneficial impact. The primary threat to the lessingia would continue to be habitat loss—an adverse impact associated with increased urbanization of the region—and habitat alteration resulting in increases in invasive, nonnative plants. Collectively, impacts to the San Francisco lessingia resulting from NPS actions that are part of the no-action alternative (the continuation of current management and trends) would be long term, beneficial, minor, and localized. The determination of effect under Section 7 of the Endangered Species Act would be "*may affect, not likely to adversely affect."*

State Threatened and Endangered Species

Bank swallow (*Riparia riparia*). The only known nesting location for bank swallows within the park is in the coastal bluffs at Fort Funston. The National Park Service would continue to maintain natural geologic processes that erode the cliffs and provide suitable nesting habitat—resulting in a beneficial impact. Visitor use in the vicinity of the nest sites, as well as the defacing of the sandy cliffs themselves, would continue to disturb individual birds and affect nesting activity and success—an adverse impact. The National Park Service would continue to monitor bank swallow populations and survey potential habitat—resulting in a beneficial impact. The primary threat to the bank swallow would continue to be habitat loss—resulting in an adverse impact associated with increased urbanization, conversion of natural habitats, and channelization of waterways in the region. Collectively, impacts to the bank swallow resulting from NPS actions that are part of the no-action alternative (the continuation of current management and trends) would be long term, beneficial, minor, and localized. However, it should be noted that bank stabilization work conducted by the City of San Francisco in the vicinity of the bank swallow colony (both on and off park lands) could continue under the no-action alternative. If so, it could continue to have notable adverse effects on bank swallow habitat.

Conclusion

Table 16: Potential Impacts to Special Status Species of Golden Gate National Recreation Area, No-action Alternative

Species	Status	ESA Determination
California red-legged frog (*Rana aurora draytonii*)	Federal threatened	"*may affect, likely to adversely affect"* for project specific actions in the short term, and "*may affect, not likely to adversely affect"* for land use and park management over the long term
Mission blue butterfly (*Icaricia icaroides missionensis*)	Federal endangered	"*may affect, likely to adversely affect"* for project specific actions in the short term, and "*may affect, not likely to adversely affect"* for land use and park management

Species	Status	ESA Determination
		over the long term
Tidewater goby (*Eucyclogobius newberryi*)	Federal endangered	"*may affect, likely to adversely affect"* for project specific actions in the short term, and "*may affect, not likely to adversely affect"* for land use and park management over the long term
San Francisco garter snake (*Thamnophis sirtalis tetrataenia*)	Federal endangered; State endangered	"*may affect, likely to adversely affect"* for project specific actions in the short term, and "*may affect, not likely to adversely affect"* for land use and park management over the long term
San Bruno elfin butterfly (*Callophrys mossii bayensis*)	Federal endangered	"may affect, not likely to adversely affect"
Coho salmon, Central California Coast (*Oncorhynchus kisutch*)	Federal threatened; State endangered	"*may affect, likely to adversely affect"* for project specific actions in the short term, and "*may affect, not likely to adversely affect"* for land use and park management over the long term
Steelhead trout, Central California Coast (*Oncorhynchus mykiss*)	Federal threatened	"*may affect, likely to adversely affect"* for project specific actions in the short term, and "*may affect, not likely to adversely affect"* for land use and park management over the long term
Western snowy plover (*Charadrius alexandrines nivosus*)	Federal threatened	"may affect, likely to adversely affect"
Northern spotted owl (Strix occidentalis caurina)	Federal threatened	"may affect, not likely to adversely affect"
San Francisco lessingia (*Lessingia germanorum*)	Federal endangered; State endangered	"may affect, not likely to adversely affect"
Bank swallow (*Riparia riparia*)	State threatened	long-term, beneficial, minor, and localized

No impairment of listed species would result from this alternative.

Alternative 1: Connecting People with the Parks (NPS Preferred Alternative for Park Sites in Marin, San Francisco, and San Mateo Counties)

Introduction

Under alternative 1, a variety of management zones would be used that would assist in the protection of special status species. Approximately 77% of the park would be zoned as Natural and Sensitive Resources zones.

Federal Threatened and Endangered Species

California red-legged frog (*Rana aurora draytonii*). Impacts to California red-legged frogs and their habitat from alternative 1 would be the same as under the no-action alternative with the exception of impacts to habitat from expanded restoration of natural areas. The removal of the dam at Tennessee Pond and other infrastructure, and the restoration of riparian habitat in Lower Tennessee Valley would result in beneficial effects. Also, vegetation management, including exotic plant removal, especially in riparian and wetland areas in San Mateo County, would be greater than under the no-action alternative, creating improvements to vegetative structure and condition that could improve breeding and foraging habitat—resulting in a beneficial impact. Impacts to the frog from new recreational development under alternative 1 would not occur because any new facilities would be sited to avoid existing or potential frog habitat. Impacts to the California red-legged frog resulting from NPS actions that are part of the alternative 1 would be long term, beneficial, minor, and localized. The determination of effect under Section 7 of the Endangered Species Act would be "*may affect, not likely to adversely affect."*

Mission blue butterfly (*Icaricia icaroides missionensis*). Impacts to mission blue butterflies and their habitat from alternative 1 would be the same as the no-action alternative with the exception of vegetation management actions in San Mateo County and new recreational development in San Mateo and Marin counties. Vegetation management, including exotic plant removal, in San Mateo County park lands would improve conditions that support the host lupine – resulting in a beneficial impact. However, increased visitor use in this area could also cause adverse impacts to host plants and butterfly larvae and pupae. New recreational development in known habitat in Marin and San Mateo counties would slightly increase the adverse impacts that are described under the no-action alternative. Impacts to the Mission blue butterfly resulting from NPS actions that are part of alternative 1 would be long term, beneficial, minor, and localized. The determination of effect under Section 7 of the Endangered Species Act would be "*may affect, not likely to adversely affect."*

Tidewater goby (*Eucyclogobius newberryi*). Impacts to tidewater gobies and their habitat from alternative 1 would be the same as the no-action alternative. Impacts to the tidewater goby resulting from NPS actions that are part of alternative 1 would be long term, beneficial, minor, and localized. The determination of effect under Section 7 of the Endangered Species Act would be "*may affect, not likely to adversely affect."*

San Francisco garter snake (*Thamnophis sirtalis tetrataenia*). Impacts to the San Francisco garter snake and their habitat under alternative 1 would be the same as under the no-action alternative with the exception of habitat improvements in San Mateo County. Vegetation management, including exotic plant removal in riparian and wetland

areas, would improve the structure and condition of vegetation that supports snakes—resulting in a beneficial impact. Impacts to the San Francisco garter snake resulting from NPS actions that are part of alternative 1 would be long term, beneficial, minor to moderate, and localized. The determination of effect under Section 7 of the Endangered Species Act would be "*may affect, not likely to adversely affect*."

San Bruno elfin butterfly (*Callophrys mossii bayensis*). Impacts to the San Bruno elfin butterfly and their habitat under alternative 1 would be the same as under the no-action alternative, with the exception of habitat improvements at Milagra Ridge and other park lands in San Mateo County. Habitat restoration activities at Milagra Ridge (including earthwork and native plantings covering about 20 acres) could improve conditions for host plant recruitment and butterfly use. Vegetation management, including exotic plant removal, elsewhere in Sam Mateo County would improve the structure and condition of vegetation and could increase the potential for local range expansion into additional suitable habitat – resulting in a beneficial impact. Impacts to the San Bruno elfin butterfly resulting from NPS actions that are part of alternative 1 would be long term, beneficial, minor to moderate, and localized. The determination of effect under Section 7 of the Endangered Species Act would be "*may affect, not likely to adversely affect."*

Coho salmon, Central California Coast (*Oncorhynchus kisutch*) and steelhead trout, Central California Coast (*O. mykiss*). Adverse impacts to coho salmon and steelhead trout and their habitat would be the same as those described under the no-action alternative. The types of beneficial impacts described under the no-action alternative would be the same under alternative 1 but the scale would be greater, resulting in increased beneficial impacts. Restoration activities in the Redwood Creek watershed in Marin County and at various creeks within San Mateo County would improve habitat characteristics that support anadromous fish. The goal of reconnecting creeks to the ocean on San Mateo County park lands, and partnering with CalTrans to improve fish passage, would provide the habitat required to support the life cycle of these anadromous fish – resulting in a beneficial impact. Impacts to coho salmon and steelhead trout resulting from NPS actions that are part of alternative 1 would be long term, beneficial, moderate, and localized. The determination of effect under Section 7 of the Endangered Species Act would be "*may affect, not likely to adversely affect."*

Western snowy plover (*Charadrius alexandrines nivosus*). Impacts to Western snowy plover and their habitat from alternative 1 would be the same as the no-action alternative. The determination of effect under Section 7 of the Endangered Species Act would be "*may affect, not likely to adversely affect."*

Northern spotted owl (*Strix occidentalis caurina*). Impacts to northern spotted owls and their habitat from alternative 1 would be the same as the no-action alternative. The determination of effect under Section 7 of the Endangered Species Act would be "*may affect, not likely to adversely affect."*

San Francisco lessingia (*Lessingia germanorum*). Adverse impacts to the San Francisco lessingia and its habitat would be the same as those described under the no-action alternative. The types of beneficial impacts described under the no-action alternative would be the same under alternative 1, but the scale would be greater, resulting in increased beneficial impacts due to expanded vegetation management and native plant habitat restoration. Impacts to the San Francisco lessingia resulting from

NPS actions that are part of alternative 1 would be long term, beneficial, minor, and localized. The determination of effect under Section 7 of the Endangered Species Act would be "*may affect, not likely to adversely affect.*"

State Threatened and Endangered Species

Bank swallow (*Riparia riparia*). Impacts to bank swallows and their habitat from alternative 1 would be the same as the no-action alternative. Impacts from NPS actions would be long term, beneficial, minor, and localized. However, as noted under the no-action alternative, adverse impacts to bank swallow from City of San Francisco bank stabilization work on and off park lands could continue.

Conclusion

Table 17: Potential Impacts to Special Status Species of Golden Gate National Recreation Area, Alternative 1

Species	Status	ESA Determination
California red-legged frog (*Rana aurora draytonii*)	Federal threatened	*"may affect, not likely to adversely affect"*
Mission blue butterfly (*Icaricia icaroides missionensis*)	Federal endangered	*"may affect, not likely to adversely affect"*
Tidewater goby (*Eucyclogobius newberryi*)	Federal endangered	*"may affect, not likely to adversely affect"*
San Francisco garter snake (*Thamnophis sirtalis tetrataenia*)	Federal endangered; State endangered	*"may affect, not likely to adversely affect"*
San Bruno elfin butterfly (*Callophrys mossii bayensis*)	Federal endangered	*"may affect, not likely to adversely affect"*
Coho salmon, Central California Coast (*Oncorhynchus kisutch*)	Federal threatened; State endangered	*"may affect, not likely to adversely affect"*
Steelhead trout, Central California Coast (*Oncorhynchus mykiss*)	Federal threatened	*"may affect, not likely to adversely affect"*
Western snowy plover (*Charadrius alexandrines nivosus*)	Federal threatened	*"may affect, not likely to adversely affect."*
Northern spotted owl (*Strix occidentalis caurina*)	Federal threatened	*"may affect, not likely to adversely affect"*

Species	Status	ESA Determination
San Francisco lessingia (*Lessingia germanorum*)	Federal endangered; State endangered	*"may affect, not likely to adversely affect"*
Bank swallow (*Riparia riparia*)	State threatened	long-term, beneficial, minor, and localized

No impairment of listed species would result from this alternative.

Alternative 2: Preserving and Enjoying Coastal Ecosystems

Introduction

Under alternative 2, a variety of management zones would be used that would assist in the protection of special status species. Approximately 92% of the park would be zoned using the Natural and Sensitive Resources zones.

Federal Threatened and Endangered Species

California red-legged frog (*Rana aurora draytonii*). Impacts to California red-legged frogs and their habitat from alternative 2 would be the same as the no-action alternative with the exception of impacts to habitat from expanded restoration of natural areas. Vegetation management, including exotic plant removal, especially in riparian and wetland areas in Marin and San Mateo counties, would be greater than under the no-action alternative, resulting in improvements to vegetative structure and condition that could improve breeding and foraging habitat—a beneficial impact. Impacts to the frog from new recreational development under alternative 2 would not occur because any new facilities would be sited to avoid existing or potential frog habitat. Impacts to the California red-legged frog resulting from NPS actions that are part of the alternative 2 would be long term, beneficial, minor, and localized. The determination of effect under Section 7 of the Endangered Species Act would be "*may affect, not likely to adversely affect."*

Mission blue butterfly (*Icaricia icaroides missionensis*). Impacts to mission blue butterflies and their habitat from alternative 2 would be the same as those of the no-action alternative, with the exception of impacts resulting from vegetation management actions and new recreation development in San Mateo County and from park land use in Marin County. Vegetation management, including exotic plant removal, in San Mateo County park lands would improve conditions that support the host lupine – resulting in a beneficial impact. However, increased visitor use in this area could also cause adverse impacts to host plants and butterfly larvae and pupae. New recreational development in known habitat in San Mateo County would slightly increase the adverse impacts that are described under the no-action alternative. Management zoning of known habitat in Marin County would provide greater protection of butterfly habitat than under the no-action alternative – creating a beneficial impact. Impacts to the Mission blue butterfly resulting from NPS actions that are part of alternative 2 would be long term, beneficial, minor, and localized. The determination of effect under Section 7 of the Endangered Species Act would be "*may affect, not likely to adversely affect."*

Tidewater goby (*Eucyclogobius newberryi*). Impacts to tidewater gobies and their habitat from alternative 2 would be the same as the no-action alternative, with the exception of greater beneficial impacts resulting from expanded restoration efforts and watershed protection. Impacts to the tidewater goby resulting from NPS actions that are part of alternative 2 would be long term, beneficial, minor, and localized. The determination of effect under Section 7 of the Endangered Species Act would be "*may affect, not likely to adversely affect.*"

San Francisco garter snake (*Thamnophis sirtalis tetrataenia*). Impacts to the San Francisco garter snake and their habitat under alternative 2 would be the same as under the no-action alternative, with the exception of impacts created by habitat improvements in San Mateo County. Vegetation management, including exotic plant removal in riparian and wetland areas, would improve the structure and condition of vegetation that supports snakes—resulting in a beneficial impact. Impacts to the San Francisco garter snake resulting from NPS actions that are part of alternative 2 would be long term, beneficial, minor to moderate, and localized. The determination of effect under Section 7 of the Endangered Species Act would be "*may affect, not likely to adversely affect.*"

San Bruno elfin butterfly (*Callophrys mossii bayensis*). Impacts to the San Bruno elfin butterfly and their habitat under alternative 2 would be the same as under the no-action alternative, with the exception of habitat improvements at Milagra Ridge and other park lands in San Mateo County. Habitat restoration activities at Milagra Ridge (including earthwork and native plantings covering about 20 acres) could improve conditions for host plant recruitment and butterfly use. Vegetation management, including exotic plant removal, elsewhere in Sam Mateo County would improve the structure and condition of vegetation and could increase the potential for local range expansion into additional suitable habitat—resulting in a beneficial impact. Impacts to the San Bruno elfin butterfly resulting from NPS actions that are part of alternative 2 would be long term, beneficial, minor to moderate, and localized. The determination of effect under Section 7 of the Endangered Species Act would be "*may affect, not likely to adversely affect.*"

Coho salmon, Central California Coast (*Oncorhynchus kisutch*) and steelhead trout, Central California Coast (*O. mykiss*). Adverse impacts to coho salmon and steelhead trout and their habitat would be the same as those described under the no-action alternative. The types of beneficial impacts described under the no-action alternative would be the same under alternative 2 but the scale would be greater, resulting in increased beneficial impacts. Restoration activities in the Redwood Creek watershed in Marin County and at various creeks within San Mateo County would improve habitat characteristics that support anadromous fish. The goal of reconnecting creeks to the ocean on San Mateo County park lands, and partnering with CalTrans to improve fish passage, would provide the habitat required to support the life cycle of these anadromous fish—resulting in a beneficial impact. Impacts to coho salmon and steelhead trout resulting from NPS actions that are part of alternative 2 would be long term, beneficial, moderate, and localized. The determination of effect under Section 7 of the Endangered Species Act would be "*may affect, not likely to adversely affect.*"

Western snowy plover (*Charadrius alexandrines nivosus*). Impacts to western snowy plover and their habitat from alternative 2 would be the same as the no-action alternative.

The determination of effect under Section 7 of the Endangered Species Act would be "*may affect, not likely to adversely affect."*

Northern spotted owl (*Strix occidentalis caurina*). Impacts to northern spotted owls and their habitat from alternative 2 would be the same as the no-action alternative. The determination of effect under Section 7 of the Endangered Species Act would be "*may affect, not likely to adversely affect."*

San Francisco lessingia (*Lessingia germanorum*). Adverse impacts to the San Francisco lessingia and its habitat would be the same as those described under the no-action alternative. The types of beneficial impacts described under the no-action alternative would be the same under alternative 2 but the scale would be greater, resulting in increased beneficial impacts due to expanded vegetation management and native plant habitat restoration. The removal of nonhistoric buildings at Fort Funston would provide an opportunity to restore dune habitat and create an area of expansion for the lessingia. Impacts to the San Francisco lessingia resulting from NPS actions that are part of alternative 2 would be long term, beneficial, minor, and localized. The determination of effect under Section 7 of the Endangered Species Act would be "*may affect, not likely to adversely affect."*

State Threatened and Endangered Species

Bank swallow (*Riparia riparia*). Impacts to bank swallows and their habitat from alternative 1 would be the same as the no-action alternative. Impacts from NPS actions would be long term, beneficial, minor, and localized. However, as noted under the no-action alternative, adverse impacts to bank swallow from City of San Francisco bank stabilization work on and off park lands could continue.

Conclusion

Table 18: Potential Impacts to Special Status Species of Golden Gate National Recreation Area, Alternative 2

Species	Status	ESA Determination
California red-legged frog (*Rana aurora draytonii*)	Federal threatened	*"may affect, not likely to adversely affect"*
Mission blue butterfly (*Icaricia icaroides missionensis*)	Federal endangered	*"may affect, not likely to adversely affect"*
Tidewater goby (*Eucyclogobius newberryi*)	Federal endangered	*"may affect, not likely to adversely affect"*
San Francisco garter snake (*Thamnophis sirtalis tetrataenia*)	Federal endangered; State endangered	*"may affect, not likely to adversely affect"*
San Bruno elfin butterfly (*Callophrys mossii bayensis*)	Federal endangered	*"may affect, not likely to adversely affect"*

Species	Status	ESA Determination
Coho salmon, Central California Coast (*Oncorhynchus kisutch*)	Federal threatened; State endangered	*"may affect, not likely to adversely affect"*
Steelhead trout, Central California Coast (*Oncorhynchus mykiss*)	Federal threatened	*"may affect, not likely to adversely affect"*
Western snowy plover (*Charadrius alexandrines nivosus*)	Federal threatened	*"may affect, not likely to adversely affect."*
Northern spotted owl (*Strix occidentalis caurina*)	Federal threatened	*"may affect, not likely to adversely affect"*
San Francisco lessingia (*Lessingia germanorum*)	Federal endangered; State endangered	*"may affect, not likely to adversely affect"*
Bank swallow (*Riparia riparia*)	State threatened	long-term, beneficial, minor, and localized

No impairment of listed species would result from this alternative.

Alternative 3: Focusing on National Treasures (*NPS Preferred Alternative for Alcatraz Island*)

Introduction

Under alternative 3, a variety of management zones would be used that would assist in the protection of special status species. Approximately 88% of the park would be zoned using the Natural and Sensitive Resources zones.

Federal Threatened and Endangered

California red-legged frog (*Rana aurora draytonii*). Impacts to California red-legged frogs and their habitat from alternative 3 would be the same as the no-action alternative with the exception of impacts to habitat from expanded restoration of natural areas. Vegetation management, including exotic plant removal, especially in riparian and wetland areas in San Mateo County, would be greater than under the no-action alternative, creating improvements to vegetative structure and condition that could improve breeding and foraging habitat—resulting in a beneficial impact. Impacts to the frog from new recreational development under alternative 3 would not occur because any new facilities would be sited to avoid existing or potential frog habitat. Impacts to the California red-legged frog resulting from NPS actions that are part of the alternative 3 would be long term, beneficial, minor, and localized. The determination of effect under Section 7 of the Endangered Species Act would be "*may affect, not likely to adversely affect."*

Mission blue butterfly (*Icaricia icaroides missionensis*). Impacts to mission blue butterflies and their habitat from alternative 3 would be the same as the no-action

alternative with the exception of vegetation management actions and new recreational development in San Mateo County, and park land uses in Marin County. Vegetation management, including exotic plant removal, in San Mateo County park lands would improve conditions that support the host lupine—a beneficial impact. However, increased visitor use in this area could also cause adverse impacts to host plants and butterfly larvae and pupae. New recreational development in known habitat in Marin and San Mateo counties would slightly increase the adverse impacts that are described under the no-action alternative. Treatments to restore cultural landscapes in known habitat in Marin County could have adverse impacts (i.e. loss or conversion of habitat) on native coastal shrub habitats and grasslands that support lupine and butterflies; however, butterfly habitat protection objectives would be included in any plans to change existing conditions in this area. Impacts to the Mission blue butterfly resulting from NPS actions that are part of alternative 3 would be long term, adverse, minor, and localized. The determination of effect under Section 7 of the Endangered Species Act would be "*may affect, not likely to adversely affect.*"

Tidewater goby (*Eucyclogobius newberryi*). Impacts to tidewater gobies and their habitat from alternative 3 would be the same as the no-action alternative. Impacts to the tidewater goby resulting from NPS actions that are part of alternative 3 would be long term, beneficial, minor, and localized. The determination of effect under Section 7 of the Endangered Species Act would be "*may affect, not likely to adversely affect.*"

San Francisco garter snake (*Thamnophis sirtalis tetrataenia*). Impacts to the San Francisco garter snake and their habitat under alternative 3 would be the same as under the no-action alternative with the exception of habitat improvements in San Mateo County. Vegetation management, including exotic plant removal in riparian and wetland areas, would improve the structure and condition of vegetation that supports snakes—a beneficial impact. Impacts to the San Francisco garter snake resulting from NPS actions that are part of alternative 3 would be long term, beneficial, minor to moderate, and localized. The determination of effect under Section 7 of the Endangered Species Act would be "*may affect, not likely to adversely affect.*"

San Bruno elfin butterfly (*Callophrys mossii bayensis*). Impacts to the San Bruno elfin butterfly and their habitat under alternative 3 would be the same as under the no-action alternative, with the exception of habitat improvements at Milagra Ridge and other park lands in San Mateo County. Habitat restoration activities at Milagra Ridge (including earthwork and native plantings covering about 20 acres) could improve conditions for host plant recruitment and butterfly use. Vegetation management, including exotic plant removal, elsewhere in San Mateo County would improve the structure and condition of vegetation and could increase the potential for local range expansion into additional suitable habitat—resulting in a beneficial impact. Impacts to the San Bruno elfin butterfly resulting from NPS actions that are part of alternative 3 would be long term, beneficial, minor to moderate, and localized. The determination of effect under Section 7 of the Endangered Species Act would be "*may affect, not likely to adversely affect.*"

Coho salmon, Central California Coast (*Oncorhynchus kisutch*) and steelhead trout, Central California Coast (*O. mykiss*). Adverse impacts to coho salmon and steelhead trout and their habitat would be the same as those described under the no-action alternative. The types of beneficial impacts described under the no-action alternative would be the same under alternative 3 but the scale would be greater, resulting in

increased beneficial impacts. Restoration activities in the Redwood Creek watershed in Marin County and at various creeks within San Mateo County would improve habitat characteristics that support anadromous fish. The goal of reconnecting creeks to the ocean on San Mateo County park lands, and partnering with CalTrans to improve fish passage, would provide the habitat required to support the life cycle of these anadromous fish—resulting in a beneficial impact. Impacts to coho salmon and steelhead trout resulting from NPS actions that are part of alternative 3 would be long term, beneficial, moderate, and localized. The determination of effect under Section 7 of the Endangered Species Act would be "*may affect, not likely to adversely affect."*

Western snowy plover (*Charadrius alexandrines nivosus*). Impacts to western snowy plover and their habitat from alternative 3 would be the same as the no-action alternative. The determination of effect under Section 7 of the Endangered Species Act would be "*may affect, not likely to adversely affect."*

Northern spotted owl (*Strix occidentalis caurina*). Impacts to northern spotted owls and their habitat from alternative 3 would be the same as the no-action alternative. The determination of effect under Section 7 of the Endangered Species Act would be "*may affect, not likely to adversely affect."*

San Francisco lessingia (*Lessingia germanorum*). Adverse impacts to the San Francisco lessingia and its habitat would be the same as those described under the no-action alternative. The types of beneficial impacts described under the no-action alternative would be the same under alternative 3 but the scale would be greater, resulting in increased beneficial impacts due to expanded vegetation management and native plant habitat restoration. Impacts to the San Francisco lessingia resulting from NPS actions that are part of alternative 3 would be long term, beneficial, minor, and localized. The determination of effect under Section 7 of the Endangered Species Act would be "*may affect, not likely to adversely affect."*

State Threatened and Endangered

Bank swallow (*Riparia riparia*). Impacts to bank swallows and their habitat from alternative 3 would be the same as the no-action alternative. Impacts from NPS actions would be long term, beneficial, minor, and localized. However, as noted under the no-action alternative, adverse impacts to bank swallow from City of San Francisco bank stabilization work on and off park lands could continue.

Conclusion

Table 19: Potential Impacts to Special Status Species of Golden Gate National Recreation Area, Alternative 3

Species	Status	ESA Determination
California red-legged frog (*Rana aurora draytonii*)	Federal threatened	*"may affect, not likely to adversely affect"*
Mission blue butterfly (*Icaricia icaroides missionensis*)	Federal endangered	*"may affect, not likely to adversely affect"*

Species	Status	ESA Determination
Tidewater goby (*Eucyclogobius newberryi*)	Federal endangered	*"may affect, not likely to adversely affect"*
San Francisco garter snake (*Thamnophis sirtalis tetrataenia*)	Federal endangered; State endangered	*"may affect, not likely to adversely affect"*
San Bruno elfin butterfly (*Callophrys mossii bayensis*)	Federal endangered	*"may affect, not likely to adversely affect"*
Coho salmon, Central California Coast (*Oncorhynchus kisutch*)	Federal threatened; State endangered	*"may affect, not likely to adversely affect"*
Steelhead trout, Central California Coast (*Oncorhynchus mykiss*)	Federal threatened	*"may affect, not likely to adversely affect"*
Western snowy plover (*Charadrius alexandrines nivosus*)	Federal threatened	*"may affect, not likely to adversely affect."*
Northern spotted owl (*Strix occidentalis caurina*)	Federal threatened	*"may affect, not likely to adversely affect"*
San Francisco lessingia (*Lessingia germanorum*)	Federal endangered; State endangered	*"may affect, not likely to adversely affect"*
Bank swallow (*Riparia riparia*)	State threatened	long-term, beneficial, minor, and localized

No impairment of listed species would result from this alternative.

CULTURAL RESOURCES

Historic Structures, Historic Districts, and Cultural Landscapes

No-action Alternative

Analysis

Under this alternative, the park would continue to manage park lands as outlined in the 1980 General Management Plan. The no-action alternative would result in few changes to contributing features of historic structures, districts and cultural landscapes within the project area. The park would continue to stabilize, preserve, and rehabilitate historic

structures, districts and cultural landscapes in accordance with the *Secretary of the Interior's Standards for the Treatment of Historic Properties*, though much of this work would be subject to funding availability.

The park would continue to seek partner opportunities for assisting in this work when possible. Historic buildings would continue to be rehabilitated and reused by the park and park partners for various public and private purposes including administration and operations; staff housing; offices; commercial ventures; historic residence leasing programs; recreation, educational, and interpretive programs. For structures and buildings where neither funding nor a park partner were available for rehabilitating these resources, the park would stabilize and potentially mothball those buildings until such funds became available. This could result in a local, long term, minor adverse impact on historic structures which would be vacant and subject to further deterioration and wear over time.

Projects and plans currently underway which include some preservation treatments for historic structures, districts and cultural landscapes within the park, such as improvements to the Marin Headlands' transportation infrastructure and the *Marin Equestrian Plan Environmental Assessment,* would be implemented. In addition, the park would continue to inventory and assess properties identified as potentially eligible for listing on the national register of historic places, and develop subsequent treatment strategies as needed for historic structures, districts and cultural landscapes. Overall, the impact under the no-action alternative would be long-term, negligible to minor, adverse and beneficial to historic structures, districts, and cultural landscapes.

Specific properties within the area of potential effect with the potential to be impacted by implementation of the no-action alternative are discussed below:

Parkwide

Seacoast Fortifications of San Francisco Bay (Draft) – The park would continue to conduct stabilization and preservation maintenance of the contributing coastal fortifications and their historic settings. Some of these structures would continue to be accessible to visitors, while others would remain secured with minimal stabilization work performed to address deterioration and safety needs. This would result in a long term, negligible to minor, adverse effect.

Marin County

Forts Baker, Barry, and Cronkhite – Historic structures and their settings would be preserved or rehabilitated for recreation, education, and other uses, including park operations. Compatible adaptive reuse of historic structures would continue to be implemented by the park and park partners to preserve buildings and their settings while offering programs that further the park's mission. Planned road, trail, and transit projects would be implemented to improve visitor access and facilitate building reuse. This would result in a long-term, negligible to minor, beneficial and adverse impacts on contributing structures and landscapes of this historic district.

Point Bonita Historic District – The lighthouse and its contributing structures and landscape setting would continue to be preserved and open to visitors. Ongoing stabilization and preservation work would continue and have a long-term, negligible, beneficial and a long-term minor, adverse impact on the district.

Sara Seaver Randall House – Management would continue to be by Point Reyes National Seashore. No actions would be taken that would have an impact on the site.

Hill 640 Military Reservation - The World War II fire control stations and associated historic landscape would be monitored and active preservation steps would be taken if there are signs of deterioration. This would result in a negligible impact.

Ranch M (Golden Gate Dairy) – The historic ranch buildings and landscape would continue to support an equestrian operation; facilities would be preserved and rehabilitated. This would result in a long-term, minor to moderate, beneficial impact and a long-term minor, adverse impact to the historic structures and landscape features of the former ranch.

Ranch A/B (Miwok) – The historic ranch would continue to house an equestrian operation. Historic structures and landscape features that contribute to the property's integrity would be preserved and rehabilitated in accordance with the recommendations in the *Marin Equestrian Plan*. This would result in a long-term, minor to moderate, beneficial impact and a long-term, minor, adverse impact.

Bolinas Copper Mine – Management would continue to be by Point Reyes National Seashore. No actions would be taken under the no-action alternative that would have an impact on the site.

Miwok Trail – Cultural landscape resources associated with the Miwok Trail would be preserved and protected; this would have a long-term, negligible, beneficial impact and a long-term, minor, adverse impact**.**

San Francisco County

Alcatraz Island NHL – The marine environment, weather, and lack of significant capital investment dollars has resulted in some deterioration and loss of historic fabric of the island's historic buildings and landscape features over time. Under this alternative, historic resources which contribute to the NHL status would continue to be stabilized and preserved and improvements incrementally implemented as opportunities and funding arise. The potential lack of investment into some of the historic structures in a timely manner to arrest further deterioration could result in an adverse impact on these resources. In addition, deterioration of buildings and landscapes would continue to limit visitor access.

The arrival area would remain much the same as it is today. Portions of Building 64 would be used for administrative functions. The lighthouse would continue to be preserved for its historic function. The Main Prison Building and adjacent areas would continue to be managed as part of the visitor experience while several areas, such as the Citadel, would remain closed to the public. Adjacent landscapes to the Main Prison area would continue to be minimally preserved while providing habitat for sea birds. The National Park Service would continue to employ sustainable infrastructure technologies, whenever possible, to reduce the island's energy and operating needs which could result in some minor, adverse effects on historic buildings and the landscape. Past studies on the island's historic buildings and features, including the recently completed cultural landscape report (CLR) for Alcatraz Island, would guide stabilization and preservation activities. Implementation of the CLR preservation treatments would have widespread minor to moderate beneficial impacts.

Overall, these changes could diminish the overall integrity of some of the contributing resources to the national historic landmark but would not result in a loss of NHL eligibility for the island. Taken together, beneficial effects such as ongoing preservation and implementation of the CLR treatment recommendations with other work would render long-term, minor to moderate, beneficial and adverse impacts to Alcatraz Island.

San Francisco Port of Embarkation National Historic Landmark – The National Park Service would continue to use Building 201 as the park headquarters. Lower Fort Mason would continue to be managed by the Fort Mason Foundation who would perform ongoing preservation and rehabilitation work on the contributing resources, informed by the cultural landscape report for Fort Mason Center. The impact would be long term, minor, beneficial and adverse. Potential future water shuttle access may be provided at one of the piers, but the effects of that proposal as well as the proposed F-Line rail extension, would be addressed in a separate environmental analysis. The anticipated impacts from these respective actions are long term, minor to moderate, and adverse (water shuttle) and long term, moderate, and adverse (F-line).

Fort Mason Historic District – Many of the historic structures would continue to be preserved and rehabilitated for use by park operations as well as a variety of park partners. Uses would include office, maintenance functions, community garden, a hostel, and residencesl. The cultural landscape would be preserved and rehabilitated over time. This would result in a long-term, minor, beneficial and adverse impact.

Fort Miley Military Reservation – Historic structures and landscape features would continue to be maintained and preserved. Park maintenance would continue to use some of the historic structures. No major improvements would be made to either the facilities or landscape. This would result in a long-term, minor, adverse impact.

Camera Obscura – Operations and maintenance under this alternative would result in minor, beneficial, and minor, adverse impacts.

Six-inch Gun No. 9 – Operations and maintenance under this alternative would result in minor, beneficial, and minor, adverse impacts.

San Francisco Veterans Affairs Medical Center – Continued operation of the park maintenance facility, picnic areas, and other visitor areas at adjacent Fort Miley would have negligible impacts on the Veterans medical center historic district, which is owned and managed by the Department of Veterans' Affairs.

China Beach – This area would be preserved for ongoing recreational use and enjoyment. Historic features would be preserved resulting in a long-term, negligible, beneficial, and minor, adverse impact.

Marine Exchange Lookout Station (Octagon House) – This structure would remain unoccupied and would be stabilized rather than rehabilitated; no landscape rehabilitation would be undertaken, resulting in a local, long-term, minor, adverse impact.

O'Shaughnessy Seawall – The historic seawall and promenade on Ocean Beach would be preserved and the area would continue to provide a long trail connection between Fort Funston and the Cliff House. The seawall's preservation and maintenance would result in a long-term, negligible, beneficial, and long-term minor, adverse impact.

San Mateo County

Point Montara Light Station – The site would continue to be managed for use by a hostel and would include ongoing preservation and maintenance work to the contributing buildings and landscape features to support this use. This would have a long term, minor, beneficial and adverse impact to the district.

Rancho Corral de Tierra – Limited public access for recreational uses would continue in this area. Any trail or site improvements for these uses would be designed in a manner so as to be compatible with, and protect and preserve any contributing historic resources. This would have a long term, minor, adverse impact.

San Francisco Bay Discovery Site National Historic Landmark – The site would continue to be protected and preserved by the National Park Service, resulting in a long-term, negligible, beneficial impact.

Shelldance Nursery – This area would be managed for park trail access and would accommodate some park operations functions as well as a commercial nursery. Reuse plans for this area would continue to preserve and protect potential contributing historic structures and landscape features, and would result in long-term, minor, beneficial and adverse impacts.

Conclusion

When combined with the effects of the actions that are common to all alternatives, the impact to historic structures, districts and cultural landscapes under the no-action alternative would be long-term, negligible to minor, adverse and beneficial. Overall, the impacts to historic buildings, structures, and landscape features on Alcatraz Island under this alternative would be long term, minor to moderate, beneficial and adverse.

Under the no-action alternative, the Section 106 determination of effect on historic buildings, structures, districts and cultural landscapes in Golden Gate National Recreation Area, excluding Alcatraz Island National Historic Landmark, would be *adverse effect*. On Alcatraz Island, the Section 106 determination of effect on historic buildings, structures and cultural landscapes would be *adverse effect*.

Because there would be no major adverse impacts to a resource or value whose conservation is 1) necessary to fulfill specific purposes identified in the establishing legislation or proclamation of Golden Gate National Recreation Area; 2) key to the natural or cultural integrity of the park; or 3) identified as a goal in the park's general management plan or other relevant NPS planning documents, there would be no impairment of the park's historic structures or districts or cultural landscapes.

Alternative 1: Connecting People with the Parks

Analysis

Actions under Alternative 1 would focus on maximizing opportunities for adaptive reuse and rehabilitation of historic structures, districts and cultural landscapes in a manner that would support overall park visitor enjoyment, understanding and community connections. One of the goals of this alternative would be to preserve and protect cultural resources while allowing visitors to connect with and better understand and appreciate these resources and their stories.

Under Alternative 1, the park would rehabilitate existing facilities to improve their condition to better welcome and support park visitors than exist today. Park partners would continue to play an important role in preserving historic resources through adaptive reuse of buildings and structures throughout the park to provide programs and services to visitors in support of the park's mission. Any historic building and landscape rehabilitation would be in accordance with the *Secretary's Standards for Historic Rehabilitation*. In some cases, building rehabilitation may also include construction of a compatible addition to accommodate a new use. Historic structures reports and cultural landscape reports would be prepared, as needed, in advance of preservation and rehabilitation project implementation.

Improved orientation and information services would be a key component of this alternative, which could require the introduction of new site furnishings and features in the park's landscape. In addition, some new visitor amenities (restrooms, parking lots, trailheads, etc.) and facilities would be constructed to enhance the overall visitor experience as well as day to day park operations (particularly in Marin and San Mateo counties). For any new development within a historic district or cultural landscape setting, an appropriate level of historic research, resource inventory and assessment would be conducted in advance of design. In addition, design guidelines for a specific area would be prepared in advance when necessary to assure compatibility of any new planning, design and construction within the historic setting. The park's cultural resources staff would continue to conduct historic resource surveys, research, and determinations of eligibility for historic structures, districts and landscapes that may be eligible for listing in the National Register of Historic Places. This information would help to guide informed decision making in the future regarding how historic structures, districts, and landscapes and their contributing features should be managed. Careful design would ensure that the rehabilitation of historic buildings, structures and landscapes, the development of new facilities such as parking areas, and the expansion or development of trails would minimally affect the scale and visual relationships among significant landscape features. In addition, the topography, vegetation, circulation features, and land use patterns of any significant cultural landscape would remain largely unaltered.

Specific properties within the Area of Potential Effect with the potential to be impacted by implementation of the Alternative 1 are discussed below:

Parkwide

Seacoast Fortifications of San Francisco Bay (Draft) – Under this alternative, the park would pursue an ongoing program of stabilization, preservation and interpretation of the seacoast fortifications that contribute to the NHL eligible district. A preservation strategy for the park's seacoast fortifications would be prepared to guide the long term treatment and management of these resources, given that each fortification is in a varying state of repair and provides different interpretive opportunities. As an example, restoration may be the preferred preservation treatment in some instances such as at Battery Townsley. Battery Mendell and the Bird Rock Overlook area in the Marin Headlands would be rehabilitated and interpreted for visitor use. In addition to the stabilization and preservation of fortifications in Marin, those contributing historic seacoast fortifications on Milagra Ridge, Sweeney Ridge, and other locations in San Mateo County would be also be preserved and interpreted. Overall, these preservation treatments for the historic

fortifications and their landscaped settings would have long-term, minor to moderate, beneficial and minor adverse impacts.

Marin County

Forts Baker, Barry, and Cronkhite – Under this alternative, no actions are proposed for Fort Baker. However, actions are contemplated for Forts Barry and Cronkhite. Within the historic district, Alternative 1 includes the following actions that could affect the cultural landscape of the district: comprehensive sets of improvements to trails, overlooks, visitor amenities; the rehabilitation and introduction of transit and orientation facilities; broad programs of natural resource enhancements; the introduction of new and expanded programs; associated facilities for activities such as camping and picnicking. Some of these actions would enhance the historic setting while introducing compatible new elements into the landscape, while others would be noticeable changes that could potentially alter a character-defining feature of the landscape. Therefore, these actions would result in both long-term minor to moderate adverse impacts and minor to moderate beneficial impacts.

Actions that could affect historic structures, as well as the surrounding historic landscape, include the removal of some of the Capehart housing units, whose historic significance and integrity needs to be assessed; some new construction at different locations for residential use, visitor facilities, overnight accommodations, and operational needs; adaptive reuse of historic structures; and preservation of coastal fortifications. These would result in both long term, minor to moderate, adverse and beneficial impacts. Modifications to historic structures and landscape features would follow the *Secretary of the Interior's Standards for the Treatment of Historic Properties* so as to minimize adverse impacts to the historic resources.

Overall these modifications would be noticeable and would result in a visual change to the district and to the individual landscape areas within the district. Although they would result in an adverse effect on individual contributing resources, taken together they would not result in an adverse effect on the integrity of the national register district. Under this alternative—with the incorporation of mitigation measures including the preparation of cultural landscape reports, historic structures reports, and design guidelines to ensure compatible new construction as described in Part 8 of this document—the long-term impact would be minor to moderate, adverse and beneficial.

Point Bonita Historic District - Historic buildings and landscape features in the Point Bonita Historic District would continue to be preserved and interpreted, resulting in long-term, minor, beneficial and adverse impacts.

Sara Seaver Randall House – Management would continue to be by Point Reyes National Seashore. No actions would be taken that would have an impact on the site.

Hill 640 Military Reservation - Under this alternative, the historic structures and cultural landscape features associated with the historic coastal defense fortifications at the Hill 640 Military Reservation would continue to be stabilized and preserved. This would result in a long-term, negligible, beneficial, and long-term, minor, adverse impact.

Ranch M (Golden Gate Dairy) – Similar to the no-action alternative, in alternative 1 the area would be managed to retain the pastoral character of the area while historic buildings and landscape features that contribute to the ranch's national register eligibility at the

Golden Gate Dairy would be rehabilitated and adaptively used for equestrian use. Other site improvements would include a small trailhead and public transit stop. Taken together, these improvements would result in a long term, minor to moderate, beneficial impact, and a long-term, minor, adverse impact due to the addition of new features and other modifications.

Ranch A/B (Miwok) - Similar to the no-action alternative, in this alternative historic buildings and landscape features that contribute to the former ranch's national register eligibility would be rehabilitated and adaptively used for equestrian use. This would result in a long-term, minor to moderate, beneficial, and long-term, minor, adverse impact. Site improvements (such as restrooms, improved parking, and visitor orientation/information) at the nearby Tennessee Valley trailhead parking area would have an indirect, local, long-term, negligible, adverse impact on the district.

Bolinas Copper Mine - Management would continue to be by Point Reyes National Seashore. No actions would be taken under alternative 1 that would have an impact on the site.

Miwok Trail - Cultural landscape resources associated with the Miwok Trail would be preserved and protected, which would have a long-term, negligible, beneficial, and long-term, minor, adverse impact.

San Francisco County

Alcatraz Island National Historic Landmark – Under this alternative, the park's management emphasis would improve the overall condition of historic buildings, structures, and landscapes across the island through preservation and rehabilitation and thus provide a greater variety of settings for visitor experiences. As a result, visitors would have access to the majority of the islands historic resources and landscapes, and many of the currently closed indoor and outdoor spaces would be reopened to the public. All of the primary buildings that contribute to the island's landmark status would be rehabilitated in accordance with the *Secretary of the Interior's Standards for Rehabilitation*, and other contributing structures would be stabilized and preserved. This would result in a long term, moderate, beneficial, and long-term, minor, adverse impact to historic structures.

Specific actions would include rehabilitation of Building 64 as a multipurpose facility for visitor services which could include overnight accommodations, and interpretive and administrative space. The Main Prison Area would be preserved to interpret the federal penitentiary period. The New Industries Building would be rehabilitated and adaptively used as multipurpose facility to host a variety of visitor services. The Guard House would be restored to the Civil War era through removal of the boathouse from a later time period, (resulting in a localized, long term, moderate adverse effect) and the remaining walls and foundations of the Post Exchange and Warden's House would be stabilized. The Power Plant and Quartermaster Warehouse, as well as a portion of the Model Industries Building, would be rehabilitated and adaptively used for maintenance, storage, public safety functions, and potentially to showcase alternative energy technologies. The lighthouse and surrounding area would be preserved, providing for improved visitor access and interpretation. Other historic buildings on would be stabilized or rehabilitated all resulting in long term, minor to moderate, beneficial, and long-term, minor, adverse impacts.

Important landscaped areas that contribute to the natonal historic landmark's integrity, such as around the Main Prison Building and the Parade Ground, would be rehabilitated, and characteristic prison-era security features restored. Improvements would be in accordance with the treatment recommendations of the *Cultural Landscape Report for Alcatraz Island* and would comply with the *Secretary of the Interior's Standards for the Treatment of Historic Properties, with Guidelines for the Treatment of Cultural Landscapes*. This would have a beneficial impact on the landscape. There could also be local, minor, adverse impacts on individual cultural landscape features through either their deterioration or loss during the course of rehabilitation to accommodate visitor uses or through the decision to allow some areas to revert to a more natural state. Overall, these landscape changes would result in long term, minor to moderate, beneficial, and long term, minor, adverse impacts.

Historic buildings and landscapes on Alcatraz Island could be adversely impacted over time from the effects of increased visitation to the island, especially with the provision of overnight visitor stays. Unstaffed or minimally staffed structures could be more susceptible to vandalism. This would result in a long term, negligible to minor, adverse impact on historic structures and landscapes. However, the park would monitor the effects of increased visitation on historic resources and could modify visitor access and uses, or would use other techniques to further protect these resources from human impacts without hindering interpretation opportunities and overall visitor experience. In addition, the park's provision of regular patrols and visitor education programs about resource significance and protection (such as discouraging vandalism) would help to reduce these potential visitor impacts to no more than minor.

In conclusion, modifications to the contributing resources on Alcatraz Island would be noticeable. Although some actions could result in an adverse effect on some individual features, taken together they would not result in an adverse effect on the overall integrity of the national historic landmark. The impact to these historic resources under this alternative would be long term, minor to moderate, beneficial and long term, minor to moderate (for removal of the Boathouse) adverse.

San Francisco Port of Embarkation NHL – Similar to the no-action alternative, actions under alternative 1 would include the park's continued use of Building 201 as the park headquarters. Lower Fort Mason would continue to be managed by the Fort Mason Foundation who would perform ongoing preservation and rehabilitation work on the contributing resources as recommended in the *Cultural Landscape Report for Lower Fort Mason*. These treatments, including energy-saving infrastructure additions, would be designed to avoid adverse effect. The impact would be long term, negligible, beneficial, and long term, minor, adverse. Potential future water shuttle access may be provided at one of the piers, but the effects of that proposal as well as the proposed F-Line rail extension, would be addressed in a separate environmental planning process. The anticipated impacts from these respective actions are long term, minor to moderate, adverse (water shuttle), and long term, moderate, adverse (F-line).

Aquatic Park Historic District National Historic Landmark – Under alternative 1, site and circulation modifications to accommodate transit improvements on the Van Ness Avenue corridor, and overall wayfinding and park orientation signage, could have direct and indirect effects on the historic landscape of the district. Efforts would be made to minimize the effects on this historic landscape. Recommendations of a cultural landscape

report would guide these changes. The potential impact would be long term, minor, and adverse. This property is within and managed by San Francisco Maritime National Historical Park.

Fort Mason Historic District - The Fort Mason District would serve as a "portal to the park" using historic structures to welcome visitors in a setting that would remain a peaceful contrast to the adjacent city. This would be accomplished through the continued rehabilitation of historic buildings and the district's historic designed landscape. Building uses would include visitor services (park orientation, information), food service, special event venues, residences, overnight accommodations, and park/partner offices and programs. Landscape improvements would be consistent with the treatment recommendations based upon the *Cultural Landscape report for Fort Mason* (2011) and would include rehabilitation of the overgrown gardens on the east and northeast slopes; the installation of identification, orientation, and wayfinding signs; opening up of important viewsheds; and considerable treatment of over-mature and (sometimes) hazardous trees. This action, along with other contemplated transit access improvements, would trigger the need for visitor circulation and associated site improvements within the district. Some actions may adversely impact individual features: the removal of trees and the time it takes for replacement trees to grow would result in short-term, minor, adverse impacts. However, taken as a whole—with the incorporation of mitigation measures such as the provision for the preparation of historic structure reports and design guidelines—these actions would have a long-term, negligible to moderate, beneficial, and long-term, minor, adverse impacts on the historic district.

Fort Miley Military Reservation – The historic structures of West Fort Miley would continue to be preserved and the landscape enhanced to provide better connections for visitors to adjacent resources and sites. Landscape changes would include the provision of picnicking and group camping facilities, which would be new features in the landscape. These changes would be designed to be compatible with the historic setting. Park maintenance functions would continue to occur in the East Fort Miley historic warehouse and batteries. These actions would result in a long term, minor, adverse impact.

Pumping Station #2, SF Fire Department Auxiliary Water Supply System – No impacts to this property are anticipated from alternative 1. This property is within Fort Mason but is owned and operated by the City of San Francisco.

Camera Obscura – Operations and maintenance under this alternative would result in minor, beneficial, and minor, adverse impacts.

Six-inch Gun No. 9 - Operations and maintenance under this alternative would result in minor, beneficial, and minor, adverse impacts.

San Francisco Veterans Affairs Medical Center – Continued operation of Fort Miley as a historic site (West) and park maintenance facility (East) would have negligible impacts on the adjacent Veterans medical center historic district, which is owned and managed by the Department of Veterans' Affairs.

China Beach – Some improvements to the existing array of visitor facilities and access would be made to support continued use of this popular site. Impacts would be long term, negligible, beneficial, and long term, minor, adverse.

Marine Exchange Lookout Station (Octagon House) - The building and adjacent landscape would be rehabilitated for park or park partner uses and interpreted, which would have a long-term, moderate, beneficial, and long-term, minor, adverse impact.

O'Shaughnessy Seawall – The historic seawall on Ocean Beach would be preserved and protected. Adjacent amenities, such as the promenade, parking area, and restroom facilities that support visitor beach use of the area, would be improved. This would have long-term, negligible to minor, beneficial, and long-term, minor, adverse impacts.

Sutro District – Managed under an existing plan, no impacts to this property are anticipated from alternative 1. This district is managed by the park as a cultural resource but has been determined to not be eligible for the National Register of Historic Places in consultation with the California state historic preservation officer.

San Mateo County

San Francisco Bay Discovery Site National Historic Landmark – The site and its associated features would be preserved, enhanced, and interpreted. A hikers hut could be constructed in the vicinity as part of a system of trail amenities for the Bay Area Ridge Trail. Any new construction and development would be sited and designed away from the actual site so as not to directly affect the historic integrity of this site. Limited vehicular access to the discovery site would be permitted as well. This could result in increased visitation to the site, which would be monitored over time for any changes to the historic setting, landscape, and monuments to ensure long term preservation. Overall, these changes would result in a long-term, minor, adverse impact.

Point Montara Light Station - The Montara Lighthouse and associated historic buildings and landscape, would continue to function as a hostel and support day-use programs. The facilities would be preserved or rehabilitated as needed and the site interpreted. This would result in long term, minor, beneficial and adverse impacts.

Rancho Corral de Tierra - If determined eligible for listing in the National Register of Historic Places, contributing historic structures and cultural landscape resources associated with the rural agricultural landscape at Rancho Corral de Tierra in San Mateo County would be preserved in balance with natural resource restoration goals. New visitor amenities, including trailheads and trails, would be compatibly designed to blend in with the historic landscape. The preservation of these resources would have a long term, minor beneficial impact; however, the introduction of new elements and natural resource restoration activities could result in long term, minor, adverse impacts.

Shelldance Nursery - If determined eligible for listing in the National Register of Historic Places, transition from a commercial nursery to an area that provides a variety of visitor services and park operational needs would have a moderate, beneficial, and minor, adverse impact, if carried out according to the *Secretary of the Interior's Standards for Historic Preservation* and if removal of any structures that may be deemed historic is avoided.

Conclusion

In conjunction with the effects from the actions common to all alternatives, alternative 1 would result in local, long-term, negligible to moderate, adverse and beneficial impacts to historic structures, districts and landscapes. Impacts would be minimized by implementing mitigation measures. The park's management strategy for historic

buildings, districts, and cultural landscapes would generally be one of preservation and rehabilitation for new and continued uses. This would have a long term, beneficial, effect on these resources. In some instances, individual projects could result in adverse effects due to the level or amount of intervention and proposed modifications to a structure or site.

With regards to Alcatraz Island National Historic Landmark, although some actions could result in an adverse effect on some individual features, taken together the actions would not result in an adverse effect on the overall integrity of the national historic landmark. The impacts to historic structures and the cultural landscape would be long term, minor to moderate, beneficial, and long term, minor, adverse.

Under alternative 1, the Section 106 determination of effect on historic buildings, structures, districts and cultural landscapes in Golden Gate National Recreation Area, excluding Alcatraz Island National Historic Landmark, would be *adverse effect*. On Alcatraz Island, the Section 106 determination of effect on historic buildings, structures and cultural landscapes would be *adverse effect*.

Because there would be no major, adverse impacts to a resource or value whose conservation is 1) necessary to fulfill specific purposes identified in the establishing legislation or proclamation of Golden Gate National Recreation Area; 2) key to the natural or cultural integrity of the park; or 3) identified as a goal in the park's general management plan or other relevant NPS planning documents, there would be no impairment of the park's historic buildings and structures.

Alternative 2: Preserving and Enjoying Coastal Ecosystems

Analysis

Actions under alternative 2 would be similar to those under alternative 1 and would maximize opportunities for adaptive reuse and rehabilitation of historic structures, districts and cultural landscapes in a manner that would support the overall park mission. One of the goals of this alternative would be to preserve and protect cultural resources with support for their stewardship and interpretation.

Under alternative 2, the park would rehabilitate existing facilities to improve their condition to welcome and support park visitors. A focus of programs would be the preservation and enhancement of the park's interconnected coastal ecosystems in which marine resources are valued and featured in interpretation. Cultural resource sites and stories would emphasize human occupation of the coastal environment as reflected in lighthouses, coastal defense structures and other developed sites, and reflected in the area's European exploration, maritime history, as well as historic agricultural land uses.

Park partners would continue to play an important role in preserving historic resources through adaptive reuse of buildings and structures throughout the park to provide programs and services to visitors in support of the park's mission. Consistent with alternative 1, any historic building and landscape rehabilitation would be in accordance with the *Secretary's Standards for Historic Rehabilitation*. In some cases, building rehabilitation may also include construction of a compatible addition to accommodate a new use. Historic structures reports and cultural landscape reports would be prepared, as needed, in advance of preservation and rehabilitation project implementation.

Improved orientation and information services would be a key component of this alternative, which could require the introduction of new site furnishings and features in the park's landscape. In addition, some new visitor amenities (restrooms, parking lots, trailheads, etc.) and facilities would be constructed to enhance the overall visitor experience as well as day to day park operations (particularly in Marin and San Mateo counties). For any new development within a historic district or cultural landscape setting, an appropriate level of historic research, resource inventory and assessment would be conducted in advance of design. In addition, design guidelines for a specific area would be prepared when necessary in advance to assure compatibility of any new planning, design and construction within the historic setting. The park's cultural resources staff would continue to conduct historic resource surveys, research, and determinations of eligibility for historic structures, districts and landscapes that may be eligible for listing in the National Register of Historic Places. This information would help to guide informed decision making in the future regarding how historic structures, districts, and landscapes, and their contributing features should be managed. Careful design would ensure that the rehabilitation of historic buildings, structures and landscapes, the development of new facilities such as parking areas, and the expansion or development of trails would minimally affect the scale and visual relationships among significant landscape features. In addition, the topography, vegetation, circulation features, and land use patterns of any significant cultural landscape would remain largely unaltered.

Specific properties that could be affected by actions proposed under alternative 2 are further described below.

Parkwide

Seacoast Fortifications of SF Bay (Draft) – Similar to alternative 1, under this alternative the park would pursue an ongoing program of stabilization, preservation and interpretation of the seacoast fortifications that contribute to the NHL-eligible district. A preservation strategy for the park's seacoast fortifications would be prepared to guide the long-term treatment and management of these resources, given that each fortification is in a varying state of repair and provides different interpretive opportunities. Based on their condition, significance, and suitability for visitor access, interpretive and educational opportunities, or park operational use, historic seacoast fortifications in the Marin Headlands would be stabilized and in some cases rehabilitated. In addition to the stabilization and preservation of fortifications in Marin, those contributing historic seacoast fortifications on Milagra Ridge, Sweeney Ridge, and other locations in San Mateo County would be also be preserved and interpreted. Cultural landscape resources associated with historic coastal fortifications would be preserved and managed in balance with natural resource restoration goals to perpetuate their historic values. Overall, these preservation treatments for the historic fortifications and their landscaped settings would have long-term, minor to moderate, beneficial, and long-term, minor, adverse impacts.

Marin County

Forts Baker, Barry, and Cronkhite - Within this historic district, alternative 2 includes actions similar to those proposed under alternative 1. Historic buildings and landscapes at Forts Barry and Cronkhite in the Marin Headlands would be rehabilitated and continue to be adaptively used by the park and park partners for recreational, educational, and stewardship activities, resulting in long-term beneficial impacts. Specific actions that

could effect the cultural landscape of the district include: comprehensive sets of improvements to trails, overlooks, visitor amenities; the rehabilitation and introduction of transit and orientation facilities; broad programs of natural resource enhancements including habitat restoration that would be consistent with the preservation of the historic landscape; the introduction of new and expanded programs; associated facilities for activities such as camping and picnicking. Some of these actions would enhance the historic setting while introducing compatible new elements into the landscape, while others would be noticeable changes that could potentially alter a character-defining feature of the landscape. Therefore, these actions would result in both long-term, minor to moderate, adverse impacts and long-term, minor to moderate, beneficial impacts.

Actions that could affect historic structures, as well as the surrounding historic landscape, include the removal of the Capehart housing—which needs an assessment of historic significance and integrity—and some potential new construction for a park operations facility in the area; adaptive reuse of historic structure,s and the ongoing preservation of coastal fortifications. These actions would result in both long term, minor to moderate, adverse, and long-term, minor to moderate, beneficial impacts. Modifications to historic structures and landscape features would follow the *Secretary of the Interior's Standards for the Treatment of Historic Properties* so as to minimize adverse impacts to the historic resources.

Overall these modifications would be noticeable and would result in a visual change to the district and to the individual landscape areas within the district. Although they would result in an adverse effect on individual contributing resources, taken together they would not result in an adverse effect on the integrity of the national register district. Under this alternative—with the incorporation of mitigation measures including the preparation of cultural landscape reports, historic structures reports, and design guidelines to ensure compatible new construction as described in Part 8 of this document—the long-term impact would be minor to moderate, adverse, and beneficial.

Point Bonita Historic District – Management of this area would be the same as alternative 1 in which historic buildings and landscape features in the district would continue to be preserved and interpreted, resulting in long-term, minor, beneficial, and long-term, minor, adverse impacts.

Sara Seaver Randall House – Management would continue to be by Point Reyes National Seashore. No actions would be taken under alternative 2 that would have an impact on the site.

Hill 640 Military Reservation – Treatment of this area would be the same as in alternative 1. Historic structures and cultural landscape features associated with the historic coastal defense fortifications would continue to be stabilized, preserved, and interpreted, resulting in a long term, negligible, beneficial, and long-term, minor, adverse impact.

Ranch M (Golden Gate Dairy) - Similar to the no-action alternative, this area would be managed to retain the pastoral character of the area while historic buildings and landscape features that contribute to the ranch's national register eligibility would be rehabilitated and adaptively used for equestrian use. Under alternative 2, nonhistoric residences near the Golden Gate Dairy could be removed if they are not needed to support community services or park operations. Taken together, these improvements

would result in a long term, minor to moderate, beneficial and long-term, minor, adverse impact.

Ranch A/B (Miwok) - Similar to the no-action alternative, historic buildings and landscape features that contribute to the former ranch's national register eligibility would be rehabilitated and adaptively used for equestrian use. This would result in a long term, minor to moderate, beneficial, and long-term, minor, adverse impact. A minimal level of visitor facilities and an improved trailhead to support visitor access to the area's extensive network of trails would be provided at the nearby Tennessee Valley trailhead parking. This would have an indirect, local, long-term, negligible, adverse impact on the district.

Bolinas Copper Mine - Management would continue to be by Point Reyes National Seashore. No actions would be taken under alternative 2 that would have an impact on the site.

Miwok Trail - Cultural landscape resources associated with the Miwok Trail would be preserved and protected, which would have a long-term, negligible, beneficial, and long-term, minor, adverse impact.

San Francisco County

Alcatraz Island National Historic Landmark – Under alternative 2, many of the island's historic buildings and landscape features would only be stabilized while others would be rehabilitated and maintained (resulting in long-term, beneficial impacts because their deterioration would be halted). The island's changing natural and built landscape would continue to evolve, further enhancing habitat for nesting birds. Only those buildings and features necessary to maintain the islands landmark status would be preserved, while natural elements would reclaim other features.

Building 64 would be rehabilitated and adaptively used to support science, education, and stewardship programs, administrative functions, and potential overnight accommodations for program participants. The Main Prison Building, including the hospital wing, adjacent landscape, and the Recreation Yard, would be rehabilitated or potentially restored to reflect historically accurate conditions. The lighthouse and surrounding landscape area would be preserved and interpreted. These rehabilitation efforts would result in a long term, moderate, beneficial, and long-term, minor, adverse impact.

The Parade Ground would be allowed to be become a "wild" landscape, and its rubble piles retained to serve as bird habitat. The New Industries Building and the Model Industries Building would be stabilized and no efforts would be made to avoid their loss to coastal erosion. In order to restore natural habitats on the island, some cultural landscape resources would be allowed to deteriorate or be removed, depending upon their condition. This would only occur after the features had been documented and recorded in accordance with the HABS/HAER/HALS standards. This would result in a long term, moderate to major, adverse effect on these structures and landscape resources. With the incorporation of mitigation measures, the effect could be reduced to moderate adverse. The interior spaces of the Quartermaster Warehouse and Power Plant would be used for park operations. The Post Exchange would be stabilized to preserve the exterior of the structure; an interior shell could be constructed within the structure for park operations. These building treatments would result in long-term, minor to moderate, beneficial, and long-term, minor, adverse impacts on these resources.

The long term impacts to particular historic structures, buildings, and landscapes on Alcatraz Island would include minor, moderate, and major, adverse impacts, as well as minor to moderate, beneficial impacts. Overall these modifications would be noticeable and would result in a visual change to the district and to the individual landscape areas within the district. Although they would result in adverse impacts on individual contributing resources, taken together they would not result in a major adverse impact on the landmark district, as it would continue to maintain its status as a national register landmark district.

Fort Point – Operations and maintenance under this alternative would result in minor to moderate, beneficial, and minor,adverse impacts.

Presidio – Operations and maintenance under this alternative would result in minor to moderate, beneficial, and minor ,adverse impacts.

San Francisco Port of Embarkation NHL – Actions would be the same as alternative 1, with long term preservation of the contributing structures and landscapes of the district. Building 201 would continue to be used as the park headquarters and Lower Fort Mason would continue to be managed by the Fort Mason Foundation. The impact would be long term, negligible and beneficial. Potential future water shuttle access may be provided at one of the piers, but the effects of that proposal as well as the proposed F Line rail extension, would be addressed in a separate environmental planning process. The anticipated impacts from these respective actions are long term, minor to moderate, adverse (water shuttle), and long term, moderate, adverse (F-line).

Aquatic Park Historic District NHL – Actions would be similar to those in alternative 1. Potential site and circulation modifications to accommodate transit improvements on the Van Ness Avenue corridor and overall wayfinding and park orientation signs, could have direct and indirect effects on the historic landscape of the district. Efforts would be made to minimize the effects on this historic landscape. A cultural landscape report would guide these changes. The potential impact would be long term, minor, adverse. This property is within and managed by San Francisco Maritime National Historical Park.

Fort Mason Historic District – With respect to the effects on the historic structures and landscape of this district, alternative 2 would be similar to alternative 1. Historic buildings would be rehabilitated and adaptively used to serve as a portal to the park and provide for uses such as a hostel and other overnight accommodations, park headquarters, and park and park partner offices and programs. Cultural landscape resources in Upper Fort Mason would be preserved through rehabilitation. As a whole, with the incorporation of mitigation measures such as the provision for the preparation of historic structure reports and design guidelines, the actions proposed under this alternative would have a long-term, negligible to moderate, beneficial, and long-term, minor, adverse impact on the historic district.

Fort Miley Military Reservation – Same as alternative 1. The historic structures of West Fort Miley would continue to be preserved and the landscape enhanced to provide better connections for visitors to adjacent resources and sites. Landscape changes would include the provision of picnicking and group camping facilities and would be designed to be compatible with the historic setting. Park maintenance functions would continue to occur in the East Fort Miley historic warehouse and batteries. These actions would result in a long term, minor, adverse impact.

Pumping Station #2, SF Fire Department Auxiliary Water Supply System – Same as alternative 1. No impacts to this property are anticipated. This property is within Ft. Mason but is owned and operated by the City of San Francisco.

Camera Obscura – Operations and maintenance under this alternative would result in minor beneficial and minor adverse impacts.

Six-inch Gun No. 9 – Operations and maintenance under this alternative would result in minor beneficial and minor adverse impacts.

San Francisco Veterans' Affairs Medical Center – Continued operation of Fort Miley as a park maintenance facility would have negligible impacts on the adjacent Veterans medical center historic district, which is owned and managed by the Department of Veterans' Affairs.

China Beach – Same as alternative 1: some improvements to the existing array of visitor facilities and access would be made to support continued use of this popular site. Impacts would be long term, negligible, beneficial, and long-term, minor, adverse. This property needs to be assessed to determine national register eligibility.

Marine Exchange Lookout Station (Octagon House) – The Marine Exchange Lookout Station (Octagon House) would be rehabilitated and adaptively used to engage the public in the natural and human history of the coastal marine environment. which would have a long-term, moderate, beneficial. and long-term, minor, adverse impact. This property needs to be assessed to determine national register eligibility.

O'Shaughnessy Seawall – the historic seawall would be preserved and protected. Adjacent amenities such as the promenade, parking area, and restroom facilities that support visitor beach use of the area would be improved. This would have long-term, negligible to minor, beneficial, and long-term, minor, adverse impacts. This property needs to be assessed to determine national register eligibility.

Sutro District – Managed under an existing plan, no impacts to this property are anticipated under alternative 2. This district is managed by the park as a cultural resource but has been determined to not be eligible for the National Register of Historic Places in consultation with the California state historic preservation officer.

San Mateo County

SF Bay Discovery Site NHL – Cultural landscape resources associated with San Francisco Bay Discovery Site National Historic Landmark on Sweeney Ridge would be preserved, enhanced, and interpreted. This would result in a long term, negligible, beneficial impact.

Point Montara Light Station – Similar to alternative 1, the Montara Lighthouse and associated historic buildings and landscape would continue to function as a hostel and would support day-use programs for park stewardship and environmental education. The facilities would be preserved or rehabilitated as needed and the site interpreted. This would result in a long term, minor, beneficial, and long-term, minor, adverse impact.

Rancho Corral de Tierra – If determined eligible for listing in the National Register of Historic Places, contributing historic structures and cultural landscape resources associated with the rural agricultural landscape at Rancho Corral de Tierra in San Mateo County would be preserved in balance with natural resource restoration goals. Compared

to alternative 1, fewer and more primitive visitor amenities would be constructed. Unnecessary fire roads could be converted to trails or removed, if not identified as contributing landscape features. The preservation of these resources would have a long term, minor, beneficial impact; however, the introduction of new elements and natural resource restoration activities could result in long term, negligible to minor, adverse impacts. This property needs to be assessed to determine national register eligibility.

Shelldance Nursery – If determined eligible for listing in the National Register of Historic Places, transition from a commercial nursery to an area that provides a variety of visitor services and park operational needs would have a moderate beneficial and minor adverse impact, if carried out according to the Secretary of the Interior's Standards for Historic Preservation and if removal of any structures that may be deemed historic is avoided.

Conclusion

In conjunction with the effects from the actions common to all alternatives, alternative 2 would result in local, long term, negligible to moderate, adverse, and local, long term, negligible to moderate, beneficial impacts to historic structures, districts and landscapes. Impacts would be reduced by implementing mitigation measures. The park's management strategy for historic buildings, districts, and cultural landscapes encompass stabilization, preservation, and rehabilitation for new and continued uses. In general, this would have a long-term, beneficial effect on these resources. In some instances, individual projects could result in long-term, moderate to major, adverse impacts, due to the level or amount of proposed change.

Impacts to Alcatraz Island National Historic Landmark would include minor, moderate, and major, adverse impacts with the potential loss of some contributing resources (structures and landscapes); however, actions would also result in minor to moderate, beneficial impacts on other contributing resources. Although some actions could result in an adverse effect on some individual features, taken together the actions would not result in an adverse effect on the overall integrity of the national historic landmark. Overall, those key features that define the essence of the landmark's integrity would be preserved.

Under alternative 2, the Section 106 determination of effect on historic buildings, structures, districts and cultural landscapes in Golden Gate National Recreation Area, excluding Alcatraz Island National Historic Landmark, would be *adverse effect.* On Alcatraz Island, the Section 106 determination of effect on historic buildings, structures and cultural landscapes would be *adverse effect.*

Because there would be no major, adverse impacts to a resource or value whose conservation is 1) necessary to fulfill specific purposes identified in the establishing legislation or proclamation of Golden Gate National Recreation Area; 2) key to the natural or cultural integrity of the park; or 3) identified as a goal in the park's general management plan or other relevant NPS planning documents, there would be no impairment of the park's historic buildings and structures.

Alternative 3: Focusing on National Treasures (NPS Preferred Alternative for Alcatraz Island)

Analysis

Actions under alternative 3 would place an emphasis on the park's nationally important natural and cultural resources. The fundamental resources of each site would be showcased with the highest level of preservation, maximizing opportunities for adaptive reuse and rehabilitation of historic structures, districts and cultural landscapes for park visitor enjoyment and understanding.

Similar to the other action alternative, under alternative 3, the park and park partners would rehabilitate existing facilities to improve their condition to better welcome and support park visitors. Historic building and landscape rehabilitation would be in accordance with the *Secretary's Standards for Historic Rehabilitation* and, in some cases, may include construction of compatible additions or new features to accommodate a new use. Historic structures reports and cultural landscape reports would be prepared, as needed, in advance of preservation and rehabilitation project implementation.

Compared to existing conditions and the other action alternatives, alternative 3 would result in providing the greatest amount of public access to the park's numerous historic buildings and landscapes, allowing park visitors direct contact with these resources when possible. In San Mateo County, park managers would work with other land management agencies and communities to promote heritage tourism and explore opportunities for regional landscape management; these actions would have a beneficial impact on the long term preservation and protection of historic structures, districts, and cultural landscapes. In order to successfully immerse visitors in the park's compelling sites and history, improved orientation and information services would be a key component of this alternative, which could require the introduction of new site furnishings and features in the park's landscape. Park staff would continue to conduct historic resource surveys, research, and determinations of eligibility for historic structures, districts. and landscapes that may be eligible for listing in the National Register of Historic Places. This information would be used to guide decisions regarding how historic structures, districts, and landscapes and their contributing features should be managed. Some new visitor amenities and facilities (restrooms, parking lots, trailheads, etc.) would be constructed to enhance the overall visitor experience as well as day-to-day park operations (particularly in Marin and San Mateo counties). For any new development within a historic district or cultural landscape setting, an appropriate level of historic research, resource inventory, and assessment would be conducted in advance of design. In addition, design guidelines for a specific area would be prepared, when necessary, in advance to assure compatibility of any new planning, design, and construction within the historic setting. Careful design would ensure that the rehabilitation of historic buildings, structures, and landscapes would minimally affect the scale and visual relationships among significant landscape features.

Specific properties within the area of potential effect with the potential to be impacted by implementation of alternative 3 are discussed below:

Parkwide

Seacoast Fortifications of SF Bay (Draft) - Under alternative 3, the park would pursue an ongoing program of stabilization, preservation, and interpretation of the seacoast

fortifications that contribute to the NHL-eligible district. In cases where conditions warrant, restoration would be pursued as well, to provide for an immersive visitor experience that will help visitors understand the fortification's history. A preservation strategy for the park's seacoast fortifications would be prepared to guide the long-term treatment and management of these resources, given that each fortification is in a varying state of repair and provides different interpretive opportunities. As an example, restoration may be the preferred preservation treatment in some instances such as at Battery Townsley. Battery Mendell and the Bird Rock Overlook area in the Marin Headlands would be rehabilitated and interpreted for visitor use. In addition to the stabilization and preservation of fortifications in Marin, those contributing historic seacoast fortifications on Milagra Ridge, Sweeney Ridge, and other locations in San Mateo County would be also be preserved and interpreted. Overall, these preservation treatments for the historic fortifications and their landscaped settings would have long-term, minor to moderate, beneficial, and long-term, minor, adverse impacts.

Golden Gate Bridge (Draft) – Continued operation and maintenance of the Presidio by the park would have negligible impacts on the adjacent Golden Gate Bridge National Historic Landmark, which is owned and operated by the Golden Gate Bridge District.

Marin County

Forts Baker, Barry, and Cronkhite – Historic buildings at Forts Barry and Cronkhite would be rehabilitated, interpreted, and adaptively used and the coastal fortifications would be preserved to showcase the history of the military's presence here, and the area's conversion from military post to national park. Similar to the other action alternatives, historic buildings and landscapes would be rehabilitated and used for a variety of park programs and functions. Some structures may be restored to evoke a better understanding of specific periods of the military's era. Similar to alternative 1, the following actions could effect the cultural landscape of the district: comprehensive sets of improvements to trails, overlooks, visitor amenities; the rehabilitation and introduction of transit and orientation facilities; and natural resource enhancements. Some of these actions would enhance the historic setting while introducing compatible new elements into the landscape, while others would be noticeable changes that could potentially alter a character-defining feature of the landscape. Modifications to historic structures and landscape features would follow the Sec*retary of the Interior's Standards for the Treatment of Historic Properties* so as to minimize adverse impacts to the historic resources. With an emphasis on historic resource preservation, all of these actions would result in both long-term, negligible to minor, adverse impacts and long-term, minor to major, beneficial impacts.

More noticeable actions that could affect historic structures, as well as the surrounding historic landscape, include the removal of some of the Capehart housing, which needs to be asseded for historic significance and integrity, accompanied by new replacement construction of park facilities on the south side of Bunker Road. This would result in a long term, minor to moderate, adverse impact.

Overall these modifications would be noticeable and would result in a visual change to the district and to the individual landscape areas within the district. Under alternative 3, with the incorporation of mitigation measures—including the preparation of cultural landscape reports, historic structures reports, and design guidelines to ensure compatible

new construction as described in Part 8 of this document—the long term impact would be minor to moderate, and both adverse and beneficial.

Point Bonita Historic District – the treatment of this historic district would be the same as in alternative 1. Historic buildings and landscape features in the Point Bonita Historic District would continue to be preserved and interpreted, resulting in long term, minor, beneficial, and long-term, minore, adverse impacts.

Sara Seaver Randall House – Management would continue to be by Point Reyes National Seashore. No actions would be taken under alternative 3 that would have an impact on the site.

Hill 640 Military Reservation – Under this alternative, the historic structures and cultural landscape features associated with the historic coastal defense fortifications at the Hill 640 Military Reservation would be preserved and interpreted. Compared to the other action alternatives, the park would perform more extensive preservation work to allow for increased visitor access and interpretation to this significant resource. This would result in a long term, negligible to minor, beneficial, and long term, negligible to minor, adverse impact.

Ranch M (Golden Gate Dairy) – Under alternative 3, this historic district would be managed to retain its pastoral landscape and historic structures. Buildings and landscape features that contribute to the ranch's national register eligibility would be rehabilitated and adaptively used for equestrian use and other recreational uses, park operations, and local community services. These improvements would result in a long term, minor to moderate, beneficial, and long-termin, minor, adverse impact.

Ranch A/B (Miwok) – Equestrian, environmental education, and stewardship activities would continue in this area. Historic buildings and landscape features that contribute to the former ranch's national register eligibility would be rehabilitated and adaptively used for equestrian use. This would result in a long-term, minor to moderate, beneficial, and long-term, minor, adverse impact. The park would establish a visitor facility in the vicinity of the ranch to provide visitor orientation and basic amenities to support the recreational and educational uses nearby. These types of site changes (such as restrooms, improved parking, and visitor orientation/information) would have an indirect, local, long term, negligible to minor, adverse impact on the district.

Bolinas Copper Mine – Management would continue to be by Point Reyes National Seashore. No actions would be taken under alternative 3 that would have an impact on the site.

Miwok Trail – Cultural landscape resources associated with the Miwok Trail would be preserved and protected, which would have a long-term, negligible, beneficial, and long-term, minor, adverse impact.

San Francisco County

Alcatraz Island National Historic Landmark – Alternative 3 would immerse visitors extensively in all of the island's historic periods, utilizing as much as possible the historic resources as tangible evidence of the past. To accomplish this would require extensive stabilization, rehabilitation, and selective restoration work on the historic structures, buildings, and landscape features. This alternative would provide for most historic

buildings to be preserved in "good" condition, and for the key landscape features, including small-scale elements such as fences, paths, and railings, to be preserved.

Specific actions would include the restoration of portions of Building 64 to interpret the post office, canteen, and a prison-era guard apartment; and restoration of the Guardhouse to better reveal the early military prison period (including removal of the boathouse addition). Other areas at Building 64 and around the arrival area would be rehabilitated for visitor services and administrative uses, and could include dorm-like overnight accommodations for program participants. The Main Prison Building (which includes the main cellblock, hospital wing, administration wing, and basement citadel) and adjacent areas would be rehabilitated and portions restored to provide visitors with greater opportunities to explore the federal penitentiary's history. The Post Exchange would be stabilized to allow visitors opportunities to explore its historic components. The lighthouse and surrounding area would be preserved with enhanced visitor access and interpretation. The Parade Ground would be rehabilitated to portray its historic periods and support year-round visitor exploration. Design for the Parade Ground's rehabilitation would incorporate measures to protect wildlife habitat. These actions would result in a long-term, moderate to major, beneficial, and long-term, minor, adverse impact.

The New Industries Building would be rehabilitated as a multipurpose facility for uses such as interpretive programs, special events, classrooms, and meetings. The Model Industries Building and adjacent courtyard would be stabilized and closed to visitors and park uses to protect nearby sensitive habitat. The Quartermaster Warehouse would be rehabilitated for park operational functions, including a preservation stewardship workshop. The Power Plant would be stabilized and the adjacent yard preserved for park operational needs. Significant historic resources along the perimeter of the island would be stabilized and preserved. These actions would result in long-term, minor to moderate, beneficial, and long-term, minor, adverse impacts.

Historic buildings and landscapes on Alcatraz Island could be adversely impacted over time from the effects of increased visitation to the island, especially with the provision of overnight visitor stays. This would result in a long term, negligible to minor, adverse impact on historic structures and landscapes. However, the park would monitor the effects of increased visitation on historic resources and could modify visitor access and uses to further protect these resources and reduce this impact to negligible. In addition, the park's provision of regular patrols and visitor education programs about resource significance and protection (such as discouraging vandalism) would help to reduce these potential visitor impacts to no more than minor.

In conclusion, modifications to the contributing resources on Alcatraz Island would be noticeable and would result in long-term, minor to major, beneficial, and long-term. minor, adverse impacts. There could also be a long term, negligible, adverse impact as a result of increased visitor access to sensitive resources.

San Francisco Port of Embarkation NHL – Building 201 at Upper Fort Mason would be rehabilitated for ongoing use the park's headquarters and to incorporate a new museum to showcase the military history of Fort Mason and the 20th century San Francisco Port of Embarkation. Other actions would be similar to those of the no-action alternative in that the Fort Mason Foundation would continue to manage Lower Fort Mason and perform ongoing preservation and rehabilitation work on the contributing resources. The impacts on this landmark would be long term, minor, beneficial, and long term, minor, adverse.

Aquatic Park Historic District NHL – Actions would be the same as in alternative 1 and could result in greater visitation along the waterfront access from Van Ness corridor and Fisherman's Wharf area to Pier 4, along with other potential site and circulation modifications to accommodate transit improvements in the area. New wayfinding and park orientation signs could have direct and indirect effects on the historic landscape of the district. Efforts would be made to minimize the effects on this historic landscape. A cultural landscape report would guide these changes. The potential impact would be long term, minor, adverse. This property is within and managed by San Francisco Maritime National Historical Park.

Fort Mason Historic District – Historic structures, buildings, and cultural landscape resources would be rehabilitated for interpretation of the installation's military and civilian history and for adaptive use. Compared with the no-action alternative, alternative 3 would result in a broader range of visitor uses within the buildings, including expanded overnight accommodations and an orientation/visitor center. Fort Mason would serve as the primary visitor entrance to Golden Gate National Recreation Area in San Francisco. Actions that could affect the historic landscape include circulation and wayfinding changes to improve adjacent transit and ferry connections. Pier 4 would be rehabilitated for use by the Alcatraz Island ferry and would include the installation of interpretive exhibits. Landscape improvements would be consistent with the *Cultural Landscape Report For Fort Mason*. While some actions may adversely impact individual features, taken as a whole—with the incorporation of mitigation measures such as the provision for the preparation of historic structure reports and design guidelines—these actions would have a long-term, minor to moderate, beneficial, and long-term, minor, adverse impact on the historic district.

Fort Miley Military Reservation – Historic buildings and landscape features associated with West Fort Miley would be preserved to showcase the area's military and maritime history. Similar to the no-action and other action alternatives, historic buildings at East Fort Miley would continue to be preserved for use by park maintenance and public safety operations. Significant character-defining features of the cultural landscape would be preserved while accommodating improved vehicle and trail access to East Fort Miley. These changes would be designed to be compatible with the historic setting. Overall, these actions would result in long-term, negligible to minor, beneficial, and long-term, minor, adverse impacts.

Pumping Station #2, SF Fire Department Auxiliary Water Supply System – Same as alternative 1, the historic Alcatraz pier (Pier 4), may be rehabilitated for use by the Alcatraz Island ferry which could result in modifications to the adjacent circulation system and landscape setting, as well as increased visitation along the immediate waterfront area. The historic building would not be directly impacted through these modifications, but these changes could result in a long term, negligible to minor, adverse impact. This property is within Ft. Mason but is owned and operated by the City of San Francisco.

Camera Obscura – Operations and maintenance under this alternative would result in minor beneficial and minor adverse impacts.

Six-inch Gun No. 9 – Operations and maintenance under this alternative would result in minor beneficial and minor adverse impacts.

San Francisco Veterans' Affairs Medical Center – Continued operation of Fort Miley as a park maintenance facility would have negligible impacts on the adjacent Veterans medical center historic district, which is owned and managed by the Department of Veterans' Affairs.

China Beach – Same as alternative 1: some improvements to the existing array of visitor facilities and access would be made to support continued use of this popular site. Impacts would be long term, negligible, beneficial, and long term, minor, adverse.

Marine Exchange Lookout Station (Octagon House) – The building and adjacent landscape would be rehabilitated and adaptively used to engage the public in the natural and human history of the coastal marine environment, which would have a long-term, moderate, beneficial, and long-term, minor, adverse impact.

O'Shaughnessy Seawall – the historic seawall would be preserved and protected. Adjacent amenities such as the promenade, parking area, and restroom facilities that support visitor beach use of the area would be improved. This would have a long-term, negligible to minor, beneficial, and long-term, minor, adverse impacts.

Sutro District – Managed under an existing plan, no impacts to this property are anticipated from alternative 3. This district is managed by the park as a cultural resource but has been determined to not be eligible for the National Register of Historic Places in consultation with the California state historic preservation officer.

San Mateo County

San Francisco Bay Discovery Site National Historic Landmark – Similar to alternative 1, under alternative 3 the site and its associated features would be preserved, enhanced, and interpreted. A hikers hut could be constructed in the vicinity, as part of a system of trail amenities for the Bay Area Ridge Trail. Any new construction and development would be sited and designed away from the actual site so as not to directly affect the historic integrity of this site. Limited vehicular access to the discovery site would be permitted as well. This could result in increased visitation to the site, which would be monitored over time for any changes to the historic setting, landscape, and monuments to ensure long-term preservation. Overall, these changes would result in a long-term, minor, adverse impact.

Point Montara Light Station – Under alternative 3, the park would restore the historic structures and landscape features, remove nonhistoric structures, and develop new visitor programs. Overnight accommodations would continue and provide an immersive visitor experience into the historic life of lighthouse keepers. These changes would result in a long term, moderate, beneficial, and long-term, minor, adverse impact.

Rancho Corral de Tierra – Actions proposed under alternative 3 would be similar to those under alternative 1. If determined eligible for listing in the National Register of Historic Places, contributing historic structures and cultural landscape resources associated with the rural agricultural landscape at Rancho Corral de Tierra in San Mateo County would be preserved in balance with natural resource restoration goals. New visitor amenities, including trailheads and trails, would be compatibly designed to blend in with the historic landscape. The preservation of these resources would have a long-term, minor, beneficial impact; however, the introduction of new elements and natural resource restoration activities could result in long-term, minor, adverse impacts.

Shelldance Nursery – If determined eligible for listing in the National Register of Historic Places, transition from a commercial nursery to an area that provides a variety of visitor services and park operational needs would have a moderate, beneficial, and minor, adverse impact, if carried out according to the *Secretary of the Interior's Standards for Historic Preservation* and if removal of any structures that may be deemed historic is avoided.

Conclusion

Under alternative 3, the park's management strategy for historic buildings, districts, and cultural landscapes would generally be one of preservation, rehabilitation for new and continued uses, and some restoration to enhance the overall historic immersion visitor experience goals of this alternative. In conjunction with the effects from the actions common to all alternatives, alternative 3 would result predominantly in long-term, negligible to moderate, beneficial impacts to historic structures, districts, and landscapes. In some instances, individual projects could result in local, long-term, negligible to minor, adverse effects due to the level or amount of intervention and proposed modifications to a structure or site. Adverse impacts would be minimized by implementing mitigation measures.

With regards to Alcatraz Island National Historic Landmark, although some actions in alternative 3 could result in an adverse effect on some individual features, taken together the actions would not result in an adverse effect on the overall integrity of the national historic landmark. The impacts to historic structures and the cultural landscape would be noticeable and would result in long term, minor to major, beneficial impacts. There could be a long term, negligible impact as a result of increased visitor access to sensitive resources. Taken together, all of these actions would not result in an adverse effect on the overall integrity of the national historic landmark.

Under alternative 3, the Section 106 determination of effect on historic buildings, structures, districts and cultural landscapes in Golden Gate National Recreation Area, excluding Alcatraz Island NHL, would be *adverse effect*. On Alcatraz Island, the Section 106 determination of effect on historic buildings, structures and cultural landscapes would be *adverse effect*.

Because there would be no major, adverse impacts to a resource or value whose conservation is 1) necessary to fulfill specific purposes identified in the establishing legislation or proclamation of Golden Gate National Recreation Area; 2) key to the natural or cultural integrity of the park; or 3) identified as a goal in the park's general management plan or other relevant NPS planning documents, there would be no impairment of the park's historic buildings and structures.

Archeological Resources

No-action Alternative

Analysis

Currently, 10% of Golden Gate National Recreation Area has been surveyed for prehistoric and historic archeological resources. To date, approximately 365

archeological sites have been inventoried, but the significance of those sites requires further study and evaluation. Furthermore, comprehensive consultations with American Indian tribes regarding archeological sites with ethnographic significance in the park will continue into the future. As a result of this need for additional survey work and consultation, archeological resources are subject to potential deterioration, lack of adequate protection in some cases, and possible loss of integrity from natural processes, ongoing agricultural and ranching operations, inadvertent visitor activity, and vandalism.

The Muir Beach Archeological District and the Point Lobos Archeological Sites are currently subject to erosion and possible loss of integrity from natural processes and human activities such as inadvertent damage and vandalism. Thus, this alternative could have a permanent, minor to moderate, adverse impact on these archeological resources. The *King Philip* and *Tennessee* shipwrecks and associated remains are currently subject to deterioration and loss of integrity from natural processes such as ocean surf and human activities such as vandalism; thus this alternative could have a permanent moderate adverse impact on these archeological resources.

On Alcatraz Island, not much is known about any prehistoric and historic archeological resources. A comprehensive professional baseline archeological survey of the island and consultations with American Indian tribes regarding archeological sites with ethnographic significance will continue to be needed. Park staff suspect that Alcatraz Island has potential for buried prehistoric and historic deposits associated with prehistoric, military, prison, and maritime commercial themes. On Alcatraz Island, just as with the rest of Golden Gate National Recreation Area, there is need for additional survey work and consultation; without this, archeological resources are subject to potential deterioration, lack of adequate protection in some cases, and possible loss of integrity from natural processes and human activities. The lack of survey and knowledge and possible loss of integrity from natural processes and human activities, as previously described, could have a permanent, minor to moderate, adverse impact on archeological resources.

Conclusion

Little information is available concerning prehistoric and historic archeological resources in Golden Gate National Recreation Area and on Alcatraz Island. A comprehensive professional archeological survey has been conducted for only approximately 10% of the park's acreage.

Actions under this alternative could have a permanent, minor to moderate, adverse impact on archeological resources associated with the Muir Beach Archeological District and the Point Lobos Archeological Sites, and could have permanent, moderate, adverse impacts on the *King Philip* and *Tennessee* shipwrecks and associated remains.

Alcatraz Island has the potential for a wide range of buried prehistoric and historic deposits associated with its prehistoric, military, prison, and maritime commercial themes. The park staff continues to work in protecting and preserving known archeological resources. The lack of survey and knowledge and possible loss of integrity from natural processes and human activities, as previously described, could result in a permanent, minor to moderate, adverse impact on archeological resources.

Based upon the above analysis, under this alternative the Section 106 determination of effect on archeological resources in Golden Gate National Recreation Area and on Alcatraz Island would be *adverse effect*.

Because there would be no major adverse impacts to a resource or value whose conservation is 1) necessary to fulfill specific purposes identified in the establishing legislation or proclamation of Golden Gate National Recreation Area; 2) key to the natural or cultural integrity of the park; or 3) identified as a goal in the park's general management plan or other relevant NPS planning documents, there would be no impairment of the park's archeological resources or values.

Alternative 1: Connecting People with the Parks

Analysis

Archeological sites continually deteriorate, due primarily to the effects of weather and gravity. Left alone, sites will inevitably degrade over time. However, impacts from human visitation and use contribute to the effects of natural agents of deterioration, and can substantially increase the rate of site deterioration. Archeological resources adjacent to or easily accessible from visitor use areas or trails would continue to be vulnerable to inadvertent damage and vandalism. Inadvertent impacts would include picking up or otherwise displacing pottery sherds and other artifacts, the compaction of cultural deposits, and the creation of social trails (which can lead to erosion and destabilization of the original site architecture). Intentional vandalism includes removing artifacts and probing or digging in sites. Inadvertent damage or vandalism would result in a loss of surface archeological materials, alteration of artifact distribution, and a reduction of contextual evidence. Many such adverse impacts could be mitigated through additional stabilization of the site, the elimination of social trails to disturbed or vulnerable sites, and/or systematically collecting surface artifacts for long-term curation. Continued ranger patrol and emphasis on visitor education regarding the significance and fragility of such resources and how visitors can reduce their impacts to archeological resources, would discourage vandalism and inadvertent impacts and minimize adverse impacts. The actions under this alternative could result in permanent adverse impacts of minor to moderate intensity to archeological resources.

Prior to demolition of any national register listed or national register eligible building or structure, a survey for archeological resources in the general vicinity of the affected structure would be designed and conducted in consultation with the appropriate state historic preservation office. The excavation, recordation, and mapping of any significant cultural remains would be completed prior to demolition, to ensure that important archeological data that otherwise would be lost is recovered and documented. Adverse impacts to affected archeological resources would be permanent and of minor to moderate intensity.

Park staff would continue to work to protect archeological resources from unauthorized removal or other destructive actions. Modification or relocation of existing trails, and construction, development, or improvement of trails, roadways, pull-offs, picnic and camping areas, overlooks, buildings, parking areas, visitor amenities, and interpretive facilities could affect the integrity of some archeological resources, but every effort would be undertaken to avoid known or discovered archeological sites. If such sites could

not be avoided, mitigative procedures would be undertaken in consultation with the California state historic preservation office. Any adverse impacts would be permanent and of minor to moderate intensity.

Additionally, it is estimated that a substantial number of the park's archeological sites could be lost as a result of rising sea levels during the coming years. The National Park Service recognizes that archeological resources help connect visitors with the park and its values. Prehistoric archeological sites on park lands, which provide the last vestiges of sites associated with indigenous peoples in the region, were among the first sites in the park listed in the National Register of Historic Places. Mitigation is currently taking place for historic archeological sites, but to a lesser degree for prehistoric sites. Historic archeological resources may be impacted under this alternative, pursuant to consultation and in compliance with mitigative measures approved by the California state historic preservation office, whereas indigenous prehistoric sites under this alternative would be preserved intact in consultation with American Indian tribes and organizations. Any adverse impacts would be permanent and of minor to moderate intensity.

Under this alternative, the Muir Beach Archeological District would be in the Natural Management zone. Archeological resources would be identified and evaluated, and would be provided stabilization, security, or other protection commensurate with their significance and sensitivity; however, they would generally not be incorporated as visitor education opportunities in the park's interpretive programs. Although some archeological resources in the archeological district could be lost (resulting in permanent adverse impacts of minor intensity), these actions would generally result in beneficial impacts on archeological resources.

Under this alternative, the Point Lobos Archeological Sites would be in the Evolved Cultural Landscape zone. Archeological resources would be identified and stabilized as part of cultural landscape enhancement, and they would be used as visitor education opportunities to interpret human occupation of and interaction with the coastal environment. Although some archeological resources could be lost (resulting in permanent adverse impacts of minor intensity), these actions would generally result in beneficial impacts on archeological resources.

There are no proposed actions under this alternative that would affect the *King Philip* and *Tennessee* shipwreck sites and their associated remains. Thus, the impacts of this alternative on these sites would be the same as those listed in the no-action alternative – permanent, moderate, and adverse.

On Alcatraz Island, within the Diverse Opportunities, Evolved Cultural Landscape, and Historic Immersion zones, the archeological resources would be identified and may be stabilized for incorporation into visitor interpretive opportunities, thus enhancing their protection through increased awareness and understanding. In the Natural and Sensitive management zones, which generally cover the island's perimeter areas, archeological resources would be identified, evaluated, and provided stabilization, security, or other protection commensurate with their significance and sensitivity. Implementing management actions that survey and treat archeological resources would have a beneficial impact. In areas that are managed for natural resources, there could be minor impacts due to erosion and other natural processes. Any adverse impacts would be permanent and of minor to moderate intensity.

Conclusion

Actions under this alternative could result in long-term, beneficial impacts to the archeological resources in the Muir Beach Archeological District and the Point Lobos Archeological Sites and on Alcatraz Island. Permanent moderate, adverse impacts would continue to the *King Philip* and *Tennessee* shipwrecks and associated remains.

Under this alternative, the Section 106 determination of effect on archeological resources in Golden Gate National Recreation Area and on Alcatraz Island would be *no adverse effect*. Impacts to the *King Philip* and *Tennessee* shipwrecks and associated remains are the same as those under the no-action alternative. Therefore, the Section 106 determination of effects on these two archeological sites would be *adverse effect*.

Because there would be no major, adverse impacts to a resource or value whose conservation is 1) necessary to fulfill specific purposes identified in the establishing legislation or proclamation of Golden Gate National Recreation Area; 2) key to the natural or cultural integrity of the park; or 3) identified as a goal in the park's general management plan or other relevant NPS planning documents, there would be no impairment of the park's archeological resources or values.

Alternative 2: Preserving and Enjoying Coastal Ecosystems

Analysis

Actions under this alternative would result in impacts to archeological resources similar to those listed under alternative 1. Park staff would continue to work to protect archeological resources from unauthorized removal or other destructive actions. Coastal ecosystem restoration and rehabilitation of pastoral and rural landscapes could impact the integrity of some archeological resources. Accordingly, this alternative would require a detailed archeological resource stabilization and recovery plan to preserve the integrity of the park's archeological resources. As part of all earth-disturbing activities, every effort would be undertaken to avoid known or discovered archeological sites. If such sites could not be avoided, mitigative procedures would be undertaken in consultation with the California state historic preservation office. Additionally, prehistoric archeological sites, which represent the last vestiges of remnant sites associated with indigenous peoples in the region, would be preserved intact in consultation with American Indian tribes and organizations. Any adverse impacts would be permanent and of minor to moderate intensity.

Archeological resources, including the Muir Beach Archeological District and the Point Lobos Archeological Sites in the Natural and Sensitive Resources management zones, which cover much of the park land in this alternative, would be identified, evaluated, and provided stabilization, security, or other protection commensurate with their significance and sensitivity. However, they would generally not be incorporated as visitor education opportunities in the park's interpretive programs. Archeological resources in the Evolved Cultural Landscape and Historic Immersion zones would be identified and stabilized, as part of cultural landscape enhancement and used as visitor education opportunities to interpret human occupation of and interaction with the coastal environment. Although some archeological resources could be lost (resulting in permanent adverse impacts of minor intensity), these actions would generally result in beneficial impacts on archeological resources.

There are no proposed actions under this alternative that would affect the *King Philip* and *Tennessee* shipwreck sites and their associated remains. Thus, the impacts of this alternative on these sites would be the same as those listed in the no-action alternative—permanent, moderate, and adverse.

In addition to the actions identified in the above analysis, managing archeological resources on Alcatraz would require a detailed archeological resource stabilization and recovery plan. As part of all earth-disturbing activities, every effort would be undertaken to avoid known or discovered archeological sites. In the Evolved Cultural Landscape and Historic Immersion management zones, which form the central historical core of the island in this alternative, archeological resources would be identified and stabilized as part of cultural landscape enhancement and visitor interpretive opportunities. In the Natural and Sensitive Resources management zones, which cover much of the rest of the island in this alternative, archeological resources would be identified, stabilized, or provided protection commensurate with their significance and sensitivity. Although some archeological resources could be lost (resulting in permanent adverse impacts of minor intensity), these actions would generally result in beneficial impacts to archeological resources on Alcatraz Island.

Conclusion

Although actions under this alternative could result in permanent adverse impacts of moderate intensity to some archeological resources, including the *King Philip* and *Tennessee* shipwreck sites and their associated remains, this alternative would generally have beneficial impacts on archeological resources in the park, including the Muir Beach Archeological District, the Point Lobos Archeological Sites, and on Alcatraz Island.

Under this alternative, the Section 106 determination of effect on archeological resources in Golden Gate National Recreation Area and on Alcatraz Island would be *no adverse effect*. Impacts to the *King Philip* and *Tennessee* shipwrecks and associated remains are the same as those under the no-action alternative. Therefore, the Section 106 determination of effects on these two archeological sites would be *adverse effect.*

Because there would be no major, adverse impacts to a resource or value whose conservation is 1) necessary to fulfill specific purposes identified in the establishing legislation or proclamation of Golden Gate National Recreation Area; 2) key to the natural or cultural integrity of the park; or 3) identified as a goal in the park's general management plan or other relevant NPS planning documents, there would be no impairment of the park's archeological resources or values.

Alternative 3: Focusing on National Treasures (NPS Preferred Alternative for Alcatraz Island)

Analysis

Park staff would continue to work to protect archeological resources from unauthorized removal or other destructive actions. Generally, archeological resources under this alternative would be 1) stabilized for interpretation purposes or as part of cultural landscape enhancement, or 2) incorporated into historic immersion opportunities and stabilized and protected to allow public understanding without the threat of damage, removal, or vandalism. Although modification or development of facilities, and the rehabilitation or restoration of resources to immerse visitors in the compelling history and

stories of the park's cultural sites could affect the integrity of some archeological resources, every effort would be undertaken to avoid disturbance of known or discovered archeological sites. If such sites could not be avoided, mitigative procedures would be undertaken in consultation with the California state historic preservation office. Although some archeological sites could be lost (resulting in permanent adverse impacts of minor intensity), actions under this alternative would generally have beneficial impacts on archeological resources.

Archeological resources in the Natural zone, including the Muir Beach Archeological District, would be identified, evaluated, and provided stabilization, security, or other protection commensurate with their significance and sensitivity, but would generally not be incorporated as visitor education opportunities in the park's interpretive programs. Archeological resources in the Evolved Cultural Landscape zone, such as the Point Lobos Archeological Sites, would be identified and stabilized, as part of cultural landscape enhancement and used as visitor education opportunities to interpret human occupation of and interaction with the coastal environment. Although some archeological resources could be lost (resulting in permanent adverse impacts of minor intensity), these actions would generally result in beneficial impacts on archeological resources.

There are no proposed actions under this alternative that would affect the *King Philip* and *Tennessee* shipwreck sites and their associated remains. Thus, the impacts of this alternative on these sites would be the same as those listed in the no-action alternative—permanent, moderate, and adverse.

On Alcatraz Island, alternative 3 is designed to enhance the contributing features of Alcatraz Island National Historic Landmark. The analysis, cataloging, and proactive recovery of archeological resources on Alcatraz Island would be given a high priority. These activities would result in enhancement of the island's cultural resource research and interpretive programs and would contribute to its emerging/growing park collections. Archeological resources in the Evolved Cultural Landscape and Historic Immersion zones, which cover the majority of the island in this alternative, would be identified, protected, or stabilized. They then would be incorporated into historic immersion and visitor education interpretive opportunities or become a part of cultural landscape enhancement. Under this alternative, the preservation and interpretation of key archeological resources, and access to such resources illustrating the island's prehistoric and historic periods and themes, would be given high priority. As part of all earth-disturbing activities, every effort would be undertaken to avoid known or discovered archeological sites. If such sites could not be avoided, mitigative procedures would be undertaken in consultation with the California state historic preservation office. Although some archeological sites could be lost (resulting in permanent adverse impacts of minor intensity), actions under this alternative would generally have beneficial impacts on archeological resources on Alcatraz Island.

Conclusion

Although actions under this alternative could result in permanent adverse impacts of moderate intensity to some archeological resources, including the *King Philip* and *Tennessee* shipwreck sites and their associated remains, this alternative would generally have beneficial impacts on archeological resources in the park, including the Muir Beach Archeological District, the Point Lobos Archeological Sites, and on Alcatraz Island.

Under this alternative, the Section 106 determination of effect on archeological resources in Golden Gate National Recreation Area and on Alcatraz Island would be *no adverse effect*. Impacts to the *King Philip* and *Tennessee* shipwrecks and associated remains are the same as those under the no-action alternative. Therefore, the Section 106 determination of effects on these two archeological sites would be *adverse effect*.

Because there would be no major, adverse impacts to a resource or value whose conservation is 1) necessary to fulfill specific purposes identified in the establishing legislation or proclamation of Golden Gate National Recreation Area; 2) key to the natural or cultural integrity of the park; or 3) identified as a goal in the park's general management plan or other relevant NPS planning documents, there would be no impairment of the park's archeological resources or values.

Ethnographic Resources / Traditional Cultural Properties

No-action Alternative

Analysis

Currently, there are no identified ethnographic resources or traditional cultural properties within Golden Gate National Recreation Area or on Alcatraz Island. However, Alcatraz Island was occupied by "Indians of All Tribes" from November 1969 to June 1971 as an internationally publicized protest to focus attention on the plight of American Indians and to assert the need for Indian unity and solidarity for achieving self-determination and securing political rights. Thus, the occupation increased awareness of the American Indian's political, economic, and social concerns and provided the foundation for what would become a political movement—the American Indian Movement—to promote cultural pride and to secure and protect Indian rights. The occupation resulted in the nation's increased awareness of American Indian concerns and issues and the establishment of D-Q University (a tribal community college that focuses on indigenous peoples) at Davis, California, and other institutions throughout the nation. Tangible evidence of the occupation on Alcatraz Island includes graffiti and physical alterations attributed to the American Indians' activities. Since the occupation, the island has become a symbolic focal point of American Indian pride and solidarity among relocated American Indians in the San Francisco Bay Area, as well as in the nation at large. Thus, the National Park Service, in recognition of the ethnographic significance of Alcatraz Island for American Indians and the island's potential for listing in the National Register of Historic Places as a Traditional Cultural Property, is in consultation with American Indians regarding the identification, preservation, and interpretation of the island's ethnographic resources. This action would have a long-term, negligible to minor, beneficial impact to the resource.

Conclusion

Currently, there are no identified ethnographic resources or traditional cultural properties in Golden Gate National Recreation Area and on Alcatraz Island. However, the National Park Service recognizes the ethnographic significance of Alcatraz Island for American Indians as a result of the island's occupation from 1969 to 1971 and thus its potential for listing in the National Register of Historic Places as a traditional cultural property. This action would have a long-term, negligible to minor, beneficial impact to the resource.

Under this alternative, the Section 106 determination of effect on ethnographic resources / traditional cultural properties for Golden Gate National Recreation Area and Alcatraz Island would be *no adverse effect*.

No impairment of ethnographic resources would result from this alternative.

Alternative 1: Connecting People with the Parks (NPS Preferred Alternative for Park Sites in Marin, San Francisco, and San Mateo Counties)

Analysis

Although Alcatraz Island has ethnographic significance for American Indians, there are no identified or recognized potential ethnographic resources or traditional cultural properties in Golden Gate National Recreation Area. On Alcatraz Island, some archeological sites and features with ethnographic significance and some resources having associations with the occupation of 1969 to 1971 could be lost due to erosion or other natural processes such as weathering, under this alternative. This alternative's emphasis on connecting people with the park's resources and stories would build and expand upon the National Park Service's ongoing consultation efforts with American Indians for the identification, preservation, and interpretation of ethnographic resources on Alcatraz Island. This action would have a long-term, beneficial impact to the resource.

Conclusion

Although Alcatraz Island has ethnographic significance for American Indians, there are no identified or recognized potential ethnographic resources or traditional cultural properties in Golden Gate National Recreation Area. Identification, preservation, and interpretation of ethnographic resources on Alcatraz Island would be enhanced as a result of expanding NPS consultations with American Indians. This action would have a long-term, beneficial impact to the resource.

Under this alternative, the Section 106 determination of effect on ethnographic resources and traditional cultural properties in Golden Gate National Recreation Area and Alcatraz Island would be *no adverse effect*.

No impairment of ethnographic resources would result from this alternative.

Alternative 2: Preserving and Enjoying Coastal Ecosystems

Analysis

Although Alcatraz Island has ethnographic significance for American Indians, there are no identified or recognized potential ethnographic resources or traditional cultural properties in Golden Gate National Recreation Area.

On Alcatraz Island, some archeological sites and features with ethnographic significance and some resources having associations with the occupation of 1969-1971 could be lost due to erosion or other natural processes. A minimum amount of stabilization would be afforded ethnographic resources so that the island's integrity as a potential traditional cultural property would not be compromised. Additionally, this alternative's emphasis on providing visitors with opportunities to engage in Alcatraz Island's isolation, natural resources, and layers of history via ecotourism, outdoor learning, and natural and cultural

resource stewardship programming would build and expand upon the National Park Service's ongoing consultation efforts with American Indians for the identification, preservation, and interpretation of ethnographic resources on Alcatraz Island. This action would have a long-term, beneficial impact to the resource.

Conclusion

Although Alcatraz Island has ethnographic significance for American Indians, there are no identified or recognized potential ethnographic resources or traditional cultural properties in Golden Gate National Recreation Area. Ethnographic significance and some resources having associations with the occupation of 1969–1971 could be lost due to erosion or other natural processes such as weathering under this alternative; a minimum amount of stabilization would be afforded ethnographic resources so that the island's integrity as a potential traditional cultural property would not be compromised. This action would have a long-term, beneficial impact to the resource.

Under this alternative, the Section 106 determination of effect on ethnographic resources/ traditional cultural properties in Golden Gate National Recreation Area and Alcatraz Island would be *no adverse effect*.

No impairment of ethnographic resources would result from this alternative.

Alternative 3: Focusing on National Treasures (NPS Preferred Alternative for Alcatraz Island)

Analysis

Although Alcatraz Island has ethnographic significance for American Indians, there are no identified or recognized potential ethnographic resources or traditional cultural properties in Golden Gate National Recreation Area.

Under this alternative, which is designed to enhance the contributing features of Alcatraz Island National Historic Landmark, analysis and cataloging of ethnographic resources on Alcatraz Island in consultation with American Indian tribes and groups would be given a high priority, thereby enhancing the island's cultural resource research and interpretive programs and contributing to its emerging and growing park collections. The island's potential for listing as a traditional cultural property in the National Register of Historic Places would also be evaluated and studied in consultation with American Indian tribes and groups. This action would have a long-term, beneficial impact to the resource.

Ethnographic resources in the Evolved Cultural Landscape and Historic Immersion zones, which cover the majority of the island in this alternative, would be identified, protected, and stabilized. Ethnographic resources that are not archeological sites could be rehabilitated or restored. They would be incorporated into historic immersion/visitor education interpretive opportunities or become part of cultural landscape enhancement. Under this alternative, preservation and interpretation of, as well as public access to, key ethnographic resources illustrating the island's prehistoric and historic periods and themes would be given high priority. This action would have a long-term, beneficial impact to the resource.

Conclusion

Although Alcatraz Island has ethnographic significance for American Indians, there are no identified or recognized potential ethnographic resources or traditional cultural

properties in Golden Gate National Recreation Area. On Alcatraz Island, analysis and cataloging of ethnographic resources and the evaluation of the island's potential for listing in the National Register of Historic Places as a traditional cultural property in consultation with American Indian tribes and groups would be given higher priority than other areas of Golden Gate National Recreation Area. These actions would enhance the island's cultural resource research and interpretive programs and contribute to its emerging and growing park collections. This action would have a long-term, beneficial impact to the resource.

Under this alternative, the Section 106 determination of effect on ethnographic resources/ traditional cultural properties in Golden Gate National Recreation Area and Alcatraz Island would be *no adverse effect*.

No impairment of ethnographic resources would result from this alternative.

Park Collections

No-action Alternative

Analysis

According to NPS *Management Policies 2006*, the National Park Service will collect, protect, preserve, provide access to, and use objects, specimens, and archival collections to aid understanding among park visitors, and to advance knowledge in the humanities and sciences. Further, collections management facilities need to accommodate the special needs of park collections for long-term preservation and protection by ensuring that they are stored in energy efficient buildings. Director's Order 24: *Park Collections Management Guideline* (September 2008) provides further guidance, standards, and requirements for preserving, protecting, documenting, and providing access to and use of NPS collections.

Golden Gate National Recreation Area's 2009 *Collection Management Report* documented 4,210,233 items in the park collections; these include items from the park's coastal defense fortifications and military installations. Additionally, the park collections include items from Alcatraz Island, such as original FBI evidence from the 1962 Alcatraz escape, as well as original uniforms, other accoutrements, and everyday objects from the island.

The park collections are currently stored in 15 different facilities throughout the park that function as visitor centers, interpretive exhibits, or dedicated storage areas. Of the four largest storage repositories, two are located in buildings owned by the Presidio Trust with no lease agreements in place. This places the park collections in a vulnerable position because of potential eviction and deteriorating structural conditions.

The no-action alternative would continue to make incremental improvements upon existing facilities. Improvements would include consolidating storage from other deficient structures and installing more compact shelving to increase the usable storage footprint threefold. The National Park Service would also formalize the use of Building 667 through an agreement with the Presidio Trust. Another option to be explored under the no action alternative is storing oversized collections in a larger joint storage facility that consolidates collections from all national park sites in the San Francisco Bay area. This proposal is outlined in the *Bay Area Museum Resource Center Plan* (2010).

These measures are intended to improve the long-term preservation of park museum collections; however, there are no formal agreements for long -term use of facilities located on the Presidio (Buildings 002 and 667). An unmet need under this alternative is public space for exhibits and programs that engage visitors in park collection stewardship and preservation activities.

Conclusion

The conditions for park collections would be improved to meet NPS standards for long-term preservation, protection, and use. Thus, continuation of current management of park collections would be expected to have short-term, minor, beneficial impacts on the park collection.

Because there would be no major, adverse impacts to a resource or value whose conservation is 1) necessary to fulfill specific purposes identified in the establishing legislation or proclamation of Golden Gate National Recreation Area; 2) key to the natural or cultural integrity of the park; or 3) identified as a goal in the park's general management plan or other relevant NPS planning documents, there would be no impairment of the park's collections.

Alternative 1: Connecting People with the Parks (NPS Preferred Alternative for Park Sites in Marin, San Francisco, and San Mateo Counties)

Analysis

In addition to the actions proposed for the park collection described under the "Actions Common to All Alternatives" section, in which the collections are consolidated into one or more facilities, alternative 1 would allow for the incorporation of artifacts into the visitor experience on a case-by-case basis at sites that are managed for historic immersion. This action would help visitors to better understand the historic context of a particular site and how park collections are inextricably linked to the park's historic resources. Use of these artifacts would still require respect for NPS standards for the preservation and protection of park collections. The public's awareness of the park collections would be increased and could result in increasing donations and support for "growing" and conserving the collections, thus resulting in overall long-term, beneficial impacts.

Conclusion

Incorporating the park collections in ways that enhance the visitor experience and help expose the values of the collection while still meeting NPS preservation standards would have a long-term, beneficial impact on the value of the collections.

No impairment of park collections would result from this alternative.

Alternative 2: Preserving and Enjoying Coastal Ecosystems

Analysis

In addition to the actions proposed for the park collections described under the "Actions Common to All Alternatives" section, in which the collections are consolidated into one or more facilities, the actions under alternative 2 would increase the ecosystem

management approach of the alternative by generating more specimens for the natural research collection. This action would contribute to the monitoring and studies associated with influence that climate change could have on the park's natural resources. The result of improving the natural resource portion of the park collections could result in improved understanding of park resources and to increased access for researchers and managers to a body of knowledge that is necessary for future management decisions. The actions under alternative 2 would have a long-term, beneficial impact to the park collections.

Conclusion
The increased emphasis of collecting and preserving natural resource specimens would have a long-term, negligible, and beneficial impact to the park collections.

No impairment of park collections would result from this alternative.

Alternative 3: Focusing on National Treasures (NPS Preferred Alternative for Alcatraz Island)

Analysis
In addition to the actions proposed for the park collection described under the "Actions Common to All Alternatives" section in which the collections are consolidated into one or more facilities, the actions under alternative 3 would include treatments of historic buildings and cultural landscape resources that range from upgrades to exhibits and furnishings to more complete restoration. The goal of these actions would be increasing access to and interpretation of some of the park's most significant resources. A larger number of artifacts and archival items would be prominently displayed for visitor education and interpretation under this alternative, thus enhancing the visitor experience, resulting in a beneficial impact. The public's awareness of the park collections would be increased and could result in increasing donations and support for "growing" and conserving the collections, thus resulting in overall long-term, beneficial effects.

Conclusion
Incorporating the park collections in ways that enhance the visitor experience and help expose the values of the collection while still meeting NPS preservation standards would have a long-term, beneficial impact on the value of the collections.

No impairment of park collections would result from this alternative.

VISITOR USE AND EXPERIENCE

No-action Alternative

Analysis

In the no-action alternative, visitors would continue to access a diversity of recreational opportunities in a wide range of settings throughout Golden Gate National Recreation Area. The park's extensive system of hiking, bicycling, and equestrian trails would be available for visitors and residents. Overnight camping and lodging opportunities would continue. Beach recreation, along with wildlife viewing and scenic touring, would also be

important components of the visitor experience. Continuing these visitor opportunities provide for a long-term, moderate, beneficial impact to the visitor experience.

During scoping and in recent visitor surveys, most respondents acknowledged their enjoyment of the park's visitor opportunities and suggested that the variety of activities should be maintained. Some people noted concerns about any further regulation or reduction of recreation opportunities, particularly for mountain bikers, equestrians, and dog owners. There was also interest in additional recreation opportunities, particularly more and different trail connections. There were some concerns expressed about conflicts between recreation activities that share facilities and areas. The park staff would continue to work to improve upon user conflict situations and conditions that currently contribute to long-term, minor, adverse impacts within the park. The park staff would also continue to complete trail improvements identified in the Trails Forever program, focusing on the California Coastal Trail and its connectors between Muir Beach and Mori Point.

A variety of educational and interpretive programs would continue to be offered by the National Park Service and its partners throughout the park. Continuing the current opportunities would have a long-term, minor, beneficial impact. Some of the public has expressed interest in having more interpretive and educational opportunities, including more onsite interpretive materials and programs. In addition, a need has been expressed for increasing outreach to diverse audiences. Access to the park collections and the integration of the collection into interpretive and educational programming and facilities have been identified as needs. This alternative would not provide these opportunities, resulting in a long-term, minor, adverse impact.

Visitor access to the various park sites would continue via multiple modes of auto, transit, bicycle, and pedestrian access. Some park sites are challenging to reach, given limited transit options and parking infrastructure, congested roadways, and conflicts between autos and bicyclists or pedestrians. There has been a significant amount of feedback from the public regarding a desire to explore the expansion and enhancements of alternative modes of access to and between park sites to provide easier access, reduced traffic congestion, and orientation opportunities. In addition, the need for more signs, maps, and orientation information to help visitors explore the park has been mentioned. Visitors have access to most of the sites within Golden Gate National Recreation Area. There are some areas that have restricted access to protect sensitive resources or visitor safety. In addition, some areas are restricted for certain types of activities. The San Mateo County park lands have minimal facilities and services to support visitation, but access is permitted. Overall, continuing the current conditions regarding access would resulted in long-term, minor to moderate, adverse impacts on the visitor experience.

Finally, there are locations within the park where visitor safety is an issue. Use conflicts between multiple modes of transportation are a concern in certain areas. Use conflicts between types of recreation activities can also occur and cause both real and perceived safety problems such as conflicts between bicyclists and equestrians. In addition, the park faces safety concerns that are typical of being in close proximity to a large urban area. The actions previosuly described would have a long-term, minor to moderate adverse impacts on the visitor experience.

On Alcatraz Island, the primary visitor activities of visiting the cellhouse and enjoying the sights and sounds of the island in the middle of the bay would continue in this alternative; a long-term, moderate, beneficial impact. The existing interpretive programs

would also continue to focus primarily on the military history and federal prison-era stories. In addition, visitors would have opportunities for self-guided exploration on only a small portion of the island.

During scoping for the plan, there were some mentions of additional recreation opportunities that were desired including more trail access around the island, more access to a larger number of structures, and overnight opportunities. Further, some visitors have expressed interest in more diverse interpretive programs. Visitors are provided limited opportunities to explore the historic military fortification and citadel that are located under the federal prison. The lack of some of these desired improvements would be a long-term, minor to moderate, adverse impact on those visitors seeking these opportunities.

Alcatraz continues to provide outstanding opportunities for understanding the stories and structures associated with the federal penitentiary period of the island. The audio tour is popular with visitors and gives them an excellent understanding of life on "the Rock." The audio tour has also provided a means to better distribute the flow of visitors and reduce noise associated with large groups visiting the cellhouse. The National Park Service and its partners have also managed the levels of use visiting the island to help control issues associated with crowding and conflicts resulting in a long-term, moderate, beneficial impact. There are isolated occasions and certain locations where crowding and use conflicts do occur resulting in long-term, minor, adverse impacts. In particular, certain locations along the walk to the cellhouse can sometimes become crowded, and there are occasional conflicts between the visitor tram and pedestrians during high-use days.

Alcatraz Island also supports one of the largest concentrations of nesting waterbirds in San Francisco Bay. Visitors have some opportunities to learn about and observe the colonies as part of their visit to the island; a long-term, minor, beneficial impact for visitors interested in understanding the important role the island plays in the ecological system of the bay. However, many areas of the island are currently closed during breeding season to protect the colonies from human disturbance. This results in long-term, minor, adverse impacts to visitors who may want to explore these areas. In addition, the sights and smells associated with large numbers of birds during the nesting season has resulted in some minor, adverse impacts to the visitor experience.

Visitors have access to the island via the NPS concession-run ferry. The ferry ride to the island is one of the highlights of the visitor experience given the views of the island and the city, along with the orientation and interpretive information provided; a long-term, minor, beneficial impact. There are times when tickets are sold out to the island and some visitors are unable to take a trip to the island at their desired date and time resulting in a long-term, moderate, adverse impact on the visitor experience. During scoping for this plan, some members of the public expressed interest in having alternative access opportunities to the island by motorized and nonmotorized boats. This alternative would not explore additional access opportunities causing a long-term, minor, adverse, impact.

Visitor safety at Alcatraz Island is generally good in the no-action alternative, although there are some safety issues associated with the deteriorating condition of historic structures—a long-term, minor, adverse impact.

Conclusion

The no-action alternative for Golden Gate National Recreation Area would result in long-term, minor to moderate, beneficial impacts from continued opportunities to access high-quality resource-dependent visitor opportunities and experience the natural, historic, and scenic qualities of the park. Visitors would have extensive trail, beach, and educational opportunities, which are some of the most valued activities in the park. However, minor to moderate adverse impacts on the visitor experience from traffic congestion, use conflicts, limited facilities in San Mateo County, and restricted access to a few desired locations would continue.

The no-action alternative for Alcatraz Island would result in long-term, minor to moderate, beneficial impacts from continued opportunities to access the cellhouse and the immediate surrounding landscape. In addition, high-quality interpretive and educational programs and materials would continue to be provided. However, minor to moderate adverse impacts on the visitor experience from conflicts with birds, limited access to areas and structures on the island, and some visitor crowding would continue.

Alternative 1: Connecting People with the Parks (NPS Preferred Alternative for Park Sites in Marin, San Francisco, and San Mateo Counties)

Analysis

The emphasis of alternative 1 for Golden Gate National Recreation Area is connecting people with the parks. This alternative would increase the diversity of recreational opportunities offered throughout the park and encourage wider participation by the local and regional population, including those that are not traditional park visitors. The establishment of recreation "portals," or locations from which multiple activities may be staged and initiated, is a primary component of this alternative. These portals would be located in Tennessee Valley, Marin Headlands, Upper Fort Mason, and Rancho Corral de Tierra. The portals would include trailheads and other visitor facilities to better support access to a diversity of recreation opportunities, and help connect visitors with the information and support services they need to plan and enjoy their visit to the park. These efforts to welcome and orient the park visitor would have a long-term, moderate, beneficial impact on the visitor use and experience at the park.

Rehabilitation, expansion, and upgrades to existing facilities, including trails, trailheads, campsites, picnic areas, and parking would better support visitor activities throughout the park, including community based park stewardship programs. In particular, enhancements to the park's trails would be beneficial because the trails are one of the most important aspects of visitor opportunities, and these improvements were highly sought after by the public. New facilities are also proposed in key park locations in this alternative including warming huts; a variety of overnight accommodations, from camping to rustic cabins; stewardship centers; picnic facilities; and trails. Establishing these facilities would result in a long-term, moderate, beneficial effect on visitor opportunities and the facilitation of visitor activities throughout the park lands.

Under alternative 1, existing recreation activities would continue and be better supported through the facilities and access improvements already mentioned. Some activities would

be expanded in this alternative, including educational and stewardship opportunities, and public equestrian programs and trailhead facilities. Equestrian facilities would be retained and improved at Rancho Corral de Tierra to expand public access and related benefits. These activities would allow the park staff to engage a wider audience and better demonstrate the unique and interesting resources found throughout the park. Further, scenic viewing throughout the park would be enhanced at key points through the addition of overlooks, landscape and facility restoration, and improvements for non-automobile access to park sites. These actions would result in long-term, moderate, beneficial, impacts.

Stewardship and volunteer activities would be enhanced in this alternative, resulting in a long-term, moderate, beneficial impact. New stewardship and educational facilities are proposed at several park locations. Efforts for programming and educational materials by park staff and partners would be purposively aimed at engaging a wider audience, as well as enhancing individual understanding of park resources and values.

Public access to park sites, including parking improvements, public transportation connections, and multimodal access would be enhanced as a result of the alternative, resulting in long-term, moderate, beneficial impacts. Improved public transportation opportunities would help connect a larger audience to park sites, offer better connections between sites, and reduce use conflicts. Further, some of the improvements would allow for easier access to busy sites, reducing visitor frustration and improving the quality of park visits.

Visitor safety would benefit by several actions in this alternative resulting in long-term, moderate, beneficial impacts. Implementing roadside improvements to State Route 1 and Panoramic Highway would benefit visitors with better wayfinding, overlooks for safe scenic viewing, and more separation between auto and bicycle use. Other safety improvements could include enhancements to multimodal transportation options to ease use conflicts and road congestion during peak times. Finally, increased ranger presence throughout the park lands, particularly in San Mateo County, would improve response capabilities for park staff. However, the addition of new multiuse trails may cause a small amount of increased conflicts among visitors.

Restrictions on public access in Sensitive Resource zones would result in some long-term, minor, adverse impacts on visitor access and opportunities for recreation, but effective educational programming and information associated with these areas could also improve visitor understanding of these highly sensitive and exceptional resources.

On Alcatraz Island, alternative 1 would offer a wider variety of settings, experiences, and activities for visitors to enjoy. Stewardship activities would be a focus of this alternative to increase visitors' understanding and appreciation of the unique and diverse natural and cultural resources on the island. In addition to telling the stories of the infamous prison history, the National Park Service would offer visitors opportunities to understand other historic periods and the island's natural history, as well as to enjoy a diversity of scenic and recreational experiences on the island, including special events. Increased preservation, interpretation, and reuse of historic buildings would expand the range of activities for visitors and allow them to better understand the lives of people who lived and worked in those buildings, resulting in long-term, moderate, beneficial impacts.

Further, this alternative could increase visitor amenities at key locations including food service at Building 64. This alternative also includes additional strategies in core visitor use areas, such as removal of the rubble piles on the parade grounds to minimize the conflict between visitors and birds, thereby increasing access and improving the experience in these areas. This wider range of activities, settings, and services would likely appeal to a wider audience of participants and would also likely encourage an increase in repeat visitation. Further, this alternative would allow for a greater dispersion of visitors throughout the island, helping to minimize crowding at key sites like the cellhouse. These actions would have a long-term, moderate, beneficial impact on the visitor experience.

Visitor safety would benefit through the preservation of the buildings as well as through increased bird management, resulting in long-term, minor, beneficial impacts. While reduced crowding could increase safety in some areas, allowing visitors to explore more of the island's rugged and natural settings could bring about more incidents.

Conclusion

The actions proposed in alternative 1 for Golden Gate National Recreation Area would result in long-term, moderate, beneficial impacts to the visitor experience. The diversity of recreational opportunities provided, the new and enhanced visitor support facilities, and the purposeful effort to engage a more diverse audience would have a positive and important impact on the visitor experience to the park. Further, the emphasis on improved access, particularly transportation connections, would be a beneficial impact on the visitor experience by reducing traffic congestion and use conflicts.

Alternative 1 would result in long-term, moderate, beneficial impacts to the visitor experience on Alcatraz Island. The enhancements to the park setting through increased preservation of the structures; the increased access to the island's various layers of historic resources and natural settings; and the purposeful effort to increase programming options and connect with a more diverse audience would help create this long-term, moderate, beneficial impact. The number of visitors who could be accommodated on the island may also be slightly increased upon implementation of this alternative given the increased number of opportunities and the ability to better disperse visitors, resulting in a long-term, minor, beneficial impact.

Alternative 2: Preserving and Enjoying Coastal Ecosystems

Analysis

Alternative 2 proposes a visitor experience that is focused on forging individual connections with the park's natural and cultural resources through more natural and challenging visitor opportunities and enhanced stewardship activities. Visitors would still have a diversity of recreation activities available to them, but there would be an emphasis on encouraging more self-reliant and more natural and wild experiences throughout much of the park lands. For those visitors who enjoy solitude, natural quiet, and some challenge during their visit to the park, this alternative would generally result in long-term, minor, and beneficial impacts. In addition, those visitors who enjoy connecting to the park lands via stewardship and educational programs would also benefit from this alternative. However, for those visitors who prefer a wider range of activities and more support

services to facilitate their visit, this alternative would have some long-term, minor, adverse impacts.

Some visitor facility improvements are proposed in this alternative for key locations throughout all three counties. These facilities would improve access to select sites, better connect sites within the park, and facilitate stewardship and education opportunities, resulting in long-term, moderate, beneficial impacts. For example, upper Fort Mason would serve as the primary portal for stewardship and participatory science activities with access to programs throughout the park, allowing these opportunities to be better marketed, coordinated, and facilitated. Alternative 2 also proposes the removal of some facilities. Equestrian facilities at Rancho Corral de Tierra would be removed or relocated further from coastal streams to allow for enhancement or restoration of the stream areas. While removal of facilities could have an adverse impact on the experience for some visitors who have relied on those facilities, it could also be beneficial to others who want to immerse themselves in a more natural environment and participate in opportunities that are more challenging.

Most of the park's current visitor activities would be maintained; however, there may be more regulations and restrictions on access to better protect resources in this alternative. Further, visitor opportunities may be relocated or concentrated to reduce the "footprint" on park lands and create a more sustainable system of recreation facilities. Alternative 2 also recognizes several sensitive resource areas, and accordingly requires limitations on visitor access to those areas. These restrictions and regulations could have a long-term, minor to moderate, adverse impact on some visitors in terms of visitor opportunities, with the greatest effect on local visitors who frequent these areas on a regular basis. Some of the areas with more substantial changes in visitor access and regulations include Slide Ranch, Fort Funston, Rancho Corral de Tierra, and the southern portion of Ocean Beach.

Visitor activities associated with immersion in and exploration of natural and cultural landscapes would be enhanced in this alternative, with plentiful opportunities for those who seek solitude, quiet, and contemplation. Trail connectivity and related improvements would allow a more diverse visitor population to enjoy trail experiences with less conflict and more focus on enjoying the setting. Scenic viewing would be enhanced in this alternative through the removal of some facilities and the addition of new overlooks. Maintaining low levels of development, removing some facilities, and restoring landscapes would provide what many members of the public identified as one of the most highly desired functions of the park: to act as a green retreat from the urban environment of San Francisco. These actions would have a long-term, minor to moderate, beneficial impact for visitors seeking these types of settings and opportunities.

Park staff and park partners would work towards more diverse, frequent, and better coordinated natural and cultural resource stewardship and restoration activities in this alternative. Stewardship programs would allow local residents to better understand and appreciate the natural settings within the park, and deepen participants' commitment to long-term protection of its resources. Further, this alternative would include additional programming and interpretation regarding the park's natural and cultural resources and related stories. These learning opportunities would be enhanced through the extensive trail system that would further highlight the park's diverse ecosystems and rich cultural history, resulting in long-term, moderate, beneficial impacts.

Access to some areas would become more difficult by personal vehicle and may generally be more regulated; however, associated public transportation services and non-vehicular access options would be improved. Improved public transportation opportunities would help connect a larger audience to park sites, better connect visits between sites, and reduce use conflicts. Further, some of the improvements would allow for easier access to busy sites, reducing visitor frustration and improving the quality of park visits. These actions contribute to a long-term, moderate, beneficial impact. In alternative 2, if a slide impacts State Route 1 near Slide Ranch in Marin County, the National Park Service could encourage Caltrans to stabilize and abandon this section of road. This action could inconvenience local residents and park visitors traveling along this route and would result in a long-term, moderate, adverse impact.

Visitor safety would increase due to several actions in this alternative, resulting in long-term, moderate beneficial impacts. If successful in promoting access improvements to State Route 1 and Panoramic Highway, visitors would benefit from better wayfinding, safer overlooks for scenic viewing, and better separation between auto and bicycle use. Other safety improvements include enhancements to multimodal transportation options to ease use conflicts and road congestion during peak times. Finally, increased ranger presence throughout the park lands, particularly in San Mateo County, would improve response capabilities for park staff.

On Alcatraz Island, alternative 2 would highlight the concept of isolation on the island, which is a recurrent theme in the island's cultural and natural history. Visitors would have opportunities to experience first-hand the island's isolation, natural systems, and layers of history. Ecotourism, outdoor learning, and natural and cultural resource stewardship programs would be the focus of this alternative, deepening the visitor's understanding of these topics as they relate to the island. This would benefit those visitors with interest in these topics and would encourage all visitors to take away more than just the federal penitentiary story. The diversity of activities available on the island would be increased given the additional emphasis on increasing visitors' understanding of the natural resources on the island. This would include programming, stewardship, and related overnight opportunities that would be new options for visitors to the island. There would also be increased opportunities for wildlife and scenic viewing, and hiking around the perimeter of the island. Expanding the visitor opportunities could have a long-term, moderate, beneficial impact to the visitor experience.

It is likely these actions would appeal to a different audience than those who primarily visit the island for its historic resources. However, the emphasis on promoting the natural values of the island would also potentially increase the conflict between visitors and birds in core visitor use areas, resulting in a long-term, moderate, adverse impact on the visitor experience during the nesting season. Further, there has been public interest in accessing many of the closed buildings on the island; this alternative would increase visitor access to some while continuing to limit access to others. This would result in a long-term, minor, adverse impact.

This alternative proposes additional visitor access restrictions in the waters surrounding the island to protect coastal resources and seabird colonies. These regulations would have an adverse impact on some visitors who enjoy navigating the waters in this area (via private boats and harbor tours), and enjoy the views of the island from close-up, resulting in a long-term, minor, adverse impact to water-based recreation.

Preservation of the buildings and spaces where visitors would be allowed would result in greater levels of visitor safety. There may be additional conflicts associated with visitors and birds, but it is unlikely that these conflicts would result in any significant concerns related to visitors' health and safety.

Conclusion

The actions proposed in alternative 2 for Golden Gate National Recreation Area would result in long-term, minor to moderate, beneficial impacts to the visitor experience. The visitor experience would be improved regarding the depth and content of educational programming, interpretation, and resource stewardship; along with the preservation and promotion of visitor activities focused on immersion in the natural and cultural settings unique to the park. Visitors would gain a better understanding of park resources and values. However, the regulation and restrictions on some visitor activities and access to some areas might not encourage as much connection to the diverse local and regional population, and may have a long-term, moderate, adverse impact on repeat visitors who have a long-standing attachment to certain locations or activities that may be regulated or restricted.

On Alcatraz Island, alternative 2 would result in long-term, minor to moderate, beneficial impacts to the visitor experience given the actions that would increase understanding and appreciation of the island's important role in the marine ecosystem and related activities and programming. However, there would be long-term, moderate, adverse impacts to the visitor experience in this alternative due to the increased interaction and related conflicts between visitors and birds during the nesting season, and the restricted access to desired locations and structures on the island.

Alternative 3: Focusing on National Treasures (NPS Preferred Alternative for Alcatraz Island)

Alternative 3 proposes a visitor experience that is focused on the nationally significant sites and resources found throughout the park. Visitors would have a diversity of recreational and educational opportunities centered on the park's iconic sights, structures, and stories. There would be many opportunities for first-hand learning. Visitors would have the opportunity to immerse themselves in a historic setting, and participate in stewardship activities at key sites. The natural and cultural resources would be preserved to their highest level of quality, providing the best opportunity for visitors to understand and forge a connection with the resources and values of the park, as well as the larger national park system. Because the large expanse of undeveloped open space is one of the park's fundamental resources and values, the park would still provide many opportunities for those visitors who enjoy solitude, natural quiet, and some challenge during their visit.

Much of the visitor facility improvements in this alternative focus on rehabilitation of and upgrades to existing facilities that would support visitor understanding and access to key sites throughout the park. In Marin County, one of the most substantial differences in this alternative occurs in the area within and around Forts Barry and Cronkhite where the structures and landscapes would be restored to showcase the stories of military history and the transition from Army post to national park. To facilitate visitors' visits and understanding of this part of the park, a new visitor center would replace the housing

infrastructure at the Capehart housing area. In addition, trails and roads in the area would be managed to connect visitors to the important historic and natural resource stories.

In San Francisco County, facility improvements include dedication of more structures at Fort Mason to visitor services; the area would serve as the primary visitor entrance to the park with improved orientation and educational services. In San Mateo County, the National Park Service would work in cooperation with surrounding cities, the county, and Caltrans to encourage a more unifying character to the State Route 1 road corridor, along with a coordinated approach to visitor access and services. This would include transitioning the Shelldance Nursery facilities to visitor support facilities, with improved access to State Route 1, providing a convenient and accessible location for coordinated information services at the entrance to San Mateo County. Further, facility improvements would include the identification and development of recreation portals with trailheads and other visitor support services in Rancho Corral de Tierra, which would better support access to a diversity of recreation opportunities, and help connect visitors with the information and services they need for a visit to this area of the park. These actions would expand visitor opportunities and access to park resources and therefore contribute to a long-term, minor to moderate, beneficial impact to the park visitor.

Most of the existing recreation activities within the park would continue and be better supported through the facilities and access improvements already mentioned. Activities that would be expanded in this alternative include educational and stewardship opportunities at key park sites. These activities would allow the park staff to engage a wider audience and better demonstrate the park's fundamental resources and values, particularly its coastal military defense structures and stories. Connected and improved trails are also proposed in this alternative, along with more multiuse trails. The expansion and enhancement of the park's already extensive trail system would allow for greater opportunities to explore the park. Given the importance of trail opportunities to the public, these improvements would result in a long-term, moderate, beneficial impact. In addition, this alternative provides for an increase in the diversity of overnight opportunities, including primitive camping. These actions would increase the diversity of recreational opportunities and were supported by the public during scoping for this plan. Additional public equestrian programs and expanded equestrian trailhead facilities are proposed in San Mateo County, allowing equestrian uses to expand in the park, which was encouraged by some members of the public. These actions would result in long-term, moderate, beneficial impacts.

Alternative 3 designates a few sensitive resource areas, and accordingly requires limitations on visitor access to those areas. In addition, this alternative proposes changes in the access and regulations for some key visitor use sites including Slide Ranch, Fort Funston, and the southern portion of Ocean Beach. These restrictions and regulations could have long-term, moderate, adverse, impacts on some visitors in terms of visitor opportunities, with the greatest effect on visitors who frequent these areas on a regular basis.

As already noted, this alternative includes proposals for enhanced understanding and exposure to the park's most important resources and stories. In particular, the military history and coastal fortifications at several sites along the coast and bay would be highlighted using the latest technological and multimedia advances and associated programming, giving visitors a deeper understanding of these nationally significant

structures. Stewardship centers located in the park would enhance community pride and commitment in the park, and serve as places to teach the next generation of park stewards, resulting in long-term, moderate, beneficial impacts.

Access and orientation to the park would generally be improved, resulting in a long-term, moderate, beneficial impact. In particular, there would be an increased focus on linking key park sites via multiple modes of transportation, which would help connect a larger audience to park sites, better connect visits between sites, and reduce use conflicts. Trail improvements and connections would be a primary element of this alternative. Trail access improvements allow visitors more convenient and safe access to and between areas within the park as well as surrounding communities and other public lands. Further, this alternative proposes visitor hubs or portals, which would provide centralized orientation and services, improving visitors' ability to access sites throughout the park.

Visitor safety would be better due to several actions in this alternative. If successful in promoting access improvements to State Route 1 and Panoramic Highway, visitors would benefit from better wayfinding, safer overlooks for scenic viewing, and more separation between auto and bicycle use. Other safety improvements include enhancements to multimodal transportation options to ease use conflicts and road congestion during peak times. Finally, increased ranger presence throughout the park, particularly in San Mateo County, would improve response capabilities for park staff. However, the addition of new multiuse trails may cause a small amount of increased conflicts for some visitors. Overall, these safety changes, including access improvements, would provide a long-term, minor, beneficial impact.

Alternative 3 is the NPS preferred alternative for managing the resources and visitors on Alcatraz Island. This alternative would immerse visitors extensively in all of the island's historic periods, providing the best opportunity for visitors to understand and forge a connection with the resources and values of the island. The visitor's immersion in the history of Alcatraz Island could be extended to the historic embarkation site at Fort Mason's Pier 4. Visitors would have access to restored portions of historic structures that would better tell the story of the various aspects of life on "the Rock." Other special events, classes, and stewardship opportunities focused around the resources and stories of the island's period of significance would also increase the diversity of opportunities available to visitors. Visitors to Alcatraz Island already highly value the interpretive and educational programming of the island's historic resources, and this alternative would expand those opportunities to include more immersive experiences, a setting that is more reflective of the period of significance, and more direct access to the island's historic structures; this would result in a long-term, moderate, beneficial impact. This increase in options would likely appeal to a wider audience of participants and would also likely encourage an increase in repeat visitation.

This alternative proposes additional visitor access restrictions in the waters surrounding the island to replicate the historic no-trespass zone as well as to protect coastal resources and seabird colonies. These regulations would have an adverse impact on some visitors who enjoy navigating the waters in this area (via private boats and harbor tours), and enjoying the close-up views of the island from the water, resulting in long-term, minor, adverse impacts to water-based recreation.

Visitor understanding, education, and interpretation would be greatly enhanced in this alternative, given the higher level of preservation of the buildings, increased access to the

structures and surrounding landscapes, and more diverse programming options. In addition, stewardship activities would provide increased visitors understanding and appreciation of the island's natural and cultural resources. Visitor safety would benefit through the preservation of the buildings as well as through increased bird management.

Conclusion

The actions proposed in alternative 3 for Golden Gate National Recreation Area would result in long-term, moderate, beneficial impacts to the visitor experience. The most significant beneficial effect of this alternative would be the increased opportunities for visitors to understand, appreciate, and take part in the preservation of the park's most fundamental resources and values. In addition, this alternative would improve access and connectivity to and between key sites in the park, facilitate the visitor experience, and reduce use conflicts and visitor frustration. However, this alternative would change visitor opportunities at a few existing use areas, leading to long-term, minor to moderate, adverse impacts on visitors who currently frequent these locations for various recreation activities.

Alternative 3 is the NPS preferred alternative for managing Alcatraz Island and would result in long-term, moderate to major, beneficial impacts to the visitor experience. This is primarily due to the opportunities to immerse oneself in the historic periods of Alcatraz Island, have access to more of the island's settings and buildings in improved condition, and to participate in stewardship and education activities supported by expanded overnight programs and facilities. The island's history, particularly as related to the military and the federal penitentiary, is of primary interest to most visitors to the island. This alternative would bring the experience alive, illustrating more aspects of life on "the Rock" for a greater diversity of visitors. The number of visitors who could be accommodated on the island may also be slightly increased upon implementation of this alternative given the increased number of opportunities and the ability to better disperse visitors; this would result in long-term, minor to moderate, beneficial impacts on visitor use and experience.

SOCIAL AND ECONOMIC ENVIRONMENT

Introduction

The analysis of impacts to the social and economic environment of the gateway communities and overall Bay Area that surrounds Golden Gate National Recreation Area and Muir Woods National Monument is based on topic research and professional judgment of planners who have experience with similar plans. To help identify the impacts of the various alternatives, the social and economic environment is described by three primary contributing factors: quality of life, population demographics, and local economy. These three factors reflect the three main areas of discussion in the Social and Economic Affected Environment section. The impact analyses in this section primarily focus on the quality of life and local economy topics because the park management actions in the various alternatives may affect these attributes of the social and economic environment. Also, in terms of geographic scope, the impact analyses in this section primarily focus on the social and economic conditions of the local gateway communities

around the park and monument and the three adjacent counties of Marin, San Francisco, and San Mateo because this is where the majority of impacts would be noticeable.

In the discussion of impacts to the social and economic environment, an analysis section and conclusion section are included for each alternative for Golden Gate National Recreation Area, including Alcatraz Island. The impacts from actions associated with the Muir Woods National Monument are discussed later in this part.

No-action Alternative

Analysis

By continuing to provide and potentially expanding open space preservation, outdoor recreation opportunities, natural and cultural resource preservation, interpretation, education, and stewardship opportunities the park would continue to strengthen its contribution to the Bay Area's high quality of life. As detailed in the Social and Economic Affected Environment section, public access to parklands is integral in sustaining a high quality of life in a highly urbanized region such as the Bay Area. The Golden Gate National Recreation Area's location at an urban-wildland interface make it particularly important for physiological health (i.e., from exercise), psychological health, community-building, community identity, and landscape aesthetics (e.g., open space backdrop to a densely populated urban area). Under the no-action alternative, the National Park Service would continue working cooperatively with other neighboring local governments and land managers to further enhance the area's quality of life by preserving a vast network of open lands in the Bay Area. In addition, with a few exceptions, existing education and stewardship opportunities for the residents would be maintained at the park, and possibly improved as financial and staffing resources become available. As other private land continues to be developed and urbanized into the future, Golden Gate National Recreation Area will become exponentially more valuable to the community and the quality of life of the residents. Its preservation would result in an impact that is long-term, moderate, and beneficial in the context of the local gateway communities and three adjacent counties.

In a general sense, the park's overall intrinsic contribution to the local economy of the gateway counties and the Bay Area would be maintained and/or enhanced by the no-action alternative. By continuing to provide open space preservation, numerous recreation opportunities, facilities, and park settings for organized group activities, the park would continue to help make the Bay Area a place for companies and talented professionals to call home. In other words, the Bay Area's quality of life becomes a draw for business and economic growth with help from places like Golden Gate National Recreation Area. The no-action alternative will sustain and enhance this economic value to the Bay Area. The economic growth and success of Silicon Valley is a prime example of how economic growth relates to a quality business location and natural landscape backdrop. This results in an impact that would be long term, moderate, and beneficial in the context of the local gateway communities and three adjacent counties.

In terms of direct effects on the local economy, the no-action alternative would generally maintain the current levels of NPS jobs; concession operations; NPS operations spending and contract work; and park partner activities. There would be occasional site-specific or program-specific improvements. The value of these attributes to the local economy is

discussed in the "Social and Economic Environment" section of Part 8. The overall value of the park's contribution to the local economy would continue to have significant positive effects on the local economy in the gateway communities and three adjacent counties. In addition, Alcatraz Island remains a major attraction that directly contributes to the tourism industry through increased length of stay in local accommodations, business opportunities related to the Alcatraz Island theme, bay tours, and other guided commercial opportunities. These commercial activities contribute to sustaining employment within the tourism industry. The continuation of the current management direction would have a long term, minor to moderate beneficial impact on the gateway communities and adjacent three counties.

Conclusion

The overall impact to the social and economic environment from the no-action alternative could be long term, minor to moderate, and beneficial for the local gateway communities and the three adjacent counties. The beneficial impacts would result from maintaining the park's contribution to the local economy and quality of life, existing education and stewardship programs, as well as maintaining existing relationships with other local governments and land managers.

Alternative 1: Connecting People with the Parks (NPS Preferred Alternative for Park Sites in Marin, San Francisco, and San Mateo Counties)

Analysis

Alternative 1 would maintain the inherent quality of life and economic values of Golden Gate National Recreation Area, as noted in the analysis for the no-action alternative. It would continue to provide open space preservation, outdoor recreation opportunities, natural and cultural resource preservation, as well as education and stewardship opportunities. The park's location at an urban-wildland interface make it particularly important for physiological health, psychological health, community-building, community identity, and landscape aesthetics, which all contribute to quality of life in a highly urbanized region. This value will only increase as more private land in the region develops in the future. As in the no-action alternative, its continued preservation would result in an impact to quality of life that is long term, moderate, and beneficial in the context of the local gateway communities and three adjacent counties. Also, alternative 1 would maintain the park's overall intrinsic contribution to the local economy, as mentioned in the no-action alternative analysis. Given its significant contribution to quality of life at the urban-wildland interface of a large urban area, the park would continue to help attract businesses and talented professionals to the Bay Area. This results in an impact that would be long term, moderate, and beneficial in the context of the local gateway communities and three adjacent counties.

In addition to continuing these attributes of the no-action alternative, alternative 1 would guide park staff to make stronger efforts at reaching out to the diverse populations of the Bay Area and welcoming them to Golden Gate National Recreation Area. Actions would include community outreach programs, adding group facilities, new park programs, and establishing new welcome/orientation facilities in key locations in the park. These outreach and welcoming efforts would include collaborative community building and

would help foster a new relationship with Bay Area residents. A community that develops a strong relationship with its parks can contribute to quality of life of its residents. Under alternative 1, new and/or improved welcoming and orientation centers, some in collaboration with local communities, would be provided at multiple locations. New and varied interpretive, educational, and stewardship programs would evolve to better connect diverse communities with the park's resources. These facility and program enhancements under alternative 1 would provide new opportunities for many school groups and residents throughout the Bay Area. Under alternative 1, the National Park Service would also work closely with local communities to improve accessibility to the park sites by improving the public transit network and connecting the park and communities with numerous trails. Collectively, these actions would contribute to the quality of life for Bay Area residents. This could result in an impact that is long term, minor to moderate, and beneficial to the local gateway communities and three adjacent counties.

Alternative 1 would support the continuation of existing equestrian facilities in the park. Some minor expansions may also take place at the facility in Tennessee Valley, while the existing equestrian facilities at Picardo Ranch and Rancho Corral de Tierra in San Mateo County will be maintained and enhanced with more programming under alternative 1. These facilities are important recreational assets to many members of the surrounding communities and contribute to the quality of life of these residents. Sustaining and/or expanding these equestrian facilities could yield impacts that are long term, minor to moderate and beneficial for the local gateway communities and the three adjacent counties.

Alternative 1 includes a variety of actions that would help foster or improve relationships between the National Park Service and local communities, park partners, and other adjacent land management agencies. These actions would include community outreach and education programs that help introduce the community to the national park system. Alternative 1 places an emphasis on preserving and enhancing opportunities for local community residents to experience nature, learn local history, and enjoy open lands with other community residents. By providing opportunities and a venue for community interaction, this would enhance the quality of life for residents of the gateway counties. This alternative would also emphasize building community connections by collaborating with local governments, park partners, and other local land managers via multi-agency projects. Community-building efforts such as these could result in impacts that are long term, moderate, and beneficial for local gateway communities. Impacts to the three adjacent counties could be long term, minor to moderate, and beneficial.

A key component of alternative 1 is providing new and upgraded visitor facilities that would complement the park staff's efforts at welcoming and orienting people to the park. Given this priority, alternative 1 would include many new and expanded facilities throughout the park in all three gateway counties. The projects would include the construction, relocation, redevelopment, and/or restoration of visitor centers, historic structures, restrooms, showers, picnic areas, parking lots, warming huts, interpretive exhibits, roadway viewpoints, campsites, trailheads, and other modest overnight accommodations. Alcatraz Island would also have numerous historic structure restoration projects. Many of these projects would generate new work for local and regional companies in the Bay Area, including engineering consultants, construction contractors,

and environmental consultants. These projects would not only support these businesses and their employees directly, but the economic multiplier effect would circulate this contract money through the local economy. The collective result of these actions would be an economic contribution that is short term, minor to moderate, and beneficial for local gateway communities and three adjacent counties.

In addition to the economic contributions as described in the no-action alternative, Alternative 1 would also create new and expanded economic opportunities for some park partners and local organizations by providing expanded visitor programs, amenities, and facilities that could help grow these organizations and partners. This could empower or leverage partners to provide more educational, stewardship programming, and visitor service opportunities. These types of collaborations with park partners and other local agencies would result in an economic impact that is long term, minor to moderate, and beneficial for local gateway communities and the three adjacent counties.

Lastly, to meet the "Connecting People with the Parks" objective of alternative 1, several park facilities and amenities would be upgraded to provide more guest services to better-accommodate the visitors (e.g., visitor orientation, food services, meeting/program space, rustic cabins, hostels, camping, and special event or conference hosting). These new or expanded services could generate additional employment for park partners, concessions, and local businesses. In addition, the local economy would benefit from the various equestrian facilities being retained under alternative 1, as the equestrian facilities generate jobs and other local business. The visitor service improvements, and associated jobs, under alternative 1 would occur at several sites throughout all three gateway counties. The creation of jobs is important for economic growth, as it provides sustained direct and secondary spending (i.e., economic multiplier effect) in local spending in the community. Thus, these proposed visitor services in alternative 1 would have an impact that is long term, minor, and beneficial in the context of the local gateway communities and three adjacent counties.

Conclusion

The short-term and long-term beneficial impacts of alternative 1 on the social and economic environment of the local gateway communities and the three adjacent counties could range from minor to moderate. These beneficial impacts to quality of life and local economy could result from

- a significant increase in public outreach programs, visitor orientation, and educational or stewardship opportunities;
- significant improvements in public accessibility, transportation options, and community trail connections;
- sustaining and/or enhancing the existing equestrian facilities;
- incorporating several community-building components;
- economic growth via many new engineering and construction contract work for numerous facility improvement projects throughout the three gateway counties;
- several new opportunities for park partners to use park facilities and expand their operations; and
- a substantial amount of job creation from the proposed increase in visitor services throughout the park.

Alternative 2: Preserving and Enjoying Coastal Ecosystems

Analysis

Alternative 2 would maintain the inherent quality of life and economic values of Golden Gate National Recreation Area, as noted in the analysis for the no-action alternative. It would continue to provide open space preservation, outdoor recreation opportunities, natural and cultural resource preservation, as well as education and stewardship opportunities. The park's location at an urban-wildland interface make it particularly important for physiological health, psychological health, community-building, community identity, and landscape aesthetics, which all contribute to quality of life in a highly urbanized region. This value will only increase as more private land in the region develops in the future. As in the no-action alternative, its continued preservation would result in an impact to quality of life that is long term, moderate, and beneficial in the context of the local gateway communities and three adjacent counties. Also, alternative 2 would maintain the park's overall intrinsic contribution to the local economy, as mentioned in the no-action alternative analysis. Given its significant contribution to quality of life at the urban-wildland interface of a large urban area, the park would continue to help attract businesses and talented professionals to the Bay Area. This results in an impact that would be long term, moderate, and beneficial in the context of the local gateway communities and three adjacent counties.

In addition to continuing these attributes of the no-action alternative, alternative 2 would emphasize a new priority of "preserving and enjoying coastal ecosystems." The park's goals would focus on educating the public on the importance of the natural resources throughout the Bay Area coastal environment and the importance of being good stewards to these unique resources. Under alternative 2, the National Park Service would increase educational and stewardship opportunities for local residents and school groups in the three gateway counties by improving facilities and enhancing education and stewardship programs at several park sites throughout the region. Raising the level of community awareness of ecological issues and active stewardship can improve the quality of life for local residents by getting them more concerned and "invested" in the park and its unique resources, which could yield a stronger sense of community value and healthy living. In turn, the open lands and unique resources would stand a better chance at being preserved into the future if the community residents become more aware and active in stewardship. In other words, by helping to preserve the resources, the residents are, in effect, also helping to preserve the qualities that make living in the Bay Area wonderful (because much of the quality of life relies on open, preserved lands and resources). Alternative 2 would also enhance community connectivity by guiding the National Park Service to work with local communities and land managers to pursue improved trail accessibility and public transit to some park sites. Providing more access opportunities would allow local residents to access more park programs and amenities, as well as open areas for exercise and community gathering. Collectively, these actions would contribute to the quality of life for area residents, resulting in long-term, minor to moderate, and beneficial impacts for the local gateway communities and the three adjacent counties.

However, under alternative 2, converting Montara Lighthouse from a hostel to a facility dedicated to education and stewardship would have a long-term, minor, adverse impact to the hostel facility operation and its users. While the equestrian facilities in Marin County would be more or less maintained in their current state, the four equestrian facilities at

Rancho Corral de Tierra in San Mateo County could be removed and/or relocated in an effort to protect resources near the streams. Similarly, the environmental and farm education centers at Slide Ranch would be relocated to a more sustainable and geologically stable area. Although the education programs would be continued in the new location, the value of the facility to local residents and school children may be negatively affected due to the location change, especially if relocated away from the Pacific Ocean. These facilities are important assets to many members of the surrounding communities and contribute to their quality of life. Therefore, if these opportunities are removed, a long-term, minor to moderate, and adverse impact could result in the context of the local gateway communities and three adjacent counties.

Alternative 2 includes several actions that would help the National Park Service develop relationships with local communities and local land management agencies of the Bay Area. Many of these actions are focused on cooperating with other land managers to jointly solve and address long-term natural resource issues. Other actions are aimed at creating relationships with gateway county communities to establish a network of natural resource stewardship programs in the park. Thus, these actions are in line with dual emphasis in alternative 2 of protecting ecological resources and educating the community on these resources (and how to be good stewards). In addition, when a diverse population of residents and agencies work together toward a common goal, such as climate change awareness, coastal preservation, or land stewardship, an evolving sense of environmental ethic and community livability develops. This further contributes to the community's quality of life. Actions like these can result in impacts that are long term, moderate, and beneficial for local gateway communities. Impacts to the three adjacent counties could be long term, minor to moderate, and beneficial.

Under alternative 2, several natural resources restoration projects would contribute to the local economy in the three gateway counties, and possibly beyond. The projects would include restoration of habitats, stream corridors, marine ecosystems, and removal of invasive species over large areas of the park. In addition, alternative 2 would improve some park facilities and infrastructure in order to continue these visitor services while working to minimize impacts on the natural resources of the park. Many of these projects would generate new work for local and regional companies in the Bay Area, including engineering consultants, construction contractors, and environmental consultants. These projects would not only support these businesses and their employees directly, but the economic multiplier effect would circulate this contract money through the local economy. These actions could result in impacts that are short term, minor, and beneficial for local gateway communities and three adjacent counties.

Alternative 2 would have some beneficial impacts on the park partners and other community organizations in the area. The most notable new impacts on park partners under alternative 2 would be at Alcatraz Island and in the City and County of San Francisco. Such collaborations between the park and partners would increase opportunities for the partners to grow their programs and organizations. This would also strengthen working relationships with the communities and raise community awareness of climate change and coastal preservation. These actions could result in impacts that are long term, minor, and beneficial for local gateway communities and three adjacent counties.

However, the removal of the facilities at Slide Ranch would have negative economic effects on the park partner that currently manages Slide Ranch. Also, alternative 2 would include the removal of work force housing units at Capehart housing area in Marin County to allow for ecological restoration. This would affect park partners who utilize these facilities. These two impacts to the local economy would be long term, minor and adverse in the context of the local gateway communities. Impacts to the three adjacent counties would be negligible.

Alternative 2 includes a proposal that, in event of catastrophic coastal landslide on U.S. State Route 1 (south of Stinson Beach) in Marin County, the National Park Service would recommend to Caltrans that it abandon this segment of road. However, because the highway is not under the jurisdiction of the National Park Service, the decision and environmental analysis regarding any State Route 1 reroute or segment closure would be administered by Caltrans. If this would occur, the closure of this segment of State Route 1 would alter the transportation system for local communities (and regionally, for Caltrans), which would be inconvenient to local residents. This closure could have an impact that is long term, moderate, and adverse to the local gateway communities. Impacts to the three adjacent counties could be long term, minor, and adverse.

On Alcatraz Island, alternative 2 would include visitor orientation, some food services, office/classroom space, day use programming facilities, and hostel accommodations for visitors and volunteer stewards. These new and expanded services could generate additional jobs for NPS employees and/or private concessioners and result in long-term, minor, beneficial impacts to the local gateway communities and negligible impacts to the three adjacent counties.

Overall, this alternative does not appreciably add new levels of visitor services and facilities, and emphasizes a more primitive visitor experience. These actions would result in negligible increase in park-related employment opportunities. Therefore, alternative 2 could have a minimal added contribution to the local economy resulting in long-term, minor, beneficial impact to the gateway communities and negligible impacts to the three counties adjacent counties.

Conclusion

In summary, the short-term and long-term beneficial impacts of alternative 2 on the local gateway communities and the three adjacent counties would range from minor to moderate. Collectively, the beneficial impacts to quality of life and local economy could result from

- some site-specific increase in public outreach programs and visitor orientation,
- a significant increase in educational and stewardship opportunities,
- some additional community trail connections,
- National Park Service collaborations with several other community governments and land management agencies,
- some new engineering and construction contract work for several restoration projects throughout the three gateway counties,
- a limited number of new park partner opportunities, and

- a limited amount of job creation from the proposed increase in visitor services throughout the park.

The long-term adverse impacts to the social and economic conditions of the local gateway communities and three adjacent counties could range from minor to moderate. The adverse impacts from alternative 2 could result from 1) a possible reduction in NPS and concession jobs at certain park sites due to area closures and some facility removal, 2) a possible reduction in opportunities for a limited number of park partners, 3) the recommended closure of a segment of State Route 1 (though Caltrans has jurisdiction and decision authority), and 4) removing or relocating equestrian facilities (at Rancho Corral de Tierra) and an environmental and farm education facility (at Slide Ranch).

Alternative 3: Focusing on National Treasures (NPS Preferred Alternative for Alcatraz Island)

Analysis

Alternative 3 would maintain the inherent quality of life and economic values of Golden Gate National Recreation Area, as noted in the analysis for the no-action alternative. It would continue to provide open space preservation, outdoor recreation opportunities, natural and cultural resource preservation, as well as education and stewardship opportunities. The park's location at an urban-wildland interface make it particularly important for physiological health, psychological health, community-building, community identity, and landscape aesthetics, which all contribute to quality of life in a highly urbanized region. This value will only increase as more private land in the region develops in the future. As in the no-action alternative, its continued preservation would result in an impact to quality of life that is long term, moderate, and beneficial in the context of the local gateway communities and three adjacent counties. Also, alternative 3 would maintain the park's overall intrinsic contribution to the local economy, as mentioned in the no-action alternative analysis. Given its significant contribution to quality of life at the urban-wildland interface of a large urban area, the park would continue to help attract businesses and talented professionals to the Bay Area. This results in an impact that would be long term, moderate, and beneficial in the context of the local gateway communities and three adjacent counties.

In addition to continuing these attributes of the no-action alternative, alternative 3 would guide the expansion and/or enhancement of several park site facilities and services in a way that offers improved information and orientation to the National Park Service and to Golden Gate National Recreation Area. By providing improved orientation services, new visitor welcoming centers, and an understanding of park-related opportunities to the diverse populations via new facilities and programs, the National Park Service could improve the quality of life for many residents of the area. In addition, compared to the no-action alternative, alternative 3 includes a substantial increase in educational and stewardship opportunities for local residents and school groups at several park sites. This alternative focuses on education and stewardship of both ecological education and historic and cultural sites. By offering local residents education about the ecological and historic significance and national uniqueness of the many sites around them, the National Park Service could generate community interest in resource stewardship of these sites, as well as provide the residents with a comprehensive understanding of the Bay Area

history. Also, under alternative 3, the National Park Service would improve a park-wide expansion of trail connections to adjacent community parks and trail networks by collaborating with many local governments. These trail connections should provide community residents with several additional ways to access Golden Gate National Recreation Area park sites to benefit from park programs and amenities. Collectively, these facility enhancements and program improvements could improve the quality of life for local residents. This would result in an impact that is long term, minor to moderate, and beneficial in the context of the local gateway communities and three adjacent counties.

Also, all existing equestrian facilities in the park would be maintained and enhanced with additional programming. These equestrian facilities San Mateo and Marin counties would continue to be important assets to many residents of the surrounding communities by contributing to their quality of life. The maintenance or enhancement of the existing equestrian facilities could yield impacts that are long term, minor, and beneficial for the local gateway communities and the three adjacent counties.

Alternative 3 includes several actions that would help the National Park Service develop relationships with local communities and local land management agencies of the Bay Area. The aim of these cooperative efforts would be to educate the Bay Area community on the national significance and uniqueness of the significant park sites (both in the park and on other public lands in the area). This heightened public awareness of the history and national significance of the many park sites in all three gateway counties would likely generate a sense of community pride throughout the area. The cooperative efforts would also attempt to inform the local residents on how the “quilt” of undeveloped land has been preserved by the National Park Service, various land trusts, several local governments, and individuals. Understanding and awareness of a resource can lead to community appreciation, awareness, and pride. These community values can contribute to the quality of life in the area. These community-building actions could result in impacts that are long term, moderate, and beneficial for local gateway communities. Impacts to the three adjacent counties could be long term, minor to moderate, and beneficial.

In terms of impacts to the local economy, alternative 3 would include major construction and restoration projects at park sites in all three gateway counties. The projects under alternative 3 would include the construction, relocation, redevelopment, and/or restoration of visitor centers, a stewardship/education center, several historic structures, restrooms, showers, picnic areas, parking lots, warming huts, interpretive exhibits, roadway pull-offs, rustic overnight accommodations, and natural landscapes. Many of these projects would generate new contract work for private firms in the Bay Area, including engineering consultants, construction contractors, and environmental consultants. These projects would not only support these contracting businesses and their employees directly, but the economic multiplier effect would circulate this contract money through the local economy. This phenomenon is explained in the Social and Economic Affected Environment section. The collective result of these contracted projects would be impacts that are short term, minor to moderate, and beneficial for local gateway communities and three adjacent counties.

The proposed expansion of facilities and services at Alcatraz Island and other historic park sites provide examples of park partners benefitting from NPS programming.

Alternative 3 would provide expanded visitor programs, amenities, and facilities that could help grow these organizations and partners. This could empower or leverage partners to provide more educational, stewardship programming, and visitor service opportunities. This collaboration with park partners and other local organizations and agencies would result in impacts that are long term, minor to moderate, and beneficial for local gateway communities and the three adjacent counties.

Alternative 3 would include the removal of some work force housing units at Capehart housing area in Marin County. These units would be replaced with a new visitor center. This could affect park partners who benefit from this housing unless it is provided elsewhere. This could result in an impact that is long term, minor, and adverse in the context of local gateway communities. Impacts to the three adjacent counties would be negligible.

To fulfill the "Focusing on National Treasures" objective of alternative 3, park facilities and amenities would be restored and new park programs developed. These new or expanded services could generate additional jobs for NPS employees and/or private concessioners. These improved services would include: a new ferry service (Fort Mason to Alcatraz Island), improved visitor orientation and additional park programs, facilities and services and special event hosting. The creation of jobs is important for economic growth, as it provides sustained direct and secondary spending (i.e., multiplier effect) in local spending in the community. Thus, these proposed service expansion actions in alternative 3 would have an impact that is long term, minor, and beneficial in the context of the local gateway communities. The impact in the context of the three adjacent counties would be negligible.

However, a possible negative impact to tour boat operators may occur with alternative 3. Although the visitor ferry access will be accommodated along the eastern shoreline, the historic no trespass zone around the island will place limitations on tour boat operators that currently use the area, thus negatively affecting jobs and reducing economic multiplier effect of this tourism industry. This impact would be long term, minor, and adverse to the local gateway communities.

Conclusion

The short-term and long-term beneficial impacts of alternative 3 on the social and economic environment of the local gateway communities and three adjacent counties could range from minor to moderate. The beneficial impacts to qualify of life and economy could result from

- an increase in public outreach programs, visitor orientation, educational/stewardship opportunities and additional park programs;
- improvements in public accessibility and community trail connections;
- sustaining and/or enhancing existing equestrian facilities;
- incorporating several community-building components;
- a moderate amount of new engineering and construction contract work for numerous facility improvement and restoration projects;
- limited new opportunities for park partners to use park facilities and expand their operations and

- a small amount of job creation from the proposed increase in visitor services at various park sites.

The adverse impacts could result from removal of work force housing units at Capehart housing area and possible restrictions on tour boat operators with implementing the historic no trespass zone around the Island. These impacts would be long term, minor, and adverse to the local gateway communities.

TRANSPORTATION

This section describes the potential impacts to transportation at Golden Gate National Recreation Area park sites, including Alcatraz Island. The impacts are described for the counties of Marin, San Francisco, and San Mateo, and for Alcatraz Island.

No-action Alternative

Analysis

Marin County

In general, park areas in Marin have good pedestrian access, with some transit access to the Marin Headlands from San Francisco, and transit to other park sites via the West Marin Stagecoach and the Muir Woods Shuttle. Traffic congestion is a current and worsening problem in specific areas as noted below. In many cases traffic congestion is related to the rural roadway system with limited options and limited capacity. In rural Marin County, roadway capacity is unlikely to increase substantially.

In the southeast coastal area (Rodeo Valley / McCullough and Conzelman Road), existing planned road, trail, and transit projects are likely to improve access for visitors from all parts of the Bay Area as well as for park partners and reduce congestion at scenic overlooks. This area is served by transit on Sundays by MUNI bus service from San Francisco, with plans to expand service to Saturdays when funding is available. Traffic congestion would continue to be problematic during peak periods on roads connecting the Golden Gate Bridge with the Marin Headlands.

Along the southwest coast, (Muir Beach to Point Bonita), small roads serving Tennessee Valley, Muir Beach, and Muir Woods National Monument experience traffic congestion ranging from moderate on warm weekends to severe during peak periods. Neither Tennessee Valley nor Muir Beach is served by transit.

For a recent report, *Transportation Planning to Address Access and Congestion Issues – Muir Woods National Monument,* HDR, Inc. collected detailed data on seven weekday and weekend days from August 7 through August 16, 2009, along State Route 1 between Highway 101 and Muir Woods. Intersections experiencing Levels of Service (LOS) E or F on weekends were: Muir Woods Road at Panoramic Highway, State Route 1 at Panoramic Highway, State Route 1 at Tennessee Valley Road, State Route 1 at Pohono Street, and State Route 1 at Flamingo Road (unsignalized). The last three of these intersections saw LOS of E or F on weekdays as well.

In the Stinson area, access to Stinson Beach along State Route 1 and the Panoramic Highway is congested on good weather weekends, approaching gridlock at times on summer weekends. Stinson Beach is served by the West Marin Stagecoach.

The absence of measures improve transportation access to park sites in Marin (beyond those already planned) would have a long-term, minor to moderate adverse impact. While projects described in the Cumulative Impacts section would help mitigate transportation shortcomings in the Marin Headlands, other areas such as Muir Beach, Muir Woods National Monument, and Stinson Beach would all continue to experience long-term, moderate, adverse impacts on accessibility to visitors during peak periods.

San Francisco

San Francisco park areas are well served by transit, and well-connected with bicycle and pedestrian paths. Exceptions to this are Lands End, Sutro Heights, and Fort Miley, which are not well served by transit. Aside from any actions taken by the park, transit to the Fort Mason area is likely to be improved with the development of the Van Ness Bus Rapid Transit system, and further enhanced with the proposed extension of the streetcar along the northern waterfront. Either of these measures would provide a long-term, moderate to major, beneficial impact in connectivity and availability of public transit to Fort Mason, Crissy Field, and the Presidio. In addition, the implementation of the *Northern Embarcadero Waterfront Plan*, which calls for bicycle lanes along Jefferson Street, will enhance transportation to Fort Mason. Independent of these external projects, the absence of further transportation measures would have a negligible impact on access to park lands in San Francisco.

San Mateo County

Under the no-action alternative, access to park lands in San Mateo County would continue to be less accessible by all modes of transportation because of unimproved trailheads, limited parking, minimal signage, and very limited transit access. Visitation would continue to increase without additional transportation improvements to direct and accommodate new visitors, or to promote or provide non-auto access options. Informal or "social" trails would continue to be a significant way to enter parklands from adjacent neighborhoods; such trails, created by visitors, can lead to deterioration of natural resources. Accessibility for people with disabilities would continue to be limited. Auto access would improve in 2011 when the Devil's Slide tunnels are opened. The County of San Mateo is required to install bus stops at the north and south pullouts near the tunnels; thus transit options in this particular area will improve as well. Taking no further transportation improvement actions in San Mateo County would have a long-term, minor to moderate, adverse effect on access to these park sites, limiting access for many potential visitors.

Alcatraz Island

In the no-action alternative, transportation to and within Alcatraz Island is limited to concession-operated water transport only; visitors board the ferry at Pier 33 on San Francisco's Embarcadero, and leave the ferry at the Alcatraz arrival area. Ferry access would remain limited to the concessioner from Pier 33. Private boats cannot land on the island, although tour boats can come within the 1,000-foot perimeter that defines the area managed by the National Park Service.

Conclusion

In Marin County, auto access to the most popular destinations is likely to continue to be difficult during peak periods, while bicycle and pedestrian access would improve, particularly in the Marin Headlands, because of projects outside of this planning process. Existing transit service would continue to enable access to park lands in Marin County for visitors without cars. The no-action alternative would have a long-term, minor to moderate to major, adverse impact on the access to most popular sites, and a long-term, minor, adverse effect on transportation in other areas, such as the Marin Headlands.

Park sites in San Francisco County in the north part of the city would see long-term, moderate, beneficial impact to access by land via improved transit implemented by the San Francisco Municipal Transportation Agency.

Park lands in San Mateo County would see a long-term minor improvement in access by land because of the Devil's Slide project and accompanying transit stops. Taking no other transportation improvement actions in San Mateo would have a long-term, minor to moderate, adverse effect on access to these park sites.

The no-action alternative would have negligible impacts on transportation to or within Alcatraz Island.

Alternative 1: Connecting People with the Parks (NPS Preferred Alternative for Park Sites in Marin, San Francisco, and San Mateo Counties)

Analysis

Alternative 1 proposes to improve and expand connectivity and access to the park and monument through new and improved transit (land or water), bicycle, and pedestrian access to and within the park.

Marin County

In addition to the actions common to all alternatives, transportation-related measures in alternative 1 would improve public transportation and multimodal access to all park sites in Marin County. Trails would be improved in all areas, increasing access and connectivity to sites.

In the southeast coastal area (Rodeo Valley / McCullough and Conzelman Road), safe pedestrian, bicycle, and motor vehicle access to overlooks and to interpretive and recreational opportunities would be provided. This would have a long-term, moderate, beneficial impact for visitors to this area. In the southwest coast area (Muir Beach to Point Bonita) a trailhead and transit stop would be added to the Golden Gate Dairy. The National Park Service would continue to work with Caltrans to improve the safety of State Route 1, including exploring regularly scheduled transit. Increased transit access would have a long-term, minor, beneficial impact for visitors in this area. Trails in the Lower Redwood Creek area would be improved to connect Muir Woods Road to the equestrian facilities at Santos Meadow. This may have a long-term, negligible effect on connections for visitors to this area.

The Diverse Opportunities zone in Rodeo Valley could include visitor amenities such as improved trailheads and accessible trails, as well as camping, picnicking, and orientation. These facilities would welcome visitors and give access to the adjacent natural areas.

Improved and accessible trails would provide a long-term, minor, beneficial effect on circulation in this area. Housing for staff, interns and volunteers would be provided within and adjacent to this management zone. A transit stop would be added at Fort Barry. Increased transit access would have a long-term, minor, beneficial impact for park and park partner's employees as well as visitors in this area.

The National Park Service would collaborate with other agencies to develop a community trailhead in Marin City. This would have a long-term, moderate, beneficial effect for hikers accessing the Marin Headlands from Marin City.

In Tennessee Valley, in collaboration with Marin County and the local community, park managers would explore transit to the trailheads on peak season weekends, extend a multiuse trail to connect with the Mill Valley Bike Path (and the San Francisco Bay Trail), and manage traffic congestion. This may enable more people to visit on peak weekends, because currently, some visitors are unable to find parking, and leave without visiting the valley. These measures would have a long-term, moderate, beneficial impact for Tennessee Valley, affecting most visitors by reducing traffic congestion on peak weekends and providing other ways to access this popular location besides driving.

Some additional parking would be added at the trailhead in Oakwood Valley. This would have a long-term, minor, beneficial impact in reducing crowded parking conditions on Tennessee Valley Road.

At Stinson Beach and along the State Route 1 / Panoramic park, the park staff would collaborate with Caltrans, Marin County, and other land management agencies to improve roadways and trail crossings for the safety and enjoyment of park visitors. New facilities could include overlooks and trailheads with parking, enhanced trail and transit connections, and a unified wayfinding system. A small trailhead parking area could be developed in the vicinity of the former White Gate Ranch. These transportation improvements would have a long-term, minor to moderate, beneficial impact on access by land, parking availability, and improved public safety. Improvements east of Panoramic Highway in the vicinity of Homestead Hill would enhance trail and transit access in this area. Improvements would fit with the rural character of the area. Increased trail and transit access would have a long-term, minor, beneficial impact in this area. Park management would continue to seek increased transit to the Beach on peak-season weekends. Increased transit access would have a long-term, moderate, beneficial impact for visitors in this area.

San Francisco

In addition to the actions common to all alternatives, alternative 1 provides greater connectivity to San Francisco parks through improved transit, trails, and signage. This alternative anticipates development of a water shuttle system connecting bay front parks.

The park would continue to improve trails and trailheads throughout its San Francisco park lands to make the park accessible to the broadest array of visitors. Sites would be connected to each other and to communities by the trail system and the city's transit and multimodal access systems. These projects would have a long-term, minor to moderate, beneficial effect on visitor connections.

Visitor circulation and wayfinding improvements would be implemented in response to new adjacent bus, streetcar and ferry connections. These projects would have a long-term, minor, beneficial effect on visitor connections.

The park would improve the California Coastal Trail and other trail connections linking Ocean Beach to Lands End, Fort Funston, city neighborhoods, and other park lands including Golden Gate Park and Lake Merced. This would have a long-term, minor to moderate, beneficial effect on connectivity between the park and neighborhoods for the southwest San Francisco park sites.

San Mateo County

In addition to the actions common to all alternatives, alternative 1 attempts to mitigate the remoteness and lack of access to the San Mateo park lands by focusing on providing more trail access to and between all park areas, as well as increasing parking and improving transit connections. A comprehensive trail plan would be prepared to create a sustainable regional trail network, providing greater opportunities to access park sites and connect with local communities. The California Coastal Trail is already built on Mori Point, allowing increased access north and south; it is partially built across the Pedro Point Headlands. Once the property is acquired and the trail is completed, it will significantly increase access to these areas.

Park managers would work with county transit providers to improve transit connections to local trailheads and east–west transit between bayside communities and State Route 1. In cooperation with Caltrans and at the request of the town of Pacifica, signs along State Route 1 would be improved to make the park and monument more visible. The significant increase in trail and transit access is likely to have a long- term, moderate, beneficial impact on all park lands in San Mateo County.

Connections to the regional trail network at the Shelldance Nursery and the surrounding public lands (SFPUC, San Pedro Valley County Park, McNee Ranch State Park, and Rancho Corral de Tierra) would be developed in coordination with other land managers. Additional connections to the Bay Area Ridge Trail and the Sawyer Camp Trail in the SFPUC watershed would be enhanced. These projects would have a long-term, minor to moderate, beneficial effect on connecting Golden Gate National Recreation Area sites in San Mateo County to other local and state park sites, regional trails, and surrounding communities. Limited vehicular access to the San Francisco Bay Discovery Site National Historical Landmark would be available by permit. Together, these actions would have a long-term, minor, beneficial impact for visitors accessing these park lands.

Access to Mori Point would be enhanced with an ADA-accessible trailhead and parking improvements, providing a long-term, moderate, beneficial impact.

Visitors would access the coastal areas through an enhanced and sustainable system of multiuse trails. The trail network would connect local communities to the park and link the ridges of Montara Mountain to the Pacific Ocean. Opportunities for a trail connection to Sweeney Ridge through the SFPUC watershed's northwest corner would be explored. Unnecessary roads could be converted to trails or removed. These projects would have a long-term, moderate, beneficial impact on visitor access, connecting the coastal areas to each other and to surrounding communities.

Alcatraz Island

Alternative 1 includes the following transportation-related actions for Alcatraz. Some indoor and outdoor areas on Alcatraz Island that are currently inaccessible would be reopened, while sensitive wildlife areas would remain protected. Parts of the perimeter trail would be made accessible year-round. This action would have a long-term, minor,

beneficial impact on making currently inaccessible areas available to the public. The National Park Service would prohibit boat tours and small boat landing in the Sensitive Resources management zone (extending 100 feet from the island's western shore). This action would have a long-term, minor, adverse effect on water access to this side of the island. The Scenic Corridor zone (extending beyond the Sensitive Resources zone and along the island's eastern shore) would be managed to accommodate ferry service to the island. Boat tours around the island and some types of water-based recreation, such as fishing, could be permitted. These actions would have a long-term, minor, beneficial effect on access to the island.

The area adjacent to the entry dock would be managed to expand the capacity and range of uses that may occur. This would enable Alcatraz Island to be part of the San Francisco Bay Water Trail, welcoming nonmotorized boats via permits or reservations. This would have a long-term, minor, beneficial effect on access to the island for those arriving in private nonmotorized boats.

Conclusion

In alternative 1, access by land to park sites in Marin County—including improved trails, increased transit services, and wayfinding—would see a long-term, moderate, beneficial effect, particularly during peak and shoulder seasons, and on holiday weekends throughout the year. Increased transit service and stops would have a moderately beneficial impact on both the functionality of the land-based transportation system and on connectivity. It would not only provide more ways for people to get to the park sites, but would also relieve congestion on the roads for both transit and motorists.

In San Francisco County, alternative 1 would have a long-term, moderate, beneficial impact on both visitor connections and the functioning of the transportation system through increased land and water transit and improved trails.

In San Mateo County, enhanced trail systems would provide a long-term, moderate to major, beneficial effect on connections by land; there would be a long-term, moderate, beneficial effect on transportation functionality through more transit availability and a minor beneficial impact on parking.

At Alcatraz Island, the slight increase in boat and ferry traffic in the Scenic Corridor zone as well as the entry dock area could result in a long-term, minor, beneficial impact by increasing access by water to the island. Re-opening improved areas of the park and increasing currently limited trail access to year-round access would have a long-term, minor, beneficial impact on pedestrian access to park features and circulation on the island.

Alternative 2: Preserving and Enjoying Coastal Ecosystems

Analysis

Alternative 2 focuses on preserving the natural resources of the park and monument by carefully controlling access and removing deteriorated or unused human-made structures, and has the least impacts on transportation.

Marin County

In addition to the measures under "Actions Common to all Alternatives," previously described, there are few actions in alternative 2 that would significantly improve or detract from visitor access and connectivity. Little-used roads would be converted to trails. The main Tennessee Valley trail, which is currently open to hikers and equestrians, would be converted to a multiuse trail, opening the trail to bicycles as well. These actions would provide a long-term, negligible to minor, beneficial impact in access and in modes of travel.

Alternative 2 recommends that the South parking lot at Stinson Beach be removed and the wetland restored. Because this lot comprises about 50% of the parking spaces at Stinson Beach, removing the south parking lot would have to be carefully coordinated with the town of Stinson Beach, the County of Marin, and Marin Transit in order to prevent major adverse effects on the local community. Data from the *Comprehensive Transportation Management Plan for Park lands in Southwest Marin, 2002*, shown in the table below, indicates that at present, the parking capacity at Stinson (approximately 840 cars) does not meet demand on peak weekends for 1,050 spaces (2002). The projected peak-season parking demand for 2023 is 1335 spaces, an increase of 285 spaces over the current capacity.

Parking overflow might only be a problem during peak weekends for the next few years, with longer term excess demand on peak and shoulder weekends. As shown in the table above, reducing the parking to approximately 420 spaces is likely not to be a problem during the off season (October through April). However, even during the off season, Stinson Beach does see increased visitors on sunny weekends, particularly those with holiday Mondays, so the off-season weekend estimates may be lower than actual demand.

Table 20: Parking Capacity at Stinson Beach, 2002 & 2023

Parking Demand at Stinson Beach – 2002					
Peak Season		**Shoulder Season**		**Off Season**	
Weekday	Weekend	Weekday	Weekend	Weekday	Weekend
365	1050	260	450	155	270

Estimated Parking Demand at Stinson Beach – 2023					
Peak Season		**Shoulder Season**		**Off Season**	
Weekday	Weekend	Weekday	Weekend	Weekday	Weekend
465	1335	315	540	180	310

NOTE: 2009 Parking Capacity: 839; with south lot removed: approximately 420

The effects of inadequate parking on the town include spillover parking in neighborhoods, and illegal parking. Enforcement of parking restrictions in Stinson Beach is under the jurisdiction of the Marin County Sherriff. Because all of West Marin is currently served by two law enforcement officers, consistent enforcement of parking

restrictions is unlikely to occur; enforcement and towing may have to be managed and could involve support from the National Park Service. Parking tickets alone are ineffective in controlling where people park in Stinson Beach; according to some residents, some visitors appear to consider the cost of a parking ticket simply the price one pays to go to the beach. In a community already experiencing severe levels of congestion on peak weekends, parking reduction could lead to even greater traffic congestion as well as increased air pollution as cars circle the parking lot and neighborhoods looking for parking spaces.

As demonstrated in community meetings held in May 2009, residents of Stinson Beach are extremely concerned about the effects of traffic and of parking overflow problems in neighborhoods adjacent to the beach. Any reduction in peak-season parking would have to include as part of the measure significant proven mitigations in order to get local support and to prevent the town from being inundated with vehicles. One such mitigation might be increased transit service and greatly expanded marketing of transit and alternative modes, including signs on Highway 101 warning of the lack of parking in Stinson Beach. Currently Stinson Beach is served by Marin Transit's Stagecoach service. Were parking to be reduced, the park staff may wish to partner with Marin Transit on increased service frequency, earlier and later hours, and joint marketing efforts to reduce the number of cars entering Stinson Beach. Closing the south parking lot may have long-term, major, adverse impacts, because it could substantially restrict access to Stinson Beach and lower the quality of the visitor experience because of increased traffic congestion. Alternatively, with substantially increased transit service, along with aggressive marketing and consistent parking enforcement, this may have a long-term, moderate, beneficial impact on the Stinson Beach area by reducing the number of cars on local roads.

Alternative 2 also includes a recommendation that, in the event of a catastrophic landslide on State Route 1 (Shoreline Highway), park managers would encourage abandonment of State Route 1 between Muir Beach and Stinson Beach in the affected segment. State Route 1 is ultimately controlled by Caltrans. If State Route 1 between Muir Beach and Stinson Beach were damaged and then abandoned at the affected segment, the coastal communities would sustain a long-term, moderate, adverse impact to connectivity. This would more than double the driving distance between Muir Beach and Stinson Beach from 5 miles to 13 miles, and lengthen the driving time from approximately 8 minutes to 30 minutes. This would have implications for residents of both communities and for emergency access to those areas.

San Francisco County

With its focus on preserving the natural environment, this alternative has no transportation-related measures affecting San Francisco other than those common to all alternatives.

San Mateo County

In addition to the measures described in the "Actions Common to all Alternatives" section cited previously, the following narrative describes the transportation measures for San Mateo County. At Sweeney Ridge, Sneath Lane could be converted to a trail and connect to the Bay Area Ridge Trail in the SFPUC watershed. Unnecessary fire roads could also be converted to trails or removed if not historic, and natural resources restored. If acquired, a trailhead would be located at Picardo Ranch with modest visitor support

facilities (restroom, picnic tables, parking). These measures are likely to result in a long-term, minor, beneficial impact at Sweeney Ridge. In the SFPUC watershed easement, park managers would promote access along the existing multiuse trail and the implementation of trail improvements proposed in the *San Francisco Watershed Management Plan* (2002), including completion of the north–south corridor through the watershed in areas of low sensitivity. Completion of these actions could have a long-term, minor to moderate, beneficial effect on access to these areas.

Alcatraz Island

In alternative 2, visitor access to now-closed sites would be opened. Visitor access to the north end of the island would be expanded to provide wildlife viewing and research while carefully managing impacts to prevent disruption of natural resources. This would result in a long-term, minor, beneficial impact on visitor circulation on Alcatraz Island.

The Scenic Corridor zone (extending beyond the Sensitive Resources zone and along the island's eastern shore) would be managed to accommodate ferry access to the island. Some other types of water-based recreation could also be permitted. This would result in a long-term, minor, beneficial impact on visitor access to Alcatraz Island via water.

Conclusion

For park lands in Marin County, impacts on access and connectivity for alternative 2 are negligible, with two exceptions. A 50% reduction in parking at Stinson Beach could have either a long-term, major, adverse impact on accessibility and user experience in Stinson Beach during peak periods and holiday weekends by exacerbating an already difficult traffic congestion situation, or a long-term, moderate, beneficial effect if combined effectively with other efforts such as provision of transit, marketing of transit, and enforcement of parking restrictions.

Closing a segment of State Route 1 between Muir Beach and Stinson Beach may have a moderate to major, adverse impact on connectivity between these two communities.

There are no transportation actions for San Francisco for alternative 2.

In San Mateo, the transportation actions in alternative 2 may result in a minor to moderate, beneficial effect on connections by land through enhanced trail systems.

The improved access on Alcatraz Island to previously closed areas could result in a long-term, minor, beneficial impact to connectivity by water transit, and access to sites on Alcatraz Island via enhanced trails.

Alternative 3: Focusing on National Treasures (NPS Preferred Alternative for Alcatraz Island)

Analysis

In addition to the impacts highlighted below, the transportation impacts that are described above in alternative 1 also apply to this alternative for park lands in Marin, San Francisco, and San Mateo counties.

At Fort Funston, alternative 3 proposes relocating both access and parking to the edge of Fort Funston, allowing restoration of dunes. This measure has long-term, minor, impacts that could be considered either beneficial (for the restoration of the dunes) or adverse

(because visitors would have a longer walk to reach the beach). This action does not appreciably limit or enhance visitors' ability to visit Fort Funston.

Alternative 3 envisions that visitors would be able to go to a larger number of locations on Alcatraz Island. Current barriers to visitor access and circulation include rubble that would be removed, buildings that would be stabilized, and trails that would be upgraded, including the perimeter trail. Pedestrian circulation would be improved for many visitors, with more sites accessible. This could have a long-term, moderate, beneficial impact on the visitor experience at Alcatraz Island, enhancing public safety by stabilizing structures.

This alternative also includes consideration of additional ferry service from San Francisco. Multiple ferry embarkation points could include the original Alcatraz dock (Pier 4) at Fort Mason, with primary embarkation still from the San Francisco Waterfront. This added embarkation would provide a historic program tour to Alcatraz Island that would leave from the restored Pier 4 west of Muni Pier. This would likely have a long-term, moderate, beneficial impact on visitor access to the island by providing more than one place to board the ferry in San Francisco.

Conclusion

In alternative 3, the relocation of parking and access to Fort Funston in San Francisco has a long-term, minor effect that is both slightly beneficial for preservation of the natural environment with a slightly adverse impact on visitor access.

For Alcatraz Island, this alternative could result in a long-term, moderate, beneficial increase in connectivity through additional ferry embarkation points; and a long-term, moderate, beneficial increase in access to additional historic features over an expanded area of the island because of trail expansion and improvement.

PARK MANAGEMENT, OPERATIONS, AND FACILITIES

No-action Alternative

Analysis

The no-action alternative would generally call for the continuation of current management, programs, operations, funded construction projects, and current levels of annual operating funds.

Staffing levels would continue at current levels. While some divisions are staffed adequately, others have the need for additional staff. For example, despite creative approaches in supplementing the work of park maintenance staff, the required workload needed to maintain and support the park assets exceeds available staff resources, resulting in a significant maintenance backlog. The aging infrastructure in the park requires increasing resources to maintain. A majority of the maintenance needs annually go unmet due to funding, which results in an expanding backlog of deferred maintenance.

The demand for educational and interpretive programs exceeds what the interpretive staff is able to provide. Other divisions, such as the Cultural Resources Division, are supplemented by volunteer staff. The Natural Resources Division's staffing levels prevent the park from completing the baseline studies and monitoring necessary to guide

the park's natural resources preservation efforts in the future. A lack of sufficient patrol units has resulted in adverse impacts to resources. Additionally, due to staff limitations, the management of volunteers is very limited; and therefore the volunteer program does not have the capacity to grow and provide additional benefit to the park and monument.

While staff at Golden Gate National Recreation Area and Muir Woods National Monument lead the field in many of the programs they spearhead—such as development of partnerships, community based stewardship, and increased sustainability in many areas of park operations—the continued impact of low staffing levels on park operations is long term, moderate, and adverse.

Facilities continue to deteriorate given minimal additional project funding and the current inadequate annual base funding for maintenance. Even given the direction of the park asset management plan for prioritizing funds, a large gap in maintenance funding would result in an increase in the deferred maintenance backlog. Inadequate project and operational funding would result in long-term, moderate, adverse impacts to park facilities.

Facilities at Alcatraz Island are in an advanced stage of deterioration. Infrastructure for utilities is another constraint on the island. For example, potable and wastewater must be transported to and from the island by ferry. Water storage constraints also place limits on the visitation and operations presence on the island. Fire system water storage and distribution is an issue on the island. Power utilization and energy demands are also an issue; power is generated by diesel engines, which pollute and also constrain operations on the island. Each of these systems requires improvement for continued use at current levels. A lack of future project funding would result in long-term, major, adverse impacts to mission critical facilities on the island.

Facility location, condition, and available use also impact park operations. Maintenance facilities do not meet the needs of the park; currently, long distances from storage and maintenance facilities to job sites, and inappropriate storage facilities for equipment affect the operations adversely and result in equipment deterioration. Park public safety is also impacted negatively by the current location of facilities; currently, law enforcement staff has limited facilities in the Headlands and no base of operations in San Mateo County. The operations would continue to have long-term, moderate, adverse impacts due to current maintenance and public safety facility locations, size, and lack of modern and secure features.

Park partners are vital to the continued operation of the park, as they provide generous funds, organize volunteers, and provide interpretive and educational programs. The park's continued efforts at developing and maintaining partnerships would continue to provide long-term, moderate, beneficial impacts to park operations.

The Volunteers-In-Parks Program is critical to the ongoing operation of Golden Gate National Recreation Area and Muir Woods National Monument. In a typical year, between 10,000 and 14,000 volunteers provide an excess of 300,000 volunteer hours to various programs and efforts within the park and monument. The continued management of volunteer programs at the park and monument contribute a continuing long-term, moderate, beneficial impact to park operations.

Conclusion

Inadequate staffing levels would result in continued long-term, moderate, and adverse impacts to operations. Continued partner and volunteer efforts would result in long-term, moderate, beneficial impacts to park operations, although these efforts would be limited by current staffing levels. Inadequate project and operational funding would result in long-term, major, adverse impacts to park facilities throughout Golden Gate National Recreation Area including Alcatraz Island. The inadequate maintenance and public safety facilities and their locations would result in continued long-term, moderate, and adverse impacts to operations.

Alternative 1: Connecting People with the Parks *(*NPS Preferred Alternative for Park Sites in Marin, San Francisco, and San Mateo Counties*)*

Analysis

While designed to contribute to the protection of resources and the enhancement of visitor opportunities, the proposals of alternative 1 will achieve these ends only if staffing and operating funds are increased in accordance with the cost estimates identified for this alternative. If funding and needed staffing levels are not made available when these actions are implemented, then the proposed actions would have long-term, moderate, adverse effects on park operations.

Additional staff needs projected under this alternative would supplement many of the divisions with the people needed to achieve the resource and visitor experience objectives of the alternative. Expanding operations into San Mateo County requires increasing employees and support facilities in order to manage the existing and newly acquired lands. In addition, some staff would be responsible for organizing and managing volunteer groups—thus leveraging park resources with the expertise and enthusiasm of willing community members and youth groups. While the park would be better able to meet resource protection goals as well as visitor experience and safety through the addition of these full-time equivalent employees, salaries for these employees would appreciably increase the operating budget and the need to develop additional partnerships. Increased staff would result in long-term, moderate, beneficial impacts to operations if appropriate funding is available, otherwise the actions of this alternative would continue the adverse impacts identified in the no-action alternative.

The proposed new or reconstructed facilities in this alternative would require additional capital investments. If funded, the improvements would result in a decrease in the park's deferred maintenance. Unless the cyclic maintenance budget is adjusted to maintain the park's facilities as identified in this alternative, the deferred maintenance will increase, even with an initial investment in that asset. Adjusting the operations and maintenance budget to realistically reflect the true costs of a facility will have a long-term, moderate, beneficial impact on park operations; otherwise, the impact would be adverse and result in an increase of deferred maintenance.

Fundraising through park partners to support specific programs to improve park facilities has often been successful, although maintenance funding is typically more difficult to come by. The investment in facilities would improve facility conditions, reduce the

deferred maintenance backlog, meet sustainability goals, and improve the ability of the park to meet its goals for natural and cultural resource protection and improve the visitor experience. Construction, rehabilitation, restoration, and demolition projects proposed in the alternative would result in long-term, major, beneficial impacts to park operations if funding could be obtained. Construction activities would impact park operations in the short term and would be minor and adverse, as some inefficiency would be caused by the closure of buildings during construction.

Enhancing park operations at Fort Funston would improve maintenance and public safety functions in that area. The proposed "portals" at Rancho Corral de Tierra, Upper Fort Mason, and Tennessee Valley would improve interpretation and public safety operations with opportunities for visitors to access park staff. These changes would result in long-term, moderate, beneficial impacts to park operations.

At Alcatraz Island, increases in staff would allow for increased levels of maintenance, public safety, resource protection, and visitor services. These increases in staff would result in long-term, moderate, beneficial impacts to operations, if the positions are adequately funded.

Alternative 1 proposes extensive restoration and rehabilitation of facilities on Alcatraz Island. These actions would result in long-term, moderate, beneficial impacts to the operations of Alcatraz Island. Construction activities would result in minor, short-term, adverse impacts due to the closure of facilities.

Conclusion

Increased number of park staff would result in long-term, moderate, beneficial impacts to operations if appropriate, annual base funding is available. Construction, rehabilitation, restoration, and demolition projects proposed in the alternative would result in long-term, moderate, beneficial impacts to park operations by addressing deferred maintenance. Construction activities would result in short-term, minor, adverse impacts on park operations, because of closures during the work. An expanded maintenance facility at Fort Funston and the addition of three "portals" would result in long-term, moderate, beneficial impacts to park operations.

Alternative 2: Preserving and Enjoying Coastal Ecosystems

Analysis

While designed to contribute to the protection of resources and the enhancement of visitor opportunities, the proposed actions of alternative 2 would achieve these ends only if staffing and operating funds are increased in accordance with the cost estimates identified for this alternative. If funding and needed staffing levels are not made available when these actions are implemented, then the proposed actions would have long-term, moderate, adverse effects on park operations.

This alternative would require significant increases in park staffing to manage the new park lands in San Mateo County; educate visitors about the coastal ecosystems of the area; gather baseline natural and cultural resource information, and use this information to guide the future of these programs; maintain facilities and landscapes; and provide for effective public safety in areas where visitors are concentrated as well as in more primitive areas. Increases in staffing levels would result in a long-term, moderate,

beneficial impact in the ability of the park to meet its operating and mission goals while leveraging the support of partners and volunteers. However, salaries for these FTEs would appreciably increase the operating budget and the need to develop additional partnerships. Increased staffing would result in long-term, moderate, beneficial impacts to operations if adequate funding accompanied the staffing increases.

The removal of noncritical facilities and the restoration of those landscapes would result in fewer maintenance needs and the removal of the deferred maintenance associated with those structures and the redistribution of park personnel and funds to remaining facilities.

Capital investment in facilities would improve facility conditions, help to reduce the deferred maintenance backlog, and help to meet sustainability goals. If adequately funded, construction, rehabilitation, restoration, and demolition projects proposed in the alternative would result in long-term, moderate, beneficial impacts to park operations. Construction and landscape restoration activities would result in short-term, minor, adverse impacts, caused by the closure of buildings and lands during construction or restoration.

On Alcatraz Island, increases in staff would allow for improved maintenance as well as increased resource protection and public safety, especially if visitor use extends into the late evenings. Such increases in staff and work would result in long-term, moderate, beneficial impacts to operations if positions are adequately funded. The increased difficulty for public safety to reach the more primitive areas of the island that would become open in this alternative would result in long-term, negligible to minor, adverse impacts to operations.

On Alcatraz Island, alternative 2 proposes wilding of many areas on the island and stabilizing some structures. In addition, alternative 2 provides for various treatments for each historic structure (e.g., stabilization, restoration, or rehabilitation). Actions in this alternative will address structures that are in poor condition and pose threat of injury to visitors and staff. The improved facility conditions would result in long-term, moderate, beneficial impacts to the operations of Alcatraz Island and would address the deferred maintenance issues. Construction activities would result in minor, short-term, adverse impacts due to the closure of facilities. Increases in law enforcement staff would allow for overnight experiences on the island.

Conclusion

Increased staff would result in long-term, moderate, beneficial impacts to operations if accompanying funding is appropriate. Construction, stabilization, rehabilitation, restoration, and demolition projects proposed in the alternative would result in long-term, moderate, beneficial impacts to park operations and address deferred maintenance issues. Construction and landscape restoration activities would result in minor, adverse impact in the short term, as some inefficiency would be caused by closure of buildings and lands during construction or restoration. The increased difficulty for public safety personnel to reach the more primitive areas would result in long-term, minor, adverse impacts to operations.

Alternative 3: Focusing on National Treasures (NPS Preferred Alternative for Alcatraz Island)

Analysis

While designed to contribute to the protection of resources and the enhancement of visitor opportunities, the proposals of alternative 3 will achieve these ends only if staffing and operating funds are increased in accordance with the cost estimates identified for this alternative. If funding and needed staffing levels are not made available when these actions are implemented, then the proposed actions would have long-term, moderate, adverse effects on park operations.

In addition to the impacts outlined in alternative 1, alternative 3 would require additional park staff and park partners to support visitor programs and services throughout the park, significant new interpretive and educational programs at Alcatraz Island, expanded natural and cultural stewardship centers, and visitor programs associated with the park collections. These additional park staff would enable the park to provide interpretive and educational programs that are especially tied to cultural and natural resources associated with the Historic Immersion management zone. Additionally, maintenance and public safety staff would require expanded hours at Alcatraz Island and for management of the park lands in San Mateo County. Increased staff would result in long-term, moderate, beneficial impacts to operations if appropriate funding is available; otherwise, the actions of this alternative would continue the adverse impacts identified in the no-action alternative.

Increased restoration of nationally significant resources would benefit operations by reducing deferred maintenance, improving facility conditions, and helping the park to reach its sustainability goals. The construction, stabilization, rehabilitation, restoration, and demolition projects proposed in the alternative would result in long-term, moderate, beneficial impacts to park operations if funding could be obtained. Some construction and landscape restoration activities would result in minor, adverse impacts on park operations in the short term, because of the closure of buildings and lands during construction or restoration. Costs to implement this alternative would be somewhat greater than historic capital project fund amounts. The ability of the park and partners to raise needed funds would dramatically affect the ability to achieve the goals of alternative 3.

Changes in facility use and location would result in moderate, long-term, beneficial impacts to park operations. The establishment of a visitor center at Capehart, a hub at Rancho Corral de Tierra, and additional visitor services at Fort Mason would make it easier for park staff to provide educational and interpretive information to visitors throughout the park. An operations area at Fort Miley would improve efficiencies in public safety and maintenance in that area.

At Alcatraz Island, increases in staff would allow for improved maintenance as well as for increased levels of public safety and resource protection. As this alternative proposes a high level of restoration to nationally significant resources, these areas would need to be staffed and managed accordingly. If adequately funded, these increases in staff would result in long-term, moderate, beneficial impacts to park operations.

Also at Alcatraz Island, national treasure facilities would be stabilized, restored, or rehabilitated. Currently, many of the facilities are in poor condition and pose the threat of injury to visitors and staff. The improved facility conditions would result in long-term, moderate, beneficial impacts to park operations at Alcatraz Island and help to address the deferred maintenance issues. Construction activities would result in minor, short-term, adverse impacts due to the closure of facilities. The funding needed to complete the projects in this alternative is significant.

Conclusion

Increased staff would result in long-term, moderate, beneficial impacts to operations if adequate funding accompanies the increase in park staffing. Construction, stabilization, rehabilitation, restoration, and demolition projects proposed in the alternative would result in long-term, moderate, beneficial impacts to park operations, but would also result in short-term, minor, adverse impacts while the activities are underway. Facility use and location changes would result in long-term, moderate, and beneficial impacts to park operations.

MUIR WOODS NATIONAL MONUMENT

NATURAL RESOURCES – PHYSICAL RESOURCES

Carbon Footprint and Air Quality

No-action Alternative

Analysis

The continuation of current conditions and management would continue to result in adverse impacts to air quality/carbon footprint. Baseline GHG emissions (2008) for Muir Woods National Monument are estimated at 2,257 MTCE.

Mobile combustion associated with visitor travel in personal automobiles and the pilot shuttle would continue to be the largest contributor of GHG emissions (2,179 MTCE), representing about 96% of gross emissions at the monument.

Greenhouse gas emissions from visitors and NPS operations do contribute to elevated ozone and other air quality concerns. The National Park Service would continue to reduce greenhouse gas emissions by reducing energy consumption and replacing high-emitting apparatus with green technology—resulting in a beneficial impact.

Overall, when compared to background levels of air pollution and GHG emissions in the region or the nation (estimated at 6 billion in 2007), impacts to air quality from the no-action alternative would be long term, adverse, and negligible.

Conclusion

Total gross emissions for Muir Woods National Monument would be estimated at 2,257 MTCE, resulting in long-term, minor, adverse impacts to the monument's carbon footprint. Overall, when compared to background levels of air pollution and GHG emissions in the region or the nation (estimated at 6 billion in 2007), impacts to air quality from the no-action alternative would be long term, adverse, and negligible.

No impairment of air resources would result from this alternative.

Alternative 1: Connecting People with the Parks (NPS Preferred Alternative for Park Sites in Marin, San Francisco, and San Mateo Counties)

Analysis

Under alternative 1 visitor travel to the monument would be altered so that dependency on personal automobiles would be reduced. About 25% of parking would be removed and the Muir Woods shuttle would be expanded and could run on compressed natural gas, a lower emissions fuel. As a result, mobile combustion is estimated to be reduced by 20% to 1,740 MTCE. When compared to the no-action alternative, impacts to air quality/carbon footprint would be reduced—resulting in a beneficial impact.

Emissions from stationary combustion and purchased electricity would be slightly reduced when compared to the no-action alternative as result of facility removal and corresponding reductions in energy usage. Emissions associated with wastewater treatment and solid waste would be the same as under the no-action alternative.

Short-term adverse impacts to air quality would occur as a result of the construction activities needed to remove facilities (buildings and parking areas) and reclaim the disturbed sites.

Long-term, adverse impacts on air quality/carbon footprint would also be expected due to increases in energy consumption and related emissions attributed to the new welcome center/shuttle parking located on Highway 101.

The combined effect of the actions included in alternative 1 is estimated to decrease the gross emissions of Muir Woods National Monument by 20% to 1,812 MTCE. This would result in long-term, minor, beneficial impacts on the Park Service's carbon footprint. As in the no-action alternative, impacts to air quality (when compared to background levels of air pollution in the region and nation) would be negligible.

Conclusion

The combined effect of the actions included in alternative 1 is estimated to decrease the gross emissions of Muir Woods National Monument by 20% to 1,812 MTCE. This would result in long-term, minor, beneficial impacts on the Park Service's carbon footprint. As in the no-action alternative, impacts to air quality (when compared to background levels of air pollution in the region and nation) would be negligible.

No impairment of air resources would result from this alternative.

Alternative 2: Preserving and Enjoying Coastal Ecosystems

Analysis

Under alternative 2 visitor travel to the monument would be altered so that dependency on personal automobiles would be significantly reduced. Most of the parking at the monument would be removed and the Muir Woods shuttle would be expanded to a year-round operation and could run on compressed natural gas, a lower emissions fuel. As a result, mobile combustion is estimated to be reduced by 85% to 333 MTCE. When compared to the no-action alternative, impacts to air quality/carbon footprint would be reduced—resulting in a beneficial impact.

Emissions from stationary combustion and purchased electricity would be slightly reduced when compared to the no-action alternative as result of facility removal and corresponding reductions in energy usage. Emissions associated with wastewater treatment and solid waste would be the same as under the no-action alternative.

Short-term adverse impacts to air quality would occur as a result of the construction activities needed to remove facilities (buildings and parking areas) and reclaim the disturbed sites as well as from the restoration of Redwood Creek.

Long-term, adverse impacts on air quality/carbon footprint would also be expected due to increases in energy consumption and related emissions attributed to the new welcome center/shuttle parking located on Highway 101.

The combined effect of the actions included in alternative 2 is estimated to decrease the gross emissions of Muir Woods National Monument by 82% to 401 MTCE. This would result in long-term, major, beneficial impacts on the Park Service's carbon footprint. As in the no-action alternative, impacts to air quality (when compared to background levels of air pollution in the region and nation) would be negligible.

Conclusion
The combined effect of the actions included in alternative 2 is estimated to decrease the gross emissions of Muir Woods National Monument by 82% to 401 MTCE. This would result in long-term, major, beneficial impacts on the Park Service's carbon footprint. As in the no-action alternative, impacts to air quality (when compared to background levels of air pollution in the region and nation) would be negligible.

No impairment of air resources would result from this alternative.

Alternative 3: Focusing on National Treasures (*NPS Preferred Alternative for Muir Woods National Monument*)

Analysis
Under alternative 3 visitor travel to the monument would be altered so that dependency on personal automobiles would be reduced. About 25% of parking would be removed and the Muir Woods shuttle would be expanded and could run on compressed natural gas, a lower emissions fuel. As a result, mobile combustion is estimated to be reduced by 20% to 1,740 MTCE. When compared to the no-action alternative, impacts to air quality/carbon footprint would be reduced—resulting in a beneficial impact.

Emissions from stationary combustion and purchased electricity would be slightly reduced when compared to the no-action alternative as result of facility removal and corresponding reductions in energy usage. Emissions associated with wastewater treatment and solid waste would be the same as under the no-action alternative.

Short-term adverse impacts to air quality would occur as a result of the construction activities needed to remove facilities (buildings and parking areas) and reclaim the disturbed sites as well as from targeted restoration of Redwood Creek.

Long-term, adverse impacts on air quality/carbon footprint would also be expected due to increases in energy consumption and related emissions attributed to the new welcome center/shuttle parking located on Highway 101.

The combined effect of the actions included in alternative 3 is estimated to decrease the gross emissions of Muir Woods National Monument by 20% to 1,813 MTCE. This would result in long-term, minor, beneficial impacts on the Park Service's carbon footprint. As in the no-action alternative, impacts to air quality (when compared to background levels of air pollution in the region and nation) would be negligible.

Conclusion
The combined effect of the actions included in alternative 3 is estimated to decrease the gross emissions of Muir Woods National Monument by 20% to 1,813 MTCE. This would result in long-term, minor, beneficial impacts on the Park Service's carbon footprint. As in the no-action alternative, impacts to air quality (when compared to background levels of air pollution in the region and nation) would be negligible.

No impairment of air resources would result from this alternative.

Soils and Geologic Resources and Processes

No-action Alternative

Analysis

Under the no-action alternative, the presence and maintenance of existing facilities (including structures, parking lots, roads, and trails) would continue to cause parkwide impacts to soils and geologic resources due to the permanent loss and function of these resources and from erosion associated with unsustainable trails and roads. The impact of these activities would be long term, minor to moderate, adverse, and localized, but would occur throughout Muir Woods National Monument.

Projects to improve natural habitat values and ecosystem function, such as the modification of trails and roads, would have beneficial effects on soils and geologic resources and processes because they would improve or restore the functionality of natural processes—the impact would be long term, minor, beneficial, and localized.

Recreational use would continue to cause compaction and erosion of soils, resulting in long-term, minor, adverse, localized impacts throughout the monument.

Park Service efforts to provide educational and participatory stewardship programs would continue to have a beneficial effect on geologic resources and soils due to increased public understanding and support for resource protection and management—the impact would be long term, minor, beneficial, and monumentwide.

Conclusion

Overall, the impact to geologic resources and soils from the no-action alternative would be long term, range from minor to moderate adverse to minor beneficial, and be localized and monumentwide. Adverse impacts would occur from the presence and maintenance of existing facilities and visitor use. Beneficial impacts would occur from restoration and education and stewardship activities.

No impairment of geologic resources would result from this alternative.

Alternative 1: Connecting People with the Parks (NPS Preferred Alternative for Park Sites in Marin, San Francisco, and San Mateo Counties)

Analysis

Under alternative 1, a variety of management zones would be used that would assist in the protection of soils and geologic resources and processes. Approximately 91% of the monument would be zoned using the Natural and Sensitive Resources zones.

The removal of facilities/structures and the reclamation of disturbed building sites in the Camino del Canyon and Druid Heights area and the current entrance to Muir Woods National Monument, as well as the removal of the upper parking lot, would improve soil function and integrity and restore natural geologic processes. The impact of these activities would be long term, minor, beneficial, and localized. Short-term, minor, adverse impacts (such as increased erosion or compaction in adjacent areas) would occur during construction activities.

Visitor access and use would be expanded under alternative 1, resulting in increased soil compaction and erosion; however, compared to use patterns under the no-action alternative, only slight adverse impacts would be expected. Most impacts would be contained within defined visitor use areas and on trails. The impact, especially in areas off-trail, would be long term, minor, adverse, and localized. This impact would occur in areas throughout the monument.

New recreational development (new facilities at Bridge 4 and welcome center / shuttle parking at Highway 101) would have long-term, adverse, localized impacts on soils and geologic resources due to the permanent loss of soil function and integrity resulting from new development and increased erosion from facility construction and maintenance. The intensity of the impact would range from negligible to minor because in some cases the impact would be confined to previously developed or disturbed sites.

Impacts from an expanded NPS educational and stewardship programs would enhance the beneficial effect on soils and geologic processes due to increased public understanding and support for resource protection and management—the impact would be long term, minor, beneficial, and monumentwide.

Conclusion

Overall, the impact to soils and geologic resources and processes from alternative 1 would be short and long term, range from negligible adverse to minor beneficial, and be localized. Adverse impacts would occur from new recreational development and expanded visitor use. Beneficial impacts would occur from trail relocation, the restoration of disturbed sites, and improved resource understanding and public support.

No impairment of geologic resources would result from this alternative.

Alternative 2: Preserving and Enjoying Coastal Ecosystems

Analysis

Under alternative 2, a variety of management zones would be used to assist in the protection of soils and geologic resources and processes. Approximately 99% of the park would be zoned using the Natural and Sensitive Resources zones —the most of all the alternatives.

Nearly all of the built environment would be removed from Muir Woods National Monument. These include facilities and structures in the Camino del Canyon and Druid Heights area as well as at the current entrance and within the primeval redwood forest of the monument, the upper and lower parking areas, unneeded management roads, and several miles of trails. In addition, Redwood Creek would be restored. Restoration of these areas would reduce soil erosion, improve soil function and integrity, and restore natural geologic processes. The impact of these activities would be long term, moderate, beneficial, and localized. Short-term, minor, adverse impacts (such as increased erosion or compaction in adjacent areas) would occur during demolition and restoration activities.

Impacts from visitor access and use would be less than those described in the no-action alternative because it would be limited and highly controlled, resulting in long-term, minor, beneficial, localized impacts.

Impacts from expanded NPS educational and stewardship programs would enhance the beneficial effect on soil and geologic resources due to increased public understanding and support for resource protection and management—the impact would be long term, minor, beneficial, and monumentwide.

Conclusion

Overall, the impact to soils and geologic resources and processes from alternative 2 would be short and long term, range from minor adverse to moderate beneficial, and localized. Adverse impacts would occur from visitor use and construction. Beneficial impacts would occur from the removal of facilities and structures and restoration of disturbed sites.

No impairment of geologic resources would result from this alternative.

Alternative 3: Focusing on National Treasures (*NPS Preferred Alternative for Muir Woods National Monument*)

Analysis

Under alternative 3, a variety of management zones would be used that would assist in the protection of soils and geologic resources and processes. Approximately 85% of the monument would be zoned using the Natural and Sensitive Resources zones.

The impacts to geologic resources and soils from the continued maintenance of existing facilities and structures under alternative 3 would be the less than the no-action alternative. New recreational development (including a new welcome center/shuttle parking at State Route 1, new recreational amenities near Bridge 4, new trails in the monument, and picnicking facilities) would have long-term, minor, adverse, localized impacts on geologic resources and soils due to the permanent loss of soil function and integrity resulting from new development and increased erosion from facility construction and maintenance.

Beneficial effects on geologic resources and soils would occur from the removal of facilities and structures and the restoration of disturbed sites throughout the monument (such as the removal of the upper parking area; a number of structures in the Camino del Canyon and Druid Heights; and targeted removal of rip rap along Redwood Creek)—a total of about 28 acres of built environment would be removed and restored to natural conditions. The impact of these activities would be long term, moderate, beneficial, and localized. Short-term, minor, adverse impacts (such as increased erosion or compaction in adjacent areas) would occur during construction activities.

Visitor access and use would continue to cause adverse impacts to geologic resources and soils due to the effects compaction and erosion. However, the impact would be less than under the no-action alternative because primary use areas and trails would be moved away from the creek (where soils may be more prone to compaction and erosion) and new boardwalks would be developed that reduce these impacts—resulting in a beneficial impact. The impacts to geologic resources and soils from visitor use under alternative 3 would be negligible.

Impacts from NPS educational and stewardship programs would generally be the same as those described in the no-action alternative.

The expanded NPS interpretive, educational and stewardship programs would engage many more visitors and could have a long-term, moderate, beneficial effect on soils and geologic resources and processes due to increased public understanding and support for resource protection and management—the impact would be long term, moderate, beneficial, and monumentwide.

Conclusion
Overall, the impact to soils and geologic resources and processes from alternative 3 would be short and long term, range from negligible adverse to moderate beneficial, and be localized. Adverse impacts would occur from new recreational development and visitor use. Beneficial impacts would occur from the removal of facilities and structures and restoration of the upper parking lot and disturbed sites, as well as creek restoration activities.

No impairment of geologic resources would result from this alternative.

Water Resources and Hydrologic Processes

No-action Alternative

Analysis
Under the no-action alternative, the presence and maintenance (or lack of maintenance in some cases) of existing facilities (including structures, roads, and trails) would continue to cause localized impacts to water quality due to pollution from urban runoff and turbidity from soil erosion. The impact of these activities would be long term, minor to moderate, adverse, and localized, but would occur throughout the monument.

Structures would remain in the 100-year floodplain of Redwood Creek resulting in adverse impacts. Trails, bridges, administrative/concession buildings, the gift shop, restrooms are located in the floodplain. Retention of these facilities would continue to affect floodplain function. The structures themselves could affect the flow of water during floods and paved surfaces such as the parking area and portions of the trail system could affect the capacity of the floodplain to store floodwaters. Furthermore, the existing rock revetment that lines portions of Redwood Creek would continue to adversely affect natural hydrologic processes and floodplain function. Riparian wetland expansion would continue to be adversely affected by the presence of the parking area. The impact of these activities would be long term, moderate, adverse, and localized.

Recreational use would continue to cause erosion of soils resulting in turbidity. Vehicle use at parking areas and on roadways in the vicinity of the monument would continue to affect water quality from runoff that contains chemical contaminants. These activities would result in long-term, minor, adverse, localized impacts to water quality.

Park Service efforts to provide educational and participatory stewardship programs would continue to have a beneficial effect on water resources and hydrologic processes due to increased public understanding and support for resource protection and management—the impact would be long term, minor, beneficial, and monumentwide.

Conclusion
Overall, the impact to water resources and hydrologic processes from the no-action alternative would be long term, range from minor adverse to minor beneficial, and be localized and monumentwide. Adverse impacts would occur from the presence and

maintenance of existing facilities (including rock revetment), visitor use. Beneficial impacts would occur from education and stewardship activities.

No impairment of water resources would result from this alternative.

Alternative 1: Connecting People with the Parks (NPS Preferred Alternative for Park Sites in Marin, San Francisco, and San Mateo Counties)

Analysis

Under alternative 1, a variety of management zones would be used that would assist in the protection of water resources and hydrologic processes. Approximately 91% of the park would be zoned using the Natural and Sensitive Resources zones.

The removal of some facilities and structures and the reclamation of disturbed building sites and roads in the Camino del Canyon and Druid Heights area and the main part of Muir Woods National Monument, including removal of the upper parking lot, would improve natural hydrologic processes. The impact would be long term, minor, beneficial, and localized. Short-term, minor, adverse impacts to water quality could occur from sedimentation and runoff during construction and restoration activities.

Impacts to floodplains would be the same as described under the no-action alternative, except for those associated with the removal of the upper parking area and restoration of the site to a natural area. The removal of the upper parking area would eliminate the impervious surface at the site, restoring floodwater capacity and natural floodplain function—resulting in a long-term, minor, beneficial impact.

Visitor access and use would be expanded under alternative 1, potentially resulting in some increase in erosion along trails and at primary visitor use areas that could have impacts on water quality—the impact would be long term, negligible to minor, adverse, and localized.

New recreational development (new facilities at Bridge 4 and welcome center/shuttle parking at Highway 101) could have short-term, negligible to minor, adverse, localized impacts on water quality from increased erosion and sedimentation, and the potential for chemical contamination resulting from inadvertent chemical spills from heavy equipment at construction sites. Similar impacts to water quality could occur over the long term due to the increased potential for fecal coliform contamination and urban pollutants. These activities would result in long-term, minor, adverse, localized impacts to water quality. However, the new restroom facility may reduce the presence of human waste in Muir Woods National Monument and the associated water quality impacts.

Impacts from expanded NPS educational and stewardship programs would enhance the beneficial effect on water resources and hydrologic processes due to increased public understanding and support for resource protection and management—the impact would be long term, minor, beneficial, and monumentwide.

Conclusion

Overall, the impact to water-related resources from alternative 1 would be short and long term, range from negligible adverse to minor beneficial, and be localized and parkwide. Adverse impacts would occur from the presence and maintenance of existing facilities

(including rock revetment), new recreational development, and expanded visitor use. Beneficial impacts would occur from trail and road maintenance and the restoration of disturbed sites and removal of the upper parking area.

No impairment of water resources would result from this alternative.

Alternative 2: Preserving and Enjoying Coastal Ecosystems

Analysis

Under alternative 2, a variety of management zones would be used that would assist in the protection of water resources and hydrologic processes. Approximately 99% of the park would be zoned using the Natural and Sensitive Resources zones.

Alternative 2 would reduce impacts to water quality by eliminating erosion from unsustainable trails and unneeded management roads, resulting in long-term, minor to moderate, beneficial, localized impacts. Short-term, minor, adverse impacts to water quality could occur from sedimentation and runoff during construction and restoration activities.

The substantial removal of facilities and structures and the reclamation of disturbed building sites and road in the Camino del Canyon and Druid Heights area and the main part of Muir Woods National Monument, as well as the removal of the upper and lower parking areas, would improve the natural hydrologic processes. The impact would be long term, moderate, beneficial, and localized. Short-term, minor, adverse impacts to water quality could occur from sedimentation and runoff during construction and restoration activities.

Impacts to floodplains would include the removal of the upper and lower asphalt parking areas and the restoration of about 6,700 linear feet of Redwood Creek (including rock revetment) and its floodplain. This would restore floodwater capacity and natural floodplain function and improve riparian wetlands and hydrologic processes. Water flow and floodplain function would also be restored by removing or redesigning bridges. These activities would result in long-term, moderate to major, beneficial impacts on floodplains and related water resources.

Impacts from expanded NPS educational and stewardship programs would enhance the beneficial effect on water resources and hydrologic processes due to increased public understanding and support for resource protection and management—the impact would be long term, minor, beneficial, and monumentwide.

Conclusion

Overall, the impact to water-related resources from alternative 2 would be short and long term, range from minor adverse to moderate-major beneficial, and be localized. Adverse impacts would occur from expanded visitor use and restoration activities. Beneficial impacts would occur from the restoration of disturbed sites, removal of structures, facilities, roads, and asphalt parking areas and substantial creek and floodplain restoration.

No impairment of water resources would result from this alternative.

Alternative 3: Focusing on National Treasures (*NPS Preferred Alternative for Muir Woods National Monument*)

Analysis

Under alternative 3, a variety of management zones would be used that would assist in the protection of water resources and hydrologic processes. Approximately 85% of the park would be zoned using the Natural and Sensitive Resources zones.

Alternative 3 would reduce impacts to water quality by reducing erosion from unsustainable trails and roads, resulting in long-term, minor, beneficial, localized impacts. Short-term, minor, adverse impacts to water quality could occur from sedimentation and runoff during construction and restoration activities.

The removal of facilities, structures, roads, and the reclamation of disturbed building sites in the Camino del Canyon and Druid Heights area and the main part of Muir Woods National Monument, as well as the removal of the upper parking area, would improve natural hydrologic processes. The impact would be long term, minor, beneficial, and localized. Short-term, minor, adverse impacts to water quality could occur from sedimentation and runoff during construction activities.

Impacts to floodplains would include the removal of the upper parking area and conversion of the remaining asphalt surface to a more pervious surface, as well as targeted restoration of Redwood Creek (including rock revetment) and its floodplain. This would restore flood water capacity and natural floodplain function and improve riparian wetlands and hydrologic processes. Water flow and floodplain function would also be restored by removing or redesigning bridges. These activities would result in long-term, moderate, beneficial impacts on floodplains and related water resources.

Visitor access and use would be expanded under alternative 3, potentially resulting in some increase in erosion along trails and at primary visitor use areas that could have impacts on water quality – the impact would be long term, negligible to minor, adverse, and localized.

The expanded NPS interpretive, educational and stewardship programs would engage many more visitors and could have a long-term, moderate, beneficial effect on water resources and hydrologic processes due to increased public understanding and support for resource protection and management—the impact would be long term, moderate, beneficial, and monumentwide.

Conclusion

Overall, the impacts to water-related resources from alternative 3 would be short and long term, range from negligible adverse to moderate beneficial, and be localized. Adverse impacts would occur from the presence and maintenance of existing facilities (including rock revetment), new recreational development, expanded visitor use, and construction and restoration activities. Beneficial impacts would occur from the restoration of disturbed sites, removal of the upper parking area, improvements to Redwood Creek, and restoration of the Camino del Canyon and Druid Heights area.

No impairment of water resources would result from this alternative

NATURAL RESOURCES – BIOLOGICAL RESOURCES

Habitat (Vegetation and Wildlife)

No-action Alternative

Analysis

Under the no-action alternative, the presence and maintenance (or lack of maintenance in some cases) of existing facilities (including structures, parking lots, roads, and trails) would continue to cause localized impacts to vegetation and wildlife habitat by fragmenting natural areas and increasing the potential for exotic plant species to displace native species and affect native habitat. The rock revetment that lines Redwood Creek, and the trails in the floodplain, are affecting vegetation and wildlife habitat by limiting natural hydrologic process that support natural conditions. Furthermore, the developed and hardened trails (such as boardwalks) themselves act as barriers to wildlife movement on the ground and in the forest canopy. The impact of these activities would be long term, moderate, adverse, and localized, but would occur throughout the monument.

Rehabilitating disturbed sites would continue to improve the integrity and diversity of habitats available to aquatic and terrestrial organisms. Ongoing vegetation management, including the use of prescribed fire, and monitoring of plants and wildlife allows the National Park Service to improve native habitat conditions. The impact of these activities would be long term, minor, beneficial, and localized.

Recreational use would continue to reduce habitat integrity by trampling plants, introducing and increasing the spread of exotic species, causing disturbance (flushing and displacement) to animals, and increasing the potential for human-wildlife conflict resulting from habituation due to the presence of humans and the introduction of unnatural food sources. Recreational use also generates noise and unnatural light sources that affect wildlife. These activities would result in long-term, minor to moderate, adverse, localized impacts throughout the monument.

Park Service efforts to provide educational and participatory stewardship programs would continue to have a beneficial effect on water resources and hydrologic processes due to increased public understanding and support for resource protection and management—the impact would be long term, minor, beneficial, and monumentwide.

Conclusion

Overall, the impact to vegetation and wildlife habitat from the no-action alternative would be long term, range from minor-moderate adverse to minor beneficial, and be localized and monumentwide. Adverse impacts would occur from the presence and maintenance of existing facilities and visitor use. Beneficial impacts would occur from restoration and ongoing management and monitoring activities.

No impairment of vegetation or wildlife resources would result from this alternative.

Alternative 1: Connecting People with the Parks (NPS Preferred Alternative for Park Sites in Marin, San Francisco, and San Mateo Counties)

Analysis

Under alternative 1, a variety of management zones would be used that would assist in the protection of vegetation and wildlife habitat. Approximately 91% of the park would be zoned using the Natural and Sensitive Resources zones.

The removal of facilities/structures and the reclamation of disturbed building sites in the Muir Woods Addition area and the main part of Muir Woods, as well as the removal of the upper parking lot, would improve vegetation and wildlife habitat by improving habitat structure and the diversity of habitats available to support various species' needs. Human-wildlife conflicts would be reduced because the food concession in the monument would be eliminated, resulting in less wildlife habituation—resulting in a beneficial impact. These kinds of activities would reduce environmental stressors and increase the resiliency of species and systems to the effects of climate change. The impact would be long term, minor to moderate, beneficial, and localized. Short-term, minor, adverse impacts to habitat could occur during construction activities.

Visitor access and use would be expanded under alternative 1, potentially resulting in additional impacts to vegetation (trampling) and wildlife (disturbance) along trails and at primary visitor use areas—the impact would be long term, minor, adverse, and localized.

New recreational development (new facilities at Bridge 4 and welcome center at Highway 101) would have long-term, negligible, adverse, localized impacts on vegetation and wildlife due to the permanent loss of plants and wildlife habitat within the construction footprint. Short-term, minor, adverse impacts to vegetation would also occur from injury or loss of plants during construction activities; however, the area would be replanted with native plants and the natural habitat would be reclaimed. Similarly, short-term adverse impacts to wildlife, such as disturbance, would occur during construction.

Impacts from expanded NPS educational and stewardship programs would enhance the beneficial effect on impacts to habitats due to increased public understanding and support for resource protection and management—the impact would be long term, minor, beneficial, and monumentwide.

Conclusion

Overall, the impact to vegetation and wildlife habitat from alternative 1 would be short and long term. They would range from negligibe adverse to minor or moderate beneficial and would be localized as well as monumentwide. Adverse impacts would occur from new recreational development and expanded visitor use. Beneficial impacts would occur from the restoration of disturbed sites.

No impairment of vegetation or wildlife resources would result from this alternative.

Alternative 2: Preserving and Enjoying Coastal Ecosystems

Analysis

Under alternative 2, a variety of management zones would be used that would assist in the protection of vegetation and wildlife habitat. Approximately 99% of the park would be zoned using the Natural and Sensitive Resources zones.

Nearly all of the built environment would be removed from Muir Woods—facilities/structures in the Muir Woods Addition area as well as in the main part of Muir Woods, the upper and lower parking areas, unneeded management roads, and several miles of trails. Restoration of about 6,700 linear feet of Redwood Creek would improve habitat structure and the diversity of habitats available to support various species' needs—an enhancement for aquatic and terrestrial organisms. Restoring the creek and its floodplain function would result in increased soil deposition that would assist in the recruitment of redwood trees. Human-wildlife conflicts would be reduced because the food concession in the monument would be eliminated, resulting in less wildlife habituation—a beneficial impact. These kinds of activities would reduce environmental stressors and increase the resiliency of species and systems to the effects of climate change. The impact would be long term, moderate to major, beneficial, and localized.

Short-term, minor, adverse impacts to vegetation would also occur from injury or loss of plants during construction activities; however, the area would be replanted with native plants and the natural habitat would be reclaimed. Similarly, short-term adverse impacts to wildlife, such as disturbance, would occur during construction.

Impacts from visitor access and use would be less than those described in the no-action alternative because it would be limited and highly controlled, resulting in long-term, minor, beneficial, localized impacts. Some impacts to vegetation (trampling) and wildlife (disturbance) along trails and at primary visitor use areas would still occur.

Impacts from an expanded NPS educational and stewardship programs would enhance the beneficial effect on habitats due to increased public understanding and support for resource protection and management. In addition, partnering with other agencies to manage visitor access and promote restoration and habitat management as part of the UNESCO Biosphere Reserve would elevate this issue and could result in benefits to vegetation and wildlife habitat. These actions would result in long-term, minor, beneficial, and monumentwide impacts.

Conclusion

Overall, the impact to vegetation and wildlife habitat from alternative 2 would be short and long term. They would range from minor adverse to moderate or major beneficial and would be localized and monumentwide. Adverse impacts would occur from visitor use and construction activities. Beneficial impacts would occur from the restoration of disturbed sites and creeks.

No impairment of vegetation or wildlife resources would result from this alternative.

Alternative 3: Focusing on National Treasures (*NPS Preferred Alternative For Muir Woods National Monument*)

Analysis

Under alternative 3, a variety of management zones would be used that would assist in the protection of vegetation and wildlife habitat. Approximately 85% of the park would be zoned using the Natural and Sensitive Resources zones.

The removal of facilities/structures and the reclamation of disturbed building sites in the Muir Woods Addition area and the main part of Muir Woods, as well as the removal of the upper parking lot, would improve vegetation and wildlife habitat by improving habitat structure and the diversity of habitats available to support various species' needs. Targeted restoration of Redwood Creek and its floodplain would improve habitat structure and the diversity of habitats available to support various species' needs—an enhancement for aquatic and terrestrial organisms. Human-wildlife conflicts would be reduced because the food concession in the monument would be eliminated, resulting in less wildlife habituation—a beneficial impact. These kinds of activities would reduce environmental stressors and increase the resiliency of species and systems to the effects of climate change. The impact would be long term, moderate, beneficial, and localized.

Short-term, minor, adverse impacts to vegetation would also occur from injury or loss of plants during construction activities; however, the area would be replanted with native plants and the natural habitat would be reclaimed. Similarly, short-term adverse impacts to wildlife, such as disturbance, would occur during construction.

New recreational development (new trails and additional visitor amenities) would cause increased habitat fragmentation and loss, resulting in long-term, minor to moderate, adverse, localized impacts.

Visitor access and use would be expanded under alternative 3, potentially resulting in additional impacts to vegetation (trampling) and wildlife (disturbance) along trails and at primary visitor use areas—the impact would be long term, minor, adverse, and localized.

The expanded NPS interpretive, educational, and stewardship programs would engage many more visitors and could have a long-term, moderate, beneficial effect on habitats due to increased public understanding and support for resource protection and management—the impact would be long term, moderate, beneficial, and monumentwide.

Conclusion

Overall, the impacts to vegetation and wildlife habitat from alternative 3 would be short and long term, range from minor adverse to moderate beneficial, and be localized and monumentwide. Adverse impacts would occur from visitor use and construction activities. Beneficial impacts would occur from the restoration of disturbed sites and creeks.

No impairment of vegetation or wildlife resources would result from this alternative.

Special Status Species (Federal and State Threatened and Endangered Species)

No-action Alternative

Introduction

In general, many of the impacts to vegetation and wildlife described in the habitat section of this part would apply to special status species. For example, visitor use and new development would result in changes that would be adverse impacts to listed species and their habitats. Likewise, vegetation management and creek restoration would result in beneficial impacts to listed species and their habitats. Keeping this in mind, the analysis provided below generalizes about the effects of land management priorities and, where possible, focuses on the impacts that specific actions included in the alternatives may have on listed species and their habitats.

Federal Threatened and Endangered

Coho salmon, Central California Coast (*Oncorhynchus kisutch*) and steelhead trout, Central California Coast (*O. mykiss*). These two listed salmonid species are analyzed together because of the similarities in their life characteristics, habitat requirements, and the effects of impacts on the two species.

Within the vicinity of Muir Woods National Monument, coho salmon are restricted to Redwood Creek and Eastkoot Creek in Marin County. Steelhead trout are restricted to Redwood Creek and the drainages to Bolinas Lagoon and Rodeo Lagoon in Marin County. Therefore, impacts would be restricted to these locations.

National Park Service activities, such as vegetation management, creek restoration, and efforts to improve water quantity and quality within the Redwood Creek watershed, would have beneficial impacts on maintaining habitat characteristics that support anadromous fish. Projects at Muir Woods National Monument (vegetation management and creek restoration) would have beneficial impacts on habitat parameters required by the two species. These projects would improve riparian vegetation and in-stream habitat complexity—resulting in improvements to spawning, rearing, and migratory habitats. Critical habitat would be affected by restoration activities. Within the immediate project area, short-term, minor, adverse, localized impacts to nearly all essential features of critical habitat (substrate, water quality, water quantity, water temperature, water velocity, cover/shelter, food, riparian vegetation, space, and safe passage conditions) would be expected. However, these short-term impacts would be outweighed by the beneficial impacts expected to occur over the long term. The National Park Service would continue to monitor coho and steelhead populations and habitat and inventory potential habitat.

Controlling and managing visitor use would reduce impacts to coho and steelhead, such as habitat alteration and direct impacts from recreational use and development; however, some adverse impacts would continue. The upper and lower parking areas, as well as the rock revetment that lines sections of Redwood Creek, would continue to adversely affect the integrity of fish habitat by impacting natural floodplain function and therefore habitat integrity—resulting in an adverse impact.

The primary threats to coho and steelhead would continue to be loss and modification of habitat, water diversions, habitat channelization, sedimentation, and degraded water

quality—adverse impacts associated with increased urbanization of the region. Collectively, impacts to coho salmon and steelhead trout resulting from NPS actions that are part of the no-action alternative (the continuation of current management and trends) would be long term, beneficial, minor, and localized. The determination of effect under Section 7 of the Endangered Species Act would be "*may affect, likely to adversely affect"* for project specific actions in the short term, and "*may affect, not likely to adversely affect"* for land use and monument management over the long term. Consultation for specific projects would occur as necessary.

Northern spotted owl (*Strix occidentalis caurina*). Suitable habitat for northern spotted owls include all evergreen forested habitat north of State Route 1 in Marin County. Within the planning area, known spotted owl populations are currently limited to Muir Woods National Monument, Homestead Valley, and the Stinson Gulch area. Therefore, impacts would be restricted to these locations.

Vegetation management actions designed to protect and enhance coniferous forest, including old-growth, second growth and remnant stands, would provide potential roosting, feeding, and nesting habitat for the owl—a beneficial impact. The National Park Service would continue to monitor owl populations and survey potential habitat. Visitor use in the area would continue to disturb owls. Barred owls would also likely continue to invade preferred spotted owl habitats—an adverse impact. Ongoing actions to reduce human-created noise and light at Muir Woods National Monument would result in improvements to habitat conditions. Current actions to reduce barred owl use and nesting would help reduce adverse impacts to spotted owls. The primary threat to the northern spotted owl in the region would continue to be the loss of habitat—an adverse impact associated with increased urbanization of the region. Other threats include expansion in the range of the barred owl, West Nile virus, changes in habitat due to Sudden Oak Death, and recreational pressure. Locally, in Muir Woods National Monument, the primary threat is from barred owls. Collectively, impacts to the northern spotted owl resulting from NPS actions that are part of the no-action alternative (the continuation of current management and trends) would be long term, minor, beneficial and localized. The determination of effect under Section 7 of the Endangered Species Act would be "*may affect, not likely to adversely affect."*

Marbled murrelet (*Brachyramphus marmoratus marmoratus*). Marbled murrelet surveys of Muir Woods National Monument have been completed but no murrelets have been observed. Vegetation management actions designed to protect and enhance old-growth redwood forest at the monument would continue to provide suitable nesting locations for the murrelet—a beneficial impact. The primary threat to the marbled murrelet would continue to be the loss of nesting habitat and increased nest predation due to high corvid (i.e., crows and jays) densities—this would result in an adverse impact associated with increased urbanization of the region. Collectively, impacts to the marbled murrelet resulting from NPS actions that are part of the no-action alternative (the continuation of current management and trends) would be long term, minor, beneficial and localized. The determination of effect under Section 7 of the Endangered Species Act would be "*may affect, not likely to adversely affect."*

Conclusion

Table 21: Potential Impacts to Special Status Species of Muir Woods National Monument, No-action Alternative

Species	Status	ESA Determination
Coho salmon, Central California Coast ESU (*Oncorhynchus kisutch*)	Federal threatened; State endangered	"*may affect, likely to adversely affect"* for project specific actions in the short term, and "*may affect, not likely to adversely affect"* for land use and monument management over the long term
Steelhead trout, Central California Coast ESU (*Oncorhynchus mykiss*)	Federal threatened	"*may affect, likely to adversely affect"* for project specific actions in the short term, and "*may affect, not likely to adversely affect"* for land use and monument management over the long term
Northern spotted owl (*Strix occidentalis caurina*)	Federal threatened	"*may affect, not likely to adversely affect*"
Marbled murrelet (*Brachyramphus marmoratus marmoratus*)	Federal threatened; State endangered	"*may affect, not likely to adversely affect*"

No impairment of listed species would result from this alternative.

Alternative 1: Connecting People with the Parks (NPS Preferred Alternative for Park Sites in Marin, San Francisco, and San Mateo Counties)

Introduction

Under alternative 1, a variety of management zones would be used that would assist in the protection of special status species. Approximately 91% of the monument would be zoned using the Natural and Sensitive Resources zones.

Federal Threatened and Endangered

Coho salmon, Central California Coast (*Oncorhynchus kisutch*) and steelhead trout, Central California Coast (*O. mykiss*). In addition to the impacts described under the no-action alternative, restoration activities (removal of some buildings and reclamation of native habitat in the Camino del Canyon and Druid Heights area, removal of the upper asphalt parking lot at the entrance, and relocation of trails) under alternative 1 would improve water quality and habitat conditions – a beneficial impact. The construction of new facilities at Bridge 4 would affect water quality and instream habitat causing short-term, minor, adverse, localized impacts to salmonids due to construction and restoration activities. Collectively, impacts to coho salmon and steelhead trout resulting from

alternative 1 would be long term, beneficial, minor, and localized. The determination of effect under Section 7 of the Endangered Species Act would be "*may affect, likely to adversely affect"* for project specific actions in the short term, and "*may affect, not likely to adversely affect"* for land use and monument management over the long term. Consultation for specific projects would occur as necessary.

Northern spotted owl (***Strix occidentalis caurina*****).** In addition to the impacts described under the no-action alternative, restoration activities (removal of some buildings and reclamation of native habitat in the Camino del Canyon and Druid Heights area and removal of the upper parking lot at the entrance) under alternative 1 would improve resource conditions and integrity, which could result in an increase of suitable nesting habitat for spotted owls at Muir Woods National Monument. Impacts to the northern spotted owl would be long term, minor, beneficial, and localized. The determination of effect under Section 7 of the Endangered Species Act would be "*may affect, not likely to adversely affect."*

Marbled murrelet (*Brachyramphus marmoratus marmoratus*). In addition to the impacts described under the no-action alternative, restoration activities (removal of some buildings and reclamation of native habitat in the Camino del Canyon and Druid Heights area and removal of the upper parking lot at the entrance) under alternative 1 would improve resource conditions and integrity, which could result in an increase of suitable nesting habitat for the marbled murrelet at Muir Woods National Monument. Impacts to the marbled murrelet would be long term, minor, beneficial, and localized. The determination of effect under Section 7 of the Endangered Species Act would be "*may affect, not likely to adversely affect."*

Conclusion

Table 22: Potential Impacts to Special Status Species of Muir Woods National Monument, Alternative 1

Species	Status	ESA Determination
Coho salmon, Central California Coast ESU (*Oncorhynchus kisutch*)	Federal threatened; State endangered	"*may affect, likely to adversely affect"* for project specific actions in the short term, and "*may affect, not likely to adversely affect"* for land use and monument management over the long term
Steelhead trout, Central California Coast ESU (*Oncorhynchus mykiss*)	Federal threatened	"*may affect, likely to adversely affect"* for project specific actions in the short term, and "*may affect, not likely to adversely affect*" for land use and monument management over the long term
Northern spotted owl (*Strix occidentalis caurina*)	Federal threatened	"*may affect, not likely to adversely affect*"

Species	Status	ESA Determination
Marbled murrelet (*Brachyramphus marmoratus marmoratus*)	Federal threatened	"*may affect, not likely to adversely affect*"

No impairment of listed species would result from this alternative.

Alternative 2: Preserving and Enjoying Coastal Ecosystems

Introduction

Under alternative 2, a variety of management zones would be used that would assist in the protection of special status species. Approximately 99% of the monument would be zoned using the Natural and Sensitive Resources zones.

Federal Threatened and Endangered

Coho salmon, Central California Coast (*Oncorhynchus kisutch*) and steelhead trout, Central California Coast (*O. mykiss*). In addition to the impacts described under the no-action alternative, restoration activities (removal of buildings and reclamation of native habitat throughout the monument, removal of the upper and most of the lower asphalt parking area, and the restoration of about 6,700 linear feet of Redwood Creek, including removal of the rock rip rap, and its floodplain) under alternative 2 would improve water quality and habitat conditions. Water flow and floodplain function would be improved by removing or redesigning bridges that constrain floodplain function. Woody debris in the creek would increase as a result of restoring natural processes and would improve habitat structure and available nutrients to coho and steelhead. All of these activities would result in improvements to spawning and rearing habitat—resulting in a beneficial impact. There would be short-term adverse impacts from construction that would be outweighed by long-term habitat improvements. Collectively, impacts to coho salmon and steelhead trout resulting from alternative 2 would be long term, beneficial, moderate, and localized. The determination of effect under Section 7 of the Endangered Species Act would be "*may affect, likely to adversely affect"* for project specific actions in the short term, and "*may affect, not likely to adversely affect"* for land use and monument management over the long term. Consultation for specific projects would occur as necessary.

Northern spotted owl (*Strix occidentalis caurina*). In addition to the impacts described under the no-action alternative, restoration activities (removal of buildings and reclamation of native habitat throughout the monument, removal of the upper and most of the lower parking lot at the entrance, and the restoration of the Redwood Creek and its floodplain) under alternative 2 would improve resource conditions and integrity, which could result in an increase of suitable nesting habitat for spotted owls at Muir Woods National Monument. Forage opportunities would likely improve as a result of these activities. The scale of beneficial impacts under alternative 2 is greater than under the no-action alternative. Impacts to the northern spotted owl under alternative 2 would be long term, minor to moderate, beneficial, and localized. The determination of effect under Section 7 of the Endangered Species Act would be "*may affect, not likely to adversely affect."*

Marbled murrelet (*Brachyramphus marmoratus marmoratus*). In addition to the impacts described under the no-action alternative, restoration activities (removal of buildings and reclamation of native habitat throughout the monument, removal of the upper and most of the lower parking lot at the entrance, and the restoration of the Redwood Creek and its floodplain) under alternative 2 would improve resource conditions and integrity, which could result in an increase of suitable nesting habitat for the marbled murrelet at Muir Woods National Monument. Forage opportunities would likely improve as a result of these activities. The scale of beneficial impacts under alternative 2 is greater than under the no-action alternative. Impacts to the marbled murrelet under alternative 2 would be long term, minor to moderate, beneficial, and localized. The determination of effect under Section 7 of the Endangered Species Act would be "*may affect, not likely to adversely affect.*"

Conclusion

Table 23: Potential Impacts to Special Status Species of Muir Woods National Monument, Alternative 2

Species	Status	ESA Determination
Coho salmon, Central California Coast ESU (*Oncorhynchus kisutch*)	Federal threatened; State endangered	"*may affect, likely to adversely affect"* for project specific actions in the short term, and "*may affect, not likely to adversely affect"* for land use and monument management over the long term
Steelhead trout, Central California Coast ESU (*Oncorhynchus mykiss*)	Federal threatened	"*may affect, likely to adversely affect"* for project specific actions in the short term, and "*may affect, not likely to adversely affect"* for land use and monument management over the long term
Northern spotted owl (*Strix occidentalis caurina*)	Federal threatened	"*may affect, not likely to adversely affect"*
Marbled murrelet (*Brachyramphus marmoratus marmoratus*)	Federal threatened; State endangered	"*may affect, not likely to adversely affect*"

No impairment of listed species would result from this alternative.

Alternative 3: Focusing on National Treasures (*NPS Preferred Alternative for Muir Woods National Monument*)

Introduction

Under alternative 3, a variety of management zones would be used that would assist in the protection of special status species. Approximately 85% of the monument would be zoned using the Natural and Sensitive Resources zones.

Federal Threatened and Endangered

Coho salmon, Central California Coast (*Oncorhynchus kisutch*) and steelhead trout, Central California Coast (*O. mykiss*). In addition to the impacts described under the no-action alternative, restoration activities (removal of buildings and reclamation of native habitat in the Camino del Canyon and Druid Heights area, removal of the upper asphalt parking lot at the entrance, and relocation of trails) under alternative 3 would improve water quality and habitat conditions—a beneficial impact. Targeted, but limited, restoration of Redwood Creek would improve resource conditions and integrity, resulting in improvements to spawning and rearing habitat. Water flow and floodplain function would be improved by removing or redesigning bridges that constrain floodplain function. There would be short-term adverse impacts from construction and restoration that would be outweighed by long-term habitat improvements. Collectively, impacts to coho salmon and steelhead trout resulting from alternative 3 would be long term, beneficial, minor to moderate, and localized. The determination of effect under Section 7 of the Endangered Species Act would be "*may affect, likely to adversely affect"* for project specific actions in the short term, and "*may affect, not likely to adversely affect"* for land use and monument management over the long term. Consultation for specific projects would occur as necessary.

Northern spotted owl (***Strix occidentalis caurina*).** In addition to the impacts described under the no-action alternative, restoration activities (removal of buildings and reclamation of native habitat in the Camino del Canyon and Druid Heights area and removal of the upper parking lot at the entrance) under alternative 3 would improve resource conditions and integrity, which could result in an increase of suitable nesting habitat for spotted owls. Realignment of the Old Muir Woods Road would reclaim some of the owl's mapped foraging habitat. Targeted, but limited, restoration of Redwood Creek would improve resource conditions and integrity, resulting in potential improvements to nesting and foraging habitats. Visitor use would affect more areas of the monument under alternative 3, potentially increasing disturbance to individuals and potential owl nesting habitat—resulting in a long-term, minor, adverse, localized impact. Collectively, impacts to the northern spotted owl from alternative 3 would be long term, minor, beneficial, and localized. The determination of effect under Section 7 of the Endangered Species Act would be "*may affect, not likely to adversely affect."*

Marbled murrelet (*Brachyramphus marmoratus marmoratus*). In addition to the impacts described under the no-action alternative, restoration activities (removal of buildings and reclamation of native habitat in the Camino del Canyon and Druid Heights area and removal of the upper parking lot at the entrance) under alternative 3 would improve resource conditions and integrity, which could result in an increase of suitable nesting habitat for the marbled murrelet at Muir Woods National Monument. Targeted, but limited, restoration of Redwood Creek would improve resource conditions and integrity, resulting in potential improvements to nesting and foraging habitats. Impacts to

the marbled murrelet would be long term, minor, beneficial, and localized. The determination of effect under Section 7 of the Endangered Species Act would be "*may affect, not likely to adversely affect.*"

Conclusion

Table 24: Potential Impacts to Special Status Species of Muir Woods National Monument, Alternative 3

Species	Status	ESA Determination
Coho salmon, Central California Coast ESU (*Oncorhynchus kisutch*)	Federal threatened; State endangered	"*may affect, likely to adversely affect*" for project specific actions in the short term, and "*may affect, not likely to adversely affect*" for land use and monument management over the long term
Steelhead trout, Central California Coast ESU (*Oncorhynchus mykiss*)	Federal threatened	"*may affect, likely to adversely affect*" for project specific actions in the short term, and "*may affect, not likely to adversely affect*" for land use and monument management over the long term
Northern spotted owl (*Strix occidentalis caurina*)	Federal threatened	"*may affect, not likely to adversely affect*"
Marbled murrelet (*Brachyramphus marmoratus marmoratus*)	Federal threatened; State endangered	"*may affect, not likely to adversely affect*"

No impairment of listed species would result from this alternative.

CULTURAL RESOURCES – HISTORIC STRUCTURES, HISTORIC DISTRICTS, AND CULTURAL LANDSCAPES

No-action Alternative

Analysis

Under this alternative, the park would continue to manage Muir Woods National Monument as outlined in the 1980 general management plan. The no-action alternative would result in few changes to contributing features of historic structures, districts and cultural landscapes within the project area. The park would continue to stabilize, preserve, and rehabilitate the contributing historic structures and landscape features of this district in accordance with the *Secretary of the Interior's Standards for the Treatment of Historic Properties*, though much of this work would be subject to funding availability.

Historic structures would continue to be preserved, rehabilitated, and maintained for use by park operations and visitor services. The primary arrival and entrance area would remain in the general location and condition as currently exists, with some improvements made for visitor services, access and circulation including shuttle drop-off and loading, pedestrian connections, and parking. Historic trails and roads, and other contributing landscape features, would be preserved and maintained. Efforts would be made to stabilize those landscape features that contribute to the historic district and whose condition is deteriorating. Overall, these ongoing preservation measures would result in a long-term, negligible to minor, beneficial impact and long-term, minor, adverse impact on contributing structures and landscapes of this historic district.

Dipsea Trail – The trail would be maintained and improvements would address erosion and natural resource issues resulting in long-term, minor, beneficial and adverse impacts.

Druid Heights – Historic buildings and landscape features would be stabilized to arrest any further loss of historic fabric, and preserved over time. This would result in a long-term, minor, beneficial and adverse impact. The national register eligibility of this property must be determined.

Hillwood Camp – Historic buildings and landscape features would be stabilized to arrest any further loss of historic fabric, and preserved over time and continue to be adaptively reused. This would result in a long-term, minor. beneficial and adverse impact.

Conclusion

When combined with the effects of the actions common to all alternatives, the impact to historic structures and landscape resources in Muir Woods National Monument under the no action alternative would be long-term, minor, beneficial and adverse. Under this alternative, the Section 106 determination of effect on historic structures, districts, and cultural landscapes for Muir Woods National Monument, would be *no adverse effect*.

Because there would be no major adverse impacts to a resource or value whose conservation is 1) necessary to fulfill specific purposes identified in the establishing legislation or proclamation of Muir Woods National Monument; 2) key to the natural or cultural integrity of the momument; or 3) identified as a goal in the monument's general management plan or other relevant NPS planning documents, there would be no impairment of the monument's historic structures or districts or cultural landscapes.

Alternative 1: Connecting People with the Parks

Analysis

Under this alternative, the park would enhance programs, facilities, and trails that access the redwood forest and connect communities to the park and surrounding open space. Significant historic structures and landscape features would be preserved and rehabilitated, with the introduction of some new compatible elements to accommodate these programs and enhance the visitor experience. Changes would be made to the arrival and entrance area to the park; an offsite welcome center for the shuttle system, with parking and visitor services, would be an important feature under this alternative. The monument's existing entrance area would be redesigned to enhance the visitor's arrival experience, protect resources, and improve safety. A compatibly designed, modest arrival facility would be provided and could include a shuttle stop, passenger drop-off/pick-up

area, a sheltered waiting area, park orientation, restrooms, food service, and bookstore. Realignment of portions of Muir Woods Road would also be considered to improve its operational safety and visitor access. These changes to the arrival sequence and entrance area would result in long-term, minor, adverse impacts.

The park would continue to stabilize, preserve, and rehabilitate the contributing historic structures and landscape features of this district in accordance with the *Secretary of the Interior's Standards for the Treatment of Historic Properties.* The Administrative-Concession Building would be rehabilitated for interpretive, educational, and stewardship programs with the Superintendent's Residence, Garage, and Equipment Shed rehabilitated for park operations and administration. Nonhistoric structures would be removed. These actions would result in long-term, minor, beneficial and adverse effects. The future use of the Old Inn would be determined through more detailed site planning that would include an evaluation of its historic significance and integrity, and consider its reuse for visitor services or operational needs, or potential removal.

The park would maintain much of the present system of trails through the forest while some existing facilities and use areas, such as the entrance area and parking lots, would be modified or relocated. Historic trails and roads, and other contributing landscape features, would be stabilized, preserved and maintained, which would result in long term, minor, beneficial and adverse impacts on these landscape features. New elements would be introduced to the cultural landscape, such as compatibly designed, new restrooms and drinking water facilities near Bridge 4, resulting in long-term, minor, adverse impacts.

Dipsea Trail – The trail would be maintained and improvements would address erosion and natural resource issues resulting in long-term, minor, beneficial and adverse impacts.

Druid Heights – the majority of the Camino del Canyon and Druid Heights area would be managed to preserve and restore the natural setting. All nonhistoric structures would be removed and the main access drive converted to a trail. Due to the emphasis on natural resource management, it is anticipated that impacts to historic resources will be long-term, moderate, and adverse. The national register eligibility of this property must be determined.

Hillwood Camp – Camp Hillwood and its immediate surroundings would be rehabilitated and adaptively reused for day use and/or overnight educational programs. These uses would be compatible with the historic setting and their preservation would result in a long-term, moderate, beneficial, and long-term, minor, adverse impact.

Conclusion

When combined with the effects of the actions common to all alternatives, the impact to historic structures and landscape resources in Muir Woods National Monument under alternative 1 would be long-term, negligible to minor, beneficial, and long-term, minor to moderate, adverse. Under this alternative, the Section 106 determination of effect on historic structures, districts, and cultural landscapes for Muir Woods National Monument, would be *adverse effect*.

Because there would be no major adverse impacts to a resource or value whose conservation is 1) necessary to fulfill specific purposes identified in the establishing legislation or proclamation of Muir Woods National Monument; 2) key to the natural or cultural integrity of the momument; or 3) identified as a goal in the monument's general

management plan or other relevant NPS planning documents, there would be no impairment of the monument's historic structures or districts or cultural landscapes.

Alternative 2: Preserving and Enjoying Coastal Ecosystems

Analysis

Under this alternative, the visitor experience would be more primitive than exists today, as the majority of the built environment would be removed. All visitors would arrive by shuttle, bicycle or on foot. Similar to Alternative 1, an off-site welcome center for visitors would be developed and shuttle service would run year round to take visitors to the national monument. The park entrance would be relocated to the current "annex" parking lot and designed to accommodate the shuttle operations. The existing arrival area, including the upper parking area and some of the lower parking lot, restrooms, and visitor center, would be removed to restore the natural setting.

To more fully restore the primeval character and natural conditions of the old growth redwood forest, several historic buildings within the Muir Woods National Monument Historic District, such as the former Superintendent's Residence and its associated buildings and the Administration-Concession Building, as well as associated site features, would be removed. The Old Inn, which may be a contributing building to the historic district, would be retained for use by park administrative and limited maintenance operations. Where not in conflict with natural resource goals, historic trails and structures could be retained and adaptively reused. The historic trail system throughout the monument would be redesigned to a more pristine setting that emphasized natural resource preservation of the historic redwood groves (including the Redwood Forest, Bohemian Grove, and Cathedral Grove). However, many historic trails and bridges could be removed, relocated, or redesigned to enhance the natural resource conditions. Historic landscape features, such as the stone revetment erosion-control structures in Redwood Creek constructed by the Civilian Conservation Corps, would be removed for natural resource and floodplain system restoration.

In accordance with the proposed mitigation measures, prior to the removal of any national register-contributing or national register-eligible structure, appropriate recordation of the building would be prepared in accordance with Section 110 (b) of the National Historic Preservation Act and the documentation submitted to the Historic American Buildings Survey / Historic American Engineering Record / Historic American Landscapes Survey (HABS/HAER/HALS) program. Taken together, actions under this alternative that include the removal of historic buildings and landscape features that contribute to the District's national register status would result in a long term, major, adverse impact.

Dipsea Trail – Under this alternative, a portion of the trail would be rerouted at the Redwood Creek crossing to reduce current impacts on adjacent natural resources. The balance of the trail would be maintained along its historic alignment. This would result in a long term, minor, adverse impact.

Druid Heights – all structures and landscape features associated with this site would be removed and the area's natural habitat and drainage systems restored. In accordance with mitigation measures stipulated in this document, the site would be documented and

recorded in accordance with appropriate HABS/HAER/HALS standards. This would result in a long term, major, adverse effect.

Hillwood Camp – All structures and landscape features associated with this site would be removed and the area's native habitat and natural drainage systems restored. In accordance with mitigation measures stipulated in Part 8 of this document, the site would be documented and recorded in accordance with appropriate HABS/HAER/HALS standards. This would result in a long term, major, adverse effect.

Conclusion

When the actions of alternative 2 are combined with the effects of the actions common to all alternatives, the impact to historic structures and landscape resources in Muir Woods National Monument, as well as Druid Heights and Hillwood Camp, would be long-term, major, and adverse. Under this alternative, the Section 106 determination of effect on cultural landscape resources in Muir Woods National Monument would be *adverse effect*.

This alternative would result in impairment with the removal of the historic buildings and landscape features of the Muir Woods National Monument National Register Historic District, Druid Heights, and Hillwood Camp.

Alternative 3: Focusing on National Treasures

(NPS Preferred Alternative for Muir Woods National Monument)

Analysis

Under this alternative, the park would present the monument as a contemplative outdoor museum for visitors to discover and learn about the primeval forest ecosystem (including the preserved redwood forest, and Bohemian and Cathedral Grove) and the monument's place in the history of the American conservation movement. Accordingly, the majority of historic structures and landscape features associated with those themes would be rehabilitated and adaptively used to support visitor programming and services.

Similar to Alternative 1, an offsite welcome center for the shuttle system, with parking and visitor services, would be an important feature under this alternative. The monument's existing entrance area would be redesigned to enhance the visitor's arrival experience, protect resources, and improve safety. A compatibly designed, modest arrival facility would be provided and could include a shuttle stop, passenger drop-off/pick-up area, a sheltered waiting area, park orientation, restrooms, food service, and bookstore. Realignment of portions of Muir Woods Road and restrictions on shoulder parking would also be considered to improve its operational safety and visitor access and. These changes to the arrival sequence and entrance area would result in long-term, minor, adverse impacts.

Under Alternative 3, historically significant buildings in the Muir Woods National Monument Historic District such as the Administration-Concession Building and Superintendent's Residence and associated buildings, would be rehabilitated and adaptively used to support visitor programming and services. Nonhistoric additions would be removed. These actions would result in long-term, minor, beneficial and adverse impacts. The future use of the Old Inn would be determined through more detailed site planning that would include an evaluation of its historic significance and

integrity, and consider its reuse for visitor services or operational needs, or potential removal.

Historic trails and roads, and other contributing landscape features, would be preserved and maintained; some new trails may be constructed to enhance the visitor experience, but would be designed to be compatible with the historic setting. Relocation or redesign of some historic trails or segments of trails, and the removal of selected portions of the erosion-control stone revetments in Redwood Creek constructed by the Civilian Conservation Corps would result in long-term, minor, adverse impacts because of the loss of historic features.

Dipsea Trail – The Dipsea Trail would be preserved and maintained and would be highlighted by park staff as an interpretive trail for visitors to understand the area's history. This would have a long term, minor, beneficial and adverse impact.

Druid Heights – Under Alternative 3, some historic structures and landscape features associated with the bohemian community at Druid Heights would be preserved. Camino del Canyon would be converted to a trail with access by foot or light service vehicle. These modifications would result in long term, minor, adverse and beneficial impacts, depending upon the extent of historic structure and landscape preservation work performed. The national register eligibility of this property must be determined.

Hillwood Camp – The historic structures and landscape features would be preserved and rehabilitated for educational and interpretive programs, when not in conflict with natural resource conservation goals, and would have a beneficial effect. However, some buildings at Camp Hillwood could be removed, resulting in long-term, adverse impacts of minor intensity. A segment of Conlon Avenue would be downgraded from its current road status and realigned to improve drainage and natural processes for this tributary of Redwood Creek. Overall these changes would result in a long term, minor, beneficial and adverse impacts due to the potential removal of some historic structures.

Conclusion

When combined with the effects of the actions common to all alternatives, the impact to historic structures and landscape resources in Muir Woods National Monument under Alternative 3 would be long-term, minor, beneficial and adverse. Under this alternative, the Section 106 determination of effect on historic structures, districts, and cultural landscapes for Muir Woods National Monument, would be *no adverse effect*.

Because there would be no major adverse impacts to a resource or value whose conservation is 1) necessary to fulfill specific purposes identified in the establishing legislation or proclamation of Muir Woods National Monument; 2) key to the natural or cultural integrity of the momument; or 3) identified as a goal in the monument's general management plan or other relevant NPS planning documents, there would be no impairment of the monument's historic structures or districts or cultural landscapes.

CULTURAL RESOURCES – ARCHEOLOGICAL RESOURCES

No-action Alternative

Analysis

Currently, there is little information available concerning prehistoric and historic archeological resources at Muir Woods National Monument. Comprehensive archeological surveys and consultation with American Indian tribes regarding archeological sites with ethnographic significance are needed. However, those known archeological resources, which include eight archeological sites associated with the Muir Woods National Monument Historic District as well as two isolated sites, are protected and preserved. Any additional sites identified through future inventories would also be protected. Without a comprehensive approach to archeological surveys and preservation, however, archeological resources may be subject to potential deterioration, lack of adequate protection in some cases, and possible loss of integrity from natural processes and/or inadvertent visitor activity. Actions under this alternative could have long-term to permanent, minor to moderate, adverse impacts on archeological resources.

Conclusion

Little information is available concerning prehistoric and historic archeological resources at Muir Woods National Monument. A comprehensive archeological survey and consultation with American Indian tribes are needed. Known archeological resources are protected and preserved as they become identified. Until a comprehensive survey is implemented, there is a potential for deterioration and lack of protection as a result of natural process and/or inadvertent visitor activity. Actions under this alternative could have long-term to permanent, minor to moderate, adverse impacts on archeological resources.

Under this alternative, the Section 106 determination of effect on archeological resources would be *adverse effect.*

Because there would be no major adverse impacts to a resource or value whose conservation is 1) necessary to fulfill specific purposes identified in the establishing legislation or proclamation of Muir Woods National Monument; 2) key to the natural or cultural integrity of the national monument; or 3) identified as a goal in the monument's general management plan or other relevant NPS planning documents, there would be no impairment of the national monument's archeological resources or values.

Alternative 1: Connecting People with the Parks (NPS Preferred Alternative for Park Sites in Marin, San Francisco, and San Mateo Counties)

Analysis

Under this alternative, identified archeological resources, such as the eight archeological sites associated with the Muir Woods National Monument Historic District and two isolated sites, would be protected from unauthorized removal or other destructive activities. Modification or relocation of trails and existing facilities could affect the integrity of some archeological resources, but every effort would be undertaken to avoid

known or discovered archeological sites. If such sites could not be avoided, mitigation procedures would be undertaken in consultation with the California state historic preservation office.

This alternative would result in more opportunities to identify, evaluate, and provide stabilization, security, or other protection to archeological resources commensurate with their significance and sensitivity because the majority of the monument would be in the Natural zone. In the Diverse Opportunities and Scenic Corridor management zones archeological resources would be stabilized and/or rehabilitated and incorporated into visitor opportunities, thus enhancing their protection through increased awareness and understanding.

Although some archeological resources in the national monument could be lost (resulting in permanent adverse impacts of minor intensity), these actions would generally result in long-term, beneficial impacts on archeological resources.

Conclusion

Identified archeological resources would continue to be protected and preserved under this alternative. Generally, this alternative would result in more opportunities to identify, evaluate, and provide stabilization, security, or other protection to archeological resources because the majority of the monument would be in the Natural zone. Archeological resources in the Scenic Corridor and Diverse Opportunities zones would be stabilized or rehabilitated and incorporated into visitor opportunities. Although some archeological resources could be lost (resulting in permanent adverse impacts of minor intensity), these actions would generally result in long-term, beneficial impacts on archeological resources.

Under this alternative, the Section 106 determination of effect on archeological resources in Muir Woods National Monument would be *no adverse effect*.

No impairment of archeological resources would result from this alternative.

Alternative 2: Preserving and Enjoying Coastal Ecosystems

Analysis

Identified archeological resources, such as the eight archeological sites associated with the Muir Woods National Monument Historic District and two isolated sites, would be protected from unauthorized removal or other destructive activities. Removal of much of the built environment, redesign of the monument's trail system, and restoration of natural processes could affect the integrity of some archeological resources, but every effort would be undertaken to avoid known or discovered archeological sites. If such sites could not be avoided, mitigation procedures would be undertaken in consultation with the California state historic preservation office.

Because much of the monument would be in the Sensitive Resources zone under this alternative, archeological resources would be identified, evaluated, and provided stabilization, security, or other protection commensurate with their significance and sensitivity.

Although some archeological resources could be lost (resulting in permanent adverse impacts of minor intensity), these actions would generally result in long-term, beneficial impacts on archeological resources.

Conclusion

Identified archeological resources would continue to be protected and preserved under this alternative. Removal of much of the built environment, redesign of the monument's trail system, and restoration of natural processes could affect the integrity of some archeological resources. Because much of the monument would be in the Sensitive Resources zone under this alternative, archeological resources would be identified, evaluated, and provided stabilization, security, or other protection commensurate with their significance and sensitivity.

Although some archeological resources could be lost (resulting permanent adverse impacts of minor intensity), these actions would generally result in long-term, beneficial impacts on archeological resources.

Under this alternative, the Section 106 determination of effect on archeological resources in Muir Woods National Monument would be *no adverse effect*.

No impairment of archeological resources would result from this alternative.

Alternative 3: Focusing on National Treasures (NPS Preferred Alternative for Muir Woods National Monument)

Analysis

Identified archeological resources, such as the eight archeological sites associated with the Muir Woods National Monument Historic District and the two isolated sites, would be protected from unauthorized removal or other destructive activities. Construction of new trails and relocation/redesign of others and restoration of some natural processes could affect the integrity of some archeological resources, but every effort would be undertaken to avoid known or discovered archeological sites. If such sites could not be avoided, mitigation procedures would be undertaken in consultation with the California state historic preservation office.

In the Interpretive Corridor management zone, which embraces the redwood groves and Redwood Creek area in this alternative, archeological resources might be incorporated into interpretive opportunities for visitors. Archeological resources in much of the rest of the monument (managed under the Sensitive Resources management none) would be identified, evaluated, and provided stabilization, security, or other protection commensurate with their significance and sensitivity.

Although some archeological resources could be lost in the national monument (resulting in permanent adverse impacts of minor intensity), these actions would generally result in long-term, beneficial impacts on archeological resources.

Conclusion

Identified archeological resources would be protected and preserved. In the Interpretive Corridor zone, which embraces the redwood groves and Redwood Creek area, archeological resources might be incorporated into interpretive opportunities for visitors.

Archeological resources in much of the rest of the monument (within the Sensitive Resources zone) would be identified, evaluated, and provided stabilization, security, or other protection commensurate with their significance and sensitivity.

Although some archeological resources could be lost in the national monument (resulting in permanent adverse impacts of minor intensity), these actions would generally result in long-term, beneficial impacts on archeological resources.

Under this alternative, the Section 106 determination of effect on archeological resources in Muir Woods National Monument would be *no adverse effect*.

No impairment of archeological resources would result from this alternative.

CULTURAL RESOURCES – ETHNOGRAPHIC RESOURCES / TRADITIONAL CULTURAL PROPERTIES

No-action Alternative

Analysis

The National Park Service has not identified any ethnographic resources or traditional cultural properties within the national monument. However, an ethnographic survey and assessment needs to be conducted.

Conclusion

There are no identified ethnographic resources or traditional cultural properties in Muir Woods National Monument.

Under this alternative, the Section 106 determination of effect on ethnographic resources or traditional cultural properties would be *no resources or properties affected*.

No impairment of ethnographic resources or traditional cultural properties would result from this alternative.

Alternative 1: Connecting People with the Parks (NPS Preferred Alternative for Park Sites in Marin, San Francisco, and San Mateo Counties)

Analysis

The National Park Service has not identified any ethnographic resources or traditional cultural properties within the national monument. However, an ethnographic survey and assessment needs to be conducted.

Conclusion

There are no identified ethnographic resources or traditional cultural properties in Muir Woods National Monument.

Under this alternative, the Section 106 determination of effect on ethnographic resources or traditional cultural properties would be *no resources or properties affected*.

No impairment of ethnographic resources or traditional cultural properties would result from this alternative.

Alternative 2: Preserving and Enjoying Coastal Ecosystems

Analysis

The National Park Service has not identified any ethnographic resources or traditional cultural properties within the national monument. However, an ethnographic survey and assessment needs to be conducted.

Conclusion

There are no identified ethnographic resources or traditional cultural properties in Muir Woods National Monument.

Under this alternative, the Section 106 determination of effect on ethnographic resources or traditional cultural properties would be *no resources or properties affected*.

No impairment of ethnographic resources or traditional cultural properties would result from this alternative.

Alternative 3: Focusing on National Treasures

Analysis

The National Park Service has not identified any ethnographic resources or traditional cultural properties within the national monument. However, an ethnographic survey and assessment needs to be conducted.

Conclusion

There are no identified ethnographic resources or traditional cultural properties in Muir Woods National Monument.

Under this alternative, the Section 106 determination of effect on ethnographic resources / traditional cultural properties would be *no resources or properties affected*.

No impairment of ethnographic resources or traditional cultural properties would result from this alternative.

CULTURAL RESOURCES – PARK COLLECTIONS

The alternatives for Muir Woods National Monument's park collections are covered under the environmental consequences in the "Actions Common to All Actions Alternatives" section and by each alternative for Golden Gate National Recreation Area.

VISITOR USE AND EXPERIENCE

No-action Alternative

Analysis

The primary visitor activities of hiking through the redwood forest and enjoying the sights and sounds of Muir Woods National Monument would continue in this alternative. The existing interpretive programs would also continue. In addition, visitors would still have some opportunities for self-guided exploration, which is a valued characteristic of visiting the monument. During scoping for the plan, there were some mentions of additional recreation opportunities that were desired including more trail access to the Camino del Canyon area and with connections to the surrounding state park lands. In this alternative, the Camino del Canyon area would remain largely inaccessible to most visitors and no additional trail connections would be established with adjacent public lands. Visitors have also expressed interest in more diverse interpretive programs and this alternative would not include additional programming or educational facilities to support programming. The lack of some of these desired improvements would be a long-term, moderate, adverse impact on those visitors seeking these opportunities.

The monument continues to provide some opportunities for solitude, quiet and connection with the primeval forest. These characteristics of the park's visitor opportunities are highly valued by the public. This alternative would continue to promote these values, including encouraging modification of visitor behavior through strategies such as quiet zones and quiet days to minimize impacts on the natural soundscape. However, a large number of visitors have expressed concerns about the amount of noise and crowding that still occurs during peak times, especially when groups are present in the woods.

Visitors would continue to have access to the monument via private automobile as well as the park shuttle during the peak season. The shuttle has improved access options to the monument and eased some of the congestion on surrounding access roads, a long-term, moderate, beneficial impact. However, there is still concern about the amount of informal parking that is occurring at the monument, and the amount of congestion from vehicles, buses, and pedestrians competing for the same space at the monument entrance. These issues result in a long-term, moderate, adverse impact on the visitor experience.

Visitor safety at the monument is considered to be good in the no-action alternative, except for the safety concerns associated with informal parking along the entrance road during peak visitation. The real and perceived safety problems associated with informal parking will continue in this alternative resulting in a long-term, minor, adverse impact.

Conclusion

The no-action alternative would result in long-term, minor to moderate, beneficial impacts from continued opportunities to experience the unique and highly valued characteristics of the primeval forest via hiking trails and educational programs. These activities and experiences are highly valued by visitors. However, minor to moderate adverse impacts on the visitor experience from visitor crowding, noise, and informal parking during peak times would continue.

Alternative 1: Connecting People with the Parks (NPS Preferred Alternative for Park Sites in Marin, San Francisco, and San Mateo Counties)

Analysis

Alternative 1 would provide for self-guided exploration in a natural park setting while making connections to a wider array of opportunities on adjacent public lands. Some additional programming and enhanced facilities would give visitors new means to understand the conservation history and primeval forest ecosystem. Additional trail and overnight opportunities in the Camino del Canyon area would also allow for new visitor opportunities. All of these actions would expand the range of activities for visitors and allow them to better understand the important stories of the monument. These actions would provide visitors with a long-term, minor to moderate, beneficial impact on their use and experience.

The monument would continue to welcome a diversity of visitors and support a range of recreation activities. New recreation activities would largely be focused on new interpretive, educational and stewardship activities that would be staged at the Administration-Concession Building and in the Camino del Canyon area. Also, visitors would be introduced to ways of accessing adjacent landscapes and recreational opportunities of surrounding public lands, creating a more seamless connection to the diversity of day and overnight recreation opportunities in the surrounding area.

Visitors would be provided a variety of programs and opportunities in exploring the natural and conservation themes throughout the monument, appealing to many learning styles and increasing the breadth of stories being told. Interpretation on the shuttle bus would orient visitors and allow them to better plan their visit. Expanded structured educational opportunities by park staff and partners would also add to the learning opportunities available to visitors. This would include new overnight educational opportunities in the Camp Hillwood area. Improved learning opportunities were highly desired by some members of the public. These added interpretive and educational programs would have a long-term, minor to moderate, beneficial effect to the visitor experience.

Alternative 1 would allow visitors improved access to the monument during peak times by providing increased shuttle service and more convenient shuttle stops. The increased shuttle access to the woods would reduce traffic congestion at the park entry, minimizing visitor frustration and conflicts on arrival. However, some visitors may experience adverse effects if they are not able to board the shuttle in a timely manner. Visitors who would prefer to park at the monument to maintain flexibility in their schedule would also be adversely affected by the proposed reduction in parking at the monument. Within the monument, visitor access would be improved and congestion reduced through greater dispersion of visitors, new facilities, and accessible trails. This would include upgrades to trails for purposes of accessibility and resource protection, along with water and restroom facilities at Bridge 4. These actions would result in long-term, moderate, beneficial impacts.

The monument's natural setting and its primary natural resource would be enhanced by reconfiguring parking away from the entrance to the primeval redwood forest and restricting parking along the road to the monument. Pulling vehicle circulation away from

the monument would also improve the natural soundscape. Implementation of a quiet zone would allow visitors to understand the value that is placed on the natural quiet of the forest and encourage visitors to help provide a quiet and contemplative experience for all. These actions would have a long-term, moderate, beneficial impact on the visitor experience at Muir Woods National Monument.

Because of the efforts made to improve the safety of the circulation system and parking at the monument, visitor safety would be improved. The potential for pedestrian and vehicular conflicts would be reduced as well as conflicts between vehicles.

Conclusion

Under alternative 1, impacts to the visitor experience would be long term, minor to moderate, and beneficial. The improvements to the arrival experience to the park, along with enhanced educational and interpretive opportunities, directly address the primary interests and concerns of most visitors to the monument. It is likely that a similar number of visitors could be accommodated in this alternative while still meeting desired conditions given the ability to better disperse and manage visitation on the park shuttle and trails, a long-term minor beneficial impact. \

Alternative 2: Preserving and Enjoying Coastal Ecosystems

Analysis

Alternative 2 would restore the primeval character of the old-growth forest and the visitor experience would be more primitive than it is today. The majority of the built environment would be removed and only light-on-the-land trails would reach into the heart of the forest. While the range of activities would be limited, the experience of the primeval forest would be heightened, benefiting visitors who are interested most in the natural ecological processes of the forest and creek.

Visitors would still have opportunities to enjoy the primary recreation activity of the monument, hiking through the forest. The experience along the trail setting would be improved with fewer encounters with others and more emphasis on connection with the surrounding natural environment. Visitors would also have opportunities for educational and stewardship programs focused on exploring the redwood forest ecology and the conservation of Muir Woods National Monument. Participatory programs would encourage a deeper and more meaningful understanding of the forest. Interpretation on the shuttle bus would orient visitors and allow them to better plan their visit. This alternative provides a different visitor experience than the no-action alternative. If managed well, alternative 2 could result in a long-term, moderate, beneficial impact to visitor experience, with visitors enjoying a more hands-on interaction with the primeval redwood forest.

The full-time shuttle access to Muir Woods National Monument will reduce traffic congestion at the park entry, minimizing visitor frustration and conflicts on arrival; a long-term, moderate, beneficial impact. However, there would be long-term, moderate, adverse effects for those that cannot get on the shuttle in a timely manner. Some visitors who would prefer to park at the monument would also be adversely affected by the substantial reduction in parking. Additionally, the restriction on tour bus access would make access for tour groups less convenient.

The park setting would be restored to a more naturalistic setting, with few indications of built structures. All structures would be moved out of the woods, giving visitors more natural viewscapes and soundscapes. The removal of all parking except for a small accessible lot would increase the naturalness of the arrival area to Muir Woods National Monument. It also would reduce the noise and pollution caused by personal vehicles and tour buses.

Because of the efforts made to improve the safety of the circulation system and parking at the monument, visitor safety would be improved. The potential for pedestrian and vehicular conflicts would be reduced as well as conflicts between vehicles. The increased rustic nature of the trail system may slightly increase the potential for safety incidences, a potential adverse impact.

Conclusion

Alternative 2 would result in long-term, minor to moderate, beneficial impacts to the visitor experience, primarily due to enhancements to the monument's natural setting and the promotion of a more authentic and connected visitor experience with the primeval forest. However, long-term, minor to moderate, adverse impacts to the visitor experience would also occur, because some visitors would likely find it challenging to visit given the lack of parking and support facilities, and the increased regulation of visitor access. Also, it is likely that alternative 2 would not further encourage use of the monument by diverse groups given more limited visitor opportunities and services. It is likely that a smaller number of visitors could be accommodated in this alternative given more limited facilities and the emphasis on fewer visitor encounters in the woods, a long-term minor adverse impact.

Alternative 3: Focusing on National Treasures (NPS Preferred Alternative for Muir Woods National Monument)

Analysis

Alternative 3 is the NPS preferred alternative and would present Muir Woods National Monument as a contemplative outdoor museum where visitors would explore and understand the primeval forest and the monument's place in American conservation history. Visitors would have greater diversity of recreational opportunities, along with multiple types of educational and stewardship opportunities provided to reach a more diverse audience with various learning styles.

Existing recreation activities would largely continue, along with the addition of thematic trails within the heart of the woods. There would also be new trail opportunities in Camino del Canyon. Other new opportunities would involve increased stewardship and educational programs that allow visitors first-hand experience in the "living museum" of the monument. The use of the Administration-Concession Building in the woods for expanded programs and research would allow for a wider range of recreation and learning opportunities. The park staff would be focused on facilitating improved understanding of park values to a broad audience. New and diverse learning opportunities were highly desired by some members of the public. Investment in new and comprehensive onsite interpretive and educational programs would expand the visitor

opportunities and understanding of the monument's resources and thereby effect long-term, moderate, beneficial impacts on the visitor experience.

The preferred alternative would allow visitors improved access to the monument during peak times by providing increased shuttle service and more convenient shuttle stops. The increased shuttle access to Muir Woods National Monument would reduce traffic congestion at the park entry, minimizing visitor frustration and conflicts on arrival—a long-term, moderate, beneficial impact. However, there would be long-term, moderate, adverse effects for those that cannot get on the shuttle in a timely manner. Some visitors who would prefer to park at the monument would also be adversely affected by the partial reduction in parking.

Within the monument, visitor access would be improved and congestion reduced through greater dispersion of visitors on thematic trails and within the newly opened Camino del Canyon area. However, some areas that would be zoned for sensitive resources would have reduced or more controlled visitor access. Camp Hillwood would be used for walk-in day use programs and thereby restrict access for existing overnight group opportunities.

Viewsheds and soundscapes at the monument would be improved in the preferred alternative. Visitors would experience a more natural setting upon arrival at the monument as a result of the reconfiguration of the parking lots. Dispersal of visitors among thematic trails and within the Camino del Canyon area would improve both the soundscapes and viewsheds, as fewer people would be in any one place at any one time. Soundscape management practices would also improve the soundscape. Overall, these actions would have a long-term, moderate, beneficial impact to the visitor experience.

Because of the efforts made to improve the safety of the circulation system and parking at the monument, visitor safety would be improved. The potential for pedestrian and vehicular conflicts would be reduced, as would the potential for conflicts between vehicles.

Conclusion

Actions proposed in the NPS preferred alternative would result in long-term, minor to moderate, beneficial impacts to the visitor experience. This alternative contributes to the purpose of the monument by providing high-quality recreation and education opportunities that welcome a wide audience to experience and understand the most important resources and stories of Muir Woods National Monument. It is likely that a reasonably large number of visitors could be accommodated in this alternative while still meeting desired conditions, given the ability to better disperse and manage visitation on the park shuttle and trails, a long-term, minor, beneficial impact.

SOCIAL AND ECONOMIC ENVIRONMENT

No-action Alternative

Analysis

As detailed in the "Social and Economic Environment" section of Part 8, park lands such as Muir Woods National Monument are integral in sustaining a high quality of life in a highly urbanized community such as the Bay Area. The no-action alternative for the national monument would continue to provide open space, a wildland experience, and public access, while maintaining a nationally significant natural resource. As other Bay Area private land continues to develop and urbanize into the future, Muir Woods National Monument will become exponentially more valuable to the community and its quality of life. The education and stewardship opportunities for the residents would be maintained, and possibly improved as resources become available, which would continue to enhance the quality of life for local residents by fostering a conservation ethic among them. Under the no-action alternative, the National Park Service would also continue to collaborate with other local land managers to maintain its "watershed approach" to land management. This would maintain a communitywide—and perhaps regionwide—effort for wildland protection, which ultimately would benefit the quality of life for local residents. This collaboration would also continue to improve community awareness and engagement in park and regional issues. Collectively, these effects to qualify of life result in an impact that is long term, moderate, and beneficial in the context of the gateway communities in Marin County, and long term, minor, and beneficial for the three adjacent counties.

In terms of effects on the local economy, the no-action alternative for Muir Woods National Monument would maintain the current level of employment for the National Park Service and concessioners and NPS spending for park operations and contracts. The value of these attributes to the local economy is discussed in the Social and Economic Affected Environment section. The no-action alternative would result in a negligible change from current conditions in impact to the local economy in the future. However, as with all other alternatives, the no-action alternative would maintain Muir Woods National Monument's overall intrinsic contribution to the local economy in the Bay Area. By continuing to provide open space preservation, recreation opportunities, and an aesthetic natural backdrop, the national monument would continue to help make the Bay Area a place for companies and talented professionals to call home. In other words, the Bay Area's quality of life becomes a draw for business and economic growth with the help from places like Muir Woods National Monument. The no-action alternative will sustain and enhance this economic value to the Bay Area. This results in an impact that is long term, moderate, and beneficial in the context of the local gateway communities in Marin County. The impact would be long term, minor to moderate, and beneficial for the adjacent three counties.

Conclusion

In the context of the local gateway communities and the three adjacent counties, the beneficial impacts to the social and economic environment from the no-action alternative would be long term and minor to moderate. The beneficial impacts could result from maintaining the park's contribution to the local economy and quality of life, existing

education and stewardship programs, as well as maintaining collaborative efforts with several local governments and land managers to maintain and expand open land protection in the region.

Alternative 1: Connecting People with the Parks (NPS Preferred Alternative for Park Sites in Marin, San Francisco, and San Mateo Counties)

Analysis

Alternative 1 would maintain the quality of life and economic benefits that the national monument provides to the local communities and counties, as described in the analysis of the no-action alternative. By providing open lands adjacent to a large urban center and continuing education and stewardship programs for local residents, the monument would continue to improve the quality of life for those in nearby communities. This alternative would also sustain the monument's intrinsic contribution to the local economy in the Bay Area (once again, as noted in the no-action alternative analysis). By continuing to provide open space preservation, recreation opportunities, and an aesthetic natural backdrop, the national monument would continue to help make the Bay Area a place for companies and talented professionals to call home. These contributions to the local economy and quality of life would result in an impact that is long term, moderate, and beneficial in the context of the local gateway communities in Marin County. The impact would be long term, minor to moderate, and beneficial for the adjacent three counties.

In addition to continuing these attributes of the no-action alternative, the public outreach, welcoming, and orientation focus of alternative 1 would contribute more to the quality of life of many residents in the area. Improved orientation, outreach, and support facilities that would be aimed at reaching the diverse populations of the Bay Area could connect with local residents and promote more awareness of the monument. Also, this alternative includes an improvement in park accessibility via an expanded shuttle bus service that would contribute to an improved quality of life in the community by allowing more local residents to access the park (e.g., those without personal vehicles), and by reducing traffic congestion on local and regional roads. All of these efforts would improve the quality of life of more residents by exposing them to the health, education, and recreation benefits of visiting Muir Woods National Monument and other park sites. This could result in an impact that is long term, minor to moderate, and beneficial in the context of the local gateway communities and three adjacent counties.

In addition, alternative 1 includes a variety of construction projects that would support the local economy by offering new contract work for local and regional firms. Most of these park projects would be associated with the improved visitor welcoming facilities that would complement the NPS effort at welcoming and orienting people at Muir Woods National Monument. These projects would generate new contract work for private firms in the Bay Area, including engineering consultants, construction contractors, and environmental consultants. These projects would not only support these contracting businesses and their employees directly, but the economic multiplier effect would circulate this contract money through the local economy. This phenomenon is explained in the Social and Economic Affected Environment section. The collective result of these

actions would be impacts that are short term, minor, and beneficial for local gateway communities and possibly the three adjacent counties.

The need for some new NPS or concession staffing may also be generated at the new welcome centers to provide new visitor services. The expanded shuttle bus services could also generate additional concession jobs. These new jobs may result in an impact that is long term, minor, and beneficial to the local gateway communities in Marin County. Impacts to the three adjacent counties would be negligible.

Lastly, alternative 1 includes an action that expands the shuttle bus service to the park and connects the shuttle with local and regional transportation systems. With the possibility of fewer park visitors accessing the park via personal vehicles because of this service, the potential exists for a reduction in local business activity in the Marin County communities (because those in personal vehicles can more readily access local sites and business while en route to the park). Therefore, the shuttle bus program could have a negative effect on the local economy. This loss in business would also have secondary negative effects on the local economy due to the reduction of the multiplier effect of the business revenues that would no longer be circulating further through the local economy. This action may result in an impact that is long term, minor, and adverse to the local gateway communities in Marin County. Impacts to the adjacent three counties would likely be negligible.

Conclusion

The overall beneficial impact to the quality of life and local economy from alternative 1 would be short term to long term, and range from minor to moderate for the local gateway communities and the three adjacent counties. The beneficial impacts would primarily result from

- a significant increase in public outreach programs, visitor orientation, and new welcoming facilities at the park,
- improved connections to local and regional transportation systems and less traffic congestion in the community,
- various new engineering and construction contracts for facility improvement projects, and
- job creation from the proposed increase in visitor services in the park and the shuttle service expansion.

The adverse impacts of alternative 1 could be long term and minor in the context of the local gateway communities. The adverse impacts could result from the possible reduction in local business activity from park visitors who opt for public transit and the park shuttle.

Alternative 2: Preserving and Enjoying Coastal Ecosystems

Analysis

Alternative 2 would maintain many of the quality of life and economic benefits that the national monument provides to the local communities and counties, as described in the analysis of the no-action alternative. By providing open lands adjacent to a large urban

center and continuing education and stewardship programs for local residents, the monument would continue to improve the quality of life for those in nearby communities. This alternative would also sustain the monument's intrinsic contribution to the local economy in the Bay Area (once again, as noted in the no-action alternative analysis). By continuing to provide open space preservation, recreation opportunities, and an aesthetic natural backdrop, the national monument would continue to help make the Bay Area a place for companies and talented professionals to call home. These contributions to the local economy and quality of life would result in an impact that is long term, moderate, and beneficial in the context of the local gateway communities in Marin County. The impact would be long term, minor to moderate, and beneficial for the adjacent three counties.

Because alternative 2 places a priority on ecological restoration, recreational opportunities in the park may be somewhat reduced for local residents. This may slightly reduce the amount of exercising, learning, and/or recreating in the local communities. However, given the availability of other park sites in the immediate proximity of Marin County, this adverse impact to quality of life would likely be negligible and very localized.

Alternative 2 includes a significant change in park accessibility. The proposed shuttle bus program will contribute to an improved quality of life by allowing more local residents to access the park (e.g., those without personal vehicles), and by reducing traffic congestion on local and regional roads in Marin County. This transportation change may result in an impact that is long term, minor, and beneficial for the local gateway communities in Marin County. The impact to the overall three adjacent counties would likely be negligible.

The focus on restoration of habitat connections may increase opportunities and reasons for local government land managers to preserve land in vicinity of the national monument (to establish public land connections and reduce further habitat fragmentation). If the adjacent local land managers pursue additional open space around Muir Woods in Marin County, the local residents of the area may have additional park sites to visit in the future. This would enhance the quality of life for residents of the area. The impact would be long term, minor, and beneficial for the local gateway communities. Impact to the adjacent three counties would be negligible.

As for impacts to the local economy, because alternative 2 focuses on preserving ecological resources, several actions in this alternative aim at restoring and reclaiming natural features in and around Muir Woods National Monument. These reclamation efforts would necessitate various types of construction and restoration projects that would support the local economy by offering new contract work for local and regional firms (including engineering consultants, construction contractors, and environmental consultants). These projects would not only support these contracting businesses and their employees directly, but the economic multiplier effect would circulate this contract money through the local economy. This phenomenon is explained in Part 3, in the Social and Economic Affected Environment section. The collective result of these actions would be impacts that are short term, minor, and beneficial for local gateway communities and possibly the three adjacent counties.

Some new NPS or concession staffing may be generated by the significant expansion to the shuttle service to the park. These new jobs may result in an impact that is long term, minor, and beneficial to the local gateway communities in Marin County.

Lastly, alternative 2 would require that all national monument visitors access the park via their own power (e.g., bike, walk) or via an expanded shuttle bus service that connects with local and regional transportation systems. Thus, this action would reduce the number of people traveling through Marin County via their personal vehicles. In terms of local economic impact, this transportation mode shift would result in less business activity for local business in Marin County because bus passengers cannot easily access local sites and businesses while en route to the park (unlike those in personal vehicles). This loss in business would also have secondary negative effects on the local economy due to the reduction of the multiplier effect of the business revenues that would no longer be circulating further through the local economy. This action may result in an impact that is long term, minor to moderate, and adverse to the local gateway communities in Marin County. Impacts to the adjacent three counties would likely be negligible, or possibly long term, minor, and adverse.

Conclusion

The beneficial impacts to the quality of life and local economy from alternative 2 would be short term to long term and minor for the local gateway communities and the three adjacent counties. The beneficial impacts could result from

- increased cooperation with other local governments and land managers to pursue the preservation of additional publicly accessible lands in the area,
- contract work created by various reclamation projects,
- possible new jobs created by the significant expansion in the shuttle service that serves the park, and
- the expanded shuttle service that would allow more local residents to access the park and reduce traffic congestion.

The adverse impacts from alternative 2 could be long term, ranging from minor to moderate for the local gateway communities, the three adjacent counties, as well as the Bay Area. The adverse impacts could result from the possible reduction in local business activity from park visitors who would need to take public transit to the park.

Alternative 3: Focusing on National Treasures (NPS Preferred Alternative for Muir Woods National Monument)

Analysis

Alternative 3 would maintain the quality of life and economic benefits that the national monument provides to the local communities and counties, as described in the analysis of the no-action alternative. By providing open lands adjacent to a large urban center and continuing education and stewardship programs for local residents, the monument would continue to improve the quality of life for those in nearby communities. This alternative would also sustain the monument's intrinsic contribution to the local economy in the Bay Area (once again, as noted in the no-action alternative analysis). By continuing to provide

open space preservation, recreation opportunities, and an aesthetic natural backdrop, the national monument would continue to help make the Bay Area a place for companies and talented professionals to call home. These contributions to the local economy and quality of life would result in an impact that is long term, moderate, and beneficial in the context of the local gateway communities in Marin County. The impact would be long term, minor to moderate, and beneficial for the adjacent three counties.

Alternative 3 for Muir Wood National Monument includes actions that provide some new visitor information and orientation, as well as interpretation programs that would be aimed at attracting the diverse populations of the Bay Area to the park. The attempts to connect with local residents would be complemented with improved visitor welcoming center facilities at Muir Woods National Monument access points. In addition, alternative 3 includes an improvement in park accessibility via an expanded schedule of shuttle bus connections with local and regional transportation systems. The shuttle bus program could contribute to an improved quality of life by allowing more local residents to access the park (e.g., those without personal vehicles), and by reducing traffic congestion on roads in Marin County. Collectively, these efforts could improve the quality of life of more Bay Area residents by exposing them to the health, education, and recreation benefits of visiting Muir Woods National Monument and other park sites. This could result in an impact that is long term, minor to moderate, and beneficial in the context of the local gateway communities and three adjacent counties.

Alternative 3 places a strong emphasis on the national significance of Muir Woods National Monument (natural and historical) and educating the public on this significance. As the residents of Marin County and the Bay Area as a whole become more aware of the uniqueness and importance of Muir Woods National Monument, they may develop a stronger sense of pride or identity in the community in which they live. These personal appreciation values and sense of community belonging can contribute to one's quality of life. This identification with the unique resources of the community may yield an impact that is long term, minor, and beneficial in the context of the local gateway communities and three adjacent counties.

The new welcome centers proposed as part of alternative 3 could generate a need for new NPS or concession staffing to provide new or expanded visitor services at the national monument. New concession jobs could also be created by the expanded shuttle bus services. This potential increase in jobs may result in an impact that is long term, minor, and beneficial in the context of the local gateway communities. Impacts to the three adjacent counties would be negligible.

Lastly, alternative 3 would expand the shuttle bus service to the park. Because this shuttle connects with local and regional transportation systems, many park visitors may choose to leave their car at home and access the park via public transportation. If this happens, local businesses in Marin County communities would experience a reduction in customers and business activity because bus passengers cannot easily access local sites and businesses while en route to the park (unlike those in personal vehicles). Therefore, the shuttle bus program could have a negative effect on the local economy. This loss in business would also have secondary negative effects on the local economy due to the reduction of the multiplier effect of the business revenues that would no longer be circulating further through the local economy. As a result, the impacts to the local

gateway communities in Marin County could be long term, minor, and adverse. Impacts to the adjacent three counties would likely be negligible.

Conclusion

The beneficial impacts of alternative 3 on the quality of life and local economy could be long term, ranging from minor to moderate for local gateway communities and the three adjacent counties. Overall, the beneficial impacts of alternative 3 could result from

- a moderate increase in public outreach, visitor orientation, and new welcoming facilities at the park,
- improved connections to local and regional transportation systems and less traffic congestion in the community,
- a modest number of possible jobs created by expanded visitor welcoming services and expanded shuttle service, and
- the community's improved awareness, pride, and appreciation of the national significance of Muir Woods National Monument.

The adverse impacts of alternative 3 could be long term and minor for the gateway communities. The adverse impacts to the social and economic environment could result from a reduction in local business activity due to a park visitors shifting from using personal vehicles to using public transportation

TRANSPORTATION

The analysis of transportation impacts in this section is based in part on several earlier studies, including

- four years of studies of the Muir Woods Shuttle pilot program conducted for the County of Marin (Nelson\Nygaard, 2005–2008);
- the "Muir Woods Shuttle Alternatives," a memo to park managers (Nelson\Nygaard 2008);
- the Comprehensive Transportation Management Plan (NPS and Marin County 2002);
- and the Transportation Planning to Address Access and Congestion Issues – Muir Woods National Monument.

See these documents for more details on the Muir Wood Shuttle operations, performance and cost, analysis of parking changes at Muir Woods National Monument, and traffic congestion analysis for the Muir Woods National Monument area.

No-Action Alternative

Analysis

Currently, about 760,000 visitors per year travel to Muir Woods National Monument. Visitation peaks during the summer months, particularly on weekends. Managing these

crowds and balancing the impact of the large number of visitors with the preservation of the park resources has been an ever-increasing challenge for park managers.

Muir Woods is reached by narrow two-lane county and state roads that wind through canyons and over Mount Tamalpais. There is little opportunity for passing, thus the roads are heavily congested on busy summer weekends, particularly on State Route 1 between Highway 101 and Panoramic Highway. Marin County is committed to keeping roads in West Marin at two lanes to preserve the rural character of the area, so reducing congestion through increased capacity is not a realistic option.

Most visitors arrive at Muir Woods National Monument by automobile. The monument provides 179 parking spaces in three parking lots, supplemented by approximately 175 legal spaces along Muir Woods Road. Estimated demand for parking spaces on peak season weekends in 2002 was 450 spaces (NPS and Marin County 2002), a figure that exceeds the formal and informal parking capacity. Parking on the roadway often has extended to areas where parking is prohibited, and there is minimal enforcement. Marin County has recently restricted some of the shoulder area with fences and signs, slightly reducing the number of available spaces. On busy weekends, cars can be found parked along the road up to a mile from the monument. This can create safety issues because people walk in the road to get to the monument, and the parked cars make the navigable roadway narrower while also obscuring the view of pedestrians and oncoming traffic.

A shuttle system connecting offsite parking lots with Muir Woods National Monument was introduced in the summer of 2005. This was originally a three-year pilot program; now the National Park Service has entered into a three-year partnership with the County of Marin to jointly fund the service from 2009 through 2011 with the objective of continuing the service into the future indefinitely. The shuttle runs on weekends and holidays from May through September, and has gradually increased hours of service each year. Passengers board the shuttle in Sausalito, in Marin City, or from two Park-and-Ride lots in Mill Valley. These satellite parking lots are more than adequate to accommodate cars of shuttle riders on the weekends. More than half of shuttle riders choose to take the shuttle because of changeable message signs on Highway 101 informing them that the lot at Muir Woods is full, and directing them to a shuttle stop.

Data gathered during the 2008 season shows that 14% of visitors to Muir Woods National Monument took the shuttle on days when the shuttle was available (Nelson/Nygaard 2009).

Ridership has grown substantially each year of service, increasing farebox revenue and sometimes requiring additional vehicles for the mid-day rush peak use period, and at the end of the day. Even with this large number of riders, roads continue to be heavily congested with visitors arriving by auto, such that the shuttle is thrown off schedule during peak periods as it waits in traffic.

In addition to the Muir Woods Shuttle, park staff estimates that 20% of visitors arrive by tour bus (personal communication with Mia Monroe, Site Supervisor - Interpretation, Marin Headlands and Muir Woods).

Conclusion

With no further action taken, visitor connections to Muir Woods National Monument and the functionality of the transportation system to the monument could experience a long-

term, minor to moderate, adverse impact. Access roads and intersections on State Route 1 between Highway 101 and Muir Woods National Monument would continue to be congested, slowing shuttle service, and making it difficult at peak times for emergency vehicles to travel in the area. The existing parking lots at the monument are likely to continue to fill early in the day from May to September, particularly on the weekends, and the unsafe roadside parking situation could also continue. On a positive note, shuttle service can be expected to see continued increases in ridership, helping reduce road congestion.

All of the Action Alternatives

Analysis

Recognizing the difficulty of accommodating the large number of visitor vehicles, all alternatives move toward reducing the number of cars coming to the monument, and increasing the proportion of visitors coming by transit. This latter objective is accomplished by both increasing transit service and by intercepting travelers earlier in their trip so that more, if not all, of the trip is on transit rather than by car. The following transportation-related measures are incorporated in alternatives 1 through 3 for Muir Woods National Monument. Although described independently, they should be considered parts of a whole strategy, to be implemented in conjunction with each other.

A new offsite welcome center would be created in the vicinity of State Route 1 and Highway 101 where visitors would board the shuttle. The center would provide parking, shelter, restrooms, park information, and snacks, and would be a transfer point between regional and local transit and national park destinations. The creation of the welcome center would have a long-term, major, beneficial impact on transit facility capacity, amenities, conditions, and on unsafe road shoulder parking on Muir Woods Road near the monument.

Express transit service from downtown San Francisco and improved connections with the regional ferry services would be pursued. This action is likely to result in a long-term, moderate, beneficial impact to connectivity to Muir Woods, including number and capacity of connections, and available modes of travel.

In alternatives 1 and 3, shuttle service would be provided during shoulder periods (May and September) and peak periods (Memorial Day through Labor Day weekends), as well as on holiday weekends throughout the year. This would have a long-term, moderate, beneficial effect by making transit service available on holidays during the nonpeak period. In alternative 2, service would run 365 days a year, which is likely to have a long-term, major, beneficial impact on transit availability and an increase in modes of travel to Muir Woods National Monument.

Parking at the monument would be reduced in alternatives 1 and 3 and eliminated (except for space needed for those with special accessibility needs) in alternative 2. Impacts of this are multidimensional and are discussed below.

In all action alternatives, a main feature would be a reduction in or elimination of parking capacity at the monument (including unsafe road shoulder parking), offset by parking at one or more satellite lots (possibly including Kent Canyon), and increased shuttle service. Parking at the offsite welcome center would accommodate autos, while other lots in the

vicinity may also be available to accommodate visitors' cars. Some of the satellite parking lots are also used by commuters during the week, so these may not be available for shuttle passengers during that time unless other changes increase capacity. By shifting the majority of visitors to the shuttle and the San Francisco Express service, automobile congestion on local roads would be expected to be reduced.

Taking the place of driving to the Muir Woods National Monument would be increased shuttle and transit service. The transit service would be the logical primary mode of access for monument visitors, because potential for increased access by bicycle, on foot, or by tour bus is limited. Continued reasonably convenient access is essential to maintain (and if possible, enhance) a high-quality visitor experience.

The overall impacts of these measures would likely be long term, moderate to major, beneficial on the functionality and safety of the transportation system, with a moderate to major increase in transit access from San Francisco, the Sausalito Ferry, and other points in southern Marin County. There would be an increase in access by land- and water-based regional transit, increased number and capacity of connections, and an increase in the available modes of travel. These measures could result in a long-term, major, beneficial impact on connections, transit service availability, and transportation facility capacity and amenities.

There would be a major, adverse impact on parking availability at the monument, offset to a large degree by parking availability at offsite lots and increased transit. Visitors are still likely to arrive by car from points west of the monument, which means that they would have no opportunity to park and take transit. These visitors would be most affected by the lack of parking, and their ability to visit the monument would be adversely affected.

Conclusion

There would be a major, adverse impact on parking availability at the monument, offset to a large degree by parking availability at offsite lots and increased shuttle and transit service. Visitors are still likely to arrive by car from points west of the monument, which means that they would have no opportunity to park and take transit. These visitors would be most affected by the lack of parking, and their ability to visit the monument would be adversely affected.

Establishing a visitor's welcome center with an offsite parking area and increasing transit from both the Sausalito Ferry and San Francisco to Muir Woods National Monument would have a long-term, moderate to major, beneficial impact on the transit system serving the monument. Reducing parking at the monument is also likely to have a long-term, moderate to major, adverse impact on parking availability for visitors.

Alternative 1: Connecting People with the Parks (NPS Preferred Alternative for Park Sites in Marin, San Francisco, and San Mateo Counties)

Analysis

In addition to the actions common to all alternatives, alternative 1 includes the following transportation-related actions for Muir Woods National Monument. It should be noted that the transportation measures in alternative 3 are identical to those in alternative 1.

In addition to the offsite welcome center previously described, the monument's existing entry area would be redesigned. Pedestrian access would be improved by separating pedestrians from roads and parking. A modest facility would be provided to receive visitors arriving by different modes of transportation including the shuttle. The entry area might include such services as restrooms, orientation and information, food service, and sheltered areas for passengers waiting for buses. This measure may have a long-term, moderate, beneficial impact on transit facility capacity, amenities, and conditions, encouraging and supporting use of the shuttle.

In order to improve pedestrian safety and protect Redwood Creek, the monument would collaborate with Marin County to restrict shoulder parking along Muir Woods Road in non-trailhead areas when sufficient transit is available to meet visitation demand.

Parking in the monument lots and on the road shoulders would be reconfigured or relocated using sustainable design practices to reduce impacts to the creek and other sensitive resources. Parking would be decreased by an estimated 33% (primarily from a reduction in road shoulder parking); capacity would meet demand during the off season. This is likely to have a long-term, minor, adverse impact on parking availability during those times when the shuttle is not running, and a long-term, minor, beneficial impact on pedestrian access.

Data from the *Comprehensive Transportation Management Plan* for park lands in Southwestern Marin indicates that off seasons and shoulder season typical weekday parking demand at the monument ranges between 115 and 155 spaces. By 2023 this is projected to increase to 135 to 190 spaces. A 33% reduction in parking supply, or removing 117 spaces, would leave 265 spaces; this would be more than adequate to meet parking demand during those times when the shuttle would not be operating (weekdays during the shoulder and off season months). This assumes that the current supply includes 179 spaces in the lots, and an estimated 175 spaces on the shoulders of the road, totaling 354 spaces.

The following table shows estimated parking demand for 2002 and 2023 using data from the *Comprehensive Transportation Management Plan*.

With removal of some parking and an increase in shuttle service, parking demand would be shifted to offsite lots in the vicinity of State Route 1 and Highway 101. The welcome center, in all alternatives, would provide parking, shelter, restrooms, park information, snacks, etc. for shuttle riders. In addition, the Manzanita and Pohono Street Park-and-Ride lots, currently used as shuttle parking, are the potential future location of the welcome center, and could accommodate cars of shuttle riders. These lots, normally used by weekday commuters, would not be able to accommodate large numbers of monument visitors during the work week without some reconfiguration. Turnover in these lots

would be slower than turnover in the current monument lots, because the parking duration would include both the time visiting the monument and the travel time to and from the monument. Detailed analysis of this and other potential locations would be the subject of a separate planning effort.

Table 25: Parking Demand at Muir Woods National Monument, 2002 & 2023

Existing Parking Demand (2002)

Peak Season (Memorial Day through Labor Day weekends)		Shoulder Season (May and September)		Off Season (October 1 to May 1)	
Weekday	**Weekend**	**Weekday**	**Weekend**	**Weekday**	**Weekend**
380	450	155*	300	115*	250

Projected Parking Demand (2023)

Peak Season (Memorial Day through Labor Day weekends)		Shoulder Season (May and September)		Off Season (October 1 to May 1)	
Weekday	**Weekend**	**Weekday**	**Weekend**	**Weekday**	**Weekend**
485	575	190*	360	135*	285

* Periods when shuttle would not run

Depending on the level of available funding, shuttle service would be increased from its current weekends-only schedule to 7 days a week during the peak period, and on weekends and holidays during the rest of the year. Service could run on approximately 15-minute headways during the peak and shoulder seasons and on holidays, with 30-minute headways during other times (nonpeak weekends). This is in addition to the downtown San Francisco Express Service proposed in all alternatives.

Operating costs for the increase in shuttle service required to carry a greater number of visitors to the monument are difficult to predict because of the variable costs of administration and marketing, as well as the effect the reduction in parking would have on the demand for transit. An analysis of the cost of shuttles was performed in the "Muir Woods Shuttle Alternatives" memo (Nelson\Nygaard 2008). In that analysis, based on the hourly cost of shuttle service, requirements for layovers and other factors, two cost estimates were developed for a 75% parking scenario (a 25% reduction); they are presented below.

Scenarios involving a 25% removal of parking result in substantial shuttle operational costs, if the intent is to fully compensate for removed parking. Note that these estimates do not include the cost of the vehicles or bus stop amenities necessary to support increased service, which would also be substantial.

Conclusion

The transportation measures included in this alternative are likely to have a long-term, major, beneficial impact on connections between both ferry and regional bus transit and

Muir Woods National Monument and the Muir Woods Shuttle. The shuttle would become the primary mode of access to the monument during peak demand periods. A much larger proportion of visitors could be expected to park remotely and take the shuttle or express service from San Francisco.

Table 26: Estimated Annual Cost of Shuttle, 75% Parking at Muir Woods National Monument

Scenario	Peak offsite parking demand	Peak buses per hour	Fleet require-ment	Annual Cost*	
				$75/hr.	$180/hr.
Alternatives 1 and 3 Scenario A: 75% onsite parking	170	9	9	$500,000	$1,200,000
Alternatives 1 and 3 Scenario B: 75% onsite parking, S.F. shuttles	130	8	10	$600,000	$1,400,000

* Based on low and high hourly rates for transit service providers.

The reduction in the number of cars on the roads approaching Muir Woods National Monument would have a long-term, moderate, beneficial impact on the functionality of the transportation system by reducing congestion. The reduction in visitor-related congestion would allow the shuttles to stay on schedule, and would allow emergency vehicles improved access to the area. This alternative could have a long-term, minor to moderate, beneficial impact on pedestrian and bicycle access by making the access roads safer for these visitors due to reduced traffic and congestion and reduction of road shoulder parking, and by redesigning the walkways from the entry area to the monument so they are separated from auto traffic. Even with a 33% reduction in parking, and a projected increase in demand, there would still be adequate parking during the off season (October through April) when the shuttle is not running. During the peak season, the reduction in parking would be offset by an increase in transit service. The reduction in parking could have a long-term, moderate, adverse impact on parking availability on those days when the shuttle is not running.

Alternative 2: Preserving and Enjoying Coastal Ecosystems

Analysis

In alternative 2, the majority of the built environment—buildings, parking lots, and paved trails—would be removed, and all visitors would arrive by shuttle, bicycle, or on foot. Only a small parking area would be available for special needs. The monument entrance as well as all visitor services would be relocated to the current lower parking lot and the area would be designed to accommodate a transit stop for the shuttle. Tour buses would no longer be accommodated.

In addition to changes in modes of access to the monument, the trail system would be redesigned to accommodate fewer visitors. The existing main trail would be relocated out of the flood plain, paved surfaces would be removed, and other trails and bridges could be removed or relocated to promote natural processes. These measures could have a long-term, moderate, adverse impact on visitor's ability to access areas of the mature redwood forest now available to them.

Trails in the monument would be designed to connect to other regional trails; the Dipsea Trail would be realigned where it crosses Redwood Creek. This is likely to have a long-term, minor, beneficial impact for those visitors connecting to the monument by trail.

Most auto access would be eliminated, with all parking, both in parking lots and on the road side, removed. Only essential parking for park operations and to meet the needs of visitors with disabilities would be retained. The upper lot and most of the lower lot in the monument would be restored to their natural condition. This action would have a long-term, major, adverse impact on parking availability at the monument. However, the lack of parking would be offset by greatly increased transit service and offsite parking, described below.

As discussed, a welcome center would be created in the vicinity of Highway 101 and State Route 1, which would include parking for visitors and connections to transit, including the Muir Woods Shuttle. Some additional parking may also be provided in other lots in the area that are currently used for weekend shuttle service. Park-and-Ride lots, normally used by commuters, would not be able to accommodate monument visitors during the work week without some reconfiguration. Recent parking counts on weekdays show the Manzanita Park-and-Ride lot is filled to slightly over 100% capacity from 8:00 AM to 3:30 PM, and the Pohono parking lot is at 90% of its maximum use by noon. Turnover in these lots would be slower than those currently in the monument, because the parking duration would include both the time visiting the monument and the travel time to and from the monument. Detailed analysis of lot configuration would take place in future planning efforts.

A lack of access to the monument entrance by auto may affect visitation. There remains the potential for a large number of would-be visitors to not make the trip to Muir Woods National Monument if they could not drive their cars. This group includes people who are continuing on to other destinations after their visit at the monument—for example, Stinson Beach or Mount Tamalpais State Park. Another segment of visitors are travelling in large groups, have small children, or have members in their party with special needs requiring them to use a car. Thus it could be assumed that elimination of all parking at the monument (except for special needs) might depress visitation, although an exact percentage cannot be modeled.

In addition, there will inevitably be those who drive to Muir Woods National Monument regardless of whether there is any official parking provided. Muir Woods Road is public and connects to small coastal communities, so access to the monument by road cannot be prohibited or even limited. Some visitors will arrive from points west and north, and will not have an opportunity to board transit to get to the monument. Enforcement of parking regulations at the monument would have to increase significantly for the elimination of roadside parking to be effective. This cost would likely be borne by the National Park Service rather than Marin County, because county law enforcement staff is extremely limited in West Marin.

Transit service to the monument would be dramatically increased. The Muir Woods Shuttle would run every day of the year, and would include express service from and to downtown San Francisco. Shuttle service originating in Marin County could run every 10 minutes during the peak and shoulder seasons and on holidays; on other days, it would run every 30 minutes. Providing increased service from Sausalito and express service from San Francisco could be expected to reduce parking demand by 25% or more. A significant increase in transit service, including San Francisco Express and Muir Woods Shuttle service to the Sausalito Ferry, would have a long-term, major, beneficial impact on the functionality of the transportation system to Muir Woods National Monument by increasing the number and capacity of connections, increasing the availability and choices of modes of travel, and reducing congestion.

Operating costs for the increase in shuttle service required to carry all visitors to the monument are difficult to predict because of the unpredictable effect on visitation, and also the variable costs of administration and marketing. An analysis of the cost of shuttles was performed in the "Muir Woods Shuttle Alternatives" memo (Nelson\Nygaard 2008). In that analysis, based on the hourly cost of shuttle service, requirements for layovers and other factors, three cost estimates were developed for the zero-parking scenario, and are presented below. Scenarios involving complete removal of parking appear to be prohibitively expensive—as much as $9.5 million per year for a package including San Francisco service. If tour bus access were removed, costs would increase further, to as much as $11.5 million per year. Note that these estimates do not include the cost of the vehicles or bus stop amenities.

Table 27: Estimated Annual Cost of Shuttle Operations, No Parking at Muir Woods National Monument

Scenario	Peak offsite parking demand	Peak buses per hour	Fleet Require-ment	Annual Cost	
				$75/hour	$180/hour
Alternative 2 Scenario A: 0% onsite parking	690	23	23	$3,000,000	$7,300,000
Alternative 2 Scenario B: 0% onsite parking, S.F. shuttles	520	22	28	$4,000,000	$9,500,000
Alternative 2 Scenario C: 0% onsite parking, S.F. shuttles no tour buses,	550	25	34	$4,800,000	$11,500,000

Managers at the monument estimate that 20% of visitors arrive by tour bus. In this alternative, private tour buses would not be allowed in the monument. The elimination of tour bus service would significantly reduce access to this site for certain populations. People who use this mode are generally from out of the area, are travelling in groups, and want to visit multiple destinations on one trip—a significant factor for those choosing not to take the shuttle, according to surveys of monument visitors. Tour buses address the needs of this group and also allow them to visit the monument without an auto. Without tour bus service, this group may not visit the monument at all. This measure could have a long-term, moderate, adverse impact on access to the monument.

Conclusion

Alternative 2 proposes actions that would significantly alter the transportation system serving Muir Woods National Monument. Redesign of pedestrian access to the monument entrance is likely to have a long-term, moderate, beneficial impact on visitor access and safety.

In conjunction with the parking provided at the offsite welcome center and other remote parking lots, and the greatly increased transit service to the monument, this alternative would have a long-term, major, beneficial, impact on availability of transit, improved traffic flow, and number and capacity of transit connections.

Removing parking from Muir Woods National Monument is likely to result in a reduction in the number of cars on the roads in southwest Marin, allowing transit to better run on schedule and emergency vehicles to have access, and offering less auto congestion to residents. However, while expanded transportation options may increase visitation, from the point of view of the visitor who arrives at the monument by car and is unable to park, the impact would be long term, moderate, and adverse, limiting the ability of some visitors to visit the monument.

The increase in transit services from San Francisco and the Sausalito Ferry, if fully funded through points in south Marin, is likely to have long-term, major, beneficial effects on the transportation system to the monument as well as throughout southwest Marin County, by increasing multimodal opportunities to get to the monument and increasing connectivity to regional transportation.

Auto access may experience a long-term, minor to moderate, beneficial impact because there may be much less auto traffic on Muir Woods Road, while bus traffic on State Route 1 would increase significantly.

Alternative 3: Focusing on National Treasures (NPS Preferred Alternative for Muir Woods National Monument)

Transportation impacts for alternative 3 for Muir Woods National Monument are identical to those in alternative 1.

PARK MANAGEMENT, OPERATIONS, AND FACILITIES

No-action Alternative

Analysis

Under the no-action alternative, current management, programs, operations, and funded construction projects would continue, along with the necessary annual operating funding.

Muir Woods maintains high standards of visitor service thanks to a committed team of NPS staff, partnerships with the Golden Gate National Parks Conservancy and concessions, and a team approach that also includes close working relationships with the state parks and neighboring communities. However, there is much operationally that is marginal due to the small staff size; this results in little time for long-term planning, major project implementation, and training.

Staffing levels would continue at current levels, which are inadequate to meet the responsibilities of the monument. With only 3.5 interpreters and no seasonal interpreters, there are often periods of time when no ranger is onsite, and the NPS presence is loosely covered by interns or volunteers. The interpreters handle educational programs and volunteer management, but there is no one to handle media, training, or partner programming. The law enforcement division operates with one staff member assigned to the area; which includes the monument as well as Muir Beach, Stinson Beach, Olema Valley, Slide Ranch, and Tennessee Valley. One seasonal law enforcement officer is assigned to the monument in the summer as well. This level of staffing is not enough to provide adequate coverage, and results in delays in response time—often interpreters onsite end up spending time responding to emergency incidents. Traffic congestion and conflict is one area of needed additional law enforcement staff. A ranger is needed to provide visitor use assistance for the shuttle and parking. The maintenance division is also understaffed to adequately maintain the monument in good condition. As a result, deferred maintenance has accrued at park facilities. Low staffing levels contribute to continued moderate, long-term, adverse impacts to park operations.

Primary monument partners are the Golden Gate National Parks Conservancy and the Muir Woods Trading Company, the concessions operation. These partners provide a host of valuable services and products to the monument, such as contact with the visitors, research, restoration, and messaging. They also provide needed funding from fee collection and concession sales. Other partners offer educational programs. The Save-the-Redwoods League is a major funder to enable young people to visit the park and support research. Marin County is a partner in providing shuttle service to the monument. The partners offer something invaluable that would not otherwise be provided and their continued involvement and support is a moderate, long-term, beneficial impact to park operations.

Volunteers are indispensable to the monument. They provide personal interpretive services, conduct special tours, support educational programs, complete much of the restoration work, and offer a special approach that the public responds to very favorably. Thousands of hours per year are logged by volunteers. Volunteer efforts are a continued long-term, moderate, beneficial impact to park operations.

Currently, the condition of many of the buildings is good, but not accessible for persons with disabilities. However, the monument has significant amounts of deferred maintenance. Even given the direction of the park asset management plan for prioritizing funds, a continued gap in maintenance funding (and staff) would result in an increasing deferred maintenance backlog. Some facilities are better maintained than others are; the Administration-Concession Building is in good condition. Maintenance facilities, such as the Old Inn, are generally in much poorer condition. Facilities in the Camino del Canyon and Conlon Avenue areas are also in poor condition. Infrastructure such as power, water, and phones need to be upgraded and frequently have lapses in service. Inadequate project funds and operational funds would result in moderate, long-term, adverse impacts to mission critical facilities at the monument.

Monument buildings are inadequate for their current uses due to small size and their lack of modern functionality. For example, in the office areas, all desks are shared, and half the computers are not hooked up to the internet. There are no break rooms or meeting rooms. The maintenance division does not have adequate storage space for equipment, or appropriate work space. Inadequate operational facilities would have a continued long-term, minor to moderate, adverse impact on park operations.

Conclusion

The continuation of current management would have both beneficial and adverse impacts on park operations. Continued long-term, moderate, beneficial impacts to operations would result from partner and volunteer efforts.

The continued impact of low staffing levels on park operations is moderate, long term, and adverse. Inadequate project and operational funding would result in major, long-term, adverse impacts to park facilities. Inappropriate space for staff would also result in continued long-term, minor to moderate, adverse impacts to monument operations.

Alternative 1: Connecting People with the Parks (NPS Preferred Alternative for Park Sites in Marin, San Francisco, and San Mateo Counties)

Analysis

There are several proposed changes indentified in alternative 1 that would influence park management, operations, and facilities. While designed to contribute to the protection of resources and the enhancement of visitor opportunities, the proposed changes will achieve these ends only if staffing, capital funds, and operating funds are increased in accordance with the cost estimates identified. If funding and needed staffing levels are not made available when these actions are implemented, the proposed actions would have long-term, moderate, adverse effects on park operations.

Additional law enforcement officers are proposed to cover increased picnicking, expanded visitor activities, and the potential for a greater number of lost or injured people. Additional rangers would also assist in parking management at the shuttle station. New maintenance staff would support trail maintenance, upkeep of interpretive signs, increased picnicking, and relocated and new visitor facilities. Increased staff would result in long-term, moderate, beneficial impacts to operations if appropriate funding is available, otherwise the actions of this alternative would result in adverse impacts such as

an inability to maintain facilities and an inability to ensure public safety and protection of resources.

The proposed new or reconstructed facilities, such as the Highway 101 / State Route 1 welcome center and parking area, would require additional capital investments. Unless the cyclic maintenance budget is collaborated to maintain the park's facilities as identified in this alternative, the deferred maintenance will increase, even with an initial investment in that asset. Adjusting the operations and maintenance budget to realistically reflect the true costs of a facility will have a long-term, moderate, beneficial impact on park operations; otherwise, the impact would be adverse and result in an increase of deferred maintenance.

Removal of nonessential buildings and parking would reduce associated maintenance and utility costs. Construction, rehabilitation, restoration, and demolition projects proposed in the alternative would result in moderate, long-term, beneficial impacts to park operations. These activities would also have short-term, minor, adverse impacts on operations due to the closure of buildings and lands during construction or restoration.

Conclusion

Increased staff would result in moderate, long-term, beneficial impacts, if funded. If funding is available for construction, rehabilitation, restoration, and demolition projects, these projects would result in moderate, long-term, beneficial impacts to park operations. Construction and landscape restoration activities would also result in short-term, minor, adverse impacts while they are underway. However, if funding and needed staffing levels are not made available when these actions are implemented, the proposed actions would have long-term, moderate, adverse effects on park operations.

Alternative 2: Preserving and Enjoying Coastal Ecosystems

Analysis

If adequate funding is available for additional staff for the public safety division at Muir Woods National Monument, such increases would result in moderate, long-term, beneficial impacts to operations. Increased law enforcement staff is recommended to manage the controlled visitor areas and to protect sensitive resources. Additional rangers would also assist in parking management at the shuttle station. Maintenance staff would decrease under this alternative because of the reduced number of facilities.

The effort to remove most facilities from the monument would have both positive and negative impacts to the operations. While demolition and natural resource restoration would require additional project funding and require staff effort in the short term, over the long term, staff efforts in maintenance of facilities would be reduced, and deferred maintenance would be reduced. However, new proposed facilities, such as the Highway 101/State Route 1 welcome center and the Muir Woods National Monument welcome center would require adjustment of the operations and maintenance budget to realistically reflect the true costs of the facilities in order to have beneficial impacts on park operations; otherwise, the impact would be adverse and result in an increase of deferred maintenance. Construction, rehabilitation, restoration, and demolition projects proposed in the alternative would result in major, long-term, beneficial impacts to park operations

if funded. Construction and landscape restoration activities would result in short-term, minor, adverse impacts while they are underway due to area and facility closures.

Conclusion

Increased staff would result in moderate, long-term, beneficial impacts. If fully funded, construction, rehabilitation, restoration, and demolition projects proposed in the alternative would result in major, long-term, beneficial impacts to park operations. Construction and landscape restoration activities also would result in short-term, minor, adverse impacts to park operations. Removal of much of the development from inside the monument could make public safety responses more difficult, and would result in a minor to moderate, long-term, adverse impact to park operations. However, if funding and needed staffing levels are not made available when these actions are implemented, the proposed actions would have long-term, moderate, adverse effects on park operations.

Alternative 3: Focusing on National Treasures (NPS Preferred Alternative for Muir Woods National Monument)

Analysis

If adequate funding is available for additional public safety and maintenance staff at Muir Woods National Monument, such increases would result in moderate, long-term, beneficial impacts to operations. Additional law enforcement officers are proposed to cover increased picnicking, expanded visitor activities, and the potential for a greater number of lost and injured people. Additional rangers would also assist in parking management at the shuttle station. Additional maintenance staff would support trail maintenance, upkeep of interpretive signs, increased picnicking, and relocated welcome centers.

The proposed new or reconstructed facilities, such as the Highway 101 / State Route 1 welcome center and interpretive trail improvements, would require additional capital investment. Unless the cyclic maintenance budget is collaborated to maintain the park's facilities as identified in this alternative, the deferred maintenance will increase, even with an initial investment in that asset. Adjusting the operations and maintenance budget to realistically reflect the true costs of facilities would have a long-term, moderate, beneficial impact on park operations; otherwise, the impact would be adverse and would result in an increase in deferred maintenance.

Removal of nonessential buildings and parking would reduce associated maintenance and utility costs. If fully funded, construction, rehabilitation, restoration, and demolition projects proposed in the alternative would result in moderate, long-term, beneficial impacts to park operations. Construction and landscape restoration activities would result in short-term, minor, and adverse impacts park operations while the activities are underway.

Conclusion

Increased staff would result in moderate, long-term, beneficial impact if adequate funding is available. If funding is available, construction, rehabilitation, restoration, and demolition projects proposed in the alternative would result in moderate, long-term, beneficial impacts to park operations. Construction and landscape restoration activities

also would result in short-term, minor, adverse impacts to park operations while the activities are underway. However, if funding and needed staffing levels are not made available when these actions are implemented, the proposed actions would have long-term, moderate, adverse effects on park operations.

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As the nation's principal conservation agency, the Department of the Interior has responsibility for most of our nationally owned public lands and natural resources. This includes fostering sound use of our land and water resources; protecting our fish, wildlife, and biological diversity; preserving the environmental and cultural values of our national parks and historic places; and providing for the enjoyment of life through outdoor recreation. The department assesses our energy and mineral resources and works to ensure that their development is in the best interests of all our people by encouraging stewardship and citizen participation in their care. The department also has a major responsibility for American Indian reservation communities and for people who live in island territories under U.S. administration.

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Golden Gate National Recreation Area • Muir Woods National Monument

Draft General Management Plan / Environmental Impact Statement

U.S. Department of the Interior • National Park Service • Denver Service Center