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1.1 Introduction

This Final Environmental Impact Statement (FEIS) evaluates a Fire Management Plan (FMP) for lands within the Golden Gate National Recreation Area (GGNRA), Muir Woods National Monument, and Fort Point National Historic Site (collectively known as “the park” for purposes of this FEIS). The National Park Service (NPS) has prepared the FEIS in accordance with the National Environmental Policy Act (NEPA). See Figure 1-1 for the park’s location and Figure 1-2 for the regional setting. The FEIS analyzes three alternatives for managing fire in the park; these alternatives are based upon park values, effective fire management strategies, NPS policy, and applicable law.

An FMP is a strategic plan describing detailed procedures for managing the full range of fire management activities, including wildland fire suppression and fuel reduction projects. NPS Director’s Order 18 (NPS 2003a) requires that each park with vegetation capable of burning prepare a plan to guide a fire management program. GGNRA is currently operating under a 1993 FMP. The NPS proposes to prepare a new FMP to reflect recent changes in fire management policy and the addition of newly acquired lands within the park boundary since the 1993 plan was written.

The FEIS for the FMP describes and assesses alternative strategies for reducing risks to the public, firefighters, sensitive resources, and park facilities from wildland fire. The document also examines the opportunities to use prescribed fire and mechanical fuel treatments as tools for achieving fire risk reduction and resource protection and enhancement objectives.

The alternative selected at the end of this NEPA process will define the overall strategy for the park’s new FMP. The FMP will be supplemented by operational procedures and plans such as preparedness plans, preplanned dispatch plans, prescribed fire plans, and prevention plans. The FMP is a separate stand-alone document that will be completed following the adoption of the alternative or actions constituting the approved plan in the Record of Decision (ROD).

1.2 Decision to Prepare an Environmental Impact Statement

The decision to prepare an Environmental Impact Statement (EIS) for the FMP was made by the superintendent of GGNRA after considering the scope, complexity, and public interest related to issues being addressed in the plan. The role of fire has implications for park use, ecosystem structure and function, and human activities in the region. This complexity and associated public interest suggested a level of analysis commensurate with an EIS. By completing an EIS for the FMP, sufficient analysis can be undertaken to assess the effects of particular alternatives and to ensure adequate involvement by the public and interested agencies.

The EIS for the FMP conforms to the provisions of the NEPA (42 U.S.C. 4321 et. seq.), and NPS Director’s Order 12 (NPS 2001a) and Handbook for Environmental Impact Analysis. Following the public comment period on the DEIS and any necessary consultation for actions that may affect natural and/or cultural resources, the FEIS is prepared and distributed to the public. At the conclusion of a 30-day waiting period, the NPS will prepare a Record of Decision. Following the Record of Decision, the recommendations of the new FMP, when completed, will include program objectives, details on staffing

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and equipment, and comprehensive information, guidelines, and protocols relating to the management of unplanned wildfire, prescribed burning, and mechanical fuels treatment. The FMP will become the working document guiding fire management actions in the park for the next 10 to 15 years.

This FEIS evaluates fire management planning at a more general, “program” level. Additional NEPA review may be needed for subsequent FMP implementation projects that involve issues not sufficiently assessed in the programmatic EIS. A five-year fire management program for implementation will be developed based on the alternative selected by the FMP EIS process. The five-year implementation program will be updated annually to reflect completed projects and add new projects that continue the progressive implementation of the selected alternative.

1.3 Planning Area

The legislated boundary of GGNRA consists of 74,816 acres in San Mateo, San Francisco, and Marin counties in California (see Figure 1-2). Within the legislated boundary, 15,700 acres of land are directly managed by GGNRA and an additional 15,400 acres on Bolinas Ridge are managed for GGNRA by Point Reyes National Seashore (PRNS). (The balance of acres are managed by other agencies.) New lands may be added, in the future, within the legislated boundary of GGNRA.

The FMP planning area encompasses those lands directly managed by GGNRA, including Muir Woods National Monument and Fort Point National Historic Site. The majority of lands directly managed by GGNRA are in Marin County and include three former military posts in the Marin Headlands and Fort Baker, and the 554-acre Muir Woods National Monument. The San Francisco GGNRA lands encompass nearly all of the city’s Pacific Ocean shoreline, including Lands End and Ocean Beach, as well as Alcatraz Island, and lands formerly held by the military at Fort Mason and along the coastal portion of the Presidio of San Francisco. The larger GGNRA units in San Mateo County are Milagra Ridge and Sweeney Ridge, former military sites between Pacifica, San Bruno, and Mori Point. The 1,200-acre Phleger Estate is the southernmost area in GGNRA. The acreage the NPS manages directly contains more than 1.7 million square feet of building space in both historic and non-historic structures. In all, GGNRA has roughly 59 miles of Pacific coast and San Francisco Bay shoreline and an estimated 40-mile long interface with developed lands, primarily residential communities. The Federal Wildland Fire Management Policy (January 2001) emphasizes the importance of reducing risk along the area between federally managed parklands and the urban interface and is therefore an important consideration in this planning effort.

The parklands in the planning area are also part of the Golden Gate Biosphere Reserve – two million acres of protected terrestrial and marine ecosystem in central California managed to promote resource conservation, research opportunities, and economically sustainable development. GGNRA lands support 19 separate ecosystems and 12 distinct plant communities. An island of open space in the densely developed nine-county San Francisco Bay Area, GGNRA lands provide habitat for 25 federally listed endangered or threatened plant and animal species and 52 additional species of concern. Park inventories have identified 872 terrestrial native plant species, 336 nonnative plant species, 282 resident terrestrial native vertebrate species, and 33 nonnative vertebrate species to date. Within GGNRA are five National

Pacific West Region

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San Francisco Bay Area

Golden Gate National Recreation Area
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Historic Landmark Districts, 667 historic structures, and more than 350 known archeological sites. Each year, more than 16 million visitors come to the park from all over the world, the country, and the Bay Area for recreation, education, inspiration, and respite (NPS 2003d).

The FMP EIS evaluates fire management options for approximately 15,000 acres of GGNRA's nearly 75,000 legislated acres. The FMP planning area does not include the following lands:

- (1) The northern lands of GGNRA, comprising 15,400 acres north of the Bolinas-Fairfax Road in western Marin County, which are managed by the Point Reyes National Seashore (PRNS) under an agreement between the two park units. Fire management responsibilities for these northern lands are addressed in the PRNS FMP Final EIS (NPS 2004a). GGNRA and PRNS have worked together to develop a complementary strategy for fire management that meets each park's objectives for sharing resources, research, and staffing during implementation of the respective FMPs.
- (2) The interior portion of the Presidio of San Francisco, Area B, which is managed by the Presidio Trust, a federal corporation. Because this area is not under the direct management of the NPS, it is not included in the FMP planning area.

In addition to lands currently under the management of the NPS, the FMP planning area includes those lands within the legislated boundary that may pass to NPS management in the near future. These areas, all in San Mateo County, include Cattle Hill and Pedro Point.

1.4 Purpose and Need for Action

Need

The park's 1993 FMP needs to be updated to conform to the Federal Wildland Fire Management Policy, which was developed to reflect lessons learned following a particularly catastrophic fire season in the year 2000. The federal policy provides guidance for the U.S. Forest Service and land management agencies in the Department of the Interior. The director of the NPS has issued new agency guidelines to direct the parks in updating their FMPs in conformance with current federal requirements.

The park's 1993 FMP focuses primarily on natural resource management issues and needs to be revised to more fully address cultural resource concerns, provide guidance for park lands acquired since 1993, and provide more guidance on effectively reducing fire risk along the wildland urban interface areas in the park. Changes are necessary to address conformance with current federal policy on issues of public and firefighter safety, hazard reduction in the wildland urban interface zone, the use of best available information as the basis for fire management planning, and the need to pair fuel reduction with management objectives for park resources.

Residential development flanking the park boundaries has intensified the potential for uncontrolled ignitions to spread across boundaries, threatening firefighters, residential areas, park visitors, and park resources. In addition, fire suppression practices have resulted in dangerous amounts of hazardous vegetative fuels that have accumulated in dense forests and shrublands. Because of these high fuel loads, residences and businesses are at risk from wildfire spreading from adjacent park lands. Also, a structural

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fire close to the park could spread into park lands and develop into a wildland fire that damages park resources. A new FMP is needed to reflect the importance of a more concerted effort to effectively reduce wildfire risk to park resources and to private property along the wildland urban interface, and to examine the feasibility of facilitating the role of fire where it is safe to do so.

The undeveloped areas of GGNRA support ecosystems that have evolved through time with periodic fire, both natural and human-ignited. Many components of these ecosystems are adapted to and may require periodic fire. As is typical of many national parks and other federal lands, active and effective fire suppression efforts for the past 150 years, in addition to logging, ranching, cultivation, pollution, and general urbanization, have changed native ecosystems. Ecosystem changes are evidenced by the spread of more flammable nonnative plant species, dense single-aged second-growth forests, conversion of shrublands to forest, forest and shrubland encroachment on grasslands, and decadence and decline of fire-adapted species. A new FMP is needed to provide a framework for managing these ecosystems and fuel loads.

Important characteristics of cultural landscapes have also been altered in the absence of fire, and the risk of wildland fire damaging historic structures has increased as fuel loading has increased. A new FMP is needed to address this issue.

Purpose

The purpose of the FMP is to provide a framework for all fire management activities in a manner that is responsive to natural and cultural resource objectives, reduces risks to developed facilities and adjacent communities, and provides for public and staff safety. The intent of this FEIS is to present and analyze alternatives for carrying out the fire management program at GGNRA. It also presents and analyzes effects that would occur as a result of implementing these alternatives. The purposes of this planning process are:

- To prepare a new FMP that is consistent with Federal Wildland Fire Management Policy and conforms to agency guidelines for fire management plans and programs; and
- To help achieve resource management objectives consistent with the park's cultural, natural resource, and land management plans and be responsive to safety considerations for park visitors, employees, and resources.

As part of the planning process, FMP goals were developed by NPS staff to reflect federal policy as well as the comments and concerns expressed by the public during the scoping period. Public scoping on this EIS began on August 8, 2003 and ran until December 5, 2003. (See Chapter 5, Section 5.1, Public Involvement and Scoping, for more information.) The goals were derived from guidance of the NPS Management Policies 2001 (NPS 2000a) and NPS Director's Order and Resource Handbook 18, Wildland Fire Management (NPS 1999a), in addition to federal policy and scoping input. The goals conform to the 1980 General Management Plan for GGNRA and the park's Resources Management Plan (1999). The goals and subsequent management objectives describe what must be accomplished in order for the fire management program to be successful and were used to formulate the alternatives analyzed in

this FEIS. Specific objectives for individual projects would be developed on a project-by-project basis and would be tied back to these FMP goals.

The FMP goals and management objectives are as follows:

Goal 1. Ensure that firefighter and public safety is the highest priority for all fire management activities.

Objectives:

Provide fire management workforce with the training, equipment, operating procedures, safety measures, and information needed to manage risks and carry out their activities safely.

Ensure that all fire management employees meet the Interagency Qualification Standards for their positions and those held while assigned to an incident.

Identify, inform, and protect visitors, communities, park partners, and other groups and individuals that potentially would be affected by fire management activities.

Comply with the National Wildfire Coordinating Group and agency fitness requirements for staff and make sure staff have personal protective equipment appropriate to the job or assignment.

Follow all aviation policies and practices during fire management activities. The fire management officer or designee will stay abreast of aviation policy changes by maintaining periodic contact with the regional aviation manager.

Goal 2. Reduce wildland fire risk to private and public property.

Objectives:

Annually analyze fire hazards, fire values, and risks to inform project priority selection for fire management units (FMUs).

Support the development of evacuation plans for wildland urban interface communities, where such plans do not exist.

Develop prevention plans to reduce the number of human-caused ignitions.

Goal 3. Protect natural resources from adverse effects of fire and fire management activities, and use fire management wherever appropriate to sustain and restore natural resources.

Objectives:

Manage ecosystems within the natural range of variability for plant community structure and fuel loads.

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Reduce potential spread of nonnative plant species to adjacent natural areas and ensure any fire activities include follow-up actions (planting, seeding, etc.) to meet overall vegetation goals. Ensure that any fill used and/or maintenance activities do not introduce weeds.

Reduce nonnative trees and shrubs (Monterey pine, Monterey cypress, acacia, eucalyptus, etc.) to the greatest extent possible.

Protect and restore rare and endangered species and sensitive habitat through fire management activities and project implementation.

Reduce erosion from fire roads and reduce sediment transport through ongoing maintenance of roads and the removal and site restoration of unnecessary fire roads.

Develop standards for the use of water and retardants in fire management activities, such as minimization of the use of saltwater and brackish water, and avoidance of use of nearby water sources with rare species, for the protection of water quality and aquatic habitat characteristics.

Identify and protect natural soundscapes through the course of mechanical treatment activities involving the extended use of power equipment.

Goal 4. Preserve historic structures, landscapes, and archeological resources from adverse effects of fire and fire management activities, and use fire management wherever appropriate to rehabilitate or restore these cultural resources.

Objectives:

Survey for and identify historic resources within a project area in the earliest possible stage of planning fire management activity.

Conduct surveys for areas of potential archeological resources (based on sensitivity modeling or prediction) prior to project implementation. Avoid ground disturbance prior to survey of sensitive areas for archeological resources. Protect archeological resources (known, predicted historical, or discovered sites).

Develop standard procedures for projects calling for the use of fire and other treatments in order to maintain the setting of historic sites and to maintain the integrity of cultural resources.

Regularly monitor fire management activities to assess their effects on cultural resources.

Protect historic structures and landscape features through the course of fire management project implementation.

Use fire management activities to preserve and in some cases to perpetuate historic vegetation patterns.

Rehabilitate pastoral landscapes where fire danger would be lessened by the establishment of a lower fuel-loading plant community.

Goal 5. Refine management practices by improving knowledge and understanding of fire through research and monitoring.

Objectives:

Monitor and evaluate the effects of fire and fuels management activities on park resources. Evaluate monitoring information to refine fire management actions and project objectives.

Identify issues or missing information important to developing effective implementation of the park's fire and fuels management program.

Continue ongoing inventory and baseline data collection to enhance existing resource information systems. Use vegetation maps, fire history maps, and other tools to develop risk assessments that will be used to identify and set priorities for appropriate treatments.

Conduct research that will help park managers to understand fire regimes, refine prescriptions, provide data for fire behavior models, and effectively implement the fire management program.

Research the role of fire in old-growth redwood forests.

Conduct research into issues of Sudden Oak Death, and the potential of fire as a management tool.

Determine how fire can be used to target nonnative plant species for eradication.

Research the effects of fire exclusion.

Determine how current fire frequency affects related ecosystems with respect to the historic fire regime.

Determine how post-fire recovery patterns may be used in restoration projects.

Goal 6. Develop and maintain staff expertise in all aspects of fire management.

Objectives:

Implement annual program reviews for fire management office and personnel.

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Implement training plans for each employee to reach target qualifications for the positions in the fire management organization. Conduct annual training appropriate to instructor qualifications.

Keep abreast of the latest developments and technology applicable to fire management.

Establish and promote measurable qualifications and staff experience to accomplish fire management program objectives in a safe manner.

Follow all safety standards and guidelines identified within the Interagency Incident Business Management Handbook.

Goal 7. Effectively integrate the fire management program into park and park partner activities.

Objectives:

Develop a fire management program that is consistent with, and meets the goals of, the park's General Management Plan (GMP) and resource management plans.

Encourage interdisciplinary pre-project planning for fire management activities.

Plan for and conduct fire management activities in an integrated manner with respect for overall resource goals and in an effort not to exacerbate existing problems.

Conduct educational outreach programs on the park's fire management activities and fire safety for park partners, including tenants in park structures within project areas.

Goal 8. Foster informed public participation in fire management activities.

Objectives:

Continue and enhance communication and education programs to broaden an understanding of the NPS fire management mission, for both internal and external audiences.

Maintain and expand the current park website to provide information about fire management activities in the park as well as fire safety.

Support an increase in fire ecology and safety programs in schools.

Increase public meetings and homeowners group presentations.

Provide more interpretive programs on fire safety and ecology.

Provide trailhead brochures on fire safety.

Goal 9. Foster and maintain interagency fire management partnerships and contribute to the firefighting effort at the local, state, and national level.

Objectives:

Maintain cooperative fire management agreements with county and city fire departments.

Continue interagency coordination and cooperation with federal land management agencies and other related agencies supporting or participating as full partners in wildland fire management activities and programs.

Attend interagency planning meetings prior to each fire season to enhance coordination and cooperation to maximize efficiency to manage wildland fire incidents.

Continue participation in regular fire management coordination meetings to share information and discuss related issues with organizations such as FIRESafe Marin.

Goal 10. Minimize smoke generation during prescribed burning through the use of a smoke management plan (SMP) that details best management practices or non-burning alternatives where these options would meet resource management and fuel reduction objectives and also achieve emissions reduction.

Objectives:

Confer regularly with Air Resources staff at the NPS Pacific West Regional Office, other parks, fire agencies, and the Bay Area Air Quality Management District (BAAQMD) to keep current on best management practices and non-burning alternatives.

Maintain current information on smoke-related health issues affecting firefighters such as exposure limits, exposure monitoring, risk minimization, and respiration technology.

Legislative and Policy Framework

The following laws, regulations, plans, and policies set the planning framework for this FMP. These include federal documents such as the NPS management policies, the park's enabling legislations, and the General Management Plan, along with related regional and local plans and policies.

Applicable Federal Regulations, Plans, and Policies

National Environmental Policy Act (NEPA)

NEPA (1970) requires that, before making decisions, federal agencies conduct a public involvement process that analyzes the potential effects of proposed actions on the human environment. Among many goals, NEPA recognizes each generation as a trustee responsible for protection of the environment and sets as national policy the attainment of the widest range of beneficial uses of the environment without degradation, risk to health or safety, or other undesirable and unintended consequences (42 USC 4331[b]). NEPA created a Council on Environmental Quality (CEQ) as part of the Executive Office of the

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President to develop implementation regulations for NEPA. Pursuant to these regulations, each federal agency must “implement procedures to make the NEPA process more useful to agency decision makers and the public” (40 CFR 1500.2).

National Park Service Director’s Order 12 (DO-12) and Handbook

The procedures for implementing NEPA, adopted by the NPS, are found in Director’s Order 12 (NPS 2001a) and the Handbook on Environmental Assessment (rev. 2004). Though known as a “handbook,” the processes described within it are legally binding on all NPS personnel. DO-12 instructs NPS staff on the integration of the NEPA process in all NPS planning efforts. An essential precept of NEPA is public involvement, and Director’s Order 12 provides guidance on integrating the public and regulatory agencies into the development of NEPA plans and projects. DO-12 never conflicts with the CEQ regulations and adds some requirements to ensure that NEPA processes respond to the specific mandates of the NPS such as the NPS Organic Act (1916).

Federal Wildland Fire Management Policy

The federal government has set fire and fuels management as a high priority issue nationwide. In 2001, the Interagency Federal Wildland Fire Policy Review Working Group revised the Federal Wildland Fire Management Policy (National Interagency Fire Council 1995), which applies to all federal land management agencies. Key elements of the policy are listed below.

- Firefighter and public safety is the first priority.
- The full range of fire management activities will be used to help achieve ecosystem sustainability.
- Fire, as a critical natural process, will be integrated into land and resource management plans and activities on a landscape scale and across agency boundaries.
- Wildland fire will be used to protect, maintain, and enhance resources and, as nearly as possible, be allowed to function in its natural ecological role.
- Rehabilitation and restoration efforts will be undertaken to protect and sustain ecosystems, public health, and safety, and to help communities protect infrastructure.
- Fire Management Plans and programs will be based on a foundation of sound science. Research will support ongoing efforts to increase scientific knowledge of biological, physical, and sociological factors.
- Agency administrators will ensure that their employees are trained, certified, and made available to participate in the wildland fire program locally, regionally, and nationally as the situation demands.
- Agencies will develop and implement a systematic method of evaluation to determine effectiveness of projects begun under the 2001 Federal Fire Policy. The evaluation will ensure

accountability, facilitate resolution of areas of conflict, and identify resource shortages and agency priorities.

National Park Service Director’s Order 18: Wildland Fire Management

Policies and directives in Director’s Order 18 (DO-18) specifically require the development of a fire management plan for each park with burnable vegetation and direct that each approved FMP will:

- Reinforce the commitment that firefighter and public safety is the first priority.
- Describe wildland fire management objectives, which are derived from land, natural, and cultural resource management plans and address public health issues and values to be protected.
- Address all potential wildland fire occurrences and consider the full range of wildland fire management actions.
- Promote an interagency approach to managing fires on an ecosystem basis across agency boundaries and in conformance with the natural ecological processes and conditions characteristic of the ecosystem.
- Include a description of rehabilitation techniques and standards that comply with resource management plan objectives and mitigate immediate safety threats.
- Be developed with internal and external interdisciplinary input and reviewed by appropriate subject matter experts and all pertinent interested parties, and approved by the park superintendent.
- Comply with the National Environmental Policy Act (NEPA) and any other applicable regulatory requirements.
- Include a wildland fire prevention analysis and plan, a fuels management analysis and plan, and procedures for short- and long-term monitoring to document that overall programmatic objectives are being met and undesired effects are not occurring.

DO-18 also specifies that until a fire management plan is approved, park areas must take an aggressive suppression action on all wildland fires, taking into account firefighter and public safety and resources to be protected within and outside the park.

National Park Service Management Policies

The NPS Management Policies 2001 document (NPS 2000a), the basic NPS-wide policy document, includes the following elements related to fire management in NPS units:

- Each park with vegetation capable of burning will prepare a fire management plan and will address the need for adequate funding and staffing to support its fire management program. The plan will be designed to guide a program that responds to the park’s natural and cultural resource objectives; provides for safety considerations for park visitors, employees, neighbors, and

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developed facilities; and addresses potential impacts on public and private property adjacent to the park.

- An environmental assessment developed in support of the plan will consider the effects on air quality, water quality, health and safety, and natural and cultural resource management objectives. Preparation of the plan and environmental assessment will include collaboration with adjacent communities, interest groups, state and federal agencies, and tribal governments.
- Until a plan is approved, parks must immediately suppress all wildland fires, taking into consideration park resources and values to be protected, firefighter and public safety, and costs.
- Parks lacking an approved fire management plan may not use resource benefits as a primary consideration influencing the selection of a suppression strategy, but they must consider the resource impacts of suppression alternatives in their decisions.
- All parks must use a systematic decision-making process to determine the most appropriate management strategies for all unplanned ignitions or prescribed fires that are no longer meeting resource management objectives.
- Parks will use methods to suppress wildland fires that minimize impacts of the suppression action and the fire, and are commensurate with effective control, firefighter and public safety, and resource values to be protected.

Golden Gate National Recreation Area General Management Plan and General Management Plan Update

The General Management Plan/Environmental Analysis, Golden Gate National Recreation Area and Point Reyes National Seashore (NPS 1980) recognized the need to incorporate prescribed burning into research programs designed to enhance ecosystem management in the park. The 1980 General Management Plan defined a series of land management zones to guide the strategy for “how the park will be managed and developed in the future based on legislative and administrative requirements, resource studies, and public preferences.” This zoning approach allows for the treatment of specific resources, while relating them to an overall approach to the park as a whole. The FMP’s proposed fire management actions for different areas of the park need to respect and reflect this current zoning, to minimize visitor, user, and resource management conflicts. The land management zones pertinent to the FMP are as follows (see Figure 1-3):

- *Intensive Landscape Management Zone* – where the landscape has been substantially modified by human activities.
- *Pastoral Landscape Management Zone* – in which dairying and cattle ranching are desirable aspects of the scene.
- *Natural Landscape Management Zone* – in which natural resources and processes will remain as undisturbed as possible.

Golden Gate National Recreation Area Park Management Zones



Source: 1990 GGNRA General Management Plan

Figure 1-3

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- *Special Protection Zone* – where Muir Woods National Monument retains special status to protect the old-growth stand of coast redwoods.
- *Preservation Zone* – where spaces and objects are managed primarily for their historic values.
- *Adaptive Use Zone* – where structures or spaces of historic value will be adapted for recreation, park management, and related activities.

The park is currently in the initial stages of preparing a new general management plan for GGNRA to replace the 1980 General Management Plan for GGNRA and Point Reyes National Seashore. Until a new plan is completed, the land use designations of the 1980 General Management Plan constitute the basic constraint imposed upon fire management planning at the park level.

Golden Gate National Recreation Area Natural Resource Management Plan

The Natural Resources Management Plan (1999) describes the status of GGNRA's natural resources and a parkwide program aimed at resource preservation, monitoring, maintenance, and restoration. A primary challenge identified in the plan is addressing the changes in ecosystem composition and accumulation of fuels resulting from the focus on fire suppression during the last century. One of the 10 principal threats to the health of the natural resources of GGNRA listed in the plan is lack of fire stimulus in fire-adapted environments. A fire history of the park suggests that in prehistoric times wildland burning occurred at frequencies of once every 21 to 27 years (McBride and Jacobs 1978). A more extensive discussion of fire history is presented in Chapter 3, Section 3.2, Project Setting, Fire Regime of the Central California Coast.

The plan acknowledges that suppression leads to high fuel loading and an increase in the risk of a catastrophic fire. Wildland fire and its suppression could have direct and indirect impacts on natural resources by contributing to the spread of nonnative plant species, compaction and disruption of soils, alteration of drainage patterns, alteration of wildlife habitat, and high mortality of wildlife. In the absence of fire, plant diversity and overall biodiversity are declining in fire-adapted plant communities such as chaparral and oak woodlands. Douglas-fir and other forest species less tolerant of regular fires are invading these communities, potentially threatening the long-term viability of several rare plant species endemic to chaparral.

The Natural Resource Management Plan recognizes the benefits gained through hazard fuel reduction programs, including prescribed burning and habitat modification, designed to prevent such catastrophic losses of park resources. Consistent with the 1993 FMP, the Natural Resource Management Plan calls for prescribed fire to be used in GGNRA to revitalize fire-adapted communities and reduce the encroachment of fire-sensitive trees. Additional research on these communities could assist in resolving natural resource concerns. Prescribed burning and fire effects monitoring is woven into strategies for protection of the endangered San Bruno elfin butterfly, Mission blue butterfly, Northern spotted owl, old-growth forest species, and the rare manzanita and ceanothus species that are found in GGNRA. Since habitat modification through prescribed fire and mechanical fuel reduction projects can have direct and indirect effects on wildlife and their habitats, the plan calls for careful interdisciplinary planning to protect existing habitat values and guide habitat enhancement.

Golden Gate National Recreation Area Cultural Resource Management Plan

The GGNRA Cultural Resource Management Plan (1998) presents a prioritized list of 128 cultural resource projects and provides a problem statement, a description of the recommended project or activity, and an estimate of budget and staff needed to complete each project. The Cultural Resource Management Plan does not include overarching objectives for resource protection and does not address fire management planning as a strategy. A forthcoming update of this plan may incorporate objectives that integrate both fire and vegetation management as means to protect, restore, or rehabilitate cultural resources and landscapes within the park.

A preliminary listing of cultural landscapes in the park has been completed for all three counties with lands in the park. See Appendix D for this listing. Cultural landscape reports have been prepared for the Presidio of San Francisco and one for Fort Baker is in final review. The Cultural Landscape Inventory, an NPS database listing properties either on or eligible for the National Register of Historic Places, has been completed for the Fort Mason, Fort Baker, Sutro Heights, Lands End, and Cliff House areas. These cultural landscape listings serve as a starting point for discussion of cultural resource protection in the FMP and NEPA document. The FMP will address the circumstances under which implementation actions trigger the need for additional cultural resource compliance through the National Historic Preservation Act (NHPA). FMP actions have the potential to affect cultural resources both adversely and beneficially. While the FMP FEIS assesses potential effects on cultural resources from proposed actions under the alternatives, the goal of cultural resource compliance is to formulate a process through which cultural resource goals for a project area can be considered early in the planning process for fire management projects.

Golden Gate National Recreation Area Strategic Plan for 2001-2005

The five-year performance plan for GGNRA (NPS 2000c) lists parkwide goals with performance measures built into each goal statement. Strategic planning goals for the restoration of GGNRA parklands disturbed by nonnative species called for research into the applicability of prescribed fire as a restoration tool to be completed by 2005 and a burn plan incorporating that research to be formulated. The strategic plan is currently in the process of being updated with goals and measurable objectives through 2008.

Vegetation Management Plan, Presidio of San Francisco

The Vegetation Management Plan (VMP) (NPS 2001b) for the Presidio was completed in 2001 as part of a collaborative planning effort between the NPS and the Presidio Trust for both Area A (under NPS management) and Area B (under Presidio Trust management) of the Presidio. The VMP addresses all vegetation resources and contains policies and actions that guide fire management activities as well as natural resources management activities, including efforts to test the efficacy, through research, of using fire to enhance and/or manage threatened and endangered plant species. Carefully planned and executed fuels treatments consistent with VMP resource management objectives have reduced the risk of wildland fire while improving ecosystem conditions. The activities proposed in the new FMP that apply to Area A of the Presidio should be consistent with the VMP resource management objectives and be coordinated with the Presidio Trust.

Applicable County, Special District, and State Plans

Mount Tamalpais Area Vegetation Management Plan, Marin Municipal Water District and Marin County Open Space District

The Mount Tamalpais Area Vegetation Management Plan (VMP) (MMWD 1995), prepared in 1995, presents strategies for managing vegetation on over 19,000 acres owned by the Marin Municipal Water District (MMWD) and an adjacent 1,150 acres owned by the Marin County Open Space District (MCOSSD). The plan provides specific recommendations for reducing fire hazards and enhancing biodiversity. GGNRA lands are present in both MMWD watersheds (West Marin and Mount Tamalpais) and have common boundaries with MMWD holdings. All jurisdictions in the Mount Tamalpais area share essentially the same resource challenges of high fuel accumulation, a complex and lengthy urban wildland interface, and the spread of highly flammable, nonnative plant species within the interface. Addressing the issues incrementally within each jurisdiction contributes to the overall success in combating these challenges throughout the Mount Tamalpais region.

A primary goal of the Mount Tamalpais Area VMP is to reduce fire hazard. Major fires covering 20,000 to 65,000 acres have raged through Marin County periodically since recordkeeping began in 1859. The last major fire on MMWD lands occurred in 1945, and fuels have been accumulating since then. Some areas of chaparral and evergreen forest have not burned in almost 70 years. The VMP calls for a network of fuel breaks to help firefighters contain wildfires. The fuel breaks will use existing ridgetop roads in the watershed buffered by zones of reduced vegetation density. The VMP also calls for prescribed burning of 100 to 200 acres per year (less than one percent of watershed land) to control nonnative plants, reduce fuels, and maintain natural habitats.

Under the proposed GGNRA FMP DEIS alternatives, the NPS would continue to provide staff support and, when available, financial support, through the federal Wildland Urban Interface (WUI) funding program to support MMWD vegetation management projects described in the VMP. The NPS would continue to seek opportunities for cooperative efforts to implement the VMP using prescribed fire and mechanical fuel reduction, and make improvements to ingress/egress for emergency vehicles and evacuation of the public and firefighters in the event of wildland fire.

Point Reyes National Seashore Fire Management Plan

The Point Reyes National Seashore (PRNS) FMP and FEIS (NPS 2004a) examine a range of alternatives for addressing the wildland fire risk and hazard at Point Reyes National Seashore and the northern lands of GGNRA. The 18,000 acres of GGNRA lands included in the PRNS FMP are under the direct administration of PRNS through an agreement between the two parks. With the catastrophic Vision Fire as a recent historical example, much of the focus of the PRNS FMP is on strategies that increase firefighter and public safety and reduce the risk of fire spreading from wildlands into neighboring communities. The alternative selected for implementation (Alternative C in the FEIS) allows up to 2,000 acres of prescribed burning and 1,500 acres of mechanical treatment to occur within the park each year. With the exception of smaller size research burns, prescribed burning would not occur within the area currently leased for agriculture.

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The GGNRA and PRNS FMPs share the same goals. To the greatest extent possible, NPS will develop objectives and proposals that contribute to meeting these shared goals and promote an efficiency of scale for the two parks through joint staffing and/or funding of projects. The planning areas of the PRNS and GGNRA FMPs adjoin each other at the Bolinas–Fairfax Road, with PRNS managing lands north of the road and GGNRA managing lands to the south. With reference to the interface between the two management areas, the PRNS FMP states that “Prescribed burning in the southernmost portion of the ridge [Bolinás Ridge] in coastal chaparral and mixed scrub habitats would also help achieve a natural resource benefit by simulative reproduction in the rare, fire adapted species Marin manzanita and Mason’s ceanothus” (NPS 2004a). The GGNRA FMP should develop a strategy for the southern end of Bolinas Ridge that is consistent with the objectives for the northern section of the Bolinas Ridge covered in the PRNS FMP.

California Fire Plan and Vegetation Management Program

In 1996, the California State Board of Forestry and the California Department of Forestry and Fire Protection (CDF) prepared the California Fire Plan (CDF 1996). The overall goal of the plan is to reduce total costs and losses from wildland fire in California by protecting assets at risk through focused pre-fire management prescriptions and increasing initial attack success. Key elements of the plan are developing wildfire safety zones and working with stakeholders, including federal agencies.

Fuel reduction actions implemented by the Marin County Fire Department (MCFD) and the California Department of Forestry and Fire Protection in San Mateo County conform to the state Vegetation Management Program. The program, adopted in 1981, strives to reduce the risk of large damaging wildfires and improve the growing conditions of native plant and wildlife species through prescribed burning and mechanical fuel reduction.

Marin Countywide Plan

A number of the policies and programs in the Environmental Hazards Element of the Marin Countywide Plan (Marin County 1994) seek to mitigate wildland fire hazards through a variety of management efforts. The element sets public education as a priority for the County and MCFD and calls for a countywide map to be developed showing fire hazard areas subject to wildland fire. This hazard map was subsequently developed as the basis for the Marin County Fire Plan published in 2000 (see “Local Fire Departments” below). The Marin County Fire Plan was developed to respond to the Marin Countywide Plan requirement for a systematic and environmentally sound reduction of hazardous vegetation, in order to reduce the buildup of vegetation created by fire suppression activities. Fire hazard reduction programs included standards for clearance around structures, guidelines for fire-resistant landscaping and resistant building materials, and a requirement for the installation of residential sprinkler systems in all new and remodeled structures. The 1994 Marin Countywide Plan directs the MCFD and other local fire protection agencies to work in concert with the Marin County Open Space District, the State Department of Forestry and Fire Protection, and the NPS to encourage and promote the maintenance of existing fuel breaks and emergency access routes for effective fire suppression.

The County is currently in the process of updating the 1994 Countywide Plan; a draft plan update is currently out for public review and a California Environmental Quality Act (CEQA) document is under

preparation. The plan update includes policies and programs intended to minimize harm to people and property due to a range of environmental hazards, including fire. The update acknowledges the new risk to wildland firefighters and the public represented by increased fuels and weakened trees and limbs from dead and dying trees infected with Sudden Oak Death. The update also notes insufficient water supply and difficult access as contributors to the risk of property damage, injury, and loss of life from fire in some locations. In addition, with most of the level areas of the county already developed, new construction continues “to encroach on wildlands” and be sited in steeper areas that are more “vulnerable to rapid changes in fire behavior” (page 3-78). The plan update advises that “careful siting and construction can lessen hazard potential” and that “adequate site clearing and construction techniques such as fire sprinklers can help reduce the threat of fire” (page 3-79).

An important goal cited in the update – to “protect people and property from risks associated with wildland and structural fires” – closely conforms to the first two goals of the FMP evaluated in this DEIS. The County proposes an impressive list of implementation programs, summarized below, to help achieve this goal.

EH-4a. Provide information about fire hazards. Make fire hazard maps readily available and provide information on hazard reduction techniques to the public.

EH-4b. Maintain fuel breaks and access routes (in conjunction with other fire protection and land management agencies such as the NPS).

EH-4c. Restrict land divisions. Prohibit new land divisions in areas with high fire hazard unless:

- the adequacy of water supply is demonstrated,
- emergency vehicle access is provided from more than one point,
- necessary fire trails and fuel breaks are provided,
- fire-resistant materials are used exclusively,
- adequate defensible space is provided around structures, and
- fire-resistant plants are used in landscaping.

EH-4d. Require compliance with fire department conditions (and the incorporated State Fire Code).

EH-4e. Review applications for fire safety,

EH-4f. Continue to require sprinkler systems.

EH-4g. Continue to require fire-retardant roofing.

EH-4h. Amend the Development Code to require adequate defensible space and use of fire-resistant materials. (Draft Community Plan, pages 3-87 to 3-89)

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The Marin County Local Coastal Plan, Units 1 and 2 (1980 and 1981), guides development in the coastal region of Marin County but does not address wildland fire hazard, fuel reduction, wildland urban interface, nor vegetation management.

The existing GGNRA Fire Management Plan conforms to the current Draft Marin Countywide Plan and to the proposed plan update, and the new FMP would contribute to County efforts to implement Programs EH-4a and EH-4b. Through the new FMP, the NPS would continue to work with local fire departments in providing information on fire hazard reduction to local residents as required in Program EH-4a. Under all alternatives, the NPS would continue routine maintenance of fire trails and roads acting in partnership according to the guidance in Program EH-4b.

Marin County Community Plans

The principal unincorporated residential areas of Marin County have Community Plans that were developed through a CEQA process led by the County with the participation of local residents. The Community Plans guide land use and development for each residential area by setting goals, policies and objectives. Relevant to this FMP FEIS are the Marin City Community Plan (1992), Stinson Beach Community Plan (1985), the Muir Beach Community Plan (1972), the Bolinas Community Plan (1975), and the Tamalpais Area Community Plan (1992). The Tamalpais Area Community Plan includes the neighborhoods of Tam Valley, Homestead Valley, Almonte and Muir Woods Park. The section of the Tamalpais Area Plan addressing Homestead Valley includes an objective to reduce wildfire hazard by working with residents and landowners to catalog and remove stands of eucalyptus trees which pose a risk to persons and property (LU30.1a, page III-69). The Plan encourages homeowners in the urban/wildland interface areas to remove flammable vegetation and to plant fire-resistant landscaping around the perimeter of their properties (page V-4).

Local Fire Departments

The State of California contracts with the county to provide protection to the “State Responsibility Area.” This area includes most of the inland rural and coastal portions of the county and several communities, including Homestead Valley, Kentfield, Lucas Valley, Marin City, Marinwood, portions of Santa Venetia, and Tamalpais Valley. Marin County Fire Department (MCFD) vegetation management projects are informed by the Marin County Fire Plan (Marin County Fire Department 2000), which provides a prescription for reducing cost and losses from wildland fire. The plan uses a four-factor assessment that defines Marin County’s wildland fire risk and hazards. The plan addresses generalized wildland fire risk for federal parklands. Marin County vegetation management actions, such as prescribed burns, comply with the California Vegetation Management Program.

Other local fire departments with jurisdiction adjacent to federal lands are the Southern Marin Fire Department, which is responsible for Tamalpais Valley and Homestead Valley, and volunteer fire departments in Muir Beach and Stinson Beach.

Unincorporated areas of San Mateo County contract with the California Department of Forestry and Fire Protection (CDF) for vegetation management and fire suppression services. CDF actions comply with the

California Vegetation Management Program. Incorporated areas of San Mateo County adjacent to GGNRA lands are served by the Pacifica and San Bruno fire departments.

San Mateo County General Plan

The San Mateo County General Plan (November 1986) requires clearance of defensible space around residential structures and inspections to ensure conformance with defensible space requirements. The plan promotes the use of fire-retardant vegetation in landscaping. San Mateo County fire agencies are encouraged to develop fire hazard maps, plan for coordination of efforts and evacuation of residents, conduct prescribed burns to reduce fuel loading, and maintain fuel breaks and fire roads.

San Francisco County Natural Areas Program and San Francisco Peninsula Watershed Management Plan

Prescribed burning is included as a strategy for controlling the spread of nonnative plant species and encouraging the germination of native species in the San Francisco Recreation and Park Department's County Natural Areas Program (NAP). The San Francisco Recreation and Park Department is responsible for managing the City's "Natural Areas." The City General Plan (Open Space Element, Policy 13) mandates the protection of significant Natural Resource Areas. NAP began in 1997 and is a community-based habitat restoration program. San Francisco Natural Areas adjacent to GGNRA lands include Mountain Lake Park on the southern border of the Presidio and Sharp Park, bordered by Mori Point on the southwest and Sweeney Ridge on the southeast and east. Sharp Park is unique in the City's Significant Natural Areas Program in that it supports the federally listed endangered San Francisco garter snake and Mission blue butterfly; the federally listed threatened California red-legged frog; the common yellowthroat, a federal bird of conservation concern; and possibly the bumblebee scarab beetle, a federal species of concern.

The 23,000-acre San Francisco Peninsula Watershed, managed by the San Francisco Public Utilities Commission (SFPUC), lies adjacent to NPS lands at Sweeney Ridge. The watershed lands are designated as a Hazardous Fire Area by the California Department of Forestry and Fire Protection (CDF). As such, the area is subject to closure by the SFPUC, as necessary or as requested by CDF, during times of high fire danger. One of the secondary goals of the recently completed Peninsula Watershed Management Plan (SFPUC 2002) is to protect the watershed, adjacent urban areas, and the public from fire hazard. Fire in the watershed would not only place nearby populated urban areas at risk but could also affect water quality, water supply, and ecological and cultural resources within the watershed and in adjacent areas. One of the primary reasons for restricting public access to the watershed lands is to reduce the potential for the deliberate or accidental start of a wildland fire. Fire Policies F1 through F10 address the protection of watershed resources through the improvement of firefighting facilities and implementation of a fire management plan for the watershed. This SFPUC fire management plan was a technical report prepared to support the San Francisco Peninsula Watershed Management Plan.

In implementing the GGNRA FMP, the NPS will coordinate with the SFPUC Land and Resources Management Section to ensure that NPS actions conform to the watershed's Watershed Management Plan and Fire Management Plan to the extent possible to meet NPS objectives. GGNRA staff meets annually with the SFPUC Land and Resources Management Section to discuss issues of joint interest and will

inform SFPUC staff of proposed fire management actions at the Phleger Estate, particularly those that could affect management of the adjacent watershed lands.

Considerations and Constraints

Conformance with the Mandate of the National Park Service

The FMP DEIS alternative selected by the NPS should best accomplish the legislated purposes of GGNRA and the statutory mission of the NPS and cannot lead to an impairment of park resources and values. The NPS mission is defined in the 1916 National Park Service Organic Act, which created the agency, and reaffirmed in the 1970 General Authorities Act. The underlying goal of the FMP, and all NPS planning and resource management documents, is the fulfillment of the NPS mission, which states:

The fundamental purpose of all units of the National Park Service is to conserve the scenery and the natural and historic objects and the wildlife therein and to provide for the enjoyment of the same in such manner and by such means as will leave them unimpaired for the enjoyment of future generations. (Public Law 91-383, Sec. 1)

To assure fulfillment of the NPS mission, NPS Management Policies 2001 (NPS 2000a) requires decision makers to consider impacts and determine in writing that a proposed action will not lead to an impairment of park resources and values before approving the action. NPS Management Policies 2001 states that impairment prohibited by the Organic Act “is an impact that, in the professional judgment of the responsible NPS manager, would harm the integrity of park resources or values, including the opportunities that would otherwise be present for the enjoyment of those resources or values.” NPS Management Policies 2001 further provides specific guidance for NPS managers to use in analyzing whether a proposed action would result in impairment. The policies state:

. . . an impact would be more likely to constitute impairment to the extent that it affects a resource or value whose conservation is:

- Necessary to fulfill specific purposes identified in the establishing legislation or proclamation of the park;¹
- Key to the natural or cultural integrity of the park or to the opportunities for enjoyment of the park; or
- Identified as a goal in the park’s general management plan or other relevant National Park Service planning documents.²

¹ GGNRA was established to “...preserve for public use and enjoyment...outstanding natural, historic, scenic, and recreation values, and in order to provide for the maintenance of needed recreational open space necessary to urban environment and planning” (Public Law 92-589). Muir Woods was established to protect the old-growth redwood described as “an extensive growth of redwood trees (*Sequoia sempervirens*) embraced in said land is of extraordinary scientific interest and importance because of the primeval character of the forest in which it is located . . .” (No. 793, Jan. 9, 1908 35 Stat.2174). In 1970, President Nixon signed Public Law 91-457 creating Fort Point National Historic Site, and gave GGNRA administrative authority over Fort Point as part of Public Law 92-589 establishing GGNRA. Fort Point was created “to preserve and interpret for future generations the historical significance of Fort Point in the Presidio of San Francisco, California” (47 18410 FP NatHistSite).

As with many of the management actions considered by NPS decision makers today, the careful balance of sometimes competing park resources and values is an important component of the review and decision-making process. However, NPS decision makers are given little leeway when considering impairment of park resources. All elements of an NPS action must avoid impairing park resources. If avoidance is not possible, the elements of the NPS action must be modified or deleted. However, “an impact would be less likely to constitute an impairment to the extent that it is an unavoidable result, which cannot reasonably be further mitigated, of an action necessary to preserve or restore the integrity of park resources or values” (NPS 2000a). NPS Management Policies 2001 provides guidance in this regard by reaffirming that the “fundamental purpose” of the national park system begins with a mandate to conserve park resources and values. Though providing for the enjoyment of park resources and values by the people of the United States is also an NPS mandate, the NPS is directed by Congress that, in cases where there is a conflict between conserving resources and values and providing for enjoyment of them, conservation is considered predominant (NPS 2000a).

The FMP will provide GGNRA with the framework through which the NPS statutory requirements, NEPA commitments, and planning objectives associated with fire management actions can be attained while assuring protection of cultural, natural, scenic, and recreational resources.

National Park Resource Considerations and Constraints

NPS legislation and management policies provide guidance on appropriate resource protection and regulatory compliance for national parks and guide the agency in land management programs that balance the NPS mandate of resource stewardship and provision of public recreation. Similarly, NPS Management Policies 2001 directs NPS fire management programs to “be designed to meet park resource management objectives while ensuring that firefighter and public safety are not compromised” (NPS 2000a). The directive to incorporate resource management objectives into fire management planning places an important constraint on the planning and implementation phase of a fire management program that otherwise might focus primarily on wildland fire risk reduction.

The definition of resources that merit protection within NPS lands is comprehensive and applies to “a park’s scenery, natural and historic objects, and wildlife, and the processes and conditions that sustain them, including, the ecological, biological, and physical processes that created the park and continue to act upon it; scenic features; natural visibility, both in daytime and at night; natural landscapes; natural soundscapes and smells; water and air resources; soils; geological resources; paleontological resources; archeological resources; cultural landscapes; ethnographic resources; historic and prehistoric sites, structures, and objects; museum collections; and native plants and animals” and “any additional attributes encompassed by the specific values and purposes for which it was established” (NPS 2000a).

In addition to compliance with agency policy, the NPS must conform to all relevant federal legislation for environmental and cultural resource protection, including federal legislation that has been delegated to the

² For example, the 1980 General Management Plan, 1994 General Management Plan Amendment for the Presidio, 1996 Crissy Field Plan, or 2000 Fort Baker Plan.

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State of California for implementation. Planning for fire management action must conform to the requirements of the following regulations and orders.

National Environmental Policy Act (NEPA)

All NPS actions, including specific projects funded with NPS money or performed by NPS staff on non-NPS lands, require conformance with NEPA. The goal of NEPA is “to make sure that agencies fully consider the environmental costs and benefits of their proposed actions before they make any decision to undertake those actions” (NPS 2001a). The primary constraints on fire management planning related to conformance with NEPA are (1) scheduling actions to coincide with the completion of NEPA review, (2) staffing needed for preparation of NEPA documents, and (3) funding of document preparation and implementation of mitigation measures adopted after initial project funding is awarded.

National Historic Preservation Act (NHPA)

This act authorizes the Secretary of the Interior to maintain a National Register of Historic Places, requires federal agencies to survey their lands for historic properties, and requires federal agencies to consider the effects of their undertakings on National Register properties. At present there are 22 properties managed by GGNRA, including National Historic Landmarks, that are listed on the National Register of Historic Places. These range from individual structures set within grasslands or forest, such as the Randall House or the Marine Exchange Lookout, to extensive historic districts where the landscape is a part of the character of the resource, such as at Forts Baker, Barry, and Cronkhite. However, a number of areas of the park, primarily former ranching properties, have not yet been fully evaluated for National Register eligibility. Furthermore, much of the park has not been surveyed for the presence of archeological resources. These two factors constrain fire management activities by requiring individual assessment of the potential of the activities to affect resources prior to any action being taken, until such point as appropriate consultations are held and further surveys and evaluations are completed.

Archeological Resource Protection Act

This act requires development of plans for surveying public lands for archeological resources. At GGNRA, areas proposed for fire management plans with the potential to disturb or damage archeological resources are surveyed prior to project implementation. If sensitive resources are found within a project area, the project may need to be modified to avoid damaging cultural resources.

Native American Graves Protection and Repatriation Act

This act assigns ownership or control of Native American cultural patrimony excavated or discovered on federal lands to lineal descendants or affiliated Indian tribes. If archeological pre-project surveys identify Native American burials or funerary objects, the NPS would begin consultation with tribal representatives and modify projects to avoid disturbance to burials and all objects protected under this act.

Endangered Species Act

GGNRA provides habitat for 25 plant and animal species listed under the federal Endangered Species Act. The NPS is required to consult with the U.S. Fish and Wildlife Service and/or the National Oceanic and Atmospheric Administration (NOAA Fisheries) if fire management actions have the potential to adversely affect these listed species or habitat values. Consultation provides a means for biologists to

modify proposed actions to either avoid or minimize effects on listed species. Research on the effects of fire management actions on the range of listed species is being compiled but is incomplete. Until further research is conducted, actions proposed for habitat areas will be constrained to a research scope and limited effect. In addition to the time involved in the consultation process, avoidance measures may constrain fire management actions to particular months, times, areas, or implementation techniques.

Migratory Bird Treaty Act

In conformance with the Migratory Bird Treaty Act and Executive Order 13186, the NPS strives to avoid disturbance to nesting birds protected under the Migratory Bird Treaty Act by conducting actions outside the locally defined breeding period. For GGNRA lands, the breeding period is currently set from March 1 through July 31 annually. (Some exceptions apply in specific areas and for specific resources.) Limiting disturbance to late summer through late winter constrains fire management actions to both the hottest time of year (September–October), when fire hazard is greatest, and the wettest period of the year (November–March), when erosion potential from ground-disturbing actions is highest.

Magnuson-Stevens Fishery Conservation and Management Act and Essential Fish Habitat Designation

The Magnuson-Stevens Fishery Conservation and Management Act (FCMA) as amended by the Sustainable Fisheries Act of 1996 (PL 104-267) was designed to prevent over-fishing in U.S. waters while still maintaining the yield from each fishery. The FCMA addresses the three major causes of fish and shellfish declines – overfishing, loss or degradation of habitat, and by catch. Management is governed by fish management plans, of which 36 have been developed to date and 3 apply to the GGNRA Fire Management Plan area. The planning area provides Essential Fish Habitat for salmonids species (found in Lagunitas Creek and Redwood Creek in Marin County) and Pacific groundfish and coastal pelagic fish. Under the FCMA, the NOAA Fisheries reviews federal projects, such as the Fire Management Plan evaluated in this DEIS, proposed for areas identified as important habitat in fish management plans. For example, the FCMA discourages actions that would increase sedimentation flowing to streams that provide important habitat and discourages the use of these streams during critical times of the year for fish breeding.

Executive Order 11990, Protection of Wetlands

This executive order applies principally to new construction in wetlands but also directs that proposed actions include “all practicable measures to minimize harm to wetlands which may result from such use.” Conformance with this executive order is strengthened by NPS Management Policies 2001 guidance on wetland protection that stresses “no net loss of wetlands.” Conformance places extra requirements on the design and implementation of fire management actions. (NPS 2000a)

Executive Order 13112, Invasive Species

This executive order directs the NPS, within the limits of existing appropriations, to restore native species and habitat conditions in ecosystems that now support nonnative invasive species. Research should be conducted on invasive species and technologies developed to prevent introduction and provide for environmentally sound control of invasive species. Further, the NPS is directed “not to authorize, fund, or carry out actions that it believes are likely to cause or promote the introduction or spread of invasive

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species.” Fire management actions are often planned to address high fuel loading from very flammable, dense stands of nonnative vegetation. Under this executive order, the NPS must integrate the control of nonnative species into fire management planning and place special focus on the post-implementation effects of projects and increasing costs, staffing requirements, and project duration.

California Native Plant Society Rare Plant Inventory

NPS Management Policies 2001 states that the NPS will inventory, monitor, and manage state and locally listed species in a manner similar to its treatment of federally listed species, to the greatest extent possible. In California, the California Native Plant Society (CNPS) Rare Plant Inventory is the recognized authority for identifying state and locally rare plants within the national park. Through the NEPA process, the NPS develops strategies for maintaining and enhancing CNPS-listed plant populations.

Climatic Considerations and Constraints

GGNRA’s location in the middle latitudes and on the west coast of North America places it in the relatively rare Mediterranean-type climate. The only other regions of the earth sharing this climate type are located in southwestern Africa, the west coasts of Chile and Australia, and the region surrounding the Mediterranean Sea. Winters are mild and wet, while summers alternate between hot and dry and heavy fogs. This unusual weather pattern places several seasonal constraints on wildland fire hazard and fire management planning at GGNRA.

The park experiences a very long fire season, from early summer when fine fuels cure through October/November when the first rains fall. Typically, only one inch of rain falls between April and November. In the United States, this prolonged dry season is unique to coastal California. Several synoptic weather types produce high fire danger during this period. One is the cold-front passage followed by winds from the northeast. A second high fire danger type occurs when a pressure ridge persists over the western portion of the United States. At the surface, this pattern produces very high temperatures, low humidity, and air mass instability. The period of highest fire hazard occurs in September through November during the last period of the drought and is often accompanied by strong winds from the hot, eastern interior of the state. The period of high danger can last as long as a week, but is more typically one to two days.

Other climatic considerations include the following:

- Though a rare occurrence in the Bay Area, summer thunderstorms with lightning strikes can occur during the dry season, causing wildland fires.
- A thick, wet summer fog pattern often develops offshore of GGNRA in mid-summer and persists until early fall. The fog bank moves inland and back out to sea in a three- to four-day cycle in response to heating and cooling in the Central Valley. Fine fuel moisture fluctuates in this cycle, while wood fuels and duff remain relatively wet, making prescribed burning difficult to schedule and carry out successfully. The summer fog pattern brings variable high winds predominantly from the northwest during many summer afternoons. The combination of dry fuels and afternoon

winds may take a controlled burn out of prescription by the afternoon before objectives can be met or cause nuisance smoke to drift unexpectedly to residential areas.

- Mechanical fuel reduction projects scheduled for the summer and fall using heavy equipment and power hand tools must use extra caution during the dry season to avoid sparks that could result in accidental fire starts.
- In shrubland and forested areas, burning can be extremely difficult due to the narrow burning window from late September to early October when fuels dry out. Northeast wind events during this same time frame can result in “red-flag days” on which no burning is allowed. Smoke can have impacts on residents surrounding the park and impair road visibility. Often, “burn days” do not coincide with weather conditions appropriate for burning in GGNRA.
- On the average, GGNRA parklands in the three Bay Area counties receive from 20 to 40 inches of rain annually, with 80 percent falling between November and March. Though burns are easier to control during the winter, saturation and cool temperatures may make it difficult to keep the fire burning.
- Multiyear droughts can intensify fire behavior. One dry year does not normally constitute a drought in California. Droughts occur slowly, over a multiyear period. Droughts exceeding three years are relatively rare in Northern California. California’s most recent multiyear drought was 1987-1992.
- More moisture than usual also increases fire danger by increasing the amount of highly ignitable fuels. During El Niño episodes like 1982-1983 and 1997-1998, the San Francisco Bay Area received more than twice its “normal” rainfall. Although El Niño events occur every four to seven years, they vary greatly in timing and strength. A mild El Niño will scarcely have any important effect, but a strong one can bring disaster. The wintertime effect of La Niña in the Bay Area is likely to be colder, windier weather and perhaps abnormal rainfall in either direction, too much or too little (or sometimes neither). If La Niña persists into the summer, stronger upwelling off the California coast brings more fog to the area. The Pacific Decadal Oscillation (PDO) affects these phenomena as follows: a high PDO at the same time as an El Niño event or a low PDO concurrent with La Niña increases the severity of El Niño and La Niña events. When the inverse of the above occurs the results are highly unpredictable and range from canceling the effect to high reinforcement.

Operational and Risk Constraints

The Bay Area Air Quality Management District (BAAQMD) issues permits for prescribed burns on the day of burn. BAAQMD must consider ambient air quality on that day and other proposed burns or special events that are within the general time period to ensure that discretionarily permitted actions do not exceed air quality standards.

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In order to conduct a prescribed burn on NPS lands, “contingency resources” must be committed and assigned to the burn (NPS 2003b). These resources are in addition to those on scene to conduct the burn and are based on needs in a worst-case scenario. Availability of additional resources can become a factor in busy fire seasons when resources are often stretched throughout the region. GGNRA maintains a wildland fire engine crew. This crew plays an active role in completing hazard fuel reduction projects.

GGNRA has approximately 40 miles of wildland urban interface (WUI) areas that are at risk from wildland fire spreading either from NPS lands to developed areas or from structural fires on private parcels into the wildlands. NPS Management Policies 2001 (NPS 2000a) indicates that park units must comprehensively consider firefighter and public safety costs as well as resource values in deciding appropriate strategic and technical options for managing wildland fires. Due to the risk presented to surrounding communities, all natural or accidental ignitions in GGNRA are suppressed, consistent with the park’s 1993 FMP.

Risk is considered in planning for mechanical fuel reduction projects. Priorities include defensible space surrounding structures, buffer zones between parklands and surrounding communities, and maintenance of strategic access, including fire roads.

Prescribed burns on GGNRA-administered lands also represent potential risk to surrounding communities. GGNRA is committed to managing prescribed fire in such a manner as will mitigate risk to private lands. Costs per acre are generally higher than for large-scale burns as more time is invested to cover fewer acres.

1.5 Fire Management Plan Scoping

Public Scoping Process

Public scoping for the FMP EIS began on August 8, 2003, with the publication of a Notice of Intent to Prepare an Environmental Impact Statement in the Federal Register. After holding scoping meetings for park staff and local fire agencies, the NPS held three public meetings during the scoping period. The meeting dates, the duration of the scoping period, and instructions on submitting comments by mail or email were published in the Notice of Intent and included in mailings sent out to the GGNRA mailing list. Information on the scoping period and how to submit comments was posted on the GGNRA fire program website.

Park staff gave presentations on the FMP at each public scoping meeting. The presentations were followed by an oral public comment session. The first and third meetings were part of the regularly scheduled, bimonthly, public GGNRA meetings held by NPS. The first meeting was held at Pacifica City Council Chambers on September 16, 2003, and the third meeting was held November 18, 2003, at Fort Mason, Building 201 in San Francisco. The second meeting was specially scheduled to focus only on the FMP and was held in Sausalito on September 24, 2003. Comments were recorded by a court reporter at each of the meetings. NPS staff also gave presentations on the FMP to FIRESafe Marin, a nonprofit organization of fire agencies and homeowners associations, and Fire Safe San Mateo County.

At the close of the scoping period on December 5, 2003, a scoping report summarizing the comments received was prepared and posted on the GGNRA fire website. A total of approximately 200 persons participated in these combined outreach efforts for scoping. For more information, see Chapter 5, Section 5.1, Public Involvement and Scoping.

Issues and Concerns Raised During Scoping Relevant to the FMP EIS

Scoping comments provided guidance to NPS staff in preparation of this EIS. The comments identify sectors of the biological, human, or social environment that the public and/or NPS staff think fire management actions could affect, either negatively or beneficially. Comments also pertain to types of fire management actions or overall strategies that were considered in the formulation of the alternatives. The comments received by the NPS helped determine which issues and alternatives are relevant and should be included in the EIS and which issues would be better served in another planning effort.

General Comments

General comments included the following:

- Whenever possible, FMP projects should seek to achieve both cultural and natural resource objectives in addition to reducing fire hazard.
- Monitoring of the implementation and results of projects should play an important role in the FMP.
- When discussing community projects funded by the Wildland Urban Interface Program, the FMP EIS should address whether these projects will be held to the same standards for monitoring, maintenance, and native plant restoration as projects within the park.
- Ongoing fuel mapping should continue as part of the FMP as it serves as a very valuable tool for identifying and setting priorities for areas.
- The FMP should address the potential for use of wildland fire where possible in GGNRA.
- Pesticides should be considered in the alternatives as one of the available FMP tools to prevent resprouting of nonnative flammable vegetation.
- The FMP alternatives should include an education component that could provide information on reducing fire hazard to neighboring communities.

Land Use

Land use issues address how the implementation of the FMP within the park could affect adjacent residents or change use patterns in that part of the park. Issues raised were the following:

- The EIS should assess the potential for changes to local wind patterns and strength to occur in neighboring communities when trees are removed within the park.

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- The EIS should assess whether FMP actions that remove parts of woodlands could increase the potential for windthrow (tree failure from weakening when supporting trees are removed) to affect the remaining trees.
- FMP projects that change vegetation type from more flammable nonnative vegetation to native plants may result in a restriction of use in that area to promote the plant restoration.
- The FMP should address how projects would be implemented in areas of the park where the boundary is not known.

Visitor Experience and Aesthetics

FMP actions could change views or elements of the park that are important to visitors and park users. Issues raised were the following:

- To avoid affecting views, the alternatives should include understory thinning rather than tree removal in eucalyptus groves.
- The FMP should describe how public education and public outreach will be incorporated into the implementation of fuel management actions.
- The NPS should consider that many visitors highly value all trees, including nonnative species such as eucalyptus.
- The EIS should evaluate whether fire management actions could result in unsightly changes to viewsheds.

Fire Risk and Life Safety

Ensuring firefighter and public safety is a primary goal of the FMP. Comments relating to fire risk and life safety included the following:

- The EIS should provide information characterizing the degree of fire hazard in the wildland urban interface in Pacifica.
- Both native and nonnative vegetation should be considered as fuels.
- The EIS should address the fire hazards inherent in the different types of fuel reduction methods such as mowing or prescribed burning.
- Does the NPS have adequate equipment (including radio equipment) and staffing to deal with wildfires?
- What are the training needs for firefighting and fire ecology for park staff?

- San Francisco areas of the GGNRA should be excluded from FMP actions such as prescribed burning, as these areas are too densely settled and the fire hazard is too high.
- The EIS should address how Sudden Oak Death has locally raised fire hazard levels where there is high tree mortality.
- The EIS should address evacuation and warning of visitors, staff, and neighbors in the event of wildland fire.
- The EIS should identify which fire roads need improvements and which could be abandoned and restored.
- There is a potential hazard if FMP actions disturb known or unmapped subsurface infrastructure interrupting service or disturbing hazardous materials.

Air Quality

FMP actions typically include prescribed burning and use of fuel-powered equipment and vehicles, all of which contribute pollutants to the atmosphere. Issues raised were the following:

- The EIS should address the effects of prescribed burning and equipment use on air quality.
- The EIS should address the health and nuisance effects of smoke on nearby residents.

Cultural Resources

Fire management implementation could disturb subsurface cultural resources, pose a hazard to historic structures, and inadvertently alter cultural landscapes. Issues raised were the following:

- The scope of the EIS triggers the need for review under the National Historic Preservation Act.
- Fuel reduction projects could remove trees and vegetation important to a cultural landscape.
- Significant effects could inadvertently occur due to the lack of existing information on the historic role of fire in the park and on many of the park's cultural resource areas, and the consequent need for research and survey in these areas.
- The EIS should develop mitigation measures that will serve as a standard protocol to follow to avoid adverse effects on cultural resources when planning or implementing FMP projects.
- The EIS should include measures for reducing fuel levels around historic structures.
- The EIS should include recommendations for the restoration of cultural landscapes to the appearance and function they had during a site's most significant historic period.

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- The EIS should address the fact that projects funded by the Wildland-Urban Interface Initiative on property outside of the park will need to conform to NHPA requirements.
- The EIS should address how improvements to fire roads will incorporate NHPA conformance.
- Grazing, a historic land use in GGNRA, should be considered as a potential strategy to reduce fire hazard where appropriate.
- The EIS should identify those areas of GGNRA with characteristics that may indicate potential archeological sensitivity.
- Tribal consultations on the EIS would be important for gathering information on sacred sites within GGNRA or important ethnographic areas within the planning area.

Vegetation and Wildlife

FMP actions could have either a positive or negative effect on natural resources, including native plant communities, wetlands and riparian corridors, and other aquatic habitats. Issues raised were the following:

- The EIS alternatives should consider restoration with native plants following FMP actions and address the needs of the native plant nurseries to supply plants for restoration projects.
- The EIS should address the potential for FMP actions to create conditions that favor the spread of nonnative plant species.
- The EIS should evaluate the effect of using saltwater scooped from the ocean for suppression on salt intolerant native plant communities.
- The EIS should evaluate the extent to which FMP actions could inadvertently result in vegetation change.
- The EIS should examine effects of prescribed burning on Marin manzanita and other plants that are fire adapted. The EIS should evaluate the potential for fire management and suppression actions to affect listed animal species, such as federally listed threatened red-legged frogs.
- The EIS should develop a natural resource protection protocol to be followed when developing and implementing FMP projects.

Hydrology, Soils, and Water Quality

Fire management actions can result in changes to water quantity, quality, and flow patterns and affect soils, soil organisms, soil permeability, soil nutrients, and levels of erosion. Issues raised were the following:

- The EIS should evaluate the potential for prescribed burning to increase erosion and subsequent sedimentation of creeks,

- Use of retardant during suppression or retardant spills could contaminate water resources potentially harming sensitive fish species.
- The EIS should evaluate whether suppression actions during late summer could use up significant amounts of water needed by plants and wildlife.
- The FMP should identify which water sources would be used to suppress fires in the interface area.
- The FMP should consider project planning on a watershed scale.

Issues Outside the Scope of the FMP

Leash Laws

During scoping meetings, the issue of off-leash areas for dog walking was raised by several members of the public. This issue is being addressed by a separate rule-making process and is not within the scope of proposed fire management planning.

State, County, and City Managed Lands

The FMP will not address fire management planning on lands within the legislated GGNRA boundary that are under the direct administration of other land management entities. The FMP will address conformance with fire management plans of adjacent public open space areas such as the northern lands administered by Point Reyes National Seashore, San Pedro Valley County Park, and the City of San Francisco watershed lands.

Impact Topics Included in the EIS

Selection of topics to be addressed in the EIS was based on concerns raised during internal and public scoping, and on federal laws, regulations, executive orders, and NPS policy requirements. These issues involve significant resources that could be beneficially or adversely affected by project implementation. All resources evaluated in impact topics are described in Chapter 3, Affected Environment, and analyzed in Chapter 4, Environmental Consequences. The impact topics include:

Watershed Processes: Soils, Hydrology, Water Quality, and Aquatic Habitat

Air Quality

Vegetation

Wetlands

Wildlife and Important Habitat

Special Status Species

Cultural Resources

Human Health and Safety

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Visitor Use and Visitor Experience

Park Operations

Socioeconomics

Impact Topics Dismissed from Further Analysis

Seismically Related Geologic Hazards

Actions related to the FMP would not increase the exposure of the public to harm from other geologic hazards such as surface rupture, liquefaction, tsunami, rockfalls, or severe ground-shaking. Seismically induced landslides are addressed in Chapter 3, Section 3.2, under the heading of Geology and Seismicity.

Traffic Congestion, Traffic Levels, and Traffic Safety

FMP actions would not affect traffic congestion or traffic levels. All burn plans would include traffic safety control measures where smoke from burns could affect traffic on vicinity roadways. This is common practice for fire departments in Marin and San Mateo counties and is also a component of integrated NPS burn plans. Tree removal projects may require off-hauling of felled trees from the project site by haul trucks. Past experience has shown that off-hauling is typically limited to fewer than five truck trips per day during the project. Tree removal does not call for contracting for multiple haul trucks that are frequently associated with traffic generated by large-scale development projects that have a time-sensitive initial grading component. Past projects have relied on one or two haul trucks over the life of the project. Visitor safety during truck transport is controlled by temporary trail closures and flag persons ensuring safe pullouts of the trucks from the park onto more heavily traffic roadways. These safeguards are common requirements for trucking contractors and for park tree removal projects. The projects generate a minimal level of additional traffic during peak hour periods and on an hourly basis throughout the day. This increase in traffic levels and the potential effect on traffic congestion and traffic safety would be negligible and short-term.

Smoke from prescribed burns and wildland fire can result in short-term, adverse effects on traffic congestion and traffic safety where smoke obscures visibility on roadways. Traffic safety hazards associated with wildland fire can be so substantial as to be life-threatening and require road closures. The effect of smoke on traffic safety is addressed in the EIS under the heading “Impacts on the Social Environment,” specifically human health and safety.

Provision or Demand for Public Transportation

The FMP would not generate additional visitation to the park or change existing transit patterns. The FMP would have no effect on the provision or demand for public transportation and this topic is not addressed in the EIS.

Minority and Low-Income Populations

Under Executive Order 12898, Environmental Justice in Minority and Low-Income Populations, federal agencies must consider whether their actions would have disproportionately high and adverse human

health or environmental effects on minority and low-income populations. The FMP alternatives seek to reduce the risk of wildfire hazard spreading from the federal parklands into neighboring residential communities. To date, fuel reduction actions have occurred throughout Marin County, adjacent to communities with varying rates of income and population mix. This parkwide focus would continue in the FMP planning process and be expanded to San Mateo and San Francisco counties. The FMP would not unduly result in adverse effects on minority or low-income populations in the park vicinity or using parklands for recreation.

Provision of Public Utilities and Services (Electricity, Natural Gas, Solid Waste)

Activities associated with implementation of the FMP would not require new or modified delivery or improvements of infrastructure delivering utilities or services, such as electricity and natural gas. Past experience has shown that alternatives to landfill disposal can be found for nearly all fuel reduction projects. Typically, brush and small trees and branches are chipped onsite and distributed within the project area. Broadcasting chipped material onsite protects surface soils from erosion by wind or water and discourages weed regeneration from the existing seed beds following fuel reduction projects. Past tree removal projects have resulted in trees off-hauled from the project areas to be used as woody debris in creek restoration projects and for commercial use as flooring and firewood. Impacts on drinking water supplies from accelerated sedimentation from fire management actions are addressed under “Watershed Processes: Soils, Hydrology, Water Quality, and Aquatic Habitat” under “Impacts on the Physical Environment.”