



AMENDMENT TO THE FIRE MANAGEMENT PLAN
FOR RANCHO CORRAL DE TIERRA

DRAFT – For Public Review

JUNE 7, 2013



TABLE OF CONTENTS

<i>INTRODUCTION</i>	1
<i>PURPOSE AND NEED</i>	1
<i>PLANNING AREA</i>	1
<i>DRAFT AMENDMENTS TO GGNRA FMP/EIS, CHAPTER 1</i>	4
Legislative And Policy Framework Section Of The FMP/EIS.....	4
Draft Amendments to Applicable Federal Regulations, Plans and Policies.....	4
Amendments to Applicable County, Special District and State Plans.....	5
<i>DRAFT AMENDMENTS TO FMP/EIS, CHAPTER 2</i>	6
Fire Management Units And Project Areas Proposed For Rancho	6
Fire Management Units	6
Project Areas	7
Fire Management Actions Defined	10
DRAFT Amendments to GGNRA FMP Strategy (Formerly Alternative C of the FMP/EIS).....	10
Strategic Approach	11
Mechanical Treatment	11
Prescribed Fire.....	12
Research	13
Goals by Fire Management Unit (FMU).....	13
<i>DRAFT AMENDMENTS TO FMP/EIS, CHAPTER 3</i>	14
Fire Weather	14
Fire History.....	14
<i>REFERENCES</i>	16
<i>ATTACHMENT A: GGNRA FMP/EIS, PURPOSE AND NEED/GOALS AND OBJECTIVES</i>	17
<i>ATTACHMENT B: DESCRIPTIONS OF FIRE MANAGEMENT ACTIONS</i>	22
<i>ATTACHMENT C: REQUIRED MITIGATION MEASURES</i>	29

LIST OF FIGURES

FIGURE 1A: Rancho Corral de Tierra Vegetation Type	3
FIGURE 2A: Proposed Fire Management Units and Project Areas.....	8
FIGURE 3A: Fire History 1994-2010	15

LIST OF TABLES

TABLE 1A: Acreage in GGNRA by Fire Management Unit (FMU) and by County	7
TABLE 2A: Summary of Annual Acres Treated and Treatment Type ¹	11
TABLE 3A: Summary of Maximum Annual Acres, GGNRA FMP Strategy by FMU & Treatment Type ¹	12

INTRODUCTION

The National Park Service (NPS) is beginning a public planning process to amend the 2006 Golden Gate National Recreation Area Fire Management Plan Final Environmental Impact Statement (FMP/EIS) to include Rancho Corral de Tierra (Rancho) which became part of GGNRA on December 9, 2011. The NPS is soliciting input from the public on how the NPS should approach wildland fire management planning for this area. The following text additions and revisions addressing Rancho would be incorporated into the FMP/EIS as an Amendment. Explanatory text is in italics. The FMP/EIS is available at <http://parkplanning.nps.gov/RCDTFMP>.

PURPOSE AND NEED

National Park Service (NPS) Management Policies (2006) and Director's Order #18: Wildland Fire Management (NPS 2008), require all parks with vegetation capable of burning to have a fire management plan (FMP) that meets the requirements of the federal wildland fire management policy and conforms to federal environmental laws. An FMP summarizes the elements of law, policy and requirements directing NPS management and distills guidance related to fire management planning from higher level park documents. In 2005 and 2006 when the Golden Gate National Recreation Area (GGNRA) FMP/EIS was being developed, Rancho Corral de Tierra (Rancho) was not yet part of the park and therefore was not addressed in the FMP.

This GGNRA Draft FMP/EIS Amendment for Rancho provides: 1) an introduction to NPS fire management planning and the GGNRA FMP/EIS, 2) background and descriptive information on Rancho, 3) text specifically amending sections of the GGNRA FMP/EIS and 4) draft Fire Management Units and Project Areas for Rancho. Sections of the GGNRA FMP/EIS are included as attachments to this Draft Amendment to provide additional context to the public on fire management planning at GGNRA. These attachments are: Attachment A, the goals and management objectives of the GGNRA FEIS/FMP that will be applied to Rancho, Attachment B, descriptions of fire management actions covered by the GGNRA FEIS/FMP and Attachment C the mitigation measures GGNRA follows when implementing fire management projects.

PLANNING AREA

Rancho Corral de Tierra is located in coastal San Mateo County approximately six miles south of Pacifica at the southern end of Devil's Slide and stretches southward to roughly six miles north of Half Moon Bay. Rancho was purchased and managed by the Peninsula Open Space Trust (POST) until it could be added to GGNRA. Rancho was added to the jurisdictional boundary of GGNRA in late December, 2005 through Public Law 109-131 and became part of park on December 9, 2011. GGNRA now manages 3,858 acres of the 4,262 acres of Rancho, with POST retaining ownership of the agricultural lands, including Cabrillo Farms. The stable operations at Ocean View Farms, Renegade Ranch, Moss Beach Ranch and Ember Ridge Stables are on NPS lands and privately run operations with lease agreements with the NPS.

Rancho borders the coastal unincorporated communities of Montara, Moss Beach and El Granada in western San Mateo County. From 19th century agricultural beginnings, the coastal communities were developed largely through land sales along the Ocean Shore Railroad which operated in the early decades of the 20th century. Census data from 2010 lists the populations for Montara, Moss Beach and El Granada as 3,103, 2,909 and 5,467 respectively. Nearly all residences in these communities are single family detached homes. In northern Montara, NPS lands also border on Farallone View Elementary School.

Lands to the east of Rancho are part of the San Francisco Peninsula Watershed managed by the San Francisco Public Utilities Commission. To the North on Montara Mountain are McNee Ranch, managed by the California Department of Parks and Recreation as a part of Montara State Beach, and San Pedro Valley County Park managed by the County Parks Department.

*Amendment to the GGNRA Fire Management Plan for
Rancho Corral de Tierra*

The westernmost portion of the Rancho is primarily ocean terrace and broad valley floors that were formerly cultivated. To the east, the lands rise steeply to approximately 1,900 on the slopes of Montara Mountain. Four creeks originate on the mountain slopes and flow southwest to the ocean; from north to south, these are: Martini, Montara, San Vicente and Denniston Creeks. The stream systems provide important riparian habitat for a number of threatened and endangered species and offer wildlife a vital source of water, increased cover, and feeding and nesting opportunities.

The climate of Rancho is cool and temperate governed by the mountain terrain and proximity to the Pacific Ocean which keep the air cooler in the summer and warmer in the winter than more inland parts of the Bay Area. The coastal fog provides a reliable source of moisture from condensation that supports the rich diversity of plant and animal life.

Coastal scrub is the predominate plant community of Rancho with smaller acreages of coastal prairie, coastal grassland, maritime chaparral and riparian corridor that provides habitat for a diverse array of plant and animal species (see Figure 1A: Rancho Corral de Tierra Vegetation). Outcrops of the Salinian granite bedrock exposed on Montara Mountain turn support plant and wildlife communities that are limited in distribution. The drainages within Rancho provide approximately 17 miles of riparian corridor, some of which may have historically supported populations of steelhead and Coho salmon. The animal community of Rancho Corral de Tierra ranges from an occasional mountain lion to bobcats, deer, gray fox, brush rabbits, black-tailed hares, and numerous species of smaller mammals, reptiles and amphibians. Rancho provides habitat for migratory and resident bird species including red-tailed hawks, peregrine falcons, northern harriers, California quail, and many species of smaller passerines.

Rancho supports numerous federally listed threatened, rare and endangered plant and animal species and a number of other special species of concern, including: Hickman's cinquefoil (*Potentilla hickmanii*), San Bruno elfin butterfly (*Callophrys mossii bayensis*), Montara manzanita (*Arctostaphylos montaraensis*), San Francisco garter snake (*Thamnophis sirtalis tetrataenia*), California red-legged frog (*Rana draytonii*), San Mateo Tree Lupine (*Lupinus arboreus* var. *eximius*), San Francisco wallflower (*Erysimum franciscanum*), San Francisco Campion (*Silene verecunda verecunda*) and Coast rock cress (*Arabis blepharophylla*). Other rare plant species on surrounding lands may also be present in Rancho in areas of the park that are less accessible due to dense vegetation and steep slopes.

In addition to the native plant communities, Rancho supports significant acreages of non-native, invasive trees, especially blue gum eucalyptus, Monterey pine and Monterey cypress. The trees, especially the taller eucalyptus, provide habitat for birds of prey and certain groves may provide overwintering habitat for Monarch butterflies. Other problematic weed species occurring at Rancho include cape ivy (*Senecio mikanioides*), French broom (*Genista monspessulana*) and pampass grass (*Cortaderia jubata*).

Cultural resources at Rancho may include landscape features and archeological sites associated with historic ranching operations dating back as far as the Mexican rancho era such as the site of the historically-documented 1840s adobe residence of Francisco Guerrero y Palomares, original grantee of the northern part of Rancho Corral de Tierra; and Ohlone Sites in the vicinity of Martini Creek.

DRAFT AMENDMENTS TO GGNRA FMP/EIS, CHAPTER 1 LEGISLATIVE AND POLICY FRAMEWORK SECTION OF THE FMP/EIS

The following sections are proposed to amend Chapter 1 of the FMP/EIS, Pages 15-32, to include plans relevant to Rancho. Rancho was not yet part of GGNRA and was not addressed in the park's 1980 General Management Plan. It is addressed in the current NEPA planning process that will update the GGNRA General Management Plan. This Draft FMP/EIS Amendment must conform to the long-range planning described for Rancho Corral de Tierra in Alternative 1, the Preferred Alternative of the Draft GGNRA GMP/EIS. The Final General Management Plan and EIS (GMP/EIS) is expected to be published in late summer or early fall 2013.

This section also discusses the relationship of the Draft Amendment for Rancho with several local fire planning documents that apply specifically to the vicinity of Rancho and were not included in the 2006 FMP/EIS. Text amendments updating the FMP/EIS text are shown in ~~strikeout~~/underline.

Draft Amendments to Applicable Federal Regulations, Plans and Policies

GGNRA Draft General Management Plan/EIS

The proposed GGNRA FMP Amendment for Rancho must conform to the long-range planning currently underway for GGNRA in the development of a new General Management Plan and Environmental Impact Statement (GMP/EIS). The park's Draft GMP/EIS was circulated for public review and comment from September 9 through December 20, 2011. The Final GMP/EIS is expected to be published in fall 2013. The NPS Draft Preferred Alternative for management of the lands at Rancho is described in Alternative 1 of the Draft GMP/EIS in Volume I, pages 218-219. The majority of Rancho would be designated as natural lands for mainly trail-based recreation and the equestrian operations zoned to provide a diversity of recreational opportunities for visitors.

In the Natural Zone, Rancho would be "managed to preserve the wild, open character of the landscape and offer trail-based recreation that is light on the land, including walking, hiking, bicycling, and horseback riding. Natural habitats and processes in the zone, which includes four creek corridors, would be restored to the greatest extent possible with the help of community stewards."

Visitors would enjoy the scenic coastal environment through an enhanced and sustainable system of trails. The trail network would connect local communities to the park and link the ridges of Montara Mountain to the Pacific Ocean. Unnecessary roads could be converted to trails or removed. Exploration of the park could be facilitated by scenic overlooks, sites for picnicking, primitive camping sites, and possibly a hikers' hut in a remote setting."

In the areas zoned for Diverse Opportunities, "Modest improvements would be created ... consisting of trailheads and other visitor facilities that provide for the enjoyment of this new area....Detailed planningwould determine the mix of uses that would share this zone. Equestrian uses would be retained at Rancho Corral de Tierra, with the exact location, type, and scale of facility improvements determined in future planning efforts.New facilities in this zone could include trails, trailheads, a community stewardship/educational center, a group picnic area, a rustic campsite, and a horse camp."

"Habitat restoration and community stewardship activities would have a strong presence in both zones. An area for native plant production would be established to support restoration projects in the park. The National Park Service would partner with surrounding land managers and the Fitzgerald Marine Reserve, one of the richest intertidal areas on the California coast, to improve habitat connectivity and protect sensitive habitats,

*Amendment to the GGNRA Fire Management Plan for
Rancho Corral de Tierra*

to protect water quality, restore the creek corridors and reconnect them to the ocean, and to reestablish anadromous fish passage where possible.”

“The National Park Service would connect people to the agriculture history of Rancho Corral de Tierra through interpretation of its cultural landscape and adjacent working farms.”

The Draft GGNRA FMP/EIS Amendment for Rancho would support the management direction proposed in the GGNRA Draft GMP/EIS by providing protections for creek restoration, the safety of visitors, and contributing to native plant community restoration efforts by fuel reduction projects focused on reducing dense stands of non-native vegetation in the WUI FMU¹.

Amendments to Applicable County, Special District and State Plans

Santa Cruz County and San Mateo County Community Wildfire Protection Plan (2010)

Wildland fire management planning for the lands surrounding Rancho are addressed in the Community Wildfire Protection Plan (CWPP) for San Mateo and Santa Cruz counties, a joint effort by CAL FIRE’s San Mateo and Santa Cruz units, the Resource Conservation District for San Mateo County and Santa Cruz County. The CWPP involved regular community outreach and participation and was adopted in May 2010. Funding was provided by a National Fire Plan grant from the U.S. Fish and Wildlife Service through the California Fire Safe Council. CWPP’s were authorized by the Healthy Forests Restoration Act which relies on CWPPs when prioritizing funding fuel reduction projects within WUI and helps rural communities, states and landowners to restore healthy forests and watershed conditions on state and private lands.

Covering a long stretch of central California, the CWPP splits the two counties into ten planning areas. The San Mateo North Coastal planning area covers the unincorporated communities from Highway 92 north to Devil’s Slide and east to the primary ridge of the coastal range on the northern peninsula in San Mateo County. For the purposes of the CWPP, the entire planning area is designated as WUI. For this CWPP process, the WUI boundaries in each planning area were set by the community with a primary objective being securing funding for fuel reduction projects.

Assets at Risks in the North Coast Planning Areas are Life and property in the coastal communities from Highway 92 north to Devil’s Slide. Other assets at risk noted were equestrian facilities, communications Facility and PG&E transmission lines. Important environmental assets listed as at risk from wildfire include the protection of open space and parkland at all levels of government, watershed protection and wildlife.

Project areas with high priority include lands within and surrounding the communities of Montara, Moss Beach and El Granada including the Wicklow Property southeast of El Granada which is managed by POST and contains a large eucalyptus forest.

¹ WUI FMU = Wildland Urban Interface Fire Management Unit. See description of fire management units in the Amendments to FMP/EIS of this document.

CAL FIRE Fire Management Plan, San Mateo/Santa Cruz Unit, July 2004

The CAL FIRE Fire Management Plan (FMP) sets forth the agency's operational strategy for reducing the risk and costs, both emotionally and financially, of wildland fires in the San Mateo and San Cruz Unit. Projects and priorities developed by CAL FIRE through a review of factors for the plan's service area including values at risk, distribution of fuel types, fire weather history, and history of fire "starts" along with the degree of success of suppression efforts to extinguish the fire during the initial attack. Operational priorities and fuel reduction projects are identified for each battalion in the planning area with emphasis also placed on enforcement of fire clearance ordinances, establishing fuel breaks, and promoting fire resistant construction standards. The Plan did not specify any fuel reduction projects for the Half Moon Bay to Montara area.

DRAFT AMENDMENTS TO FMP/EIS, CHAPTER 2 FIRE MANAGEMENT UNITS AND PROJECT AREAS PROPOSED FOR RANCHO

FMP/EIS Chapter 2, Fire Management Units and the subsequent section Project Areas are amended to include text applying to Rancho. Text amendments updating the FMP/EIS text are shown in strikeout/underline. Figure 2A is added showing FMU and Project Areas for Rancho. The FMP/EIS text and maps showing FMUs and Project Areas throughout GGNRA are found on pages 48-67 of that document available on PEPC at <http://parkplanning.nps.gov/RCDTFMP>.

Figure 2A shows draft Project Areas for Rancho – the draft project areas purposely overlap and apply only generally to the underlying topography. The draft Project Areas are presently to promote discussion on the types of actions appropriate to each area and the logical boundaries of the areas. The Project Areas reference the three residential communities that border Rancho; from north to south, the Project Areas are Montara (A), Moss Beach (B) and El Granada (C).

Fire Management Units

Fire Management Units (FMUS) provide the framework for development of a wildland fire program. As directed by NPS Reference Manual-18: Wildland Fire (RM-18) (NPS 1999a), each FMU should be unique as evidenced by management strategies, objectives, and attributes; should be consistent with management goals and objectives found in land and resource management planning documents; and should avoid redundancy. In addition, the number of units should be kept to a minimum.

The park's landscape has been divided into three FMUs, and ~~20~~ 17 project areas (subunits of the FMUs). The FMUs for the action alternatives are largely based upon geography, proximity to developed areas, fuel hazards, and values at risk. Each FMU has its own set of management strategies, objectives, and attributes. Dividing the park into three FMUs allows park management to set broad strategies for each unit, with a set of allowable fire management actions under each. The strategies for each FMU vary by alternative, and the types of management actions that would occur in each are addressed in the discussions of the alternatives in this FEIS.

Unit 1, Wildland Urban Interface (WUI). This FMU includes those lands that border developed or "interface" zones. The basic WUI zone was defined as any land within 1,200 feet of an urban/developed area. Where it made practical sense, the WUI FMU boundary was extended to fire roads, trails, and jurisdictional boundaries. Lands within this FMU are characterized by a close proximity to values at risk (i.e., houses, infrastructure, etc.); have high hazard fuels/slopes and dry, easterly wind exposure; and receive high visitation (increased chance of ignitions).

Amendment to the GGNRA Fire Management Plan for Rancho Corral de Tierra

Unit 2, Park Interior. This FMU is the largest and is characterized by a lower probability of fire threatening structures and the potential to use prescribed fires to achieve some resource management goals. The park interior lands include larger expanses of natural areas and cultural landscapes, inclusive of ranching and farming lands, and contain relatively intact native plant communities and contiguous areas and corridors of wildlife habitat.

Unit 3, Muir Woods National Monument. The designation of Muir Woods National Monument as an FMU is based on the area’s unique values at risk (first-growth redwoods), the area’s high visitation (ignition potential), and an ongoing fire management program for this area.

TABLE 1A: Acreage in GGNRA by Fire Management Unit (FMU) and by County

FMU	Marin	San Francisco	San Mateo	Total Acres
Wildland Urban Interface	2,524	923	1,479 <u>2,586</u>	4,926 <u>6,033</u>
Park Interior	7,910	NA	1,765 <u>4,452</u>	9,675 <u>12,362</u>
Muir Woods	552	NA	NA	552
Total Acres	10,986	923	3,244 <u>7,038</u>	15,153 <u>18,947</u>

Source: Pacific Regional Office, Fire Management Office
 NA = not applicable

The GGNRA FMUs are further subdivided into smaller, logical geographic project areas, allowing for an informed discussion of treatment strategies and management goals tailored to each project area, and, ultimately, a better definition of the individual alternatives. The majority of these project areas are the same as the park unit in which they are found: e.g., Tennessee Valley Project Area, Sweeney Ridge Project Area, Milagra Ridge Project area. Rancho is divided into three Project Areas based largely on proximity to its three neighboring residential communities.

Project Areas

The three FMUs are further broken down into a total of ~~17~~ 20 project areas, allowing for a finer level of understanding of existing resource values, vegetation and fire management conditions, treatment options, and management objectives specific to the resources contained within that area. It is anticipated that project areas would form the framework for planning the five-year implementation program for the selected alternative. Project areas were delineated using practical and geographically logical boundaries such as roads and trails, watersheds, park boundary, and buffers from urban development.

18. Montara Project Area (A). The two parcels in this Project Area are separated by the Caltrans right-of-way for the Devil’s Slide Bypass.

The western parcel is within the WUI FMU due to its proximity to structures in Montara, Farallone View Elementary School, Montara State Beach, McNee Ranch unit, Ocean View Farms Stables and Highway 1. The Project Area also borders on Ocean View Farms. Martini Creek is on the northern property boundary

shared with the State Park and the parcel is within the Martini Creek Watershed. The drainage at the southern boundary of the parcel is referred to as the Farallon Drainage which branches off from the main stem of Montara Creek. The majority of the Project Area is open grassland and coastal scrub. Scattered herbaceous wetlands and riparian forest/scrub are in the lower lying areas may support red-legged frogs. Hickman's cinquefoil occurs in the upper elevations of this parcel. Along the southeastern boundary with Montara and the school property are several large stands of Monterey pine and Monterey cypress. Further northeast along the boundary are eucalyptus stands.

The eastern parcel of the Montara Project Area is almost completely coastal scrub vegetation. The highest points of Montara Mountain, Montara Knob and South Peak, are both within the portion of the Project Area as are the headwaters of Montara Creek. Several riparian corridors cross the parcel flowing roughly northeast to southwest and the parcel is split within three northwest to southeast trending watersheds: Martini Creek Watershed in the northwestern area, Montara Creek in the majority of the site and San Vicente Creek is the southeastern slope of South Peak. Several stands of Monterey pine, Monterey cypress and eucalyptus are sited along the eastern half of the southern parcel boundary. Several sensitive plant species occur within this parcel and there are records for the federally-listed San Bruno Elfin Butterfly and San Francisco garter snake.

The primary issues for fire management planning in the Montara Project Area are developing strategies and securing funding for abating hazardous fuels along the boundary with residential development and the potential for small scale prescribed burns to improve habitat for sensitive plant and animal species and control non-native invasive plants. The NPS will work cooperatively with homeowners associations and neighbor groups in providing defensible space along the WUI boundary in Montara.

19. Moss Beach Project Area (B). The private inholding in the center of the Project Area separates the Park Interior FMU zone to the north from the WUI FMU zone to the east and south. The primary channel of Denniston Creek forms much of the eastern boundary of the Project Area. The slopes east of the Denniston Creek channel are in Park Interior FMU as are the upper elevations of the Project Area. The northeast to southwest trending Moss Beach Project Area includes the uppermost portion of the Denniston Creek Watershed at the northeast; the remainder of the Project Area in the San Vicente Watershed. The headwaters of both creeks are within the Project Area. The vegetation of the Park Interior FMU is largely coastal scrub with scattered riparian forest/scrub along the drainages on the southwest facing slopes above Denniston Creek.

Areas designated WUI FMU are adjacent either residential development in Moss Beach to the west or near the three stables (Renegade Ranch, Ember Ridge and Moss Beach Ranch) or adjacent to Cabrillo Farms along Highway 1. Several eucalyptus stands ring the southern boundary of the large private inholding and overlie the western boundary of the Project Area with Moss Beach. There are scattered stands of Monterey pine and cypress in both FMUs. Vegetation in the southern portion of the WUI FMU is a mix of grassland, former agricultural fields, coastal scrub, wetlands and riparian forest. Denniston Creek provides habitat for both the California red-legged frog and the San Francisco garter snake. Both San Vicente and Denniston Creeks once supported Southern steelhead trout. Rare plant populations are recorded in the upper elevations of the Project Area.

The primary issues for fire management planning in the Montara Project Area are developing strategies and securing funding for abating hazardous fuels along the boundary with residential development. The NPS will work cooperatively with homeowners associations and neighbor groups in developing defensible space where needed along the WUI boundary in Moss Beach.

20. El Granada Project Area (C). The El Granada Project Area is almost entirely within the Park Interior FMU with the exception of the southeastern boundary of the Project Area where WUI FMU is designated in the area adjacent to two residential neighborhoods accessed by Coral Reef Avenue. In 2009, two stands of eucalyptus trees were subject to mechanical fuel reduction treatments through a cooperative effort between the San Mateo Resource Conservation District, POST and CAL FIRE. One of the stands treated in 2009 is now within Rancho in Project Area C. The 3-acre project site provided a shaded fuel break for homes to the south on Sevilla and San Carlos Avenues. The southeastern corner of the Project Area may provide habitat for the San Francisco garter snake and California red-legged frog. Expanded grasslands by burning back coastal scrub could improve habitat for these species.

The primary issues for fire management planning in the Montara Project Area are developing strategies and securing funding for abating hazardous fuels along the boundary with residential development. Routine maintenance of the treated eucalyptus stand in Rancho should be factored into the workload of the fire management program if possible. The NPS will work cooperatively with homeowners associations and neighbor groups in providing defensible space along the WUI boundary in El Granada. Opportunities to improve habitat for listed species through prescribed burning should be researched.

FIRE MANAGEMENT ACTIONS DEFINED

The range of fire management actions under consideration for implementation at Rancho were addressed in the FMP/EIS on pages 68 - 79. The FMP/EIS text defining these management actions such as prescribed burning, mechanical fuel reduction, pile burning, etc., is reproduced in Attachment B to this Draft Amendment.

DRAFT AMENDMENTS TO GGNRA FMP STRATEGY (FORMERLY ALTERNATIVE C OF THE FMP/EIS)

The current FMP strategy being implemented under FMP/EIS is referred to in the FMP/EIS as Alternative C or the NPS Preferred Alternative. Alternative C became the GGNRA FMP Strategy when the ROD for the FMP/EIS adopted through the NPS Regional Director signing of the ROD on February 22, 2006. In the section, limited text amendments, using strikeout and underline, add specific references to projects that could occur in Rancho. The original text, from FMP/EIS pages 88 – 91, is reproduced here with the exception of text addressing FMU 3, Muir Woods National Monument.

The term “GGNRA FMP Strategy” in lieu of “Alternative C” is used throughout this section to reflect the adoption and continued implementation of the former Alternative C as the current GGNRA FMP Strategy.

The GGNRA FMP Strategy permits the broadest use of fire management strategies throughout the park – mechanical treatment, pile burns, and prescribed burning to reduce fuel loading near developed areas and resources. Fuel reduction would primarily occur in those areas with the highest risk for being affected by unplanned fires: developed private areas along the park boundary, developed enclaves within the park, and/or areas and habitats that could be adversely affected by unplanned fire. The objective of fuel reduction projects would be to establish areas of reduced fuels to slow the rate of fire spread and facilitate fire suppression. Natural and cultural resource goals and objectives would be integrated into the design and implementation of mechanical fuel reduction and prescribed fire projects. Prescribed fire would be used to assist with restoration and maintenance of the park’s ecosystems and cultural resources in all FMUs where research, monitoring, and experience have proven the efficacy of these activities.

Strategic Approach

Under the GGNRA FMP Strategy, prescribed burns and mechanical treatments would emphasize the following:

- Reduction of hazardous accumulations of vegetation (fuels) in areas where these activities would have the highest likelihood of reducing the potential risk of wildland fire to lives and property;
- Enhancement of the conditions of natural resources (e.g., increasing abundance or distribution of habitat for threatened and endangered species; reducing infestations of nonnative plants; increasing native plant cover); and
- Protection or enhancement of cultural resource elements and values (e.g., burning would be used to reduce vegetation in areas that are identified as important historic views).

Annually, a maximum of 275 acres would be subject to mechanical fuel treatments, and a maximum of 320 acres would be subject to prescribed burning. Every five years, fire management and resource management personnel would develop specific plans for prescribed burning and mechanical treatments that would be subject to an NPS internal project review process. These five-year burn projects would be reviewed annually and updated as needed.

TABLE 2A: Summary of Annual Acres Treated and Treatment Type¹

Treatment Type	County	GGNRA FMP
Mechanical Treatment ² (acres/year)	Marin	225
	San Francisco	10
	San Mateo	40
	TOTAL	275
Prescribed Burning (acres/year)	Marin	285
	San Francisco	<1
	San Mateo	35
	TOTAL	320

Source: GGNRA Fire Management Office Data 2004.

¹As shown in Tables 2A and 3A, the maximum number acres that can be treated annually under the GGNRA FMP Strategy is not proposed to be increased despite the additional of nearly 4,000 acres with the Amendment for Rancho. The number of acres treated annually since the adoption of the GGNRA FMP Strategy has not approached the upper maximum limits set in the FMP EIS 2005. Given budgetary uncertainties, it is unlikely that project acreage will approach this limits in the coming decade.

²Mechanical treatment refers to fuel reduction through methods such as mowing, cutting, short-term grazing, and selective thinning.

Mechanical Treatment

Mechanical treatments would be used to reduce hazardous fuel accumulations and to create and maintain defensible space and fuel breaks. Some of the acres to be mechanically treated would be the same acres that are subject to prescribed burning (e.g., Scotch broom may be mowed prior to burning). In many instances, mechanical treatments would be used to complement prescribed burning, with the two treatments being used hand-in-hand to address specific fire management and vegetation needs.

TABLE 3A: Summary of Maximum Annual Acres, GGNRA FMP Strategy by FMU & Treatment Type¹

Treatment Type	County	WUI FMU	Park Interior FMU	Muir Woods FMU	Total Acreage Annually All Counties by Treatment
Mechanical Treatment (ac/yr)	Marin	130	90	5	275
	San Francisco	10	0	0	
	San Mateo	30	10	0	
	Total Acres Annually Mechanical Treatment by FMU		170	100	
Prescribed burning (ac/yr)	Marin	50	185	50	320
	San Francisco	<1	NA	NA	
	San Mateo	5	30	0	
	Total Acres Annually Prescribed Burning by FMU		55	215	

Source: GGNRA Fire Management Office Data 2004.

¹Reprinted from GGNRA FMP/EIS for GGNRA FMP Strategy (Alternative C).

Prescribed Fire

Implementation of GGNRA FMP Strategy would result in a substantial increase in the acres that could be subject to prescribed burning. The focus for prescribed burns would be in areas where NPS ecologists believe ecosystem health would be enhanced by burning and in areas where fuel accumulations create fire hazards. To the extent possible, prescribed burns would be conducted to approximate natural fire intensity and fire intervals. The intent would be to allow the process of fire to act on the landscape as it has for thousands of years, to the greatest extent possible, while ensuring human safety and protecting property. Prescribed fire would be used to reduce infestations of highly nonnative plant species, restore native habitat, and rehabilitate cultural landscape settings.

Prescribed burns intended for resource enhancement would initially be small and would be subject to intensive monitoring and research. If research results indicated that ecological conditions were improving after prescribed burns in certain habitat types, the size of prescribed burns in these habitat types could increase. All prescribed burns would be conducted under specific burn plans in accordance with national fire policy requirements.

Research

Under the GGNRA FMP Strategy, fire research programs begun prior to 2005 under the previous FMP would continue. New research would be initiated as needed to direct the prescribed burning program. Potential research topics might include the following:

1. The effects of fire on management of nonnative plant species such as eucalyptus, Scotch/French broom, and Harding grass;
2. The effects of fire on the species composition and fuel load of coastal grassland and scrub communities;
3. The role of fire in Douglas-fir/coastal redwood communities and the effect of fire on fuel loading in these communities;
4. The interaction between plant diseases such as Sudden Oak Death (SOD) and fire; and
5. The effects of prescribed fires and wildfires on plant and/or animal communities, including rare or sensitive species and their habitat.

Goals by Fire Management Unit (FMU)

Unit 1, WUI

The primary goal in this FMU would be to reduce hazardous fuel loads through mechanical fuel reduction projects and some prescribed burning to complement mechanical treatments. Prescribed fire would be available as a management tool, but restricted in its use and applied strategically to answer research questions and inform proposed project work for the Park Interior FMU. Examples of fire management treatments in this FMU would include:

- Removal of nonnative evergreen trees in most project areas where needed to achieve fire management objectives;
- Removal of nonnative evergreen trees that do not contribute to the historic setting and that are spreading beyond boundaries of the historic Forts Baker and Barry;
- Control and reduction of nonnative plant species in coastal scrub and grassland communities with mechanical treatments in combination with follow-up burning treatments in most project areas, and when possible, restoration and expansion of these native plant communities;
- Prescribed test burns for enhancing mission blue butterfly habitat, San Bruno Elfin or other listed wildlife species;
- Limited research burns for Douglas-fir/redwood areas to reduce fuel loads in the Phleger Estate project area; and
- Research into prescribed burning for restoration of grassland communities.

Unit 2, Park Interior

Under the GGNRA FMP Strategy, prescribed burns would be used to reduce fuel loads and also to implement natural and cultural resource management goals. Prescribed burn projects would be based upon an understanding of vegetation type, restoration goals, and location. Projects would have a strong research and monitoring component. Examples of the types of projects that would occur in this FMU include:

- Prescribed burns, including broadcast burns, to manage nonnative perennial grasses;
- Research burns, and potentially broadcast burns, for management of coastal scrub communities in the Marin Headlands or Rancho Corral de Tierra;
- Research into use of fire for managing Sudden Oak Death syndrome in key locations;
- Use of some prescribed fire, including broadcast burns, for management of Harding grass and broom in the coastal scrub and grassland communities in Tennessee Valley and Rancho Corral de Tierra.
- Mechanical treatment to reduce fuel loading and fire hazard along roads and near sensitive resources and historic properties.

DRAFT AMENDMENTS TO FMP/EIS, CHAPTER 3 FIRE WEATHER

The following text specifically addressing lightning strikes in San Mateo County near the planning area is added to FMP/EIS page 141 following the first paragraph after the heading Fire Weather.

On May 5, 2013, in San Mateo County, ten lightning strikes occurred with the first two of which were reported in Half Moon Bay. Both were small fires were ignited, one of which burned approximately 0.12-acres of brush and dead grass behind Half Moon Bay High School. A second lightning strike fire was reported and suppressed on San Francisco Watershed lands near the Allied Waste Ox Mountain Landfill. This fire ignited in a dense stand of Douglas fir and required tree fellers to be called to cut down four large trees with fire in the canopies. The size of this second fire was estimated at 0.25-acres (CAL FIRE, 5/6/2013.) Though rare in the Bay Area, lightning fires do occur in coastal San Mateo County.

FIRE HISTORY

The following Figure, 3A, showing recent fire history for the San Mateo Coastside would be added to the FMP/EIS on page 156 to supplement existing figures showing fire history in the park vicinity as of 2005. Data obtained from CAL FIRE shows there were no fire starts within Rancho since 1994. Nearly all fires in the vicinity of Rancho were kept to less than an acre, probably due to quick suppression response.

Amendment to the GGNRA Fire Management Plan for Rancho Corral de Tierra



REFERENCES

- CAL FIRE. 2010. Santa Cruz County San Mateo County Community Wildfire Protection Plan. Prepared by CALFIRE, San Mateo — Santa Cruz Unit, Resource Conservation District for San Mateo County and Santa Cruz County. May 2010.
- _____. 2013. CAL FIRE News Release, California Department of Forestry and Fire Protection, San Mateo-Santa Cruz Unit, Rich Sampson, Division Chief, Dated May 6, 2013.
- National Park Service. 2005. Fire Management Plan, Final Environmental Impact Statement, Golden Gate National Recreation Area. November 2005.
- _____. 2006. Record of Decision, Fire Management Plan, Final Environmental Impact Statement, Golden Gate National Recreation Area. February 22, 2006.
- _____. 2006. NPS Management Policies 2006: U.S. Department of the Interior, National Park Service.
- _____. 2008. Director's Order 18. Wildland Fire Management. January 16, 2008.
- _____. 2011. Golden Gate National Recreation Area and Muir Woods National Monument, Draft General Management Plan/Environmental Impact Statement. August 2011.
- _____. 2011. Director's Order 12. Conservation Planning, Environmental Impact Analysis and Decision-making, National Park Service. October 5, 2011.
- _____. 2013. Reference Manual 18: Wildland Fire. Published, maintained and revised online. Last consulted June 1, 2013. www.nps.gov/fire/wildland-fire/resources/documents/reference-manual-18.pdf
- _____. 2013. National Park Service. Reference Manual 12: Handbook for Environmental Impact Analysis. Published, maintained and revised online. Last consulted June 1, 2013. www.nps.gov/policy/DOrders/RM12.pdf

ATTACHMENT A: GGNRA FMP/EIS, PURPOSE AND NEED/GOALS AND OBJECTIVES

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:

The following goals and objectives of the GGNRA FMP/EIS direct FMP planning and implementation will be applied to wildland fire management planning for Rancho:

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

Objectives:

- 1.a. Provide fire management workforce with the training, equipment, operating procedures, safety measures, and information needed to manage risks and carry out their activities safely.
- 1.b. Ensure that all fire management employees meet the Interagency Qualification Standards for their positions and those held while assigned to an incident.
- 1.c. Identify, inform, and protect visitors, communities, park partners, and other groups and individuals that potentially would be affected by fire management activities.

*Amendment to the GGNRA Fire Management Plan for
Rancho Corral de Tierra*

- 1.d. Comply with the National Wildfire Coordinating Group and agency fitness requirements for staff and make sure staff has personal protective equipment appropriate to the job or assignment.
- 1.e. 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:

- 2.a. Annually analyze fire hazards, fire values, and risks to inform project priority selection for fire management units (FMUs).
- 2.b. Support the development of evacuation plans for wildland urban interface communities, where such plans do not exist.
- 2.c. 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:

- 3.a. Manage ecosystems within the natural range of variability for plant community structure and fuel loads.
- 3.b. 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.
- 3.c. Reduce nonnative trees and shrubs (Monterey pine, Monterey cypress, acacia, eucalyptus, etc.) to the greatest extent possible.
- 3.d. Protect and restore rare and endangered species and sensitive habitat through fire management activities and project implementation.
- 3.e. Reduce erosion from fire roads and reduce sediment transport through ongoing maintenance of roads and the removal and site restoration of unnecessary fire roads.
- 3.f. 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.
- 3.g. 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:

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

*Amendment to the GGNRA Fire Management Plan for
Rancho Corral de Tierra*

- 4.c. 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.
- 4.d. Regularly monitor fire management activities to assess their effects on cultural resources.
- 4.e. Protect historic structures and landscape features through the course of fire management project implementation.
- 4.f. Use fire management activities to preserve and in some cases to perpetuate historic vegetation patterns.
- 4.g. 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:

- 5.a. 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.
- 5.b. Identify issues or missing information important to developing effective implementation of the park's fire and fuels management program.
- 5.c. 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.
- 5.d. 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.
- 5.e. Research the role of fire in old-growth redwood forests.
- 5.f. Conduct research into issues of Sudden Oak Death, and the potential of fire as a management tool.
- 5.g. Determine how fire can be used to target nonnative plant species for eradication.
- 5.h. Research the effects of fire exclusion.
- 5.i. Determine how current fire frequency affects related ecosystems with respect to the historic fire regime.
- 5.j. 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:

- 6.a. Implement annual program reviews for fire management office and personnel.
- 6.b. 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.
- 6.c. Keep abreast of the latest developments and technology applicable to fire management.
- 6.d. Establish and promote measurable qualifications and staff experience to accomplish fire management program objectives in a safe manner.

- 6.e. 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:

- 7.a 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.
- 7.b Encourage interdisciplinary pre-project planning for fire management activities.
- 7.c 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.
- 7.d 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:

- 8.a Continue and enhance communication and education programs to broaden an understanding of the NPS fire management mission, for both internal and external audiences.
- 8.b Maintain and expand the current park website to provide information about fire management activities in the park as well as fire safety.
- 8.c Support an increase in fire ecology and safety programs in schools.
- 8.d Increase public meetings and homeowners group presentations.
- 8.e Provide more interpretive programs on fire safety and ecology.
- 8.f 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:

- 9.a. Maintain cooperative fire management agreements with county and city fire departments.
- 9.b. 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.
- 9.c. Attend interagency planning meetings prior to each fire season to enhance coordination and cooperation to maximize efficiency to manage wildland fire incidents.
- 9.d. Continue participation in regular fire management coordination meetings to share information and discuss related issues with organizations such as FIRESafe Marin and Fire Safe San Mateo.

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:

- 10.a. 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.

*Amendment to the GGNRA Fire Management Plan for
Rancho Corral de Tierra*

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

ATTACHMENT B: DESCRIPTIONS OF FIRE MANAGEMENT ACTIONS

There are no wildland fire management actions proposed for Rancho that were not addressed in the FMP/EIS. No text amendments are needed to the sections of the FMP/EIS describing wildland fire management actions. For the benefit of the public in reviewing this FMP Amendment, the FMP/EIS text describing fire management actions including prescribed burning, mechanical fuel reduction, pile burning, wildfire suppression, is included as Attachment C to the FMP/EIS Amendment with the exception of strategy specifically applying to Muir Woods National Monument and parklands in San Francisco. The following text is on pages 68 – 79 of the FMP/FEIS available on the PEPC website for the FMP Amendment for Rancho: <http://parkplanning.nps.gov/RCDTFMP>.

Fire Management Actions

Vegetation within NPS units is managed to achieve resource benefits and management goals such as restoring ecosystems, maintaining ecosystem health, maintaining or improving the condition of cultural landscapes, and reducing hazard fuels. Fuels management includes strategic planning and implementation of treatments ranging in scale from site-specific to landscape level. These treatments are designed to improve the park's ability to protect life and property and to maintain or restore the sustainability of healthy ecosystems, which is a fundamental legislative mandate (NPS 2003a).

Fuel reduction activities reduce the fire hazard of all fuel types when risk assessments demonstrate a reasonable chance for future wildland fire damage. The beneficial outcome is that firefighter and public safety is enhanced, real property as well as natural and cultural resources may be protected, and potential suppression and property damage costs may be significantly reduced. The goal of fuel reduction projects is to provide for increased protection of homes within and adjacent to parklands, and to protect sensitive species and their habitats and important cultural resources within the park.

The following sections review types of fire management activities that are further described and articulated in each of the alternatives.

Suppression

Wildfire suppression is the activity that most people associate with fire management. Suppression includes all actions taken to put out an active fire, and is defined as the restriction of the spread of a wildland fire and the elimination of all threats from that fire. All wildland fire suppression activities provide for firefighter and public safety as the highest consideration while minimizing loss of resource values, economic expenditures, and/or the use of firefighting resources (NPS 2003a). Fire suppression methods used should be those that cause minimum resource damage while accomplishing effective control. A flexible suppression strategy allows for the choice of using methods to confine, contain, or control a wildland fire, with input from the park, suppression forces, and adjacent landowners.

Mechanical Treatment

Mechanical treatment is a term used to describe the application of various tools and equipment to reduce fuels and achieve fire and resource management goals. The park often uses mechanical treatments, including mowing, short-term grazing, cutting, and selective thinning, to remove hazardous fuels around buildings, along travel corridors, and in a number of places within the park where wildland fuels grow directly against the urban interface (i.e., along the boundaries where there are houses and other built developments), and to reduce the long-term fuel hazard through vegetation type conversion. The most common method of mechanical fuel reduction is through the use of chain saws to thin or remove targeted vegetation, which is

then piled to be burned at a later date, or chipped using a chipper. In other instances, such as for fire road maintenance, large mowers and brush-cutting attachments are used for controlling vegetation.

- Mechanical treatment includes provisions such as the following:
- Fuel breaks – clearing corridors of vegetation;
- Shaded fuel breaks – reducing density of underbrush, removing tree limbs;
- Mosaics of cleared areas, areas with reduced vegetation density, and uncleared areas;
- Short-term use of animals (such as cows or goats) to reduce fuels;
- Removal of nonnative, nonhistoric trees and treatment of cut stumps with herbicide to prevent resprouting when necessary; and
- Revegetation, as appropriate, of treated areas to avoid erosion and retain natural and/or cultural resource values over the long term.

Prescribed Fire

Prescribed fire is the use of management-ignited fire to meet specific resource and fire management goals and objectives under predefined fuel and weather conditions. (A prescription will always factor in a set of conditions to address the safety of the public and fire staff, weather, and probability of meeting the burn objectives.) Prescribed fires are used to manage vegetation, reduce hazardous fuel loads near developed areas, manage cultural landscapes, and restore natural systems, and for research purposes. Before any prescribed fire is permitted, a smoke management plan approved by the Bay Area Air Quality Management District (BAAQMD) must be in place. Also, a burn plan, signed by the superintendent, is required.

Ecosystem restoration projects can use prescribed fire to control nonnative plants and restore degraded habitat. Information gained through the use and effect of prescribed fire on natural resources can be critical to sound, scientifically based management decisions for a particular resource and can aid in future management decisions. Similarly, cultural resource management goals can also be achieved through the judicious application of prescribed fire to, for instance, modify vegetation type and patterns in cultural landscapes, or provide opportunity to reveal previously unknown archeological resources in densely overgrown areas.

Pile Burning

Pile burning refers to the controlled burning of piles created during mechanical fuel reduction activities or general park maintenance operations. Pile burning is frequently used when chipping is not feasible or is done in conjunction with prescribed burning (in the first phase) to reduce fuel loads to a level that allows burning over the landscape. Pile locations are sited to minimize impacts from intensive soils heating. Piles are covered, allowed to dry, and then typically burned during wet conditions when the probability of fire extending beyond the piles is low. This can occur any time during the year, depending upon weather conditions. As pile burning contributes emissions to the Bay Area Air Basin, a smoke management plan must be submitted to BAAQMD and approval received prior to burning. An approved burn plan must also be in place.

Monitoring and Research

Integral to any fire management plan are monitoring and research programs that allow the park to document basic information, to detect trends, and to ensure that the park meets its fire and resource management objectives. By studying trends, park staff can identify specific concerns, develop hypotheses, and identify specific research projects to develop solutions to problems. Using results from a high-quality monitoring program to evaluate a park's prescribed fire management program is important to successful adaptive management. These results can help managers determine whether objectives are being met and verify that the program is on track, or conversely, provide clues to what may not be working as planned so that appropriate changes can be made.

The NPS uses a standardized fire effects monitoring program as a data collection procedure nationwide. The benefits of establishing standardized data collection procedures in a fire monitoring program include documenting basic information, detecting trends, identifying future research needs, and facilitating information exchange between resource protection staff and fire suppression agencies. Research projects, their methodology and objectives vary over the park landscape depending on the research questions and the researchers involved. Research projects developed in association with the fire management program will be managed in conjunction with the NPS Research and Collection Permit Program through the GGNRA Natural Resources Management and Science Division.

Wildland-Urban Interface Initiative

In 2001, the NPS began implementing provisions of the federal Wildland-Urban Interface Initiative program. This program was designed to facilitate cooperative ventures with park neighbors – including other federal agencies, states, counties, private landowners, and local fire agencies – to reduce the potential for wildland fire to burn from federal lands to neighboring properties. This is accomplished through implementation of fuel reduction projects in communities adjacent to GGNRA. Through this program, the NPS also receives funding for fuel reduction projects on parklands near the interface with private property or lands managed by other agencies.

Defensible Space/Vegetation Clearing around Buildings

The protection of all buildings from wildfire within GGNRA would continue under all alternatives. NPS staff or private contractors would continue to clear vegetation around park structures. Individual structures would be assessed to determine the appropriate vegetation treatment based on fuel type and slope, building construction type, historic significance, and potential sources of ignition.

Priorities for hazardous fuels removal projects are set annually and the projects are performed throughout the year. The defensible space required at each structure is based on individual site topography and usually ranges from 30 to 100 feet around structures.² In some cases, a larger cleared area may be required to protect the structure from potential fire hazard due to prevailing winds or the presence of drainages or swales close to the structure. Fuel type and fuel loading are also factors considered in determining these types of projects. Large trees are pruned or removed if the tree poses a threat. Grasses are cut, and smaller trees are pruned or removed based on an individual assessment. Pruning and removal actions must be in conformance with

² Parcels in Marin and San Mateo counties, mapped by the State Board of Forestry as State Responsibility Areas, must comply with PRC 4290-4291, which requires a minimum 100 feet of defensible space as of January 2005.

approved cultural landscape preservation plans and historic preservation compliance stipulations when the landscape has been determined to be historic.

Roadside Fuel Reduction

The park maintains roads that provide routes for public safety, recreation, and access for park management uses. Front-country roads that are paved are generally open to public motor vehicle traffic. Unpaved, back-country roads are generally open only to NPS vehicles, but may also be open to foot, horse, and/or bicycle users. Some roads may serve as control lines during a prescribed fire or wildland fire suppression operation.

Upkeep of park roads is the responsibility of the GGNRA Maintenance and Engineering Division. The FMP alternatives do not propose changes to the status or management of park roads and trails. All fire roads would continue to be maintained to allow for safe and efficient access by emergency vehicles, and at a minimum, to allow access by Type III fire engines. Maintenance standards for emergency vehicles access on back-country roads in Marin County would conform to those described in the Memorandum of Understanding (MOU) between the Marin Municipal Water District (MMWD) and the NPS. FMP actions may include grading of road surfaces, placement of erosion control measures, and vegetation thinning by mowing or cutting along the road corridor to a specified width based on fuel type, slope, and roadway composition. Larger trees along the sides of the roadways may be limbed up and smaller trees removed as needed to ensure emergency vehicle clearance is met. Grass that grows within the roadway may be cut or mowed. Debris would be cut up and broadcast in the immediate area, piled and burned, or chipped and hauled offsite.

In separate actions apart from the FMP, the park may evaluate on an ongoing basis the condition of park roads. Unnecessary roads may be eliminated or designated for non-vehicular use, in coordination with other park planning efforts such as the Trails Forever initiative. In some cases, existing roads may be reconfigured or rerouted to address erosion and/or maintenance concerns.

In Marin County, there are approximately 44 miles of fire roads, amounting to 52 acres requiring treatment each year to keep clear and open from debris. In San Mateo County, there are 10 miles of fire roads, amounting to 16 acres of mechanical treatment each year. San Francisco County roads, as well as paved roads in parklands in Marin and San Mateo counties, would be maintained on a regular basis under the park's maintenance operation and are not included as part of the fire road calculations.

Suppression

The current policy at GGNRA is to suppress all unplanned ignitions using minimum impact suppression tactics (MIST) whenever possible and feasible given the constraints along the urban interface. Suppression of fires will be aggressive and will be conducted with the highest regard for human safety. Specifics of MIST tactics are included in Appendix G³.

Wildland fire suppression would be conducted to suppress wildfire at minimum cost consistent with values at risk, while minimizing the impacts from suppression activities. A "confine," "contain," or "control" strategy would be used in the suppression of all wildfires, as follows, with the majority of wildfires suppressed using the control strategy.

³ MIST prepared specifically for GGNRA is attachment C to this FMP/EIS Amendment for Rancho.

*Amendment to the GGNRA Fire Management Plan for
Rancho Corral de Tierra*

Confine – to restrict the wildfire within boundaries determined either before or during the fire. These identified boundaries will confine the fire, with no action being taken to put the fire out.

Contain – to restrict a wildfire to a defined area using a combination of natural and constructed barriers that will stop the spread of the fire under the prevailing and forecasted weather conditions until the fire is out.

Control – to fight a wildfire aggressively through the skillful use of personnel, equipment, and aircraft to establish fire lines around a fire to halt the spread and extinguish all hot spots until the fire is out. Control activities will use standard suppression practices.

Suppression will be accomplished through a combination of cooperative agreements with local fire agencies and qualified park fire personnel. Annual operating plans will identify individual suppression concerns in order to minimize suppression impacts. Furthermore, all control efforts will be evaluated for consideration of effects on resource values.

Fire suppression methods used should be those that cause minimum resource damage while accomplishing effective control. Suppression activities will attempt to avoid disturbance of all threatened and endangered (T&E) species and their habitats, as well as archeological and cultural sites, whenever reasonably possible, i.e., when these activities do not preclude life, safety, or private property considerations. A representative from the NPS will be present during extended attack suppression activities within or near GGNRA.

A Wildland Fire Situation Analysis (WFS) and Delegation of Authority (DOA) will be prepared for the superintendent's approval each time a wildfire escapes initial attack or burns into a second burning period. It is also possible that, during an emergency situation in which an unplanned ignition has grown to a large and dangerous fire, the superintendent would authorize the use of heavy motorized equipment such as bulldozers to construct larger and longer fire lines. Other fire suppression activities require limited offroad vehicle use by trucks, fire engines, and lowboys for hauling heavy equipment.

Aircraft may drop retardant and water during suppression of unplanned ignitions. Since retardant (e.g., Phoschek) contains phosphorus, retardants will not be used in streams or wetlands when feasible. Helicopters may also be used to deliver water, foam, and/or retardant. Helicopters will need areas to land (helispots) within the park. All landing areas will meet the standards outlined in the Interagency Helicopter Operations Guide (IHOG). In addition, the GGNRA Aviation Management Plan identifies safe locations for landing in areas administered by the park. Temporary road and trail closures may occur during fire suppression events.

Public Information and Fire Education Programs

The NPS manages an active fire information and education program within the park that also serves local communities. This program assists in educating NPS employees, volunteers, park partners, other agencies, park visitors, and the general public about fire management goals and policies. The education program currently produces flyers for nearly all fire management projects within the park for distribution to the public, posting at the project site, and posting on the park's fire management web pages. The fire management office has arranged for, conducted, or presented at a wide range of public meetings in communities close to WUI program projects.

A comprehensive public information and education program would be included as part of all of the alternatives. GGNRA has shared a full-time fire education, prevention, and information specialist with Point Reyes National Seashore since 2001. The fire information and education program is in the developmental

*Amendment to the GGNRA Fire Management Plan for
Rancho Corral de Tierra*

stages at both local and national levels. This program is adding to what has been traditionally provided through GGNRA's Office of Public Affairs and the Division of Interpretation and Education. This fire information and education program includes fire safety and prevention, fuels management, the role of fire in GGNRA's ecosystems, GGNRA's fire history and the cultural use of fire on the landscape, and fire research programs and opportunities. The fire information and education program is directed at neighbors, visitors, partners, NPS employees, and the news media.

The proposed program could include the following:

- Site bulletins and temporary exhibits/bulletin boards about prescribed burns;
- Fire ecology and wildfire wayside exhibits at key visitor locations;
- Public Information Officer (PIO) on wildfires;
- Site bulletins and temporary exhibits/bulletin boards about mechanical fuels treatment projects;
- "Burning Issues" teacher workshop;
- Fire education ranger-led or self-guided walk at Muir Woods National Monument;
- Fire news reporting/ParkNet;
- Enhanced fire management web pages;
- Fire education internship program;
- Increased press releases, media briefings, and tours;
- Defensible space home evaluation program;
- Community notification electronic mailing lists integrated with fire and fuels management planning;
- Two community mailings per year; and/or
- Short fire and fuels management video presentations at some visitor centers.

Notification of fire and fuels management activities would be done prior to project commencement and could be achieved by using road and trail signs as well as postings at visitor centers, entrance stations, post offices, and other areas of high visitor use. The fire management office will develop and implement an education and communication plan for all site-specific fire management implementation projects. For large-scale fuel reduction projects (more than one acre) that could affect mid- to close-range viewsheds for residents on the park boundary, park staff will arrange a meeting with the community to present the scope of work and provide an opportunity for public comment. Communication plans for projects may require information such as the project scope, schedule, and alternative trail routes, where needed, to be posted in the project vicinity.

Communication with adjacent land management agencies (e.g., State Department of Parks and Recreation, Marin County, and Marin Municipal Water District) would always be conducted when projects occur at or near their boundaries. These agencies also would be notified if a project on GGNRA lands has potential to affect lands under their jurisdiction.

*Amendment to the GGNRA Fire Management Plan for
Rancho Corral de Tierra*

When prescribed fires or unplanned ignitions are visible from scenic overlooks or popular visitor use areas, park interpreters or the fire education specialist would be present, if possible, to alleviate public concern and to teach visitors about the objectives and benefits of prescribed burning. The Public or Fire Information Officer (P/FIO, respectively) would notify adjacent communities by press release, as requested, before implementing prescribed fires.

GGNRA staff would follow the standard operating procedures for implementing a Fire Step-up Plan during fire season. For example, when red-flag warnings are issued by the National Weather Service for the local area, fire managers may post high fire danger signs within the park.

In the event of wildland fire, the P/FIO would work closely with visiting FIOs who may be part of Incident Management Teams to ensure that the park message is delivered accurately and effectively. Wildland fire will also be reported to BAAQMD as soon as possible. Media and public queries would receive prompt replies that would contain information about the fire, the fire management plan, and ecosystem restoration as appropriate.

Community mailings would reinforce prevention measures and inform the public of fire and fuels management activities. A defensible space homeowner education program would provide an opportunity for homeowners to learn about ways to minimize loss of property.

Fire Effects Monitoring

Fire effects monitoring is essential to determining the effects of the fire program on GGNRA ecosystems and to providing guidance to the fire program for adaptive management. The effects of prescribed fire have been monitored in GGNRA since 1991. In accordance with the NPS Fire Monitoring Handbook (FMH), vegetation and/or fuels data are collected both before and one, two, five and ten years after prescribed burns in order to assess whether or not the burn has met stated objectives (NPS 2003b). Existing FMH plots at GGNRA are located at Bolinas Ridge, Stinson Beach, Muir Woods National Monument, Tennessee Valley, Rodeo Valley, Milagra Ridge, and Sweeney Ridge, in habitat types subject to prescribed burning. Under all alternatives, these plots would continue to be monitored according to the FMH schedule and new plots would be established as necessary to determine the effects of fire. Further, the data from this program would be analyzed and reviewed on a regular basis to help direct the GGNRA fire program as well as to identify areas where fire research or other monitoring efforts should be focused, such as evaluating the effectiveness of mechanical fuel treatments and follow-up, and effects on threatened and endangered species.

As part of the Fire Effects Monitoring Program, both prescribed burns and wildfires are monitored during a fire event for weather conditions, fire behavior, and air quality. This monitoring would also continue under all alternatives. Both live fire monitoring as well as the establishment and monitoring of FMH plots as described above are carried out by the Fire Effects Monitoring Crew, which is hosted at Point Reyes National Seashore. Funding for the Fire Effects Monitoring Crew is provided through the National Fire Office.

ATTACHMENT C: REQUIRED MITIGATION MEASURES

The following mitigation measures were adopted by the NPS through the signing of the Record of Decision by the NPS Regional Director on February 22, 2006 which concluded the NEPA process for the GGNRA FMP EIS. By amending the GGNRA FMP to include Rancho Corral de Tierra, all mitigation measures below that were adopted for GGNRA will also apply to actions at Rancho under the GGNRA FMP Amendment.

Mitigation Measures

The NPS will implement these measures for wildland fire management actions. These measures would not be fully applicable in the event of a catastrophic fire. The NPS will have primary and full responsibility for coordinating the specific elements of each mitigation measure and ensuring that each mitigation measure has been implemented as specified herein.

Many of the FMP mitigation measures have been developed to avoid or minimize potential effects on plant and animal species found at GGNRA that are listed as threatened or endangered by the U.S. Fish and Wildlife Service (USFWS) or NOAA Fisheries under the federal Endangered Species Act (ESA). As required by the ESA, the NPS consulted with the USFWS and NOAA Fisheries to ensure that the FMP will not jeopardize the survival of these listed species but rather protect the species and their habitats.

Review of proposed projects for conformance with Section 106 of the National Historic Preservation Act (NHPA) was conducted through a process defined in a Programmatic Agreement developed specifically for GGNRA's fire management program.

General FMP Mitigation Measures

- FMP-1(a)** To ensure that GGNRA fire management actions are in conformance with NEPA, the Record of Decision on the Final EIS, and NPS policy, individual fire management projects and modifications to the GGNRA five-year implementation plan will be subject to the GGNRA project review. Through the project review process, an interdisciplinary team will evaluate whether the potential effects of a proposed action or five-year plan, including appropriate mitigation measures, are adequately addressed by the Final EIS and reflect NPS management policies. If it is determined that the project has the potential for new environmental effects not addressed in this EIS or effects greater than those described in this EIS, a separate environmental process will be conducted.
- FMP-1(b)** To ensure compliance with 36 CFR 800, the regulations for implementing the NHPA, the Programmatic Agreement that will be developed specific to this park's fire management program will stipulate that each five-year implementation plan will be made available to the State Historic Preservation Officer, the Advisory Council on Historic Preservation, and the public for comment.
- FMP-2** GGNRA staff will meet with representatives of local fire agencies that could respond to wildfires in GGNRA lands in Marin, San Francisco, and San Mateo counties. The purpose of the meeting will be to provide information to fire agencies on the location and preferred strategies for suppression actions that will minimize damage or afford protection to important park resources in the event of a wildfire. The information exchanged between the NPS and local fire agencies will include notification procedures, new or modified facilities in the park, updated information on cultural and natural resources, low-impact suppression techniques, or potential protection techniques for certain locales in GGNRA.

*Amendment to the GGNRA Fire Management Plan for
Rancho Corral de Tierra*

- FMP-3** GGNRA cultural and natural resources staff will work with the fire management staff in preparing and updating maps and other data sources showing areas of the park with sensitive resources such as National Register properties; archaeological sensitivity; cultural landscapes; plant communities of special management concern (e.g., wetlands, riparian areas, dunes, and Special Ecological Areas identified in the park's Natural Resource Management Plan); habitat of federal, state, and locally listed species; and other important natural and cultural resources.
- FMP-4** GGNRA staff will conduct a training session for all contractor crews at the beginning of new fuel reduction projects to familiarize the crews with sensitive resources at the project site and review project conditions. Training sessions may include identification of NPS staff resource contacts; special status plants, wildlife, or other sensitive resources in the work area; identification and specific removal techniques to protect cultural resources from disturbance or prevent resprouting of nonnative plants; markings for the limit line of disturbance; thresholds that trigger a change in implementation techniques or require a halt in project implementation; proper disposal of food waste and garbage to discourage feeding by vectors and corvids; daily close-up of the project site to assure public safety; and information for public contacts during project implementation.
- FMP-5** An education program for field personnel involved with implementation of FMP projects will be conducted prior to the initiation of field activities. The program may include a brief presentation on any listed species at the work area, including a description of the species and its ecology, habitat needs, legal status, and protection afforded to the species. Cultural resource issues may include the type of artifacts or soils that could indicate the presence of subsurface cultural resources, the presence of known resources at the site, and important elements of the cultural landscape that must be left undisturbed, among other issues.
- FMP-6** The superintendent of GGNRA will appoint members of GGNRA staff to act as resource specialists to consult with operations crews in the event of wildland fire and during planning and execution of prescribed fire. The resource specialists will meet with local fire agencies likely to command wildland fire suppression actions on GGNRA lands and develop strategies for implementing flexible suppression to protect important resources.
- FMP-7** Natural and cultural resources staff will be notified of wildland fires as soon as possible so that appropriate staff can advise the lead fire agency on the location of sensitive resources and preferred suppression techniques and begin planning for rehabilitation of the burned area. Natural and cultural resource advisors will be assigned to the incident as needed.
- FMP-8** For any multiday fire suppression event, a local or regional Burned Area Emergency Response team will be requested to facilitate development, in conjunction with park staff, of the emergency suppression stabilization and rehabilitation proposals.

Air Quality Mitigation Measures

- AIR-1** If recommended by BAAQMD, smoke management plans submitted by the NPS for BAAQMD review can be modified to reduce production of pollutants by reducing the amount of fuels available for burning. Options for reducing the amount of fuels available and emissions produced include reducing the area to be burned, reducing fuel loading (e.g., mowing and understory thinning), managing the rate of fuel consumption, and redistributing the emissions. Treatments to reduce overall air emissions from prescribed burns will be based on current smoke management techniques such as those listed in the Western Regional Air Partnership publication "Non-burning

Alternatives to Prescribed Fire on Wildlands” (Jones and Stokes, 2004) and those listed in Appendix I of this FEIS.

- AIR-2** The NPS will develop a Smoke Communication Strategy to guide management of smoke events during prescribed fires, managed wildland fires, suppression actions, and fires occurring outside the park. Notification of proposed burns will be disseminated locally to provide adequate advance notice to persons with sensitivities to smoke.
- AIR-3** To reduce smoke and pollutant generation during the prescribed burning season, efforts will be made to burn fuel concentrations, piles, landings, and jackpots at other times of the year.
- AIR-4** To reduce impacts on visibility in the national park, burning will be avoided on holidays or other periods when recreational visitation is typically high.
- AIR-5** To avoid public health and nuisance impacts on neighboring communities, information about upcoming prescribed burns, including guidance for those who are sensitive to smoke, will be provided to park visitors, park employees, and park partners. Prescribed burns will be conducted under meteorological conditions that best avoid smoke drift into nearby residential areas and roadways.
- AIR-6** The NPS will arrange in advance with other parks that routinely monitor air quality (i.e., Yosemite National Park or Sequoia National Park) to monitor particulate levels during larger prescribed burns in GGNRA provided the necessary staff and equipment can be made available for GGNRA use.

Soils and Water Quality Mitigation Measures

- SW-1** Planned and unplanned fire actions will include strategies to minimize impacts from erosion, such as avoiding steep slopes and highly erosive soils, timing burns to minimize erosion potential, avoiding scraping or burning to bare mineral soil (layer below duff), or using erosion control techniques during or after burns. Subject matter experts will ensure that the erosion control plan for each action is sufficient to prevent long-term moderate or major impacts on the rate of soil erosion. Sites with identified high potential for soil erosion will be monitored.
- SW-2** Following a prescribed fire or wildland fire, visual monitoring will be conducted downslope of the area burned and at down-gradient water bodies (including ditches, streams, and wetlands) for evidence of increased soil erosion or increased sedimentation. Additional erosion control/sediment control measures will be applied where warranted.
- SW-3** Following wildland fires or prescribed burning, all fire lines (both hand and dozer lines) or other areas disturbed by equipment or vehicles will be rehabilitated as quickly as possible to prevent erosion, discourage the spread of nonnative plants and address soil compaction. Burned area rehabilitation techniques, including recontouring, soil stabilization, and removal and monitoring of nonnative plants, will be used for rehabilitation efforts.
- SW-4** Unless no feasible alternative is available, heavy equipment working on fire management actions (excluding suppression) will not be used in areas with soils that are undisturbed, saturated, or subject to extensive compaction. Where staging of heavy equipment, vehicles, or stockpiling is unavoidable, the limit of allowable disturbance will be clearly demarcated by staking, flagging, or

*Amendment to the GGNRA Fire Management Plan for
Rancho Corral de Tierra*

fencing. Following the end of work, surface soils will be scarified to retard runoff and promote revegetation.

- SW-5** During implementation of prescribed burns, some of the available coarse, woody debris will be left on the site to foster nutrient recycling and mycorrhizal function and other natural resource benefits.
- SW-6** Mechanical regrading and rehabilitation of fire roads will be conducted to specifications identified in the GGNRA Trails Inventory and Condition Assessment and the Memorandum of Understanding for Maintenance and Management of Dirt Roads with adjacent land management agencies.
- SW-7** After tree felling, stumps will be left in place in areas with highly erosive soils or on steep slopes.
- SW-8** Where surface soils supporting native vegetation will be disturbed as part of fire management actions, the topsoil layer will be excavated and stockpiled separately from other fill and replaced as topsoil at the end of the action.
- SW-9** Erosion and sediment control measures will be implemented as prescribed where project actions could leave soils exposed to runoff prior to revegetation.
- SW-10** Where multiple burn piles are created on undisturbed soils, the size of the piles will be kept small with sufficient distance between piles to minimize impacts on soils from high-intensity fires and to facilitate reestablishment of mycorrhizal fungi and soil microorganisms from adjacent unburned land.
- SW-11** A post-project site stabilization plan will be developed and implemented for all fire management projects.

Wetland Mitigation Measures

- WET-1** Fires will be allowed to back into, around, or through wetlands and meadows to avoid suppression damage. Wetlands will be avoided to the greatest extent possible while constructing fire lines and breaks during wildfire suppression. Where wetlands are used as a natural boundary to help contain a fire, the control line will be sited outside the wetland area. Trample lines (rather than dug lines) may be used if it is necessary to site the control line in the wetland.
- WET-2** Foams, saltwater or other fire retardants will not be used on or near wetlands to the greatest extent possible.

Vegetation Mitigation Measures

- VEG-1** Prescribed burns will be conducted at a time of year when introduction or spread of nonnative plants will be minimized and mortality of nonnative plant species will be maximized.
- VEG-2** Soil disturbance during mechanical treatments, prescribed burns, and suppression fires will be minimized to the greatest extent possible to reduce the potential for introduction or spread of nonnative plant species, to protect topsoil resources, and to reduce available habitat for new nonnative plant species.

*Amendment to the GGNRA Fire Management Plan for
Rancho Corral de Tierra*

- VEG-3** Areas subject to fire management treatments will be monitored periodically for the presence of nonnative plant species; if such species become established or spread as a result of such activities, the nonnative, nonhistoric plants will be removed.
- VEG-4** All vegetation management actions under the FMP will conform to federal and state regulations governing interstate and intrastate restrictions (respectively) adopted to prevent the artificial spread of Sudden Oak Death (*Phytophthora ramorum*) beyond the currently affected area. It will be the responsibility of the natural resources division chief to ensure that current guidelines and regulations are circulated to GGNRA staff involved in fire management actions. Relevant regulations are the Code of Federal Regulations, Title 7, Section 301.92 (updated 9/27/04) and California Code of Regulations, Title 3, Section 3700 (updated 9/2/04). Current regulations do not permit the movement of plant species and associated material listed in 3700(c) outside of the regulated quarantine area (defined in 3700(b)), which includes all three GGNRA counties.
- VEG-5** All FMP projects will incorporate techniques that control existing populations of weed species at the project site and incorporate practices to reduce the potential spread of weed species to noninfested areas of the park. Practices to reduce the spread of weed species include the following:
- Movement or deposition of fill, rock, or other materials containing weed seed or viable plant cuttings to areas relatively free of weeds will be restricted.
 - Where feasible based on the density of the weed population present, the fire management project manager will survey the road shoulders of the routes that provide project access for nonnative plant species and coordinate removal of those plants that could be disturbed by passing vehicles.
 - When project vehicles are required to move from offroad use in weed-infested areas to relatively weed-free areas, and water lines and water tenders are available for use, the tires and body of heavy equipment and vehicles will be hosed down before each transit to the relatively weed-free area.
- VEG-6** All herbicide use will be administered through the park's integrated pest management (IPM) coordinator, and only licensed personnel will be allowed to apply pesticides. All herbicide use for fire management actions will be reported monthly to the IPM coordinator.
- VEG-7** No herbicide foliar spraying or direct stump applications will be allowed in riparian or wetland habitats supporting special status species except in the dry season.

Special Status Species Mitigation Measures

- SS-1** When emergency actions must be taken to prevent imminent loss of human life or property and these actions would result in a taking of listed species or adverse modification of critical habitat not covered under existing FMP biological opinion, the NPS will respond to the situation in an expedient manner to protect human health and safety. After the incident is under control, the NPS will initiate emergency consultation procedures with the appropriate agency(ies).

*Amendment to the GGNRA Fire Management Plan for
Rancho Corral de Tierra*

- SS-2** The fire management project manager will ensure that contractor crews working in areas designated as habitat of listed species are monitored by a qualified biological monitor to ensure that project actions conform to restrictions developed for species protection.
- SS-3** All fire management actions will operate under a policy of No Net Loss of Endangered Species Habitat, which applies to all species federally listed as threatened or endangered or proposed for listing. The project review process will be used to document the no net loss finding through the conformance assessment conducted for each FMP action proposed for listed species habitat.
- SS-4** To avoid the spread of highly nonnative animal species (e.g., bullfrogs) and protect the habitat of federally listed threatened or endangered species, GGNRA resource advisors and fire management staff will advise local fire agencies responding to wildland fires in the park and vicinity of the following guidance:
- Drawing water from freshwater bodies in GGNRA and Rodeo Lagoon should be avoided unless there are no alternative sources available. If freshwater is drawn or scooped from water bodies in the park, it should be used on wildfires within the same watershed whenever possible.
 - Ocean and bay waters are preferred water sources for fighting wildfires in the park and vicinity. Habitats of sensitive aquatic species and mission blue butterflies should be avoided when saltwater is used.
- SS-5** An education program for the field personnel involved with the FMP shall be conducted prior to the initiation of field activities. The program shall consist of a brief presentation by a person(s) knowledgeable in the California red-legged frog, San Francisco garter snake, mission blue butterfly, and other appropriate listed species. The program shall include the following: a description of these species, their ecology, and habitat needs; an explanation of their legal status and their protection under the Act; and an explanation of the measures being taken to avoid or reduce effects to these species during implementation of the FMP. The education may be conducted in an informal manner (e.g., ranger and field personnel in a field setting).
- SS-6** If a California red-legged frog(s), San Francisco garter snake, or early stages of the mission blue butterfly are observed in the work/burn areas, a qualified biologist or an individual trained in the biology and ecology of these listed animals and designated by the NPS shall capture it and move the animal(s) to an appropriate aquatic or upland location outside of the work area.

Special Status Plants

- SS-7** Potential impacts associated with tree removal in the vicinity of the Raven's manzanita, San Francisco lessingia, and Marin dwarf-flax will be evaluated in consultation with the USFWS.
- SS-8** To address fire actions occurring within special status plant species populations, site- and/or species-specific rehabilitation plans will be developed to minimize or avoid impacts on the greatest extent possible.
- SS-9** When FMP actions disturb the habitat of special status plant species, revegetation and weeding plans will be developed in conjunction with project planning.

*Amendment to the GGNRA Fire Management Plan for
Rancho Corral de Tierra*

SS-10 The potential for research burning and/or mechanical fuel treatments to enhance federally listed threatened or endangered plant habitat will be investigated. Burning in these habitats will be limited to carefully prescribed research burns, designed in conjunction with USFWS staff consultation and in accordance with established recovery plan objectives. Experimental treatments will be scientifically designed with replicate controls and a commitment to post-treatment monitoring.

Salmonids

SS-11 Except in emergency situations, water drafting from park streams and creeks that support salmonids must be halted when water levels drop to a level that could result in disconnected pools of water in the channel. Any water pumping from salmonid streams will require measures to prevent injury to fish, such as using offstream sumps, restricting approach velocities to less than 0.8 foot per second, and screening at intake with openings no greater than 0.25 inch.

SS-12 A buffer will maintained around riparian areas where fire management activities will be restricted. Staging, fire line construction, and vehicle use will occur outside the buffer area, and any activities such as nonnative vegetation removal and limited prescribed burning will occur under tightly controlled conditions. Any impacts that occur in the buffer area must be correctable by site-specific actions, and must be confined to short-term, minor (or less) adverse effects.

SS-13 The fire management officer will consult with natural resources subject matter experts to identify rehabilitation and revegetation strategies where fuel reduction projects require bank stabilization in riparian areas. Rehabilitation in riparian areas will be accomplished by hand treatment techniques, using erosion control materials if treatment areas are bare prior to rains, revegetating where needed, and where possible, returning native woody material (large woody debris) to stream banks. No work will be conducted directly in the wetted channel without additional consultation.

Northern Spotted Owl

SS-14 Treatment activities described in the FMP or any noise generation above ambient noise levels will not occur within 0.40 kilometer (0.25 mile) of a known occupied or previously used northern spotted owl nest site, or within potential spotted owl habitat between February 1 and July 31 (breeding season), or until such date as surveys conforming to accepted protocol have determined that the site is unoccupied or nonnesting or nest failure is confirmed.

SS-15 Mechanical fuel reduction activities in suitable spotted owl habitat, known or potential will not substantially alter the percent cover of canopy overstory and will preserve multilayered structure. When shaded fuel break features in suitable northern spotted owl habitat are constructed, the resulting multilayered canopy will only be reduced to a height of 6 to 8 feet, or along roadways as needed for emergency vehicle clearance.

SS-16 Prior to fire management activities, project areas will be surveyed for the presence of dusky footed woodrat nests. If feasible, woodrat nests will be protected.

SS-17 Within northern spotted owl habitat, the cutting of native trees greater than 10 inches diameter at breast height (dbh) will be avoided unless a determination is made that the native tree presents a clear hazard in the event of a fire or cutting is the only option to reduce high fuel loading.

*Amendment to the GGNRA Fire Management Plan for
Rancho Corral de Tierra*

- SS-18** The fire management officer will arrange for qualified biologists to conduct post-project monitoring to determine short- and long-term effects of fire management actions on spotted owl activity centers if resources are available.

San Francisco Garter Snake

- SS-19** No heavy equipment will be used off of existing fire roads or developed features in areas of known San Francisco garter snake habitat. If use of heavy equipment and trucks is required during emergency situations or for work that would improve San Francisco garter snake habitat, mitigation measures to avoid mortality will be incorporated into the project schedule. Measures to avoid mortality include hand-clearing areas prior to fire management activities, hand-excavating all burrows, trapping snakes out of the excavation area, using monitors to prevent equipment from injuring listed species, and training workers on identification and avoidance of listed species. Work will be conducted by biologists with a valid 10(a)(1)(A) permit and any collected San Francisco garter snakes will be relocated outside affected areas.

Marbled Murrelet

- SS-20** Where marbled murrelet habitat overlaps northern spotted owl habitat, the restrictions on noise generation in spotted owl habitat above the level of ambient noise will be to August 5. Further, from August 6 through September 30, noise generation will be limited to ambient noise levels from two hours before sunset to two hours after sunrise to protect any nesting marbled murrelets that have not been noted during surveys (USFWS letter to NPS dated April 13, 1994).
- SS-21** In marbled murrelet habitat, felling of very large Douglas-fir or coast redwood trees will be avoided and the fire perimeter will be established at a distance that will preclude the need to fell large trees.

Mission Blue Butterfly

See also Mitigation Measure SS-4 regarding use of ocean and bay waters for suppression actions.

- SS-22** Fire management activities will not occur within or immediately adjacent to existing or potential mission blue butterfly habitat during the flight period of the butterfly from February 15 through July 4.
- SS-23** Pile burning will only be permitted on barren, disturbed soils in mission blue butterfly habitat.
- SS-24** During the information meeting with local fire agencies, the location of mission blue butterfly habitat will be identified. During this meeting and when providing information at an active wildland fire as a resource advisor, natural resources staff will advise the local fire agency of the following guidelines:
- Avoid staging fire suppression actions in or directly adjacent to mission blue butterfly habitat;
 - Construct fire lines outside of mission blue butterfly habitat to the greatest extent possible;
 - Use wet lines wherever feasible, or narrow, hand-constructed fire lines where water is not available to help contain the spread of the fire; and

*Amendment to the GGNRA Fire Management Plan for
Rancho Corral de Tierra*

- Avoid using saltwater or retardant on habitat of the mission blue butterfly.

SS-25 The potential for research burning and/or mechanical fuel treatments to enhance butterfly habitat will be investigated. Burning in mission blue butterfly habitat will be limited to carefully prescribed research burns. Experimental treatments will be scientifically designed with replicate controls and a commitment to post-treatment monitoring. No more than five percent of existing mission blue butterfly habitat in each county will be treated experimentally each year.

SS-26 Where possible, maintain a 100-foot-wide buffer between fire management activities and mission blue butterfly habitat except when fires are being conducted for research purposes. For habitat enhancement projects, additional measures will include establishment of buffer areas, flagging of *Lupinus albifrons* in the vicinity of activities, installation of temporary fencing, dust control, and worker education (USFWS Biological Opinion for the Fort Baker Plan/EIS, September 29, 1999).

SS-27 The fire management officer will arrange for the removal of nonnative plants within and adjacent to mission blue butterfly habitat following fire management actions, including fire suppression.

San Bruno Elfin Butterfly

SS-28 No planned fire management actions will occur in San Bruno elfin butterfly habitat. Proposed project areas in San Mateo County will be assessed to determine the potential for occurrence of San Bruno elfin butterfly habitat.

SS-29 A 100-foot-wide buffer will be maintained between fire management activities and potential San Bruno elfin butterfly habitat.

SS-30 During the information meeting with local fire agencies, the location of San Bruno elfin butterfly habitat will be identified. During the meeting and when advisors are called to provide information at an active wildland fire, natural resources staff will advise the local fire agency of the following guidelines:

- Avoid staging fire suppression actions in or directly adjacent to San Bruno elfin butterfly habitat;
- Construct fire lines outside of San Bruno elfin butterfly habitat to the greatest extent possible;
- Use wet lines wherever feasible, or narrow, hand-constructed fire lines where water is not available to help contain the spread of the fire; and
- Avoid the use of saltwater or retardant drops on San Bruno elfin butterfly habitat.

SS-31 Conduct fire management activities in areas directly adjacent to San Bruno elfin butterfly habitat outside the flight period of the butterfly, which is from February 1 through May 15.

Tidewater Goby

See also Mitigation Measure SS-4 regarding scooping of Rodeo Lagoon water for use in suppression actions.

SS-32 During information meetings with local fire agencies (see Mitigation Measure NR-1), and on the scene of active suppression actions, natural resource advisors will inform responding fire agencies

that Rodeo Lagoon shall not be used for water drafting unless needed to protect life and property and no other feasible water source is available.

California Red-Legged Frog

See also Mitigation Measure SS-4 regarding use of freshwater ponds as a water source for suppression actions and areas of the park sensitive to the use of ocean and bay waters for suppression actions.

SS-33 All suitable habitat within areas proposed for fire management activities will be surveyed and flagged by a qualified biologist to determine whether the site supports suitable breeding or nonbreeding areas for the California red-legged frog.

SS-34 To prevent direct injury to California red-legged frogs, removal of vegetation within suitable frog habitat will be accomplished by a progressive cutting of vegetation from the overstory level to ground level to allow frogs to move out of the treatment area.

SS-35 If likely habitat is identified at the project site, a qualified and permitted biologist will follow accepted protocol and collect and relocate any individual red-legged frogs to nearby suitable habitat, in accordance with the biological opinion from the USFWS.

Western Snowy Plover

SS-35 Where fire management actions involve operation of vehicles or heavy equipment on the beach, the fire management officer or the resource advisor (in the case of a wildfire) will ensure that vehicles will be driven at slow speeds (15 miles per hour maximum) over the wet sand portion of the beach and that natural wave-cast debris will be left on the beach to provide foraging habitat for the western snowy plover.

SS-37 To avoid disturbance of western snowy plovers, aircraft assisting the NPS in the implementation of FMP projects will avoid flying directly over and parallel to the beach to the greatest extent possible.

California Brown Pelican

SS-38 To avoid disturbance to the California brown pelican from late spring to early winter:

- Avoid operating aircraft below and within 500 feet of Rodeo Lagoon, Bird Island, and Bolinas Lagoon to the greatest extent possible.
- Avoid drafting water from Rodeo Lagoon, the ocean near Bird Island, or Bolinas Lagoon.

Monarch Butterfly

SS-39 All known clustering sites of monarch butterflies will be considered for protection from fire management actions.

Wildlife and Important Habitat Mitigation Measures

- WIL-1** Prescribed burns, mechanical treatments, and mowing of shrubs and grasses taller than 8 inches will not be conducted during the bird-nesting season, from March 1 through July 31, unless a qualified biologist conducts a pre-project survey for nesting birds and determines that birds are not nesting within the project area. To the greatest extent possible, these activities will be planned and conducted outside bird-nesting season. In intensively managed landscapes where mowing is justified for fuel reduction, vegetation will be maintained at a height of less than 8 inches throughout the nesting season (March 1 through July 31) to discourage the nesting of ground-dwelling bird species.
- WIL-2** In addition to WIL-1, in order to protect nesting raptors, trees shall not be removed between January 1 and March 1 unless qualified personnel conduct a pre-project survey for nesting birds and determine that birds are not nesting within the project area. If nesting raptors are detected, a qualified biologist will delineate a suitable buffer.
- WIL-3** Subject to project review conditions, fire management actions proposed for areas of the park that provide only limited habitat (such as areas dominated by broom or ivy species) may be conducted at any time
- WIL-4** Since older burn piles could provide wildlife habitat, the piles will be spread out (to move out animals) as much as possible before burning. If moving the piles is not feasible, the fire management project manager will ensure that piles are lit from one side only (with firefighters on the ignition side), so that any wildlife in the pile can run out.
- WIL-5** For prescribed fire projects proposed in the Muir Woods FMU, the fire management officer will arrange for a qualified biologist to conduct bat surveys of the tree hollows within the burn unit to identify potential maternity colonies. Measures will be implemented to protect active maternity roosts.

Cultural Resources Mitigation Measures

- CUL-1** Project Preparation Phase. To assure that cultural resources are considered early in the fire management planning process and afforded the utmost protection, the following preparatory actions will be undertaken:
- Computer and other databases containing cultural resources data will be maintained by cultural resource staff in coordination with the needs of fire management activities.
 - Appropriate cultural resources monitoring protocols will be established by cultural resources staff and applied to fire management practices as warranted.
 - Potential research opportunities to study the effects of fire management actions on cultural resources will be identified by cultural resources staff.
 - Cultural resources specialists from adjacent land management agencies will be consulted by NPS staff, as appropriate, in order to coordinate mitigation efforts prior to fire management actions.

*Amendment to the GGNRA Fire Management Plan for
Rancho Corral de Tierra*

- Indigenous archeological sites, spiritual sites, and important plant communities will be identified and appropriately managed for preservation, maintenance, and/or enhancement by park cultural resources staff. Consultation with local Native American communities will, where pertinent, continue to occur in the context of fire management actions.
- Fire management personnel and other staff will receive annual training in cultural resources in relation to fire management activities.

CUL-2

Project Planning Phase. All areas slated for fire management activities will be considered for pre-action field surveys, based on the recommendations of cultural resource specialists and the need to identify cultural resources in proposed project areas. This includes areas likely to be disturbed during future wildfire suppression activity, such as helispots, staging areas, and spike camps. Site-specific information gathering may include the following:

1. In cultural landscape areas, parameters for identifying vegetation for removal or retention will be incorporated into project planning.
2. Evaluation of the relative hazards of fuel loads in proposed project areas will address the protection of cultural resource values, including:
 - 2(a) Maintenance of light fuel loads on and in close proximity to cultural resources;
 - 2(b) Benefits gained from reduced fuel loads in relation to the need to avoid or minimize adverse effects on cultural resources;
 - 2(c) Opportunities to restore or enhance the historic character of cultural landscapes;
 - 2(d) In developing burn plans, assessment of the potential effects of heat intensity and duration above, at, and below the surface in relation to cultural resources; and
 - 2(e) For projects with the potential for accelerating the rates of erosion, potential effects of erosion on cultural resources.

CUL-3

Project Implementation. Adverse effects on known and unknown cultural resources will be avoided or minimized during the implementation of fire management projects. A variety of treatments and techniques, as detailed in the project planning and preparation phase for individual projects, will be used for the protection of cultural landscape features during implementation of both prescribed fire and mechanical treatment activities, as follows:

1. A cultural resource specialist or resource advisor will:
 - 1(a) Be present during fire management actions, as stipulated, where recorded and suspected but not-yet-recorded historic or prehistoric resources are considered at risk;
 - 1(b) Deliver a pre-project briefing to fire management staff as necessary; and
 - 1(c) Share data with fire management personnel as needed to avoid or minimize adverse effects.

*Amendment to the GGNRA Fire Management Plan for
Rancho Corral de Tierra*

2. Vegetation will be flagged, or otherwise identified, in order to properly carry out project planning stipulations for:
 - 2(a) Retention, based upon age determination or diameter thresholds as previously agreed upon;
 - 2(b) Raising the skirts on landmark trees and other tree pruning;
 - 2(c) Flush-cutting trees removed from cultural resource areas unless otherwise stipulated; and
 - 2(d) Brush removal within agreed-upon boundaries.
3. Fences may be a character-defining feature of historic properties. In such cases:
 - 3(a) Avoid fences with heavy equipment;
 - 3(b) Remove brush and scrub only by hand or with hand-tools in a 10-foot-wide buffer zone along fence lines;
 - 3(c) Provide vehicle access at gates where necessary; and
 - 3(d) Cut other openings, if necessary, between fence posts.
4. Field patterns may be a character-defining feature of historic properties. In such cases:
 - 4(a) Use prescribed burn to restore field patterns;
 - 4(b) Protect fences by not using heavy equipment within a 10-foot-wide buffer zone, and instead using less damaging methods to lessen fire danger, such as watering, hand removal, and hand tools; and
 - 4(c) Use hand removal of noncontributing vegetation near or in historic vegetation.
5. Structures and small-scale features may contribute, or be themselves, historic properties. In such cases:
 - 5(a) Remove brush approximately 30 feet from burnable structures, depending on slope, with hand tools being the default method; and
 - 5(b) If there are foundation plantings, create defensible space outside ornamental edge plantings wherever possible.
6. Some areas may be sensitive for archeological resources on or near the surface. In such cases:
 - 6(a) Do not drag cut vegetation;
 - 6(b) Do not use rakes;
 - 6(c) Use no burning when surface or subsurface resources are sensitive to heat; and

*Amendment to the GGNRA Fire Management Plan for
Rancho Corral de Tierra*

6(d) Avoid using surface scarification to retard runoff in archeological sites.

7. Erosion will be minimized to the extent possible, by methods such as:

7(a) Constructing control lines perpendicular to the slope;

7(b) Using the existing road network;

7(c) Keeping heavy equipment off paths and trails;

7(d) Keeping heavy equipment away from areas adjacent to ponds and riparian corridors;
and

7(e) Avoiding these and other areas marked by flagging.

CUL-4 Post-Project Phase. Adverse effects on known and suspected cultural resources will continue to be avoided or minimized through careful consideration of actions during the post-action phase of mechanical treatment, prescribed fire, and fire suppression activities.

1. The post-action condition of all recorded cultural resources will be assessed, as necessary.

1(a) Post-action surveys may be conducted both in previously surveyed areas and in unsurveyed areas.

1(b) Previously unrecorded cultural resources will be assessed for condition, and stabilization and other protection needs.

2. Stabilization and other treatment needs of cultural resources will be addressed in the development and implementation of Emergency Stabilization Plans and Burned Area Restoration Plans, and in the development of funding requests for these and other post-fire programs as needed.

3. Monitoring and research data will be compiled, evaluated, and used to help refine cultural resource compliance for future fire management actions and objectives.

Visitor Use and Visitor Experience Mitigation Measures

VUE-1 Project work hours will normally be limited to normal work hours (8 A.M. to 5 P.M.) to minimize potential noise impacts on nearby residents and park visitors. Exceptions may occur outside of normal work hours where warranted, for example to take advantage of windows of favorable weather or to allow for project completion before wildlife breeding period restrictions begin.

VUE-2 Where noise levels from project operations could be intrusive to adjacent residents or park trail users, all efforts will be made during project planning to site project staging areas in order to optimize the noise level reduction gained from natural barriers and screening vegetation. Staging areas will be sited to minimize noise levels for sensitive receptors to the extent feasible without causing adverse environmental effects on park resources, values, or public access.

VUE-3 Park fire staff will avoid temporary closures of areas of the park during fuel reduction projects if spotters can be available to escort the public safely through the work area.

*Amendment to the GGNRA Fire Management Plan for
Rancho Corral de Tierra*

- VUE-4** To the extent feasible while protecting public health and safety, fire management officer will instruct contractors or NPS crews to secure work sites at the end of the work day so that closures around a project site can be lifted prior to and after working hours during weekdays and all day on weekends.
- VUE-5** The fire management office will develop and implement an education and communication plan for all site-specific fire management implementation projects. For large scale fuel reduction projects (more than 1 acre) that could affect mid- to close-range viewsheds for residents on the park boundary, park staff will arrange a meeting with the community to present the scope of work and provide an opportunity for public comment. Communication plans for projects may include information such as the project scope, schedule, and alternative trail routes, where needed, to be posted in the project vicinity.

Public Health and Safety Mitigation Measures

- PHS-1** Site plans for tree removal projects will be reviewed by the project review committee for potential safety hazards from windthrow and wind pattern change as a result of implementation.