

TABLE OF CONTENTS

INTRODUCTION	1
1. FOUNDATION OF THE FMP	5
1.2 RELATIONSHIP TO FEDERAL FIRE MANAGEMENT POLICY	5
1.2.1 Federal Wildland Fire Management Policy (2001)	5
1.2.2 National Park Service Management Policies (2006)	6
1.2.3 Director's Order #18, Wildland Fire Management (2005).....	7
1.3 RELATIONSHIP OF FMP TO GGNRA PLANNING	8
1.3.1 GGNRA General Management Plan and General Management Plan Update.....	8
1.3.2 GGNRA Natural Resource Management Plan	9
1.3.3 GGNRA Cultural Resource Management Plan	9
1.4 RELATIONSHIP OF FMP TO LOCAL FIRE MANAGEMENT PLANNING.....	9
1.4.1 Marin County Fire Department.....	9
1.4.1.1 Marin County Fire Management Plan.....	9
1.4.1.2 Marin County Community Wildland Fire Protection Plan (CWPP)	10
1.4.2 Vegetation Management Plan, Presidio of San Francisco	12
1.4.3 Mt. Tamalpais Area Vegetation Management Plan.....	12
1.4.4 Point Reyes National Seashore Fire Management Plan.....	13
1.4.5 Cal Fire California Fire Plan	13
1.4.5.1 Cal Fire, San Mateo/Santa Cruz Unit	14
1.4.6 San Francisco Co., Recreation & Park Dept., Parks & Significant Natural Areas Program	14
1.4.7 San Francisco Peninsula Watershed Management Plan	15
1.4.8 San Mateo County Parks and Recreation Department Documents	16
1.4.8.1 Decision-Making Guidelines for Vegetation Management.....	16
1.4.8.2 Huddart and Wunderlich County Parks Draft Master Plan	16
2. FIRE MANAGEMENT STRATEGIES	19
2.1 FIRE MANAGEMENT GOALS.....	19
2.2 GENERAL MANAGEMENT CONSIDERATIONS.....	23
2.2.1 Legal Considerations.....	23
2.2.1.1 Enabling Legislation	23
2.2.1.2 Endangered Species Act.....	23
2.2.1.3 Clean Air Act	24
2.2.1.4 National Historic Preservation Act.....	24
The National Historic Preservation Act	24
2.2.2 Jurisdictional Considerations.....	25
2.2.2.1 Direct Protection Areas (DPA).....	25
2.2.3 Technical or Logistic Considerations.....	25
2.2.3.1 Limited Season for Effective Use of Prescribed Burning.....	25
2.2.3.2 Risk-related Considerations	25
2.2.3.3 Park Resources or Values Considerations.....	25
2.2.3.4 Staffing Considerations	26
2.3 WILDLAND FIRE MANAGEMENT OPTIONS	27

2.4 ENVIRONMENTAL FACTORS INFLUENCING FIRE MANAGEMENT	28
2.4.1 Fire Regime and Fire History	28
2.4.1.1 San Francisco Bay Area Fire Regime	28
2.4.1.2 San Francisco Bay Area Fire Regime Research.....	31
2.4.1.3 Recent Fire History in Marin and San Mateo Counties	32
2.4.2 Climatic and Topographic Influences	33
2.4.2.1 Relative Humidity	33
2.4.2.2 Wind Patterns.....	36
2.4.2.3 Recurrent Drought.....	37
2.4.3 Fire Weather.....	40
2.4.4 Prescribed Fire Windows	41
2.5 GGNRA WILDLAND FIRE RISK/HAZARD VALUE ANALYSIS MODEL	41
2.5.1 Objectives.....	41
2.5.2 Analysis Area	41
2.5.3 Methodology.....	41
2.5.3.1 Input Variables	42
2.5.3.2 Analysis using Asset Analyzer	45
2.5.3.3 Model Results and Discussion	46
2.6 MARIN COUNTY FIRE DEPT HAZARD MODEL.....	51
2.7 CAL FIRE RISK ASSESSMENT FOR SAN MATEO COUNTY	53
2.8 STRATEGIC APPROACH OF THE FMP	53
2.8.1 GGNRA Fire Management Units (FMU).....	55
2.8.2 Descriptions and Strategies of the FMUs.....	56
2.8.2.1 Wildland Urban Interface FMU	56
2.8.2.2 Park Interior FMU	56
2.8.2.3 Muir Woods FMU	59
2.9. GGNRA PROJECT AREAS	61
2.9.1. Marin County Project Areas	62
2.9.1.1 Alta Project Area	62
2.9.1.2 Fort Baker Project Area	62
2.9.1.3 Homestead Valley Project Area.....	65
2.9.1.4 Marin Headlands Project Area.....	65
2.9.1.5 Muir Beach/Green Gulch Project Area	66
2.9.1.6 Muir Woods Project Area	66
2.9.1.7 Oakwood Valley Project Area.....	67
2.9.1.8 Stinson Beach Project Area	67
2.9.1.9 Tamalpais Valley Project Area	67
2.9.1.10 Tennessee Valley Project Area	68
2.9.1.11 Wolfback Ridge/Sausalito Project Area.....	68
2.9.2 San Francisco County	68
2.9.2.1 San Francisco Project Area.....	68
2.9.3 San Mateo County.....	69
2.9.3.1 Milagra Ridge Project Area	69
2.9.3.2 Mori Point	69
2.9.3.3 Phleger Estate Project Area	69
2.9.3.4 Pedro Point Project Area.....	70
2.9.3.5 Sweeney Ridge/Cattle Hill Project Area	70
3. FIRE MANAGEMENT PROGRAM COMPONENTS	73

3.1	DESIGNATION OF WILDLAND FIRE PROTECTION RESPONSIBILITY	73
3.2	GENERAL IMPLEMENTATION PROCEDURES FOR SUPPRESSION ACTIONS	74
3.3	AGREEMENTS GOVERNING SUPPRESSION ACTIONS	75
3.4	MINIMUM IMPACT SUPPRESSION TACTICS	76
3.5	PREPAREDNESS ACTIONS.....	76
3.5.1	Fire Prevention	77
3.5.1.1	Training and Fire Readiness	77
3.5.1.2	Fire Weather and Fire Danger.....	79
3.5.1.3	Range Of Potential Fire Behavior.....	80
3.5.1.4	Weather Stations.....	81
3.3.1.5	National Fire Danger Rating System (NFDRS)	82
3.5.2	Step-Up Plan	84
3.5.3	Detection	84
3.6	INITIAL ATTACK.....	85
3.6.1	Initial Attack Priorities and Closest Resources.....	86
3.6.2	Appropriate Management Response.....	86
3.6.3	Response Time Frames	86
3.6.4	Restrictions and Special Concerns	87
3.6.5	Extended Attack and Large Fire Suppression.....	90
3.6.5.1	The Wildland Fire Situation Analysis (WFSA) Development	92
3.6.5.2	Complexity Decision Process for Incident Management Transition.....	92
3.6.5.3	Delegation of Authority for IC	92
3.6.6	Rehabilitation Guidelines and Procedures	92
3.6.7	Records and Reports	94
3.7	PRESCRIBED FIRE	95
3.7.1	Annual Planning, Review and Documentation for Prescribed Burning	96
3.7.1.1	Prioritizing and Review the Annual Implementation Plan	96
3.7.1.2	Review of Projects for NEPA Conformance	98
3.7.1.3	Developing Burn Plans	98
3.7.1.4	Long-Term Strategy	100
3.7.1.5	Personnel	100
3.7.1.6	Fire Behavior and Fire Effects Monitoring	100
3.7.1.7	Reporting and Documentation.....	100
3.7.1.8	Prescribed Burn Plan Elements.....	101
3.7.2	Exceeding Existing Prescribed Burn Plan	102
3.7.3	Air Quality and Smoke Management.....	103
3.7.3.1	Regulatory Compliance and the Approval Process	103
3.7.3.2	Regional Air Quality Considerations for Prescribed Burning	104
3.8	NON-FIRE TREATMENT APPLICATIONS	106
3.8.1	Annual Review	109
3.8.2	Equipment and Seasonal Use Restrictions	110
3.8.3	Effects Monitoring.....	110
3.8.4	Reporting and Documentation.....	110
3.8.5	Annual Planned Projects	110
3.9	FIRE COMMUNICATION AND EDUCATION.....	110
3.10	FIRE ECOLOGY AND FIRE EFFECTS MONITORING PROGRAMS	112

3.10.1 Programmatic and Policy Direction	112
3.10.2 Current Program.....	112
3.10.3 Monitoring Levels	112
3.10.4 Data Management and Analysis	113
3.10.5 Wildland and Prescribed Fire Monitoring and Research Plan.....	113
3.11 FIRE RESEARCH.....	113
4. ROLES, FUNDING AND REVIEW.....	115
4.1 NPS ORGANIZATIONAL STRUCTURE, ROLES, AND RESPONSIBILITIES	115
4.1.1 GGNRA Positions.....	115
4.1.1.1 Park Superintendent.....	115
4.1.1.2 Chief Ranger	115
4.1.1.3 Bay Area Network Fire Management Officer.....	115
4.1.1.4 Fire GIS	116
4.1.1.5 Senior Engine Captain	116
4.1.1.6 Assistant Engine Captain	117
4.1.2 Shared / Consulting Network Positions.....	117
4.1.2.1 Fire Program Planner	117
4.1.2.2 Fuels/Prescribed Fire Specialist.....	117
4.1.2.3 Fire Communication and Education Specialist.....	118
4.1.2.4 Fire Ecologist.....	118
4.1.3 Shared Regional Positions.....	119
4.1.3.1 Lead Fire Effects Monitor	119
4.1.3.2 Fire Effects Crew Members (biological science technicians)	119
4.2 FUNDING	121
4.3 INTERAGENCY COOPERATION AND CONTACTS.....	121
4.4 INTERAGENCY AGREEMENTS.....	122
4.5 RECORDS AND REPORTS	123
4.6 ANNUAL REVIEW OF THE FIVE YEAR FUELS TREATMENT PLAN AND FMP	123

LIST OF FIGURES

Figure 1 – GGNRA Lands	3
Figure 2 – Marin County CWPP Map	11
Figure 3 --Historic Fires in Marin County	34
Figure 4 -- Historic Fires, San Francisco & San Mateo Counties	35
Figure 5 – Predominant Wind Patterns in Central California	36
Figure 6 – California's Historic Dry Periods (1850 – Present)	38
Figure 7 – Value Model Input Variables: WUI & Fire Density	47
Figure 8 -- Value Model Input Variables: Intensity & Crown Fire Potential	48
Figure 9 -- Risk Value Model Results: Equal Weight & Crown Behavior Emphasis.	49
Figure 10 -- Risk Value Model Results: Crown Fire & Ignition Risk Emphasis.	50

Figure 11 – Marin County Fire Department’s Fuel Ranking Map	51
Figure 12 – Marin County Fire Department’s, Areas Resistant to Wildfire Control.....	52
Figure 13 – Fire Management Units, Marin County.....	57
Figure 14 – Fire Management Units, San Francisco & San Mateo Counties	58
Figure 15 – FMP Project Areas, Marin County	64
Figure 16 – FMP Project Areas, San Francisco & San Mateo Counties.....	71
Figure 17 – Monthly Burning Index Levels (1981- 2000).....	78
Figure 18 – RAWS Weather Stations, San Mateo County	83
Figure 19 – Burning Index Levels during Past Wildfires	85
Figure 20 – GGNRA Fire Management Branch Organizational Chart.....	120

LIST OF TABLES

Table 1 – CWPP Fuelbreak Sections on GGNRA Lands	12
Table 2 -- San Francisco Bay Area Climatic Changes	28
Table 3 -- Wildfire History of Coastal Marin and San Mateo Counties.....	32
Table 4 – GGNRA Recent Wildfire History.....	33
Table 5 -- GGNRA Vegetation Types and Fuel Model Types.....	43
Table 6 – Annual Maximum Achievement.....	53
Table 7 -- Distribution of FMU Acreage by County	55
Table 8 – Acres of Vegetation Type by Project Area.....	63
Table 9 -- Acres of Vegetation by Project Area	64
Table 10 – Vicinity RAWS Stations	82
Table 11 – Red Flag Warning Matrix.....	84
Table 12 – Contacts	121
Table 13 – Interagency Agreements	122
Table 14 – Records and Reports	123

APPENDICES

APPENDIX A. REFERENCES AND CONTRIBUTORS	A-1
APPENDIX B. SPECIES OF CONCERN	B-1
APPENDIX C. GGNRA FMP RECORD OF DECISION	C-1
APPENDIX D. FMP MITIGATION MEASURES	D-1
APPENDIX E. SUPPLEMENTAL INFORMATION	
1. GGNRA Run Card	E-1
2. Daily Resource Availability/Officer Duty Call Sheet	E-3
3. Weather Information Management System Walk-through	E-5
4. GGNRA Dispatch Protocol for Wildland Fire.....	E-7
5. NFDRS Indices and Park Visitor Fire Restrictions	E-11
6. Fire Step-up Plan (SOP 37)	E-13
7. Bay Area Network Parks Burn Index Graph.....	E-19
8. Delegation from Superintendent GGNRA to Network FMO	E-21
9. Marin Emergency Radio Authority (MERA) Radio Talk Group Matrix...E-23	
10. MIST Guidelines	E-25
11. Wildland Fire Situation Analysis.....	E-39
12. Incident Complexity Analysis: Types 5, 4 and Transition to Type 3 Incident.....	E-53
13. Redbook Complexity Analysis – Types 1 and 2.....	E-55
14. Minimum Tool Flow Chart.....	E-59
15. Example of Delegation of Authority Form	E-75
16. Briefing Checklist Template	E-77
17. Briefing to the Incident Management Team Template	E-79
18. Prescribed Fire Plan Template	E-87
19. BAAQMD Application for Pile Burning	E-107
20. FMU Maps of Past and Proposed Fire Management Projects	E-109
21. Ignition Index and Fuel Hazard Rating.....	E-111
22. GGNRA FMU Vegetation Maps	E-115
APPENDIX F. WILDLAND AND PRESCRIBED FIRE MONITORING AND RESEARCH PLAN (<i>in preparation</i>)	
APPENDIX G. FIRE COMMUNICATION AND EDUCATION PLAN (<i>in preparation</i>)	