

**PU'UKOHOLA HEIAU NHS
FIRE MANAGEMENT PLAN**

September 2006

Prepared by: _____ Date _____

Recommended: _____ Date _____

Approved: _____ Date _____

PU'UKOHOLA HEIAU NHS FIRE MANAGEMENT PLAN

EXECUTIVE SUMMARY

The 1996 Federal Wildland Fire Management Policy and Program Review initiated the need for all federally owned lands with vegetation capable of supporting a fire to have an overall strategic Fire Management Plan (FMP). This plan will serve as (1) programmatic direction for all fire management activities, and (2) the basis for future funding.

FMP for each NPS unit will follow federal and NPS Policy, but equally important, it will reflect specific characteristics, legislative obligations, as well as environmental and social considerations of the area. All aspects of the Fire Management Program for Pu'ukohola Heiau National Historic Site, from fire prevention to the use of fire as a management tool, are outlined in this document. Strategies and activities suggested in this document are intended to help achieve desired future conditions, goals & objectives of the Pu'ukohola Heiau Resource Management Plan.

The primary management response for wildland fire is suppression. Pu'ukohola Heiau intends to utilize the Appropriate Management Response (AMR) concept explained in **Section III: B-1, B-1(a)** and **Figures 1 & 2**, which calls for prudent selection of tactics to achieve a suppression response with no or minimal resource damage from the suppression actions.

A major activity in this FMP calls for the use of prescribed fire to reduce hazard fuels accumulations, essentially an annual or bi-annual pile burn. The plan also sets the stage for future native plant species restoration and maintenance. This involves a low intensity prescribed burn in existing areas of native species to stimulate seed production and/or rejuvenation of plant population, or as a means to lessen existing alien plant competition. Implementation of this project will require further NEPA compliance.

Development of this FMP involved a dynamic and interdisciplinary process, including a supporting Categorical Exclusion. The FMP will be reviewed annually and updated as conditions or national policy changes.

Table of Contents

I. INTRODUCTION	5
APPROPRIATE MANAGEMENT RESPONSE (AMR)	5
WILDLAND FIRE SITUATION ANALYSIS (WFSA)	6
I: A. REASONS FOR FIRE MANAGEMENT PLAN (FMP)	7
I: B. RELATIONSHIP WITH NEPA AND NHPA.....	7
I: C. AUTHORITIES FOR IMPLEMENTING THE FMP.....	7
II. NPS POLICY AND RELATION TO OTHER PLANS	9
III. SCOPE OF WILDLAND FIRE MANAGEMENT PROGRAM	11
IV. WILDLAND FIRE MANAGEMENT.....	22
V: FUELS MANAGEMENT.....	37
VI. FIRE MANAGEMENT ORGANIZATION AND RESPONSIBILITIES.....	45
VII: FIRE RESEARCH.....	49
VIII: MONITORING AND EVALUATION	50
IX: PUBLIC SAFETY	52
X: PUBLIC INFORMATION AND EDUCATION	53
XI. PROTECTION OF SENSITIVE RESOURCES	54
XII. FIRE CRITIQUES AND FMP REVIEW.....	55
XIII. CONSULTATION AND COORDINATION.....	55
XIV. APPENDICES	56
REFERENCES	56
GLOSSARY.....	57
EXHIBIT 1 WILDLAND FIRE MANAGEMENT POLICY	59
EXHIBIT 2 WILDLAND FIRE IMPLEMENTATION PLAN (WFIP)	60
EXHIBIT 3 WILDLAND FIRE SITUATION ANALYSIS (WFSA)	61
EXHIBIT 4 PU'UKOHOLA HEIAU NHS VICINITY MAP.....	66
EXHIBIT 5 COOPERATIVE AGREEMENT (NPS-HCFD)	67

EXHIBIT 6 DELEGATION OF AUTHORITY LETTER (SAMPLE)68

EXHIBIT 7 MIST GUIDELINES70

EXHIBIT 8 NPS PRESCRIBED BURN PLAN (FORMAT & INSTRUCTIONS).....74

EXHIBIT 9 PUHE FIRE MANAGEMENT ORGANIZATIONAL CHART.....83

EXHIBIT 10 FIRE MANAGEMENT PROGRAM FUNDING.....84

EXHIBIT 11 INTERAGENCY CONTACT LIST.....85

EXHIBIT 12 ANNUAL FIRE PROGRAM CRITIQUE FORM87

EXHIBIT 13 FIRE MANAGEMENT PLAN COMPLIANCE.....87

EXHIBIT 14 PUHE EMERGENCY NOTIFICATION LIST.....98

EXHIBIT 15 PRE-ATTACK PLANNING CHECKLIST99

I. INTRODUCTION

Current Federal Wildland Fire Management Policy presents some significant departures from previous fire management policies and procedures. A flowchart (**Exhibit 1**) was developed by the National Wildfire Coordinating Group (NWCG) to assist with explanation of these concepts. It along with the following paraphrased statements from the Wildland and Prescribed Fire Implementation Guide summarize these concepts and provide clarification of the current Wildland Fire Management Policy.

According to current policy, all fires are either wildland or prescribed fires. A Fire Management Program for an administrative unit can follow one of three pathways as outlined by the flowchart. It depends upon the level of resources management planning completed, resource values affected, and fire cause.

Administrative units without an approved FMP have limited management options --- primarily initial attack suppression strategies (first line of the flowchart) and prescribed fire (third line).

Administrative units with an approved FMP can also manage fire according to the second line of the flowchart. This provides more management options for wildland fires, particularly implementation of wildland fire to accomplish resource objectives. Therefore, with an approved FMP, the full range of management options, described by this flowchart, are available with a wildland ignition.

Prescribed fire, as shown by the bottom line of the flowchart, differs very little from how it has been managed under previous interagency policy. This fire management strategy is further described in Section V of this FMP and is implemented using a site-specific burn plan and prescription parameters.

The current Wildland and Prescribed Fire Management Policy that evolved following the Federal Wildland Fire Management Policy Review of 1995, emphasized some new concepts and terminology. These concepts and terms are not in conflict with the NPS or park's Resource Management Plan. They may cause confusion or misunderstanding as they are new in regards to the traditional thinking associated with Fire Management practices of the past 50-80 years. As information, the major concepts and terms of the current federal wildland fire management policy are:

Appropriate Management Response (AMR)

According to past wildland fire policy, fires were suppressed regardless of burning conditions, fuels or land management objectives. This policy was not always cost-effective or responsive to land or resource objectives management objectives, and often left long-term

detrimental landscape or resource impacts from the suppression activities.

Appropriate Management Response (AMR), which appears on the second line, is a new concept that evolved with the current Wildland Fire Management Policy. AMR is defined as "specific action taken in response to a wildland fire to implement protection and fire use objectives." **This term is a new term that does not replace any previously used term.** The AMR for different areas throughout an administrative unit could vary. It could range from immediate suppression to a suppression tactic of surveillance and monitoring.

The AMR(s) for an administrative unit is developed by analyzing each situation, i.e. risk to public and firefighter safety, fire behavior, values-to-be-protected, land management objectives, anticipated fire effects, potential losses, and external concerns.

In some units the approved FMP also includes pre-identified parameters for the management of naturally ignited wildland fire to achieve resource benefits. This AMR is a "high risk" management activity, and either involves large size areas or prior fuel management activities before being implemented.

Wildland Fire Use (WFU) - not intended to be used at Pu'ukohola Heiau

Wildland Fire Use "is the management of naturally ignited wildland fires to accomplish specific pre-stated resource management objectives in predefined geographic areas outlined in the FMP." The operational management considerations are described in a working document titled Wildland Fire Implementation Plan (WFIP).

Wildland fire use is not to be confused with "fire use", which is a broader term. "Fire use" refers to situations where the application of fire is used to meet resource objectives. The fire can either be a wildland fire ignition or a prescribed fire, i.e. a fire ignited by fire managers (management actions) to meet specific management or resource objectives. A written, approved prescribed fire plan must exist before ignition, and must be followed throughout the prescribed fire project.

Wildland Fire Situation Analysis (WFSA)

When a wildland fire is not suppressed with initial attack efforts and it is evident it will not be contained before the next burning period, a Wildland Fire Situation Analysis (WFSA) is necessary. The WFSA is "a decision-making process that evaluates alternative management strategies against selected safety, environmental, social, economic, political, and resource management objectives" (**Exhibit 3**).

I: A. Reasons For Fire Management Plan (FMP)

Every NPS area with burnable vegetation will have a Fire Management Plan approved by the Superintendent. Each NPS unit will have a fire management program that reflects the broad NPS Policy, but equally important, one that reflects the specific characteristics, legislative obligations, as well as environmental and social considerations of the area. This document meets that NPS Director's Order (DO-18). It also addresses activities related to both wildland fire managed as a suppression response, and prescribed fire as intended to be used by this NPS site as a management tool.

I: B. Relationship With NEPA and NHPA

This FMP meets National Environmental Policy Act (**NEPA**) procedures. This FMP planning process includes Categorical Exclusion for small parks with a full suppression program and minimal mechanical fuels reduction and prescribed fire programs.

This FMP also meets National Historical Preservation Act (NHPA) requirements. NHPA concerns and requirements related to fire effects were addressed through consultation with state SHPO. Prescribed fire is intended to be used as a management tool in the reduction of hazardous fuels and with further project compliance; restoration of the historic scene at this National Historical Site. It is outlined in this FMP.

This FMP document is compliant with the National Environmental Policy Act (NEPA), and can serve as a NEPA overview for the various Fire Management Program activities. Some strategies listed in this FMP can be and should be implemented as routine fire management program activities. Some activities, however, such as prescribed fire use, may need additional on-site specific evaluation before implementation of the activity. An appropriate environmental document (Addendum, Categorical Exclusion, EA, or Environmental Impact Statement) may be necessary for some projects.

I: C. Authorities For Implementing The FMP

Strategies and activities outlined in this FMP utilize a variety of Federal and UDSI Departmental authorities derived from a various legislative acts and laws:

- The Organic Act of August 25, 1916, Section 102, established the National Park Service (NPS) and defined the purpose of the agency as "to conserve the scenery and the natural and historic objects and the wildlife therein and to provide for the enjoyment of the same in such manner and by such means as will leave them unimpaired for the enjoyment of future generations."

The authority for FIREPRO funding (Normal Fire Year Programming) and all emergency fire accounts is found in the following authorities:

- Section 102 of the General Provisions of the Department of Interior's annual Appropriations Bill provides the authority under which appropriated monies can be expended or transferred to fund expenditures arising from the emergency prevention and suppression of wildland fire.
- Public Law 101-121, Department of the Interior and Related Agencies Appropriation Act of 1990 - established the funding mechanism for normal year expenditures of funds for fire management purposes.
- 31 USC 665 (E) (1) (B) - provides the authority to exceed appropriations due to wildland fire management activities involving the safety of human life and protection of property.

Authorities for procurement and administrative activities necessary to support wildland fire suppression missions are contained in the Interagency Incident Business Management Handbook.

Authority for interagency agreements is found in "Interagency Agreement between the Bureau of Land Management, Bureau of Indian Affairs, National Park Service, U.S. Fish and Wildlife Service of the United States Department of the Interior and the Forest Service of the United States Department of Agriculture" (1982).

Authorities to enter into agreements with state, county, and municipal governments; and with private companies, groups, corporations, and individuals are cited in NPS-20 (Federal Assistance and Interagency Agreements).

Authority for rendering emergency fire or rescue assistance outside the National Park System is covered by the Act of August 8, 1953 (16 USC 1b(1) and the Departmental Manual (910 DM).

II. NPS POLICY AND RELATION TO OTHER PLANS

II: A. NPS Fire Management Policy

National Park Service Fire Policy recognizes that the occurrence of fire is an integral factor of some ecosystems. It further states that fire will be managed in order to fulfill the need of protecting, perpetuating, or recreating natural environments or historic scenes. Relevant statements from NPS Management Policies for this National Historic Site:

- Fire management programs will be designed to meet resource management objectives prescribed for the area and to ensure firefighter and public safety are not compromised.
- Each NPS site with vegetation capable of burning will prepare a fire management plan to guide a fire management program that is responsive to the site's natural and cultural resource objectives and to safety considerations for NPS site visitors, employees and developed facilities.
- Methods used to suppress wildland fires should minimize impacts of the suppression action and the fire, commensurate with effective control and resource values to be protected.
- Superintendents will pursue mutual assistance agreements with nearby fire management units of Federal, state, and local agencies.
- All prescribed fire projects will have a burn plan approved by the superintendent and will have NEPA/SHPO compliance completed prior to initiation of the project.

II: B. Pu'ukohola Heiau NHS Establishment & Purpose

Pu'ukohola Heiau National Historic Site was authorized by Congress in August 1972 (86 Stat. 562) "to restore and preserve in the public ownership the historically significant temple associated with Kamehameha the Great, ... and the property of John Young ..."

Park legislation directs that the 77 acres set aside as Pu'ukohola Heiau National Historic Site is to be managed in order to protect three major historic sites:

- Pu'ukohola Heiau
- Mailekini Heiau
- John Young's House Site

II: C. General Management Plan Objectives

In 1991, an Operations Evaluation Team concluded that "The Statement for Management" would suffice as the primary objective for overall management of this NPS site. That management statement is to "restore the landscape to more nearly resemble the period of construction of Pu'ukohola Heiau and the residency of John Young."

Additional objectives pertinent to all NPS units and the overall management of this site are:

- To protect human life.
- To protect all cultural resources present at this historic site.
- To protect other federal and private physical facilities (i.e. visitor center, adjoining facility structures).

II: D. The Statement for Management - FMP Relationship

The FMP is a detailed Action Plan of strategies and actions intended to provide programmatic direction for the effective management of wildland and prescribed fire on the Pu'ukohola Heiau National Historic Site. It is in accordance with the Federal Wildland Fire Management Policy and Program Review (USDI/USDA 1995).

It will serve as the implementation document to help achieve historic vegetational landscape resource management objectives, and fire protection goals defined in the **Statement for Management** and/or other approved management plans for this site. It also recognizes that the use of prescribed fire appears to be beneficial for the increase and establishment of native plants (particularly Pili grass).

It builds on the decisions made through earlier planning efforts and provides a program of actions with specific guidance and procedures. The plan defines a level of protection necessary to ensure safety, protection of facilities and resources; procedures to minimize undesirable environmental impacts.

The FMP is also designed to promote agency standardization, represent continued interagency cooperation, and serve as a reference and guidance for personnel, consistent with the Federal Wildland Fire Management Policy and Program Review.

Development and maintenance of this FMP involves a dynamic and interdisciplinary process which considered existing and future land use, cultural and natural resource values, and earlier fire-use planning efforts and public concerns. However, the FMP should be updated when changing conditions on this historic site significantly

influence the implementation of fire management strategies presented in this plan or when the GMP is changed.

III. SCOPE OF WILDLAND FIRE MANAGEMENT PROGRAM

Pu'ukohola Heiau National Historic Site has been placed within Fire Management Category #II. This management category within NPS Fire Management Policy automatically indicates immediate suppression of all wildland fires using minimum impact tactics.

III: A. Pu'ukohola Heiau NHS Fire Management Goals

- Firefighter safety is the highest priority of every fire management activity.
- Suppress all wildland fires regardless of ignition source to protect the public, private property, natural, cultural and historic resources of the unit.
- Utilize suppression methods/tactics least damaging to resources and the environment.
- Minimal use of prescribed fire focusing on hazard fuel reduction within the unit. Use of prescribed fire for resource benefits will require additional NEPA/SHPO compliance prior to project implementation.
- Maintain the highest standards of professional and technical expertise in planning and safely implementing an effective wildland fire management program.
- Fire personnel will be equipped with personal protective equipment appropriate to incident assignment.
- All NPS employees assigned to wildland fire incidents, or used with prescribed fire, will meet training and qualification standards for that position, set by the National Wildfire Coordinating Group (NWCG 310-1).
- Mutual aid cooperators, responding to NPS fires under Memoranda of Agreement, will meet their respective personal protective equipment and qualifications during initial action operations. However, during project fire or extended operations, cooperators will meet NWCG qualification standards.
- Educate employees and the public about the scope and effect of wildland fire management, including fuels management and resource protection.

- Integrate fire management with all other aspects of park management.

III: B. Wildland Fire Management Elements to be Applied

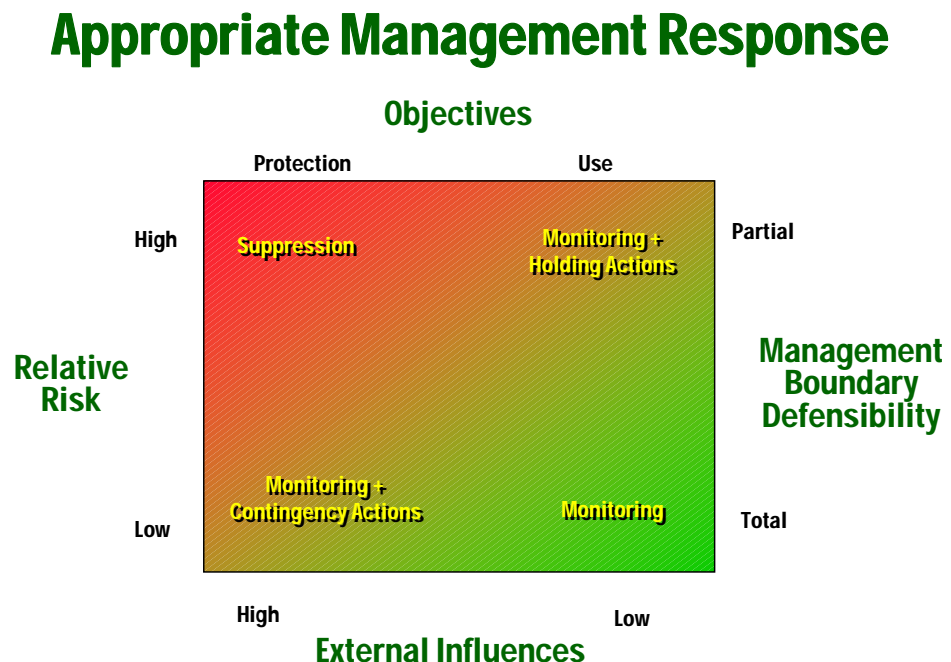
All Fire Management Program Elements, i.e. prevention, preparedness, appropriate management response, mobilization, minimal use of prescribed fire (focusing on hazard fuel reduction), and mechanical hazardous fuel reduction will be utilized to achieve goals outlined in the resource management and fire management program plan(s).

Specific strategies relating to these fire management program elements are displayed in the following sections of this FMP. The extent that each element is implemented or range of management options that are utilized, is dependent upon the need and case by case situation that exist at this NPS unit and throughout all Hawaii NPS units.

III: B-1. Wildland Fire

All wildland fires will be managed as a control response. They are expected to be managed with consideration for management/resource objectives, relative risk (immediate and external influences), complexity and defensibility of management boundaries. Determination of the appropriate management response(s) and strategies/tactics will follow the logic displayed in **Figure 1**, as provided by the Federal Wildland and Prescribed Fire Policy Guide. Due to the size of the park and the potential of the fuels to burn quickly all wildland fires have a "high" relative risk and a "protection" objective leading to every wildland fire to have a full suppression response.

Figure 1



The overall responsibility for the Fire Management Program is the Superintendent. This responsibility is usually delegated to the Chief Ranger. This individual is responsible for implementation of the policies, strategies, and activities outlined in this FMP.

III: B-1(a). Wildland Fire Suppression

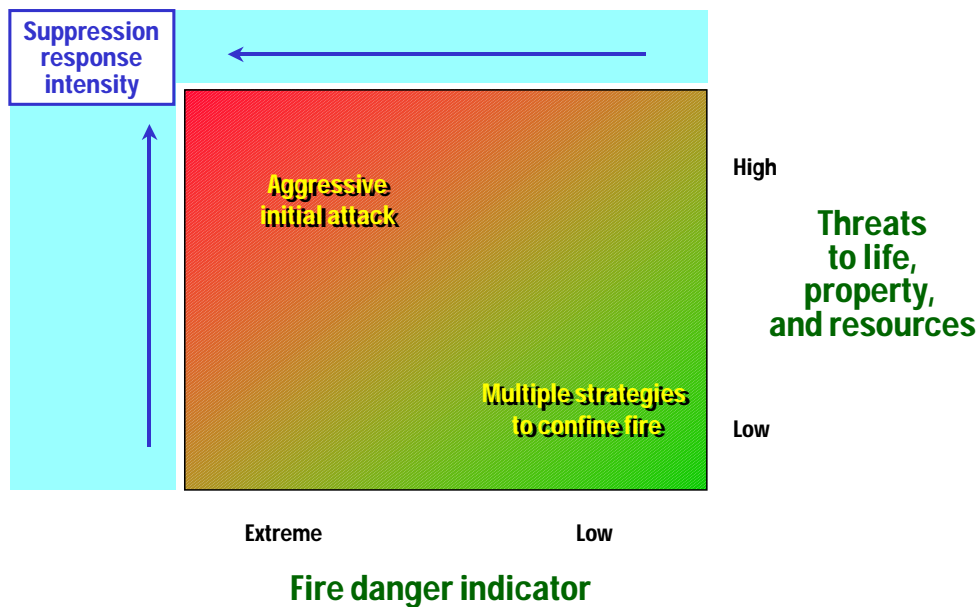
Suppression management response will be initiated on all wildland fires that occurred within or enter the Pu'ukohola Heiau NHS. However, suppression actions will follow the direction provided by the Federal Wildland Fire Management Policy, i.e. "fires are suppressed at minimum cost, considering firefighter and public safety, benefits, and values to be protected, consistent with resource objectives."

This direction calls for **prudent selection of tactics** to achieve a suppression response with minimal cultural and natural resource damage caused from the suppression actions.

A suppression management response could vary from fire to fire and sometimes even along the perimeter of a fire. The level of suppression response intensity will always be a 'control' strategy. The display in **Figure 2** should be used to help determine the appropriate suppression response intensity. Fire danger is determined from the National Fire Danger Rating System (NFDR), which is determined daily from the fire weather forecast. An NFDRS remote weather station has been installed on the Kona coast and will provide NFDRS indices in the near future. An accurate impression of existing fire danger can be determined based on weather data available from that station posted hourly.

Figure 2

Appropriate Management Response



III: B-1(b). Wildland Fire Use

Wildland Fire Use (WFU) is explained in the Introduction Section (**Section I**). Due to the size of this NHS, extreme flammability that can occur with the existing wildland fuels and historical data that indicates this geographic area does not appear to have naturally ignited occurrences, **this fire management response is not considered appropriate for this unit**. All wildland fires will be suppressed using an appropriate management response action, displayed in **Figure 2**.

III: B-2. Wildland Fuel Management

Major goal of the fuel management strategy is to achieve and maintain a fuel level that facilitates protection of life, property, natural and cultural resources, and helps establish a healthy ecosystem.

Management of wildland fuels is critical in terms of fire behavior and possible resource damage that could result from a wildland incident, and in achieving a particular species composition for ecosystem management or restoring the historic scene. The importance of intentionally managing the wildland fuels in order for a successful fire management program for this NHS is reiterated in DO - 18:

- NPS units will identify, manage, and reduce where appropriate, accumulations of hazardous fuels.

- NPS units will reduce, to the extent possible, hazardous fuels in wildland/urban interface. (This can be further interpolated to include NPS facilities, or developed sites within the NPS unit, or adjacent to the unit, i.e. Samuel Spencer Beach Park.)
- Prescribed fire and non-fire techniques are appropriate tools for reducing hazardous fuels.

A major change in wildland fuels existing today are alien plants that have flourished, particularly Kiawe or mesquite (*prosopis pallida*) and or buffel grass (*cenchrus ciliaris*) which serves as the primary fuel for sustaining fire spread. These two species dominate in varying proportion to one another, covering 90% of the park's acreage. Expectations are that this scrub-grassland will continue and eventually expand its range over the park area. Both Kiawe and buffel grass have been seen to resprout vigorously after each wildland fire occurring at the park in the areas once dominated by the native Pili grass. Past researchers (Rock, 1974 and Carlquist, 1970) suggest that the Pili grass and Kakonakona specie have undergone a drastic reduction in occurrence along this arid coastline of the island since 1978.

A major concern for this NPS site is recent invasion of fountain grass (*pennisetum setaceum*). It appears this species is a vigorous post burn competitor, more so than buffel grass. The growth form of this plant is a robust bunchgrass, which ultimately results in a high fine fuel loading, easily receptive of an ignition that can spread quickly with high heat intensity.

The possibility exists that, if left unchecked, these alien species will continue to expand their range throughout the park, thereby lessening the opportunity for restoration of native species.

III B-2(a). Prescribed Fire

Prescribed fires are intentionally ignited under predetermined environmental parameters to accomplish various resource management objectives. All prescription parameters, actions, and measurable objectives are stated in a project burn plan, approved by the superintendent prior to ignition.

Prescribed burning will be used to reduce wildland hazardous fuel situations (caused from insect, disease, wind or general biomass accumulation), and maintain a fuel level that ensures protection of life, property, cultural values, and natural resources. Besides providing protection from wildland fire damage, other management benefits can be achieved, such as (1) seedbed and/or stimulation of more desired native grasses, (2) determent of undesired species, and (3) decrease in biomass in event of wildland fire.

It is also recognized that hazard fuel reduction will enable fire suppression forces to be more effective in implementing the appropriate management response when necessary. In addition, future use of prescribed fire for resource benefits, after the proper level of NEPA/SHPO compliance can be more effectively and efficiently accomplished.

III B-2(b). Non-Fire Applications

Although prescribed fire can be an effective tool with the management of both natural and activity created fuels, in some situations due to the existing heavy fuel loading, a combination of mechanical with prescribed fire may be necessary to achieve the desired fuel level.

This method appears to be most appropriate for reduction of Kiawe trees from targeted areas, particularly in and around the Mailekini Heiau. A prescribed burn in the present fuel situation is predicted to produce fire behavior likely to spread beyond park boundaries. A prescribed burn plan will be prepared and approved prior to disposal of the piled biomass.

Following removal of such wildland fuel situations, continued manual removal will be necessary to maintain a vegetation less flammable, less threatening for archeological resources, and more closely resembling earlier historic landscape.

It is also expected manual removal of wildland fuels will need to continue around all historic structures, including pictograph sites.

III: C. Description of Fire Management Units (FMU)

A **Fire Management Unit (FMU)** is "a unique land management area defined by land objectives, topographic features, values to be protected, political boundaries, fuel types, or major fire regimes."

Pu'ukohola Heiau will be treated as one FMU. The size, vegetation, wildland fuel concerns, management goals, and suggested fire management strategies/activities in this FMP are applicable for the entire unit.

III: C-1(a). FMU Characteristics

Location: Pu'ukohola Heiau NHS is located on the northwestern coast of the island of Hawai'i, one mile south of Kawaihae, from Hawai'i Highway 270, (**Exhibit 4**).

Climate: A warm sub-tropical weather pattern is common for the area, with periodic rains and long periods of drought. More than 90% of the days throughout the year are sunny and clear. Clouds that do form inland over the Kohala Mountains and the Waimea Plateau usually disperse before they reach the historic site.

The area usually experiences NE trade winds. Winds usually blow up slope and inland from the coast in the daytime. Gusts from 20-40 knots can occur with both upslope and downslope winds. Mean annual temperature is about 80 degrees Fahrenheit. Summer temperatures are slightly higher. Annual precipitation at Kawaihae averages 7 inches. Average daily minimum and maximum relative humidity ranges from 44% in November to 87% in July.

Adjacent Land Pattern: The area surrounding the park is sparsely populated and used primarily for recreational activities associated with the Kohala coastline. The County's Samuel Spencer Beach Park boundary adjoins the park to the south. Camping and picnicking are permitted at the County Park. Access is via an NPS road through Pu'ukohola Heiau NHS.

III: C-1(b). FMU Objectives

Objectives identified by/for the Pu'ukohola Heiau NHS Fire Management Unit are:

- Protect human life and property both within and adjacent to park areas.
- Perpetuate or recreate the natural scene that characterized landscape during the time when the Pu'ukohola Temple was being constructed (1790) up to and during the residence of John Young (1830). The natural scene will be regarded as the

species composition, distribution and pattern of vegetation present during this time span.

- Protect all cultural and natural resources at Pu'ukohola Heiau NHS and intrinsic values from unacceptable impacts attributable to fire management activities.
- Suppression of all wildland fires. Employ suppression strategies/tactics that minimize costs and resource damage, consistent with values at risk.
- Minimize, and where necessary, mitigate human-induced impacts to resources or natural processes attributable to wildfire or suppression activities.
- Promote an interagency approach to managing fires on an ecosystem basis.
- Promote public understanding of fire management programs and objectives.
- Prevent unplanned human caused ignitions.
- Organize and maintain a fire management program capability that consistently applies the highest standards of professional and technical expertise.
- Encourage research to advance understanding of fire behavior, effects, ecology, and management.
- Integrate fire management with all other aspects of park management.

III: C-1(c). Operational Considerations With Implementation

Major consideration during implementation of all activities within the park, especially fire suppression, is the use of mechanized equipment. Therefore **mechanized equipment will be prohibited from leaving the designated roadways within the park other than for protection of human life and/or historic structures.**

Park resource & fire specialists contend that archeological resources are more likely to be damaged from suppression actions than by the effects of fire. Reasons supporting this opinion are:

1. Most surface artifacts and archaeological resources within the park have survived fires on previous occasions.
2. The heat intensity of the fires are low and thus not likely to cause significant damage or discoloration to these

resources. (Fuels in the vicinity of exposed/above ground archaeological resources are grasses.)

3. The risk to these resources by mechanized suppression equipment is significant.

Other operational considerations during implementation of all fire management activities are:

- Ensure that air quality requirements are considered and followed.
- Ensure socio-political economic impacts are considered and mitigated.
- Adverse impact to sensitive species is not anticipated.

III: C-1(d). Fire History

Fire occurrence records were not generally recorded; therefore fire history can only be speculated.

It is highly unlikely that fire frequency today is representative of the period to be commemorated. The occurrence of fine fuels necessary for fire spread within the park today were probably somewhat limited historically due to the introduction of cattle and horses by George Vancouver in 1793 and 1803. McEldowney (1983) reported that the lands near the coast at Kawaihae were called "*pili*" lands, referring to the prominence of grasses including but not restricted to the indigenous *pili* (*Heteropogon contortus*). As grasses were important for thatching material, lowland grasslands were maintained by Hawaiians through the use of fire (Kirch 1982). Hawaiians harvested the larger fuel sources for shipbuilding, firewood, and foreign trade. Gradually agricultural uses of adjacent native landscapes interrupted the continuity of fuels to the extent that fire became a local phenomenon. Furthermore, it is unreasonable to assume that the Hawaiians used fire indiscriminately since they had great respect for it.

III: C-2. Fire Regime - Wildland Fuel Alteration

Today's wildland environment at Pu'ukohola Heiau NHS continues its adaptation to frequent, low intensity surface fires. With the onset of contact with Western Civilization, native flora has gradually given way to a more fire climax community of exotic vegetation supporting increased fuel loads (also reference **Section III: B-2** of this FMP).

There is concern that with establishment of Kawaihae Harbor port of trade, there is increased threat of introduction of exotic species. Scientists have speculated that as changes were made to the leeward Kohala landscape (forests receded and streams diminished), Kawaihae's

climate become drier, hotter and more typical of a fire environment. Changes in climate with increased number of ignition sources (park visitors) have made the park more "fire prone."

III: C-3. Fire Season

The general climate and existing amount of fine size wildland fuels that exist today (reference **Sections III, C-1(a) and C-2**), and the usual low amount of rainfall (annual average of 7 inches), poses a state of flammability allowing ease of ignition, quick heat intensity development and rapid rate of spread. It can exist daily throughout the year.

IV. Wildland Fire Management

IV: A. General Management Considerations

Based on recent ecological and historical surveys it is concluded that only very careful use of fire would re-create the historic burning effects within the park. It is estimated that 78% of plant species now present were probably introduced since 1830. The ten indigenous species that remain in the park contribute insignificantly to the overall species composition and total plant occurrence. These native species remain localized in occurrence to areas that are partially protected from human impact and most importantly, spread of wildland fire. It is felt that fire spread over an extensive area, would favor increased establishment of alien species and further lessen survival of native plants. However, site-specific controlled use of fire could be beneficial for native species, as experienced with experimental *pili* plots established and monitored over a 6 year period in the mid 1990's. Results were very positive that *pili*, once established, competed well against the alien buffelgrass and its growth stimulated by fire (Daehler 1998-2004).

IV: A-1. Appropriate Management Response:

The existence of very flammable alien grass fuels and the concern for their expansion over the area supports a need for an **immediate 'control' suppression strategy** as the only appropriate management response for all wildland fires at Pu'ukohola Heiau NHS.

IV: A-2. Implementation Procedures

All suppression actions will be done in accordance with policy, priorities, strategies and appropriate tactics outlined in this FMP (**Section III: B-1(a)**).

The Wildland Fire Implementation Plan (WFIP) - "Stage I Initial Fire Assessment" process will be initiated with all wildland ignitions. This is equivalent to what used to be an initial 'size-up' of the fire, which are the elements of a Stage I WFIP.

The following fire management strategies will also be taken to supplement this suppression management response:

- Continue to maintain a stand of Bermuda grass around the Visitor Center until such time when the structure is moved or a more fireproof structure is constructed. Although this grass is an alien to the park, it is specialists opinion that it is unlikely to spread or maintain a natural range without intensive care. Present existence of this species, as a green lawn, will assist as fuelbreak for the Visitor Center and adjacent structures.

- Management will continue to reduce hazardous wildland fuels around all historic structures, and keep pictograph sites free of brush and other plants.
- Kiawe trees will gradually be removed from targeted areas of the park, particularly in and around the Mailekini Heiau, through the use of mechanical/manual removal and chipping.
- Debris burning will be conducted in accordance with NPS-DO-18.

These strategies support goals and objectives identified as overall management for this NHS. Their implementation is consistent with capabilities provided by the current management staff, occasional support from adjacent NPS units and mutual agreements with the County Fire Department of Hawai'i.

IV: B. Wildland Fire Use Considerations

Wildland Fire Use (WFU) was explained in **Sections I and III: B**. Since this management response is not applicable for this NPS Unit, detailed procedures for its implementation will not be addressed in this FMP.

IV: C. Wildland Fire Suppression

In order to accomplish Pu'ukohola Heiau NHS goals and objectives of eventually recreating historic landscape scene, suppression is the only management response deemed appropriate. However strategies and tactics implemented need to adhere to other goals and objectives mandated for the area, which relate to protection of cultural and archeological sites, minimum impact suppression actions, and follow prudent decisions as discussed in **Section III: B-1(a)**.

IV: C-1. Range of Potential Fire Behavior

The climate referenced in **Section III: C-1(a)** and wildland fuels referenced in (**Sections III: B-2 & III: C-2**), describes a fire environment that can be a threat for public safety and a concern with achievement of overall management goals/objectives. More recent fires in the park burning in these flashy fuels have exhibited rates of spread and fire behavior similar to Fire Behavior Fuel Model 3 (heavy loading of grass fuels). See **Table II**.

IV: C-2. Preparedness Actions

Although wildland fire is not a common occurrence nor may it be a serious threat each year, the potential exists for an incident that could result in major consequences. The following preparedness strategies and actions are not intended to be assessed lightly, and are expected to be implemented in a professional manner.

IV: C-2(a). Wildland Fire Prevention Activities

The Pu'ukohola Heiau NHS Fire Management Program will attempt to use a cost effective mix of wildland fire prevention strategies (activities) within the broad categories of education, engineering, enforcement and administration.

A brief description of each category is:

- **Education**: Activities aimed at changing people's behavior by awareness and knowledge.
- **Engineering**: Activities designed to shield an ignition source (e.g. spark arrester) or remove the fuel that ignites from a spark or fire brand (e.g. clearance around a home).
- **Enforcement**: Activities used to gain compliance with fire regulations and ordinances.
- **Administration**: Activities such as planning, budgeting and training.

GOAL: Although the major **goal** of the Pu'ukohola Heiau NHS Fire Management Program is to reduce the threat of human caused fires, a secondary **goal** is to accomplish that challenge by emphasizing activities of education, engineering and administration as initial priorities. However enforcement activities will be used if necessary.

OBJECTIVE: The Wildland Fire Prevention **Objective** for Pu'ukohola Heiau is not to exceed the present average number of human caused fires in the park. The present average annual number recorded during 1976 - 1990 is 1.07.

The following suggestions are activities for consideration. Which activities to implement however should depend on results from a Wildland Fire Prevention Workload Analysis. This process is described later in this section.

Education

Educational activities will focus on educating Park visitors and adjacent landowners about fire prevention regulations, appropriate prevention activities and current fire danger ratings using media, signs, and verbal contact.

Additionally, fire prevention education should also be focused toward park employees so it can be integrated into their jobs and appropriate fire prevention messages developed for properties adjacent to the Park.

Pu'ukohola Heiau NHS will continue, or initiate, wildland fire prevention efforts with the following cooperators or public(s):

- Use of signs, posters, and notices on bulletin boards as a means of

public education. Fire awareness bulletins will be issued at fixed stations.

- Issuance of warnings to the public, particularly during periods of high fire danger, through contacts by rangers and public service announcements (radio).
- Provide homeowners with instruction and information regarding actions to fireproof their home and property.
- Publish fire prevention and homeowner's fireproofing information in the Park's Newsletter, or initiate a "special bulletin" when conditions are drier than normal.
- Coordinate with County Fire Department of Hawaii concerning the issuance of burning permits for open burning on the private lands.
- Utilize a photo display of fireproof conditions in/around home sites and property.
- Display/distribute fire use information and wildfire prevention items at annual Community or County events.
- Display/distribute fire use information and wildfire prevention items jointly with the local Interagency Fire Prevention Committee.
- Expand the annual wildland fire prevention program at schools to include fire use information and/or current data of recent prescribed burns & positive effects.

Engineering/Maintenance

- Ensure equipment operators (or contractors) use fire prevention devices (i.e., spark arrestor) on all field equipment.
- Evaluate Park structures for flammable construction materials and the need for hazard fuel reduction work.
- Maintenance Supervisor inspect NHS area as often as necessary to insure grass is cut at least 50 feet around Visitor Center, along the side of Spencer Beach Park, road from Highway 270 to Spencer Beach, and the entrance road to the park. (These roads are the responsibility of NPS.)

Administration

- Park employees incorporate fire prevention awareness as opportunities arise during dialogue with visitors, property owners, and cooperators.
- Ensure fire prevention awareness is included in dialogue with Power Company personnel regarding issues associated with power lines crossing NPS lands.
- Chief Ranger and Pacific Islands FMO jointly decide when wildland fuel conditions are such to warrant prohibiting open fires in the park and smoking on visitor trails.

Enforcement

- Continue to conduct routine patrols as means to inform and enforce regulations regarding campfires, smoking, etc., as appropriate.
- Conduct area closures when extreme fire danger warrants.

Prevention Workload Analysis

Periodically Pu'ukohola Heiau NHS should utilize the Prevention Workload Analysis (PWA) to identify potential ignition-causing situations that warrant corrective action and verify the most appropriate, cost effective wildland fire prevention activities to implement.

Normally the following components are the major considerations for a PWA:

- **Risks** - those uses or human activities that have the potential to result in a wildland fire ignition.
- **Hazards** - the fuels and topography of an area that have the potential for a "large" or "difficult to control" fire from a human-caused ignition.
- **Values** - natural, cultural or developed areas where loss or destructive effects by a wildland fire would be unacceptable.

After evaluating these components, it should indicate where, when, and how to implement effective fire prevention activities.

It will be the responsibility of the Pacific Islands Fire Management Officer (FMO) in coordination with the NHS Chief Ranger to perform an annual review of wildland fire causes and verify the effectiveness of the current programmatic prevention strategies. Activities can be included or deleted in the annual Fire Management Program, if deemed necessary.

Another reference to consult during this review is the NWCG *Wildfire Prevention Strategies* (1998).

IV: C-2(b). Wildland Fire Training/Qualifications

Annually the Chief Ranger and Pacific Islands FMO will:

- Maintain a list, identifying individuals currently qualified for both wildland fire suppression and prescribed fire positions, including the various support/overhead positions.
- Assess/prioritize training needs and personnel to attend.
- Ensure knowledgeable, quality individuals are used as instructors, even if there is the need to recruit from outside the agency.

The list of individuals qualified for various wildland fire/prescribed fire position(s), including support positions, will be coordinated annually with the Western Region Coordinating Dispatch Center.

The assessment of training needs will be coordinated with the Western Region Coordinating Center, along with recommendations for training schedule revisions when necessary. Efforts will be made to have personnel attend sessions presented by other agencies when none are available locally.

Qualifications

Pu'ukohola Heiau NHS Fire Management Program will follow the National Wildfire Coordinating Group (NWCG) Standards in determining qualifications for the various wildland and prescribed fire positions. Reference NWCG Publication 310-1 regarding requirements and qualifications for wildland and prescribed fire positions.

First year firefighters and all red-carded personnel will need to pass physical fitness requirement commensurate with their red card qualifications. Information about this requirement can be obtained from the Chief Ranger or Pacific Islands FMO. Individuals who pass the fitness physical, are qualified to attend Basic Fire Behavior (S-190), Fire Suppression (S-130), Standards of Survival and the 8 hour annual Refresher Course. Basic knowledge of the Incident Command System (ICS) is also required.

All personnel involved in wildland and prescribed fire activity will be required to attend the 8 hour Refresher Course and perform the Work Capacity Test annually.

Advancement Positions

Efforts will be made to assign individuals seeking the next higher incident or prescribed fire position, with others already qualified for that position. The intentions are to improve knowledge and performance based on training experiences. These efforts will be coordinated through the Western Region Coordinating Office.

GOAL: The **goal** at Pu'ukohola Heiau NHS is to have the Chief Ranger qualified at the Crew Boss and IC-IV position as a minimum, with the ultimate goal of all "fire protection" personnel qualified at the squad boss level. For other fireline-related Park personnel, the goal is to have them be qualified at firefighter II level.

Besides NWCG Courses/Sessions, the following training considerations will be assessed and conducted as needed:

- All Park staff trained in first aid and cardio-pulmonary resuscitation.

- One Day Preparedness Session for Chief Ranger, all "fire protection" employees, and County Fire Department cooperators reviewing major parts of FMP, use of Wildland Fire Situation Analysis (WFSA), and location of electrical cutoffs, water main or hydrants. (Optional attendance for portions of the session by Superintendent and other Park employees.)
- Minimum Impact Fire Suppression Tactics" Techniques (MIST) training for Chief Rangers and "fire protection" employees.
- Role and Responsibilities of Resource Advisor

IV: C-2(c). Resource Advisor

Resource Advisor is an important fire incident position, especially with wildland fires that involve extended attack, or are using mechanized equipment. This person serves as the representative for the NPS Unit (Chief Ranger/Superintendent, depending on the complexity of the fire). He or she must meet regularly with the incident commander and/or the appropriate section unit leaders of the incident team, to assure that all natural/cultural resources and management concerns are adequately considered and protected during an incident.

The Chief Ranger and Pacific Islands FMO will maintain a current list of persons qualified to serve as Resource Advisors. It should be reviewed/updated annually, and included in Mobilization Plans for the Pacific Islands.

Resource Advisors will be identified prior to the fire season, considering the following criteria:

- Training
- Broad resource background and experience
- Knowledge of the Park's archeological, natural, & cultural resources and management objectives
- Awareness of, and ability to communicate concept of appropriate management response and tactics
- Familiarity and preferably experience with wildland fire or use of prescribed fire
- Awareness of role and responsibility of a Resource Advisor
- Assertiveness

IV: C-2(d). Fire Readiness of Personnel, Equipment and Supplies

The current Fire Management Program for the Pacific Islands designates Pu'ukohola Heiau NHS as a five person readiness fire cache.

Annually, the Chief Ranger will conduct an inventory to ensure all necessary personal protective gear, tools, and items are in place to support a five person crew for immediate dispatch, for a wildland fire

on-site or at another NPS unit. A check-list of equipment/items expected to be in a fire cache for a five person crew is available from (or should be developed) by the Pacific Island FMO.

Individuals assigned to be members of this fire crew should also have their own "personal gear bag" packed and ready to take with them when a dispatch is received, i.e. extra clothing, personal medicine, hygiene items, etc. in event incident extends beyond first burning period.

Equipment -- Equipment purchased with Fire Management funds or assigned for that use will be used for fire protection purposes only, except in emergencies. All tools will be marked with red paint and kept separate from other utility tools. The Chief Ranger is responsible to ensure the 500-gallon pumper trailer and all fire equipment are ready for immediate dispatch and operation.

Supplies - Chief Ranger is responsible for maintaining perishable supplies such as rations and batteries in sufficient quantity at the field fire caches.

Contract Equipment Agreements - NPS can only use OAS carded helicopters and pilots. This is maintained at the OAS website, www.oas.gov

Since the park has a year round fire season, personnel, equipment and fire cache must be in a constant state of readiness.

Periodically throughout the year, a check should be performed on the automatic fire detection system, which is linked to the burglar alarm system. Likewise an inspection will be made to ensure that all fire extinguishers meet NFPA standards, are tested, and maintained according to the National Fire Code and manufacturer's instructions. **All** park employees will be trained in the use of fire extinguishers.

IV: C-2(e). Fire Weather and Fire Danger

The park intends to utilize the fire weather station located at Kaloko-Honokohau NHP for daily observations or to determine the various indices in accordance with the National Fire Danger Rating System (NFDRS).

In the meantime, overall weather for the area can be monitored from the airport or radio/television media, to at least assess the fire danger trend. When it becomes visually apparent that the NHS is in a higher fire danger than normal, the Chief Ranger in coordination with Pacific Islands FMO can initiate appropriate fire prevention or fire preparedness measures.

IV: C-2(f). Wildland Fire Detection

Due to the size of the park and its visibility from nearby heavily traveled roads, detection is provided by park employees, visitors or traveling public(s). Increased detection patrols may be warranted during extreme fire danger or heavily visited periods of time.

Signs are posted throughout the park area with NPS phone number to use for reporting wildland fires. Park employees also have radio access. Employees should use channel 1 to notify the Park Office and other park employees. In addition, channel 6 (emergency channel of Waimea Police Department with better radio reception) and channel 10 have been designated as the emergency channel with the Kona Police Department, in which a wildfire report can be relayed to the NPS Chief Ranger or nearby Fire Department.

The receiving employee at the Park Headquarters will confirm the location and immediately inform the Chief Ranger. The Chief Ranger will coordinate initial attack performed by the NHS crew; notify the local fire department(s) and Pacific Islands FMO. The Chief Ranger may request additional support.

Park employees should continue to monitor their radios. Communications between park work force, Fire Department and Waimea Police Department (if needed) should be kept brief and only related to the fire situation.

IV: C-2(g). Step - up Staffing Plan

Traditional Step-up Plan format is not applicable due to the small size of the park and size of staff, only a limited step-up plan can be initiated, therefore no formalized document outlining or authorizing step-by-step procedures to follow at each increasing level of fire danger was deemed necessary.

As fire danger increases, emphasis will proportionately be more toward either intensifying existing preparedness or prevention activities, or implementing additional measures. If the appropriate activities to implement extend beyond capabilities of existing park staff, measures will be pursued for emergency preparedness funding or personnel detail assignments from other NPS units. These measures will be coordinated through Pacific Islands FMO.

IV: C-3. Pre-attack Plan

No formalized pre-attack plan has been developed nor deemed necessary for the fire complexity and size of this NPS site. However as a prevention maintenance activity, mowing as a means of reducing fuel bed height along the park boundary has been done and is maintained periodically throughout the year.

IV: C-4. Initial Attack

Initial attack strategy calls for an immediate suppression response consistent with firefighter and public safety, and values to be protected. Emphasis should be: limit wildland fires to the smallest acreage possible in order to lessen the population of undesired alien plants following the burn. Of equal importance is the need to emphasize use of minimum impact suppression tactics to ensure protection of archeological values. The priority for immediate initial attack throughout the park and these two points of emphasis are consistent with management goals of the park as reiterated in the legislation that established this site.

All wildland fire fighting operations will be conducted under the Incident Command System. When Hawai'i County Fire Department (HCFD) arrives, the park representative will establish a joint command. The park representative will inform HCFD of park priorities and will remain on-scene until demobilized, to ensure compliance with park policy. Park staff and the county will be responsible to the designated Park Incident Commander (IC). The IC will determine protection priorities, strategies, and suppression tactics to be used.

All park employees should remain constantly aware of the fire situation and location of electrical/telephone wiring or devices, hazardous materials, and park structures that could be threatened by the fire, and coordinate necessary precaution measures with the IC.

Throughout the life of an incident, an IC may be replaced by a more qualified person if fire behavior or incident complexity exceeds red carded abilities of the assigned IC.

Should a non red-carded person discover a fire, the person should immediately report the fire to the Chief Ranger's Office.

Twenty-four hours after the fire is declared controlled, a final check will be made before declaring the fire out. Subsequent checks may be warranted in the event that high fire danger conditions persist.

A cooperative agreement outlining working relationships between NPS and the HCFD exist and should be jointly reviewed annually, (**Reference Exhibit 5**). The two HCFD locations likely to serve as first respond for wildland fires within the park are Mauna Lani Fire Station, six miles to the south and Waimea Fire Station 12 miles to the east.

IV: C-5. Extended Attack & Large Fire Suppression

The Chief Ranger and Pacific Islands FMO along with the Superintendent will determine the need for the management transition of an incident to a Type II or Type I Incident Management Team.

The objective of this process is to lessen the burden from the respective agency when an incident exceeds local management

capabilities. Procedures for activation and implementation of an Incident Management Team are in the Western Region Mobilization Plan.

Preparation of a WFSA for an "extended attack" and/or large fire organization will be done as a means to evaluate & document the appropriate management response(s)/strategies to further manage the fire (**Reference Exhibit 3**). Follow WFSA procedures outlined in the Wildland and Prescribed Fire Management Policy Guide).

If fire spread and size exceed the management response outlined in the current WFSA, the WFSA needs revised to reflect this change and the management response that will be implemented.

It will be the responsibility of the Chief Ranger to initiate this document. The Park Superintendent is responsible for its approval, although this may be delegated in writing to another NPS person, if desired.

Enhanced resource values may be a collateral benefit of the planned action under the WFSA, but cannot be part of the objective of the management response.

"Delegation of Authority" Letter(s)

Example letter(s) of "Delegation of Authority" is listed in the Pacific Islands Mobilization Plan, and referenced in the Appendix of this FMP (**Exhibit 6**). These letters should be reviewed and verified annually by the Park Superintendent, Chief Ranger, and Pacific Islands FMO.

The Park Superintendent is responsible for signing the Delegation of Authority Letter, although in most situations unless the incident is high complexity or involves a large size, this responsibility may be delegated to another NPS individual.

IV: C-6. Minimum Impact Suppression Tactics (MIST) Requirements

Implementation of MIST is essential in order to ensure protection of the park values. These guidelines and tactics, in their entirety, are listed in **Exhibit 7**. A few basic considerations, applicable with all wildland fires within this park boundary, regardless of the management response being implemented are listed below.

The principles of MIST should be emphasized annually prior to the fire season. This should occur during NPS and Interagency Management Team Meetings to ensure there is common awareness and support among cooperators and park administrators. It should also be included in basic and refresher training sessions for park personnel qualified for fire suppression activities and/or designated as Resource Advisors.

As a minimum the following basic MIST considerations should be applied with all wildland fire suppression activities occurring within the Pu'ukohola Heiau NHS:

- Use natural firelines (barriers) as much as possible to avoid ground disturbance in creating the fireline on the perimeter of the fire. Where the fire has stopped, feel the edge to make sure it is out.
- Utilize water, where possible, to halt fire spread. If water is not available in portions of the perimeter, construct the fireline as narrow and shallow as possible.
- Vehicles or mechanized equipment will not leave roadways or visitor trails, unless human life is threaten.
- Use water saturation where practical during mop-up to avoid stirring, mixing ashes or otherwise further disturbing the burn area.
- As time permits during mop-up, let fuels consume naturally.
- Use natural openings for helispots as needed. Minimize clearing new sites. If a new helispot is created, return the helispot area to a natural appearance after use.
- Exercise caution with chemical retardants near lakes, waterways, and wetlands.
- Archeological sites will be protected from disturbance during wildland fire suppression activities.
- Pack out all material transported into the fire perimeter.

IV: C-7. Rehabilitation

Rehabilitation actions need to be considered with every fire management activity. The following sections apply to the short and long term rehabilitation guidelines and procedures for impacts caused by (1) fire suppression activities and (2) the wildland fire.

IV: C-7(a). Fire Suppression Rehabilitation

Assess and implement actions to rehabilitate cultural, natural resource or environmental damage caused by suppression activities. The primary purpose is to leave the fire suppression damaged area(s) as natural appearing as possible.

Initiate implementation of these fire suppression rehabilitation actions while fire suppression crews, equipment, and resources are still on the site.

These actions are appropriately financed from emergency operation funds.

IV: C-7(b). Burned Area Emergency Rehabilitation

Refer to the USDI-NPS Burned Area Emergency Rehabilitation (BAER) Handbook for appropriate planning, financing, and implementing this wildland fire rehabilitation activity.

No rehabilitation of burned over lands at Pu'ukohola Heiau NHS has taken place with past fires. Topography of the site is such that major erosion after fires has not been a problem. Natural re-vegetation is desired and has been allowed to occur. Natural regeneration of ground cover after fires has been satisfactory to ensure adequate protection of soils, although majority are undesired alien species.

Special consideration needs to be taken for burned areas. Appropriate mitigating measures, including possible seeding and temporary irrigation, may be necessary to aid with dust control, prevent erosion, and to help ensure control of undesired plants.

IV: C-8. Records and Reports

The Chief Ranger's Office will prepare reports on all fires as required by DO-18. All fire reports will be reviewed by the Chief Ranger and Pacific Islands FMO before they are submitted to the Superintendent for signature. All reports are due within ten days after the fire is declared "out" in accordance with DO -18.

The Pacific Islands FMO will enter the data into the Wildland Fire Management Information System (WFMI).

An outline of reports/records related to an incident, the responsible position and the time frame it is expected, is as follows:

<u>Reports - Records Expected</u>	<u>Responsible</u>	<u>Date/Time</u>
Incident Reported	IC/Chief Ranger	Immediately when Reported
WFSA	Chief Ranger/PI FMO	Extended burning, or larger Size
Individual Fire following Report "control"	Chief Ranger/Supt.	10 days
Fire Report to following "control"	Supt./PI FMO	15 days

Various other Fire Management Program reports/records, responsible position (person) and due dates for all fire management activities are outlined in **Table II**.

V: Fuels Management

The major goal of the fuel management strategy is to achieve and maintain a fuel level that facilitates protection of life, property, natural, cultural and archeological resources, and when additional project specific NEPA/SHPO compliance is completed, helps establish a landscape similar to the park's commemorative period era (1790-1835 a.d.). **Reference Exhibit 8, NPS Prescribed Burn Plan.**

Fire is a potential management tool to periodically remove vegetation, including alien species from the site(s), mechanical removal may be required to fully prevent continued establishment of undesired or destructive alien shrubs.

V: A. Scope of Program

Prescribed fire use in the park will focus on reduction of hazardous fuels for this planning cycle. After additional project specific NEPA/SHPO compliance prescribed fire can be used for other resource benefits. Wildland fuels management at Pu'ukohola Heiau involves two major concerns:

- Increased population of alien grass species creating an increased loading of fine size fuels and a more homogenous fuel bed of flashy fuels, easily ignited, and resulting in rapid fire spreads.
- Increased population of Kiawe, an introduced woody plant, that is deep rooted, capable of surviving in arid environments, creating very dense stands. A dense stand of Kiawe contains a heavy loading of fine size woody fuels, easily ignited which can support quick development of a high intensity fire.

Besides kiawe being a hazardous fuel, the penetration of the tree's boles and roots into wall, platforms, and structures results in damage to archeological features.

Urban Interface Fuel Situations

Adjacent to the NHS Boundary are isolated residences located within wildland fuel situations that could be threatened by an advancing fire. Likewise, a fire start in the fuel situations near these residences, under the right wind direction, could spread and threaten resource values, investments or management concerns in the park.

More detailed strategies and instructions related to "fire-proofing" within or adjacent to urban interface situations are listed in this FMP; see Fire Prevention Program Element (**Section IV: C (2a)**). Similar instructions and ideas can be found on Firewise Homepage at <http://www.firewise.org>.

V: B. PRESCRIBED FIRE

Prescribed fire is recognized as an important factor in the management of vegetation communities, control and/or manipulation of certain plant species, and achievement of resource management goals/objectives outlined for this NPS site.

Prescribed fire may be used as a tactic to develop defensible space around valued resources and/or investments, essentially focusing on the reduction of hazardous fuels. Prescribed fire may also be used in conjunction with mechanical means to achieve fuel reduction and lessen threat of damaging wildfire.

Prescribed fire has been used and evaluated in research projects with native grasses at Hawai'i Volcanoes and Pu'ukohola Heiau. Initial results indicated that prescribed fire used at the right time and heat intensity appears to create a situation for rejuvenation of native species. This increased population of native species appears to successfully compete against alien plants.

Objective: Pu'ukohola Heiau proposes to utilize prescribed fire, after project specific NEPA/SHPO to:

- Stimulate rejuvenation of native grass species for seed production and increase population of that species throughout the site.
- Stimulate rejuvenation of *pili* grass with intentions of increasing its presence over more of the landscape.
- Disposal of Kiawe trees that have been mechanically removed and piled.
- As a possible means to lessen re-establishment of aliens species (woody and/or grass) in areas where dominant alien plants have been removed.

V: B-1. Prescribed Fire Planning

A prescribed burn activity can be proposed by any resource manager or specialists. A proposal should contain, at a minimum, the objective and desired future conditions from the burn. This information is essential to assist in the development of an appropriate burning prescription and professional burn plan. Included will be the appropriate level of compliance for the project including the need for SHPO approval.

Periodically, prescribed fire may be used to remove dead/live vegetation as a maintenance method.

The Pacific Islands FMO will assist with preparation of a prescribed burn plan and recommend a Prescribed Burn Boss. Together they should conduct a field reconnaissance of the proposed burn site(s) with appropriate managers and specialists to verify project objectives, identify specific concerns, assess effects, and develop appropriate implementation procedures.

Planning and execution of prescribed fires will be funded from the benefiting function. Only persons meeting NWCG Prescribed Fire qualification standards will be used as prescribed burn personnel. Training of personnel to meet qualifications required for prescribed fire can be funded from fire and/or project funds.

Approval Authority

According to national policy the Superintendent will ensure that prescribed burn plans and the personnel executing them meet minimum National and Regional requirements.

The Superintendent is the approving officer of a prescribed burn plan(s), however this authority may be delegated to an assistant or the FMO pending the complexity of the prescribed fire project. The burn plan should have regional FMO or peer review prior to approval.

V: B-2. NPS Prescribed Fire Burn Plan

All elements identified in the NPS Prescribed Burn Plan will be addressed for each prescribed burn project. However to what extent each element needs to be addressed depends on the objectives to be accomplished and the complexity of the burn.

The Wildland and Prescribed Fire Management Guide should be consulted for explanation of specifics to be addressed with each element (**Reference Exhibit 8**), NPS Prescribed Burn Plan format. A prescribed fire burn plan will contain, as a minimum the following elements:

- **Description of the Prescribed Burn Area**, including map.
- **Goals and Objectives**, identifying purpose of the burn, resource management goals, and specific objectives to be achieved stated in measurable terms.
- **Range of Acceptable Results Expected**, expressed in quantifiable terms.
- **Project Assessment**, identifying both (a) level of complexity and (b) risk assessment; (as a minimum, consider all risk and complexity elements described in the Wildland and Prescribed Fire Policy Guide, page 43).
- **Organization**, a brief outline of the prescribed fire positions for the burn project, skills-knowledge level of the positions, and who will serve in those positions.
- **Prescribed Fire Implementation Actions**, which addresses such actions as (a) pre-burn consideration, on-and off-site, (b) briefing, (c) test fire, (d) prescribed fire prescription, including environment and fire behavior parameters, (e) special conditions, public and personal safety, (f) burn organization, (g) ignition operation, and (h) holding provisions.
- **Cooperation**, listing provisions for interagency and intra-agency coordination, public involvement, and burn-day notification.

- **Contingency**, identifying actions if prescription parameters are exceeded and the fire cannot be returned to prescription within projected funds.
- **Funding**, stating source of funding for the burn project and estimated costs.
- **Smoke Management and Air Quality**, describing how the project will comply with the various air quality regulations pertinent for the area affected by the burn.
- **Monitoring**, provisions and/or documentation to ensure project is implemented within prescription parameters, and adequate information is acquired to facilitate short-term and long-term evaluation.
- **Post-Burn Activities**, provisions for post burn evaluations. It needs to be emphasized that to evaluate some project objectives, pre-burn data may be necessary.

V: B-3. Prescribed Fire Operations

All prescribed fires will have an approved NPS Prescribed Burn Plan which addresses specifically the objectives, burning prescription, procedures and standards that will be followed in conducting the prescribed burn.

Personnel involved in the project must meet the skills/knowledge level determined by the complexity of the burn, and the fitness level for the prescribed burning position they are performing.

The size and qualifications of the prescribed burn team will be established in the burning plan. All members must meet current qualification standards. If qualified individuals are not available at the local area at the time of project implementation, a resource order for qualified individuals will be made. These individuals must be available on site, before the project is implemented.

Prior to ignition, the designated Prescribed Burn Boss will verify that all pre-burn considerations outlined in the burn plan are completed. This person will also conduct a briefing with the crew regarding project objectives, burning parameters/prescription, ignition instruction, communications, job hazard analysis and safety considerations.

Twenty four hours prior to ignition of the prescribed burn the Public Information Officer will notify the media and other local and State contacts listed in the burn plan with the following information:

- location
- purpose of burn

- type of burn
- number of acres
- number of resources used
- any anticipated concerns/needs for resources

All prescribed fires will be carried out in strict compliance with the approved Prescribed Fire Burn Plan.

V:B-4. Prescribed Fire Evaluation

All prescribed fires will be evaluated to determine if objectives were met. The extent of this evaluation depends on the sensitivity of the objectives to be accomplished. The evaluation process could range from pre/post photo points to more extensive data-gathering methods as outlined in the NWCG Prescribed Fire Monitoring Handbook.

V: C. Exceeding Prescribed Fire Burn Plan Parameters

Prescribed burns that exceed prescription parameters outlined in the approved burn plan and cannot be brought back into prescription within the budgeted project cost, will need to be managed in the suppression response. A **WFSA** will be initiated to determine the appropriate suppression strategy and tactics to use (**Reference Exhibit 3**). Follow WFSA procedures outlined in the Wildland and Prescribed Fire Management Policy Guide.

Fire suppression actions will follow the concepts/strategies described in the Fire Suppression sections of this FMP (**Sections III: B-1(a)** and **IV: C-5**).

V: D. Air Quality and Smoke Management

Hawaii Volcanoes National Park is the nearest Class I airshed. The park will notify the Hawaii State Department of Health of any prescribed burns. Pu'ukohola Heiau is a Class II Airshed, which recognizes some degrading of air quality over the park. Smoke may be viewed as a short term effect unavoidable when using fire as the management tool to meet park resources and management objectives. The effect on visibility and odor are transient. However concerns may develop depending on the duration and intensity, therefore these effects must be assessed and addressed in the burn plan.

Occasionally, vistas are partially obscured by volcanic smoke ("vog") originating from active volcanoes at Hawai'i Volcanoes NP. This condition is uncommon and occurs only when winds are calm or blowing from a southerly direction. Air Quality is generally excellent because of the trade winds.

There is concern that smoke may impair visibility on access roads to/from or within the park or State Highway 270 during prescribed burn activities or wildland fires. Hawai'i County Police will be notified

of the possibility to assist with traffic control in order to prevent accidents due to poor visibility. No prescribed burning will be conducted on County Outdoor Burning Ban days.

Federal, State and Local Air Quality plans/ordinances will be consulted during development of prescribed fire projects. These plans should serve as the basis to assess concerns and identify appropriate mitigating procedures to implement. These concerns and intended mitigating measures will need to be included in the prescribed burn plan.

V: E. Non-Fire Applications

Mechanical treatments (chain saw, possibly small size dozer or grapple) are anticipated to be used with reduction of Kiawe. A major concern with any ground disturbance-type equipment is the known and unexpected cultural resource sites. All mechanical treatments projects must be monitored regularly to ensure restrictions are followed and no adverse or long-term impacts are caused to the desired residual vegetation, the landscape or archeological features.

Planning, programming and budgeting for these projects will utilize appropriate project forms and procedure for approval prior to implementation.

Monitoring of pre and post project conditions and costs will be documented for overall program evaluation and future planning.

VI. FIRE MANAGEMENT ORGANIZATION AND RESPONSIBILITIES

The staff at Pu'ukohola Heiau NHS consists of nine (9) permanent full-time employees. Together they coordinate and fulfill the various roles and responsibilities associated with the programs and activities to accomplish the park goals/objectives.

The park staff works closely with the County Fire Department(s) for suppression of all wildland fires within the park. Mauna Lanii and Waimea Fire Stations are located approximately 6 and 12 miles from the park, respectively.

A cooperative agreement between the National Park Service and the Hawai'i County Fire Departments exists, (**Reference Exhibit 5**).

In wildfire suppression, both park and county will be responsible to the Pu'ukohola Heiau IC when working within the administrative boundaries of the park. The IC will determine protection priorities and strategies, including suppression tactics, to be used and other necessary work assignments.

VI: A. Fire Management Organization

The Pu'ukohola Heiau NHS Fire Management Organization is a direct line from the Superintendent - Chief Ranger, with direct coordination with the Pacific Islands FMO. No park personnel are assigned to the FMO, but coordination is expected by the Superintendent from the other discipline specialists/managers and cooperators, in order to accomplish the fire management activities.

Initial suppression response and/or extended response with wildland fire will primarily be with the respective fire departments (cooperatives) coordinated by the Pacific Islands FMO.

Currently the following personnel are expected to be qualified and fulfill the following fire management positions on a wildfire suppression activity:

Incident Com.-Type IV:	Chief Ranger
Liaison Officer:	Superintendent

An Interagency Contact List is included in **Exhibit 11** with the List of Cooperators/Contractors.

An organizational chart outlining the various fire management activity responsibilities with NPS positions is displayed in Appendix (**Reference Exhibit 9**).

The major positions, roles and responsibilities and how they relate to the rest of the park's organizational structure are as follows:

Incident Commander (IC) Designation -- When qualified, the Chief Ranger automatically assumes suppression responsibilities as Incident Commander unless he/she elects to delegate these responsibilities to an individual whom he/she feels is more capable of assuming the job.

The first responding individual on initial attack will take appropriate action commensurate with their qualifications and make proper notifications (911 and Chief Ranger) until the qualified IC arrives. On all fires within or threatening the park, the Pacific Islands FMO will be notified.

On Mutual Aid Fires outside the Park, the first responding individual on initial attack will take and direct appropriate action commensurate with their qualifications until relieved by an agency representative of the lands involved.

The IC must constantly be aware of the possibility that park visitors may be ahead or upslope from a fire.

Superintendent - The Pu'ukohola Heiau NHS Superintendent is responsible for overall implementation of the fire management program. The Superintendent has designated full authority to the Chief Ranger, Visitor & Resource Protection Division for all fire management strategies & activities outlined in the FMP.

The park superintendent is responsible for periodic informal assessments to certify that all activities of the wildland fire management program is acceptable. The park superintendent under certain conditions may delegate this responsibility to another organizational level.

Chief Ranger, (Visitor & Resource Protection) - As head of the Visitor & Resource Protection Division, he/she serves as the park's Fire Management Officer and is responsible to the Superintendent for accomplishments and results of strategies & activities of the FMP. The Chief of Protection supervises and advises the ranger and maintenance personnel in implementing the FMP including calling for assistance as needed from the other NPS units, local & State agencies. This person assists with coordination of Service-wide mobilization and inter-island operations with Pacific Islands FMO stationed at Hawai'i Volcanoes National Park.

Permanent and Seasonal Rangers - These employees will be assigned to various positions in wildland fire suppression and/or prescribed fire positions according to their capabilities and training.

Research Scientist - Since a portion of fire use is intended as a research project, a research scientist is shown on the Fire Management Organization Chart. This position may be a Pu'ukohola Heiau employee or could be from another park, agency or even an academic institution. This person will coordinate with the Pacific Islands FMO with development and implementation of all fire related research at the site. This will involve review of prescribed burn plans for experimental and management purposes, and monitoring the effects on vegetation for evaluation and documentation.

Safety Officer (designated) - This individual has direct authority from the Superintendent to ensure that safety is a priority concern, unsafe acts and safety hazards are eliminated and proper safety training is implemented, including all fire management activities.

VI: B. Fire Mgt. Organization - FIREPRO Funding

Fire Program Analysis (FPA) budgeting tool is in development and will replace the current process (FIREPRO) PUHE is part of the Pacific Islands Fire Program Unit (FPU) and will be involved in the annual fire budget development process for this budgeting process.

Some regional fire management funds are allocated annually for various fire management activities such as preparedness, prevention, personnel training travel expense and fire cache.

Funding for wildland fuel reduction projects (prescribed fire or combination of mechanical and prescribed burn) could vary from year to year, pending federal funding. After projects have been prioritized, usual annual program and budgeting procedures will be followed.

Exhibit 10 outlines funds used for current fire management program and related activities. This exhibit is expected to change annually

VI: C. Fire Mgt. - Interagency Coordination

Pu'ukohola Heiau is activity involved and committed to cooperative agreements and interagency coordination, to ensure the fire management program is implemented in a timely, safe, cost efficient and professional manner.

Reference Exhibit 11 for cooperator agreements/contracts in place.

Pu'ukohola Heiau will take the initiative to coordinate training in wildland fire, prescribed fire and the ICS system with the local, State and Federal Agencies.

These agencies and organizations will be contacted annually to determine training needs and to develop a coordinated annual training plan. Pu'ukohola Heiau and Pacific Island FMO will attempt to provide qualified instructors for joint training. In the absence of

qualified instructors, Pacific Islands FMO will take the lead role to obtain qualified instructors from other agencies.

VII: FIRE RESEARCH

Fire has been used on a limited basis in the experimental *pili* grass plots located southeast of the main temple. It appears fire is beneficial in creating a seedbed and/or stimulating rejuvenation of this grass in sufficient amount to compete and become the more dominant species with existing alien grasses.

Pili grass (*Heteropogon contortus*) was once a dominant component of the vegetation at many dry, leeward coastal sites in the Hawaiian Islands. Today, most pili grasslands have been replaced by near-monocultures of introduced African grasses. The goal of this research project at Pu'ukohola Heiau is to develop methods for restoring pili grasslands. Fire is being used in this project as a means to give Pili grass a reproductive and competitive edge over the alien buffel grass (*Cenchrus ciliaris*) that now dominates the park. Pili grass is well adapted to fire. From previous observations, fire stimulates pili grass growth. It is hypothesized that a certain fire regime will favor pili grass over buffel grass.

In February 1998, an effort was initiated to increase pili grass establishment. Two 25 x 10 meter experimental plots dominated by buffel grass were prescribed burned and then seeded with pili grass. In the fall of 1998 young pili grass plants were transplanted in an adjacent plot. These plants have survived extremely well and more outplanting of pili grass plants into park areas have been done over the years.

To date almost a pure stand of pili grass exist in the experimental plot areas. One aspect of this research project is to use fire in the experimental plot areas, to determine the effects of burning on pili grass growth, flowering and seed production. The objective is to expand the size of the seed bed, harvest seed from the plant, lessen the buffel grass and strive to maintain a composition primarily of pili grass throughout the primary landscapes of the park.

With an adequate supply of pili seed, projects are anticipated that will possibly utilize a pre-treatment of herbicide to kill existing areas of alien species, followed by a light intensity prescribed burn to consume existing biomass and create a seedbed for pili grass establishment. In some situations, fire may not be used prior to the seeding of pili, as part of this research project.

In the long term, efforts will be made to use a combination of activities (herbicide, seeding and transplanting of pili grass, and periodic prescribed burns), in order to identify the best methods for restoring and perpetuating pili grasslands on a larger scale.

VIII: MONITORING AND EVALUATION

Monitoring and evaluation procedures will be professionally conducted to ensure the Fire Management Program and projects are implemented to achieve management/project objectives, and such results are utilized to improve quality of the program and future projects. Normally this is a joint effort between NPS Research and resource management. A research scientist from outside the agency may be involved.

Monitoring is the task of ensuring a project is implemented according to the plan. On larger size program activities or more complex projects, usually at least one person may be designated to specifically perform this task.

Monitoring needs to occur with **every** prescribed burn project. Documentation formats are provided in the NWCG Prescribed Fire Monitoring Handbook.

Evaluation is the task of comparing whether or not program activities or project objectives were achieved. In most case, a professional evaluation cannot be performed unless some information is available or collected prior to implementation.

VIII: A. Annual Monitoring Review & Actions/Revisions

Most programs identified in the park's overall management plan(s) suggest monitoring and evaluation actions. Three levels of monitoring and evaluation will be performed: implementation monitoring, effectiveness monitoring and validation monitoring.

- Purpose of implementation monitoring is to determine if the individual program activities or projects are being implemented and managed in accordance with the RMP Standards and Guidelines, strategies or procedures outlined in this FMP.
- Purpose of effectiveness monitoring is to determine if the individual program activities, or projects, are effective in meeting the management goals and objectives of the park, and/or Fire Management Program.
- Purpose of validation monitoring is to determine whether the assumptions used in developing the Fire Management Program or this FMP need adapted to achieve the goals and objectives.

Each year the Chief Ranger and Pacific Islands FMO will review the FMP to determine the necessity for revisions. Specific information and documentation to be reviewed might include:

- (a) Prescribed Fire
 - Evaluations of prescribed fires

- (b) Wildland Wildfires
 - Individual Fire Reports
 - Documentation for choice of suppression strategy
 - Evaluation of rationale/documentation for AMR
 - All WFSA's prepared, if necessary

- (c) Other Fire Management Program Elements
 - Fire Prevention Activities (PWA considerations)
 - Fire Management Analysis FIREPRO)
 - Changes in Pacific Island Fire Mgt. budget
 - Major changes in park wildland fuel hazard(s)
 - Any policy changes that could effect Fire Management Program (FMP strategies/activities)

IX: PUBLIC SAFETY

Safety of personnel and the public (visitors or neighbors) is first priority with all fire management activities. This is the responsibility of the person designated as "person in charge" of a fire management activity/project.

Public: In event of a wildfire, the I.C. will determine the appropriate method of protecting public safety.

1. The IC will decide how best to evacuate park visitors.
2. Either evacuate or restrict vehicle traffic on Spencer Beach Road.
3. The parking lot at Spencer Beach may serve as a safety zone for visitors.

Temporary closure of portions of the park will be affected where danger exists to visitors. Appropriate signing and enforcement will be provided.

NPS Personnel: Only personnel currently certified according to NWCG standards will be permitted to participate in fire management activities. Training and physical fitness will be commensurate with these standards.

Qualified personnel will be equipped and utilize required fire safety clothing and equipment when involved with fire management activities. Safety equipment including fire retardant shirts, trousers, jackets and other approved wearing apparel, goggles, face shields, leather or leather-palmed gloves, hard hats and sturdy lace-up boots of at least eight-inch height with lug soles as necessary for the project.

Pre-incident training and equipment proficiency is essential. State-of-the-art equipment, techniques and procedures will be used as funding permits and adaptability and feasibility is determined.

Materials, equipment or other devices identified as essential to the safe performance of fire assignments will be made available for use.

Pre-burn and initial attack safety briefings, including review of terrain, fire characteristics and weather predictions, will be accomplished. Fire Safety escape routes and procedures for medical and rescue activities will be established and discussed with all participants before committal.

X: PUBLIC INFORMATION AND EDUCATION

The Pacific Islands FMO and Pu'ukohola Heiau's Information Officer will initiate fire management activities, coordinated with the Chief Ranger of Visitor & Resource Protection.

X: A. Fire Management Program Information

Suggested strategies for public information and education are, but not limited to:

- The Fire Management Program shall be discussed annually during meetings or informal discussions with all park personnel, local communities and at appropriate public relations opportunities.
- Fire Management Program concepts and major activities will be incorporated into the Interpretive Program' i.e., incorporated into interpretive walks, talks and other programs dealing with volcanic activity and vegetation management.
- Informational handouts prepared describing program concept/major activities to be made available at the Visitor Center and other place with park information.
- All visitors to zones where fires are burning will be informed at the trailhead.
- Adjacent landowners and managers shall be notified of preparedness, suppression and prescribed burn activities that may affect their operations.
- During prescribed burning projects, news briefs shall be released to newspapers, radio and television stations as appropriate.

X: B. Fire Information - During Incidents, Increased Fire Danger

The Pu'ukohola Heiau Chief Ranger will be kept informed of the incident status and/or increasing fire danger. When conditions warrant, the following actions will be coordinated with the Pacific Islands FMO, Superintendent and Chief Ranger:

- When areas are closed due to fire situation, information shall be posted and preferably park personnel present near the area most of the day.
- Park personnel will keep users informed of the fire situation.
- Consult public information activities and capabilities in response to escalating fire danger Pacific Islands FMO.

XI. PROTECTION OF SENSITIVE RESOURCES

Existing archeological, cultural and historic resources have already been emphasized as the major resource value and management goal for this NHS.

A major element associated with these resources is the challenge to manage the landscape, particularly the vegetation, to resemble the appearance and species composition present during the era when the Heiau was constructed.

Restriction of mechanized equipment off major roadways during implementation of fire management activities, including suppression, emphasis on use of MIST (**Exhibit 7**) during suppression, and intentions to reduce existing wildland fuels as means to lessen heat intensity and extensive fire spread summarize the means to provide this protection.

XII. FIRE CRITIQUES AND FMP REVIEW

XII: A. Wildland Fire Critique

The Incident Commander will conduct a fire critique within 15 days after a wildland fire has been declared out. The purpose is to identify procedures that may need to be improved, processes that might need changed, and those situations that worked well and need to be emphasized in the future.

XII: B. Fire Management Plan Review

This Fire Management Plan will be reviewed annually. Minor modifications will be made as deemed necessary, with approval by the Superintendent, Pacific Islands FMO and the NPS Pacific West Regional Director.

The compliance document this plan is based on is scheduled for a major review five (5) years from the approval date.

Major changes will require a reassessment of the appropriate NEPA compliance document.

XIII. CONSULTATION AND COORDINATION

This plan was developed along with an Environmental Assessment. As required by the National Environmental Protection Act, public cooping, public notices, and contacts with other federal, State and local officials were done at that time. Their issues were addressed by the NEPA process. Their concerns and/or mitigating measures were incorporated in the strategies and activities outlined in this FMP.

Reviewers and contributors for this plan are:

Joe Molhoek Pacific Islands FMO, Hawaii Volcanoes National
Park, P.O. Box 52, Hawaii N.P., HI

Jack Minassian, Pacific Islands FMO (now retired), Hawaii
Volcanoes National Park, P.O. Box 52, Hawaii N.P., HI

Rick Smedley, PWR Fire Planner, 1220 Main Street, Suite
460, Vancouver, WA 98660

XIV. APPENDICES

References

Daehler, Curtis C. *Using Fire to Restore and Manage Pili Grasslands at Pu'ukohola NHS*, November, 1998. Department of Botany, University of Hawai'i Manoa, Honolulu, HI.

Haleakala National Park. *Fire Management Plan*. November, 1990.

National Wildfire Coordinating Group. *Prescribed Fire Handbook*. National Interagency Fire Center, Boise, Idaho.

National Wildfire Coordinating Group. *Western Region Prescribed Fire Monitoring Handbook*. National Interagency Fire Center, Boise, Idaho.

National Wildfire Coordinating Group, 1998. *Wildfire Prevention Strategies*. Publication # NFES 1572. National Interagency Fire Center, Boise, Idaho.

Pu'ukohola Heiau National Historic Site. *Fire Management Plan*. June, 1992.

Rock, 1974 and Carlquist, 1970. *Observations & Comments Regarding Native Vegetation Change on Island of Hawai'i*.

U.S.D.I. *BAER Handbook*. National Office, Washington D.C.

U.S.D.I. *DO- 18 (NPS Director's Order)*, NPS Fire Management Policy. 2000.

Zimmerman, G. Thomas (NPS) & David L. Bunnell (FS) "*Draft*" *Environmental Assessment*. 1998. *Wildland and Prescribed Management Policy - Implementation Procedures Reference Guide*. National Interagency Fire Center, Boise, Idaho.

Glossary

Appropriate Management Response - Specific actions taken in response to a wildland fire to implement protection and fire use objectives.

Burning Index (BI) - A number relating to the contribution of fire behavior to the effort of containing a fire.

Monitor - (confine) To allow a fire to burn within determined boundaries established either prior to the fire, during the fire, or in an wildland fire situation analysis.

Monitor + Contingency action - (Contain) Any action necessary to keep fire within predetermined boundaries which can reasonably be expected to check the fire's spread under prevailing conditions.

Contingency Plan - A back-up plan of action for implementation when actions described in the primary plan are no longer appropriate. On prescribed fires, these are the actions to be taken if the fire is declared out of prescription and designated a wildfire.

Direct Suppression - (Control) direct suppression is to complete a line around the fire, any spot fires, and any interior islands to be saved; to burn out any unburned area adjacent to the fire side of the control line; and to cool down all hot spots that are immediate threats to the line until the line can reasonably be expected to hold under foreseeable conditions.

Escaped Fire - A fire that has exceeded the first calculation of initial attack resources and reasonable reinforcements necessary for prompt control or that exceeds its fire prescription.

Fire Management Unit (FMU) - A term used to denote the division of an area for fire planning purposes based on common fire management objectives

Fuel Model - A simulated fuel complex for which all the fuel descriptors required for the solution of a mathematical fire spread model have been specified

Holding Plan - A plan necessary to maintain a fire within a designated area. On prescribed fires, this plan describes actions to be taken to maintain the fire within prescription such as line construction, burnout, mop-up, and facilities protection.

Minimum Impact Suppression - The application of strategy and tactics which effectively meet suppression and resource objectives with the least cultural, environmental, and social impacts.

Minimum Tool - Apply only the minimum impact policy, device, force, regulation, instruments, or procedure to bring about a desired result.

Monitoring Team - A team, designated in writing by the responsible line officer, whose function is the daily monitoring of wildland fire use and there commendation of management options for those fires.

Prescribed Fire - Any fire ignited by management actions to meet specific objectives. A written approved prescribed fire plan must exist, and NEPA requirements must be met prior to ignition.

Prescription - Measurable criteria that guide selection of appropriate management actions and response. Prescription criteria may include safety, economic, public health, environmental, geographic, administrative, social or legal considerations.

Wild Fire - An unwanted wildland fire.

Wildland Fire Implementation Plan (WFIP) - A progressively developed assessment and operational management plan that documents the analysis and selection of strategies and describes the appropriate management response for a wildland fire or a wildland fire being managed for resource benefits. A full WFIP consists of three stages. Different levels of completion may occur for differing management strategies (i.e., fires managed for resource benefits will require tow to three stages of the WFIP completed while some fires that receive a suppression response may only have one or two stages completed).

Wildland Fire - Any non-structure fire, other than prescribed fire, that occurs in the wildland.

Wildland Fire Situation Analysis (WFSA) - A decision making process that evaluates alternative management strategies against selected safety, social, economical, political, and resource management objectives as selection criteria.

Wildland Fire Use - Fires in designated areas, which are ignited by lightning and are allowed to burn under preplanned, specified conditions and objectives, to achieve resource management benefits.

Exhibit 1 Wildland Fire Management Policy

NPS fire policy is contained in Director's Order 18. NPS fire policy meets Federal Fire Policy for all wildland fire fighting agencies.

Implementation of NPS fire policy is delineated in NPS Reference Manual 18.

Exhibit 2 Wildland Fire Implementation Plan (WFIP)

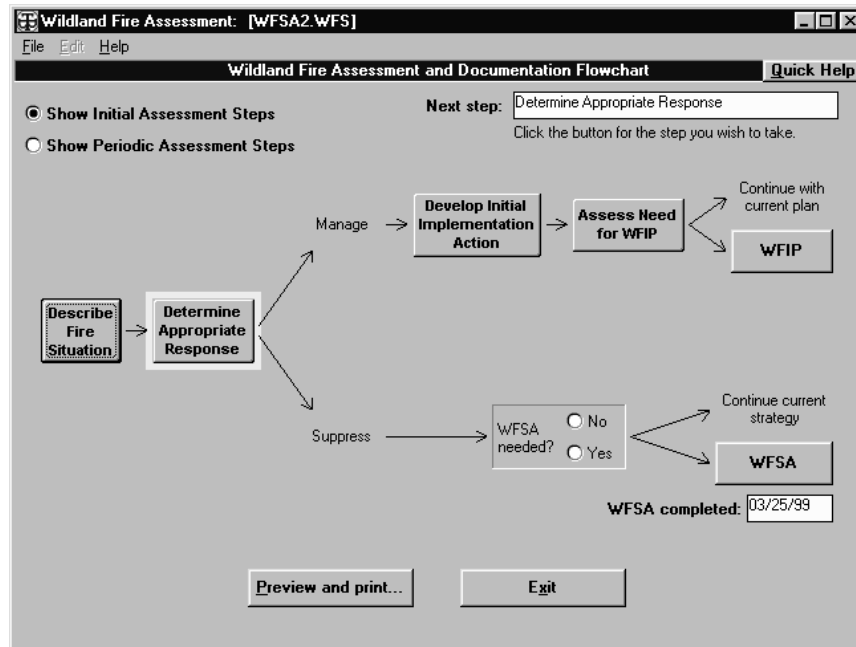
The Wildland Implementation Plan (WFIP) is available from the NIFC website ([http:\www.nifc.gov](http://www.nifc.gov))

Exhibit 3 Wildland Fire Situation Analysis (WFSA)

The following figures represent the steps required in the completion of a WFSA. This software is available from the NIFC website. (<http://www.nifc.gov>)

The first three steps show data entry screens necessary for the completion of the WFSA, including the flowchart which aids decision making. The inputs are then calculated by the software, and a report is generated (see Step 4). Based on the input information, this report will give an overall assessment of the fire, the alternatives for managing the fire, and costs associated with each.

Step 1: WFSA Flowchart



Step 2: Appropriate Management Response Assessment

Question	Yes	No
Is the fire human caused?	<input type="radio"/>	<input type="radio"/>
Is a suppression oriented response required due to lack of an approved management plan?	<input type="radio"/>	<input type="radio"/>
Is there a serious threat to life, property or resources?	<input type="radio"/>	<input type="radio"/>
Are potential effects on cultural and natural resources outside the range of desired effects?	<input type="radio"/>	<input type="radio"/>
Are relative risk indicators and/or risk assessment results unacceptable to the appropriate Agency Administrator?	<input type="radio"/>	<input type="radio"/>
Is there other proximate fire activity that limits or precludes successful management of this fire?	<input type="radio"/>	<input type="radio"/>
Are there other Agency Administrator issues that preclude wildland fire use?	<input type="radio"/>	<input type="radio"/>

Step 3: Complete Situation, Objectives, Costs, Impacts, Evaluation, Compare, Complexity, and Decision charts.

Step 4: Generate WFSA

Wildland Fire Situation Analysis

WFSA Information

WFSA Number: 1	Jurisdiction(s):
Fire Name:	Geographic Area:
Incident Number:	Unit:
Date/Time Prepared: 03/25/99 0807	Management Code:

Fire Situation

Start Date/Time:

Current Fire Size: acres

Fuel Conditions:

Fire Behavior - Current and Forecast:

Weather - Current and Forecast:

Suppression Resource Availability:

Objectives

Objective	Priority	Contribution	Overall
Safety	5	0.25	
Firefighter Safety	5	0.33	0.083
Aviation Safety	5	0.33	0.083
Public Safety	5	0.33	0.083
Economic	5	0.25	
Forage	5	0.14	0.036
Improvements	5	0.14	0.036
Recreation	5	0.14	0.036
Timber	5	0.14	0.036
Water	5	0.14	0.036
Wilderness	5	0.14	0.036
Wildlife	5	0.14	0.036
Environmental	5	0.25	
Air	5	0.25	0.063
Visual	5	0.25	0.063
Fuels	5	0.25	0.063
T & E Species	5	0.25	0.063
Social	5	0.25	
Employment	5	0.33	0.083
Public Concern	5	0.33	0.083
Cultural	5	0.33	0.083

Alternatives

	Alternative A	Alternative A
Primary Strategy		

Successful Outcome
 Probability: 100%
 Final Fire Size: acres
 Time to Contain: days
 Time to Control: days

Suppression Costs

	Alternative A	Alternative A
Successful Outcome		
Suppression cost: \$0		

Exhibit 4 Pu'ukohola Heiau NHS Vicinity Map



Exhibit 5 Cooperative Agreement (NPS-HCFD)

Agreement No. _____

MEMORANDUM OF UNDERSTANDING

BETWEEN

NATIONAL PARK SERVICE

AND

HAWAII COUNTY FIRE DEPARTMENT

I. Background

A. Purpose:

1. The purpose of this Memorandum of Understanding (hereinafter MOU) is to provide personal services and equipment required for fire prevention/suppression and the protection of life and property from fire on lands administered by National Park Service (hereinafter NPS) and Hawaii County Fire Department (hereinafter Department).

B. Authority:

1. The statues found at 42 U.S.C. 1856 and 16 U.S.C. 1b(1) provide authority for the National Park Service to enter into reciprocal agreements and to render emergency fire fighting and cooperative assistance to nearby fire prevention agencies to extinguish fires and preserve life and property.

2. The Chief of the Hawaii County Fire Department has signature authority to enter into agreements with the NPS regarding fire prevention and suppression services on NPS administered lands.

3. The Pacific Island Superintendent has signature authority to enter into agreements with the Hawaii County Fire Department, regarding fire prevention and suppression services on NPS administered lands and to provide reciprocal assistance.

Exhibit 6 Delegation of Authority Letter (Sample)

**Pu'ukohola Heiau NHS
LIMITED DELEGATION of AUTHORITY**

Date:

To: _____, Incident Commander, _____ Fire

From: Superintendent, **Pu'ukohola Heiau NHS**

Subject: Delegation of Authority for Fire Suppression

As Superintendent, I am responsible to protect PUHE's resources and the lives of its visitors and employees. Your expertise in management of fires will assist me in fulfilling that responsibility during the present emergency situation.

By means of this memorandum I delegate to you the authority to carry out control of the fire or complex of fires named above in accordance with Department of Interior and Park Service policy and guidelines provided in the Agency Administrator's briefing and the wildland fire situation analysis. These documents will provide you with information on the current situation, management objectives and priorities, and constraints necessary to protect the National Historic Site's resources. You will find additional guidelines, concerns and constraints, if any, attached. A list of personnel assigned to assist you and of facilities available for use is attached.

Upon the arrival of the entire team, I will conduct an onsite briefing for you and your overhead organization. The local fire bosses will also conduct a fireline briefing for you and your staff.

Additional considerations follow.

1. Your first priority at all times is safety of firefighters and the public.
2. My Agency Advisor for you is _____, whose title is _____. He/she has full authority to act for me in my absence.
3. My Resource Advisor for you is _____, whose title is _____.
4. Consistent with the suppression strategy, minimize environmental impacts. Use natural barriers and cold trail when possible. Avoid opening corridors along trails. Cut stumps to ground level, and remove trash from firelines daily. If not already addressed, specific needs for rehabilitation will be identified.
5. Emergency funds are available, but you should be prepared to make full explanation and provide accountability for any and all expenditures.
6. Dozers and all-terrain or off-road vehicles shall not be used without specific authorization except for a threat to life and habitable or historic structures. Use of aircraft, power saws and pumps, and generators are authorized as needed.
7. Please try to minimize impacts on **Pu'ukohola Heiau NHS** visitors and neighbors.
8. I expect you to assume management of the fire by this time: _____.

9. Office of Aircraft Services/Forest Service certified aircraft will be used within the constraints of Department of Interior policy.

10. All firelines will be rehabilitated, according to NPS policy and plans approved by my Resource Advisor.

11. Manage the fire with minimum disruption to visitor access and Recreation Area operations, consistent with public safety. You may close areas if necessary for public safety by authority of 36 CFR. You must notify me prior to implementing any closure.

12. My Resource Advisor must approve environmentally compatible retardant use, after the first load is dropped..

13. Incident base, staging areas, helispots, and camp operations will be confined to:

14. Public information for this Incident must be closely coordinated with the Chief Ranger. The Chief Ranger is _____, whose telephone number is _____.

15. Notify me of any threats to life or property as soon as possible.

16. Emergency suppression funding is available, and all requests for resources should be forwarded to the Pacific West Regional Office Fire Management Officer: Sue Husari

17. Provide training opportunities for personnel when possible to strengthen our organizational capabilities.

18. A closeout fire analysis and evaluation will be conducted by me or my representative prior to the Incident team departure. I request a 24-hour advance notice of the meeting.

19. Key resource constraints are:

- a. _____
- b. _____
- c. _____

20. Cultural features requiring priority protection are:

- a. _____
- b. _____
- c. _____

21. A determination will be made as to the necessity of rehabilitation of burned areas. If it is determined that rehabilitation of burned areas is necessary then a Burned Area Emergency Rehabilitation report will be prepared for both short and long term rehabilitation requirements. This report will be submitted within 24 hours of control of the fire.

Superintendent

Date

Incident Commander

Exhibit 7 MIST Guidelines

MINIMUM IMPACT SUPPRESSION TECHNIQUES

Fire management activities within this NPS area will be carried out in a manner that minimizes impacts to the resources. Primary directive to impart upon suppression forces is the importance of "minimum impact" policy (choosing methods and equipment which least alter the landscape or disturb the resources). The objective is to protect the integrity of the park without relaxing safety standards or compromising suppression objectives. A resource advisor should be utilized on extended attack fires. The following are specific minimum impact tactics to be used when fighting a fire in this park.

FIRELINE PHASE

Select procedures, tools, and equipment that least impact the environment.

- Give serious consideration to use of water as a fire-lining tactic.
- Cold trail fire-edge instead of constructing fireline.
- Wherever possible, allow fire to burn to natural barriers.
- Consider burning out.
- If possible, roll logs out of intended fireline instead of bucking. If moving or rolling is not possible, or if the down log/bole is already on fire, build line out around and let the material be consumed.
- Adjacent to fireline; limb only enough to prevent additional fire spread.
- Inside fireline; remove or limb only those fuels which if ignited would have potential to spread fire outside the fireline.
- Minimize cutting trees, burned trees and snags.
- Live trees will not be cut, unless determined they will cause fire spread across the fireline or seriously endanger workers. If tree cutting occurs, cut the stumps flush with the ground or use a slant cut
- If constructed fireline is necessary, it should be kept to the minimum width and depth necessary to stop the fire's spread. Effectively widen minimal firelines by carefully burning fuels between the line and the fire.

- Locate the fireline in areas requiring a minimum of scraping and cutting.
- Follow an irregular line.
- Minimize clearing of fuels next to the fire's edge.
- When possible, scrape fuels from the base of snags and around heavy fuel concentrations to prevent fire spread and spotting.

MOP-UP PHASE

- Check burned fuels inside the fire perimeter by hand.
- Try to avoid tool scars by using water or wetting agents to extinguish fire when necessary.
- Minimize soil disturbance during spading or water use.
- Roll logs to check for fire instead of bucking or excessive cutting. If rolling is not possible, let the log burn out if it is not a threat to additional fire spread.
- Cool, remove, or burn fuels, which may ignite and cause fire spread.
- Allow fuels, snags, and trees to burn until out when they are well inside the fire perimeter and pose no threat to safety or fire spread.
- When falling appears necessary, consider alternative methods such as fireline explosives, heli-bucket drops, or marking and surveillance.

HELISPOT CONSTRUCTION - AERIAL OPERATIONS

- Consider long lining instead of helispot construction.
- Use natural openings whenever possible; minimize tree cutting only to allow safe operation.
- Avoid construction of landing areas in high visitor use areas or sensitive meadows/sites.
- Consider use of heli-bucket and water before calling tanker/retardant.
- If tanker use is necessary, request retardant without color dye.

SPIKE CAMPS

Fire Camp facilities will be located outside of the sensitive areas whenever possible. In spike camp situations, firefighters should follow the same land/park ethics as is expected of the recreation visitor.

- Whenever possible, use existing campsites or select a site that is unlikely to be seen by a visitor.
- Camp on impact-resistant sites such as rocky or sandy soils or openings within heavy timber. Avoid camping in meadows or along streams and shorelines.
- Use stoves for cooking. Avoid constructing rock or pit fire rings.
- Locate toilet sites a minimum of 200 feet from water sources.
- Keep latrine holes less than 8 inches deep to speed decomposition of waste by soil bacteria. If there is a very large group, dig a trench style latrine.
- Evaluate "coyote"/spike camps versus travel to/from base campsites especially when sensitive areas are involved.
- Avoid clearing vegetation, trenching around sleeping areas and cutting of boughs for bedding.
- Do not cut trees or brush to construct campsites unless absolutely necessary.
- Personal washing should be done 200' from water sources using biodegradable soap.
- Avoid using food packaging that is illegal in the park area (cans and bottles).

REHAB

The planning for rehab should begin as soon as the crews arrive. This will for time to plan and do a thorough job.

FIRELINE AND MOP-UP

- Fill in firelines with the dug-out soil and duff.
- Drain trails or use water bars and sediment dams to prevent erosion.
- Scatter obvious, large accumulations of cut limbs, seedlings, and saplings to a more natural arrangement.--Scatter some cut brush and limbs onto fireline so it blends with the natural appearing landscape.

- Cut stumps so not to exceed 2-4 inches in height.
- Camouflage cut stumps.
- Consider using explosives that result in more natural looking stumps.
- Remove all plastic flagging and trash along the fireline.

HELISPOTS

- Scatter limbs and trees that were cut during construction in a natural appearing manner. If excessive amounts exist, pile in an area not visible to visitors, to be burned at a later date.
- Obliterate landing pad and leave in as natural condition as possible.
- Remove plastic flagging, signing and trash.

CAMPSITES

- Leave the area in as natural appearing state as possible.
- If a site was constructed, scarify area if necessary and fill in the latrine.
- Complete a thorough litter sweep of the area.
- Consider re-vegetation needs in the rehab plan.

AIRCRAFT

When not essential to the mission, or mission safety, aircraft will maintain 4000' MSL restriction over the park area. During heavy air operations and large fire activity this restriction will be waived for aircraft safety. The Chief Ranger may approve aerial foam use on a case-by-case basis. Retardants may be thinned with water to ease impacts on the resources.

Exhibit 8 NPS Prescribed Burn Plan (format & instructions)

Prescribed Burn Plan Format

Pu'ukohola Heiau NHS

Project Name Here

Approval Signatures:

Prepared by: _____ Date: _____

Prescribed Fire Specialist

Reviewed by: _____ Date: _____

Chief Ranger/ Resource Specialist

_____ Date: _____

Resource Technician

Approved by: _____ Date: _____

Superintendent

ON FIRST DAY OF IGNITION:

Accepted by: _____ Date: _____

Burn Boss

Go/ No-Go Checklist

	YES	NO
Is the burn plan complete and approved?		
Are all fire specifications met?		
Is the current and projected fire weather forecast favorable?		
Are all personnel required in the burn plan on site?		
Have all personnel been briefed on the plan requirements?		
Have all the personnel been briefed on safety hazards, escape routes, and safety zones?		
Is all of the required equipment in place and in working order?		
Are available resources available as backup for containment under worst case conditions?		
Have all pre-burn telephone calls and public safety concerns been met?		
Have all mitigation measures for protected resources been met?		
In your opinion, can the burn be carried out according to plan and will it meet the objectives?		
Are you comfortable with the contingency plan?		

If there is a NO response to any of the above questions, the burn will not occur until the problem is solved.

This is a required form and must be completed prior to ignition.

Signature of burn boss

Date

Time

Description of the Prescribed fire area

INSERT DESCRIPTION OF THE SITE

DESCRIPTION OF SPECIFIC UNIT

Include a description of the unit being burned.

PUHE is a Class II airshed. Smoke effects need to be considered for the nearby communities. Table 1 lists physical characteristics of the unit.

Figure 1: Map of burn unit

Table 1: Physical description of burn unit

Location:
Size:
ELEVATION RANGE:
SLOPE RANGE:
ASPECT(S):
DESCRIPTION OF BOUNDARIES:

Goals and objectives

The purpose of this burn is to FILL IN Appropriate Verbiage

This burn plan is compliant with the Fire Management Plan and Categorical Exclusion for PUHE,

_____ Date: _____

The specific objectives for this burn are to:

- 1)

Range of acceptable results

Acceptable results for this burn include meeting these resources objectives while doing the following:

- 1) Ensure safety for the public and personnel associated with the fire.
- 2) Eliminate natural and cultural resource damage.
- 3) Limit smoke impacts to neighboring communities.
- 4) Increase public education regarding the role of fire in these ecosystems.

Project assessment

Complexity

Table 2 Lists the calculated Complexity rating for the burn. This complexity analysis provides a method to assess the complexity of both wildland and prescribed fires. The analysis incorporates an assigned numeric rating value for specific complexity elements that are weighted in their contribution to overall complexity. The weighted value is multiplied times the numeric rating to provide a value for that item. Then all values are added to generate the total complexity value. Breakpoint values are provided for low, moderate, and high complexity values.

Complexity ratings for each category range from 1 (low complexity) to 5 (high complexity). Descriptions of complexity level ratings can be found in the Fire Management Plan. Weighting values are shown in the table.

Complexity Rating (circle)	Low	40-90
	Moderate	91-140
	High	140-200

Table 2: Complexity Rating

Complexity Element	Weighting Element	Complexity Value	Total Points
Safety	5		
Threats to boundaries	5		
Fuels and fire behavior	5		
Objectives	4		
Management Organization	4		
Improvements	3		
Natural, cultural, social values	3		
Air quality values	3		
Logistics	3		
Political concerns	2		
Tactical operations	2		
Interagency coordination	1		
TOTAL COMPLEXITY POINTS			

Risk Assessment

INSERT RISK ASSESSMENT FOR THE PROJECT HERE

Prescribed fire implementation actions

Preburn Considerations

The following will be completed prior to ignition:

- 1) Ensure protection of visitors, employees, and the public. Local media will be informed of the burn prior to ignition.
- 2) The burn boss will be responsible for any holding actions deemed necessary at the time of ignition. Resource advisors will be involved with the construction of any fireline.
- 3) Layout of ignition areas will be precise prior to ignition. Maps will be prepared and be readily available to all personnel. NO ONE will be allowed inside the burn unit area without a proper briefing.
- 4) Helispots will be identified and marked for use as necessary.
- 5) On site weather and spot weather forecasts will be available prior to ignition. These data will assist in all aspects of the burn and will aid in ensuring firefighter safety. This is the burn boss' responsibility.

Briefing

A briefing will be conducted for all fire personnel. This briefing will include distribution of a staffing plan and maps to all individuals working on the fire. Elements of the briefing should include safety, personnel assignments, communications, ignition and holding plans, and description of the contingency plan.

Test Fire

A test fire will be ignited prior to ignition of the entire unit. At the discretion of the burn boss, this test fire may occur as part of the stated ignition sequence. If this test fire is deemed to be burning within prescription, the ignition sequence may continue.

Prescribed Fire Prescription

Table 3 lists the range of acceptable values for key variable in the prescription. Appendix B contains the BEHAVE runs validating these ranges.

Table 3: Prescription parameters

	Day 1		Day 2	
	Acceptable Range	Desired	Acceptable Range	Desired
Fuel Model				
Temperature				
RH				
Mid-Flame Wind Speed				
Slope				
Wind Direction				
1 hr fuel moisture				

10 hr fuel moisture				
100 hr fuel moisture				
Live fuel moisture				
Rate of Spread				
Flame length				
Scorch height				
Spotting distance				

Special Conditions, Public and Personnel Safety

All standard wildland firefighter safety rules will be strictly enforced. Project personnel will wear appropriate personal protective equipment (PPE) during all phases of the project. No person will be allowed into the project area during preparation or execution without the appropriate PPE.

A daily safety briefing will be held prior to work on the project during each phase of the project (see briefing section).

The burn boss and prescribed fire management team will analyze safety concerns such as smoke on main roads, potential health impacts to visitors, and other issues. The burn boss will be responsible for resolving these issues, as appropriate.

The Burn Boss will work with and through appropriate line supervisors to institute any corrective safety measures associated with this project. If a serious safety issue cannot be resolved prior to ignition of any portion of this project, ignition will not take place. If the issue occurs during the execution of the project it will be mitigated with the most reasonable measures possible that will provide for the safety of the public and employees. If necessary, the project will be shut down. The burn boss, Chief Ranger, Prescribed Fire Specialist, and Superintendent have the authority to shut down operations on this project.

Burn Organization

Required positions for this burn include:

1 **LIST POSITIONS HERE**

Multiple positions may be filled by 1 person where appropriate (e.g., burn boss and ignition specialist). All persons filling the se positions must be NWCG qualified. The Burn boss has the discretion to increase the number of personnel on the fire, as deemed necessary.

Ignition Plan

The proposed ignition for this burn is **(GIVE SEASON)**_____. Burn duration is expected to be _____**(NUMBER OF)** days.

The burn will NOT be conducted if any of the following conditions exist:

- 1) Out of prescription dates or conditions of project plan are not met.
- 2) Emergency shutdown necessary.
- 3) Management concerns preclude ignition.
- 4) Local, regional, or national preparedness levels preclude new ignitions.

Firing methods will consist of **(DETAIL IGNITION METHOD AND TECHNIQUE)**.

All decisions regarding ignitions may be changed on-site, without revision of the burn plan, as long as prescription parameters are met. Topography, fuels, and weather conditions will drive firing techniques that will be employed on a given day. The Burn Boss, Ignition specialist, and Holding specialist will jointly determine techniques to be used.

Holding Plan

The holding specialist and/or burn boss will recommend holding actions for this burn.

No fire line will be constructed without consultation with a resource advisor, where feasible. All efforts will be made to control any slopover or spots with minimal amounts of ground-disturbing activity.

Aircraft may be used to hold portions of the project when holding capabilities are exceeded. No retardant shall be used within the **Pu'ukohola Heiau NHS** boundaries without the approval of the Superintendent or designate.

Mop-up will be conducted **LIST SPECIFICS**.

The holding specialist and burn boss may set up portable water sources, as necessary. Patrols of the fire perimeter will be conducted as determined by the holding specialist and burn boss.

The burn boss, prescribed fire specialist, and superintendent have the right to declare the prescribed fire a wildland fire, should conditions warrant.

Cooperation

Resources from other Federal Agencies may assist in the planning and implementation of this burn.

Contingency Plan

During the life of any portion of this project, prescribed fire activity may threaten the planned fire perimeter through spot fires or slopovers. These types of occurrences are planned for and will not cause the fire to be declared a wildland fire unless the fire activity exceeds the control of the forces available.

Means of attack on slopovers or spots within the contingency area may include (but are not limited to) the use of burnout activities, water from pumps or helicopters, etc. If line building is deemed necessary within the **Pu'ukohola Heiau NHS** boundaries, a resource advisor must be consulted.

The holding specialist will supervise all initial attack activities outside the burn perimeter and contingency boundaries. The holding specialist will make recommendations to the burn boss regarding the ability of the forces at hand to suppress these spots and slopovers. If additional holding forces are not readily available and the spots or slopovers threaten life or values at risk, the burn boss, prescribed fire specialist, or superintendent may declare the escape a wildland fire.

Any suppression activities within the **Pu'ukohola Heiau NHS** boundaries must comply with the **Pu'ukohola Heiau NHS** Fire Management Plan.

Should the fire burn onto State/County land, the State/County will be notified immediately.

Should the fire burn onto private land, the private landowner will be immediately notified. Should the private landowner have a burn permit and appropriate line constructed, the state will be notified that these conditions exist. If the private landowner does not have the required documentation or is not prepared, the state will be notified and the fire will be declared a wildland fire and appropriately suppressed.

Upon conversion to a wildland fire, the Burn boss will notify all personnel on the burn and the IC (as identified in the staffing plan; may be the burn boss if so qualified) will assume control of the fire. Dispatch will be notified immediately of the conversion and appropriate resources will be ordered.

The burn boss will be responsible for ensuring that, when necessary, additional contingency resources are available on the day of the burn or place on standby. This will be based on seasonality of the burn, fuel conditions, and ambient weather conditions.

Funding

Funding for this project is provided through NPS hazard fuel monies. Table 4 shows the money allocated through SACS (NPS budgeting mechanism).

Table 4: Funding

Smoke Management

Pu'ukohola Heiau NHS is a Class II airshed. List local communities that might be impacted by smoke.

Smoke will be managed following guidelines outlined in the Fire Management Plan including meeting state regulations, monitoring smoke column height and duration, and recording any complaints received by the local community.

Monitoring

Monitoring for fire behavior and effects for this burn will follow guidelines outlined in the Fire Management Plan (2005). Fire weather, rate of spread, flame lengths and a qualified fire behavior monitor will make other fire considerations.

Monitoring plots will be established in the burn unit prior to the burn. A map of these plots will be attached to the burn plan.

STATE POSITION OF MONITORS DURING THE BURN.

The fire monitor(s) will be directly supervised by the burn boss and will abide by all decisions made by the burn boss.

Post-fire monitoring will be completed as soon as conditions in the burn unit have been determined to be safe.

Post-burn Activities

Patrols will be established by the burn boss and/or holding specialist, as necessary. The burn boss has the responsibility of declaring the fire out.

The staff of **Pu'ukohola Heiau NHS** will be responsible for continued public education and interpretation regarding the burn. Notices and press releases will be prepared after the completion of the burn.

Monitoring of the burn will continue following monitoring guidelines stated previously and in the Fire Management Plan.

Exhibit 9 PUHE Fire Management Organizational Chart

Position/Role	Organization/Agency	Phone number
Daniel Kawaiaea - Superintendent	NPS	(808) 882-7218 (x22)
Ben Saldua – Chief Ranger	NPS	(808) 882-7218 (x26)
Joe Molhoek – FMO	NPS	(808) 985-6042
County Fire	HCFD	911

Exhibit 10 Fire Management Program Funding

Funding for fire management programs is in transition. FIRPRO was the historical funding program for NPS fire programs. FIREPRO is now being replaced by FIRE PROGRAM ANALYSIS a single funding program for all federal wildland firefighting agencies.

PUHE is a member of the PACIFIC ISLANDS Fire Program Unit (FPU).

Exhibit 11 Interagency Contact List

List of Cooperators/Contractors

Position/Role	Organization/Agency	Phone number
Darryl Oliveira-Chief	HCFD	(808) 961-8297
Eric Moller-Chief	DOD - PTA	(808) 969-2441
Andy Kikuta - FMO	FWS	(808) 933-6915

Table I

Fire Behavior Potential

Fuel Model	Flame Length	ROS	Comments
1	4 feet	78 ch/hr	Native grasses
3	12 feet	104 ch/hr	Existing alien grasses

*Comparison of potential fire behavior between native and alien grasses based on representative 90% weather parameters of 8% fire fuel moisture and 5 m.p.h. wind speed.

Table II

Annual Fire Management Reports - Records

Record/Report	Revision/Preparation Frequency	Responsible	Distribution
WFMI	Per incident	IC	FMO/VAX
Fire Weather Records	Daily from RAWS Daily from HQ Station	Chief, PR	Park
FMP Review	Annual	Chief, PR	Memo to Files
FMP Revision	Every year	Chief, PR	Park
FIREPRO Submission	Annual	FMO	WRO/NIFC
Park Situation Report	As needed	Chief, RM, FMO	FMO/NIFC, Districts
National Situation Report	As requested	FMO	Requester
Fire Danger/MC	Daily, when High to Extreme	Chief, RM. FMO	FMO, Supt/Chief s/ Districts
Emergency Firefighter Suppression Account	Per Wildfire	IC	FMO/Supt/W R
WR Burn Plan/NPS Complexity Analysis	Per Prescribed Burn	PBB or PFM	FMO/Supt
Red Cards	Annual	FMO	All appropriate fire personnel

Exhibit 12 Annual Fire Program Critique Form

Annual Fire Program Critique Form

**PUHE Fire Program
Annual Review**

Fiscal Year XXXX

Suppression

Total Number of Fires in PUHE:

Total Number of Fires PUHE Personnel Responded To:

Total PUHE Acres Burned:

Number of PUHE Personnel with at least 1 fire assignment:

List of Suppression Program Strengths and Weaknesses:

Specific Recommendations for Change (Indicate if the change is in the Fire Management Plan)

Fuels Management

Total Number of Projects Completed:

Total Number of Projects Planned:

Acres Within Planned Activity Areas:

List of projects with initial indication of whether the project objectives and goals were met (indicate the activity type i.e. broadcast burning, handpiling, machine piling etc.):

List of Fuels Management Programs Strengths and Weaknesses

Specific Recommendations for Change (Indicate if the change is in the Fire Management Plan)

Fire Management Program Overview

Recommendations for Change

Exhibit 13 Fire Management Plan Compliance

Decision Memorandum on the Action
and for the Application of Categorical Exclusion 1.12

Fire Management Plan for
Pu'ukohola Heiau National Historic Site

U.S. Department of the Interior
National Park Service
Pu'ukohola Heiau National Historic Site
Kawaihae, Hawaii

Pu'ukohola Heiau (NHS) Location

Pu'ukohola Heiau National Historic Site (NHS) is along the dry, western Kona coastline on the island of Hawai'i, in the northwestern portion. This NPS site is one mile south of Kawaihae, off highway 270, 27 miles north of Keahole-Kona International Airport.

Enabling Legislation For Pu'ukohola Heiau NHS

Pu'ukohola Heiau National Historical site was authorized by Congress in August, 1972 (86 Stat. 562) "to restore and preserve in public ownership the historically significant temple associated with Kamehameha the Great, ... and the property of John Young."

Enabling park legislation directs that the 77 acres set aside as Pu'ukohola Heiau National Historic Site is to be managed in order to protect three major historic sites:

- Pu'ukohola Heiau
- Mailekini Heiau
- John Young's House

Additional legislation that supports establishment of this National Historic Site and its significance are:

- The Organic Act of August 25, 1916, Section 102, established the National Park Service (NPS) and defined the purpose of the agency as "to conserve the scenery and the natural and historic objects and the wildlife therein and to provide for the enjoyment of the same in such manner and by such means as will leave them unimpaired for the enjoyment of future generations."
- The Historic Sites Act of 1935, in which Congress declared that "..... it is a national policy to preserve for public use historic sites, buildings, and objects of national significance for the inspiration and benefit of the people"
- National Trust Act of March 27, 1978 (P.L. 96-250) in which "Congress declares that the protection, management, and administration of(the National Parks)... shall be conducted in light of the high public value and integrity of the National Park System and

shall not be exercised in derogation of the values and purposes for which these various areas have been established, except as ...directly and specifically provided by Congress.”

Resource Management Plan Goals/Objectives

In 1991, an Operations Evaluation Team concluded that “The Statement for Management” would suffice as the primary objective for overall management of this NPS site. That management statement is to “restore the landscape to more nearly resemble the period of construction of Pu’ukohola Heiau and the residency of John Young.”

Additional objectives pertinent to all NPS units and the overall management of this site are:

- To protect human life.
- To protect all cultural resources present at this historic site.
- To protect other federal and private physical facilities (i.e. visitor center, adjoining facility structures, adjoining private and state/county properties).

The park’s authorizing legislation indicated that the site be established to “preserve historic sites and objects of national significance.” The specific period of historical significance centers on the era of King Kamehameha.

The park’s Statement for Management indicates that “the preservation of the historic remains ...” and “equally important, is consideration that the resource should be enjoyed by an optimum number of visitors in a setting that will, as nearly as possible, retain the atmosphere of historic Hawai’i.” The Statement of Management suggests that “the desired atmosphere is fragile and involves not only the historic structures and a setting unfettered by reminders of the twentieth century, but also the original ecology, which are associated with early Hawaiian occupation.”

Besides the reconstruction, stabilization or restoration of selected structures, other specific programs propose removal of exotic plants and restoration of the historic landscape “in the prime historic areas.” Encroachment by major exotic plants like Kiawe, buffel grass and fountain grass should be prevented.

Purpose and Need for the Action

The Fire Management Plan delineates fire management activities implemented at this National Historic Site, and proposes minimal use of fire for hazard fuel reduction and restoration of native plant species. This FMP outlines other fire management strategies, utilizing appropriate management response for suppression of wildfires and mechanical treatment of some hazardous fuel situations. Within this plan, cultural and natural resources conditions are intended to be restored and/or perpetuated, while protecting the park’s existing resources and surrounding lands

This programmatic fire plan may be used to guide the development of site-specific project plans, such as wildland hazard fuel reduction and use of prescribed fire. Use of prescribed fire will have a separate compliance document completed prior to project implementation.

This Fire Management Plan meets the requirements of Director’s Order 18 (DO-18) and this categorical exclusion is utilized for those parks with simple suppression programs.

Goals

The goals of the fire management plan are to:

1. Maintain the highest standard of firefighter and public safety, while protecting private property, park infrastructure, cultural resources, and other social values.
2. Facilitate reciprocal fire management activities through the development and maintenance of cooperative agreements and working relationships with pertinent fire management entities and neighbors.

Fire Suppression

Historically, all wildland fires have been suppressed at Pu'ukohola Heiau National Historic Site. Under the plan, the Historic Site will continue to suppress all wildland fires using a 'control' suppression strategy. A 'control' strategy will be used due to the threat to human safety, threat and potential damage to property, resources, and cost effectiveness. Suppression may not be used to accomplish resource objectives.

All suppression activities will follow these guidelines. They include:

1. Keep fire line widths as narrow as possible when they must be constructed.
2. Avoid ground disturbance within known natural and archaeological/cultural/historic resource locations. When fire line construction is necessary in proximity to these resource locations, it will involve as little ground disturbance as possible and be located as far outside of resource boundaries as possible.
3. Use soaker hose, sprinklers or foggers in mop-up, avoid boring and hydraulic action.

Mechanical Treatments

Hazard fuels at Pu'ukohola Heiau NHS are typically managed through mowing (grasses and other herbaceous vegetation), raking, cutting and chipping (woody vegetation), or other mechanical or cultural means.

Fuels around buildings, boundaries, roads, trails, picnic areas and other sites occasionally accumulate sufficient fuel density to create a hazard to real property, historic resources, or human health and safety. These fuels are usually managed by mechanical removal. Firebreaks are maintained around most structures in the Historic Site.

Heavy equipment including industrial mowers, large trucks, and trailer-mounted wood chippers could be used in mechanical fuel removal. Heavy equipment except mowers should usually be confined to existing roads and trails. In all cases, tracked and wheeled vehicles should only be used off roads and on trails under conditions where they will not significantly disturb soils, compact soils, or break up vegetative cover.

Compliance with the National Environmental Policy Act

The mechanical treatment option for reduction of fuels that is described in the fire management plan is categorically excluded from further documentation under the National Environmental Policy Act (NEPA) in accordance with 516 DM 2, Appendix 1, 1.12. Mechanical methods for crushing, piling, thinning, pruning, cutting, chipping, mulching, and mowing will not exceed 1,000 acres. Under this plan, there will be no hazardous fuels reduction activities using prescribed fire. Any proposed prescribed fire projects will require additional compliance commensurate to the activity proposed. Activities will be identified through a collaborative framework and be conducted consistent with agency and Departmental procedures and applicable land and resource management plans. Pu'ukohola Heiau National Historic Site does not contain Wilderness Areas. Additionally, the fire management program will not include the use of herbicides or pesticides or the construction of new permanent roads or any other new permanent infrastructure. There will be no sale of vegetative material. The fire management plan was designed to conform to all National Park Service standards, and it incorporates the appropriate guides for the required and desired conditions relevant to the project activities. Suppression activities, if needed, would be considered emergency actions and not subject to NEPA requirements.

Thus, implementation of the fire management plan is categorically excluded from further documentation under NEPA in accordance with 516 DM 2, Appendix 1, 1.12 because it meets all the specified criteria for the use of this categorical exclusion as described in the *Federal Register* (Vol 68, No. 108, pages 33814-33824).

As documented in the Environmental Screening Form, the application of this categorical exclusion is appropriate in this situation because there are no extraordinary circumstances that have the potential to significantly affect the environment. None of the exceptions to categorical exclusions found in §3.5 of the DO-12 Handbook (Director's Order-12, *Conservation Planning, Environmental Impact Analysis, and Decision-Making Handbook*) or other cautions found in §3.6 of the Handbook apply.

Persons and Agencies Consulted

Federal Agencies

Daniel K. Kawaiāe'a Jr., Superintendent, Pu'ukoholā Heiau National Historic Site, National Park Service
Ben Saldua, Chief Ranger, Pu'ukoholā Heiau National Historic Site, National Park Service

Peter Amerling, Maintenance Division Supervisor, Pu'ukoholā Heiau National Historic Site, National Park Service

Geraldine Bell, Superintendent, Pu'uhonua o Honaunau NHP & Kaloko-Honokohau NHP, National Park Service

Cindy Orlando, Superintendent, Hawai'i Volcanoes National Park

Donald Swanson, Scientist-in-charge, Hawaiian Volcanoes Observatory

Plant or animal species, listed as Endangered or Threatened under the Endangered Species Act, are not known to occur within Pu'ukoholā Heiau National Historic Site. In addition, no species that are proposed to be listed or candidates for listing under the Act are found within the Historic Site. Therefore, consultation with the US Fish and Wildlife Service under Section 7 of the Endangered Species Act is not required.

Cultural Contacts

William Akau, 'Ihilani Ali'i, Nā Papa Kanaka o Pu'ukoholā Heiau

Fred Cachola, Hawaiian Community Elder

Bud Pomaikai Cook, Na 'Aikāne o Pu'ukoholā Heiau

Mel Kalahiki, 'Ihilani Ali'i, Nā Papa Kānaka o Pu'ukoholā Heiau

Herb Kawainui Kāne, Artist/Historian

Dan Kaniho, Kalaimoku, Nā Papa Kānaka o Pu'ukoholā Heiau

John Keola Lake, Kahuna Nui, Nā Papa Kanaka o Pu'ukoholā Heiau

Paul Andrade, Director, Ka Hale o Kawaihae & Konohiki, Nā Papa Kānaka o Pu'ukoholā Heiau

Kunani Nihipali, Po'o, Hui Mālama i Nā Kūpuna o Hawai'i Nei

Richard Paglinawan, Queen Emma Foundation

Fran Sanford, Vice President, Nā 'Aikane o Pu'ukoholā Heiau

Willette Guerrero, President, Waimea Hawaiian Civic Club

Jojo Tanimoto, President, Kawaihae Hawaiian Homesteaders Association

Manuel Veincent, President, Kawaihae Canoe Club

State Agencies

Ian Birnie, District Manager, Department of Transportation, Harbors Division
Lanny Terlep, Hawai'i Island Branch Chief, Department of Land and Natural Resources
Glenn Taguchi, District Park Superintendent, Department of Land and Natural Resources
Stanley Tamura, Hawai'i District Engineer, Highways Division, State Department of Transportation
Nancy Murphy, Acting Boating District Manager, Department of Land and Natural Resources
Robert Nishimoto, Neighbor Island Aquatic Biologist, Division of Aquatics, Department of Land and Natural Resources
Ruby McDonald, Community Resource Coordinator, Office of Hawaiian Affairs
James Dupont, District Supervisor, Hawaiian Home Lands
Lynne Lee, Land and Natural Resources Officer, Office of Hawaiian Affairs
Janet Kawelo, Deputy Director, Department of Land and Natural Resources
Peter Young, Chairperson, Board of Land and Natural Resources

Local Agencies

Patricia Engelhard, Director, Department of Parks & Recreation, County of Hawai'i
Lawrence Mahuna, Chief of Police, Hawai'i County Police Department
Darryl Oliveira, Chief, Hawai'i County Fire Department
Kissaiea Hayward, President, Kawaihae Village Association
Ralph Blancato, Vice President, Kawaihae Boaters Association
Art Ushijima, President, Queen's Medical Center
Robert Oshiro, CEO, Chairman of the Board, The Queen Emma Foundation
Les Goya, Project Manager, The Queen Emma Foundation
President, Kawaihae Pua ka 'Ilima Community Association
Yoichi Asari, President, Mauna Kea Properties
Dennis Lee, Chief Engineer, Hawai'i County Department of Public Works
Robbie Hind, President, Mauna Kea Soils & Conservation District

Plan Conformance

The fire management plan is in conformance with the National Historic Site's approved plans: Upon its approval, the fire management plan will be considered an action plan in conjunction with the Statement for Management.

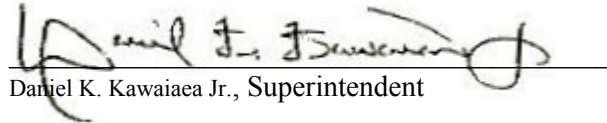
The Statement for Management emphasizes the protection and preservation of the Historic Site's resources, primarily the cultural resources. The overriding concerns are to ensure that fire management activities do not threaten those resources, but instead are used to ensure their continued protection. The provisions included in the fire management plan and the management considerations that affect operational implementation are consistent with addressing these concerns.

Decision and Rationale on Action

I have decided to implement the fire management plan at Pu'ukohola Heiau National Historic Site. The Pu'ukohola Heiau National Historic Site Fire Management Plan delineates the appropriate management response that Historic Site managers will follow in the event of a wildland fire. The plan defines levels of protection needed to insure personnel and public safety and to protect facilities and resources. The fire management plan includes manual or mechanical fuel treatments as components of fire management in the Historic Site. The mechanical treatments for reduction of fuels are categorically excluded from further documentation under the National Environmental Policy Act (NEPA) in

accordance with 516 DM 2, Appendix 1, 1.12. Under this fire management plan, neither prescribed fire nor wildland fire use will be employed at Pu'ukohola Heiau National Historic Site.

I have determined that no further environmental analysis is required.


Daniel K. Kawaiaea Jr., Superintendent

Sept. 13, 2005
Date

Administrative Review or Appeal Opportunities

This action is not subject to administrative appeal because the NPS does not have a formal appeal process. Concerns about this action should be directed to the Pacific West Regional Director, National Park Service, 1111 Jackson Street, Suite 700, Oakland, CA 94607.

Contact Person

For additional information concerning this decision, contact:
Daniel K. Kawaiaea Jr., Superintendent
Pu'ukohola Heiau NHS
62-3601 Kawaihae Road
Kawaihae, HI 96743
808-882-7218
Headquarters

Categorical Exclusion Form

Project: Pu'ukohola Heiau National Historic Site Fire Management Plan Date: Sept. 13, 2005

Describe project, including location (reference the attached Environmental Screening Form (ESF), if appropriate):

The Pu'ukohola Heiau National Historic Site Fire Management Plan delineates the appropriate management response that Reserve managers will follow in the event of a wildland fire. The plan defines levels of protection needed to insure personnel and public safety and to protect facilities and resources. The Historic Site is a historic park with fire suppression implementation handled by Hawaii County Fire Department with oversight from Historic Site Staff.

Describe the category used to exclude action from further NEPA analysis and indicate the number of the category (see section 3-4 of DO-12):

Implementation of the fire management plan is categorically excluded from further documentation under NEPA in accordance with 516 DM 2, Appendix 1, 1.12 because it meets all the specified criteria for the use of this categorical exclusion as described in the *Federal Register* (Vol 68, No. 108, pages 33814-33824).

Describe any public or agency involvement effort conducted (reference the attached ESF):

Need to initiate public out-reach letting folks know about the fire management plan

On the basis of the environmental impact information in the statutory compliance file, with which I am familiar, I am categorically excluding the described project from further NEPA analysis. No exceptional circumstances (i.e., all boxes in the ESF are marked "no") or conditions in section 3-6 apply, and the action is fully described in section 3-4 of DO-12.

 Sept. 13, 2005
Park Superintendent or Designee **Date**

Park Superintendent
Title

Benjamin Saldua Chief Ranger
NPS Contact Person **Title**

62-2601 Kawaihae Road Kawaihae, HI 96743 808-882-7218 (x26)
Address **Phone Number**

Environmental Screening Form

Project Description/Location:

The Pu'ukohola Heiau National Historic Site Fire Management Plan delineates the appropriate management response that Historic Site managers will follow in the event of a wildland fire. The plan defines levels of protection needed to insure personnel and public safety and to protect facilities and resources. The plan establishes a fire management unit for the entire Historic Site. The fire management plan includes manual or mechanical fuel treatments as components of the fire management program in the Historic Site. The plan will not implement prescribed fire or wildland fire use as fire management program activities for this National Park Service unit.

	Yes	No	Data Needed to Determine
Mandatory Criteria (A-N). Would the proposal, if implemented:			
A. Have material adverse effects on public health or safety?		X	
B. Have adverse effects on such unique characteristics as historic or cultural resources; park, recreation, or refuge lands; wilderness areas; wild or scenic rivers; national natural landmarks; sole or principal drinking water aquifers; prime farmlands; wetlands; floodplains; or ecologically significant or critical areas, including those listed on the National Register of Natural Landmarks?		X	
C. Have highly controversial environmental effects?		X	
D. Have highly uncertain and potentially significant environmental effects or involve unique or unknown environmental risks?		X	

	Yes	No	Data Needed to Determine
E. Establish a precedent for future action or represent a decision in principle about future actions with potentially significant environmental effects?		X	
F. Be directly related to other actions with individually insignificant, but cumulatively significant, environmental effects?		X	
G. Have adverse effects on properties listed or eligible for listing on the National Register of Historic Places?		X	
H. Have adverse effects on species listed or proposed to be listed on the List of Endangered or Threatened Species, or have adverse effects on designated Critical Habitat for these species?		X	
I. Require compliance with Executive Order 11988 (Floodplain Management), Executive Order 11990 (Protection of Wetlands), or the Fish and Wildlife Coordination Act?		X	
J. Threaten to violate a federal, state, local, or tribal law or requirement imposed for the protection of the environment?		X	
K. Involve unresolved conflicts concerning alternative uses of available resources (NEPA sec. 102(2)(E)).		X	
L. Have a disproportionate, significant adverse effect on low income or minority populations (EO 12898).		X	
M. Restrict access to and ceremonial use of Indian sacred sites by Indian religious practitioners or adversely affect the physical integrity of such sacred sites (EO 130007)		X	
N. Contribute to the introduction, continued existence, or spread of federally listed noxious weeds (Federal Noxious Weed Control Act).		X	
O. Contribute to the introduction, continued existence, or spread of non-native invasive species or actions that may promote the introduction, growth or expansion of the range of non-native invasive species (EO 13112).		X	
P. Require a permit from a federal, state, or local agency to proceed, unless the agency from which the permit is required agrees that a CE is appropriate?		X	
Q. Have the potential for significant impact as indicated by a federal, state, or local agency or Indian tribe?		X	
R. Have the potential to be controversial because of disagreement over possible environmental effects.		X	
S. Have the potential to violate the NPS Organic Act by impairing park resources or values?		X	

	Yes	No	Data Needed to Determine
Are any measurable impacts possible in the following categories relating to physical, natural, or cultural resources? (Tailor the following to meet individual project needs.)			
A. Geological resources—soils, bedrock, streambeds, etc.		X	
B. From geohazards		X	
C. Air quality, traffic, or from noise		X	
D. Water quality or quantity		X	
E. Streamflow characteristics		X	
G. Floodplains or wetlands		X	
H. Land use, including occupancy, income, values, ownership, type of use		X	
I. Rare or unusual vegetation—old growth timber, riparian, alpine, etc.		X	
J. Species of special concern (plant or animal; state or federal listed or proposed for listing) or their habitat		X	
K. Unique ecosystems, biosphere reserves, World Heritage sites		X	
L. Unique or important wildlife or wildlife habitat		X	
M. Unique or important fish or fish habitat		X	
N. Introduce or promote non-native species (plant or animal)		X	
O. Recreation resources, including supply, demand, visitation, activities, etc.		X	
P. Visitor experience, aesthetic resources		X	
Q. Cultural resources, cultural landscape, sacred sites, etc.		X	
R. Socioeconomics, including employment, occupation, income changes, tax base, infrastructure, etc.		X	
S. Minority and low-income populations, ethnography, size, migration patterns, etc.		X	
T. Energy resources		X	
U. Other agency or tribal land use plans or policies		X	
V. Resource, including energy, conservation potential		X	

	Yes	No	Data Needed to Determine
W. Urban quality, gateway communities, etc.		X	
X. Long-term management of resources or land/resource productivity		X	

Please answer the following questions.

1. Are the personnel preparing this form familiar with the site, and/or has a site visit been conducted? (Attach additional pages noting when site visit took place, staff attending, etc.)

Yes, all personnel are familiar with the site.

2. Has consultation with all affected agencies or tribes been completed? (Attach additional pages detailing the consultation, including the name, date, and summary of comments from other agency or tribal contacts.) Yes in 1992 (Remove Hazardous Fuel / Undertaking #1278, EA closed out with a FONSI). Again in 1995 for another Rx Burn with a determination of no effect received by SHPO on June 7, 1995. Mechanical removal has always been a part of the previous undertakings, however future reduction of hazardous fuel loads will no longer involve Rx or slash burning. Current FMP recommends that only mechanical removal will be conducted.

Instructions

When you have completed a site visit (or if staff are familiar with the specifics of the site) and consultation with affected agencies and/or tribes, and if the answers in the checklist above are all “no,” you may proceed to the categorical exclusion form if the action is described in section 3-4 of Director’s Order #12. If any answers in the checklist are “yes” or “data needed to determine,” or if the action is not described in section 3-4, prepare an Environmental Assessment or Environmental Impact Statement. Attach maps, notes of site visits, agency consultation, relevant data or reports, the categorical exclusion form or other relevant information to this form to begin the statutory/administrative record file.

Signatory

In signing this form, you are saying you have completed a site visit or are familiar with the specifics of the site, that you have consulted with affected agencies and tribes, and that the answers to the questions posed in the checklist are, to the best of your knowledge, correct.

<u>Daniel K. Kawaiaea Jr.</u> Interdisciplinary Team Leader	<u>September 13, 2005</u> Date
<u>Richard Smedley / Fire Management</u> Technical specialist/field of expertise	<u>Joe Molhoek / Fire Management</u> Technical specialist/field of expertise

Exhibit 14 PUHE Emergency Notification List

PUHE Emergency Notification List

PUHE NHS		
Wildland Fire Emergency Notification List		
Position/Role	Organization/Agency	Phone number
Fire Management Officer	HAVO NP	(808) 985-6042 Cell: (808) 936-4873
Chief Ranger	PUHE NP	(808) 882-7218 x26 Cell: (808) 937-2020
Superintendent	PUHE NP	(808) 882-7218 x22 Cell: (808) 557-8342
Regional Contacts		
Fire Management Officer Sue Husari	NPS - WRO	(510) 817-1371 Cell: (415) 613-7752

Exhibit 15 Pre-attack Planning Checklist

Pre-attack Planning Checklist

1. Fire Organization
 - a. Fire Management Plan current
 - b. Park fire organization chart completed
 - c. Supervision adequate/qualified

2. Administration
 - a. Physical fitness/step tests completed
 - b. Fire qualifications cards up-to-date
 - c. Physical fitness program established
 - d. Appropriate training conducted
 - e. Interagency agreements current
 - f. Preparedness plan current
 - g. Pre-attack WFSA (if appropriate)
 - h. Pre-positioning needs
 - i. Draft delegation of authority
 - j. Management Constraints
 - k. Evacuation Procedures
 - l. Structural Protection Needs
 - m. Closure procedures

3. Facilities/Equipment
 - a. Weather stations maintained
 - b. Tools maintained
 - c. Saw and pump kits ready for use
 - d. Personal protective equipment inspected/ready
 - e. Engines maintained/equipped
 - f. Preventive maintenance conducted on engines
 - g. Fire caches in order

4. Fire Operations
 - a. Pre-season risk analysis conducted
 - b. Communications equipment ready
 - c. Prevention plan current
 - d. Step-up plan current
 - e. Local interagency cooperation arranged
 - f. Fire investigation procedures established
 - g. ICP, base, camp locations
 - h. Roads, trails (including limitations)
 - i. Utilities
 - j. Medical Facilities
 - k. Stores, restaurants, service stations

- l. Transportation resources location
- m. Rental equipment sources (by type)
- n. Construction contractors
- o. Sanitary facilities
- p. Police, fire departments
- q. Portable water sources
- r. Helispot, helibase locations
- s. Flight routes, restrictions
- t. Water sources
- u. Control line locations
- v. Staging area locations

Planning

- a. Park base map
- b. Topographic maps
- c. Infrared imagery
- d. Vegetation/ fuels maps
- e. Hazard locations (ground and aerial)
- f. Paleontological/Archaeological/cultural base map
- g. Endangered species critical habitats
- h. Sensitive plant populations
- i. Special visitor use areas
- j. Land status