
Emergency Stabilization & Rehabilitation Plan

Kalaupapa Fire

Pu'ukoholā Heiau National Historic Site, HI



Submitted by: _____ Date: _____

Daniel Kawaiaea, Superintendent



July 2020



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Unit Summary Information

Unit Name	Pu'ukoholā Heiau National Historic Site
Unit Identifier	PUHE
DOI Region	12

Fire Summary Information

Fire Name	Kalaupapa
Fire Number	HI-PHP-2000001
Fire Code	MZY8
Detection Date/Cause	January 9, 2020/Human
Date Contained	January 10, 2020
Acreage	21 acres NPS=21 acres

Account Number(s)

Emergency Stabilization—Plan Preparation, FY20

Fund	20XP112585
Cost Center	PPPWPUHE00
Functional Area	PF220ES85.RM0000
WBS	PF.FE MZY8020.00.1

Emergency Stabilization—Implementation, FY20

Fund	20XP112585
Cost Center	PPPWPUHE00
Functional Area	PF220ES85.RM0000
WBS	PF.FE MZY8020.00.2

Team Members

Position	Name & Affiliation
Team Leader/ Vegetation	Mark Wasser, Pacific Island Network I&M
Vegetation	Sierra McDaniel, Hawai'i Volcanoes NP
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EXECUTIVE SUMMARY

Introduction

This joint Emergency Stabilization (ES, also called Burned Area Emergency Response [BAER]) and Burned Area Rehabilitation (BAR) Plan has been prepared in accordance with Department of the Interior and National Park Service (NPS) policy and guidance, including:

- *Office of Wildland Fire (OWF) Policy Memorandum 2016-01 (Post-Wildfire Recovery Program and Policy Changes)* [\[LINK\]](#);
- *Interagency Standards for Fire and Fire Aviation Operations, 2020* [\[LINK\]](#);
- *NPS Reference Manual 18 (Chapter 18)* [\[LINK\]](#);
- *NPS Wildland Fire & Aviation Management Business Rules, FY20* [\[LINK\]](#);
- *Interagency Burned Area Emergency Response Guidebook (Version 4.0)*;
- *Interagency Burned Area Rehabilitation Guidebook (Version 1.3)*.

The primary objectives of the BAER program are to assess the need for and prescribe cost effective post-fire stabilization measures necessary to protect human life, property, and critical natural and cultural resources. The BAR program is intended to protect resources by repairing or improving burned landscapes unlikely to recover naturally to desired management conditions and to repair or replace fire-damaged minor assets. BAER and BAR are conducted in accordance with approved land management plans and policies, and all relevant federal, state and local laws and regulations.

BAER and BAR are intended to address imminent (<1 year) and short-term (<5 years) threats caused by wildfire, respectively; neither program is responsible for long-term management or rectifying deficiencies that existed prior to the fire. Department of the Interior and NPS BAER policy echoes federal wildland fire policy regarding protection priorities: human safety is first, and property and critical natural and cultural resources are ranked based on the relative values to be protected, commensurate with emergency stabilization and rehabilitation costs.

The basis of the BAER and BAR assessment process is identifying, assessing, and, as needed, protecting, repairing or replacing values at risk (VARs)—human safety, properties, capital improvements and critical natural and cultural resources—located within and downstream of burned areas, and impacted by fire and/or vulnerable to post-fire conditions. When evaluating a given VAR, consideration is given to the significance of the value, probability of damaging events occurring, the magnitude of potential consequences, and the feasibility to mitigate.

Management Documents

Pertinent approved land management plans and resource assessments that guided the preparation of this document included:

- Foundation Document, Pu'ukoholā Heiau National Historic Site (National Park Service, 2015)
- Pu'ukoholā Heiau NHS Fire Management Plan (National Park Service, 2006)
- Ala Kahakai National Historic Trail Comprehensive Management Plan (National Park Service, May 2009)
- Update to the Pu'ukoholā Heiau National Historic Landmark Nomination, Pu'ukoholā Heiau National Historic Site, Island of Hawai'i. Pu'ukoholā Heiau National Historic Site, c/o P.O. Box 52 Hawaii National Park, HI 96718, Kona, Hawaii (Pacheco, R., M.J. Tomonari-Tuggle, M. Bell, 2015)
- Archaeological Overview and Assessment for the Three West Hawai'i Island Parks, National Park Service. National Park Service, Kona, Hawai'i (Tomonari-Tuggle, M. J., H.D. Tuggle, 2006.)
- National Park Service Cultural Landscapes Inventory Pu'ukoholā Heiau National Historic Landmark Pu'ukoholā Heiau National Historic Site (Duwall, T. 2003)
- Vegetation management strategies for three national historical parks on Hawai'i Island (Pratt, L. W. 1998).
- Assessment of Coastal Water Resources and Watershed Conditions at Pu'uhoonua O Hōnaunau National Historical Park, Hawai'i. Technical Report NPS/NRWRD/NRTR-2006/352. NPS Water Resources Division, Fort Collins, CO (Hoover, D., C. Gold. 2006.)
- Kohala Watershed Partnership. 2011. Pelekane Bay Watershed Restoration Project August 2009 - February 2011. Final Project Report.

Assessments and Specifications

Eight specifications are proposed to address post-fire issues on the Kalaupapa Fire in FY20-FY23. These are summarized by costs below, and described in greater detail by subject matter area.

KALAUPAPA FIRE: EMERGENCY STABILIZATION SPECIFICATIONS

SPECIFICATION NUMBER	TITLE	UNIT	UNIT COST	NUMBER OF UNITS	WORK AGENT	FY20	FY21	COSTS
F-1	Stabilize Fire-Damaged Comfort Station	Each	\$14,225	1	F, S	\$14,255	\$0	\$14,255
F-2	Replace/Repair Miscellaneous Minor Assets	Each	\$530	14	F	\$7,420	\$0	\$7,420
CR-1	Cultural Resource Assessments	N/A	\$7,300	N/A	F	\$7,300	\$0	\$7,300
CR-2	Control Feral Ungulates	Each	\$495	13	F	\$6,445	\$0	\$6,445
V-1	Detect & Control Invasive Plants	Acres	\$240	21	F	\$5,058	\$0	\$5,058
V-2	Restore Native Vegetation	Acres	\$5,991	5	F	\$29,952	\$0	\$29,952
V-3	Remove Fire-Killed Trees	Miles	\$3,135	1	F	\$3,135	\$0	\$3,135
AD-1	Administration	N/A	N/A	N/A	F	\$4,900	\$0	\$4,900
TOTAL COSTS						\$78,465	\$0	\$78,465

Work Agent: C=Coop Agreement, F=Force Account, G=Grantee, P=Permittees, S=Service Contract, T=Timber Sales Purchaser, V=Volunteer

KALAUPAPA FIRE: BURNED AREA REHABILITATION SPECIFICATIONS

SPECIFICATION NUMBER	TITLE	UNIT	UNIT COST	NUMBER OF UNITS	WORK AGENT	FY21	FY22	FY23	COSTS
V-1	Detect & Control Invasive Plants	Acres	\$ 110	63	F	\$2,304	\$2,304	\$2,304	\$ 6,912
V-2	Restore Native Vegetation	Acres	\$ 6,075	15	F	\$41,098	\$32,498	\$17,522	\$ 91,118
TOTAL COSTS						\$43,402	\$34,802	\$19,826	\$ 98,030

Work Agent: C=Coop Agreement, F=Force Account, G=Grantee, P=Permittees, S=Service Contract, T=Timber Sales Purchaser, V=Volunteer

Vegetation

Issues

- Fire-killed and damaged trees in public use and administrative areas and in proximity to significant cultural resources.
- Direct fire mortality and damage in sections of pili grass restoration area and interpretive landscaping areas.
- Expansion of non-native invasive species in the cultural landscape and displacement of native plant species.
- Increase in hazardous fuels associated with the invasion of several non-native invasive species on concern.
- Failure to re-establish post fire vegetation cover due to herbivory by non-native feral goats.
- Direct and secondary post-fire risks to sensitive and threatened species, and/or species that contribute to the cultural landscape.

Recommendations

- *V-1 Detect and Control Invasive Plants* [ES (FY20), BAR (FY21-23)]. Invasive plant survey and control will be conducted within the burn area for the three high-priority invasive species/fuels concerns incipient to PUHE – guinea grass, fountain grass, and kiawe. The burn area will be surveyed semiannually (once in summer and once in winter) during FY20, and annually (summer) in FY21-23. Any individuals found will be removed using either mechanical or chemical control methods.
- *V-2 Restore Native Vegetation* [ES (FY20), BAR (FY21-24)]. The irrigation system used to stimulate growth of pili grass for out planting material for restoration of the cultural landscape was destroyed during the fire, and many outplanted individuals and their drip lines were also destroyed. The irrigation system needs to be repaired in order to provide planting materials during the critical, post-fire re-establishment phase; this work will be financed from a source other than ES or BAR. The transplanting of plugs of pili grass must also start immediately under this phase to best utilize the favorable conditions provided in the near term post-fire environment, and minimize the undoing of previous pili restoration work.

Pili grass is the desired condition for the cultural landscape, and restoration of pili will continue under BAR for three additional years. Existing pili areas will continue to be cared for and provide source material for ongoing restoration efforts. As plants gain size they can be divided and used as plugs for planting into new areas. Restoration will continue in the area of Pu'ukoholā Heiau, and can be expanded further down trailsides in the core area.

The rehabilitation of impacted landscaping areas will also be completed under this BAR treatment. Upright, woody, and highly flammable landscaping species will be replaced with mostly herbaceous, prostrate native species in burned landscaping areas next to infrastructure. This will reduce the risk and potential damage from future fires to that infrastructure, while also providing interpretive opportunities with ecologically appropriate native species.

- *V-3 Remove Fire-Killed and Damaged Trees* [ES (FY20)]. Fire-killed and damaged milo and kiawe trees pose a potential hazard to visitor safety and other values at risk (cultural and natural resources). The removal of these trees mitigates the hazard to visitors and employees and potential damage to cultural resources (damaged/dead trees are more likely to fall and impact archaeological sites), and also serves to reduce the presence of a heavy fuel and invasive species (kiawe) on the landscape. Depending on delayed mortality, as many as 30 trees may need to be treated, and known hazard trees will be mitigated as soon as possible.
- Post-fire management of vegetation will also benefit from specification *CR-2 Control Feral Ungulates*.

Infrastructure

Issues

- Severe fire damage to the Visitor Center comfort station rendered this facility unusable and vulnerable to further impacts.
- Fire damage to an above-ground waterline compromised the domestic water supply at the Headquarters.
- Fire damage to an above-ground irrigation system threatens the survival of landscape native vegetation plantings and will hinder post-fire restoration efforts.
- Loss or damage to various minor assets (park entrance sign, debris disposal bins, road signs, fencing, sprinkler/alarm system) will impact park operations and visitor experience.

Recommendations

- *F-1 (Stabilize Fire-Damaged Comfort Station)*: Per direction of the Region 12 Civil Engineer (Appendix A), a 12-mm. canvas tarp should be installed to prevent further

water intrusion. The tarp should be monitored during storms and repaired or replaced if damaged. Removing the tarp between rain events will allow for better air circulation within the structure. Second, four porta-potties (three regular, one handicap-accessible) should be rented to serve as restroom facilities for visitors until the Comfort Station can be rehabilitated. Costs associated with these treatments are very likely to extend into FY21.

- *F-2 (Replace/Repair Miscellaneous Minor Assets):* The following tasks should be performed:
 - Replace eight fire-damaged waste disposal bins and three cigarette butt receptacles should be replaced. If cost-effective, containers should be upgraded to materials better able to withstand future fires.
 - Replace ironwood trailhead fence in-kind.
 - Repair fire-damaged fire alarm and sprinklers on the exterior of the Visitor Center.
 - Purchase materials for approximately 2,000 feet of fire-damaged irrigation line and components.

Cultural Resources

Issues

- PUHE is a National Historic Landmark encompassed within a National Historic Site comprised of archaeological sites, historic structures, cultural landscapes, and traditional cultural properties. Native Hawaiian Organizations maintain strong traditional ties to these cultural resources.
- [REDACTED]
[REDACTED] Suppression actions—off-road vehicle traffic, dragging off fire hose, and water bucket drops—occurred in locations known to contain cultural resources. Loss of vegetative cover exposed numerous archaeological artifacts and cultural features to potential erosion, and sprouting vegetation has attracted feral goats into the park.
[REDACTED] Finally, the NPS Visitor Center contains important museum objects that may have been exposed to adverse environmental extremes during and immediately after the fire.
- Other emergency stabilization treatments have been proposed for public safety, preservation of park infrastructure, or protection of natural resource values. These treatments may have the potential to impact significant cultural resources, especially if ground disturbing activities are required.

Recommendations

- *CR-1 (Cultural Resource Assessments)* [ES (FY20)]: Archeological sites and features and museum objects were assessed as described above. No further treatments are recommended for archeological sites or features. The two PEM2 data loggers in the Visitor Center should be recalibrated in order to obtain temperature and humidity data during the Kalaupapa Fire.
- *CR-2 (Control Feral Ungulates)* [ES (FY20)]: As noted following the Kawaihae Fire in 2015, goats can cause damage to cultural resources, impede the recovery of native vegetation, and encourage the spread of exotic invasives. Because goats are entering PUHE via the park entrance road and it is not feasible to construct a barrier across public roadways, mitigation will consist of the HAVO Wildlife Biologist and Hunt Crew driving animals from the park as necessary. A preliminary estimate of five day trips to PUHE are projected for this task.
- Post-fire management of cultural resources will also benefit from specifications *V-1 Detect and Control Invasive Plants*, *V-2 Restore Native Vegetation*, and *V-3 Remove Fire-Killed and Damaged Trees*.

Plan Organization

This plan includes a narrative summary of the Kalaupapa Fire, followed by in-depth resource or issue specific burned area assessments, and itemized specifications for BAER and BAR treatments and activities. Two appendices are found at the end of the plan.

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Kalaupapa Fire

Emergency Stabilization and Rehabilitation Plan

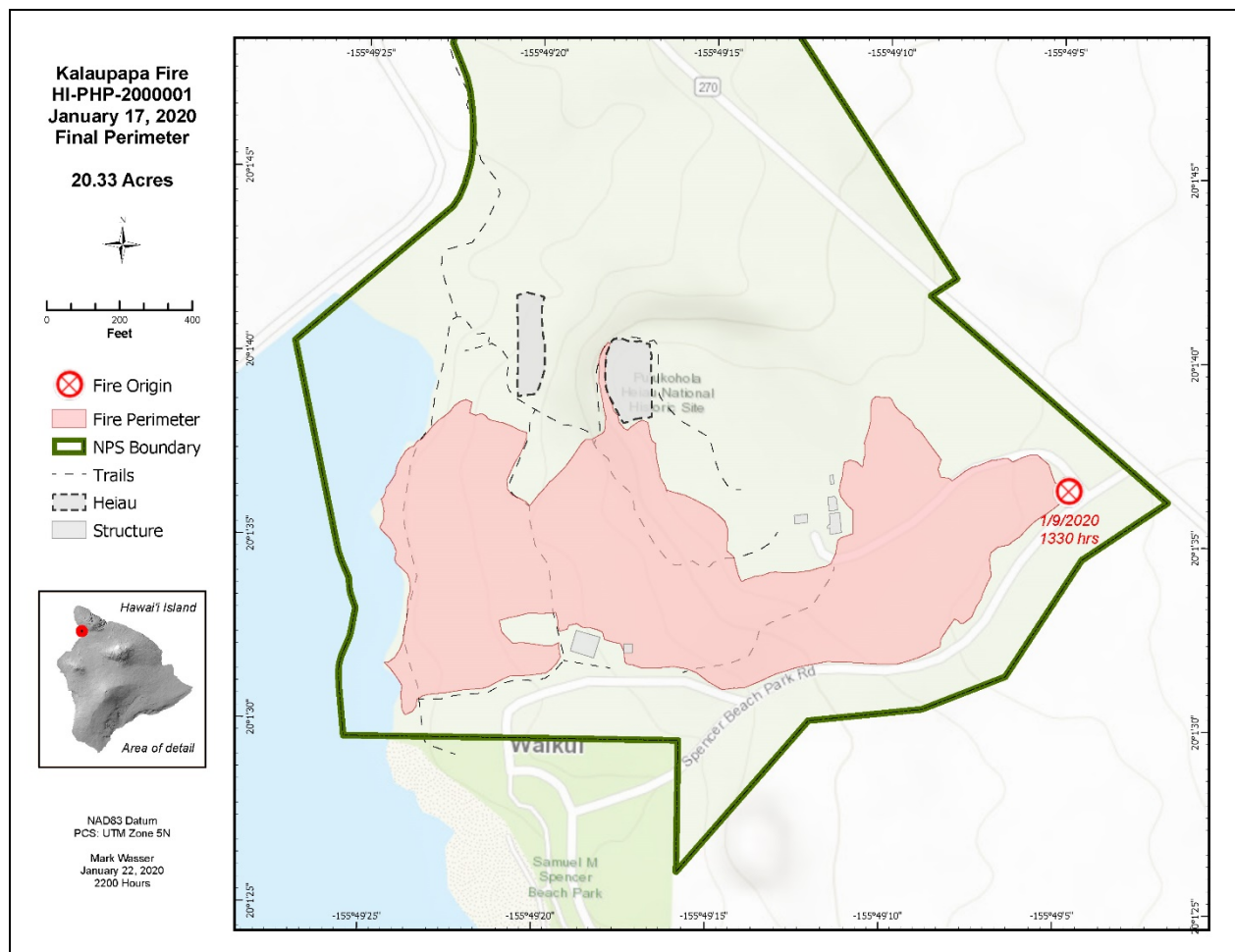
FIRE NARRATIVE

On January 9, 2020, at approximately 1320 hours, an engine fire emanating from a private vehicle parked on the roadway shoulder near the entrance to Pu'ukoholā Heiau National Historic Site (PUHE) ignited a wildland fire (Maps 1, 2). Fanned by 35-50 mile per hour offshore winds and burning in light, flashy fuels, the Kalaupapa Fire spread quickly towards the Park Headquarters and Visitor Center facility. Within about a half an hour the fire had reached the shoreline (a distance of about 1,900 feet to the west), and began to spread back to the northeast towards Pu'ukoholā Heiau, Mailekini Heiau, and Pohaukole Gulch.

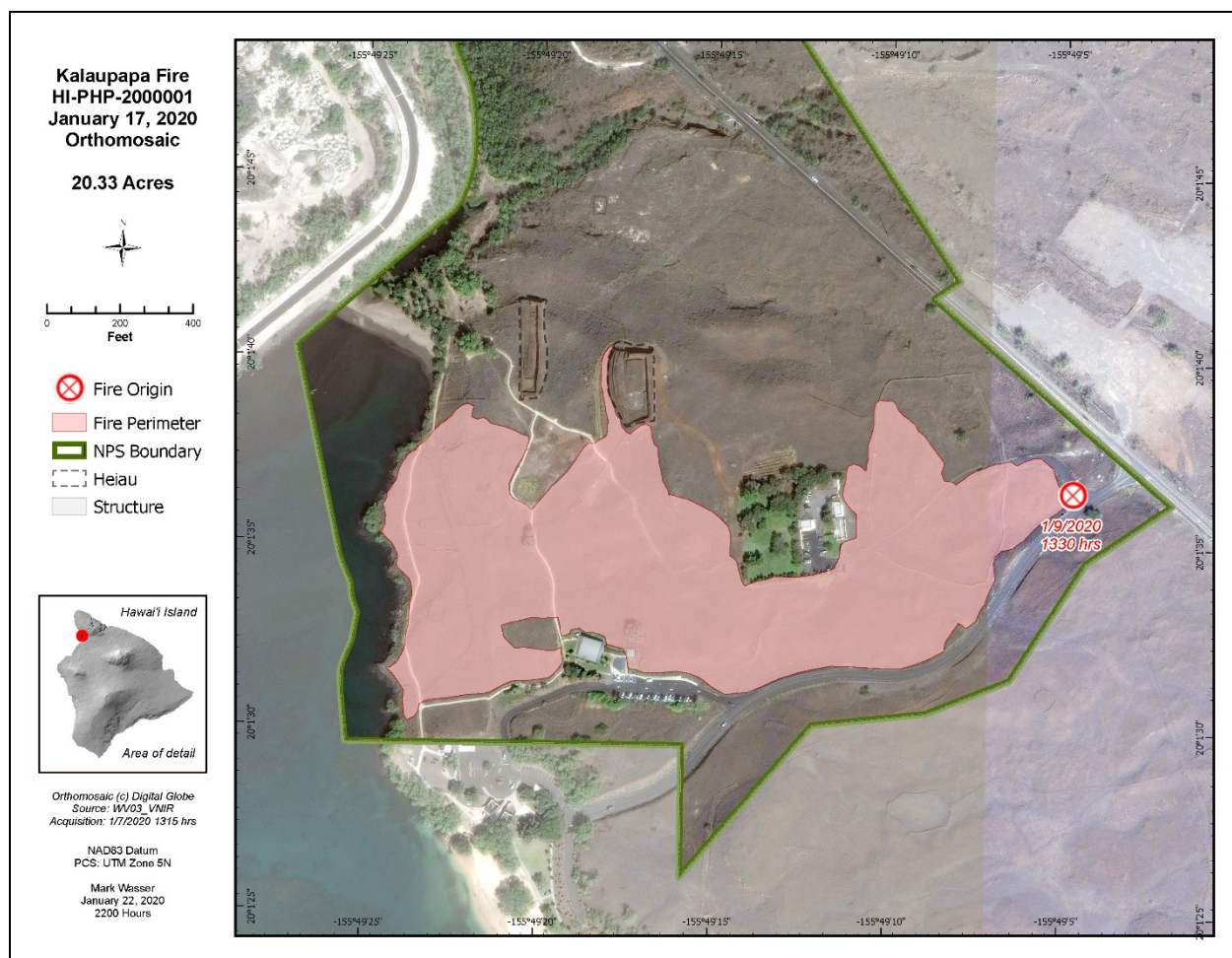
Local resources, including eight Hawaii County Fire (HFD) units, several volunteer units, and an HFD Type II Helicopter, provided initial attack and prevented the fire from reaching Mailekini Heiau and advancing into heavy fuels located in Pohaukole Gulch immediately to the north. Additionally, several NPS personnel aided the initial response by activating perimeter irrigation around the Park Headquarters, evacuating the Visitor Center, and fire suppression with the only water source available (garden hoses). These actions prevented any injury or loss of life, and prevented further damage to both government property and POVs.

All HFD resources had departed by 1730 hours, by which time an NPS Type 6 Engine and several firefighters had arrived on-scene. NPS resources stayed through the night to monitor hotspots and continue mop-up activities. The fire was declared contained on January 10 and placed in patrol status, having burned 20.33 acres on PUHE (Maps 1, 2).

Known and potential suppression damage in the park included ground disturbance due to off-road vehicle traffic, water bucket drops, and dragging of hose, although the extent of these impacts to park facilities and resources is still being determined. The NPS resources assigned to the fire conscientiously applied Minimum Impact Strategies and Tactics (MIST) during the mop-up phase, which greatly reduced further disturbance. Finally, as detailed in this plan, an array of major and minor park facilities were directly or indirectly affected by the fire, as were natural and cultural resources.

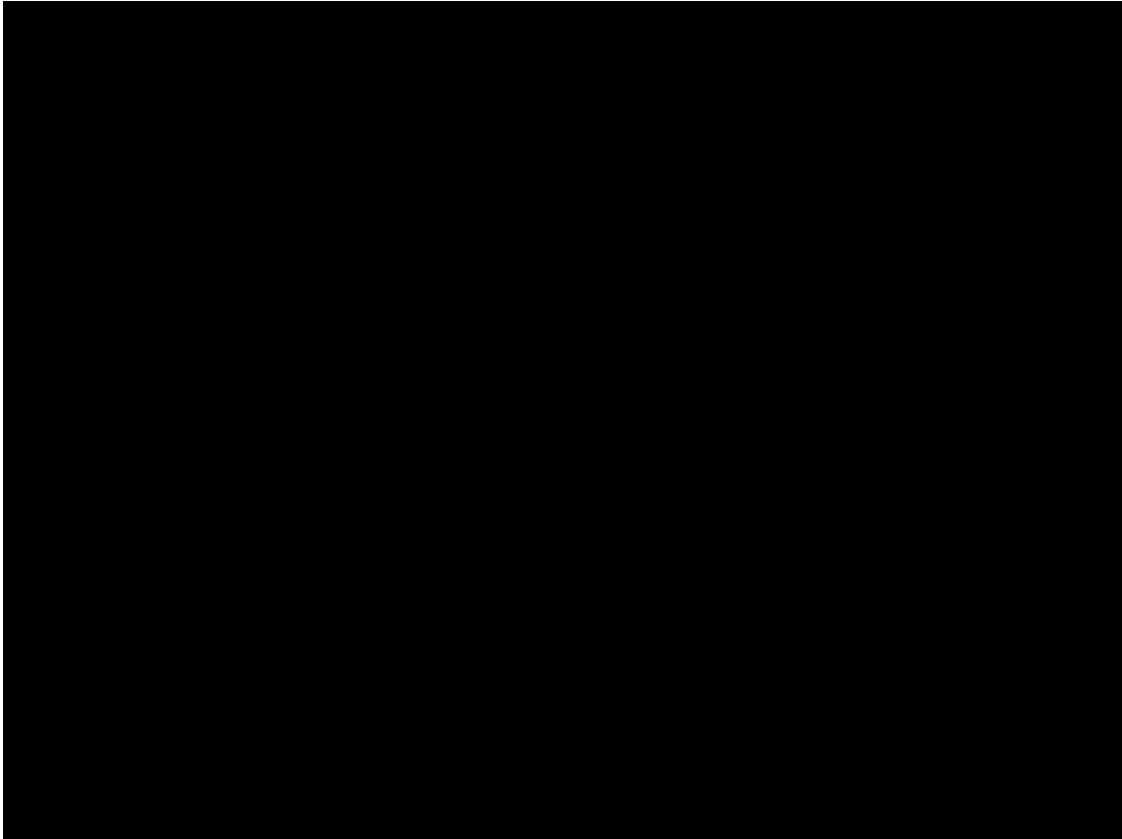


Map 1



Map 2

Burned Area Assessments



Kalaupapa Fire

Emergency Stabilization and Rehabilitation Plan

VEGETATION ASSESSMENT

OBJECTIVES

- Assess threats to human safety and property from post-fire vegetation conditions.
- Assess effects of fire on vegetation including effects on native plant communities and sensitive plant species, the spread of invasive non-native species, the cultural landscape, and interpretive landscaping areas.
- Assess effects of fire on the pili grass restoration project started following the Kawaihae Fire in 2015.
- Evaluate the potential for native plant recovery and recommend strategies in impacted areas that promote rehabilitation while also enhancing the cultural landscape.
- Evaluate the potential for aggressive non-native plants to invade the park landscape, reduce the potential for native species recovery, and increase fuel loading and future fire risk.
- Develop treatment recommendations and identify future monitoring needs.

ISSUES

- Fire-killed and damaged trees in public use and administrative areas and in proximity to significant cultural resources.
- Direct fire mortality and damage in sections of pili grass restoration area and interpretive landscaping areas.
- Expansion of non-native invasive species in the cultural landscape and displacement of native plant species.
- Increase in hazardous fuels associated with the invasion of several non-native invasive species on concern.
- Failure to re-establish post fire vegetation cover due to herbivory by non-native feral goats.
- Direct and secondary post-fire risks to sensitive and threatened species, and/or species that contribute to the cultural landscape.

BACKGROUND

The Kalaupapa Fire consumed approximately 21 acres within PUHE. Most of the area affected is heavily modified/invaded lowland dry grassland, and is dominated by buffel grass (*Cenchrus*

ciliaris). However, the area affected also included parts of a pili grass (*Heteropogon contortus*) restoration project started in 2015 to increase native species cover and enhance the cultural landscape. Additionally, the affected area included sections of native landscaping used for interpretation near the Park comfort station, and an area near the administration complex containing several individuals of the Federally-listed endangered loulu palm (*Pritchardia maideniana*). The burn area also contains potential habitat for several rare species historically found at PUHE including pololei fern (*Ophilioglossum consinnuum*), pā'ū o hi'iaka (*Jaquemontia ovalifolia* subsp. *sandwicense*), and ma'o (*Gossypium tomentosum*).

RECONNAISSANCE METHODS

Fire impacts were assessed on site one week post ignition. The fire perimeter and areas of interest were walked and documented with photographs and notes. Burn severity and localized vegetation damage was examined in detail but not formally quantified. The pili restoration areas, T&E and rare species locations, invasive species locations, and the landscaping area were all examined in further detail.

The Vegetation Assessment was completed by the BAER Team Leader, who has a background in botany and Hawaiian vegetation. He was assigned to assess damage to vegetation, evaluate potential recovery options, and recommend actions to assist with recovery in the burn area. The PUHE -Resource Management Crew lead served as a liaison/host for the site visit and was consulted about recommended actions. The Botanist from Hawai'i Volcanoes National Park (HAVO) was also consulted and provided valuable input for both the preparation of this assessment and the development of recommended actions.

FINDINGS

Fire Effects

Fire severity appeared to be moderate throughout the burn, with grass foliage generally completely consumed and minimal stubble visible. Root crowns were generally intact, and re-sprouting was observed during the assessment (one week post-fire). Foliage, twigs, and some smaller branches of shrubs were consumed, but sample size was low. No burned shrubs were observed to be re-sprouting, but very small seedlings (cotyledons only) from at least one species of shrub appeared to be present. Trees (both in landscaped areas and naturally occurring) impacted by the fire were partially to fully scorched, but in general there was no consumption of foliage or woody material.

The RAWs located near the burn area within the park recorded nearly two inches of precipitation over the month following the Kalaupapa Fire. In light of this precipitation, a rapid recovery of fine fuels is expected. The persistence of seedlings of woody species (such as

pōhinahina) that germinated immediately post-fire will be dependent on continued precipitation (Photo 1).



Photo 1. Seedlings of what is believed to be pōhinahina (*Vitex rotundifolia*) sprouting one-week post fire in the burn area of the Kalaupapa Fire. Many scorched and unscorched seed capsules are visible on the ground.

Impacts to Vegetation and the Cultural Landscape

The area in and around PUHE has a long history of human disturbance, including the use of fire to stimulate pili growth (it was a preferred thatch for traditional houses or *hale*). The pre-human vegetation composition is not definitively known, but was likely a sparse grassland or shrubland owing to the arid climate of the area. Pili was the dominant plant species on the landscape at the time of the Park's commemorative period (late 18th century) well into the 20th century, but has declined sharply in the last several decades. Both buffel and pili grass generally respond favorably to fire, and both species were observed to be re-sprouting at the time of the vegetation assessment. In areas where these two species are co-located (such as the burn area), whichever species occurs at the highest density pre-fire is generally the most competitive in localized post-fire environments. Recovery is also highly dependent on rainfall, with the area exhibiting strong seasonality (very dry summers).

Shrubs are not a prominent component of the vegetation within PUHE, and other than a few scattered individuals, shrubs affected by the fire were limited to the landscaped area around

the Comfort Station and immediately fronting the Visitor Center. These areas were both planted intensively and irrigated. Seedlings were observed under burned individuals of some shrubs, mostly in areas of pōhinahina (*Vitex rotundifolia*). Some other affected species of shrubs, such as a'ali'i (*Dodonaea viscosa*) and 'ilima (*Sida fallax*), generally recover well following fire, but it is not known if that response will be different in a landscaped area in which most individuals were planted and irrigated. A'ali'i is mostly confined to the landscaped areas of PUHE, but individuals of 'ilima are scattered across the greater landscape. One individual of the rare shrub species ma'o (*Gossypium tomentosum*) occurred within the burn outside the landscaped areas and was completely consumed. The individual response of that species following fire is not clear from existing literature and other resources.

Kiawe is the only tree species present outside landscaped and/or irrigated areas of PUHE. It has largely been eliminated from the central part of the park (area between the Visitor Center and the two heiau) following previous fires and post-fire removal of seedlings, but it still occurs in patches near the shoreline and in a thickly vegetation gulch at the north end of the park. Individuals present in the patches near the shoreline were partially to fully scorched, and two individuals providing shade through one of the main paths in the area were lightly scorched. There were also a number of trees on the edge of the managed lawn near the Administration Area that were affected by the fire. A row of milo (*Thespesia populnea*) bounding the south perimeter of the area were fully scorched with char height extending up nearly $\frac{3}{4}$ the height of the trees (~4m). It is unknown whether or not these individuals will survive. Just beyond the row of milo is a row of loulu palms (*Pritchardia maideniana*) (Photo 2). This species is both a Federally listed endangered species and also holds cultural significance – loulu were long cultivated by the Hawaiians, and had many uses including the fronds which were used for thatching. Most individuals in this row were lightly to moderately scorched, with char height extending up the majority of the trunks and some drooping fronds scorched. The apical meristem did not appear scorched on any of these individuals. Palms are generally resistant to fire, but effects have not been well studied with this particular species.



Photo 2. Fire effects on trees near the administration area at PUHE. A row of milo trees (left), and the smallest loulu that sustained the most visible fire effects (right) within the Kalaupapa Fire area.

The fire burned through the main part of the park and the focal area of the cultural landscape (the area between the Visitor Center and the two heaiu, which includes the battlefield) (Photo 3). The continued reduction of native species and expansion of non-native species is the primary threat to the cultural landscape. The Kalaupapa Fire impacted areas where pili had been successfully re-established following the Kawaihae Fire in 2015, destroyed landscaping used to highlight native Hawaiian plants to visitors, and damaged individuals of key threatened and endangered species that are important to the cultural landscape.

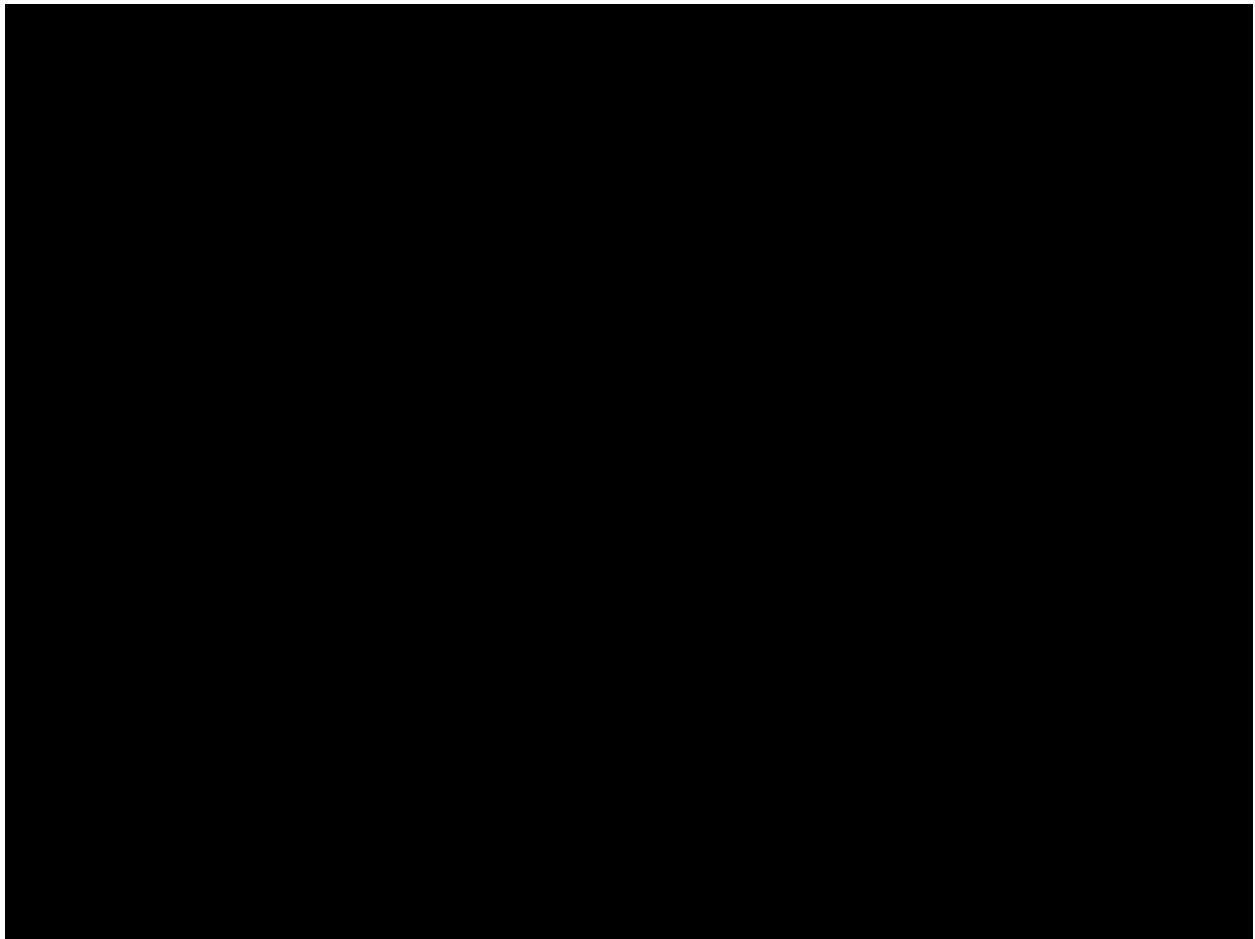


Photo 3. Part of the burn area and the cultural landscape. Pu'ukoholā Heiau is the prominent stone structure in the background on the right hand side of the frame.

Invasive Species

Non-native species dominate the landscape at PUHE, but several invasive species on concern pose the most risk to both the cultural landscape and other values-at-risk. Buffel grass and pili are both highly flammable, but the overall fuel loading created from both species on the landscape is relatively low. Guinea grass (*Magathysus maximus*), fountain grass (*Cenchrus setaceus*), and kiawe are all aggressive alien species that are high priority species of concern for fuels management. All three of these species are currently incipient to the park, and widespread establishment of any of these species would hinder pili restoration efforts – pili can out-compete buffel grass once it is established, but cannot persist in competition with these more aggressive alien species. Overall fuel loading, continuity, and fire danger on the landscape and to park resources would also greatly increase should any of these species become established.

Kiawe density within PUHE is reduced with each subsequent fire, and the Kalaupapa Fire should offer a similar opportunity. Fire killed and/or damaged trees can be removed, and if seedlings are suppressed post-fire the density reduction will persist in the affected area. Neither fountain grass nor guinea grass was widely established in the park prior to the Kalaupapa Fire. A single, mature, incipient individual of guinea grass was treated and removed near the Admin area in the previous years, and fountain grass was not found in the park during annual surveys between 2015 and 2018. The post-fire environment presents favorable conditions for all three of these species, but landscape level management is still possible since none of the three are widely established on the landscape (excepting kiawe in a heavily forested gulch at the north edge of the park).

Recommendations

Three specifications are prescribed to address post-fire vegetation issues. Two specifications provide for a 4-person crew to continue pili restoration utilizing a combination of in situ nurseries and outplantings, and sweep/control incipient fuels species for one day/week for the rest of FY20, one day/pay period in FY21 and FY22, and one day/two pay periods in FY23. We have also included time (one pay period in FY21 and one week each in FY22 and FY23) for a botanist/restoration ecologist and their technician to coordinate with the crew, other park cultural landscape specialists and restoration ecologists, and scientists working on fire and restoration of native Hawaiian landscapes. The ecologist and botany technician will also be responsible for planning the re-planting of landscaping areas, monitoring the success of pili restoration and incipient fuels treatments, providing feedback on best methods, and submitting reports on accomplishments in collaboration with the BAER Implementation Coordinator. The third specification entails mitigating fire-killed and damaged trees.

Specifications

V-1 Detect and Control Invasive Plants [ES (FY20), BAR (FY21-23)]. Invasive plant survey and control will be conducted within the burn area for the three high-priority invasive species/fuels concerns incipient to PUHE – guinea grass, fountain grass, and kiawe. The burn area will be surveyed semiannually (once in summer and once in winter) during FY20, and annually (summer) in FY21-23. Any individuals found will be removed using either mechanical or chemical control methods.

V-2 Restore Native Vegetation [ES (FY20), BAR (FY21-24)]. The irrigation system used to stimulate growth of pili grass for out planting material for restoration of the cultural landscape was destroyed during the fire, and many outplanted individuals and their drip lines were also destroyed. The irrigation system needs to be repaired under in order to provide planting materials during the critical, post-fire re-establishment phase; this work will be financed from a source other than ES or BAR. The transplanting of plugs of pili grass must also start immediately

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V-3 Remove Fire-Killed and Damaged Trees [ES (FY20)]. Fire-killed and damaged milo and kiawe trees pose a potential hazard to visitor safety and other values at risk (cultural and natural resources). The removal of these trees mitigates the hazard to visitors and employees and potential damage to cultural resources (damaged/dead trees are more likely to fall and impact archaeological sites), and also serves to reduce the presence of a heavy fuel and invasive species (kiawe) on the landscape. Depending on delayed mortality, as many as 30 trees may need to be treated, and known hazard trees will be mitigated as soon as possible.

Post-fire management of vegetation will also benefit from specification *CR-2 Control Feral Ungulates*.

Non-Specification

Monitoring of impacted T&E species and previously established vegetation transects. Ten vegetation monitoring transects were established following the Kawaihae Fire in 2015, and read semiannually from 2015 to 2018. The continued reading of these transects following the Kalaupapa Fire would provide valuable insight to the effects of multiple fires on the vegetation within PUHE. Additionally, the endangered loulou palms damaged during the Kalaupapa Fire are expected to survive, but should be monitored to confirm that hypothesis and provide data about the response of this critically endangered and culturally important species to fire.

REFERENCES

Kawaihae Fire Burned Area Emergency Response Plan (2015)
Kawaihae Fire Burned Area Rehabilitation Plan (2015)

CONSULTATIONS

Sierra McDaniel, Botanist, Hawai'i Volcanoes National Park

Willy Akima, Resources Management, Pu'ukoholā Heiau National Historic Site

PREPARER(S)

Mark Wasser, BAER Team Lead

Sierra McDaniel, HAVO Botanist

Kalaupapa Fire

Emergency Stabilization and Rehabilitation Plan

INFRASTRUCTURE ASSESSMENT

OBJECTIVES

- Evaluate park infrastructure assets for fire-related damages and replacement and stabilization needs.

ISSUES

- Severe fire damage to the Visitor Center comfort station rendered this facility unusable and vulnerable to further impacts.
- Fire damage to an above-ground waterline compromised the domestic water supply at the Headquarters.
- Fire damage to an above-ground irrigation system threatens the survival of landscape vegetation plantings and will hinder post-fire restoration efforts.
- Loss or damage to various minor assets (park entrance sign, debris disposal bins, road signs, fencing, sprinkler/alarm system) will impact park operations and visitor experience.

BACKGROUND

The Kalaupapa Fire burned in the portion of PUHE containing both major park facilities—Headquarters and Visitor Center—and a variety of minor assets. This same area burned during the 2015 Kawaihae Fire, which also resulted in significant impacts to park infrastructure, some of which were subsequently damaged during the Kalaupapa Fire.

RECONNAISSANCE METHODS

Infrastructure in the burned area was inspected by PUHE and Network Maintenance staff shortly after the fire.

FINDINGS

Visitor Center Comfort Station

The entire roof of the comfort station, including skylights and ventilation fixtures, was severely damaged by fire (Photo 1). Further, significant damage to the ceiling, interior walls and floor,

restroom partitions, and miscellaneous fixtures from heat and/or smoke was also documented or presumed. The facility is unusable, and the damaged roof leaves the interior susceptible to water intrusion.



Photo 1. Roof of fire-damaged comfort station.

Water Supply/Irrigation Systems

Approximately 550 feet of 2-in. HDPE above-ground water line east of the Headquarters were damaged by the fire (Photo 2). This is the domestic water supply for the Headquarters. Additionally, as also occurred during the 2015 Kawaihae Fire, the Kalaupapa Fire severely impacted the landscape irrigation system in the Headquarters and Visitor Center areas (Photo 2). Damages included loss of approximately 2,000 ft. of 3/4-in. poly line and connectors, 40 ft. of PVC pipe, five plastic valve boxes and electric valves, and one valve controller. This system irrigates native plantings that would otherwise not survive in the hot and arid climate. Further, the burned plastic from the existing lines that remains on the landscape creates a visual intrusion on the cultural landscape and constitutes a hazard to terrestrial and marine ecosystems.



Photo 2. Fire-damaged water supply line (left) and irrigation system (right).

Waste Bins

Eight waste/recycling bins and three cigarette butt receptacles at the Visitor Center were significantly damaged by the fire (Photo 3). In the absence of functional containers, littering within the park poses an immediate and multi-faceted threat to public safety and resources.



Photo 3. Fire-damaged waste disposal bins.

Signs

Three traffic signs and the PUHE entrance sign (Photo 4) were damaged by the fire. The former (one STOP sign, two speed limit signs) comprise a hazard to human safety.



Photo 4. Fire-damaged signs.

Trailhead Fence

Approximately 12 feet of ironwood trailhead fencing was destroyed by the fire. The absence of this barrier puts the public at risk and could threaten sensitive cultural resources.

Miscellaneous

- Fire-staining on approximately 600 feet of paved trail
- Damage to Visitor Center exterior fire alarm/sprinkler systems

- Suppression impacts to fire hydrants

Recommendations

Three specifications are recommended through ES to address damages and threats to PUHE infrastructure. Several other advisable actions, which should be financed from other fund sources, are also summarized.

Specifications

F-1 (Stabilize Fire-Damaged Comfort Station): Per direction of the Region 12 Civil Engineer (Appendix A), a 12-mm. canvas tarp should be installed to prevent further water intrusion. The tarp should be monitored during storms and repaired or replaced if damaged. Removing the tarp between rain events will allow for better air circulation within the structure. Second, four porta-potties (three regular, one handicap-accessible) should be rented to serve as restroom facilities for visitors until the Comfort Station can be rehabilitated. Costs associated with these treatments are very likely to extend into FY21.

F-2 (Replace/Repair Miscellaneous Minor Assets): The following tasks should be performed:

- Replace eight fire-damaged waste disposal bins and three cigarette butt receptacles should be replaced. If cost-effective, containers should be upgraded to materials better able to withstand future fires.
- Replace ironwood trailhead fence in-kind.
- Repair fire-damaged fire alarm and sprinklers on the exterior of the Visitor Center.
- Purchase materials for approximately 2,000 feet of fire-damaged irrigation line and components.

Non-Specification

The following tasks will likely be financed from fund sources other than ES or BAR:

- Replace the roof and refurbish the interior of the comfort station (FY20 PMIS request submitted)
- Replace fire-damaged above-ground waterline and landscape irrigation systems at the Headquarters and Visitor Center (FY20 PMIS request submitted)
- Replace PUHE entrance sign in-kind (FY20 PMIS request submitted)
- Replace three fire-damaged traffic signs (FY20 Cyclic Maintenance)
- Repaint fire-stained trail tread (FY21 ADA repave)
- Repairs related to suppression actions (hydrants)

REFERENCES

Henrickson, Scott, Trip Report – Pu‘ukoholā Heiau National Historic Site (PUHE), Hawai‘i, January 29, 2020. February 5, 2020. Appendix A.

Kawaihae Fire Burned Area Emergency Response Plan (2015)

CONSULTATIONS

Peter Amerling, PUHE Facilities Management, PUHE

Daniel Kawaiaea, PUHE Superintendent

PREPARER(S)

Nelson Siefkin, Post-Fire Coordinator, Region 12

Kalaupapa Fire

Emergency Stabilization and Rehabilitation Plan

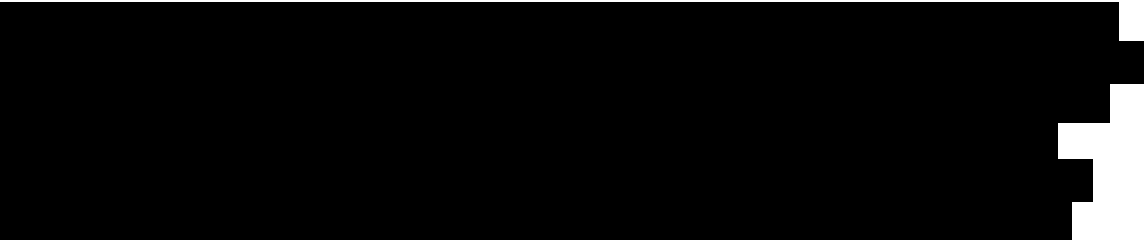
CULTURAL RESOURCES ASSESSMENT

OBJECTIVES

- Determine if known or incidentally encountered cultural resources within, adjacent to or downstream of the Kalaupapa Fire were impacted by the fire and/or are threatened by post-fire conditions. If applicable, prescribe emergency stabilization treatments or activities to minimize or mitigate those impacts.
- Determine if any proposed emergency stabilization or rehabilitation treatments for the Kalaupapa Fire might adversely impact cultural resources and, if so, prescribe actions to minimize or mitigate adverse effects.
- Determine if suppression actions taken in conjunction with the Kalaupapa Fire resulted in impacts to cultural resources.
- Meet all Federal cultural resources legal mandates, including consultation with appropriate Native Hawaiian organizations.

ISSUES

- PUHE is a National Historic Landmark encompassed within a National Historic Site comprised of archaeological sites, historic structures, cultural landscapes, and traditional cultural properties. Native Hawaiian Organizations maintain strong traditional ties to these cultural resources.

- 

Culturally-significant native vegetation (including restored pili grass stands) in the Pu'ukoholā Heiau National Historic Landmark Cultural Landscape was burned by the fire, causing both mortality and increased vulnerability to invasion by exotic species. Finally, the NPS Visitor Center contains important museum objects that may have been exposed to adverse environmental extremes during and immediately after the fire.

- Other emergency stabilization treatments have been proposed for public safety, preservation of park infrastructure, or protection of natural resource values. These

treatments may have the potential to impact significant cultural resources, especially if ground disturbing activities are required.

BACKGROUND

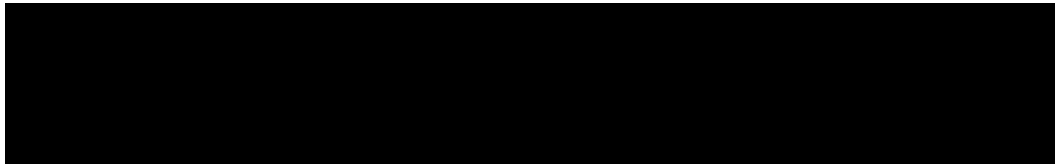
Many excellent volumes of historic research have been compiled that speak to the history and culture of PUHE. The most comprehensive of these is Greene's (1983) *A Cultural History of Three Traditional Hawaiian Sites on the West Coast of Hawai'i Island*. More recently, an archaeological research design was completed for PUHE (Reith and Tomonari-Tuggle 2019) that provides a good archaeological context and more current analysis of research needs and management recommendations. Cultural landscape evaluations include a cultural landscape inventory (NPS 2003) and an environmental assessment evaluating the historic scene (Tetra Tech 2004).

The following overview is excerpted from the Pu'ukoholā Heiau National Historic Landmark Cultural Landscape Inventory (NPS 2003):

Pre-contact

In the late 1780s, Kamehameha I began his quest to unify all the Hawaiian Islands under his rule as a king. A priest from the king's court received a prophecy. The guarantee was that Kamehameha I would conquer all of the Hawaiian Islands if he built a heiau (temple) in honor of Kū kā 'ili moku (war god). Priests determined the site, orientation, dimensions and configuration of the heiau and performed ceremonies throughout its construction (Kuykendall 1938:37). Pu'ukoholā (literally translated to 'the hill of the whale') Heiau was constructed by thousands of Hawaiians including Kamehameha I himself.

In order to construct the heiau, it is believed that a human chain spanned from Pololū Valley to the site. Stones for construction of Pu'ukoholā Heiau were passed from hand to hand. During the construction of the temple, human sacrifices were offered to assure Kū kā 'ili moku of the king's devotion. The heiau and its associated structures were completed in the summer of 1791. A few months later, Kamehameha I fulfilled the prophecy and was successful in defeating the rival chief, Keoua. Kamehameha I then conquered the three neighboring islands, solidifying his power.



[REDACTED]

[REDACTED]

[REDACTED] the site where Kamehameha I established his primary residence while constructing Pu'ukoholā Heiau. Pelekane was the location of the royal court of Kamehameha I and included houses for the royal family, priest, and other nobility. Pelekane was a taboo, or kapu, area, limited to those associated with royalty. It is the birthplace of Queen Kamamalu, the daughter of Kamehameha I and Kaheiheimalie, in approximately 1802. Later, Queen Emma, a granddaughter of John Young and Kamehameha I, who became the bride of Kamehameha IV, may also have been born or resided at Pelekane (Kelly 1974:16).

Historical accounts and illustrations provide much of the story of Pelekane.

[REDACTED]
[REDACTED] Captain Louis de Freycinet described the royal house at Pelekane as:

'A grass dwelling 10 to 12 feet long and little less in width; the flooring was padded with mats, as is the custom in the Sandwich Islands....one could not compare this royal habitation to anything better than the shepherds' huts of certain provinces in France, built for the purpose of occasional shelter' (as stated by Freycinet 1918, editor Kelly 1978:17).

Not only is Pelekane important because it was the royal court, but it is also the site where Kamehameha I assumed the kingship of all the Hawaiian Islands when his rival Keoua was killed and offered. Although the exact location of Hale o Kapuni Heiau is unknown, remnants lay somewhere just off-shore from Pelekane, and below Mailekini and Pu'ukoholā Heiau.

[REDACTED]

Oral tradition indicates that Hale o Kapuni Heiau was dedicated to the shark gods (including Uukanipo and Kaaipai) in prehistoric times. In 1859, Theophilus Davies traveled over [REDACTED] and recounts an informant's comments that [REDACTED] 'where '...bleeding victims were placed before the gods...' The sport of catching sharks was practiced by chiefs within Hale o Kapuni Heiau. Human flesh was sometimes used to attract them. [REDACTED]

Post-contact (Historic)

The first documented Hawaiian contact with Europeans was from Captain James Cook in 1778. In 1790, John Young and Issac Davis arrived at Kawaihae and were taken into service by Kamehameha I. Young eventually became the king's closest advisor regarding politics, trade and commerce. In 1793, John Young was presented with property in Kawaihae, now called the homestead, from Kamehameha I following the ancient custom rewarding loyal service in victorious battle. John Young and his first wife, Namoku'elua, established a residence in the lower portion of the homestead, at the mouth of Makahuna Gulch. Oral tradition and archival research indicate that these structures were of traditional Hawaiian thatch and pole construction.

In 1798, John Young began building structures at the upper portion of the homestead, situated on a knoll above two gulches. Eventually the homestead contained several buildings, including a cook house, storage, animal pens and a whitewashed picket fence. Island stones were laid in mud and plastered on both interior and exterior surfaces. Thatch roofs with post structures were combined with the plastered walls.

Numerous accounts of John Young were recorded in ship's logs and journals by visiting sea captains. Guests at the homestead included some of the more prominent early missionaries to Hawai'i. Many meetings of trade, foreign affairs, and warfare took place here.

During one period of warfare, in 1810, under the direction of John Young, [REDACTED]

Kamehameha I died in 1819. His son, Liholiho (Kamehameha II) immediately denounced the kapu system. Many heiau were demolished and images were burned. [REDACTED].

In 1835, upon the death of John Young, the upper portion of his homestead was abandoned. During the next 49 years the site was neglected and left for ruin. Historical notes from the Addenda of The Thirty-Eighth Annual Report of the Hawaiian Historical Society for the Year 1929 (1930:60) mention John Young's house:

'There is a probability that John Young's house in Kawaihae, island of Hawai'i, where he lived during the earlier years of his residence in Hawai'i...will be preserved to posterity...because it was there that all ship captains and many others generally consulted with Young before having an audience with Kamehameha I, and it was there that much of the governmental foundation for the new Kingdom of Hawai'i was studied out. Governor Judd, it is reported, favors the plan for a 'John Young park'.'

[REDACTED]

In the 1920s, the Parker Ranch constructed a wagon road [REDACTED] and continuing south along the coast. In the early 20th century (circa 1910), a section of a marine railway was constructed within the Pelekane area to service the small sugar operations in the region. By 1917, the railway was non-functional.

[REDACTED]. A 1922 report from the Smithsonian Institution stated [REDACTED] were greatly hampered by the overgrowth of the non-native tree, kiawe (*Prosopis pallida*). In 1928, poorly documented [REDACTED] 'friends of Pu'ukoholā' (Ladd 1986). The extent of the work completed is unknown. In 1975-76 two phases of stabilization effort [REDACTED] were conducted. Access to Spencer Beach Park from State Highway 270 was established in circa 1936 by the construction of a paved two-lane road passing between [REDACTED]. The Pelekane area was used as a dry-dock in the 1940s and became a dumping ground for old cars, boats and trash (DCP 1989:15).

Cultural Resources and Wildland Fire

Impacts to cultural resources as a result of fire, fire management actions, and post-fire conditions can be conveniently divided into three categories: direct, operational, and indirect. Direct impacts are those caused by the wildland fire itself or its byproducts (e.g., smoke); operational impacts are caused by fire management actions made in response to wildland fires (e.g., fire line construction, retardant drops); and indirect impacts occur as a result of fire-induced changes to the context in which cultural resources are found (e.g., looting and erosion due to loss of vegetation cover).

Operational impacts to cultural resources are identified, assessed and mitigated as part of fire suppression damage repair and funded from the fire emergency suppression account. Potential operational impacts associated with the Kalaupapa Fire included off-road vehicle traffic, dragging of fire hose, and helicopter water bucket drops, the principle concerns of which are ground disturbance in archeological deposits and displacement of archeological structures.

BAER funds are used to assess and, if necessary, mitigate the direct effect of fire and related indirect impacts such as erosion, as well as identify and mitigate resources that could be affected by emergency stabilization treatments (e.g., ground-disturbing activities). With regard to direct effects to material cultural resources, the level of threat is a function of the fuels and associated fire behavior, and the nature of cultural materials present. Fire effects vary with fire intensity and duration of heating that is dependent upon fuel type, fuel loading, and burning conditions. All else being equal, fire intensity is typically higher and sustained longer in heavy fuels (trees, large shrubs) than lighter ones (grasses, sparse shrubs). Objects located on or above the ground surface are most vulnerable to direct impacts, as are those of flammable or light-weight composition (e.g., shell, thin glass and metal). Smoke and climatic fluctuations can pose a threat to sensitive museum objects (Appendix B).

[REDACTED]

Indirect impacts of the greatest concern within the Kalaupapa Fire include erosion, disturbances by feral goats, and climatic fluctuations in museum objects (Appendix B). Erosion includes sediment loss and deposition from rain-splash impact and overland flow. Newly sprouting vegetation has attracted feral goats into the park, which disturb cultural soils, damage rock features, and impede the recovery of native vegetation. Emergency stabilization measures were taken to curb erosion threats—principally sandbags along trails—and feral goats were excluded from the park [REDACTED].

RECONNAISSANCE METHODS

On February 4, 2020, seven NPS Archeologists conducted an assessment of impacts to historic properties within the Kalaupapa Fire. This effort was coordinated by KAHO Cultural Resource

Manager Tyler Paikuli-Campbell. Direct and operational impacts and indirect threats to resources were described and photographed, and GPS points were obtained.

Museum objects curated at the PUHE Visitor Center were evaluated by Kristi Ausfresser, Museum Curator at Hawai'i Volcanoes National Park, on January 28, 2020, accompanied by PUHE staff, George Enuton, Interpretation Park Ranger and museum liaison, Ben Saldua, Supervisory Park Ranger, and an employee of the Hawai'i Pacific Parks Association (HPPA). The evaluation methods employed are provided in Appendix B.

Vegetation resources associated with the Pu'ukoholā Heiau National Historic Landmark Cultural Landscape were evaluated as part of the Kalaupapa Fire Vegetation Burned Area Assessment.

FINDINGS

Archeological Resources

[REDACTED]

Operational impacts included four potential helicopter water drops within archeological sites. However, these impacts, which are subtle surface soil disturbances, may be the result of previous archeological testing.

Threat of erosion was recognized [REDACTED]

However, these areas, [REDACTED]

[REDACTED] The rapid reestablishment of ground cover will likely reduce the erosion threat. Feral goats were observed in the burned area by PUHE staff shortly after the fire, apparently attracted by sprouting vegetation.

Cultural Landscape

The Kalaupapa Fire burned through the main part of the park and the focal area of the Pu'ukoholā Heiau National Historic Landmark Cultural Landscape. The continued reduction of native species and expansion of non-native species is the primary threat to the cultural landscape. The fire impacted areas where pili had been successfully re-established following the Kawaihae Fire in 2015, destroyed landscaping used to highlight native Hawaiian plants to visitors, and damaged individuals of key threatened and endangered species that are important to the cultural landscape.

Museum Objects

Detailed findings related to museum objects are found in Appendix B. During the Kalaupapa Fire the Visitor Center was evacuated, during which time PUHE staff closed the electronic rolling metal doors for security and fire protection. One door initially failed to operate but was successfully closed later during the fire. The exterior sprinkler system on the Visitor Center deployed, but the interior system did not.

PUHE staff and visitors reported the smell of smoke within the building for approximately two weeks after the fire, but it had dissipated by January 28. There was no visible smoke damage, soot, or residue. All museum objects were accounted for with an unchanged condition from before the fire.

UV film applied to windows showed no sign of visible heat damage, and measured UV levels were below the NPS standard. Measured visible light levels, however, exceeded the NPS standard. Although the pre-fire levels are unknown, an increase due to damages caused by the Kalaupapa Fire is unlikely.

Fluctuations in temperature and humidity during and after the Kalaupapa Fire could not be determined because the data in the PEM2 data loggers were inaccessible. Given the harsh local climate, obtaining that information is advisable.

Recommendations

Specifications

CR-1 (Cultural Resource Assessments) [ES (FY20)]: [REDACTED]

[REDACTED] The two PEM2 data loggers in the Visitor Center should be recalibrated in order to obtain temperature and humidity data during the Kalaupapa Fire.

CR-2 (Control Feral Ungulates) [ES (FY20)]: As noted following the Kawaihae Fire in 2015, goats can cause damage to cultural resources, impede the recovery of native vegetation, and encourage the spread of exotic invasives. Because goats are entering PUHE via the park entrance road and it is not feasible to construct a barrier across public roadways, mitigation will consist of the HAVO Wildlife Biologist and Hunt Crew driving animals from the park as necessary. A preliminary estimate of five day trips to PUHE are projected for this task.

Post-fire management of cultural resources will also benefit from specifications *V-1 Detect and Control Invasive Plants*, *V-2 Restore Native Vegetation*, and *V-3 Remove Fire-Killed and Damaged Trees*.

Non-Specification

None

REFERENCES

Greene, Linda Wendell. 1993. A Cultural History of Three Traditional Hawaiian Sites on the West Coast of Hawai'i Island.

National Park Service. 2003. Pu'ukoholā Heiau National Historic Landmark Cultural Landscape Inventory.

National Park Service. 2015a. Kawaihae Fire Burned Area Emergency Response Plan.

National Park Service. 2015b. Kawaihae Fire Burned Area Emergency Response Accomplishment Report, FY15.

Reith, T, and M.J. Tomonari-Tuggle. 2019. Archaeological Research Design for Pu'ukoholā Heiau National Historic Site, Kawaihae 2 Ahupua'a, South Kohala, Hawai'i. National Park Service.

Tetra Tech, Inc. 2004. Reestablishment of the Historic Scene at Pu'ukoholā Heiau National Historic Site, Hawai'i County, Hawai'i, Environmental Assessment.

Tomonari-Tuggle, M.J. and H. David Tuggle. 2006. Archaeological Overview and Assessment for the Three West Hawai'i Island Parks, National Park Service.

CONSULTATIONS

N/A

PREPARER(S)

Adam M. Johnson, PUHE Archaeologist
Tyler Paikuli-Campbell, KAHO Cultural Resource Manager
Kristi Ausfresser, HAVO Museum Curator

Kalaupapa Fire
Emergency Stabilization and Rehabilitation Plan

Specifications



KALAUPAPA FIRE: EMERGENCY STABILIZATION SPECIFICATIONS

SPECIFICATION NUMBER	TITLE	UNIT	UNIT COST	NUMBER OF UNITS	WORK AGENT	FY20	FY21	COSTS
F-1	Stabilize Fire-Damaged Comfort Station	Each	\$14,225	1	F, S	\$14,255	\$0	\$14,255
F-2	Replace/Repair Miscellaneous Minor Assets	Each	\$530	14	F	\$7,420	\$0	\$7,420
CR-1	Cultural Resource Assessments	N/A	\$7,300	N/A	F	\$7,300	\$0	\$7,300
CR-2	Control Feral Ungulates	Each	\$495	13	F	\$6,445	\$0	\$6,445
V-1	Detect & Control Invasive Plants	Acres	\$240	21	F	\$5,058	\$0	\$5,058
V-2	Restore Native Vegetation	Acres	\$5,991	5	F	\$29,952	\$0	\$29,952
V-3	Remove Fire-Killed Trees	Miles	\$3,135	1	F	\$3,135	\$0	\$3,135
AD-1	Administration	N/A	N/A	N/A	F	\$4,900	\$0	\$4,900
TOTAL COSTS						\$78,465	\$0	\$78,465

Work Agent: **C**=Coop Agreement, **F**=Force Account, **G**=Grantee, **P**=Permittees, **S**=Service Contract, **T**=Timber Sales Purchaser, **V**=Volunteer

KALAUPAPA FIRE: BURNED AREA REHABILITATION SPECIFICATIONS

SPECIFICATION NUMBER	TITLE	UNIT	UNIT COST	NUMBER OF UNITS	WORK AGENT	FY21	FY22	FY23	COSTS
V-1	Detect & Control Invasive Plants	Acres	\$ 110	63	F	\$2,304	\$2,304	\$2,304	\$ 6,912
V-2	Restore Native Vegetation	Acres	\$ 6,075	15	F	\$41,098	\$32,498	\$17,522	\$ 91,118
TOTAL COSTS						\$43,402	\$34,802	\$19,826	\$ 98,030

Work Agent: **C**=Coop Agreement, **F**=Force Account, **G**=Grantee, **P**=Permittees, **S**=Service Contract, **T**=Timber Sales Purchaser, **V**=Volunteer

INDIVIDUAL SPECIFICATION

TREATMENT/ACTIVITY NAME	Stabilize Fire-Damaged Comfort Station	PART E SPECIFICATION #	F-1
NFPORS TREATMENT CATEGORY*	Property	FISCAL YEAR(S) (list each year):	2020, 2021
NFPORS TREATMENT TYPE *	Stabilize/Secure/Protect Structures	WUI? Y / N	Yes
IMPACTED COMMUNITIES AT RISK	Kawaihae	IMPACTED T&E SPECIES	N/A

* See NFPORS Restoration & Rehabilitation module - Edit Treatment screen for applicable entries.

WORK TO BE DONE (describe or attach exact specifications of work to be done):

Number and Describe Each Task:
A. General Description: The roof of the Visitor Center comfort station, including skylights and ventilation fixtures, was severely damaged by fire (Appendix A). Further, significant damage to the ceiling, interior walls and floor, restroom partitions, and miscellaneous fixtures from heat and/or smoke was also documented or presumed. The facility is unusable, and the damaged roof leaves the interior susceptible to water intrusion. Once funding is secured, the comfort station roof will be replaced and interior refurbished. B. Location/(Suitable Sites): Visitor Center, Pu'ukoholā Heiau National Historic Site. C. Design/Construction Specifications: In FY20, (1) per direction of the Region 12 Civil Engineer (Appendix A), a 12-mm. canvas tarp will be installed over the entire roof before significant storms to prevent further water intrusion. The tarp will be monitored during storms and repaired/replaced as needed. The tarp will remain off between storm events to allow for better air flow circulation within the comfort station. The request covers material purchase and labor associated with tarp installation, removal and monitoring for two storm events; (2) four porta-potties (three regular, one handicap-accessible) will be rented to serve as restroom facilities for visitors until the comfort station can be rehabilitated. Funding needs are likely to extend into FY21 (costs TBD). D. Purpose of Treatment Specifications: This emergency treatment will prevent further water intrusion into the interior of the comfort station and provide visitors with functional restroom facilities. E. Treatment Effectiveness Monitoring Proposed: The comfort station will be inspected during and after rain events and the general condition of the tarp will be monitored by PUHE staff on a regular basis. It will be repaired or replaced as needed. The porta-potties will be inspected by PUHE staff and maintained by the rental company.

LABOR, MATERIALS AND OTHER COST:

PERSONNEL SERVICES: (Grade @ Cost/Hours X # Hours X # Fiscal Years = Cost/Item):	COST / ITEM
Do not include contract personnel costs here (see contractor services below).	
FY20: PUHE Staff (WS-7=20 hours, WG-7=20 hours, WG-5=12 hours)	\$2,200
FY21: TBD	
TOTAL PERSONNEL SERVICE COST	\$ 2,200
EQUIPMENT PURCHASE, LEASE AND/OR RENT (Item @ Cost/Hour X # of Hours X #Fiscal Years = Cost/Item):	COST / ITEM
Note: Purchases require written justification that demonstrates cost benefits over leasing or renting.	
FY20: Four (3 regular, 1 handicapped) Rental Porta-Potties (\$1000/month x 9 months)	\$ 9,000
FY20: GSA vehicles (one pick-up, one dump truck, one month each)	\$ 700
FY21: TBD	
TOTAL EQUIPMENT PURCHASE, LEASE OR RENTAL COST	\$ 9,700
MATERIALS AND SUPPLIES (Item @ Cost/Each X Quantity X #Fiscal Years = Cost/Item):	COST / ITEM
FY20: Emergency Roof Cover (50 snake/sand bags=\$200; 12mm heavy-duty tarp=\$1,300; miscellaneous supplies [cordage, galvanized trash cans, light-duty tarps, etc.]= \$600)	\$ 2,100
FY21: TBD	
TOTAL MATERIALS AND SUPPLY COST	\$ 2,100
TRAVEL COST (Personnel or Equipment @ Rate X Round Trips X #Fiscal Years = Cost/Item):	COST / ITEM
FY20: O'Dell Travel (\$255)	\$ 255
TOTAL TRAVEL COST	\$ 255
CONTRACT COST (Labor or Equipment @ Cost/Hour X #Hours X #Fiscal Years = Cost/Item):	COST / ITEM
N/A	
TOTAL CONTRACT COST	\$ -
TOTAL ALL COSTS	\$ 14,255

SPECIFICATION COST SUMMARY

FISCAL YEAR	PLANNED INITIATION DATE (M/D/YYYY)	PLANNED COMPLETION DATE (M/D/YYYY)	WORK AGENT	UNITS	UNIT COST	PLANNED ACCOMPLISHMENTS	PLANNED COST
2020	01/09/20	09/30/20	F	1	\$ 14,255	1	\$ 14,255
TOTAL							\$ 14,255

Work Agent: C=Coop Agreement, F=Force Account, G=Grantee, P=Permittees, S=Service Contract, T=Timber Sales Purchaser, V=Volunteer

SOURCE OF COST ESTIMATE

1. Estimate obtained from 2-3 independent contractual sources.	
2. Documented cost figures from similar project work obtained from local agency sources.	
3. Estimate supported by cost guides from independent sources or other federal agencies.	
4. Estimates based upon government wage rates and material cost.	P, M
5. No cost estimate required - cost charged to Fire Suppression Account.	

P = Personnel Services, E = Equipment M = Materials/Supplies, T = Travel, C = Contract, F = Suppression

INDIVIDUAL SPECIFICATION

TREATMENT/ACTIVITY NAME	Replace/Repair Miscellaneous Minor Assets	PART E SPECIFICATION #	F-2
NFPORS TREATMENT CATEGORY*	Property	FISCAL YEAR(S) (list each year):	2020
NFPORS TREATMENT TYPE *	Replace Administrative Asset	WUI? Y / N	Yes
IMPACTED COMMUNITIES AT RISK	Kawaihae	IMPACTED T&E SPECIES	N/A

* See NFPORS Restoration & Rehabilitation module - Edit Treatment screen for applicable entries.

WORK TO BE DONE (describe or attach exact specifications of work to be done):

Number and Describe Each Task:

A. General Description: The Kalaupapa Fire burned in the portion of PUHE containing both major park facilities—Headquarters and Visitor Center—and a variety of minor assets. This same area burned during the 2015 Kawaihae Fire, which also resulted in significant impacts to park infrastructure, some of which were subsequently damaged during the Kalaupapa Fire. This specification entails replacing 11 fire-damaged waste disposal receptacles, approximately 12 feet of burned trailhead fence, repairing fire-damaged fire alarms and sprinklers, and emergency repairs to fire-damaged water/irrigation systems.

B. Location/(Suitable Sites): Kalaupapa Fire, Pu'ukoholā Heiau National Historic Site.

C. Design/Construction Specifications: (1) Eight waste/recycling bins and three cigarette butt receptacles will be purchased and installed at the Visitor Center. If cost-effective, fire-resistant containers will be purchased; (2) replace the burned trailhead fence in-kind using locally collected materials; (3) repair fire-damaged fire alarm and sprinklers on the exterior of the Visitor Center; (4) purchase materials for approximately 2,000 feet of fire-damaged irrigation line and components.

D. Purpose of Treatment Specifications: Replacement or repair of these assets is necessary to protect human safety and critical resources. Other fire-damaged assets will be repaired or replaced from other fund sources.

E. Treatment Effectiveness Monitoring Proposed: PUHE staff will monitor waste disposal, visitor use, and completion and function of other treatments.

LABOR, MATERIALS AND OTHER COST:

PERSONNEL SERVICES: (Grade @ Cost/Hours X # Hours X # Fiscal Years = Cost/Item):

Do not include contract personnel costs here (see contractor services below).

FY20: PUHE staff (WG-7=16 hours, WG-5=16 hours)	\$	1,260
TOTAL PERSONNEL SERVICE COST	\$	1,260

EQUIPMENT PURCHASE, LEASE AND/OR RENT (Item @ Cost/Hour X # of Hours X #Fiscal Years = Cost/Item):

Note: Purchases require written justification that demonstrates cost benefits over leasing or renting.

N/A	\$	-
TOTAL EQUIPMENT PURCHASE, LEASE OR RENTAL COST	\$	-

MATERIALS AND SUPPLIES (Item @ Cost/Each X Quantity X #Fiscal Years = Cost/Item):

FY20: 8 trash/recycling cans @ \$465/each: \$3,720; 3 cigarette butt receptacles @ \$95/each: \$285; Visitor Center sprinklers/fire alarm (\$1,380); Water/irrigation system parts (\$775)	\$	6,160
TOTAL MATERIALS AND SUPPLY COST	\$	6,160

TRAVEL COST (Personnel or Equipment @ Rate X Round Trips X #Fiscal Years = Cost/Item):

N/A		
TOTAL TRAVEL COST	\$	-

CONTRACT COST (Labor or Equipment @ Cost/Hour X #Hours X #Fiscal Years = Cost/Item):

N/A		
TOTAL CONTRACT COST	\$	-
TOTAL ALL COSTS	\$	7,420

SPECIFICATION COST SUMMARY

FISCAL YEAR	PLANNED INITIATION DATE (M/D/YYYY)	PLANNED COMPLETION DATE (M/D/YYYY)	WORK AGENT	UNITS	UNIT COST	PLANNED ACCOMPLISHMENTS	PLANNED COST
2020	01/09/20	04/01/20	F	Each	\$ 530	14	\$ 7,420
TOTAL							\$ 7,420

Work Agent: C=Coop Agreement, F=Force Account, G=Grantee, P=Permittees, S=Service Contract, T=Timber Sales Purchaser, V=Volunteer

SOURCE OF COST ESTIMATE

1. Estimate obtained from 2-3 independent contractual sources.	
2. Documented cost figures from similar project work obtained from local agency sources.	
3. Estimate supported by cost guides from independent sources or other federal agencies.	
4. Estimates based upon government wage rates and material cost.	P, M
5. No cost estimate required - cost charged to Fire Suppression Account.	

P = Personnel Services, **E** = Equipment **M** = Materials/Supplies, **T** = Travel, **C** = Contract, **F** = Suppression

INDIVIDUAL SPECIFICATION

TREATMENT/ACTIVITY NAME	Cultural Resource Assessments	PART E SPECIFICATION #	CR-1
NFPORS TREATMENT CATEGORY*	Assessment	FISCAL YEAR(S) (list each year):	2020
NFPORS TREATMENT TYPE *	Fire-Damage Assessment	WUI? Y / N	Y
IMPACTED COMMUNITIES AT RISK	N/A	IMPACTED T&E SPECIES	N/A

* See NFPORS Restoration & Rehabilitation module - Edit Treatment screen for applicable entries.

WORK TO BE DONE (describe or attach exact specifications of work to be done):

Number and Describe Each Task:
A. General Description: Perform assessments of known and incidentally discovered archeological sites and features and museum objects within and potentially affected by the Kalaupapa Fire.
B. Location/(Suitable Sites): Kalaupapa Fire, Pu'ukoholā Heiau National Historic Site.
C. Design/Construction Specifications: See plan.
D. Purpose of Treatment Specifications: See plan.
E. Treatment Effectiveness Monitoring Proposed: N/A

LABOR, MATERIALS AND OTHER COST:

PERSONNEL SERVICES: (Grade @ Cost/Hour X # Hours X # Fiscal Years = Cost/Item): Do not include contract personnel costs here (see contractor services below).	COST / ITEM
FY20: Archeological Crew (\$45/hour x 4 person days)	\$ 6,000
FY20: Museum Curator (GS-11, 17 hrs)	\$ 900
TOTAL PERSONNEL SERVICE COST	\$ 6,900
EQUIPMENT PURCHASE, LEASE AND/OR RENT (Item @ Cost/Hour X # of Hours X #Fiscal Years = Cost/Item): Note: Purchases require written justification that demonstrates cost benefits over leasing or renting.	COST / ITEM
TOTAL EQUIPMENT PURCHASE, LEASE OR RENTAL COST	\$ -
MATERIALS AND SUPPLIES (Item @ Cost/Each X Quantity X #Fiscal Years = Cost/Item):	COST / ITEM
FY20: Recalibrate data loggers (\$150/ea x 2: \$300)	\$ 300
TOTAL MATERIALS AND SUPPLY COST	\$ 300
TRAVEL COST (Personnel or Equipment @ Rate X Round Trips X #Fiscal Years = Cost/Item):	COST / ITEM
FY20: Museum Curator (\$100)	\$ 100
TOTAL TRAVEL COST	\$ 100
CONTRACT COST (Labor or Equipment @ Cost/Hour X #Hours X #Fiscal Years = Cost/Item):	COST / ITEM
TOTAL CONTRACT COST	\$ -
TOTAL ALL COSTS	\$ 7,300

SPECIFICATION COST SUMMARY

FISCAL YEAR	PLANNED INITIATION DATE (M/D/YYYY)	PLANNED COMPLETION DATE (M/D/YYYY)	WORK AGENT	UNITS	UNIT COST	PLANNED ACCOMPLISHMENTS	PLANNED COST
2020	01/28/20	04/01/20	F	N/A	N/A	N/A	\$ 7,300
TOTAL							\$ 7,300

Work Agent: C=Coop Agreement, F=Force Account, G=Grantee, P=Permittees, S=Service Contract, T=Timber Sales Purchaser, V=Volunteer

SOURCE OF COST ESTIMATE

1. Estimate obtained from 2-3 independent contractual sources.	
2. Documented cost figures from similar project work obtained from local agency sources.	M
3. Estimate supported by cost guides from independent sources or other federal agencies.	
4. Estimates based upon government wage rates and material cost.	P
5. No cost estimate required - cost charged to Fire Suppression Account.	

P = Personnel Services, E = Equipment M = Materials/Supplies, T = Travel, C = Contract, F = Suppression

Kalaupapa Fire
Emergency Stabilization &
Rehabilitation Plan

INDIVIDUAL SPECIFICATION

TREATMENT/ACTIVITY NAME	Control Feral Ungulates	PART E SPECIFICATION #	CR-2
NFPORS TREATMENT CATEGORY*	Cultural & Heritage Resources	FISCAL YEAR(S) (list each year):	2020
NFPORS TREATMENT TYPE *	Protect Cultural/Heritage Sites	WUI? Y / N	Y
IMPACTED COMMUNITIES AT RISK	N/A	IMPACTED T&E SPECIES	N/A

* See NFPORS Restoration & Rehabilitation module - Edit Treatment screen for applicable entries.

WORK TO BE DONE (describe or attach exact specifications of work to be done):

Number and Describe Each Task:

A. General Description: Soon after the Kalaupapa Fire, attracted by sprouting vegetation, feral goats began to infiltrate the burned area from adjacent lands.

B. Location/(Suitable Sites): Kalaupapa Fire, Pu'ukoholā Heiau National Historic Site.

C. Design/Construction Specifications: Because goats are entering PUHE via the park entrance road and it is not feasible to construct a barrier across public roadways, mitigation will consist of the HAVO Wildlife Biologist and Hunt Crew driving animals from the park as necessary. A preliminary estimate of five day trips to PUHE are projected for this task. Work may continue into FY21 if warranted.

D. Purpose of Treatment Specifications: As noted following the Kawaihae Fire in 2015, goats can cause damage to cultural resources, impede the recovery of native vegetation, and encourage the spread of exotic invasives.

E. Treatment Effectiveness Monitoring Proposed: PUHE staff will monitor the burned area for the presence of goats and will notify the HAVO Wildlife Biologist in the event of detections.

LABOR, MATERIALS AND OTHER COST:

PERSONNEL SERVICES: (Grade @ Cost/Hours X # Hours X # Fiscal Years = Cost/Item):

Do not include contract personnel costs here (see contractor services below).

	COST / ITEM
FY20: HAVO Wildlife Biologist (\$53/hour x 40 hours) + HAVO NRM Hunt Crew (\$35/hour x 40 hours x 3 personnel)	\$ 6,320
FY21: TBD	

TOTAL PERSONNEL SERVICE COST \$ 6,320

EQUIPMENT PURCHASE, LEASE AND/OR RENT (Item @ Cost/Hour X # of Hours X #Fiscal Years = Cost/Item):

Note: Purchases require written justification that demonstrates cost benefits over leasing or renting.

	COST / ITEM
FY20: GSA vehicle - 25% monthly rent (\$125)	\$ 125
FY21: TBD	

TOTAL EQUIPMENT PURCHASE, LEASE OR RENTAL COST \$ 125

MATERIALS AND SUPPLIES (Item @ Cost/Each X Quantity X #Fiscal Years = Cost/Item):

	COST / ITEM
N/A	

TOTAL MATERIALS AND SUPPLY COST \$ -

TRAVEL COST (Personnel or Equipment @ Rate X Round Trips X #Fiscal Years = Cost/Item):

	COST / ITEM
N/A	

TOTAL TRAVEL COST \$ -

CONTRACT COST (Labor or Equipment @ Cost/Hour X #Hours X #Fiscal Years = Cost/Item):

	COST / ITEM
N/A	

TOTAL CONTRACT COST \$ -

TOTAL ALL COSTS \$ 6,445

SPECIFICATION COST SUMMARY

FISCAL YEAR	PLANNED INITIATION DATE (M/D/YYYY)	PLANNED COMPLETION DATE (M/D/YYYY)	WORK AGENT	UNITS	UNIT COST	PLANNED ACCOMPLISHMENTS	PLANNED COST
2020	03/01/20	09/30/20	F	13	\$ 495	13	\$ 6,445
TOTAL							\$ 6,445

Work Agent: C=Coop Agreement, F=Force Account, G=Grantee, P=Permittees, S=Service Contract, T=Timber Sales Purchaser, V=Volunteer

SOURCE OF COST ESTIMATE

1. Estimate obtained from 2-3 independent contractual sources.	
2. Documented cost figures from similar project work obtained from local agency sources.	
3. Estimate supported by cost guides from independent sources or other federal agencies.	
4. Estimates based upon government wage rates and material cost.	P, E
5. No cost estimate required - cost charged to Fire Suppression Account.	

P = Personnel Services, E = Equipment M = Materials/Supplies, T = Travel, C = Contract, F = Suppression

Kalaupapa Fire
Emergency Stabilization &
Rehabilitation Plan

INDIVIDUAL SPECIFICATION

TREATMENT/ACTIVITY NAME	Detect & Control Invasive Plants	PART E SPECIFICATION #	V-1
NFPORS TREATMENT CATEGORY*	Natural Resources	FISCAL YEAR(S) (list each year):	2020, 2021, 2022, 2023
NFPORS TREATMENT TYPE *	Noxious Weed Detection	WUI? Y / N	Y
IMPACTED COMMUNITIES AT RISK	N/A	IMPACTED T&E SPECIES	<i>Pritchardia maideniana</i>

* See NFPORS Restoration & Rehabilitation module - Edit Treatment screen for applicable entries.

WORK TO BE DONE (describe or attach exact specifications of work to be done):

Number and Describe Each Task:
A. General Description: Non-native species dominate the landscape at PUHE, but several invasive species of concern pose the most risk to the cultural landscape and other values-at-risk. Guinea grass (<i>Machyrus maximus</i>), fountain grass (<i>Cenchrus setaceus</i>), and kiawe (<i>Prosopis pallida</i>) are aggressive alien species that are high priority species of concern for fuels and resources management. All three of these species are currently incipient to the park, and widespread establishment of any of these species would hinder ongoing cultural landscape restoration efforts. B. Location/(Suitable Sites): Kalaupapa Fire, Pu'ukoholā Heiau National Historic Site. C. Design/Construction Specifications: Invasive plant survey and control will be conducted within the burn area for the three high-priority invasive species listed above. The burned area will be surveyed semiannually (once in summer and once in winter) during FY20 (financed through Emergency Stabilization), and annually (summer) in FY21-23 (financed through Burned Area Rehabilitation). Any individuals found will be removed using either mechanical or chemical control methods. D. Purpose of Treatment Specifications: To prevent aggressive alien species and hazard fuels from becoming established on the landscape. E. Treatment Effectiveness Monitoring Proposed: The treated areas will be monitored annually by the HAVO Botanist and a technician.

LABOR, MATERIALS AND OTHER COST:

PERSONNEL SERVICES: (Grade @ Cost/Hours X # Hours X # Fiscal Years = Cost/Item):	COST / ITEM
Do not include contract personnel costs here (see contractor services below).	
FY20: Veg lead (\$45/hour x 32 hours) + Veg crew (\$33/hour x 32 hours x 3 personnel)	\$ 4,608
FY21: Veg lead (\$45/hour x 16 hours) + Veg crew (\$33/hour x 16 hours x 3 personnel)	\$ 2,304
FY22: Veg lead (\$45/hour x 16 hours) + Veg crew (\$33/hour x 16 hours x 3 personnel)	\$ 2,304
FY23: Veg lead (\$45/hour x 16 hours) + Veg crew (\$33/hour x 16 hours x 3 personnel)	\$ 2,304
TOTAL PERSONNEL SERVICE COST	\$ 11,520
EQUIPMENT PURCHASE, LEASE AND/OR RENT (Item @ Cost/Hour X # of Hours X #Fiscal Years = Cost/Item):	COST / ITEM
Note: Purchases require written justification that demonstrates cost benefits over leasing or renting.	
N/A	\$ -
TOTAL EQUIPMENT PURCHASE, LEASE OR RENTAL COST	\$ -
MATERIALS AND SUPPLIES (Item @ Cost/Each X Quantity X #Fiscal Years = Cost/Item):	COST / ITEM
FY20: Herbicide (Glyphosate + Imazapyr)	\$ 450
TOTAL MATERIALS AND SUPPLY COST	\$ 450
TRAVEL COST (Personnel or Equipment @ Rate X Round Trips X #Fiscal Years = Cost/Item):	COST / ITEM
N/A	
TOTAL TRAVEL COST	\$ -
CONTRACT COST (Labor or Equipment @ Cost/Hour X #Hours X #Fiscal Years = Cost/Item):	COST / ITEM
N/A	
TOTAL CONTRACT COST	\$ -
TOTAL ALL COSTS	\$ 11,970

SPECIFICATION COST SUMMARY

FISCAL YEAR	PLANNED INITIATION DATE (M/D/YYYY)	PLANNED COMPLETION DATE (M/D/YYYY)	WORK AGENT	UNITS	UNIT COST	PLANNED ACCOMPLISHMENTS	PLANNED COST
2020	03/01/20	09/30/20	F	Acres	\$ 240	21	\$ 5,058
2021	10/01/20	09/30/21	F	Acres	\$ 110	21	\$ 2,304
2022	10/01/21	09/30/22	F	Acres	\$ 110	21	\$ 2,304
2023	10/01/22	09/30/23	F	Acres	\$ 110	21	\$ 2,304
TOTAL							\$ 11,970

Work Agent: C=Coop Agreement, F=Force Account, G=Grantee, P=Permittees, S=Service Contract, T=Timber Sales Purchaser, V=Volunteer

Kalaupapa Fire
Emergency Stabilization &
Rehabilitation Plan

SOURCE OF COST ESTIMATE

1. Estimate obtained from 2-3 independent contractual sources.	
2. Documented cost figures from similar project work obtained from local agency sources.	
3. Estimate supported by cost guides from independent sources or other federal agencies.	
4. Estimates based upon government wage rates and material cost.	P, M
5. No cost estimate required - cost charged to Fire Suppression Account.	

P = Personnel Services, E = Equipment M = Materials/Supplies, T = Travel, C = Contract, F = Suppression

INDIVIDUAL SPECIFICATION

TREATMENT/ACTIVITY NAME	Restore Native Vegetation	PART E SPECIFICATION #	V-2
NFPORS TREATMENT CATEGORY*	Terrestrial Habitat	FISCAL YEAR(S) (list each year):	2020, 2021, 2022, 2023
NFPORS TREATMENT TYPE *	Planting	WUI? Y / N	Y
IMPACTED COMMUNITIES AT RISK	Kawaihae	IMPACTED T&E SPECIES	<i>Pritchardia maideniana</i>

* See NFPORS Restoration & Rehabilitation module - Edit Treatment screen for applicable entries.

WORK TO BE DONE (describe or attach exact specifications of work to be done):

Number and Describe Each Task:
A. General Description: The Kalaupapa Fire burned pili grass outplantings and native landscaping planted in the developed areas. Pili grass is the desired vegetation in the PUHE cultural landscape and the landscape plantings increase native plant diversity and enhance overall visitor experience.
B. Location/(Suitable Sites): Kalaupapa Fire, Pu'ukoholā Heiau National Historic Site.
C. Design/Construction Specifications: This treatment entails outplanting pili plugs and native plants, and caring for existing pili plantings that burned during the Kalaupapa Fire. Pili plugs and native plant starts will be obtained from a combination of <i>in situ</i> plantings and nurseries. Due to the extent of damage to PUHE infrastructure during the Kalaupapa Fire, much of which resulted from burning of native landscaping, new plantings will be shifted from upright woody to prostrate herbaceous species. Work in FY20 will be financed from ES, and will involve stabilizing existing plantings that burned (e.g., ensuring sufficient soil moisture [the fire damaged irrigation system will be replaced from another fund source]) and initiating pili plantings and nursery grow-outs. In FY21-FY24, BAR will finance continued outplanting and treatment maintenance and monitoring. All work will be performed by the PUHE Vegetation Crew with assistance from the HAVO Botanist and a technician. Non-fire fund sources will significantly contribute to the effort.
D. Purpose of Treatment Specifications: Protect previous investments and critical resources, attain management objectives, and enhance visitor experience.
E. Treatment Effectiveness Monitoring Proposed: The HAVO Botanist and a technician will perform annual treatment monitoring.

LABOR, MATERIALS AND OTHER COST:

PERSONNEL SERVICES: (Grade @ Cost/Hours X # Hours X # Fiscal Years = Cost/Item): Do not include contract personnel costs here (see contractor services below).	COST / ITEM
FY20 (ES): Veg lead (\$45/hour x 208 hours) + Veg crew (\$33/hour x 208 hours x 3 personnel)	\$ 29,952
FY21 (BAR): Veg lead (\$45/hour x 192 hours) + Veg crew (\$33/hour x 192 hours x 3 personnel)	\$ 27,648
FY21 (BAR): Botanist (\$51/hour x 80 hours) + Technician (\$44/hour x 80 hours)	\$ 7,600
FY22 (BAR): Veg lead (\$45/hour x 192 hours) + Veg crew (\$33/hour x 192 hours x 3 personnel)	\$ 27,648
FY22 (BAR): Botanist (\$55/hour x 40 hours) + Technician (\$44/hour x 40 hours)	\$ 3,800
FY23 (BAR): Veg lead (\$45/hour x 88 hours) + Veg crew (\$33/hour x 88 hours x 3 personnel)	\$ 12,672
FY23 (BAR): Botanist (\$55/hour x 40 hours) + Technician (\$44/hour x 40 hours)	\$ 3,800
TOTAL PERSONNEL SERVICE COST	\$ 113,120
EQUIPMENT PURCHASE, LEASE AND/OR RENT (Item @ Cost/Hour X # of Hours X #Fiscal Years = Cost/Item): Note: Purchases require written justification that demonstrates cost benefits over leasing or renting.	COST / ITEM
N/A	\$ -
TOTAL EQUIPMENT PURCHASE, LEASE OR RENTAL COST	\$ -
MATERIALS AND SUPPLIES (Item @ Cost/Each X Quantity X #Fiscal Years = Cost/Item):	COST / ITEM
FY21 (BAR): Native plants for landscaping	\$ 2,500
TOTAL MATERIALS AND SUPPLY COST	\$ 2,500
TRAVEL COST (Personnel or Equipment @ Rate X Round Trips X #Fiscal Years = Cost/Item):	COST / ITEM
FY21 (BAR): Botanist + Technician @ \$1675/each for 5-day trip to PUHE	\$ 3,350
FY22 (BAR): Botanist + Technician @ \$525/each for 2-day trip to PUHE	\$ 1,050
FY23 (BAR): Botanist + Technician @ \$525/each for 2-day trip to PUHE	\$ 1,050
TOTAL TRAVEL COST	\$ 5,450
CONTRACT COST (Labor or Equipment @ Cost/Hour X #Hours X #Fiscal Years = Cost/Item):	COST / ITEM
N/A	
TOTAL CONTRACT COST	\$ -
TOTAL ALL COSTS	\$ 121,070

SPECIFICATION COST SUMMARY

FISCAL YEAR	PLANNED INITIATION DATE (M/D/YYYY)	PLANNED COMPLETION DATE (M/D/YYYY)	WORK AGENT	UNITS	UNIT COST	PLANNED ACCOMPLISH MENTS	PLANNED COST
2020 (ES)	03/01/20	09/30/20	F	Acres	\$5,990	5	\$ 29,952
2021 (BAR)	10/01/20	09/30/21	F	Acres	\$8,220	5	\$ 41,098
2022 (BAR)	10/01/21	09/30/22	F	Acres	\$6,500	5	\$ 32,498
2023 (BAR)	10/01/22	09/30/23	F	Acres	\$3,505	5	\$ 17,522
TOTAL					\$6,054	20	\$ 121,070

Work Agent: **C**=Coop Agreement, **F**=Force Account, **G**=Grantee, **P**=Permittees, **S**=Service Contract, **T**=Timber Sales Purchaser, **V**=Volunteer

SOURCE OF COST ESTIMATE

1. Estimate obtained from 2-3 independent contractual sources.	
2. Documented cost figures from similar project work obtained from local agency sources.	
3. Estimate supported by cost guides from independent sources or other federal agencies.	
4. Estimates based upon government wage rates and material cost.	
5. No cost estimate required - cost charged to Fire Suppression Account.	

P = Personnel Services, **E** = Equipment **M** = Materials/Supplies, **T** = Travel, **C** = Contract, **F** = Suppression

INDIVIDUAL SPECIFICATION

TREATMENT/ACTIVITY NAME	Remove Fire-Killed Trees	PART E SPECIFICATION #	V-3
NFPORS TREATMENT CATEGORY*	Human Life and Safety	FISCAL YEAR(S) (list each year):	2020
NFPORS TREATMENT TYPE *	Hazard Removal-Other	WUI? Y / N	Y
IMPACTED COMMUNITIES AT RISK	Kawaihae	IMPACTED T&E SPECIES	N/A

* See NFPORS Restoration & Rehabilitation module - Edit Treatment screen for applicable entries.

WORK TO BE DONE (describe or attach exact specifications of work to be done):

Number and Describe Each Task:

A. General Description: The Kalaupapa Fire partially to fully scorched a number of planted native (<i>Thespesia populnea</i> , <i>Pritchardia maideniana</i>) and naturalized non-native (<i>Prosopis pallida</i>) trees, many of which are located in developed areas. Dead or damaged trees pose a threat to human safety and critical cultural resources, and also constitute hazardous fuels.
B. Location/(Suitable Sites): Kalaupapa Fire, Pu'ukoholā Heiau National Historic Site.
C. Design/Construction Specifications: PUHE staff will monitor tree health and thin or fall fire-damaged or dead trees as needed. As many as 30 trees may need to be addressed; known hazard trees will be mitigated as soon as possible. Cut material will be chipped and utilized within the park as mulch.
D. Purpose of Treatment Specifications: Protect visitor and employee safety and critical cultural resources and reduce hazardous fuels.
E. Treatment Effectiveness Monitoring Proposed: PUHE staff will monitor tree health.

LABOR, MATERIALS AND OTHER COST:

PERSONNEL SERVICES: (Grade @ Cost/Hours X # Hours X # Fiscal Years = Cost/Item): Do not include contract personnel costs here (see contractor services below).	COST / ITEM
FY20: PUHE Staff (WG-05, 80 hours)	\$ 2,640
TOTAL PERSONNEL SERVICE COST	\$ 2,640
EQUIPMENT PURCHASE, LEASE AND/OR RENT (Item @ Cost/Hour X # of Hours X #Fiscal Years = Cost/Item): Note: Purchases require written justification that demonstrates cost benefits over leasing or renting.	COST / ITEM
FY20: GSA vehicles (pick-up, dump truck, 0.25 months/each)	\$ 175
TOTAL EQUIPMENT PURCHASE, LEASE OR RENTAL COST	\$ 175
MATERIALS AND SUPPLIES (Item @ Cost/Each X Quantity X #Fiscal Years = Cost/Item):	COST / ITEM
FY20: Chipper parts	\$ 320
TOTAL MATERIALS AND SUPPLY COST	\$ 320
TRAVEL COST (Personnel or Equipment @ Rate X Round Trips X #Fiscal Years = Cost/Item):	COST / ITEM
N/A	
TOTAL TRAVEL COST	\$ -
CONTRACT COST (Labor or Equipment @ Cost/Hour X #Hours X #Fiscal Years = Cost/Item):	COST / ITEM
N/A	
TOTAL CONTRACT COST	\$ -
TOTAL ALL COSTS	\$ 3,135

SPECIFICATION COST SUMMARY

FISCAL YEAR	PLANNED INITIATION DATE (M/D/YYYY)	PLANNED COMPLETION DATE (M/D/YYYY)	WORK AGENT	UNITS	UNIT COST	PLANNED ACCOMPLISHMENTS	PLANNED COST
2020	01/27/20	09/30/20	F	Miles	\$ 3,135	1	\$ 3,135
TOTAL							\$ 3,135

Work Agent: C=Coop Agreement, F=Force Account, G=Grantee, P=Permittees, S=Service Contract, T=Timber Sales Purchaser, V=Volunteer

SOURCE OF COST ESTIMATE

1. Estimate obtained from 2-3 independent contractual sources.	
2. Documented cost figures from similar project work obtained from local agency sources.	E
3. Estimate supported by cost guides from independent sources or other federal agencies.	
4. Estimates based upon government wage rates and material cost.	P, M
5. No cost estimate required - cost charged to Fire Suppression Account.	

P = Personnel Services, E = Equipment, M = Materials/Supplies, T = Travel, C = Contract, F = Suppression

INDIVIDUAL SPECIFICATION

TREATMENT/ACTIVITY NAME	Administration	PART E SPECIFICATION #	AD-1
NFPORS TREATMENT CATEGORY*	Administration	FISCAL YEAR(S) (list each year):	2020, 2021
NFPORS TREATMENT TYPE *	Administration	WUI? Y / N	Y
IMPACTED COMMUNITIES AT RISK	Kawaihae	IMPACTED T&E SPECIES	<i>Pritchardia maideniana</i>

* See NFPORS Restoration & Rehabilitation module - Edit Treatment screen for applicable entries.

WORK TO BE DONE (describe or attach exact specifications of work to be done):

Number and Describe Each Task:
A. General Description: This specification funds salary and travel for the Kalaupapa BAER Implementation Leader to assist with post-fire plan development and oversee implementation of proposed BAER treatments and activities associated with the Kalaupapa Fire in FY20 (and FY21 as applicable).
B. Location/(Suitable Sites): Kalaupapa Fire, Pu'ukoholā Heiau National Historic Site.
C. Design/Construction Specifications: Among the tasks to be performed under this specification include (as applicable): (1) Develop post-fire plan, including amendments (2) Develop scopes of work (3) Intra-agency coordination (5) Implementation monitoring (6) Budget tracking (7) Accomplishment reporting
D. Purpose of Treatment Specifications: The Kalaupapa Fire created a variety of emergency post-fire issues on NPS lands. Multiple specifications are proposed to address these issues, most of which require specialized expertise provided by other NPS staff. Dedicated overhead implementation staff time is required to ensure specifications are completed correctly and in a timely manner, budgets are tracked, and accomplishments are reported.
E. Treatment Effectiveness Monitoring Proposed: N/A

LABOR, MATERIALS AND OTHER COST:

PERSONNEL SERVICES: (Grade @ Cost/Hours X # Hours X # Fiscal Years = Cost/Item): Do not include contract personnel costs here (see contractor services below).	COST / ITEM
FY20: Mark Wasser (GS-09, 100 hours, \$44/hour)	\$ 4,400
FY21: TBD	
TOTAL PERSONNEL SERVICE COST	\$ 4,400
EQUIPMENT PURCHASE, LEASE AND/OR RENT (Item @ Cost/Hour X # of Hours X #Fiscal Years = Cost/Item): Note: Purchases require written justification that demonstrates cost benefits over leasing or renting.	COST / ITEM
N/A	\$ -
TOTAL EQUIPMENT PURCHASE, LEASE OR RENTAL COST	\$ -
MATERIALS AND SUPPLIES (Item @ Cost/Each X Quantity X #Fiscal Years = Cost/Item):	COST / ITEM
N/A	
TOTAL MATERIALS AND SUPPLY COST	\$ -
TRAVEL COST (Personnel or Equipment @ Rate X Round Trips X #Fiscal Years = Cost/Item):	COST / ITEM
FY20: Wasser Travel	\$ 500
FY21: TBD	
TOTAL TRAVEL COST	\$ 500
CONTRACT COST (Labor or Equipment @ Cost/Hour X #Hours X #Fiscal Years = Cost/Item):	COST / ITEM
N/A	
TOTAL CONTRACT COST	\$ -
TOTAL ALL COSTS	\$ 4,900

SPECIFICATION COST SUMMARY

FISCAL YEAR	PLANNED INITIATION DATE (M/D/YYYY)	PLANNED COMPLETION DATE (M/D/YYYY)	WORK AGENT	UNITS	UNIT COST	PLANNED ACCOMPLISH MENTS	PLANNED COST
2020	01/09/20	09/30/20	F	N/A	N/A	N/A	\$ 4,900
TOTAL							\$ 4,900

Work Agent: **C**=Coop Agreement, **F**=Force Account, **G**=Grantee, **P**=Permittees, **S**=Service Contract, **T**=Timber Sales Purchaser, **V**=Volunteer

SOURCE OF COST ESTIMATE

1. Estimate obtained from 2-3 independent contractual sources.	
2. Documented cost figures from similar project work obtained from local agency sources.	
3. Estimate supported by cost guides from independent sources or other federal agencies.	
4. Estimates based upon government wage rates and material cost.	P, T
5. No cost estimate required - cost charged to Fire Suppression Account.	

P = Personnel Services, **E** = Equipment **M** = Materials/Supplies, **T** = Travel, **C** = Contract, **F** = Suppression

Appendices

APPENDIX A

Facilities Assessment Trip Report

APPENDIX B

Museum Assessment Trip Report