NORTHWEST HAWAI'I ISLAND COMMUNITY WILDFIRE PROTECTION PLAN

ISLAND OF HAWAI'I, HAWAI'I

ORIGINAL PLAN: 2007 UPDATED AND EXPANDED: 2016

This document represents the collective efforts of community members, agencies, and stakeholders to reduce wildfire risks and enhance resilience. Originally developed in 2007, the 2016 update included community and agency meetings throughout the region to identify and document an updated set of hazards, concerns, and recommended actions. The boundaries of the 2007 plan were also expanded to include the entire geographic area of both North Kohala and South Kohala county districts. The CWPP established a comprehensive framework for wildfire hazard assessment, community values, and recommended strategies for risk reduction.

PRIORITY PROJECTS UPDATED: 2024

In 2024, the plan was updated to include a detailed list of priority projects, making it a dynamic, living plan that evolves with the community's needs and priorities. The CWPP remains a cornerstone for wildfire risk mitigation, project planning, and funding, ensuring a collaborative and proactive approach to wildfire resilience.

Coordinated and developed by Hawai'i Wildfire Management Organization, in partnership with Hawai'i Department of Land and Natural Resources, Division of Forestry and Wildlife. Funded by the USDA Forest Service.

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PLEASE READ BEFORE CONTINUING

Introduction to the Community Wildfire Protection Plan (CWPP) and Updates

The Community Wildfire Protection Plan (CWPP) is a vital tool for guiding communities, agencies, and stakeholders in reducing wildfire risks and enhancing resilience across our landscapes. Since its inception, the CWPP has provided a comprehensive foundation for understanding wildfire hazards, the characteristics of our landscapes, the values at risk, and the community and agency concerns that shape our wildfire mitigation strategies. The CWPP has always been designed to serve as a dynamic, living document that remains relevant and actionable over time.

Foundational Elements of the CWPP

The foundational elements of the CWPP were established during the original completion of the CWPP document. These remain steadfast and include:

- Detailed assessments of wildfire hazards and risks.
- Descriptions of the local and regional landscape.
- Identification of community values at risk, including natural resources, homes, infrastructure, and cultural heritage.
- Documentation of community and agency concerns regarding wildfire impacts.
- General recommended next steps and strategies to address wildfire risk.

When there are significant changes in risk, values, emergency operations, or similar, an entirely new CWPP document will be developed. Until such time, these core components ensure that the CWPP continues to provide a reliable, broad-based framework for understanding and addressing wildfire challenges.

The Evolution of the CWPP: Annual Priority Projects and Actions Updates

To ensure that the CWPP remains an actively utilized tool for project planning and funding, we have adopted a system of annual updates to the appendix. These updates focus specifically on identifying and prioritizing shovel-ready projects that align with the overarching goals of the CWPP. This approach allows us to:

- Keep the CWPP alive and relevant by incorporating evolving community needs and priorities.
- Enhance its utility as a foundational resource for securing funding and implementing wildfire mitigation projects.
- Ensure that project lists remain current, specific, and actionable.

While the foundational elements of the CWPP persist as written, the priority projects and actions list naturally shift and evolve over time. This flexibility ensures that the CWPP remains both a strategic guide and a practical resource for action.

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Mutual Agreement Signature Page

The following three entities mutually agree to the final contents of this Community Wildfire Protection Plan and the subsequent List of Priority Projects and Actions: State of Hawaii Department of Land and Natural Resources, Division of Forestry and Wildlife; Hawaii Fire Department; and Hawaii County Civil Defense Agency.

This plan:

- Was collaboratively developed by agencies, entities, community members, and individuals with interest or jurisdiction within the CWPP area.
- Describes wildfire hazards in the natural and built environment.
- Provides the concerns, recommended actions, and priorities of those who live and work in the area to better reduce wildfire threats, mitigate hazards, improve public safety, and protect natural resources from the impacts of wildfire.
- Is written to appropriately begin and inform wildfire mitigation action planning at the local level, and is not regulatory or binding.
- Includes both foundational information and updated lists of projects.

Pursuant to the 2003 Healthy Forest Restoration Act (HFRA), the following signatures represent mutual agreement of the contents of this CWPP.

Acknowledgment of the 2024 Update

This 2024 update represents the latest step in the CWPP's evolution. It includes a brand-new list of priority projects and actions, each identified with detailed specifications to guide implementation.

By signing this document, we affirm our collective commitment to the CWPP's foundational principles and to the ongoing process of refining and advancing our wildfire mitigation project priorities and implementation efforts.

Michael Walker _____ 12/19/2024

Michael J. Walker, State Fire Protection Forester — Date
Department of Land and Natural Resources
Division of Forestry and Wildlife

_____ 01/13/2025

Kazuo S.K.L. Todd, Fire Chief — Date
County of Hawaii
Hawaii Fire Department

Talmadge Magno _____ 12/19/2024

Talmadge Magno, Administrator — Date
Hawaii County Civil Defense Agency

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Table of Contents:

Cover image: Northwest Hawaii CWPP boundary map, courtesy of the Hawaii Wildfire Management Organization. All photos in CWPP courtesy of Denise Laitinen unless otherwise noted.

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Executive Summary:

The leeward or west side of Hawaii Island with its arid weather conditions and sprawling grasslands, interspersed with housing development is a wildland urban interface (WUI). The wildland/urban interface (WUI) is any area where wildlands abut houses or a development. This interface area poses the highest risk of loss of life and property due to wildland fire. The risk of wildland fire impacting structures in the WUI is determined by several factors, including the ignitability of fuels, structural ignitability, weather conditions, and topographical features, such as slope.

Unlike the contiguous United States, wildfire is not a natural part of Hawaii's ecosystem. In Hawaii, wildfires destroy native ecosystems, which impacts watersheds and traditional cultural activities. Wildfires have also caused the demise of or have fragmented the habitats that support native flora and fauna, many of which are listed as endangered or threatened. Sixty-five percent (65%) of Hawaii Island's dryland forest ecosystems have been lost primarily due to wildfire carried by invasive grasses. Consequently, Hawaii's dryland habitats are mere remnants of what was once referred to as the most diverse dryland ecosystem in the state. Wildfires in Hawaii also cause soil erosion, which negatively impacts our ocean reefs. Exposed soils pose a significant health hazard as well when the loose particulates are picked up in the wind and carried to populated areas.

The overwhelming majority of wildfires in Hawaii are caused by arson or human error. Human error includes errant fireworks, burning rubbish, cooking, or agricultural fires that get out of control in the wildland-urban interface, as well as vehicle-caused wildfires.

Principal stakeholders who have an interest in protecting Northwest Hawaii from wildfire include Hawaii Wildfire Management Organization, which sponsored this CWPP, Hawaii Fire Department, Hawaii County Civil Defense, Department of Land and Natural Resources Division of Forestry and Wildlife, Department of Hawaiian Home Lands, the U.S Army, the U.S. Fish and Wildlife Service, and large landowners. These decision makers were invited to participate in the development of this Plan.

A wildfire hazard assessment determined that WUI areas in Northwest Hawaii communities have a high risk of wildfire. Wildland fires occur frequently throughout Northwest Hawaii, threatening area residents. The largest wildfire in state history was in Northwest Hawaii in 1969 and burned more than 47,000 acres and a 2005 wildfire that burned 25,000 acres forced the evacuation of thousands of people. The continued invasion of non-native plant species, which are considered high-intensity burning fuels, increases the wildfire risk within Westside communities. Grazing traditionally assisted in reducing fuel loads and wildfire risk. However, due to a variety of circumstances, grazing has been reduced or eliminated in many areas, which has contributed to the accelerated wildfire risk in areas that were previously less prone to wildfire. The lack of reliable water resources for both ground and helicopter fire suppression crews have also compromised the rapid response to these disasters and have contributed to the increased fire spread. Communities vary in their access of water, with some communities relying on private water systems or catchment water basins, with others accessing county water.

Meetings with community members and fire agency personnel identified a variety of mitigation measures to reduce the chance of fires starting in Northwest Hawaii, as well as to attempt to minimize the impact of a wildfire. These measures include: 1) installation of pre-staged static water and helicopter dip tanks; 2) acquisition of adequate resources for first responders, including off-road tankers; 3) reduction of fuel loads and/or appropriate conversion of fuels along road sides, in community open areas, and individual homes; 4) adoption of development standards and community planning that requires the mitigation of wildfire risks; 5) creation of secondary emergency access roads and emergency egress signage within subdivisions; 6) development of emergency staging areas within

communities; 7) reduction and/or control of invasive species that possess inherent fire or ignition properties; 8) continued fire prevention education, including arson prevention; and 9) integration of communication equipment to increase effective firefighting response.

While homes and structures have been lost to wildfire in the past, Hawaii County has been fortunate in controlling wildland fires in and around communities. To date, there has been no loss of life contributed to wildfire disasters. However, the existing wildfire risk is severe given the fire history, rapid development of the region, and the increasing fire fuel load. The mitigation measures outlined in this CWPP will enable Northwest Hawaii communities to reduce their risk to wildfire and create a more efficient fire-protection plan. The mitigation measures listed above identify pro-active projects that communities and fire agencies can undertake to minimize losses from a major wildland fire.

Background:

This CWPP covers a broad expanse (451,086 acres) of the leeward side of Hawaii Island. Figure 1 depicts the Base Map of the Northwest Hawaii CWPP. The area included in this CWPP extends from Kohala (intersection of Akoni Pule Highway and Old Coast Guard Road) south to Hina Lina subdivision in Kailua-Kona and from sea level in the west, eastward to Kohala Mountain Road in Kohala, Pu'u Kapu in Waimea, Waiki'i, and the extensive state land holdings east of Mamalahoa Highway between Saddle Road and Kamehameha School land holdings. Covering an expanse from sea level to the 8,800-foot elevation, this CWPP encompasses the base of Mauna Loa, the world's largest volcano. The inhabited areas at potential risk to wildland fire include Kohala Ranch, Kohala by the Sea, Kohala Estates, Kawaihae, Kawaihae Village, Puako, Waimea, Pu'u Kapu, Waiki'i, Pu'uanahulu, Pu'u Wa'a Wa'a Waikoloa, Kona Palisades, Kealakehe, and Hina Lani, as well as vast areas of state and federal lands, and open grasslands.

Figure 1: The Northwest Hawaii CWPP area of consideration is outlined in yellow and covers more than 451,086 acres.

There are five main roads in West Hawaii: Queen Kaahumanu Highway, Mamalahoa Highway, Akoni Pule Highway, Waikoloa Road, and Kohala Mountain Road. Queen Kaahumanu Highway (Route 19) runs north-south along the coast from Kona to Kawaihae as does Mamalahoa Highway (Route 190), which also runs north-south, upslope and parallel to Queen Kaahumanu Highway at an elevation ranging from 1,000 – 2,000 feet. In Kawaihae, Queen Kaahumanu Highway continues north as Akoni Pule Highway (Route 270), while Route 19 veers to the east – upslope to Waimea along Kawaihae Road. Kohala Mountain Road also runs north–south from Waimea to Hawi and is roughly parallel to Akoni Pule Highway at a higher elevation. Waikoloa Road runs east-west, connecting Queen Kaahumanu Highway and Mamalahoa Highway and is the primary access to the Waikoloa community. These five roads provide access to all the communities covered by this CWPP.

Within Northwest Hawaii there are several communities, including, from north to south, Kawaihae, Waimea, Puako, Pu'uanahulu, and Waikoloa. Communities covered by this CWPP vary in size from 100 single-family home subdivisions to more than 2,700 dwellings with single-family homes, condominiums, retail outlets, schools, historical sites, recreational areas, and commercial facilities. Some of the subdivisions in the coverage area are: Waiki'i, Puakea Ranch, Kohala by the Sea, Kohala Ranch, Kohala Estates, Kawaihae Village, Pu'u Kapu, Pu'u Lani Ranch Estates, Kona Palisades, Kealakehe, and Hina Lani Estates. In addition, there are several internationally known world-class resorts that draw thousands of visitors from around the world.

Within the CWPP boundary, county fire stations are located in Waimea, Puako, and Waikoloa with volunteer fire stations in Pu'uanahulu, Kohala Estates, Waiki'i, and Kona Palisades. A fire station in Kapa'au, while outside the boundary of the CWPP, is responsible for the northern most area included in the CWPP. Each county station has four personnel on duty and is manned 24 hours a day. Volunteer fire stations rely on volunteer personnel.

The Waikoloa county fire station houses a Type 1 engine, ambulance, and hazardous materials vehicle with no firefighting capability, as well as battalion chief quarters for West Hawaii. The South Kohala fire station, located on the Kohala Coast between Waikoloa and Puako, houses a Type 1 engine, 750-gallon tanker, ambulance, and a Type 3 helicopter. The Waimea fire station, near downtown Waimea, houses a Type 1 engine, a 750-gallon tanker, and an ambulance.

In addition to the communities and subdivisions, large landowners within the CWPP coverage area include Parker Ranch, Department of Hawaiian Home Lands, the State of Hawaii, Queen Emma Land Corporation, and Kamehameha Schools. The majority of Queen Emma land within the CWPP boundary area is leased to Parker Ranch for grazing. Figure 2 below illustrates the various large landowners within the Northwest Hawaii CWPP boundary.

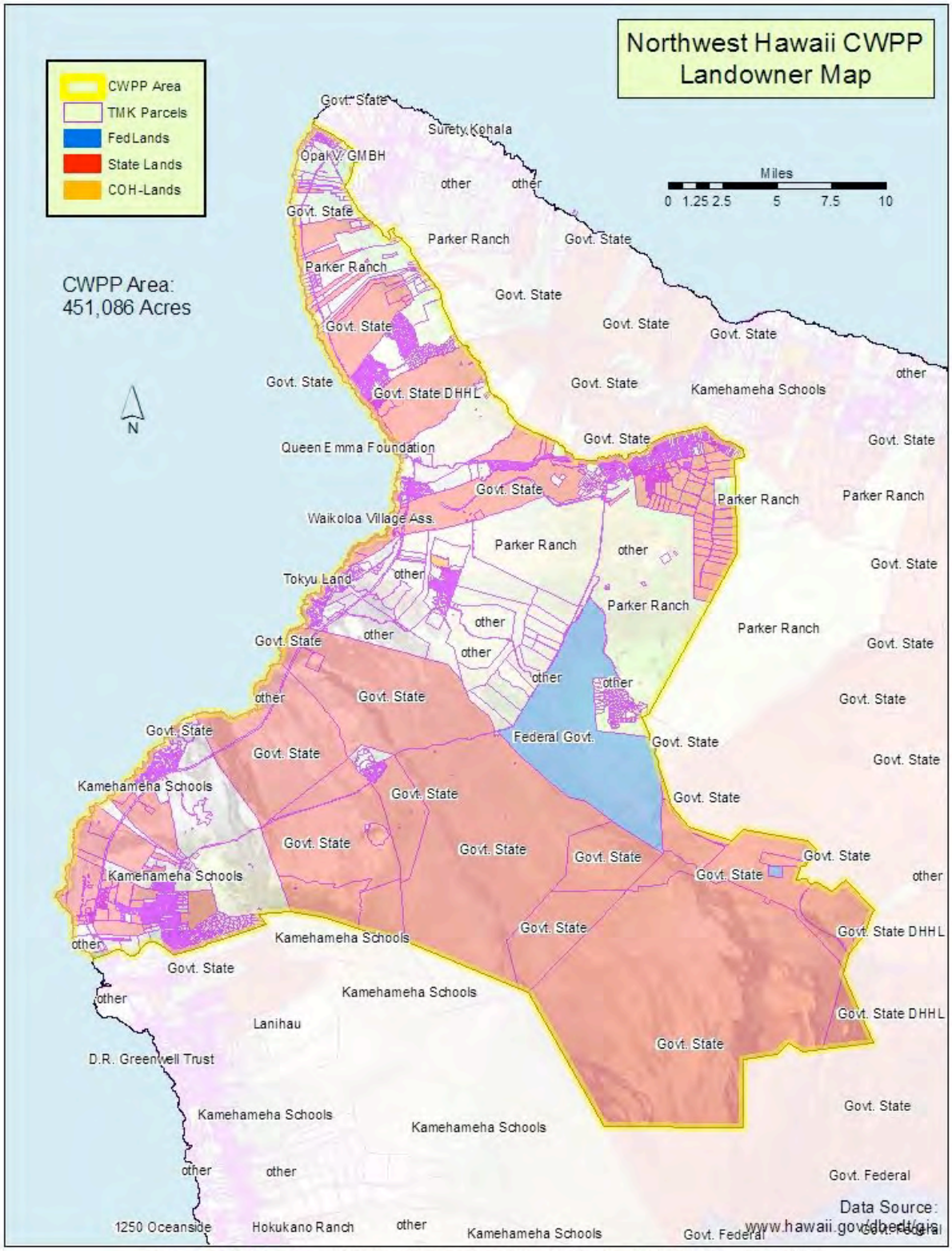

Figure 2: Map depicts major landowners within Northwest Hawaii CWPP coverage area. Reddish areas are state lands, while those in gold are county lands. Queen Emma Land Corporation, Kamehameha Schools, Parker Ranch, and the Department of Hawaiian Home Lands also own extensive land tracts.

As seen in Figure 3 below, land use in Northwest Hawaii varies between agricultural, conservation, rural, and urban. The majority of land, or 52 percent of the area within the CWPP boundary, is used for agricultural purposes.

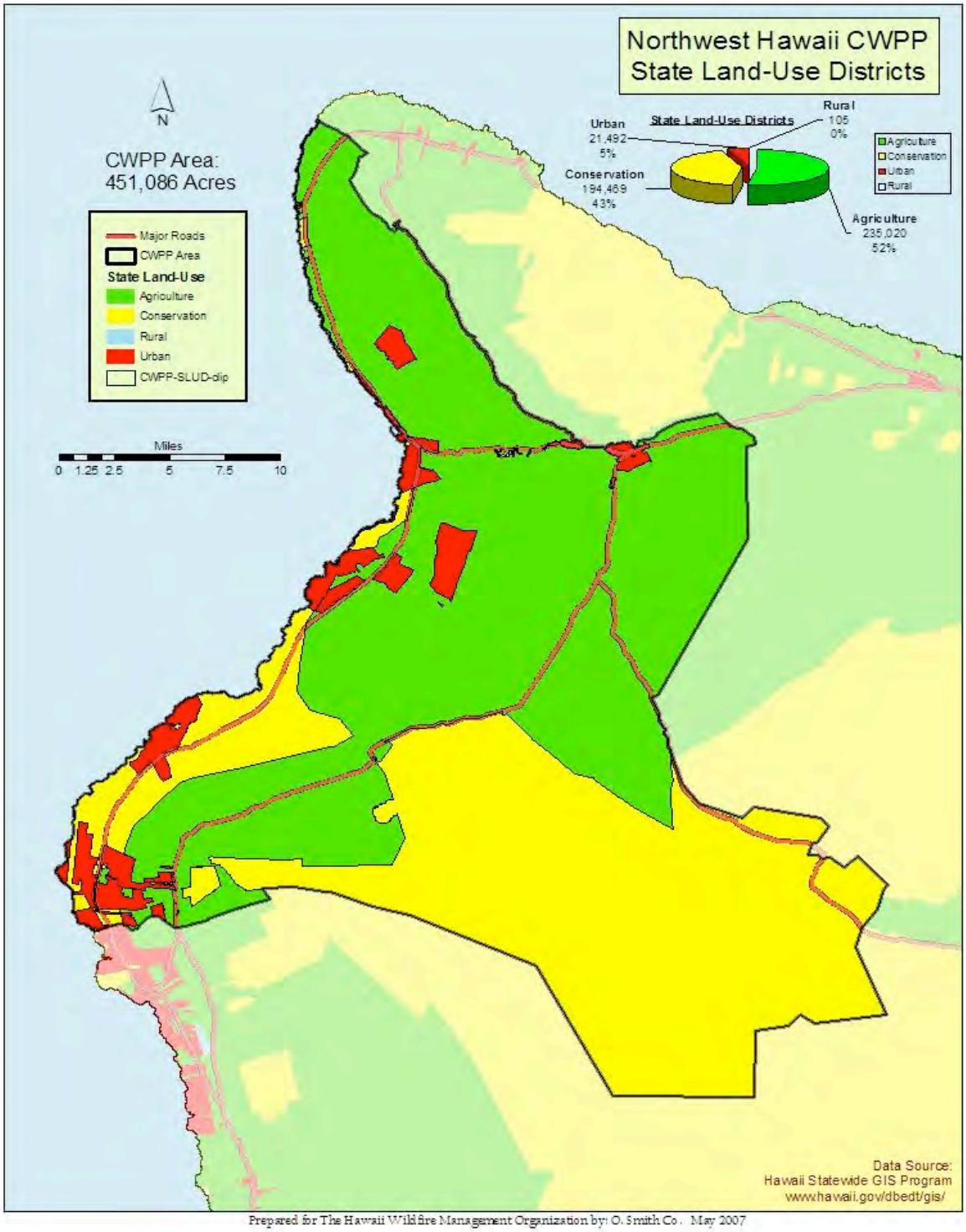

Figure 3: Map depicts land use districts within Northwest Hawaii. Green denotes agricultural areas (235,000 acres or 52 percent of CWPP area), yellow denotes conservation areas (194,469 or 43 percent of coverage area), blue denotes rural areas (0 percent), and red highlights urban areas (21,492 or 5 percent of CWPP area).

The CWPP area encompasses historical, archeological, and cultural sites and natural areas of importance. Examples of these sites are: Pu'ukohola Heiau National Historic Site; Puako Petroglyph Archeological Preserve; Lapakahi State Historical Park; county parks and beaches, including the popular Hapuna Beach State Recreation Area; and more than 3,000 acres of State land holdings, including Pu'u Wa'a Wa'a State Wildlife Preserve.

Northwest Hawaii receives an average rainfall of 10 – 20 inches a year. Communities along the coast receive less than 10 inches of rain while higher elevations receive more precipitation. The coverage area is notoriously dry and at times can be extremely dry. Kawaihae holds the state record for the least amount of annual rainfall (0.19 inch in 1953) and Puako has the distinction of the lowest average annual rainfall (1987-2000) at 8.93 inches.

Ridge along the southern boundary of Pu'u Lani Ranch Estates subdivision. The ridge is a fire concern due to its steep slope and the high-intensity burning vegetation growing on the ridge.

Slope within the region varies by geography, although the overall terrain in the region naturally slopes from the mountains down to the sea. Gulches, as well as volcanic vents or hills several hundred feet in elevation, dot the countryside. Some subdivisions, such as Pu'u Lani Ranch Estates, have steep ridges bordering their community, others, such as Kohala by the Sea and Waikoloa; have gulches running through their communities. These ridges and gulches are covered with invasive grasses and shrubs that are high intensity burning fuels.

Vegetation zones, as depicted in Figure 4 below, vary within Northwest Hawaii between grasslands, mixed forest, high-intensity developed, scrub/shrub, bare land, estuarine shrub/scrub, and low-intensity developed, among others. Communities and subdivisions in Northwest Hawaii are often separated by vast expanses of open grasslands containing high-intensity burning fire fuels, including grasses and shrubs. Large lava flows also dot the landscape, providing natural fuel breaks.

The dryland ecosystem in Northwest Hawaii was once referred to as the most diverse native dryland ecosystem in the state of Hawaii. Development, the lack of fine fuels mitigation, and continuous wildfires have caused the demise of much of these native forests, leaving pockets, or kipuka, of remnant plant communities dotting the countryside. Small kipukas of wili wili (*Erythrina sandwicensis*) and lama (*Diospyros sandwicensis*) trees in Waikoloa and along highway 190 are examples of these remnant forests. Attempts at reforestation are under way in Pu'u Wa'a Wa'a and Waikoloa. However, alien trees, shrubs, and grasses have invaded these kipuka. Many of the grasses, such as molasses grass (*Melinis minutiflora*) and fountain grass (*Pennisetum setaceum*), are fire-adapted and increase wildfire potential in areas they invade.

Lava flows dot the Northwest Hawaii landscape providing natural fire fuel breaks. However, invasive grasses, such as fountain grass (above) have spread across open lands and the lava flows reducing their effectiveness as fuel breaks.

The 1859 lava flow, which started from Mauna Loa and flowed westward to the sea, presently serves as a natural fuel break between the communities of Waikoloa and Pu'uanahulu. To the south of Pu'uanahulu, the 1801 lava flow traverses from the mountaintop of Hualalai to sea level in multiple areas. These flows, along with numerous smaller sparsely vegetated flows, serve as natural fuel breaks. However, the proliferation of fountain grass has compromised these fuel breaks. A prolific

non-native species, fountain grass is colonizing lava flows at an alarming rate, and as a result, enabling fire to burn on the fuel break. Fountain grass is so prevalent in Northwest Hawaii that complete eradication of the plant is unfeasible.

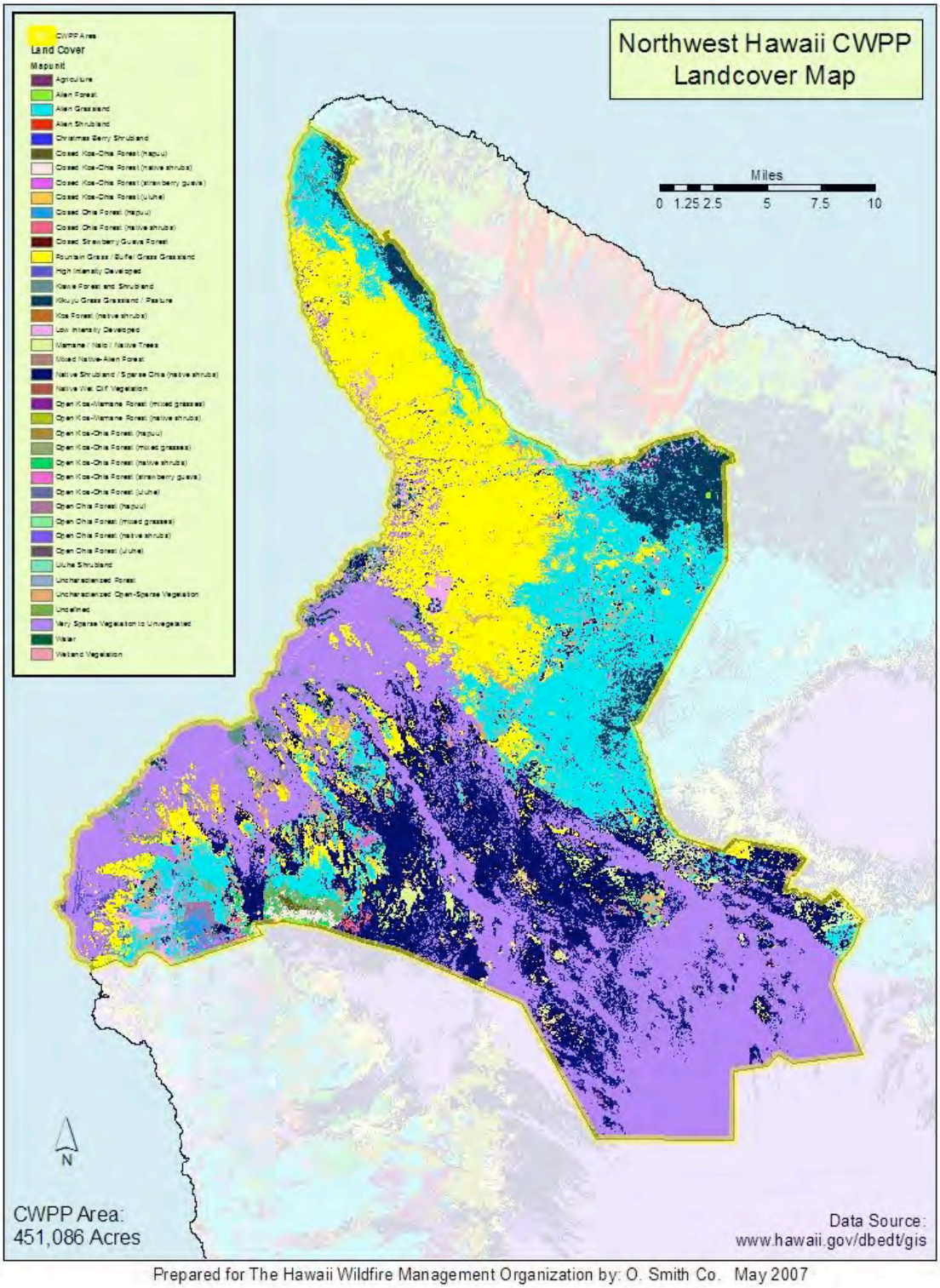

Figure 4: Land cover map of Northwest Hawaii depicting various vegetation zones. Yellow areas denote fountain grass, buffel grass, and/or gassland; purple denotes unvegetated or very sparse vegetation; light blue denotes alien grassland; and dark blue denotes native shrubland / sparse ohia (native shrubs).

Northwest Hawaii is home to more than 54 federally-listed endangered and threatened plant and animal species, including the Hawaiian duck, (*Anas wyvilliana*), Hawaiian goose (*Branta sandvicensis*), Hawaiian hawk (*Buteo solitarius*), Palila (*Loxioides bailleui),* Akepa (*Loxops coccineus coccineus*), Hawaii creeper (*Oreomystis mana*), ‘Ohai (*Sesbania tomentosa),* Hala pepe (*Pleomele hawaiiensis),* Po`e (*Portulaca sclerocarpa*), and Loulu (*Pritchardia affinis*). Figure 5 below shows a plant density map for endangered and threatened plants in Northwest Hawaii. Maps of native Hawaiian bird species locations and forest bird ranges in Northwest Hawaii can be found in Appendix A.

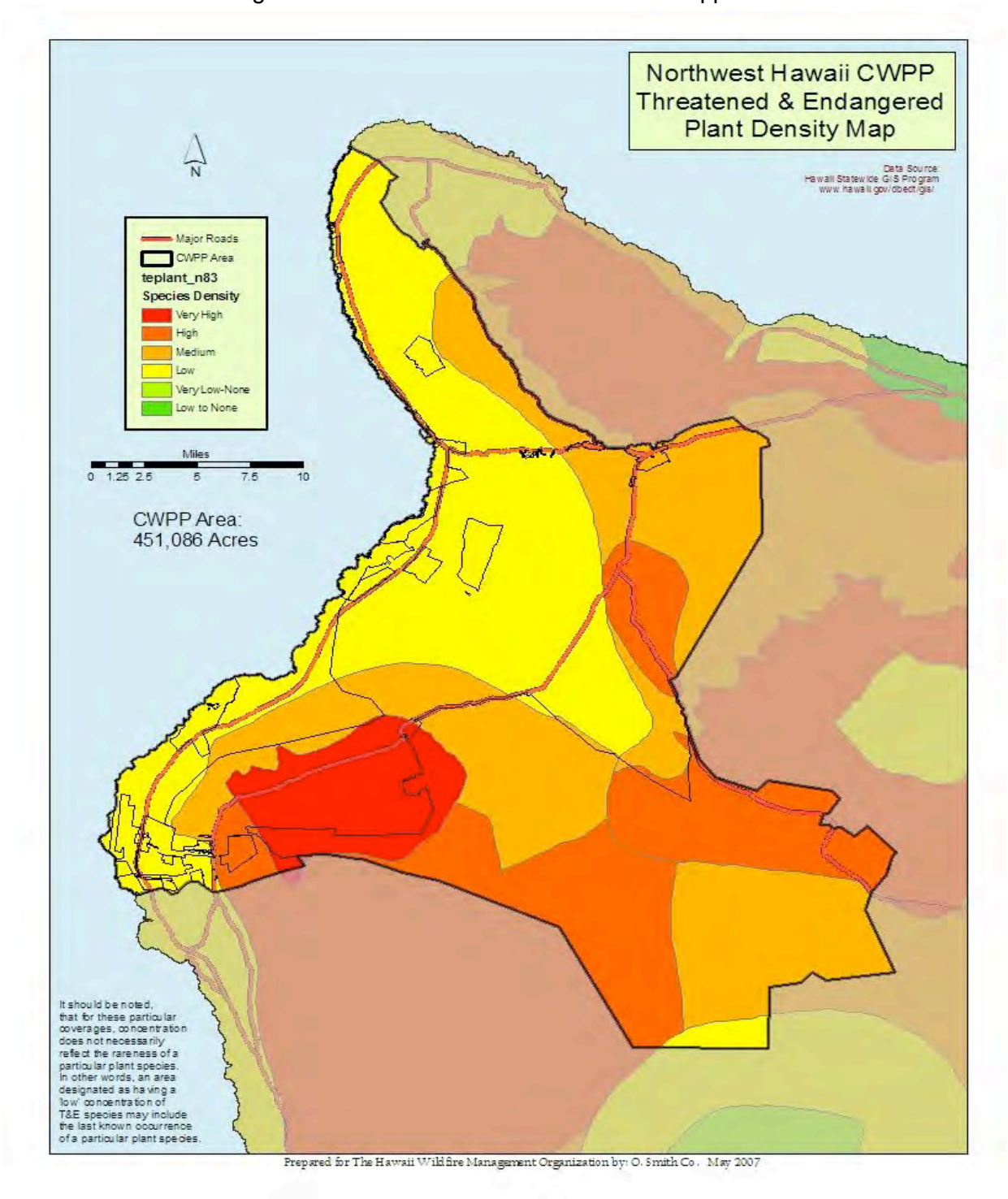

Figure 5: Map depicting endangered and threatened plant densities in Northwest Hawaii. Red zone denotes very high plant density, dark orange denotes high density, light orange is medium density, and yellow is low density of endangered plants.

Fire History:

Different agencies are responsible for fire suppression around the county, depending on fire location. Hawaii Fire Department is responsible for fire suppression in county residential areas while the State Division of Forestry and Wildlife is responsible for fire suppression on state lands. The Pohakuloa Training Area has an organized fire department that responds to fires on the Army's federal land while the National Park Service responds to fires on Park land. All of these agencies have a Memorandum of Understanding for mutual aid in fire suppression. Each organization maintains separate fire history statistics.

An August 2005 wildfire that started along Kawaihae Road in Waimea consumed 25,000 acres in West Hawaii and burned south all the way to Waikoloa Village. (Photo Credit: Wayne Ching).

Figure 6, below, is a fire history map for West Hawaii spanning from 1954 – 2005 with graphs depicting fire size and frequency. The graphs within the map can be found in Appendix B.

While the Waikoloa fire (above right) was burning, a wildfire started by a roadside vehicle ignited grasslands north of Kohala Ranch and jumped the Akoni Pule Highway, burning more than 1,500 acres. (Photo Credit: Wayne Ching).

The fire history map also illustrates how fuels have been managed in the region. For example, grazing objectives in the Pu'u Wa'a Wa'a area are aimed at fine fuel reduction to minimize the wildfire threat. Wildfires in this area have been infrequent and small and as a result, damage to the dryland forest ecosystem has been less severe than in Pu'uanahulu. Comparatively, grazing was removed in Pu'u Anahulu (adjacent to Pu'u Wa'a Wa'a and separated by a lava flow) in the 1960s and since than, this area has experienced numerous large catastrophic fires that have decimated much of the native dryland habitat.

In the past decade Northwest Hawaii has experienced at least 39 wildfires with 13 of those burning more than 1,200 acres. Average size for all wildland fires within the CWPP coverage area during the past 50 years is 2,835 acres with a median size of 400 acres. However, northwest Hawaii has experienced some of the state's largest wildfires, including a 1969 fire that burned 45,000 acres and a 2005 wildfire that encompassed an area from Waimea to Waikoloa burning 25,000 acres. In 2005 there were two simultaneous wildfires burning just days apart. The first fire was the large 25,000-acre Waikoloa conflagration and the second fire was the Akoni Pule Highway wildfire that consumed 1,500 acres. These two large wildfires burning in the same region put a tremendous strain on firefighting

A March 2006 wildfire, caused by a lightening strike, burned more than 300 acres in Pu'uanahulu and the state-owned Pu'u Wa'a Wa'a Forest Reserve. (Photo Credit: Wayne Ching).

resources and in fact, resources from other islands were brought in to assist.

Wildfire ignition or fire starts are from various sources. Vehicular fire starts, such as the Akoni Pule Highway wildfire (where a vehicle was set on fire) are a common cause of fire starts. In many cases, catalytic converters and traffic accidents, account for most of the fire starts related to vehicles, including a 60-acre blaze just north of Pu'u Lani Ranch Estates that was started when a vehicle veered over a cliff and caught fire, igniting nearby brush. Human caused fire starts are also common. Agricultural escape burns, unauthorized residential burning, and arson are some examples of fires attributed to humans. The presence of an arsonist within the Waikoloa/Kohala area is a concern for local firefighters and the community. Hawaii County fire and police departments and the state Forestry and Wildlife Division have created a task force to apprehend the arsonist(s). While natural causes are the least likely sources of wildfire ignition, they do occur. A 300-acre fire in Pu'uanahulu was started by a lightening strike. Below is a chart showing wildfires in the CWPP coverage area from 1954 to 2005. The Hawaii Wildfire Management Organization is currently updating its fire history data. As this report is being written there has been a rash of wildfires in Northwest Hawaii that officials believe were intentionally set. Between January and mid July 2007 more than 14,000 acres burned within the CWPP coverage area.

West Hawaii Fire Data 1954 - 2005

DATE	ACREAGE	CITY
12/12/05	25.00	Kailua-Kona
10/29/05	35.00	Kailua-Kona
8/4/05	2500.00	Hawi
8/3/05	25000.00	Waikoloa
8/2/05	2500.00	Kawaihae
8/1/05	6000.00	Kamuela
7/22/05	2500.00	Kamuela
7/12/05	150.00	Hawi
6/15/05	100.00	Kamuela
6/14/05	50.00	Kamuela
6/1/05	1.00	Hawi
5/24/05	400.00	Kamuela
5/18/05	150.00	Hawi
3/2/05	10.00	Kamuela
2/28/05	7.00	Kawaihae
11/27/04	2.50	Kapaau
9/20/04	1500.00	Kamuela
9/15/04	1200.00	Kamuela
9/12/04	1500.00	Kamuela
9/7/04	400.00	Waikoloa
9/6/04	350.00	Waikoloa
8/10/04	5.00	Kamuela
7/11/04	40.00	Hawi
7/8/04	40.00	Hawi
7/7/04	40.00	Hawi
7/6/04	100.00	Kawaihae
7/5/04	40.00	Hawi
7/3/04	20.00	Kamuela
7/15/00	1.70	Waiki'i
1/15/00	70.55	Saddle Road Junction
10/15/99	4553.44	Pu'uanahulu

10/15/99	4382.84	Waikoloa
7/15/99	429.93	Saddle Road Junction
7/15/99	595.49	Waiki'i
7/15/99	4.13	Saddle Road Junction
4/15/99	9758.00	Pu'uanahulu
5/15/98	3287.52	Pu'uanahulu
4/15/98	7463.78	Waikoloa
4/15/97	102.27	Hualalai
4/15/96	113.52	Hualalai
1/15/96	84.46	Pu'uanahulu
10/15/95	196.84	Waiki'i
5/15/95	40.01	Waiki'i
3/15/95	1072.98	Hualalai
7/15/94	24714.92	Pu'uanahulu
12/15/93	745.40	Pu'uanahulu
6/15/93	107.61	Pu'uanahulu
5/15/93	352.78	Hualalai
7/15/91	193.78	Puako
3/15/91	46.28	Pu'uanahulu
9/15/90	98.00	Puako
8/15/90	1133.50	Waiki'i
10/15/89	13.17	Hualalai
7/15/89	2835.30	Kiholo Mauka
12/15/88	2.00	Hualalai
8/15/88	551.21	Pu'uanahulu
7/15/88	1064.98	Waikoloa
3/15/88	1160.26	Hualalai
8/15/87	5234.00	Waikoloa
7/15/87	676.24	PTA
7/15/87	1963.48	Waikoloa
7/15/87	3530.81	Pu'uanahulu
7/15/87	794.90	Puako
9/15/86	3486.01	Pu'uanahulu
9/15/85	18291.33	Waikoloa
9/15/85	13993.35	Waikoloa
10/6/83	1309.11	Saddle Road Junction
10/6/83	1817.41	Waikoloa
4/15/78	3510.01	PTA
10/15/77	97.38	PTA
9/15/77	854.69	PTA
11/15/75	44.40	Waiki'i
8/15/75	233.26	Waiki'i
9/15/73	53.45	PTA
7/15/73	2211.32	Pu'uanahulu
6/15/73	27.48	Pu'uanahulu
6/15/73	53.37	Pu'uanahulu
4/15/73	190.34	Hualalai
4/15/73	7.78	Hualalai
3/16/73	8120.77	Kawaihae
2/15/73	2800.04	Waiki'i
9/15/69	47974.79	Pu'uanahulu
7/15/69	984.22	Pu'uanahulu
9/15/68	8744.35	Pu'uanahulu
11/15/54	4179.65	Waiki'i

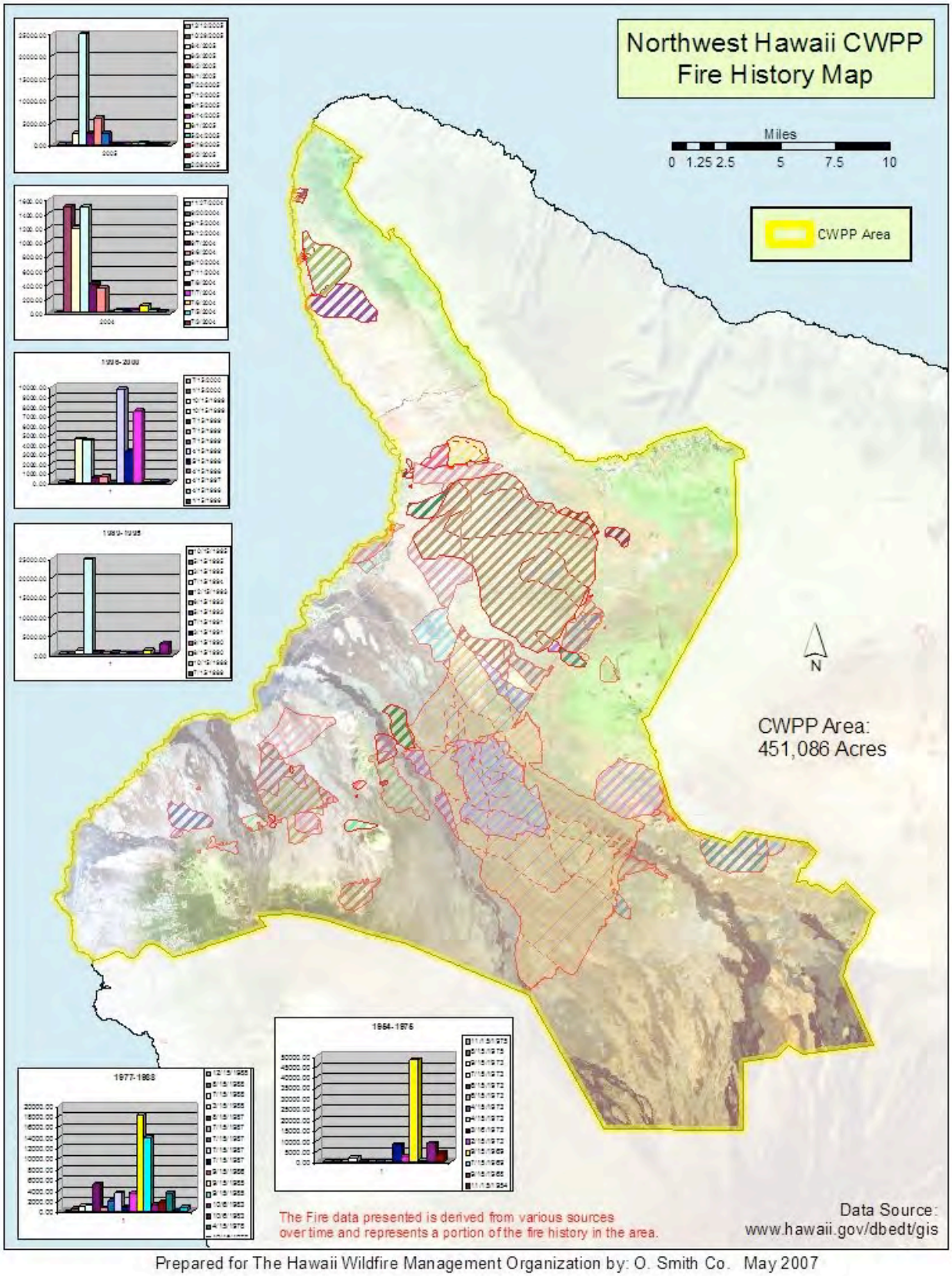

Figure 6: Fire history map of Northwest Hawaii, showing wildfires in the region from 1954 –2005. The imbedded graph charts depict fires in annual ranges by size and can be found in Appendix B.

Stakeholders:

Stakeholders are individuals or groups who have a high level of interest in the protection of their assets from wildfire. The CWPP area encompasses lands managed by federal, state, county, and private entities. Contact information for principal government stakeholders is listed below.

Federal:

Pohakuloa Training Area (U.S. Army)
Eric Moller
Deputy Fire Chief
USAG-HI, IFSO
Box 4607, Hilo, HI 96720
(808) 969-2441
mollereh@shafter.army.mil

Hawaii Volcanoes National Park
Joe Molhoek
Pacific Island Fire Mgmt. Officer
PO Box 52, HNP, HI 96718
(808) 985-6042
Joe_Molhoek@nps.gov

State:

Department of Land and Natural Resources: Division of Forestry and Wildlife
Wayne Ching
State Protection Forester
1151 Punchbowl St., Room 325, Honolulu, HI 96813
(808) 587-4173
Wayne.F.Ching@hawaii.gov

County:

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Fire Chief Darryl Oliveira
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County:

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Wildfire Risk Assessment for Northwest Hawaii:

In 2006, the Hawaii Wildfire Management Organization commissioned the Firewise coordinator to conduct a series of wildfire hazard assessments for a dozen West Hawaii communities, using the Hawaii Wildland Fire Risk and Hazard Severity Assessment based on the Assessment in Appendix A of NFPA 1144, *Standard for Protection of Life and Property from Wildland Fire*. These hazard assessments were conducted to identify the level of wildfire risk for the West Hawaii communities included in this CWPP.

HFD personnel, Dr. Kimbal of Puako Community Association, and Earl Spence (far right), a HWMO contractor, view a map of Puako before accompanying the Firewise coordinator in a wildfire hazard assessment of Puako.

Using a pre-established point system, the Hawaii Wildland Fire Risk and Hazard Severity Assessment is a tool used to determine the level of wildfire risk to a home or community. Points are given regarding overall terrain and location, road width, local area fire history, prevailing winds and seasonal weather, geographical contours, native vegetation, water availability, location of fire suppression resources, as well as the combustibility of building materials, including the roof, siding, and attached items, such as decks, fencing, or an unit. The combined points in all these categories are added together and the overall risk is determined by whether the score falls in the low-, medium-, high-, or extreme-risk point range. Given the ignitability of individual structures, preponderance of fuels in close proximity to structures, and lack of water, all the communities within Northwest Hawaii, with the exception of Pu'u Kapu, scored in the high-hazard range in the wildfire hazard assessment, while Pu'u Kapu scored in the medium-risk range.

While the Northwest Hawaii region as a whole shares certain common characteristics, the communities within it vary tremendously and deseve separate description in terms of slope, size, and water availablity. Therefore short descriptions excerpted from the wildfire hazard assessments are provided below.

Kohala Ranch and Kohala Estates

Kohala Ranch is a developed subdivision in Kohala, Hawaii that spans from the Akoni Pule Highway, near sea level, up to Kohala Mountain Road at the 3,300-foot elevation. It is comprised of 4,000 deeded acres, with lots ranging in size from a half-acre to more than 10 acres. Kahua Ranch borders Kohala Ranch. Cattle and sheep from Kahua and Ponoholo Ranches graze within the Kohala Ranch subdivision and help to reduce fuel load within the community.

The subdivision has underground utilities, paved roads, hydrants, and setbacks. There is one means of ingress and egress at the top and bottom of the subdivision (at Akoni Pule Highway and Kohala Mountain Road). Both entrances have a gate and guard shack with the Akoni Pule entrance staffed 24 hours a day and the Kohala Mountain Road entrance staffed 16 hours a day (unmanned from 10 pm – 6 am). Ala Kahua Road, a paved road on the south east side of the subdivision, leads to the neighboring subdivision of Kohala Estates but there is a locked gate separating the communities. A 12-foot wide equestrian trail with wood fencing on either side extends along the perimeter of the Heathers I section of the subdivision and the trail has been graded for 4-wheel drive vehicles. Several homes within the subdivision have locked gates blocking their driveways.

Kohala Estates is a developed subdivision directly south of and adjacent to Kohala Ranch. Lots were originally sold in 20-acre parcels, but have since been subdivided into 3-acre lots. Kohala Estates, which also starts at Akoni Pule Highway, is ungated and side streets within the subdivision are off Ala Kahua Drive. Since Ala Kahua Drive is gated directly below the volunteer fire station, this leaves the community with one means of ingress and egress from the subdivision.

Kiawewai gulch separates Kohala Ranch and Kohala Estates.

Kohala Estates has paved roads, with hydrants spaced less than 1,000 feet apart. Some utilities are underground and some are above ground. Road signage is metal and reflectorized, however house numbers vary in size and color. There is no organized grazing of animals within Kohala Estates.

Slope within both subdivisions varies between 10 to 20+ percent. Kiawewai gulch runs along the southern boundary of the subdivision between Kohala Ranch and Kohala Estates. Property lines from both subdivisions extend to the middle of the gulch. Kiawewai gulch is a fire hazard due to the kiawe/buffel grass vegetation.

There is a 100,000-gallon water tank on the Kohala Ranch side of the gulch, which feeds all the fire hydrants within Kohala Ranch and Kohala Estates. The tank is pressurized and if there is a loss of electricity, the tank becomes gravity fed. Kohala Ranch and Kohala Estates are not part of the Hawaii County water system. Kohala Ranch Water Company controls and supplies the water for Kohala Ranch, Kohala Estates, Kohala By the Sea, and DHHL Hawaiian Homes Residence Lots subdivisions (the latter subdivisions are just south of Kohala Ranch and Kohala Estates).

Kohala by the Sea

Kohala By The Sea (KBTS) is a developed gated community directly south of Kohala Estates. KBTS covers approximately 77 acres and the general topography is a gentle slope of 9 percent. However, there is a large gulch that runs through the middle of the community. This gulch is a particular fire hazard because of the kiawe trees and haole koa brush within it.

There are 73 lots within the subdivision with 42 homes either built or under construction. The community has underground utilities, paved roads, hydrants, and setbacks, as well as one functional point of egress and ingress. There is a paved road on the north side that ties into the adjacent community of Kohala Estates, which can be used as an escape route in case of emergency.

The KBTS community is surrounded and intermixed by bunchgrass, which produces fast moving and intense fire conditions. The strong onshore winds that persist everyday make this community prone to wildfires.

Kohala by the Sea residents, concerned about the threat of wildfire to their community, went through the steps to become the first nationally recognized Firewise Community in Hawaii. They are the only community in Hawaii to earn this distinction and have maintained recognition status for three consecutive years.

Kohala by the Sea residents during a 2005 Firewise community workday. Collaborative mitigation efforts helped the community achieve national recognition as part of the Firewise Communities USA program.

Kawaihae

Kawaihae is a community in the North Kohala district of Hawaii along the leeward coast. Akoni Pule Highway runs through the community, which includes a commercial harbor with a shipping terminal and fuel depot; Ka Ilima O Kawaihae Cultural Surf Park; Kawaihae Canoe Club and boat ramp; retail shopping centers and restaurants; Pu'ukohola National Heiau National Historic Site, an Industrial Park**,** Ke Hale O Kawaihae Transitional Housing, Kawaihae Village, Department of Hawaiian Home Lands Kawaihae Residence Lots, and Ke Hale O Kawaihae.

Ke Hale O Kawaihae is on the mauka side of Akoni Pule Highway, diagonally across from Pu'ukohola National Heiau National Historic Site just south of Kawaihae Harbor. The Kawaihae Industrial Park is three miles north of Ke Hale O Kawaihae, also on the mauka side of Akoni Pule Highway. The DHHL Kawaihae Makai Lots are on the makai side of Akoni Pule Highway across from the Industrial Park with the bulk of the Kawaihae Residence Lots just north of the Industrial Park on the mauka side of the highway.

Ke Hale o Kawaihae is a 24-unit facility that is part of Catholic Charities Transitional Housing Program. The program provides temporary housing to homeless families with children. There are no driveways or roads within this facility as the units are clustered around an unpaved parking lot directly off Akoni Pule Highway. Utilities are above ground along the highway. There is a power station directly south of the units on the same side of the highway. On either side and behind the units are open lands filled with grasses and brush, including fountain grass and kiawe. Units are of post and pier construction with combustible siding and non-combustible roofing.

Kawaihae Residence Lots are part of Hawaiian Home Lands. Congress created *The Hawaiian Homes Commission Act of 1920* as a land trust. The purpose of the Act was the rehabilitation of native Hawaiians, those individuals of not less than one-half Hawaiian blood. The program offered 99-year leases for residential, agricultural, and pastoral homesteads on the islands of Kauai, Oahu, Maui, Molokai, and the island of Hawaii. When Hawaii became the 50th state in the U.S., one of the conditions of statehood was that the State of Hawaii would administer this program.

The Makai Lots are directly north of the Kawaihae Canoe Club and across the highway from the Industrial Park. There are 22 house lots in the Makai Lots ranging from 15,000 to 23,489 square-feet. In the Makai Lots, one paved road, Honokoa Street, runs between Akoni Pule Highway and the ocean and accesses Akoni Pule Highway at either end. Utilities are above ground and there are hydrants along the road. Driveways are less than 100 feet long and at least 12 feet wide with 15-feet vertical clearance. There are thick groves of kiawe trees on the makai side of the highway. In addition to these Makai Lots there are 3 more house lots across from the harbor.

The 196 lots in the Residence Lots range between one-half acre to an acre in size. They have above ground utilities, paved roads, hydrants spaced less than 1,000 feet apart, and setbacks. Kalo'olo'o Drive, which starts at Akoni Puli Highway, is the main road in the Kawaihae Residence Lots, with side streets that dead end or loop around off of this main road. Road signage is metal and reflectorized, however individual house numbering is spotty to nonexistent. Driveway lengths vary in the Residence Lots, those that are shorter (less than 100 feet) tend to be paved with concrete, while longer driveways tend to be unpaved. Driveways are at least 12 feet wide with 15-feet vertical clearance. Only a few homes within the Residence Lots have locked gates blocking their driveways.

Slope in the community varies between 10 to 20+ percent. The Transitional Housing and Makai Lots are flat at or near sea level. The Industrial Park is on a slight hill above the Makai Lots. There are rolling hills throughout the Residence Lots with Kalo'olo'o Drive on a steep incline. There are gulches run to

the north and south of the Residence Lots. These gulches are a fire hazard due to the grasses and kiawe trees growing within them.

The Residence Lots are not part of the Hawaii County water system. A single company controls the water for Kohala Ranch, Kohala Estates, Kohala By the Sea, and Hawaiian Home House lots.

Kawaihae Village is just mauka of the intersection of Queen Kaahumanu Highway and Kawaihae Road. The village complex includes rental housing used by Mauna Kea Observatories for their employees.

Much of the land area owned by Queen Emma Lands on the north side of the Kawaihae Road, although not highly suitable for grazing, was fenced and the Ranch grazes this area to reduce the amount of fire fuel that could enhance wildfires. This grazing project is a collaborative effort, including Mauna Kea Soils and Water Conservation Services, Parker Ranch, Queen Emma Lands, and the State Department of Health.

Anekona Estates and Kanehoa in Waimea
Anekona Estates and Kanehoa are developed adjoining subdivisions on the south side of Kawaihae Road at the 1,800-foot elevation in Waimea. The Kanehoa subdivision has 44 homes with two empty lots. Lots in Kanehoa were originally 5 acres in size, although some have been subdivided into 2.5-acre lots. Several lots have two houses on property, which are considered condominiums by the Kanehoa Homeowners Association. The majority of homes are owner occupied. Lots in Anekona Estates appear to be at least a half-acre to acre in size.

Anekona Estates and Kanehoa subdivisions have underground utilities, paved roads, hydrants, and setbacks. There is a drainage ditch that separates the Anekona Estates and Kanehoa subdivisions.

Road widths within Anekona Estates and Kanehoa are 20 feet within the subdivisions. Kanehoa Homeowners Association is responsible for mowing the road shoulders within its subdivision, and schedules mowing according to rainfall. The majority of driveways within Anekona Estates are paved and several are gated. House numbering within Anekona Estates is inconsistent: varying in size, some are rusty and would be difficult to see at night or in smoky conditions.

Ouli Street is the only road in the Kanehoa subdivision. Ungated, Ouli Street exits onto Kawaihae Road and dead ends at the Waimea end of the subdivision with a small turnaround. There are road shoulders on either side of Ouli Street. There are two means of egress from Anekona Estates: Kanehoa Street and Anekona Street. Kanehoa Street exits onto Kawaihae Road and dead ends with no turn around space at a road barrier blocking entrance to Ouli Ekahi subdivision. Anekona Street exits onto Kawaihae Road where there is a gate, and merges into Kanehoa Street at the other end. Several homes within Anekona and Kanehoa subdivisions have locked gates blocking their driveways. There is road signage in Kanehoa but there is no street signage for side roads in Anekona Estates. House numbers vary in size and color.

There are gently rolling hills within both subdivisions and slope varies between 0 to 10 percent. Some houses are built on the top of hills while others are on flat land. Behind the subdivision is open hilly grasslands extending for several miles to the south to Waikoloa. There are open areas within both subdivisions with tall grasses.

Hydrants, spaced 1,000-feet apart within both subdivisions, are supplied by the Hawaii County Department of Water Supply (DWS). A storage tank for the county water system is located on Kawaihae Road at the 1,800-foot elevation near the Kanehoa subdivision. The tank is maintained by the DWS. Kanehoa subdivision has its own agricultural water system for irrigation. Three reservoirs are

located at the top of the subdivision and those residents that pay to use the reservoir can use this water. Residents within Kanehoa are oriented towards green growth for fire safety. There is a stream that runs through the subdivision through a series of ditches that runs sporadically and is available to all homeowners. This is in addition to the above-mentioned reservoirs.

Directly south of Anekona Estates is Ouli Ekahi, an affordable rental project of 33 units managed by the County of Hawaii (Housing and Community Development Corporation of Hawaii). There is a combination of houses and cottages. It has one road in and out of the subdivision with side streets at the end of the main entrance road. There are utilities above ground along the entrance road. Ouli Ekahi is separated from Anekona Estates by a road barrier. Lots are considerably smaller than Anekona or Kanehoa, averaging 10,000-square feet. Houses in Ouli Ekahi have metal roofing and combustible (wood) siding. Driveways are typically 12 feet wide with 15-foot vertical clearance. Several homes have fences, although the fences for the most part are non-combustible, i.e. of rock or metal with only one or two fences composed of wood. Most homes have defensible space because they lack vegetation.

House in Kanehoa subdivision. Built atop a slight hill, the front yard is covered in invasive grasses, a potential wildfire hazard.

In addition to area fuel load, strong winds, and minimal rainfall, there is an additional threat to these subdivisions. According to fire officials there is unexploded ordinance (UXO) in Waimea Anekona Estates, mostly small size mortar rounds and bullets. Some homes are built on unexploded ordinance. There have been explosions from UXO in residential areas during past wild fires. Per the Fire Chief's directive, no fire suppression field operations are allowed in designated UXO areas for safety reasons. It's believed there are UXO large enough to be fatal to dozer operators in the UXO areas.

Homes in all three subdivisions have Class A roofs, however some houses have wood siding and/or lanais, while others have non-combustible siding and/or lanais. Houses vary between post and pier and concrete slab construction. Some lots have defensible space around the house, while others have grasses growing right up to the house. Since Ouli Street is the only means of egress for many residents in Kanehoa, evacuation of residents and response by fire fighting personnel may be compromised if smoke or flames impede road access. According to Hawaii Fire Department personnel, some of the houses along the highway in Kanehoa are at risk because if a fire began along the highway, the wind would blow flames towards the houses.

Pu'u Kapu

Pu'u Kapu is a Department of Hawaiian Home Lands community in Waimea, on either side of Mamalahoa Highway in the South Kohala District covering an area of 11,949 acres. Pu'u Kapu I, on the Kona side of Mamalahoa Highway, is comprised of three distinct separate areas: Kuhio Village subdivision off Kamamalu Road, which contains 121 house lots; Farm lots, of which there are 75; and 204 Pastoral lots. Pu'u Kapu II is on the Kohala side of Mamalahoa Highway and borders the Kohala Forest. The information below focuses on Pu'u Kapu I.

House lots in Kuhio Village range from 10,000 square feet to an acre in size. Driveways in the subdivision are typically less than 100 feet, and few, if any, have turnarounds large enough for fire engine apparatus. Several driveways are gated or fenced. Driveways are typically at least 12 feet wide with 15 feet vertical clearance. House numbering is inconsistent and in many cases nonexistent. The majority of homes have metal roofs and wood siding. Roads are paved and there are multiple means to access Mamalahoa Highway, the main road through the Waimea community. Fire hydrants are spaced

throughout Kuhio Village subdivision. Utilities are above ground. Hawaii County is responsible for the maintenance and repair of roadways and shoulders in Kuhio Village.

Pu'u Kapu Farm lots are between Kuhio Village House lots and the Pastoral lots and range from 1.5 acres to 30 acres in size. The majority of the road system is built to county standards, with the exception of the partially paved substandard area on Kahilu Road that merges into Mana Road. There is more than one road to access the farm lots from Mamalahoa Highway. Some of the roads in the Farm lots area are paved single lane roads and some are unpaved dirt roads. Hawaii County is responsible for the maintenance and repair of roadways and shoulders in the Farm lots. Driveways tend to be longer than 300 feet and several are gated or fenced. House numbering is inconsistent or nonexistent. As in Kuhio Village, houses in the Farm lots tend to be constructed with metal roofs and combustible siding. Vegetation is denser in the Farm lots than in Kuhio Village House lots and some properties have windbreaks of eucalyptus or pine trees. Several lot owners raise horses, sheep, and/or goats. Fire hydrants are spaced throughout the farm lots and utilities are above ground. There are several active commercial agricultural operations in the farm lots, which are well irrigated.

The first phase of the Pu'u Kapu I pastoral lot leases were awarded in 1952 with the second phase being awarded in 1990. These lots, which range from 10 – 300 acres in size, are furthest away from Mamalahoa Highway and the Waimea fire station. Fire Road 7, an unpaved dirt road less than 24 feet wide that has access off of Mana Road, and Poliahu Road, a paved road 20 feet wide, are the main access roads to the Pastoral lots, with several side roads connecting to Fire Road 7. Access to DHHL Pastoral lots is gated on both Poliahu Road, shortly after the gate the road changes from paved to unpaved, and at the intersection of Mana Road and Fire Road 7. At the present time the gates to the Pastoral lots are unlocked.

Several Pastoral lot owners raise horses, cattle, goats, and/or sheep. Driveways within Pastoral lots are typically longer than 300 feet with room to stage firefighting apparatus. House numbering is not common in the Pastoral lots. With the exception of a few of the 100-acre lots, most people do not have access to electricity with homesteaders relying on generator, solar, or wind power. DHHL, via Sandwich Isle Communications, installed an underground fiber optic system with the capability of running underground lines should electricity become available. DHHL is responsible for maintaining the roads in the Pastoral lots. The agency does not mow the road shoulders.

Landowners in the Pu'u Kapu Pastoral lots graze cattle, goats, sheep, and/or horses, which helps to reduce fire fuel load (photo on right). However, not all lot owners manage their grazing to reduce fuels (photo on left).

There are no fire hydrants in Pu'u Kapu Pastoral lots. County potable water is available to a limited number of lots via a 4-inch main line. All lots awarded in 1952 have water via this 4-inch line. There is a Department of Water Supply 12,000-gallon tank on Fire Road 11 specifically for fire department use.

The Pu'u Kapu Pastoral Water Group has a 10,000-gallon tank opposite the 12,000-gallon tank near lot #78. There are two water meters near lots #15 and #20 that supply water to various homesteads. About 40 lots have their own water tanks that are fed through these meters with the tanks serving as the main source to individual lots and for fire protection. The majority of the lots issued in 1990 rely on catchment water. HWMO has installed a 5,000-gallon helicopter dip tank for the Pu'u Kapu community to serve as an additional water source for firefighting suppression.

For the most part, the community is on flat land, graded at less than 5 percent. The community experiences offshore winds in the morning and onshore winds in the afternoon. Normal trade winds blow north to south, although the area experiences strong, dry winds.

Puako

Puako is a developed community on the makai side of Queen Kaahumanu Highway in the South Kohala District. There are 150 homes in the Puako community with a mix of older (30-50 years old) and newer homes, incorporating varying degrees of fire-resistant construction materials. For instance, some of the older homes have wood shake roofs. Roughly one-third of the homes are owner occupied, one-third are long-term rentals, and one-third are vacation rentals. Driveways in Puako are typically less than 300 feet, and few, if any, have turnarounds large enough for fire engine apparatus. House numbering within Puako is inconsistent. While some homes have fire-resistant roofing and siding, others have wood shake roofs and wood siding. Many homes do not have defensible space around their property.

Homes in Puako range from older cottages to new, much larger models.

One road, Puako Beach Road, is a paved road less than 24 feet in width and is the main means of ingress and egress from the community. A secondary emergency access road, which is unpaved and can handle two-wheel drive vehicles traveling 25 miles per hour, is located behind the Catholic Church on the mauka side of Puako Beach Road and is locked and gated. Fire hydrants in Puako are less than 1,000 feet apart.

For the most part the community is on flat land, graded at less than 5 percent, although the terrain is at a slope at the transfer station and at the main entrance to Puako at Queen Kaahumanu Highway.

There is a kiawe forest running along the mauka boundary of the community from Queen Kaahumanu Highway down towards the community.

The community experiences offshore winds in the morning and onshore winds in the afternoon. Normal trade winds blow north to south, although the area experiences strong, dry winds.

The 100-foot fuel break on the mauka side of the Puako community created in 2003.

In 2003, the Hawaii Wildfire Management Organization provided technical assistance in the planning and creation of a 100-foot wide fuel break, which runs along the mauka side of the community from Hokuloa Church to the end of the subdivision lots. In 2004, HWMO worked with the Puako Community Association (PCA) to reimburse them for maintenance of the fuel break. PCA and the Puako community is working on several wildfire mitigation measures, including the maintenance of access lanes between private lots to enhance fire suppression efforts, increasing the width of the community fuel break to 300 feet and maintaining it annually, establishing a secondary emergency access routes from community through the Maui Lani resort, creating buffer zone around petroglyph areas, and enhancing defensible space around individual properties.

Waikoloa

Waikoloa Village is a developed community encompassing four square miles or 2,560 acres, between Queen Kaahumanu Highway and Mamalahoa Highway on Hawaii County's leeward coast. Waikoloa Village contains more than 2,700 homes, condominiums, and apartment units; a 122-acre golf course; a recreational complex; tennis courts and swimming pool; schools; churches; a shopping center and offices; as well as two small community parks. Waikoloa Village is surrounded by miles of open land filled with non-native vegetation, such as fountain grass.

There has been a sizable increase in development in recent years, with additional condominium complexes and subdivisions built within the community. For example, in 2006, developers Castle and Cook broke ground for the first phase of constructing 54 single-family homes and 175 condos and plans to develop another 520 additional condos and homes in the future. There are also plans for 1,200 affordable housing units to be built, in addition to numerous empty lots within the Village that may be built upon at any time. House lot sizes in Waikoloa Village range from 12,000-square-feet to 18,000-square-feet, with the 12,000-square-foot size being the norm. Driveways are less than 100 feet long with no turnaround space for fire apparatus, and several are less than 12 feet wide with 15-foot vertical clearance. The majority of homes are owner-occupied although some are used as vacation rentals. Road signage within the Village is metal and reflectorized. House numbers are displayed on mailboxes and painted on curbsides in front of homes.

The community has underground utilities, paved roads, hydrants, and setbacks. Waikoloa Road, which runs east west from Queen Kaahumanu Highway at sea level up to Mamalahoa Highway, is the main means of ingress and egress to the community. Waikoloa Road is a two-lane paved road greater than 24 feet wide. Roads within the Village are paved with some as much as 40 feet wide. Paniolo Avenue, a major thoroughfare through the community, is four lanes wide. During previous fires, the community had only one means of ingress and egress, which severely impacted the evacuation of thousands of residents. To address this concern, an emergency access road was recently built providing the community with an alternative means of egress

An emergency access road leading from Waikoloa Village to Queen Kaahumanu Highway was recently built to provide additional egress during wildfire emergencies.

in case of wildfire. The unpaved road, composed of compacted gravel, runs from Hulu Street, in a newly built part of western Waikoloa Village down to Queen Kaahumanu Highway. The road is gated and the fire department has an emergency access key.

Slope within the community varies between 0 to 20+ percent with rolling hills throughout the Village. There are gulches within the community filled with kiawe trees. Gulches can channel fire and kiawe trees are known to carry fire and create embers that can be easily carried onto residential properties. During a 2003 fire, the gulch next to the Baptist church carried fire through the community.

Water to fire hydrants, as well as residential and commercial properties within the Village is supplied by Hawaii County Department of Water Supply.

Pu'uanahulu

Pu'uanahulu is a community in the North Kona District, along the Mamalahoa Highway at the 2,200-foot elevation 18 miles north of Kona and 19 miles south of Waimea. The only road through the community, Mamalahoa Highway, runs northeast from Kona to Waimea. The community is composed of several houses along the highway; a church; a community complex, including a community center, equestrian ring, and volunteer fire station; a golf course, and the gated community of Pu'u Lani Ranch Estates (PLRE). The Baptist church is considered a historical landmark. Pu'u Wa'a Wa'a Ranch is directly south of the community.

The Baptist Church in Pu'uanahulu, on Mamalahoa Highway, is considered a historical landmark.

The Pu'u Wa'a Wa'a ahupua'a, directly south of Pu'uanahulu, contains more than 36,000 acres of state land and is an area rich in native Hawaiian plants and animals. At one time it was a Native Hawaiian dryland forest, but wildfires and grazing have destroyed much of the forest.

Houses along the highway have been established for at least 100 years. Pu'u Lani Ranch Estates is a gated community developed within the past 20 years. When approaching Pu'uanahulu from Kona on Mamalahoa Highway, there is a steep curve at the base of the ridge by Pu'u Wa'a Wa'a Ranch with the road winding around curves until the top of the hill at which is the entrance to PLRE and the Big Island Country Club. All the above-mentioned homes and enterprises are between the base of the ridge and the top of the hill.

Homes along the highway have above ground utilities, hydrants and setbacks. Mamalahoa Highway is the only means of ingress and egress from the community. The Big Island Country Club is behind the homes on the makai side of the highway and PLRE is behind the homes on the mauka side of the highway. Some landowners along the highway graze goats and/or horses on their property.

Typical house in Pu'u Lani Ranch Estates. This house has defensible space, although not all homes in the subdivision do.

Pu'u Lani Ranch Estates is a developed subdivision, the entrance of which is on Mamalahoa Highway. Built in phases since 1986, there are more than 146 lots in

the subdivision, and as of February 2007 there were 72 houses built. Lots are a minimum of one-acre parcels, with some lots being two acres in size. Within Pu'u Lani Ranch Estates there are several vacant lots with overgrown brush, many owned by mainland or international investors. Within PLRE there is a community clubhouse, tennis courts, and an equestrian facilities. The subdivision has underground utilities, paved roads greater than 20 feet in width, hydrants, and setbacks. There is one road for ingress and egress from the subdivision, which is gated. Several homes within the subdivision have locked gates blocking their driveways. Road signage is metal and reflectorized, however house numbers vary in size and color.

Driveways in PLRE must be paved using asphalt or concrete, or crushed. Driveways in PLRE tend to be less than 100 feet long, while driveways of homes along the highway tend to be longer and curved.

Diagonally across the highway from PLRE (on the makai side) is the Big Island Country Club, which includes a golf course, clubhouse, and undeveloped areas. Lynch Investments owns 400 acres and The Big Island Country Club owns the golf course, which is more than 100 acres.

There is one main road in and out of the golf course. A dirt road runs along the backside or makai boundary of the golf course, through the maintenance area connecting to Mamalahoa Highway. This road could be used as a secondary means of egress in case of emergency. Beyond the boundary of the golf course are grass filled rolling hills containing more than 3,000 acres of state land.

The unmaintained areas within the golf course contain 105 house lots that are slated for high-end residential construction. Lynch Investments owns these house lots and is moving forward in the construction permit process.

Within the PLRE subdivision slope is less than 20 percent. However those homes along the ridge are at a much higher risk from wildfire since the slope is nearly 100 percent in some places and is covered with high intensity fuels. Homes along the ridge are set back more than 30 feet from the slope. The steep ridge is covered with fountain grass, a high-intensity burning fuel, as well as silver oak, which is easily ignitable due to oily resins, and kiawe, which is known for having a long burn time. Firewise community workdays have been held in the past to decrease the fuel load at the base of the ridge to reduce wildfire risk from vehicle accidents.

Pu'uanahulu, including PLRE, is not part of the Hawaii County water system. The community came together several years ago to purchase the water system supplying the area and formed their own water company, Napu'u Water Inc. Two wells supply the community: one well at the PLRE clubhouse and one well at Pu'u Wa'a Wa'a ranch. Area residents must pay for this water, which is expensive. Because Napu'u Water Inc.'s predecessor supplied subsidized water for grazing in the area; grazers now pay premium prices for water. This may impact the viability of grazing, which will have an impact on reducing fuels in the area.

At the Big Island Country Club the hydrants within the golf course are not active (hydrants are the responsibility of Lynch Investments). Of Big Island Country Club's two wells, one is working and one is currently under repair.

North Kona: Hina Lani, Kona Palisades, Kealakehe

There are several miles of open grass lands south of Pu'uanahulu and north of Kona. The subdivisions of Kealakehe, Kona Palisaides, and Hina Lani are south of the grasslands and increase in proximity to the urban center of Kailua-Kona. While the wildfire risk is slightly lower in this region, due to increased industrial and residential development, it is still in the wildland urban interface. The area was originally

dryland forest, and there is still native flaura in the area, in addition to cultural sites, including refuge caves. The above communities span between Mamalahoa Highway and Queen Kaahumanu Highway.

Winds are typically north to north east trade winds averaging 5 – 15 mph, although the area does experience strong south winds on occasion. While homes in these subdivisions are generally built on flat land, the communties themselvves are built on steep grade, particularly Kona Palisades, which runds from 1,500 foot elevation to sea level in the span of less than four miles.

Houses in subdivisions in North Kona, such as the ones in Kealakehe, above, tend to be closer together than other communities.

House lots are smaller in size (10,000 – 15,000 square feet) than the more rural areas to the north. Driveways are also shorter, genreally only 50 to 100 feet in length, with no turnaround. Driveways are typically 12 feet wide with 15 feet of vertical clearance. Almost all homes in these subdivisions have non combustible roofing, although many have combustible siding and/or lanais. Houses vary in level of defensible space, with many homes using gravel and landscaping to create defensible space. However, those homes closest to undeveloped areas have kiawe growing in close proximity to the homes.

Community Assets at Risk:

Assets at risk are valued resources that can be damaged or destroyed by wildfire. In addition to ensuring firefighter safety and protecting residents and visitors, the following assets warrant consideration in pre-incident planning: watersheds; forest reserves; wildlife; scenic, cultural, and archeological sites; ranchlands; and structures. The following were identified as valued resources within Northwest Hawaii that would be adversely affected by wildfire.

Commercial / community resources:

Resorts, shopping centers, schools, community centers, churches, restaurants, industrial parks, and retail establishments.

Natural / Cultural Resources:

Pu'ukohola Heiau National Historic Site, Puako Petroglyph Archeological Preserve, Lapakahi State Historical Park, county parks and beaches including Hapuna Beach State Recreation Area, Wailea Bay, Spencer Beach Park, Pu'u Wa'a Wa'a State Wildlife Preserve, as well as native dryland forest, rare and endangered plants and animals, and cultural and archeological features, such as refuge caves. Importantly, the North Kohala coastline has the most numerous intact archeological sites in the state.

Houses and residences are at risk to wildfire in Northwest Hawaii. Overgrown vegetation close to homes and an increase of non-native high-intensity plants was found in every northwest Hawaii community. Northwest Hawaii as a whole has experienced tremendous development in recent years. Waikoloa Village already contains 2,700 single-family houses, condominiums, and apartment units and there are plans for nearly 2,000 additional homes and condominiums. New subsdivisions are being built on either side of Hina Lani in North Kona. Many new residents are from other parts of the United States and unfamiliar with the wildfire risks of Hawaii communities.

The majority of homes within residential areas in Northwest Hawaii have Class A roofing, however, several homes can be found in almost every subdivision with wood shake roofs. Many homes in West

side communities also have combustible siding and/or lanais (decks). Homes vary widely in defensible space regardless of socio-economic background, with lava serving as a natural fuel break on some lots and vegetation growing close to the home on other lots. Few driveways have turnaround access for emergency vehicles.

Community Concerns for West Hawaii:

Community meetings specifically on the CWPP process held in May 2007 with community members and fire agencies identified the most pressing fire concerns in Northwest Hawaii. They include, in order of priority:

1. Insufficient water infrastructure to adequately and quickly suppress wildfires;
2. Inadequate fire suppression resources, such as vehicles;
3. Fuel load along roadsides, in community open areas, and individual homes;
4. Regional and local planning and development standards that do not require communities' and subdivision designs to consider and/or mitigate fire risk
    4 a. Structures' design, materials, and placement and landscaping that promotes or does not mitigate fire risk;
5. Community egress and firefighting vehicle ingress during a wildfire;
    5a. Identification of evacuation route roads within subdivisions;
6. Lack of emergency access staging areas within subdivisions for evacuation purposes;
7. Need to reduce and/or control invasive species that possess inherent fire or ignition properties;
8. Arson;
7. Need to Increase/integrate communication equipment between state, federal, and county agencies; and
9. Lack of public awareness of the wildfire threat;
    9a. Need for awareness regarding restricting vehicle access and/or those vehicles with catalytic converters.

Recommended Actions for Northwest Hawaii:

Based on identified community concerns, the following recommendations are made to reduce the wildfire threat in Northwest Hawaii. The implementation of a multi-modal approach will increase firefighting efficiency, reduce fire fuels, and improve community and firefighter safety. Mitigation measures to reduce wildfire risk and/or impact in Northwest Hawaii include in order of priority:

1. Installation of pre-staged static water and helicopter dip tanks;
2. Acquisition of adequate resources for first responders, including off road tankers;
3. Reduction of fuel load and/or appropriate conversion of fuels along road sides, in community open areas, and individual homes. Appropriate conversion would include transition to vegetation with low ignition potential and low ability to carry fire, especially native plants;
4. Creation of development standards and community planning that requires the mitigation of wildfire risks at the regional, community/subdivision, and individual structure levels;
5. Creation/improvement of secondary access roads for those communities with only one means of ingress/egress; identification of evacuation route roads within subdivisions;
6. Development of emergency staging areas within communities and promoting awareness of such areas within the community, including holding mock disaster drills;
7. Reduction and/or control of invasive species that increase fire risk and, where appropriate, conversion to vegetation as described in priority number three;

8. Continued fire prevention education and outreach; including arson prevention education and the development of a fire danger rating system.
9. Integration of current and future communication equipment utilized by federal, state, and county fire suppression personnel to increase effective firefighting response.

Based on the results of the community risk assessment, priority ratings have been selected for Northwest Hawaii and areas of community importance. The community recommendations for the type and method of treatment for the surrounding vegetation are listed in the following table.

Community, structure or area at risk	**Type of Treatment**	**Method of Treatment**	**Overall Priority**
Kawaihae	Mechanical	Need for additional pre-staged static water and helicopter dip tanks	Very High
Kohala, Kawaihae, Pu'u Kapu, Waimea, Puako, Waikoloa, Pu'uanahulu, North Kona	Mechanical / Chemical / Hand Labor	Reduction of fuel load along roadsides, community open areas, and individual homes	Very High
Kohala, Kawaihae, Pu'u Kapu, Waimea, Puako, Waikoloa, Pu'uanahulu, North Kona	Mechanical	Acquisition of adequate resources for first responders, including off road tankers	High
Kohala by the Sea, Waimea Anekona, Puako, Pu'u Lani Ranch Estates	Mechanical / Chemical / Hand Labor	Creation of secondary emergency ingress/egress roads	High
Kohala, Pu'u Kapu, Waikoloa, Pu'u Lani Ranch Estates	Mechanical	Street signage identifying evacuation routes	High
Kohala, Kawaihae, Pu'u Kapu, Waimea, Puako, Waikoloa, Pu'uanahulu, North Kona	Mechanical	Development of emergency staging areas within communities, promoting awareness of such areas within the community, including holding mock disaster drills	High
Kohala, Kawaihae, Pu'u Kapu, Waimea,	Mechanical / Chemical / Hand Labor	Reduction and/or control of invasive species	High

Puako, Waikoloa, Pu'uanahulu, North Kona			
Kohala, Kawaihae, Pu'u Kapu, Waimea, Puako, Waikoloa, Pu'uanahulu, North Kona	Public Education and Outreach	Continued fire prevention education and outreach, including arson prevention education	Medium
Kohala, Kawaihae, Pu'u Kapu, Waimea, Puako, Waikoloa, Pu'uanahulu, North Kona	Mechanical / Political	Increase effective integrated communication between federal, state, and county fire suppression agencies	Medium

Community organizations, federal agencies, and private landowners in Northwest Hawaii were invited to submit projects that provide protection and reduce wildfire risk. The following table displays a list of projects based on recommendations from community and fire-related organizations. HWMO intends to assess the progress annually and invite agencies and landowners to submit projects that provide community protection.

Community, structure, or area at risk	**Project**	**Agency**	**Funding Needs**	**Timetable**	**Community Recommendation**
Kawaihae, leeward N Kohala coast, Pu'uanahulu; S Waimea, Pu'u Wa'a Wa'a, Waikoloa	Installation of pre-staged static water and helicopter dip tanks	Multiple Agencies: federal, state, county, and private	Cooperative Funding $128,000	2008 - 2009	Yes
Kohala, Kawaihae, Pu'u Kapu, Waimea, Puako, Waikoloa, Pu'uanahulu, North Kona	Reduction and/or conversion of fuel load along roadsides, community open areas, and individual homes	Multiple Agencies: county	Cooperative Funding $850,000	2008 - 20012	Yes
All communities and areas in the CWPP planning	Creation of development standards and community planning that	Multiple Agencies: county and state	Cooperative Funding $150,000 for outreach, any needed	2008-2009	

planning area	planning that requires the mitigation of wildfire risks		impact studies and education		
Kohala by the Sea, Waimea Anekona, Puako, Pu'u Lani Ranch Estates	Creation of secondary emergency ingress/egress roads	Multiple Agencies: federal, state, county, and private	Cooperative Funding $750,000 if environment-al assess-ments required	2008 - 2010	Yes
Kohala, Pu'u Kapu, Waikoloa, Pu'u Lani Ranch Estates	Street signage identifying evacuation routes	Multiple Agencies: federal, state, county, and private	Cooperative Funding $50,000	2008 - 2012	Yes
Kohala, Kawaihae, Pu'u Kapu, Waimea, Puako, Waikoloa, Pu'uanahulu, North Kona	Development of emergency staging areas within communities, promoting awareness of such areas within the community, including holding mock disaster drills	Multiple agencies: private	Cooperative Funding $33,000 for planning and outreach	2008 - 20010	Yes
Kohala, Kawaihae, Pu'u Kapu, Waimea, Puako, Waikoloa, Pu'uanahulu, North Kona	Reduction, control, and or conversion of invasive species	Multiple Agencies: federal, state, county, and private	Cooperative Funding $1,500,000 includes maintenance, grazing, and conversion projects	2008 - 2012	Yes
Kohala, Kawaihae, Pu'u Kapu, Waimea, Puako, Waikoloa, Pu'uanahulu, North Kona	Continued fire prevention education and outreach, including arson prevention education	Multiple agencies: federal, state, county, and private	Cooperative Funding $30,000	2008 - 2012	Yes
Kohala, Kawaihae, Pu'u Kapu, Waimea, Puako, Waikoloa	Increased effective integrated communication between federal, state,	Multiple agencies	Cooperative Funding	2008 - 20011	Yes

Waikoloa, Pu'uanahulu, North Kona	and county fire suppression agencies				

Installation of pre-staged static water and helicopter dip tanks
Lack of water for fire suppression was identified as one of the most important challenges facing Northwest Hawaii communities. Pre-staged static water and helicopter dip tanks will greatly increase effective fire suppression and firefighting efficiency.

Acquisition of adequate fire suppression resources
Acquisition of additional fire suppression vehicles, particularly smaller off-road vehicles, may help fire fighting personnel reach remote fires quicker.

Reduction and/or appropriate conversion of fuel load
Reducing vegetation or appropriately converting fuels to species with low ignition potential in the vicinity of valued resources (houses, churches, community centers, cultural resources), in community common areas, and along road sides and fuel breaks will decrease fire risk to important resources and improve fire suppression capabilities. Whenever possible, fuels conversion should incorporate native plants.

Development standards and community planning that requires the mitigation of wildfire risks
Adopting development standards and community plans that mitigate wildfire risk will prevent many of the problems that set the stage for loss during fires and will greatly assist in suppression efforts and maximizing responder safety.

Creation / improvement of secondary access roads
Creation or improvement of secondary access roads to provide emergency egress should be pursued, secured, and improved where appropriate. Other secondary roads that may be used for fire suppression activities should be clearly signed and maintained.

In order to remain effective, the secondary emergency egress roads must be maintained on a regular basis. Funding should be secured to ensure that the roads are maintained at least twice a year. The organization that is determined to be responsible for the access roads may want to consider the purchase of a dozer or other equipment to maintain the roads.

Also, evacuation routes should be clearly identified within Northwest Hawaii subdivisions with signage posted marking these roads for express egress in case of emergency.

Development of emergency staging areas within communities
Recognizing that evacuation may not always be possible during a wildfire, community association and/or neighborhood groups may want to develop emergency staging areas within their community for times when evacuation is not possible. Once these staging areas are identified, communities should promote awareness of such areas within the community, as well as hold periodic mock disaster drills.

Reduction, control, and/or conversion of invasive species
Invasive grasses, such as molasses grass and fountain grass are high-intensity burning fuels that carry fire to other fuels. The ability of fountain grass to establish on barren lava flows compromises natural fire breaks for use by fire agencies. Proactive measures should be taken to mitigate the growth of fire fuels on these natural fuel breaks. Current strategies to address fine fuel build-up along roadsides should be continued, including developing vegetated fuel break corridors consisting of plants less likely to ignite or carry fire with an emphasis on native plants. It is recommended that community associations

in Northwest Hawaii adopt CCRs that address fire fuels build-up within their community. It is also strongly recommended that outreach efforts include alerting residents and developers to the wildfire risk caused by invasive grasses and ways to prevent their spread. Periodic inspection of the each home site and sanitation strategies should be suggested by the homeowners associations. Landscaping with fire resistant plant species and especially native plant species should be recommended by the homeowners associations.

Continued fire prevention education
Fire agencies in Hawaii County and the Hawaii Wildfire Management Organization have partnered with Firewise to promote community wildland fire awareness in wildland urban interface communities. The objective is to increase overall awareness of fire hazard issues that affect residents within the wildland urban interface. While a Firewise coordinator has provided much needed outreach in the community, funding for such a position has been intermittent. Stable funding for an outreach coordinator should be developed to ensure consistent fire prevention outreach. With a continued influx of residents from other parts of the United States who are unaware of Northwest Hawaii's unique fire risks, it is crucial to continue a comprehensive fire education and outreach campaign. This program should consist of the following:

a. Continued development and coordination of community meetings and outreach events. Coordination with other community groups, such as the local disaster preparedness committee and civic organizations, to provide wildland fire safety information on defensible space and fire-resistant Firewise building materials. Provide outreach at community events.

b. Develop educational materials specific to community fire threat and continue outreach in local publications. Continued outreach is needed with large numbers of new residents moving into the area.

c. Development of fire prevention outreach materials, including TV and radio public service announcements, posters, and handouts.

d. Development of arson prevention outreach materials, including TV and radio public service announcements, posters, and handouts.

e. Creation and promotion of a systematic fire danger rating system. Such a system has been in development for a couple of years and when finalized the fire danger rating system should be promoted in Northwest Hawaii, so residents know when fire hazards within their community are at their highest.

Increased effective communication between emergency personnel agencies during disaster
Fires, earthquakes, and hurricanes are among the risks that threaten Northwest Hawaii communities. It is imperative that current and future communication equipment utilized by federal, state, and county fire suppression agencies are integrated to increase effective firefighting response.

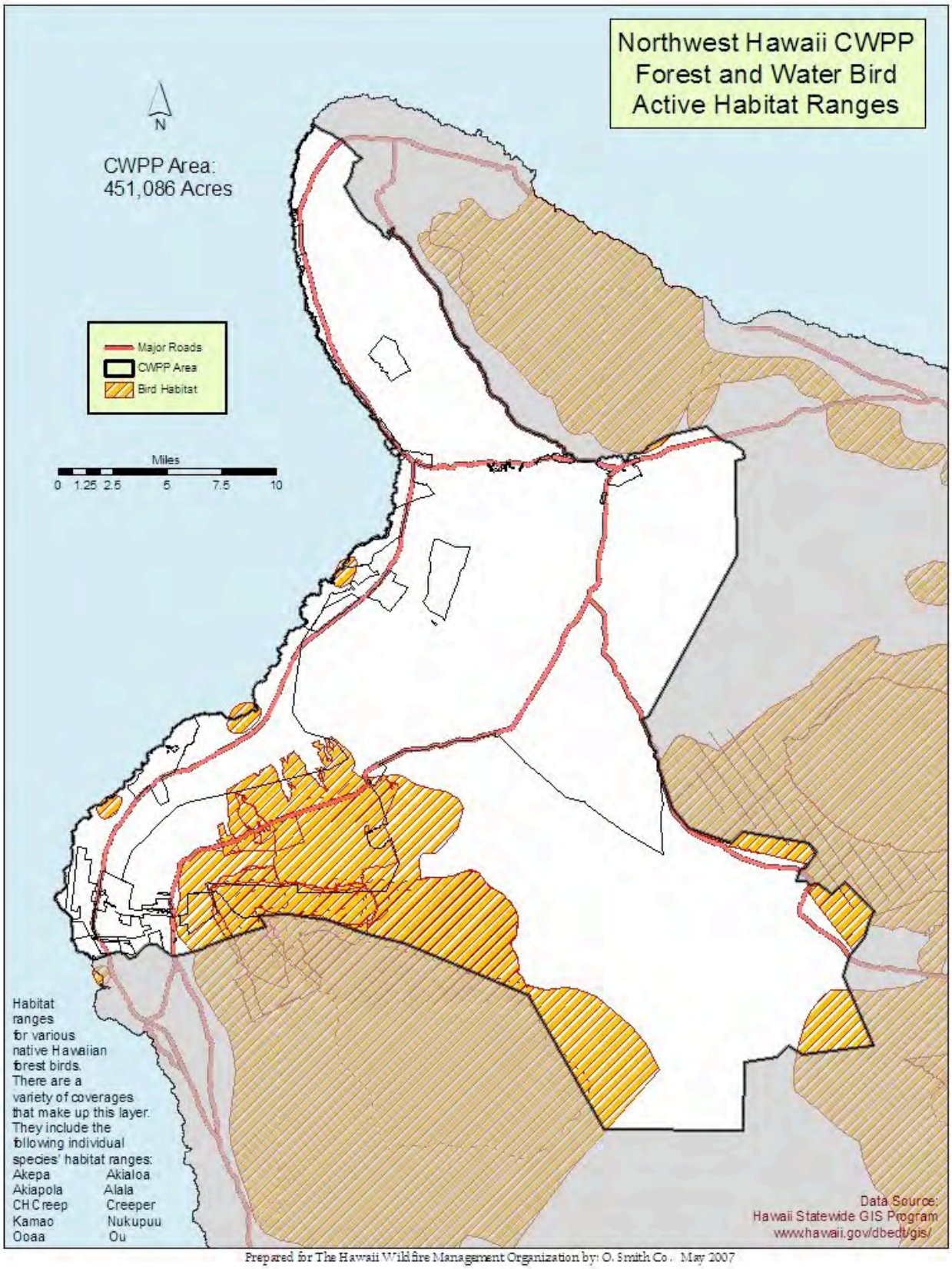
Reducing Structural Ignitability:

Individuals and community associations can reduce structural ignitability throughout their community by taking the following measures recommended by the Firewise program.

• Create a buffer zone of defensible space around a property of at least 30 feet or to the property line if the house has less than 30 feet of yard. Remove flammable vegetation and combustible growth within 30 feet of the house.
• Prune tree limbs 6 – 10 feet above the ground.
• Space trees and shrubs ten feet apart in the yard.
• Make sure that plants closest to the house are low-lying. And whenever possible use native Hawaiian or succulent plants.
• Routinely remove dead leaves and other organic matter from the yard.
• Sweep and/or clean gutters, eaves, and roofs regularly to prevent the build-up of leaves and other matter.
• Use fire-resistant building materials for the roof, siding, and decks, such as metal, stucco, tile, brick, and cement.

Appendix A: Native Hawaiian Bird Species and Forest Bird Ranges in West Hawaii

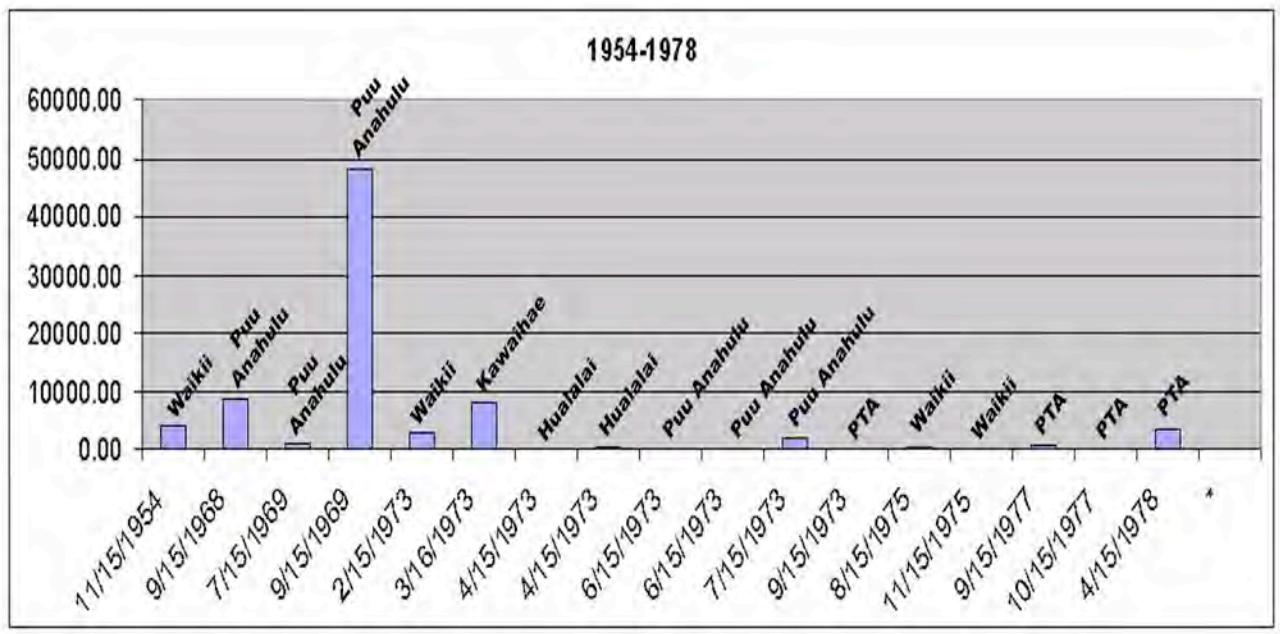
Prepared for The Hawaii Wildfire Management Organization by: O. Smith Co. May 2007

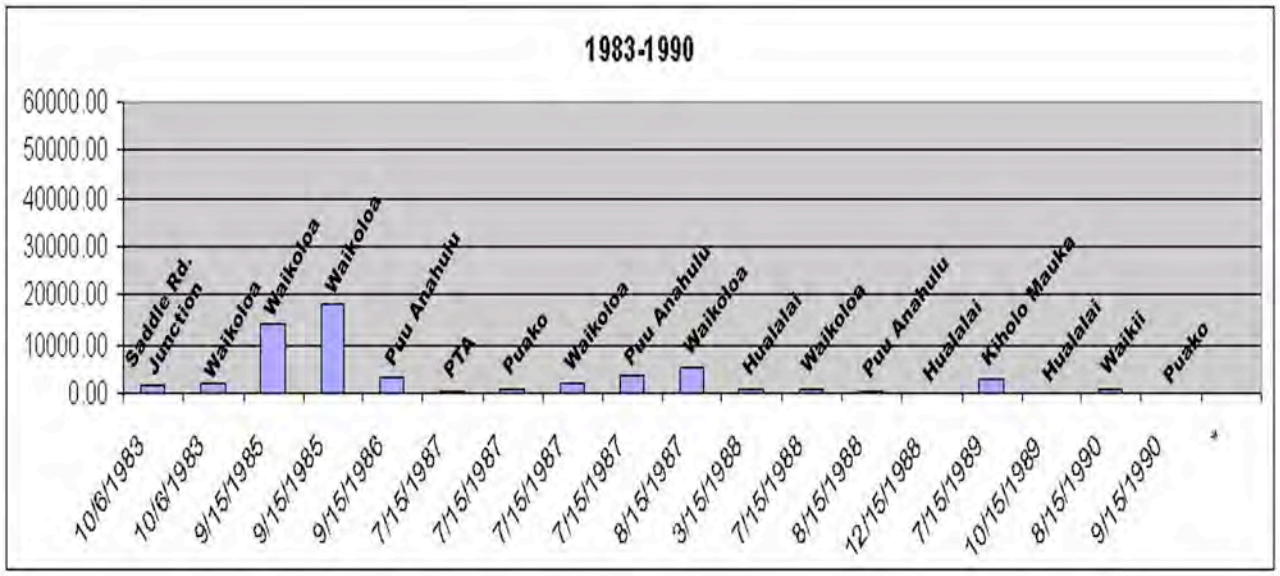


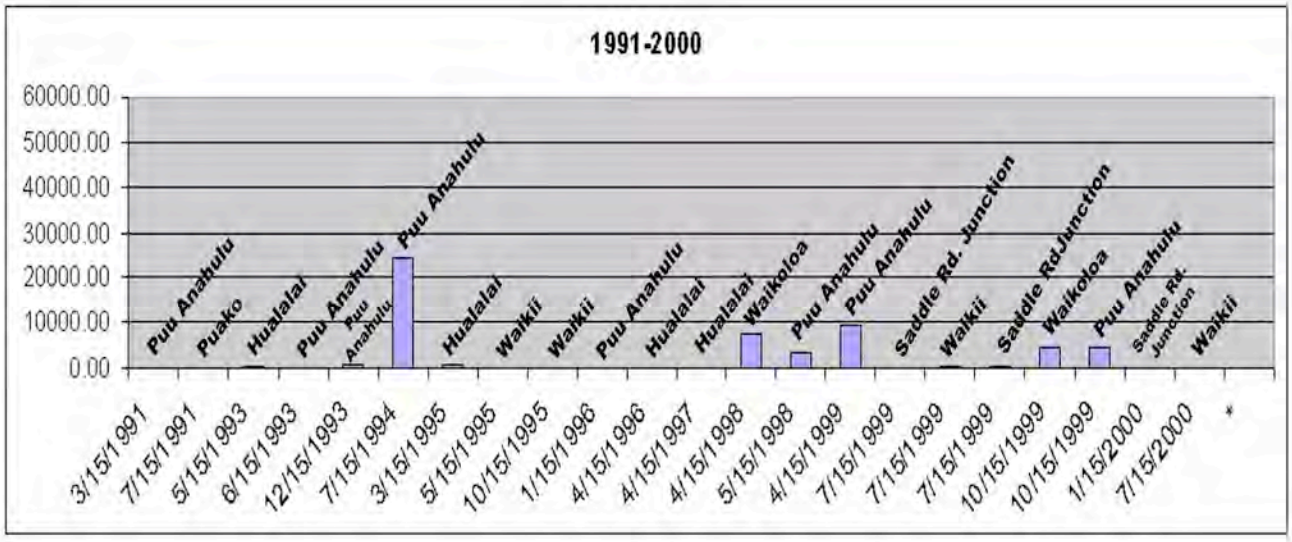
Prepared for The Hawaii Wildfire Management Organization by: O. Smith Co. May 2007

Appendix B: Fire History Graphs for Major Fires 1954 - 2005

Graphs from Northwest Hawaii Fire History map depict fire size for different periods of time. Data unavailable for the period 1978-1983.






1991-2000
60000.00
50000.00
40000.00
30000.00
20000.00
10000.00
0.00
Puu Anahulu
Puako
Hualalai
Puu Anahulu
Puu Anahulu
Puu Anahulu
Hualalai
Waikii
Waikii
Puu Anahulu
Hualalai
Hualalai
Waikoloa
Puu Anahulu
Puu Anahulu
Saddle Rd. Junction
Waikii
Saddle Rd.Junction
Waikoloa
Puu Anahulu
Saddle Rd. Junction
Waikii
3/15/1991
7/15/1991
5/15/1993
6/15/1993
12/15/1993
7/15/1994
3/15/1995
5/15/1995
10/15/1995
1/15/1996
4/15/1996
4/15/1997
4/15/1998
5/15/1998
4/15/1999
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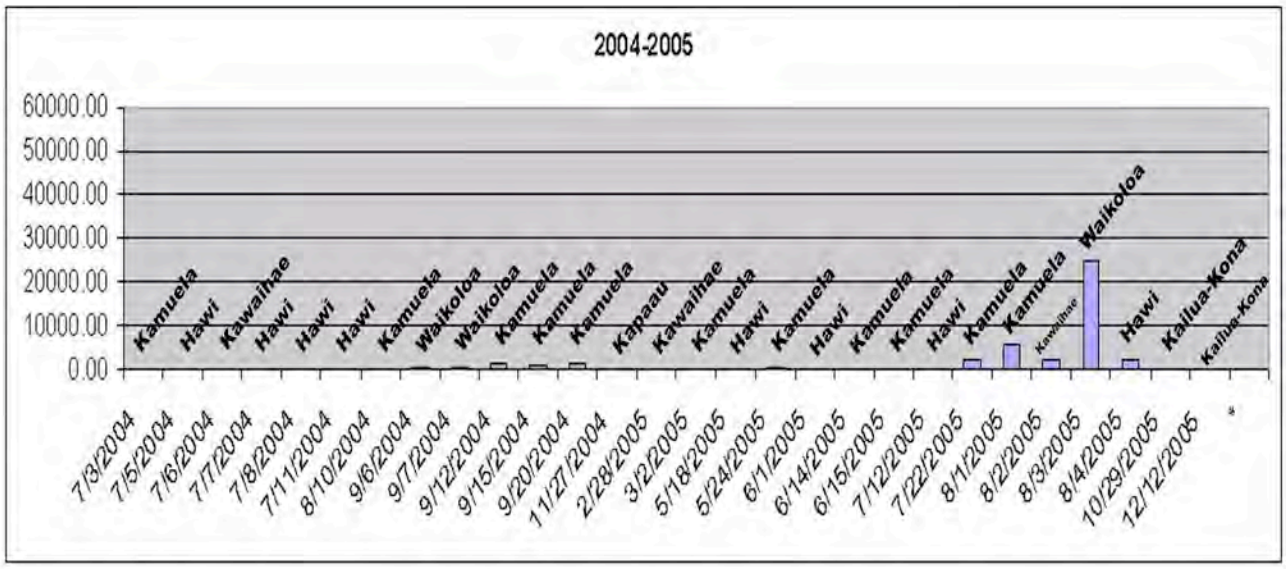
7/15/1999
7/15/1999
10/15/1999
10/15/1999
1/15/2000
7/15/2000
*


2004-2005
60000.00
50000.00
40000.00
30000.00
20000.00
10000.00
0.00
Kamuela
Hawi
Kawaihae
Hawi
Hawi
Hawi
Kamuela
Waikoloa
Waikoloa
Kamuela
Kamuela
Kamuela
Kapaau
Kawaihae
Kamuela
Hawi
Kamuela
Hawi
Kamuela
Kamuela
Hawi
Kamuela
Kamuela
Kawaihae
Waikoloa
Hawi
Kailua-Kona
Kailua-Kona
7/3/2004
7/5/2004
7/6/2004
7/7/2004
7/8/2004
7/11/2004
8/10/2004
9/6/2004
9/7/2004
9/12/2004
9/15/2004
9/20/2004
11/27/2004
2/28/2005
3/2/2005
5/18/2005
5/24/2005
6/1/2005
6/14/2005
6/15/2005
7/12/2005
7/22/2005
8/1/2005
8/2/2005
8/3/2005
8/4/2005
10/29/2005
12/12/2005
*

Appendix C: Updated Project List 2009-2012

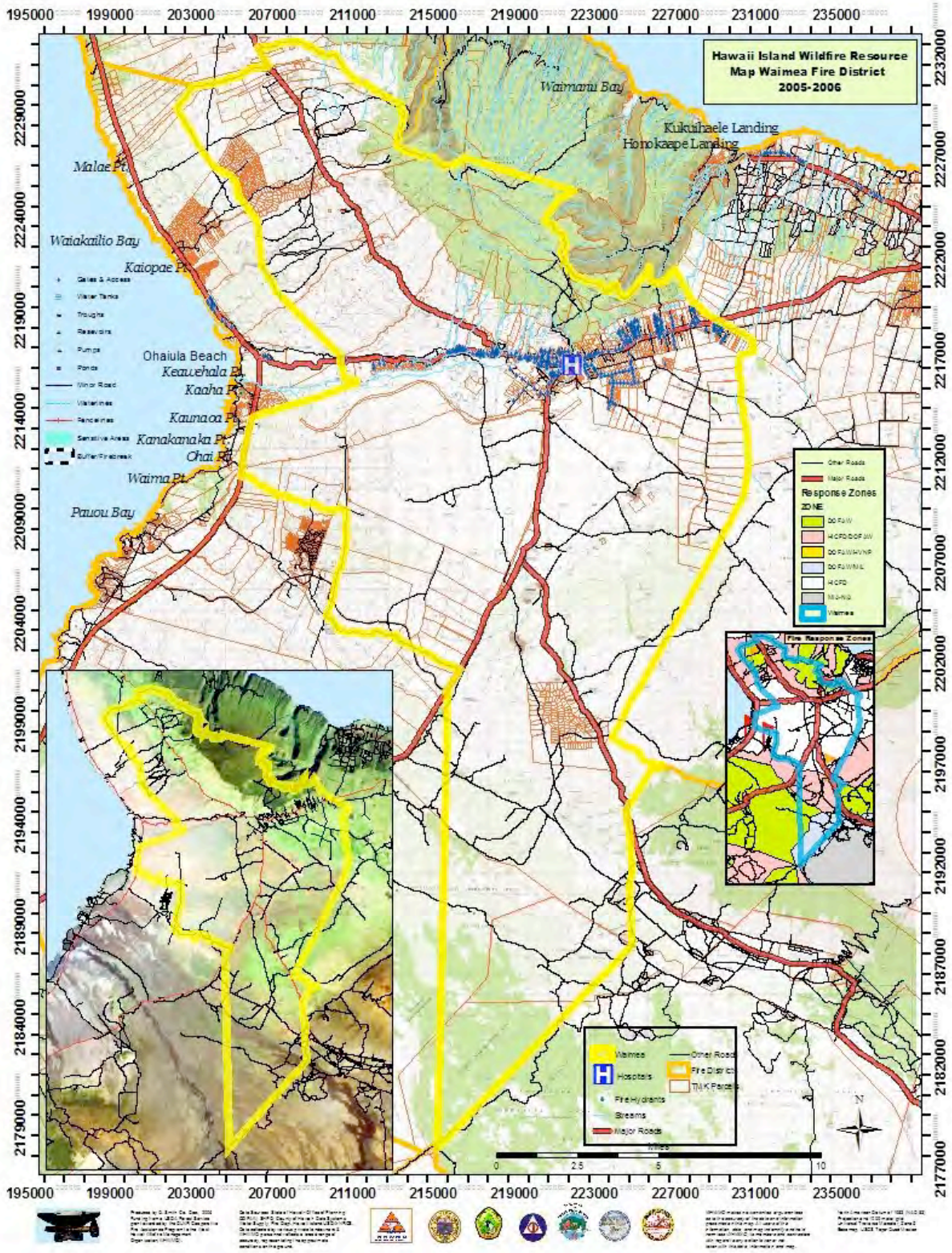
Federal agencies and private landowners in Northwest Hawaii were invited to submit projects that provide wildfire protection and reduce risk. The following table displays a list of recommended projects.

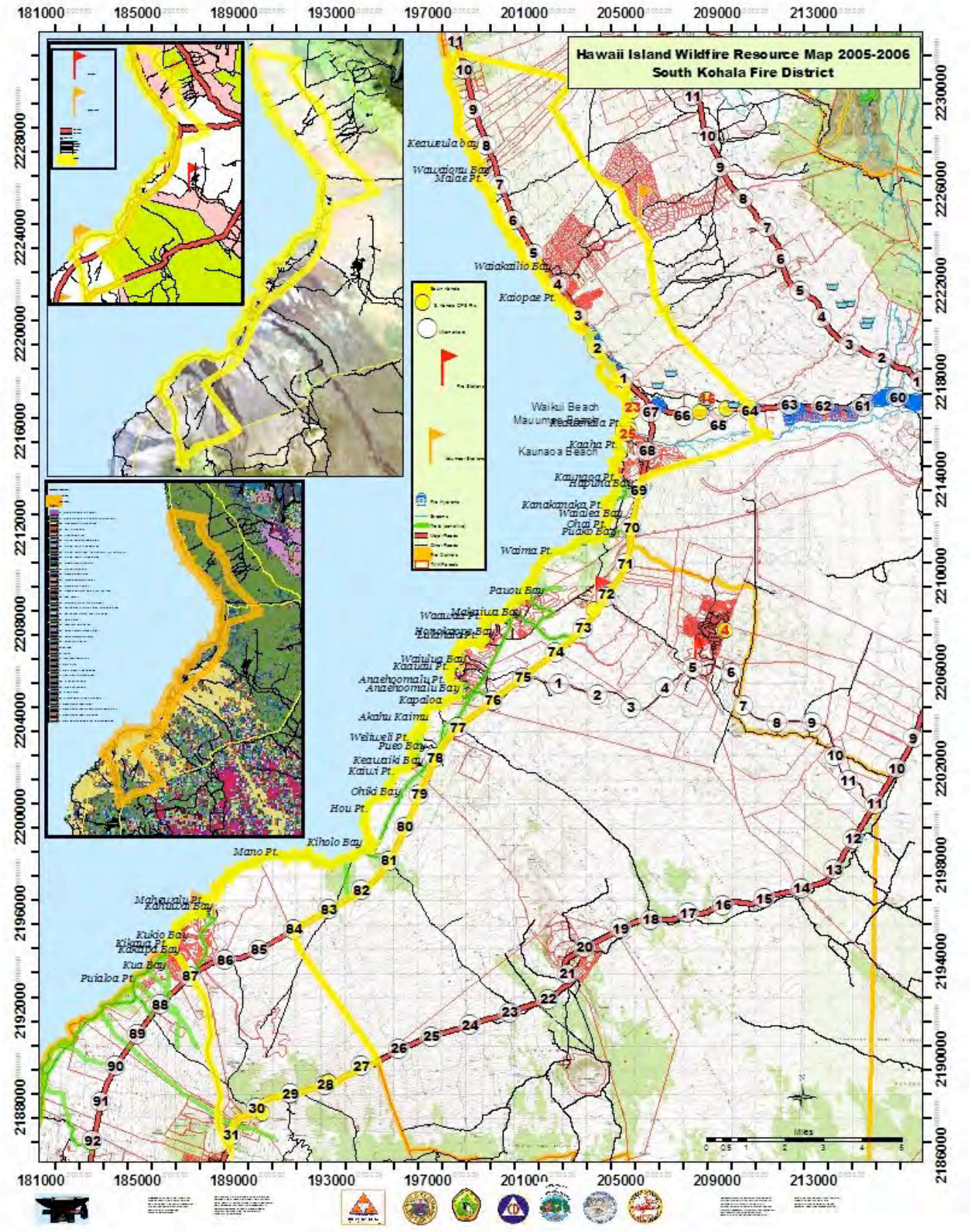
Community, structure, or area at risk	Project	Agency	Funding Needs	Timetable	Community Recommendation
Kawaihae, leeward N Kohala coast, Pu'uanahulu; S Waimea, Pu'u Wa'a Wa'a, Waikoloa	Installation of pre-staged static water and helicopter dip tanks	Multiple Agencies: federal, state, county, and private	Cooperative Funding $128,000	2008 - 2009	Yes
Kohala, Kawaihae, Pu'u Kapu, Waimea, Puako, Waikoloa, Pu'uanahulu, North Kona	Reduction and/or conversion of fuel load along roadsides, community open areas, and individual homes	Multiple Agencies: county	Cooperative Funding $850,000	2008 - 20012	Yes
All communities and areas in the CWPP planning area	Creation of development standards and community planning that requires the mitigation of wildfire risks	Multiple Agencies: county and state	Cooperative Funding $150,000 for outreach, any needed impact studies and education	2008-2009	
Kohala by the Sea, Waimea Anekona, Puako, Pu'u Lani Ranch Estates	Creation of secondary emergency ingress/egress roads	Multiple Agencies: federal, state, county, and private	Cooperative Funding $750,000 if environ-mental assess-ments required	2008 - 2010	Yes
Kohala, Pu'u Kapu, Waikoloa, Pu'u Lani Ranch Estates	Street signage identifying evacuation routes	Multiple Agencies: federal, state, county, and private	Cooperative Funding $50,000	2008 - 2012	Yes
Kohala, Kawaihae, Pu'u Kapu, Waimea	Development of emergency staging areas within	Multiple agencies: private	Cooperative Funding $33,000 for planning	2008 - 20010	Yes

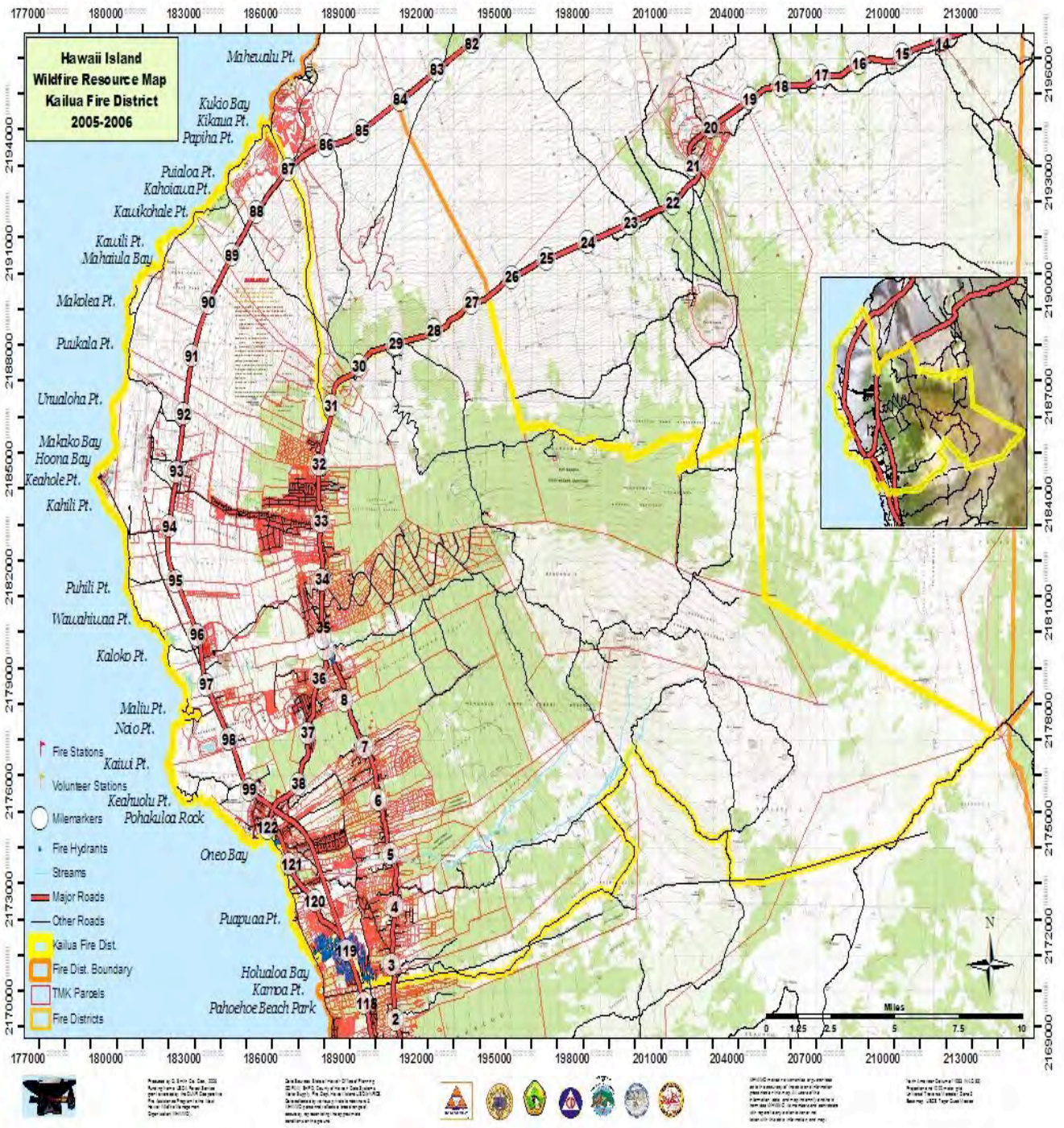
Waimea, Puako, Waikoloa, Pu'uanahulu, North Kona	communities, promoting awareness of such areas within the community, including holding mock disaster drills		and outreach		
Kohala, Kawaihae, Pu'u Kapu, Waimea, Puako, Waikoloa, Pu'uanahulu, North Kona	Reduction, control, and or conversion of invasive species	Multiple Agencies: federal, state, county, and private	Cooperative Funding $1,500,000 includes maintenanc e, grazing, and conversion projects	2008 - 2012	Yes
Kohala, Kawaihae, Pu'u Kapu, Waimea, Puako, Waikoloa, Pu'uanahulu, North Kona	Continued fire prevention education and outreach, including arson prevention education	Multiple agencies: federal, state, county, and private	Cooperative Funding $30,000	2008 - 2012	Yes
Kohala, Kawaihae, Pu'u Kapu, Waimea, Puako, Waikoloa, Pu'uanahulu, North Kona	Increased effective integrated communication between federal, state, and county fire suppression agencies	Multiple agencies	Cooperative Funding	2008 - 20011	Yes

Appendix D: Fire Resource Maps for Northwest Hawaii, Hawaii

Maps courtesy of Hawaii Wildfire Management Organization.




Hawaii Island Wildfire Resource Map 2005-2006
South Kohala Fire District
181000
185000
189000
193000
197000
201000
205000
209000
213000
2228000
2226000
2224000
2222000
2220000
2218000
2216000
2214000
2212000
2210000
2208000
2206000
2204000
2202000
2200000
2198000
2196000
2194000
2192000
2190000
2188000
2186000
Keauepula bay
Waiaakilio Bay
Kaiopae Pt.
Waikui Beach
Kaaha Pt.
Kaunaoa Beach
Kanakanaka Pt.
Waialea Bay
Ohai Pt.
Puako Bay
Waima Pt.
Pauou Bay
Anaehoomalu Bay
Kapaloa
Akahu Kaimu
Weliweli Pt.
Pueo Bay
Keauaiki Bay
Kaiui Pt.
Ohiki Bay
Hou Pt.
Kiholo Bay
Mano Pt.
Kukio Bay
Kua Bay
Puialoa Pt.
Miles


Hawaii Island
Wildfire Resource Map
Kailua Fire District
2005-2006
Mahewalu Pt.
Kukio Bay
Kikaua Pt.
Papiha Pt.
Puialoa Pt.
Kahoiawa Pt.
Kaukohale Pt.
Kauili Pt.
Mahaiula Bay
Makolea Pt.
Puukala Pt.
Umualoha Pt.
Makako Bay
Hoona Bay
Keahole Pt.
Kahili Pt.
Puhili Pt.
Wawahiwaa Pt.
Kaloko Pt.
Maliu Pt.
Nao Pt.
Kaiwi Pt.
Keahuolu Pt.
Pohakuloa Rock
Oneo Bay
Puapuaa Pt.
Holualoa Bay
Kampa Pt.
Pahoehoe Beach Park
Fire Stations
Volunteer Stations
Milemarkers
Fire Hydrants
Streams
Major Roads
Other Roads
Kailua Fire Dist.
Fire Dist. Boundary
TMK Parcels
Fire Districts
N
Miles
0 1.25 2.5 5 7.5 10

Appendix E: List of Potential Grant Resources

Below is a list of potential grant sources to help fund mitigation projects described within this CWPP. The list below is by no means exhaustive and potential community groups should also research grant funding sources available to them.

Grant Program	Deadline	Contact Information	Matching Funds Required?
State Fire Assistance Grants. Funds target hazard mitigation in the Wildland Urban Interface for mitigating risks of hazardous fire conditions through hazardous fuels reduction, information and education, and homeowner and community defensible space treatments.	September 7, 2007 for 2008-2009 competitive funding	Division of Forestry and Wildlife Attn: Wayne Ching, 1151 Punchbowl St., Rm. # 325 Honolulu, HI 96813 http://www.state.hi.us/dlnr/dofaw/fmp/wui0809.htm	Yes: 50/50 match
Rural Fire Assistance Grants (RFA) The Dept. of the Interior receives an appropriated budget each year for a rural fire assistance (RFA) grant program. This funding will enhance the fire protection capabilities of rural and volunteer fire departments through training, equipment purchases, and fire prevention work on a cost-shared basis. This program is primarily for rural departments serving populations under 10,000 and which have responsibilities to provide mutual aid to Dept. of Interior lands (e.g., Tribal, National Parks etc.) Te DOI assistance program targets rural and volunteer fire departments that routinely help fight fire on or near DOI lands.	Varies by state	Hawaii Volcanoes National Park Joe Molhoek Pacific Island Fire Mgmt. Officer PO Box 52, HNP, HI 96718 (808) 985-6042 Joe_Molhoek@nps.gov	The maximum award is $20,000. This year RFA grants will require 90/10 cost-share.

One of these four agencies administers those lands: Bureau of Land Management (BLM), Bureau of Indian Affairs (BIA), U.S. Fish and Wildlife Service (FWS) and the National Park Service (NPS).			
Volunteer Fire Assistance Grant (VFA): The VFA program, formerly known as the Rural Community Fire Protection program, is administered by state forestry agencies through 50-50 cost-sharing grants to local fire depts. in rural communities. The program's main goal is to provide federal financial, technical, and other assistance in the organization, training, and equipping of fire departments in rural areas with a population of 10,000 or less. Congressionally appropriated VFA funds are provided to the State forestry agencies through the USDA Forest Service. The State forestry agencies pass this money on to needful fire departments within their states. Any fire agency or volunteer fire department that serves a community of 10,000 or less may apply.		Wayne Ching Division of Forestry and Wildlife 1151 Punchbowl St.,Rm. # 325 Honolulu, HI 96813 (808) 587-4173 Fax: (808) 587-0160 wayne.f.ching@hawaii.gov	50/50 cost share.

Of note, Hawaii County Civil Defense is acquiring firefighting apparatus through a Department of Homeland Security grant, however, these grants are only available to government agencies.

Appendix F: 2016 Update and Annual List of Priority Projects and Actions

Northwest Hawaii Island Community Wildfire Protection Plan
2016 Community Input and Action Plan Update

There are currently five CWPPs for Hawaii Island including: Volcano, Ka'u, Ocean View, South Kona and NW Hawaii Island. Although there is no requirement to update the CWPPs, HWMO felt an update would be an important tool to spark community organizing activities and action. In addition, the community input and action projects needed to be updated. Fire hazard is predicted to increase with high vegetation and continued drought. We have decided that now is an important window of opportunity to update the plans and learn from, inspire, and support communities to reduce their hazard and increase their protective/preventative efforts.

From March 2015 to February 2016, Hawaii Wildfire Management Organization coordinated and held six meetings across the Northwest Hawaii Island Planning area to update the community input and action plan for the Community Wildfire Protection Plan. Hawaii Fire Department, County of Hawaii Civil Defense, and Division of Forestry and Wildlife participated in these meetings.

In addition to this update input and action plan information, the boundaries of the plan were expanded to include the entirety of the North and South Kohala districts, as well as the area that comprise Pohakuloa Training Area, which is a slight expansion, but allows the CWPP-covered area to be more complete and representative of the projects and wildland-urban interface in the region. Future full-narrative updates will use the updated and improved boundaries as well.

Community Input and Action Plan Waikoloa Area		
Community Concerns	**Action Plan**	**Estimated Costs & Project Lead**
Dedicated secondary/emergency egress is needed; Lack of ingress/egress (current backup road heads west).	Pave and/or grate the emergency access road; Inform state/county/reps that more money and better legislation are needed; Install more roads, improve shoulders on Waikoloa Rd, and improve road construction for evacuation and firefighting in the Waikoloa area;	$60K grating per year, $4M paving. WVA + County Time costs. WVA + community volunteers Costs TBD, WVA + County + State

	Develop and distribute more maps of emergency evacuation routes for residents.	$10K mapping, $4K printing WVA or HWMO
Controlling fuels/vegetation	Develop more firebreaks around perimeter of Waikoloa neighborhoods, in unmanaged areas within the Village, throughout the adjacent wildland areas, and to protect nearby sensitive natural resource areas like the Wiliwili Forest;	$400K-$2M, WVA, Private ranchers, HWMO, Waikoloa Dry Forest Initiative
	Develop firebreak and firefighting access on NW perimeters of Village;	$200K, WVA, HWMO, Private ranchers/lessees
	Support financial and logistical assistance programs that assist residents with control of fuels within village boundaries;	$8-10k per chipper/dumpster day, WVA, HWMO, County
	Support more cattle ranching (esp. mauka), to include installing the necessary infrastructure for water and fencing for animals to graze fire fuels;	$50K-$2M, WVA, Ranchers
	Enforce brush abatement codes;	Costs TBD (internal to HFD, County needs greater personnel capacity and funding to enforce
	Increase awareness of native, drought tolerant plants through education, workshops, and programs to grow and distribute Firewise and native plants.	$50k/year; Waikoloa Dry Forest Initiative, HWMO
	Enforce unmaintained vegetation on private property and developer lands	$100k, WVA
Vegetation management in gulches and	Install fencing for pulse grazing by managed sheep or goats for fuels management in gulches and internal unmanaged areas of Waikoloa Village;	$100K- 350K, WVA or private landowners

unmanaged vegetated areas	Limb, trim, remove, and maintain kiawe trees throughout and around the village as necessary for improved mitigation and risk reduction.	$75K- $300K yearly, WVA or HWMO
Wildfire conditions are increasing but public awareness is not yet high enough	Develop neighborhood action items and programs to educate and assist with risk reduction; Put up fire safety, ignition prevention, and extreme fire danger signs.	$50K-$100K/year, WVA or HWMO $50K-$100K, WVA or HWMO
Firefighters are overwhelmed and under-resourced during big wildfires. We need to improve access to water and more water for firefighting	Gain permits as needed and install standpipes for truck refill and temporary firefighting water ponds as well as diptanks for helicopter-based firefighting strategically in and around Waikoloa Village and surrounding wildland environments; Develop staging areas near stand pipes and water resources to aid in firefighting operations. Increase CERT team roles and training in and around Waikoloa and nearby areas	$400K- $4M, WVA, County, HWMO, WDFI $100-400K, County, WVA, Lessees $200k for training and travel; County, WVA, HWMO
Need to prepare for wildfire response that is smooth including evacuation awareness/education	Model and hold drills of emergency scenarios with all agencies and CERT groups Install evacuation signage and maps	$50K-$150K, WVA, County, HWMO $40K, WVA, HWMO, County
Illegal trash/debris burning	Increase awareness (renters, newcomers); signs and flyers at shopping center; include handout in welcome to community packet (The Greens, condos)	$20K, WVA and/or HWMO
Communication about wildfire preparation	Increase HWMO's ability to be present in the area, support part of staff time to dedicate to this area's	$30k/year, HWMO

between responders/communities (residents)	awareness and education, and Firewise leadership; Increase youth education (Kaleo the Pueo)	 $25k/year, HWMO
Personal property owners dumping their green waste in fire break and yards	Implement fines; share in cost of container for private green waste disposal days	$150k/year, WVA
Need to improve water availability for firefighting	Install system of water reservoirs and diptanks Install standpipes in strategic locations for firefighting use	$150k per diptank, $3-7M for full network in North Kohala Costs TBD, County, State

Community Input and Action Plan **Coastal North and South Kohala (Puako, Waialea, Hapuna, Mauna Kea, Kawaihae area, Kohala Waterfront)**		
Community Concerns	**Action Plan**	**Estimated costs & Project Lead**
Dry fire prone vegetation isn't managed to reduce fire risk	Work within community associations to identify residents and owners to issue a citation or send out letters; Develop and/or support community programs and workdays for fuels management and reduction of fire prone vegetation; Hold residential/neighborhood green waste removal and chipper days;	$5-$20k per community/year, community associations $60k region-wide community program coordinator/year, $10-15K per workday, all communities, HWMO $10-$15k per greenwaste or chipper day, community associations, HWMO

	Manage fuels on Waialea Bay backtrail and Puako fuelbreaks Develop hazard assessments and specific plans for each residential community;	$150k/year; Waialea/Puako community associations $10k per assessment, community associations, HWMO
Specific input to Puako: Cannot clear vegetation next to Puako church - rubbish and trees - trail is broken but neighbors don't want to see people walking by on trail. There is a misperception of mulch on Puako firebreak being a fire hazard	Define what counts as a match for Firewise grant; seek donations for monthly veg. clean up days; work with Puako Property managers; education and facilitation of better collaborations is needed	Part of $60K for regional coordinator or $20k for community association to implement Same as above
Illegal campfires	Install signs, work to increase access for HPD/HFD.	Signage per trouble spot, $8-15K, community associations
Fuels bordering communities	Contract vegetation reduction along perimeters Develop and implement longer term strategy, such as grazing corridors or re-planting of less fire-rone plants	Costs TBD, based on contractor estimates, led by community associations, HWMO, fire partners
Fuels management along highway	Work with DOT to understand what is already covered and how often, fill in gaps	Costs TBD, community associations, HWMO
Community Development Plan includes fire breaks that are not yet installed	Review and install	Costs TBD, County, Community associations, HWMO
Many fires start right on road. Lots of fountain grass and accidental ignitions.	Install signage on roads and beaches Arson reporting program and signs	$15k, community associations, county, DOFAW, State Parks, HWMO $100k, HFD, HPD, Community Associations,

	Fuels management along roadways;	HWMO
Not all house numbers are visible from street - firefighter access	Remind people to make house numbers visible, hire painting or address installation service as needed per community	Costs TBD, Community associations
Hazardous fuels around Puako boat ramp (high traffic area)	Needs attention; need to contact state or county to find ownership; install signs and manage fuels	Costs TBD, based on contractor estimates; Lead TBD based on ownership/jursidiction
Lack of community awareness and preparedness	Support Firewise program to help communities through Firewise process; Door to door outreach with printed materials	$75K per year for Firewise coordinators and projects, HWMO $5k/year printed materials and volunteer support, community associations

Community Input and Action Plan Waimea, North Kohala, and Mauka Areas		
Community Concerns	**Action Plan**	**Estimated costs & Project Lead**
Cultural sites are highly impacted by wildfires	Protocol for mitigation/fuels reduction in a culturally sensitive way; map out sites ahead of time to help during suppression	$10-25K, (Kohala Lihikai NGO to contact and work with)
Sensitive cultural features present firefighting challenge - cannot access rock walls, burial sites, not enough info only can take defensive posture	Work with OHA, state archaeologists. Need maps, protocols, pre-fire plans (don't bulldoze here, where is water, etc.)	$20-40K project coordination, $100K pre-fire plan each for 3 regions, HWMO, Kohala Lihikai, NPS, Ala Kahakai
Residents not prepared to take care of homes & yards	Education and outreach via HWMO and Firewise program	Costs TBD, support community program coordinator and programs, HWMO, Community associations, DOFAW
Need signs on road (high fire danger)	Get permission from state; put up signs at	$10-15K; HWMO, DOT, State Highways

	Queen K hwy and upper road (Mamalahoa)	Division, Community Associations
Address signs standards should be implemented	Define address standards law? Ordinance?	Cost TBD, County, HWMO, Community Associations
Carelessness, unattended, unauthorized burning, cooking fires	Education; provide ordinance info to violators	Costs TBD, County, DOFAW, HWMO
Unexploded ordnance (indicate which areas are cleared)	Need updated maps, distribute or make available to public	Cost TBD, Lead TBD
Need water for firefighting	Install system of water reservoirs and diptanks along FD-defined elevation line to improve water for firefighting Install standpipes in strategic locations for firefighting use	$150k per diptank, $3-7M for full network in North Kohala Costs TBD, County, State

Because of the non-regulatory nature of the CWPP, the relevance and effectiveness of the CWPP updated action plan will rely heavily upon community initiative and involvement. Expertise, technical support, and implementation assistance can be provided by the appropriate agencies and organizations involved in fire issues in the NW Hawaii Island area, and area residents are urged to contribute their time and effort to implement the actions they self-identified in the CWPP update meetings.

Hawaii Wildfire Management Organization, in cooperation with the Big Island Wildfire Coordinating Group, will provide technical support, identify and coordinate funding when possible, and serve as a centralized resource for wildfire risk reduction information. Together, representatives will work within their scope and jurisdictions to assist in prioritizing and recommending funding for projects, documenting the successes and lessons learned from those projects, and evaluating and updating the CWPP as needed.

Hawaii Wildfire Management Organization will continue to raise funds and aim to provide outreach and educational programs to youth and adults through school programs, community events, homeowners/community association programs, and workshops in the coming year to kickstart additional community involvement in implementing the actions identified in this plan.

Many of the CWPP action items will require new financial and time support for wildfire risk mitigation projects. This will involve actively pursuing funding for projects, staying informed and in contact with one another, and updating the CWPP regularly so that it remains a “living” document. Continuing to build community awareness of these issues and actions will assist with fostering individual and community investment in projects.

CONTINUED
APPENDIX F:

2024 LIST OF PRIORITY PROJECTS AND ACTIONS NORTHWEST HAWAII ISLAND

2024 LIST OF PRIORITY PROJECTS AND ACTIONS

Northwest Hawaii Island
State of Hawaii

Drafted by Hawaii Wildfire Management Organization, in cooperation with the Department of Land and Natural Resources - Division of Forestry and Wildlife, Hawaii Fire Department, and Hawaii County Civil Defence

Table of Contents

I. INTRODUCTION

Community Wildfire Protection Plans (CWPP) are a great community planning tool and have become a prerequisite for receiving federal funding for wildfire protection projects. A CWPP assists a community in identifying and prioritizing areas for hazardous fuel reduction treatments and supports communities in taking action. The plans assess values at risk, such as safety, natural resource protection, recreation, scenic values, and economic assets. Through a collaborative process involving input from community members, resource management and firefighting agencies, and various other interested parties, CWPPs help bring wildfire hazard information and planning and action opportunities to all parties. These plans are increasingly important in Hawaii, which faces unique wildfire threats that are becoming more challenging due to increasing ignitions, drought episodes, and land use changes.

In order to keep the CWPPs current and relevant, this Appendix to the CWPP serves as a repository for annual updates to the list of priority projects and actions. These project and action updates are designed to keep the CWPP actionable and aligned with the community's current needs and opportunities for wildfire mitigation. In this appendix, you will find a list of projects and actions that help at-risk communities to protect their citizens, homes, and resources from the destruction of catastrophic wildfires in the wildland-urban interface (WUI).

This approach was mutually agreed upon and affirmed through the signatures at the front of this document, ensuring collective commitment to maintaining the CWPP as a living and evolving tool. By focusing on shovel-ready priority projects, we enable more effective planning, resource allocation, and funding efforts. Each update reflects the collaborative efforts of stakeholders and represents the best available information for advancing wildfire risk reduction.

Readers are encouraged to refer to these updates in conjunction with the foundational elements of the CWPP. Together, they provide a comprehensive framework for understanding wildfire risks and implementing effective mitigation strategies.

II. TABLE OF PROJECTS AND ACTIONS

Project Name: Fire Adapted Hawaii County	
Communities and Neighborhoods that will benefit from this project: Waikoloa Village, Kailua, Honaunau-Napoopoo, Kealakehe, Pahala, Waiohinu	
Affiliation: Hawaii Wildfire Management Organization (HWMO)	**Project Lead:** HWMO **Partners:** DLNR-DOFAW, Hawaii Fire Department
CWPP Area: Northwest Hawaii Island	**Cost:** $1,395,297

Project Description:
The proposed project is for HWMO to lead the following two programs for Hawaii County:

1. The Firewise Communities (FC) program, which leads resident education, aids communities through the Firewise hazard assessment and recognition process. It also supports defensible space and risk-reduction efforts for at-risk, underserved communities via vegetation removal/transport assistance; and

2. The Wildfire Resilient Landscapes (WRL) program, which provides education and technical support for land managers, policymakers, emergency responders, and others. The WRL program provides education via in-person and virtual workshops, facilitates collaboration by facilitating ongoing working groups toward sustained multi-partner planning and cross-boundary mitigation, and provides area-specific and onsite technical mitigation and planning guidance.

This work will be implemented in close partnership with fire and forestry agencies.

The August 2023 fires on Hawaii Island and Maui were spread by heavy winds and through unmanaged lands heavily invaded by fire-prone grasses that entered the built environment, causing substantial damage to life and property. These wildfires were the most devastating and publicized fires in Hawaii's history in terms of the number of lives and structures lost. However, wildfire size and frequency has been growing over the past few decades with broad and long-lasting impacts. Hawaii County's infrastructure is not designed or built with wildfire safety in mind, nor are its ecosystems adapted to fire. Every CWPP in Hawaii County has prioritized community and/or land manager education and vegetation management in and around at-risk communities and WUI boundaries. This project supports both.

These programs address several CWPP priorities at once. CWPP priority actions that are addressed via the proposed Firewise Communities program are as follows:

NW Hawaii Island CWPP 2016 Update action items: (from Waikoloa, Puako, & North Kohala Action Tables, pgs 47-49, 51): Support financial and logistical assistance programs that assist residents; Develop neighborhood action items and programs to educate and assist with risk reduction; Increase HWMOs ability to be present in the area, support part of staff time to dedicate to this areas awareness and education, and Firewise leadership; Share in cost of container for private green waste disposal days; Develop and/or support community programs and workdays for fuels management and reduction of fire prone vegetation; Hold residential/neighborhood green waste removal and chipper days; Support Firewise program to help communities through Firewise process; Education and outreach via HWMO and Firewise program.

North Kona CWPP 2016 Action Plan Items (page 60-62): Assist interested communities in completing Firewise certification process; Green waste removal and recycle programs; Increase outreach to community associations; Provide wildfire education for decision makers;

South Kona CWPP 2015 Update, Concern #3 (page 21): Education/Outreach: Conduct outreach to landowners (page 21). Action Item #4 (page 24): Continued fire prevention education and outreach (page 23).

Kau CWPP Update: Wildfire Concern #1: Outreach and Education (page 20). Projects #1, 2, and 5: Wildfire education, community awareness programs; fuels management via community volunteer work days; and community chipper days as incentives/educational programs. Action Item #1 Wildfire Education- (Support) community awareness programs.

The CWPP priority actions that are addressed via the proposed Wildfire Resilient Landscapes portion of the program are as follows:

NW Hawaii Island CWPP 2016 Update (pgs 50-51): Work with property managers-education and facilitation of better collaborations; Develop and implement longer term strategy, such as grazing corridors or re-planting of less fire-prone plants; Work with DOT to understand what is already covered and how often, fill in gaps; Develop protocol for mitigation/fuels reduction in a culturally sensitive way.

North Kona CWPP 2016: Action Plan Items (page 60-62): Develop pre-fire mitigation and fire management plans for reserves and large landholdings; Work with large landowners to encourage fuels/access management.

South Kona CWPP 2016 Concern # 1, 2: Fuels Management: Overgrown large properties; Adjacent landowners not managing fuels; Action items: Conduct outreach to landowners, farmers, lessees, CTAHR, agricultural groups, and developers; Fuels Management legislation, education (page 21, 23).

The project supports the updated goals of the Cohesive Wildland Fire Management Strategy (CWFMS, 2023). By providing the opportunity for people to work together to

reduce fire risk the project will support the goal of creating fire-adapted communities. By engaging practitioners to inform, learn and work toward climate-smart land and fire management, the project will support the goal of creating resilient landscapes by prioritizing management actions to safeguard and restore landscapes. The project also supports the new wildland fire critical emphasis areas of: (1) community resilience, and (2) diversity, equity, inclusion and environmental justice in creating fire-adapted communities.

This need for community risk reduction education and fuels management is also highlighted in the Hawaii Forest Action Plan (https://dlnr.hawaii.gov/forestry/files/2013/09/Hawaii-Forest-Action-Plan-2016-FINAL.pdf) as Issue # 3: Wildfires: Priority 1.a. Prevention education: Reduce the threat from wildfires to native ecosystems, forests, watersheds, and threatened and endangered species as well as communities within WUI areas through established fire prevention programs; and Priority 2.c Pre-suppression fuels management: Mitigate the impacts of wildfires on natural and built environments.

By bringing together a diverse group of agencies, organizations, and the public, the two proposed programs also support the State of Hawaii Forest Action Plan (FAP) by providing an opportunity to address wildfire issues in Hawaii by strengthening collaborative partnerships through the partner-heavy implementation of the FC program, and by facilitating collaborative learning and project planning across jurisdictional and land ownership boundaries through the WRL program.
The full set of programs will operate throughout Hawaii County, focusing on the communities with the highest fire threat, all of which are identified as Communities at Risk by the State Division of Forestry and Wildlife and Hawaii Wildfire Management Organization. Wildfire in Hawaii County poses threats to many communities on the island, however many of our communities at highest risk of wildfire are also socioeconomically vulnerable, underserved, and/or low-income, particularly Hawaiian Homestead Lands in leeward Hawaii County, which are designated as underserved Tribal areas in the CWDG tool.

Importance: These two programs have been key to Hawaii's progress toward wildfire preparedness and risk reduction thus far, but support is needed to carry forward the programs at the county level. The request for participation in the programs has increased 1,500% since our recent devastating fires. People across Hawaii County have become both scared and motivated. This proposal will meet those emotions and motivations with meaningful programming, sound information, and sustained technical support and risk reduction project assistance, carried out at the county level instead of at the existing, albeit limited, statewide level. Supporting county-level implementation of the two programs will provide higher quality education and technical support for individuals and communities (via FC program) and for others who influence fire outcomes (land stewards, large landowners, policymakers, and more, via the WRL program) in this new era when capacity, not complacency, has become our biggest obstacle.

Project Name: Dedicated Risk-Reduction Support for Native Hawaiians	
Communities and Neighborhoods that will benefit from this project: All DHHL Homestead Communities	
Affiliation: Department of Hawaiian Home Lands (DHHL)	**Project Lead:** Richard Hoke
CWPP Area: Northwest Hawaii Island	**Cost:** $150,000 annually per firewise coordinator, plus annual mitigation funds

Project Description: DHHL homesteaders are Native Hawaiians who receive land leases from DHHL to build homes and establish sustainable communities. Many face socioeconomic challenges, including lower income levels and limited access to essential resources. While DHHL will provide financial assistance for community mitigation efforts, grant funds will directly support the hiring of a dedicated Firewise Coordinator for these vulnerable communities, enabling unified efforts in wildfire preparedness and mitigation.

As a central point of contact, the Coordinator will support three groups: those interested in wildfire preparedness (Firewise-interested sites), those needing assistance to meet Firewise requirements (emerging sites), and those already in the Firewise program seeking advanced guidance (existing sites).

Firewise-interested sites will receive resources and participate in workshops aimed at increasing knowledge around wildfire risks and mitigation best practices. Emerging sites will benefit from social and technical support to meet Firewise criteria, including forming a team, completing a hazard assessment, developing an action plan, and executing a risk-reduction project. Emerging and existing sites will receive technical assistance for mitigation planning and implementation, as well as access to the broader community of Firewise sites across the state (HI-Firewise Network).

Mitigation projects to be designated by this Firewise assessment process.

Importance: We are committed to investing millions in fuel breaks & land management activities to enhance the health/safety of the lands & communities we steward. However, achieving this vision requires the cooperation & active participation of our beneficiaries/homesteaders. Our primary aim is to target the enabling factors that will empower them to take proactive risk-reduction actions, while DHHL simultaneously mitigates risks on surrounding lands. This initiative will assess the impact of coordination support for our homestead communities and the availability of funds for their risk-reduction projects. Targeting both residential areas and DHHL-owned lands fosters a cohesive approach to wildfire management. This strategy encourages collaboration among neighboring communities and with DHHL, effectively reducing overall risk across the landscape. Additionally, this initiative aligns with broader wildfire management strategies, contributing to a unified regional response. As communities implement their mitigation plans and achieve Firewise recognition, we will establish a network of prepared landscapes and neighborhoods. This collaborative effort will collectively reduce wildfire hazards and promote sustainable, long-term risk reduction strategies.

Project Name: Rock Mulch Conversion	
Communities and Neighborhoods that will benefit from this project: Holo Holo Ku at Parker Ranch	
Affiliation: Holo Holo Ku at Parker Ranch	**Project Lead:** Bryan Graboyes
CWPP Area: Northwest Hawaii Island	**Cost:** ≥ $5,000
Project Description: The scope of the project would be to replace pre-existing wood mulch with rock mulch aggregate within the 0'-5' fire zone whenever reasonably applicable. This alteration will be around all 44 homes and the community building. The project will take approximately 3,000 cubic yards of gravel.	
Importance: It helps to guarantee zero fuel load around homes that would catch sparks or brands in the 0'-5' fire zone.	

Project Name: Fountain grass remediation work (removal) and gravel installed	
Communities and Neighborhoods that will benefit from this project: Waiulaula at Mauna Kea Resort	
Affiliation: Wai'ula'ula at Mauna Kea Resort, a Firewise Site	**Project Lead:** John Landers
CWPP Area: Northwest Hawaii Island	**Cost:** $75,000 annually
Project Description: Removing fountain grasses 15 feet from the roadways, install rock or gravel	
Importance: Prevent fires from encroachment and spreading	

Project Name: Waikoloa Wildfire Fuels Reduction Project	
Communities and Neighborhoods that will benefit from this project: Waikoloa Village	
Affiliation: Waikoloa Dry Forest Initiative-Waikoloa Village a Firewise Community	**Project Lead:** Jen Lawson Partners: Waikoloa Village Association, WVA Firewise Committee, HWMO, Hawaii Water Service, The Lewhauser Company, Goodfellow Brothers Inc

CWPP Area: Northwest Hawaii Island	**Cost:** $1,500,000
Project Description: The Waikoloa Community Wildfire Defense Project is a vital initiative aimed at addressing the substantial wildfire risk confronting Waikoloa Village, which ranks among the most fire-prone communities in the nation. Waikoloa is located in South Kohala within the Wildland Urban Interface and is recognized as a top-priority area for wildfire mitigation in the Hawaii State Forest Action Plan. The current wildfire risk poses a direct threat to over 7,300 residents and sensitive native ecosystems. The project seeks to prioritize and expand fuel treatments to diminish fire intensity, spread, and the risk of structural ignition. The project will be a collaborative effort between the Waikoloa Dry Forest Initiative, the Waikoloa Village Association, private landowners, public agencies, and community members. The project's key focus is to implement actions outlined in the Community Wildfire Protection Plan for Northwest Hawaii Island, which includes establishing a network of firebreaks to protect Waikoloa. These firebreaks will serve to reduce fuel loads and enhance firefighting access in previously unmanaged areas around neighborhoods, adjacent wildlands, and areas near native forest resources.	
Importance: This project is aimed at preventing catastrophic wildfires from impacting Waikoloa, its residents, and biocultural resources. Without significant investment in a comprehensive fire mitigation plan and implementation, the community will remain at extreme risk.	

Project Name: Eliminate Fire Hazards at Waikii Ranch Homeowners Association	
Communities and Neighborhoods that will benefit from this project: Waikii Ranch Homeowners Association	
Affiliation: Waikii Ranch	**Project Lead:** Paul Purdy
CWPP Area: Northwest Hawaii Island	**Cost:** $15,000.00. Tree trimming and discarding of limbed, trimmed or dead trees in roll off containers.
Project Description: Project description: To eliminate fire hazards at Waikii Ranch Homeowners Association. Job description would be to limb, trim or eliminate dead trees at the front entrance to Waikii Ranch, and at or around the clubhouse, recreational center and tennis court.	
Importance: This project is important due to the high volume of traffic each day at each location, (Entrance/Exit to Waikii Ranch, Clubhouse, Recreational Center and Tennis court) by way of vehicle or foot, by homeowners, guests and family members.	

Project Name: Puu Kapu Fuelbreak Maintenance	
Communities and Neighborhoods that will benefit from this project: Puu Kapu, Waimea	
Affiliation: Parker Ranch	**Project Lead:** Zachary Judd
CWPP Area: Northwest Hawaii Island	**Cost:** $30,000 annually
Project Description: Vegetation maintenance within recently constructed 30' wide fuel breaks surrounding DHHL Puu Kapu community. This will be conducted via ground based or aerial application of herbicide to maintain bare ground for the entire length of the fuel break.	
Importance: Following the Lahaina Fires in 2023, tremendous effort went into identifying communities at high risk of wildfire and implementing fuel break construction on areas that did not have significant defensible space between urban and wildland areas. One of the fuel break projects conducted by the State Department of Transportation was the installation of 9 miles of fuel break on the windward and southwestern boundaries of Puu Kapu which provides a break in fuels between the grazed pastures of Parker Ranch and the agricultural homesteads of Puu Kapu. Maintaining the integrity of this fuel break will substantially reduce the risk of fires traversing between the two neighboring areas.	

Project Name: Kamuela View Estates woody fuel buffer	
Communities and Neighborhoods that will benefit from this project: Kameula View Estates, Ohia Ku, DHHL Agricultural Lessees	
Affiliation: Parker Ranch	**Project Lead:** Zachary Judd
CWPP Area: Northwest Hawaii Island	**Cost:** $25,000
Project Description: Maintain woody and fine fuel buffer between Parker Ranch grazing lands and Kamuela View Estates Subdivision. Removal of heavy fuel load caused by invasive tree species growing in pasture areas via heavy equipment and trucking all woody material to green waste facility. Additionally, we are looking to improve access lanes for fire vehicles behind the subdivision on the windward side of the community in pasture that was washed out in 2024 heavy rain events.	
Importance: The windward side of Kamuela View Estates has been the location of many fires over the years including the most recent fire in 2022 that started on Kohala mountain road and burned right up to the subdivision boundary. Over the years Parker Ranch has worked collaboratively with the community to effectively manage fuel loads in the wildland urban interface. To that end we are seeking funds to do additional work in the area to further reduce the fuel load, increase fire vehicle access, and maintain an adequate buffer between the Kamuela View Estates subdivision and Parker Ranch.	

Project Name: Urban fuel reduction in Kamuela	
Communities and Neighborhoods that will benefit from this project: Holoholo Ku Subdivision, Puu Kapu Hawaiian Homestead lots, Waimea Senior Living, Sandalwood subdivision, Lalamilo Farm Lots	
Affiliation: Parker Ranch	**Project Lead:** Zachary Judd
CWPP Area: Northwest Hawaii Island	**Cost:** $50,000
Project Description: Woody fuel reduction in grazed pasture areas that border numerous communities within the Kamuela area.	
Importance: Parker Ranch actively grazes numerous pasture areas adjacent to numerous urban areas and agricultural lots. Over time these areas have seen an influx of invasive species that grazing animals tend to avoid. Removal of these invasive species in buffer areas surrounding the communities will reduce the fire risk in the Wildland Urban Interface and provide defensible space for firefighters to protect homes and lives in the area should a fire ignition occur. The general urban core of Waimea has seen numerous fire ignitions in the last 5 years mostly due to homeless encampments, fireworks, and vehicle exhaust.	

Project Name: Kamuela View Estates Dip Tank	
Communities and Neighborhoods that will benefit from this project: Kamuela View Estates	
Affiliation: Parker Ranch	**Project Lead:** Zachary Judd
CWPP Area: Northwest Hawaii Island	**Cost:** $50,000
Project Description: Installation of Dip Tank upwind of Kamuela View Estates to better facilitate firefighting operations in the Wildland Urban Interface	
Importance: There are currently no dippable water sources within a 1.5 mile radius of these communities which leads to a delay in a helicopter being able to respond to a wildfire until a mobile dip unit can be deployed. Having static water features available greatly reduces response time and limits the potential spread of a fire.	

Project Name: Highway 190 fuel break	
Communities and Neighborhoods that will benefit from this project: Waikōloa	
Affiliation: Parker Ranch	**Project Lead:** Zachary Judd
CWPP Area: Northwest Hawaii Island	**Cost:** $3,000,000 including dozer work and accessibility improvements, maintenance, dip tanks
Project Description: Installation and maintenance of fuel break makai of highway 190 from Waimea airport to old saddle road. This fuel break will be just makai of existing HELCO power lines and provide a fuel break downwind of historical ignition points that threatened Waikōloa in the past.	
Importance: Waikōloa has had a long history of wildfires threatening the community with most originating from the roadside at highway 190. By installing a fuel break that parallels highway 190 on the makai side of the road it provides static protection to the community and allows time for firefighters to catch fire ignitions before they get into inaccessible areas.	

Project Name: Implementation of CWPP for Puu Kapu	
Communities and Neighborhoods that will benefit from this project: Puu Kapu, South Kohala	
Affiliation: Puu Kapu	**Project Lead:** Michael Hodson
CWPP Area: Northwest Hawaii Island	**Cost:** $5,327,150
Project Description: Implementation of CWPP for our area Improving firefighting access via improved firebreaks: This project will level off the 15 foot shoulders of the 22 miles of fire roads and remove the existing large fuel loads to create a 50-foot firebreak that can be used by firefighting vehicles. This task will be contracted out to be completed with heavy machinery during the first two years so that the shoulder areas can be maintained by WNCDC, creating a defensible space for Emergency personnel and their equipment, as well as for the residents of the community. Maintenance will include keeping the fuels as close to the soil as recommended by mowing on a regular basis. This task will be completed by the personal that we will employ through a local professional employment service during the duration of this five-year project to allow the organization to stay focused on the project.	

Providing prevention and mitigation education via home assessments: This project will hire a contractor to provide free home assessments to 50 households per year (250 total). The contractor will promote the free assessments through flyers, notices that will be included in the water bills that go to residents every month via US postal mail, and at community events and meetings. Home assessments will consist of a trained home assessor doing a 45-60 minute walk- around with the resident, making observations about the various hazards and providing mitigation recommendations. A written report will be provided to the organization to work-out the prevention recommendations and schedule the work to be done as well as being mailed or email to the homeowner upon request. Creating defensible space around residential structures: This project will provide residents that complete a home assessment with access to mitigation contractors. They will work with the homeowners to mitigate within the first 30 feet of their structures using a team of 5 staff and contract out the larger mitigating problems, such as 1-2 hundred foot trees overhanging homes. Expected work to be completed with supplies provided by this funding include, for example, trim limbs hanging over roofs or values, limb trees at a height recommended, utilize a chipper to discard the trimmings, remove bushes that are too close together, remove piles of old vegetation that has become large pockets of fuel, and removed them from the property utilizing small equipment and trailers used to transport to a designated disposal site within a designated day and time agreed upon with the homeowner.

CWPP Recommended Actions to be Taken:
A1 – Installation of pre-staged static water and helicopter dip tanks: At the present time, there are 5 Puukapu fire tanks to draw water and use for helicopter dipping
A2 – Acquisition of adequate resources for first responders, including off road tankers: Obtain and deploy equipment that can gain access to areas where traditional firefighting equipment can't. The equipment must be self-contained, skid mounted fire fighting units.
A3 - Reduction of fuel load and/or appropriate conversion of fuels along road sides, in community open areas, and individual homes. Appropriate conversion would include transition to vegetation with low ignition potential and low ability to carry fire and keeping it low to the soil, especially native plants.
A4 - Creation of development standards and community planning that requires the mitigation of wildfire risks at the regional, community/subdivision, and individual structure levels.
A5 – Creation and/or improvement of secondary access roads for those communities with only one means of ingress/egress; identification of evacuation route roads within subdivisions.
A6 – Development of an emergency center
within communities and promoting awareness of such areas within the community, including holding mock disaster drills for the community and volunteer training;
A7 - Reduction and/or control of invasive species that increase fire risk and, where appropriate, conversion to vegetation as described in priority number three.
A8 - Continued fire prevention education and outreach; including arson prevention

education and the development of a fire danger rating system.
A9 - Integration of current and future communication equipment utilized by federal, state, county, and community fire suppression personnel to increase effective firefighting response.

Planned Mitigation:
M1 – 5 large Fire Dip tanks were built in the 1990's by DHHL in the Puukapu area. In collaboration with WNCDC, we will develop a plan for each of the five fire tanks, to repair, modify or retro fit the tanks to meet the mitigating plan developed for the Puukapu area of the CWPP.
M2 – Lionel Camara is a former Honolulu Firefighter with 35 years of experience, from the rank of firefighter to Chief of the Honolulu fire Department, he has many years of field experience and knowledge regarding wildfires, the steps that need to be taken to prevent them and methods, techniques and processes to prevent/minimize the spread of a wildfire. Now more so than ever, we recognize the importance of working closely with our government officials, first responders, private landowners and residents to implement our 2016 CWPP. The topography of the land in the Puukapu district restricts access to many of the current firefighting resources available in the Waimea area. This was quite evident in the July 2021 wildfire in which the local fire department struggled to gain access to the initial fire. This resulted in the fire rapidly spreading throughout the district and became the largest fire in the state's history. Fortunately, many ranchers, farmers, residents and community members used their own equipment to cut fire breaks, build roads so firefighters could gain access and fight the fire itself. Based on the lessons learned from the July 2021 wildfire, we are looking to obtain and deploy equipment that can gain access to areas where traditional firefighting equipment can't. The equipment proposed would be self-contained, skid mounted, firefighting units. These recommendations by Camara, who was on the ground fighting the fire while on vacation, will be implemented.
M3 - For hazardous fuels reduction this project will level off the 15 foot shoulders and remove the existing large fuel loads to create a 50-foot firebreak that can be used by firefighting vehicles. Maintenance will include keeping the fuels as close to the soil as recommended by mowing on a regular basis. We will also be assessing an estimate of 250 homes utilizing a private contractor and we will work with the homeowners to mitigate the recommendation with them, with a team of 5 staff and contract out the larger mitigating problems, such as 1-2 hundred foot trees overhanging homes
M4 – This is an ongoing process with the larger Waimea community to include the Puukapu community. Fire awareness, community fairs, brochures and educational material is ongoing with numerous non-profits that we participate with
M5 – Within the Puukapu area, there are secondary roads, but these roads have been poorly maintained. We will open these secondary roads and maintain them to give our residents options to evacuate during wildfire events. These are part of the 22 miles of firebreak roads developed in our Puukapu area identified in M3.

Importance: It has a higher Wildfire Hazard Potential than 98.3% of tribal areas and counties in the nation.

Project Name: West Hawaii Water Tanks	
Communities and Neighborhoods that will benefit from this project: Puuwaawaa, Puu Anahulu, Waikii, Waikaloa Village, Waimea DHHL and Puukapu DHHL	
Affiliation: DLNR - DOFAW	**Project Lead:** Mike Walker **Partners:** Hawaii Board of Water Supply, and The State of Hawaii DHHL
CWPP Area: Northwest Hawaii Island	**Cost:** $1,640,000 (subject to market costs)

Project Description: The Northwest Hawaii cisterns project was developed to meet a single goal: Provide high risk areas with limited water infrastructure for aerial and ground fire suppression with eight cisterns across the landscape.

The cistern section of the project is described in the 2016 Northwest Hawaii CWPP update within the community Input and Action Plan for Waimea, North Kohala, and Mauka areas table which states: Install water tanks around margins of communities to serve as dip tanks for helicopter fire suppression.

With the assistance of cooperators Parker Ranch and Department of Hawaiian Homelands, a total of eight sites have been identified to install cisterns on cooperator land and DOFAW lands. The costs associated with developing a cistern site include conditional use permits, conducting archeological and environmental surveys, design and engineering, foundation work, and the purchase of the cisterns, cost of installation and site improvements.

Tank Locations:
Puuwaawaa: 19.803444656885997, -155.84103961365994
Puukapu: 20.004667632201993, -155.6427452913334
Parker Ranch 1: 20.041731361894975, -155.72688580619058
Parker Ranch 2: 20.02737802149845, -155.70662976487066
Parker Ranch 3:19.960916278057717, -155.67315579828258
Parker Ranch 4:19.924769977319325, -155.66440106844152
Waikoloa Village:19.939846022903794, -155.7781035011307

Importance: In many areas of Hawaiian islands fresh water is not often available and helicopters must dip their buckets in the ocean. Ocean dipping increases the risk to communities and firefighters due to having to cross roads and developed areas, increases turn around time between water drops, and is detrimental to equipment, aircraft, plant cover, and soil structure and viability.

Project Name: Long term fire risk mitigation in West Kohala

Communities and Neighborhoods that will benefit from this project:
Kawaihae Village, Kailapa, Kohala by the Sea, Kohala Waterfront, Kohala Estates, Kohala Ranch; Kawaihae Harbor; and Indirectly through sharing of experience, other local and national communities.

Affiliation: Kohala Ranch Firewise Working Group	**Project Lead:** Bernard Sadoulet

Partners: Communities including Kawaihae Village, Kailapa, Kohala by the Sea, Kohala Waterfront, Kohala Estates; HWMO; Ranches in the area: e.g., Ponoholo Ranch, Kahua Ranch; Businesses in Kawaihae Harbor area and resorts in South Kohala; Collaboration with the County, the Fire Department (and our local volunteer fire unit), DOF, DOT, DLNR and DHHL, and land-owning entities such as the Queen's Foundation; Collaboration with other Firewise communities; and Collaboration with other local organizations (e.g., Kawaihae Canoe Club, Coastal Coalition, The Nature Conservancy, Terraformation, Vibrant Hawai'i, etc.).

CWPP Area: Northwest Hawaii Island	**Cost:** $50K-$1M per year, leading eventually to a self-supporting wildfire risk reduction effort.

Project Description:

- West Kohala area around Kawaihae on the Big Island of Hawaii
- Coordinated regular vegetation abatement in areas which have been cleaned up over the last year to protect our communities against wildfires (6 miles of DOT fuel breaks, *25* acres of vegetation abatement around Kailapa, Kawaihae Village and along HI 270 'Akoni Pule Highway, which borders our communities over 3 miles and historically a major ignition source).
- Extension of regular vegetation control, in particular to the gulches (gullies), which cut across our communities and provide dangerous fire penetration paths, to the 330 acres of fenced DHHL land around Kailapa, and to the intersection between HI 19 and HI 270 **(**Kawaihae Road and 'Akoni Pule Highway), a critical intersection on an important escape route for our communities.
- This is a shovel ready project: we have collectively gained experience on vegetation control with goat and cow grazing and mechanical methods (weed whacking, tree trimming). We will optimize the mix depending of the specific areas and the funding available.
- This project will also give us the opportunity to explore various approaches with experts (e.g., HWMO, University of Hawaii Manoa, DOF) and experiment with scientifically based long term solutions.
- The project will further develop existing partnerships with our HOAs, Ranches, the County and State agencies and grassroots organizations.
- These partnerships are essential to reach our long-term goal: institutionalize technically and financially sustainable measures to protect our communities against wildfire, while promoting a healthy environment.

Importance:

- This dry savannah region of the Big Island of Hawaii is very prone to fire, because of tall dry grasses, steep terrain with a number of vegetation clogged gulches and very strong dry Easterly winds. We had a major fire on August 8, 2023, the same day Lahaina burned down in similar meteorological conditions. Approximately 1800 acres of wild lands, and 100 acres in the Kohala Ranch subdivision were scorched, and four of our communities were under evacuation orders. Thanks to the competence of the Fire Department, damage to structures was kept to a minimum.
- With a focus on collaborative efforts on fuel breaks and vegetation abatement around our communities, we will complement the effort of each community to control vegetation, provide defensible space and harden their homes within their own subdivision.
- Only a broad partnership can address the complex issues of wild lands - community interfaces. At the same time, we need to focus on a few concrete actions, which can demonstrate science-based solutions and indicate directions for the future.
- Our coastal environment is very fragile. Not only does fire have very detrimental effects on our reefs, but the risk mitigation effort should also be tailored to promote a healthy ecosystem.
- While forming a natural group of subdivisions, fairly isolated from the larger semi-urban centers, our six communities are very diverse in terms of demography and socio-economic circumstances. Striving to collaborate in a way which responds to the needs of each community and respects our diverse cultures is an unusual and ultimately necessary effort that could, if successful, be generalized.

Project Name: Gravel covered fuel breaks as a long-term, low maintenance strategy	
Communities and Neighborhoods that will benefit from this project: Kawaihae Village	
Affiliation: Kawaihae Village Firewise Community	**Project Lead:** Brenda DuFresne **Partners:** Queen Emma Land Trust (QEL), Hawaii Wildfire Management Organization (HWMO), Hawaii Fire Department, Hawaii DOT, DLNR, Hawaii County
CWPP Area: Northwest Hawaii Island	**Cost:** $120,000
Project Description: Kawaihae Village is in South Kohala, leeward NW side of the Big Island of Hawaii, near Mauna Kea resort and Kawaihae town. The community is next to Highway 19 and within ¼ mile of the main intersection of Highway 19 and Highway 270 and a half mile from the Pacific Ocean. In July of 2024, Queen Emma Foundation cut invasive species of flashy fuel grasses and removed trees creating a 40-foot-wide fuel break surrounding 3 sides of Kawaihae Village.	

The cleared area was sprayed with herbicide to inhibit regrowth. However, this is only a temporary solution and would require the efforts to be redone several times a year, especially before and possibly during the dry season. A more cost-effective, long-term option is to cover the fuel break with gravel as a permanent solution and walking path for the residents. This would include 2300 feet from the entrance to the community on the NE side of the Village, going all the way around the apartments and the back side of the community, around the west end of the Village and in the approximate 0.3-acre invasive grass area in front of the community along the highway.

Importance: This and the other three projects submitted on behalf of Kawaihae Village are safety driven, intended to save human life and protect our community from complete destruction and devastation due to wildfire. Each of these four projects work together to create effective, sustainable, easily maintained and environmentally respectful fuel breaks, fire barriers and where permanent structures are not practical or feasible, manage the vegetation and reduce fuel load on a continuous basis to provide the best chance of preventing fires from destroying our community and potentially killing our residents and the families that live here. All projects align with the recommendations from Hawaii Wildfire Management Organization as documented in their Hazard Assessment report dated March 2024 and align with lessons learned from the Lahaina Wildfire of 2023.

Since we are only a half mile from the Pacific Ocean, there is concern with repeated use of herbicides and runoff into the ocean. It is highly desirable to minimize herbicide use and implement sustainable and environmentally responsible solutions. One long-term and environmentally responsible solution is to cover the fuel break area with a weed mat followed by compacted gravel. This not only creates a more permanent, low maintenance fuel break area and eliminates the invasive grass “flashy fuel” species, but also creates a walking path for our residents and minimizes erosion during the wet season and eliminates the need for repeated herbicide treatment of cut grass. This recommendation was made in Hawaii Wildfire’s Hazard Assessment Report for Kawaihae Village in March of 2024 and is included in the community’s action plan.

The 0.3-acre section in front of the community and along highway 19 is considered a high-risk area since most fires start along the roads. The homes are less than 100 feet apart and share fire-spreading topographical features, such as a steep slope from the community to the highway. In general, the steeper the slope, the higher the rate of spread and intensity of a wildfire. This coupled with low rainfall of less than 10” annually, and a history of wildfires and evacuations due to wildfire makes it imperative to implement long-term solutions. With climate change predictions of more rainfall and flooding to promote growth and more abundant fuel loads during wet season and longer, drier drought seasons require more permanent structures and solutions whenever possible. The threat is not going away, it is expected to continue and get more extreme.

Project Name: Reduction of fuel load by removing invasive grass species and haole koa trees

Communities and Neighborhoods that will benefit from this project:
Kawaihae Village

Affiliation: Kawaihae Village Firewise Community	**Project Lead:** Brenda DuFresne **Partners:** Queen Emma Land Trust (QEL), Hawaii Wildfire Management Organization (HWMO), Hawaii Fire Department, Hawaii DOT, DLNR, Hawaii County
CWPP Area: Northwest Hawaii Island	**Cost:** $15,000 annually

Project Description:
Kawaihae Village is in South Kohala, leeward NW side of the Big Island of Hawaii, near Mauna Kea resort and Kawaihae town. The community is next to Highway 19 and within ¼ mile of the main intersection of Highway 19 and Highway 270.

In June and July of 2024, several fire prevention projects were implemented including removing 13 cubic yards of chipped haole koa trees and trimmed keawe tree material from the high fire risk area between the community and highway 19. Four months later, new haole koa trees have filled the ditch that runs along the main road in the Village and are growing throughout the community.

Managing our invasive species flashy fuel grasses, vegetation and trees, in particular the haole koa and keawe trees that grow abundantly in this area is critical in reducing fuel loads mandatory for fire mitigation, prevention and risk reduction for our residents and their families. This is an ongoing and continuous effort and requires on-going funding. This project is intended to request that funding.

Importance: This and the other three projects submitted on behalf of Kawaihae Village are safety driven, intended to save human life and protect our community from complete destruction and devastation due to wildfire. Each of these four projects work together to create effective, sustainable, easily maintained and environmentally respectful fuel breaks, fire barriers and where permanent structures are not practical or feasible, manage the vegetation and reduce fuel load on a continuous basis to provide the best chance of preventing fires from destroying our community and potentially killing our residents and the families that live here. All projects align with the recommendations from Hawaii Wildfire Management Organization as documented in their Hazard Assessment report dated March 2024 and align with lessons learned from the Lahaina Wildfire of 2023.

Kawaihae Village gets less than 10 inches of annual rainfall, which is much lower than the rest of the island. Especially with climate change, the wet seasons can see significantly more rainfall and flooding while the dry seasons create severe drought conditions. It's predicted in the Pacific region that more extreme weather events such as droughts and floods will

increase the quantity of available vegetative fuels during wet season and the likelihood of wildfires during extended dry conditions, leading to an increase both in fire risk and in the frequency that mitigation measures such as firebreaks and fuel reduction need to be applied.

The land surrounding Kawaihae Village is considered pastureland and is full of invasive, fire-promoting dense grasses considered “flashy fuels” and haole koa trees. In May of 2024, KVA received 19 inches of rain in less than 24 hours. By June 2024, the flashy fuel grasses were 24-36 inches tall and lush green. In June 2024, haole koa trees were cut and killed (to stop regrowth). By September 2024, the area was in drought conditions and at risk for wildfires. By October 2024, new haole koa trees are found growing throughout the community.

Haole koa trees are known for their perseverance and ability to spread easily and grow quickly. Haole koa can transfer heat well through convection, can be difficult to navigate around for fire suppression purposes and its pods have been known to travel upwards of 7 miles during strong wind events, according to local firefighters. These pods can act as firebrands and ignite vegetation near the house or structure directly. It is imperative to continuously cut and kill these invasive trees and maintain the invasive grasses to heights of 2-4 inches especially during the dry season to reduce fuel for wildfires. Creation of fuel breaks, ongoing elimination of the haole koa trees and reduction of fuel load through vegetation abatement and addressing invasive grasses throughout our community is imperative to create defensible space to protect our homes and our residents.

Project Name: Rock wall fire barrier to provide a second line of defense and long-term fire protection	
Communities and Neighborhoods that will benefit from this project: Kawaihae Village	
Affiliation: Kawaihae Village Firewise Community	**Project Lead:** Brenda DuFresne **Partners:** Queen Emma Land Trust (QEL), Hawaii Wildfire Management Organization (HWMO), Hawaii Fire Department, Hawaii DOT, DLNR, Hawaii County
CWPP Area: Northwest Hawaii Island	**Cost:** $690,000 Total [Phase 1: Highest risk areas (NE and along the highway) $400,000 Phase 2: West and North (mountain side) $290,000]
Project Description: Kawaihae Village is in South Kohala, leeward NW side of the Big Island of Hawaii, near Mauna Kea resort and Kawaihae town. The community is next to Highway 19 and within ¼ mile of the main intersection of Highway 19 and Highway 270.	

The land in the Kohala region of the Big Island is filled with rock. Rock walls are commonly used across the island due to the abundance of this resource. Rock walls are also a fabulous line of defense for wildfires and serve as a barrier preventing fires from spreading into a community. The highest risk area for wildfires in Kawaihae Village is the NE section since this is the dominant wind direction and, in the past, has been the location where fires have gotten closest to the village and prompted multiple mandatory evacuations. The second high-risk area is along the highway since most fires start along the roads and the steep slope from the road to the community would increase the rate of spread and intensity of a wildfire. The estimated length and height of the proposed rock wall to protect these sections of the village are 1920 feet in length and 4 foot in height for the highest risk, high priority areas only. This would be phase 1 of the rock wall fire barrier project. Phase 2 would continue the rock wall to surround the Village with an additional 1400 feet in length, which would be on the mountain side (North) and the west side. Even though this is not a dominant wind direction, fires will travel and follow the fuel. The west and mountain (North) side of the village are surrounded by invasive species of flashy fuel grasses that are not maintained nor cut and are allowed to grow and dry out as open pastureland. Large fires can also create their own wind currents and even fire tornados, so having a continuous rock wall fire barrier surrounding the village is a safety structure that will protect our community long term and maintenance free.

The ideal fire barrier is to have the gravel fuel break on the inside of the rock wall for fires in high wind events that could jump the 4' rock wall. The gravel fuel break is a separate project.

Importance: This and the other three projects submitted on behalf of Kawaihae Village are safety driven, intended to save human life and protect our community from complete destruction and devastation due to wildfire. Each of these four projects work together to create effective, sustainable, easily maintained and environmentally respectful fuel breaks, fire barriers and where permanent structures are not practical or feasible, manage the vegetation and reduce fuel load on a continuous basis to provide the best chance of preventing fires from destroying our community and potentially killing our residents and the families that live here. All projects align with the recommendations from Hawaii Wildfire Management Organization as documented in their Hazard Assessment report dated March 2024 and align with lessons learned from the Lahaina Wildfire of 2023.

Since the rock used in making the rock wall barriers is found abundantly in the ground here, it is a practical structure to utilize as a barrier to block a fire from spreading into our community. A rock wall is sustainable, permanent, resilient, environmentally responsible and an effective line of defense for protecting our friends, families and our community from wildfires. It is a permanent long-term investment in the safety and well-being of our community.

Project Name: Second Emergency exit project for evacuation and emergency personnel safety	
Communities and Neighborhoods that will benefit from this project: Kawaihae Village	
Affiliation: Kawaihae Village Firewise Community	**Project Lead:** Brenda DuFresne **Partners:**Queen Emma Land Trust (QEL), Hawaii Wildfire Management Organization (HWMO), Hawaii Fire Department, Hawaii DOT, DLNR, Hawaii County
CWPP Area: Northwest Hawaii Island	**Cost:** $300,000
Project Description: Kawaihae Village is in South Kohala, leeward NW side of the Big Island of Hawaii, near Mauna Kea resort and Kawaihae town. The community is next to Highway 19 and within ¼ mile of the main intersection of Highway 19 and Highway 270. Power lines run parallel to the highway and are close to the community. Hawaii Wildfire Management Organization conducted a Hazard Assessment of Kawaihae Village in March of 2024. A second emergency exit was identified as a high priority safety measure. The best route for this new one-lane road would start at the current dead end of Hulukupuna Street and continue to the dirt road entering the sewage treatment plant and then to highway 19. The length of this proposed road is estimated to be 1500 feet x 12 feet in width. The project would include preparation of the ground and significant breaking of the rock and/or removal.	
Importance: This and the other three projects submitted on behalf of Kawaihae Village are safety driven, intended to save human life and protect our community from complete destruction and devastation due to wildfire. Each of these four projects work together to create effective, sustainable, easily maintained and environmentally respectful fuel breaks, fire barriers and where permanent structures are not practical or feasible, manage the vegetation and reduce fuel load on a continuous basis to provide the best chance of preventing fires from destroying our community and potentially killing our residents and the families that live here. All projects align with the recommendations from Hawaii Wildfire Management Organization as documented in their Hazard Assessment report dated March 2024 and align with lessons learned from the Lahaina Wildfire of 2023. Kawaihae Village (KVA) has only one way in and out. A second emergency exit is required not only for evacuation purposes for the residents, but also for the safety of emergency personnel and for secondary access to the community should the main entrance be inaccessible due to wildfire or down power lines from high winds. Connecting the two roads would provide a continuous route to be used as an	

emergency exit and for emergency personnel that could otherwise become trapped inside the community. The main entrance is on the NE side of the village, which is the dominant wind direction and where past wildfires have gotten closest to the community and forced multiple evacuations in the past.

In 2024, Queen Emma Foundation cleared a 40-foot fuel break around Kawaihae Village on three sides, including the west side which is within the scope of this proposed road project. They cleared the grass and applied herbicide to slow regrowth. Once the grass was cut, it exposed all the rocks that are abundant in the land in this area. The existing dirt road to the sewage treatment plant also has exposed rocks due to erosion, some so large that the road is not drivable. Unless a more permanent solution is implemented, any work smoothing the path would continuously result in exposed rock, continued erosion and impassibility. It is extremely expensive to break rock and smooth the path to create a drivable surface. Based on our estimates, paving the road as a permanent solution is much more cost effective and a more permanent long-term solution. It is a permanent investment in protecting the safety of our residents and emergency personnel in the event of wildfire.

Project Name: Reduction of fuel load by removing invasive grass species and haole koa trees for NW Hawaii main evacuation route	
Communities and Neighborhoods that will benefit from this project: Kawaihae Village, Kohala Ranch, Kohala by the Sea, Kohala Estates, Kailapa and Kawaihae town and shipping yard.	
Affiliation: Kawaihae Village Firewise Community	**Project Lead:** Brenda DeFresne **Partners:** Queen Emma Land Trust (QEL), Hawaii Wildfire Management Organization (HWMO), Hawaii Fire Department, Hawaii DOT, DLNR, Hawaii County, Kohala Ranch, Kohala by the Sea, Kohala Estates, and Kailapa Firewise Communities
CWPP Area: Northwest Hawaii Island	**Cost:** $50,000 annually
Project Description: Kawaihae Village is in South Kohala, leeward NW side of the Big Island of Hawaii, near Mauna Kea resort and Kawaihae town. The community is next to Highway 19 and within ¼ mile of the main intersection of Highway 19 and Highway 270. Highways 19 and 270 are the main evacuation routes for the NW communities on the	

Big Island of Hawaii. This includes 5 Firewise communities, the village of Kawaihae and a major shipping port for the island of Hawaii.

In July of 2024, several fire prevention projects were implemented including removing 13 cubic yards of chipped haole koa trees and trimmed keawe tree material from the high fire risk area between the community and highway 19. Queen Emma cleared the flashy fuel grasses and trees along Highway 19 (Kawaihae Road) up to and including the major intersection of Highways 19 and 270. This project required 4 landscape workers, heavy machinery including excavators, a chipper and dumpsters, and took 2 days to complete. Managing our invasive species flashy fuel grasses, vegetation and trees, in particular the haole koa and keawe trees that grow abundantly in this area is critical in reducing fuel loads mandatory for fire mitigation, prevention and risk reduction for our North and South Kohala residents and their families, the town of Kawaihae and a major shipping yard. It is critical to protect the main evacuation routes and access roads for emergency personnel. This is an ongoing and continuous effort and requires on-going funding. This project is intended to request that funding.

Importance:
This and the other projects submitted on behalf of Kawaihae Village are safety driven, intended to save human life and protect our community from complete destruction and devastation due to wildfire. Each of these projects work together to create effective, sustainable, easily maintained and environmentally respectful fuel breaks, fire barriers and where permanent structures are not practical or feasible, manage the vegetation and reduce fuel load on a continuous basis to provide the best chance of preventing fires from destroying our community and potentially killing our residents and the families that live up and down the northwest coast of the Big Island of Hawaii. All projects align with the recommendations from Hawaii Wildfire Management Organization as documented in their Hazard Assessment report dated March 2024 for Kawaihae Village and align with lessons learned from the Lahaina Wildfire of 2023. This project is unique in that it not only protects a major evacuation route for Kawaihae Village residents, but also 4 additional Firewise communities (Kohala Ranch, Kohala by the Sea, Kohala Estates, Kailapa), the town of Kawaihae and a major shipping port for the Big Island of Hawaii. Highway 270 runs North and South and is the main route for all communities north of Kawaihae town to evacuate south. Highway 19 continues South toward Kona and NE toward Waimea and the upper road. The intersection of highways 19 and 270 is critical for these communities to evacuate in the event of wildfire. Should this intersection be blocked due to fire, all communities could become trapped due to the limited number of alternative roads on the island. In August 2023, there were multiple fires in the Kawaihae area that closed this critical intersection. High winds took down an electric pole on highway 19 toward Waimea, so that route also was closed. That completely blocked in residents of

Kawaihae Village and put all Kohala communities and businesses in a very vulnerable situation. Not only is this intersection critical for the evacuation of residents and tourists, but it is also critical for emergency personnel to get in and out of these areas in the event of wildfire.

This region gets less than 10 inches of annual rainfall, which is much lower than the rest of the island. Especially with climate change, the wet seasons can see significant more rainfall and flooding while the dry seasons create severe drought conditions. It's predicted in the Pacific region that more extreme weather events such as droughts and floods will increase the quantity of available vegetative fuels during wet season and the likelihood of wildfires during extended dry conditions, leading to an increase both in fire risk and in the frequency that mitigation measures such as firebreaks and fuel reduction need to be applied.

The land surrounding these communities is considered pastureland and is full of invasive, fire-promoting dense grasses considered "flashy fuels" and haole koa trees. In May of 2024, KVA received 19 inches of rain in less than 24 hours. By June 2024, the flashy fuel grasses were 24-36 inches tall and lush green. In June 2024, haole koa trees were cut and killed (to stop regrowth). By September 2024, the area was in drought conditions and at risk for wildfires. By October 2024, new haole koa trees are found growing throughout the community and lining the roadways. It is imperative to continuously cut and kill these invasive trees and maintain the invasive grasses to heights of 2-4 inches especially during the dry season to reduce fuel for wildfires. Creation of fuel breaks, ongoing elimination of the haole koa trees and reduction of fuel load through vegetation abatement and addressing invasive grasses throughout our communities is imperative to create defensible space to protect our homes, our residents, businesses and access to our major shipping port.

Project Name: Hawaii Fire Department Curbside Chipping Program	
Communities and Neighborhoods that will benefit from this project: Waikoloa Village, Kailua, Honaunau-Napoopoo, Kealakehe, Pahala, Waiohinu	
Affiliation: Hawaii Fire Department	**Project Lead:** Hawaii Fire Department **Partners:** COH Dept of Public Works, COH Dept of Environmental Managements Solid Waste Division, Office of the Mayor, DLNR-DOFAW, HWMO, and others
CWPP Area: Northwest Hawaii Island	**Cost:** $3,039,232

Project Description:
Unmanaged fuels and inadequate defensible space within and around community areas were a contributing factor to the four concurrent wildfires that occurred across Hawaii Island in August 2023. These wildfires resulted in mandatory evacuations, structure loss, and damage to hotel and residential properties along with ecosystem impacts. Unprepared agencies and communities are now eager to change behavior and practices to catch up to the current and growing wildfire risks faced by island communities and landscapes, including the more widespread adoption of creating buffers (defensible space) around homes and neighborhoods for mitigation and firefighter access/safety purposes. Major sticking points to defensible space progress (voiced by island homeowners after receiving home assessments) are the dearth of available and affordable mitigation contractors, lack of financial resources to complete mitigation recommendations, and lack of defensible space information and resource offerings from the Fire Department.

Hawaii Fire Department (HFD) needs a minimum of $2,482,579 over 5 years to provide curbside chipping services and coordination/planning support to at-risk neighborhoods across Hawaii County. Community projects eligible to receive the services will include community-level defensible space projects (e.g. clearing of common areas, roadsides, fire/fuel breaks), residential-level defensible space projects (e.g. min. 15 households completing defensible space actions on their private lots), and defensible space projects that span land ownership to include larger lands adjacent to at-risk communities. The curbside chipping service will be available once per month during months 6-12 and twice per month during years 2-4. Months 1-6 will consist of program planning and coordination, equipment purchasing, and promoting the services to at-risk communities.

The funds will be used to purchase two 15 Vermeer BC1500 brush chippers and two Ram 5500 trucks/cabs with chip boxes (one set for each side of the island), one support truck (for moving/storing supplies and small hand-tools) with an attached trailer unit (for hauling green waste), and a Morbark 950 tub grinder and a Kubota KX080-4 compact excavator (for loading debris into the tub grinder and that will be hauled by a DPW truck) for larger-scale chipping projects. Funds will also be used to pay personnel to operate the curbside chippers and to contract a trusted community-based nonprofit partner to help promote the program, support the at-risk communities, and track outcomes. Personnel will come from either the County Fire Department or the County Department of Public Works (DPW). Only personnel that are trained to safely operate the machinery and are familiar with the equipment will be used. The County will be responsible for storing and maintaining the equipment when not in use, and HFD will work with DPW and other departments to develop a plan for using this equipment when not in use to further the county's work in reducing fire fuels on county-owned lands adjacent to at-risk communities.

This project will reduce the structural ignition potential of 60 homes (yr1)/300 homes (yrs2-5) (1,260 homes total), reduce the wildfire risks in and around 26 at-risk WUI communities by removing 4,612.5 cubic yards of hazardous fuels per year (generating

1,153.1 cubic yards of chipped debris), and build community and HFD capacity towards improved wildfire outcomes through community partnership.

The curbside chipping services will be available for free to at-risk neighborhoods that work together to plan and coordinate community defensible space projects. Each neighborhood that enrolls will have a pile registration deadline and all participating residents within that neighborhood (including the adjacent large landowners) must register their physical address, # hrs spent cutting, dragging and making the piles (to serve as an in-kind matching contribution), and other information on/before deadline date. Online pile registration forms will be built using Google forms. For residential-level defensible space projects, all participating households will be required to have a home assessment completed ahead of time and to indicate on the registration form the date in which the home assessment was completed. Free assessments can be requested on HWMOs website (www.hawaiiwildfire.org/home-assessments).

During community events, chips will be piled or broadcast on site depending on the participants choice on the registration form, or will be hauled away to the County's Solid Waste Facility for a $25 haul fee (or to a common area pre-determined by the neighborhood). For chipped debris that remains on site for piling or broadcasting, education will be provided around the ideal location (where needed for water retention, erosion control, and landscaping) and the not-ideal location (within the first 5 feet from structures).

Public education/outreach and community engagement will be key to this project's success. HFD will work with the Firewise USA Communities and Home Assessment Programs to promote the program, as well as with the broader wildfire mitigation and education work being conducted in partnership with the Big Island Wildfire Coordinating Group (government emergency management and forestry agencies, Hawaii Wildfire Management Organization, and Hawaii Community College Fire Science Program).

Contracted work will include a contractor that will help promote the program, provide assistance/support to communities planning/coordinating community mitigation events, manage the on-line registration portal that accepts requests for participation (including an option for registering over the phone for residents who don't have access to the Internet), liaise and coordinate logistics between HFD and neighborhood, and track in-kind contributions (number of hours spent making the piles) and the amount of chipped debris generated.

CWPP Priority: This program strategically addresses several CWPP priorities at once. CWPPs were written to specifically address the goals and tenets of the Cohesive Strategy so the priorities concurrently represent both our CWPPs and the Cohesive Strategy because that was the foundational framework for CWPP development. The priorities addressed are as follows:

NW Hawaii Island 2016 update, Priorities #2, 3, 4: Controlling vegetation: Enforce brush abatement codes, Enforce unmaintained vegetation on private property and developer lands; Address vegetation management in gulches and unmanaged vegetated areas; Develop neighborhood action items and programs to educate and assist with risk reduction.

South Kona CWPP Fire Adapted Communities Priorities #1, 2, 3 (page 21): Address overgrown large properties and large lands adjacent to communities who aren't managing fuels through fuel abatement legislation and enforcement, maintenance responsibility, and by conducting outreach to landowners.

North Kona CWPP: Every priority provided by meeting participants throughout North Kona in the Resilient Landscapes Category of goals except for one pertains to vegetative fuels management (page 50-51), with top concerns including: Debris around homes, Undeveloped acres ringed by houses, Lots of hazardous brush next to homeowners, and similar (Page A-2)

Kau CWPP Fire Adapted Communities Priorities (Page 20) # 1, 2, 3: Education, Fuels Management on Private Land, and Fuels Management of guinea grass.

The project supports the updated goals of the Cohesive Wildland Fire Management Strategy (CWFMS, 2023). By providing the opportunity for people to work together to reduce fire risk the project will support the goal of creating fire-adapted communities; and it will support the goal of creating resilient landscapes by prioritizing management actions to safeguard and restore landscapes and by engaging members of the community who can contribute their traditional ecological knowledge (TEK) to inform climate-smart land and fire management.

The low-income and socially vulnerable communities of Hawaii Island are traditionally underserved. The project also supports the CWFMS new critical emphasis areas in resilience and diversity, equity, inclusion and environmental justice in creating fire-adapted communities. This program will provide added assistance to these communities so that their residents have the social and technical support needed to organize their communities around community- and residential-level defensible space projects and the planning and coordination that is required of them. For participating residents that prefer to have their chipped debris hauled off site the $25 haul fee will be waived. For participating residents that have access and mobility needs, HWMO will assist them in addressing their defensible space needs through their partnership with Team Rubicon who has trained sawyers available for socially vulnerable resid

Importance: The overall goal of this program is to help at-risk communities/residents create defensible space in and around their neighborhoods to minimize loss of life and property due to the increasing occurrence of devastating wildfires in the wildland-urban interface in Hawaii County.

Project Name: Reducing Wildfires by Reducing Fuels	
Communities and Neighborhoods that will benefit from this project: Kailapa Kawaihae Hawaiian Homes Community	
Affiliation: Kailapa Community Association	**Project Lead:** Kailapa Community Association **Partners:** Hawaii Wildfire Management Organization, DLNR-DOFAW, USDA NRCS
CWPP Area: Northwest Hawaii Island	**Cost:** $380,795

Project Description: Prevention of Wildfire, Wildfire danger, and Wildfire management is what we are focusing on. Eliminating, Buffelgrass (*cenchrus ciliaris*), fountain grass (*penniselum setaceum*) (a non-native, invasive grass) that has spread rapidly within this community's ecosystem and creates an extraordinary risk of fire danger when fueled . When buffelgrass-fueled fires occur, fires spreads rapidly, it does this because of its extraordinary biomass that can build up to ten times that of native plants (McDonald and McPherson, 2013) dense, once dormant strands of buffelgrass, can burn at over 1,400F, almost three times hotter than fires generated by flammable native vegetation. The dangers by buffelgrass invasions is gaining increasing attention, particularly regarding the species impact on wildfire probability, severity, and potential damage to infrastructure and could lead to loss of life.

A primary driver of increasing wildfire activity is climate change, hotter, drier conditions enable fires to ignite, spread, and intensify more easily. The Northwest Hawaii Community Wildfire Protection Plan, references on page 20 and describes fire hazards due to the grasses growing within this community. More inclusive activities and processes to help build an approach to wildfire risk, are more likely to improve the future outcomes by recognizing the complexity of this problem, acknowledging the essential role of fire prevention and responding to the diverse ways to manifest its solutions. Current and long term strategic solutions is to manage wildfires, to reduce high intensity burning fuels that would carry fire to other fuels. A objective for this project will be to achieve reduction of at minimum 80% of buffelgrass,, and this community's outreach, will be integral to project success. This planned project has community based collaboration, which include shared information, and resource, communication as a foundation of work, and a collaborative approach from local, state, and federal contributors.

Applicant's proactive comprehensive measures is to reduce hazardous fuels by creating a buffer zone of defensible space, that is prone to wildfire by installing "perimeter fencing" surrounding the community, as to allow the existing feral goats grazing, of flammable vegetation, without entering, and impacting the homestead community that is at risk of wildfire. The area that surrounds this community is approximately 322 acres of unmanaged land that is dominated by non-native fire prone, species including buffelgrass and fountain grass, this will strengthen this communities defense against wildfires. KCA proposes to have a four foot height, hog wire fence installed a total of 11,000 lineal ft of the perimeter of the

community or a total of approximately 322 acres , installed to create permanent fencing, keeping the already present feral goats out and allowing the grazing of flammable vegetation without the animals entering the impact community. Preponderance of fire fuels, and lack of water that continues to present Kailapa Kawaihae Community as a high hazard area. The proposed project will significantly reduce future wildfire risk in this low income and underserved community. This community also deals with the lack of water; it continues to score high, as a hazard range in wildfire hazard, and this fire reduction break will decrease the risk whenever possible. The narrative below describes actions to manage fire fuels and the reduction of controlled species that are a fire risk for both Kailapa and the larger Kawaihae Community.

1) Contractor aims to Install ungulate-exclusion proof hog wire fence, around the existing Kailapa Homestead Community on the boundary of the existing homestead lot, to create permanent fencing, keeping the feral goats out and allowing the grazing of flammable vegetation without animals entering the impact homestead community., by converting fuels fuels potential in the surrounding vicinity and community. A primary driver of increasing wildfire activity is climate change, hotter, drier conditions
enable fires to ignite, spread, and intensify more easily. Project-related materials includes installation of fence posts - 6ft height standard size (t-posts) @10 ft distance apart to support the fence, #104750 hog wire fence @47" height with a 47% continued tension, standard hog wire fencing, and at every 300 ft a 7ft high 5 inches diameter solid wooden post, inserted at minimum of 2 feet depth, for fence support , which acts as anchors and joints and stability. Standard aluminum coated with benzenal clips at every T-post on every run installed to secure the fence to the T-posts @ a cost of $30.00 per foot - to include materials, and labor.

2) On-site fence layout, by Kailapa or DHHL representative. Before work commences on the project, the contractor shall hold a coordination meeting to orient the construction crew to the requirements, line installation requirements, on call monitoring. At this meeting, the contractor will discuss the procedures for this site. At the meeting, the contractor will discuss measures that need to be taken to minimize adverse impact of the fence line to any archaeological sites.

3) Future plans include KCA's goals to Implement a) use of area to support grazing paddocks. b) grazing management program c) plan species of livestock - employ grazing animals d) plan a level of grazing needed to reduce fire intensity, grazing
schedule e) create a future opportunity for community pasture.

Importance: The work outlined, is part of KCA's renewed commitment to increasing resources to fight invasive species. KCA's focuses solely on invasive species and outreach to communities to include new strategies, new resources, and commitments to tackle the threat posed by the expansion of buffelgrass and other invasive species of concern. The installation of permanent fencing would reduce cost of grazing services and would create a future opportunity for a community pasture. KCA's future goal is to undertake a feral animal and erosion mitigation program.

Project Name: Hawaii Fire Department Defensible Space Inspection Program	
Communities and Neighborhoods that will benefit from this project: Waikoloa Village, Kailua, Honaunau-Napoopoo, Kealakehe, Pahala, Waiohinu	
Affiliation: Hawaii Fire Department	**Project Lead:** Hawaii Fire Department **Partners:** Hawaii County Civil Defence, DLNR-DOFAW, HWMO, and others
CWPP Area: Northwest Hawaii Island	**Cost:** $5,344,342

Project Description:
Every CWPP in Hawaii County has prioritized vegetation management and enforcement. This proposal represents HFDs increased commitment to reducing wildfire risk ahead of events by building internal capacity to conduct education and inspections, and by shifting local culture regarding vegetation management to one of knowledge and accountability.

HFD is requesting $4,823,612.48 over 5 years to provide a year-round workforce of 1 captain level fire management officer, 4 Inspectors, and support for a collaborative program for defensible space educational home assessments. This combined workforce of HFD inspectors who carry out inspections and enforcement, and community-based educators/ home assessors at the residential level will provide a solid foundation upon which to build a comprehensive Defensible Space Inspection (DSI) program to adequately address the growing number of parcels in high fire risk areas of Hawaii County that are not in compliance.

This project falls under the Wildfire Prevention and Mitigation Education/Outreach project type in the NOFO as Property inspections and/or assessments and/or Adoption, implementation, enforcement, and training of [NFPA] or [ICC], or similar
codes.

Background: Lack of defensible space is a major factor in our fires, and has contributed to the majority of our destructive fires for more than two decades. HFD has been unable to address this issue because of a lack of capacity, too few inspectors, and no HFD fire management officer to focus on wildland fire issues.

While HFD is the primary response and initial attack agency for wildfires in Hawaii County, it is also responsible for ambulance/medical response, structural fires, hazmat, ocean safety, and more, making large wildfire events a challenge for response when resources are stretched extremely thin to also maintain daily
operations. As an island-county, we are limited to the resources we have on-island for suppression. HFD is prioritizing education, code inspection, and enforcement as an essential pathway toward reducing risk and the likelihood of the extreme fire
behavior we are increasingly experiencing.

Overall Strategy: HFD will implement a comprehensive DSI program for high-risk areas, that is capable of inspecting 100% of complaint driven inspection requests (upward of 200 annually), and 80% of the large-acreage parcels that threaten communities in the target area. Comprehensive follow up enforcement activities will be completed on the 35 or so large land parcels each year that remain non-compliant after the inspectors make multiple attempts to work with the property owner.

Community-based educational home assessments will also be conducted for 1000 residential parcels over the 5-year period through a contracted partner program.

HFD leadership will oversee the entire DSI effort, including the supervision and direction of the DSI personnel, ensuring documentation and records are completed properly, and determining which parcels will be referred for further follow up and possible legal action. The contracted community program will coordinate the educational home assessments program.

Inspection Details: The DSI program personnel will conduct initial and follow-up property evaluations on both a proactive and complaint-driven basis. The Inspectors will engage owners of non-compliant properties in a constructive, education-focused process to bring the parcel into compliance. Voluntary compliance is, by far, the primary objective of this program. Those parcels that remain non-compliant after multiple on-site assessments will be evaluated by the fire management officer and fire chief on a case-by-case basis for referral through the legal enforcement process as governed by Hawaii revised Statutes Duties of the Fire Chief, which govern the enforcement process.

As we implement the DSI program, we will track gaps and sticking points in enforcement and/or codes and use that information to inform and modify our next fire code adoption to better meet our wildfire risk reduction and vegetation management needs.

There is political will and an appetite for this DSI program and for ongoing improvement of it in order to improve fire outcomes across Hawaii County.

Education and Public Engagement: The DSI program personnel and cooperators will engage residents during community events, one-on-one discussions, and other outreach opportunities, providing education regarding defensible space, fuel reduction, and techniques to harden their property and improve their property's chance of surviving a wildfire. Some examples of community events include community and HOA meetings, hazard preparedness events and planning meetings, CWPP meetings and working groups, and local festivals.

The DSI program strategically addresses several CWPP priorities at once. Our CWPPs are actually written to specifically address the goals and tenets of the Cohesive Strategy, so the priorities concurrently represent both our CWPPS and the Cohesive Strategy because that was the foundational framework for CWPP development. The priorities addressed are as follows:

NW Hawaii Island 2016 update, Priorities #2, 3, 4: Controlling vegetation: Enforce brush abatement codes, Enforce unmaintained vegetation on private property and developer lands; Address vegetation management in gulches and unmanaged vegetated areas; Develop neighborhood action items and programs to educate and assist with risk reduction.

South Kona CWPP Fire Adapted Communities Priorities #1, 2, 3 (page 21): Address overgrown large properties and large lands adjacent to communities who aren't managing fuels through fuel abatement legislation and enforcement, maintenance responsibility, and by conducting outreach to landowners. Work to develop HFD enforcement capability for fuel abatement violations

North Kona CWPP: Every priority provided by meeting participants throughout North Kona in the Resilient Landscapes Category of goals except for one pertains to vegetative fuels management (page 50-51), with top concerns including: Debris around homes, Empty lots and unmanaged fuels, Adjacent properties that have unmanaged fuels need penalties, Undeveloped acres ringed by houses, Lots of hazardous brush next to homeowners, and similar (Page A-2)

Kau CWPP Wildfire Response Priority #3 (page 19) Fire inspection to address wildfire hazard violations; and Fire Adapted Communities Priorities (Page 20) # 1, 2, 3: Education, Fuels Management on Private Land, and Fuels Management of guinea grass.

Specific to the Cohesive Strategy itself, this project supports the Creating fire-adapted communities factor, along with the guiding principle that Rigorous wildfire prevention programs are supported across all jurisdictions and the outcome goal of "Individuals and communities accept and act upon their responsibility to prepare their properties for wildfire".

This need for community risk reduction education and fuels management is also highlighted in the Hawaii Forest Action Plan as Issue # 3: Wildfires: Priority 1.a. Prevention education: Reduce the threat from wildfires to native ecosystems, forests, watersheds, and threatened and endangered species as well as communities within WUI areas through established fire prevention programs; and Priority 2.c Pre-suppression fuels management: Mitigate the impacts of wildfires on natural and built environments through fuel assessment, modeling, reduction, and management.

The full defensible space program will operate throughout Hawaii County, focusing on the communities with the highest fire threat, all of which are identified as Communities at Risk by the State Division of Forestry and Wildlife and Hawaii Wildfire Management Organization, as shown on page 104 of the Forest Action Plan. Wildfire in Hawaii County poses threats to a diversity of communities on the island, however many of our communities at highest risk of wildfire are also socioeconomically vulnerable, underserved, and/or low-income, particularly Hawaiian Homestead Lands in leeward Hawaii County, which are designated Tribal areas.

Importance: The overall goal for this program is to launch and carry out a Defensible Space Inspection program in Hawaii County to educate property owners about defensible space and wildfire risk reduction, conduct defensible space inspections and enforcement, and promote a culture of personal responsibility and accountability for fuels management across our county.

Project Name: Cross-boundary fuels management technical assistance and education to reduce wildfire risk in Hawaii's underserved communities	
Communities and Neighborhoods that will benefit from this project: Waianae, Makaha, Anahola, Waimea, Kailapa, Kohala, Kula, Waiohuli, Haliimalie	
Affiliation: University of Hawaii at Manoa	**Project Lead:** University of Hawaii at Manoa **Partners:** HWMO and others
CWPP Area: Northwest Hawaii Island	**Cost:** $6,744,187

Project Description:

This project will establish Fireshed Partnerships in each CWPP region to bring together landowners and agencies within and adjacent to underserved and vulnerable communities to specify areas for contiguous, cross-boundary fuels mitigation and shared resources and establish agreements whereby partners implement and/or build capacity to implement these actions. The Fireshed Partnerships will target highly fire-prone, largely unmanaged lands that lie between Hawaii's communities and watershed forests and comprise the vast majority of area burned in the islands. This will fill gaps in fuels management by bridging existing community level Firewise projects and programs coordinated by HWMO and the upper elevation terrestrial management by the Hawaii Division of Forestry and Wildlife (DOFAW) and Hawaii Watershed Partnerships. The Fireshed Partnerships will work on three objectives: 1) map available fire-related suppression resources, hazardous fuels, vulnerable assets, resource needs, and potential mitigation strategies; 2) develop cross-boundary agreements/MOUs by determining costs and resource sharing opportunities for long-term, spatially contiguous fuels mitigation projects at landscape scales; and 3) expand and develop multi-use, multi-partner fuels management demonstrations, including grazing, conventional fuel breaks and reforestation/restoration green strips, that will reduce risk and be used to educate local leadership and other communities. In terms of geographic scope, the project will aim to accomplish Objectives 1, 2 and 3 for to establish one Fireshed Partnership per county in Years 1-3 and initiate Objectives 1 and 2 for an expansion of or establishment of new Fireshed Partnerships in each county in Years 4 and 5.

This project's goals support two of the Cohesive Strategy's challenges: Managing vegetation and fuels, and Protecting homes, communities, and other values at risk. The Fireshed Partnership addresses the most fire-prone and least fire-resilient landscapes in Hawaii which pose the greatest threats to communities, watershed forests, and near-shore areas, namely former agricultural lands dominated by nonnative grasses and shrubs. This project will identify and integrate proven and locally relevant strategies (conventional fuel and green breaks, grazing, fuels conversion/restoration) into planning and implementation efforts to deal with the unique fuel types of Hawaii. By mapping resources and fuels projects, the project will also create opportunities for safer fire response, addressing the third Cohesive

Strategy challenge. This project addresses objectives of the 2016 Hawaii Forest Action Plan. Chapter 3 (pages 109-110) points to the need for fuel assessment, modeling, reduction, and management and improved fire data management systems to support fire management projects. Pages 121 and 122 also include Address wildland fire landowner management plans, and develop maps that identify the resources and incorporate risk assessment.

Long-term strategies for wildland fire (Page 125) call to improve cross-sector collaboration among agencies with responsibilities in the areas of planning, wildfire mitigation, and public safety.

This effort will leverage existing partnerships among the Hawaii Department of Land and Natural Resources, the Hawaii Association of Watershed Partnerships and HWMO to expand landowner participation and fill fuels mitigation gaps across the landscape. Within Year 1 for each Partnership area, the Project Lead and Project Manager will work with the GIS Analyst and County-level Extension Agents to review existing projects, fire risk and fuels maps developed by UH Fire, and conduct site assessments. We will identify key allies among our state and/or private landowner partners with whom we will develop a variety of engagement strategies (from one-on-one meetings to working groups). Within Year 1 the GIS Analyst will also contract University of Hawaii Information and Technology Services to develop and maintain a database for storing and sharing spatial information. Over Years 1 and 2, the Agents will develop and implement engagement strategies to establish Partnership MOUs.

This process will involve collaborative mapping of resources and site specific planning spatial extents, timelines, and material needs (labor, supplies, equipment) for new fuels reduction actions. In Years 1-2, the Economic Analyst will project costs for the purposes of fundraising by partners beginning in Years 2 and 3. Large-scale (e.g.,10-50 acre), cross-boundary demonstration projects (Objective 3) will be established over Years 2 to 3 and Agents will document best practices and project costs with the Economic Analyst for dissemination (Years 4 and 5) via the Pacific Fire Exchange. Demonstrations will provide models for future actions elsewhere, and build from prior successes of small-scale (1-3 acre) fuels reduction/conversion demonstrations of green breaks, grazed fuel breaks, and agroforestry restoration. In Years 4 and 5, the Project Lead and Project Manager will assess the outcomes of the initial Fireshed Partnerships and develop proposals for continued funding. In Years 4-5, the Agents will work with the GIS and Economic Analysts to expand or develop new Fireshed Partnerships and conduct mapping and MOU development (Objectives 1 and 2) with an additional community in each County.

Planning for diverse types of fuels mitigation in lands surrounding communities was identified in each of the CWPPs referenced by this project. For the West Oahu CWPP, fuels management was the highest ranked with Improved Planning ranked third as priorities (Figure 3, page 48). Table 9 (page 55) of the West Oahu CWPP states the need for grazing corridors, reforestation and restoration, and fuel breaks for fuels

reduction. Proposed projects (Table 11; Page 63) include working with large land owners to encourage fuels management, the need to consult with land use planners, and to re-establish agriculture as a form of fuels conversion. Table 11 also explicitly pointed to the need for fencing and water troughs to facilitate grazing around the community.

In the Upcountry Maui CWPP general fuels management and using agricultural and/or grazing methods to reduce fuels were the most frequently recommended strategies for fire risk reduction (page 53). Fuels management planning was second alongside ecosystem protection and improved access (page 53). Planning for large landowners and pre-fire actions, was the second most recommended action for increasing firefighter safety (Page 55). Fuels reduction recommendations included grazing, mowing and herbicide, and fuels conversion through reforestation/restoration and shaded fuel breaks (Table 9, page 56). Table 9 also pointed to converting fuels to drought-tolerant, fire-resistant plants (preferably native) as well as re-establishing agriculture. Longer-term plans (Table 11, page 64) identify fencing and water storage to increase grazing feasibility, multi-use water storage, and working with large landowners to encourage access for fire management. Finally, page 65 of the CWPP recommends forming action teams, funding fire risk reduction projects and documenting successes from those projects.

The Kauai CWPP (2016) ranks vegetative fuels management the highest need, followed by planning (page 35). The top four fuels management priorities (Page 36) included using agriculture and grazing, increasing capacity among landowners for fuels mitigation, reducing fuels on vacant, fallow lands, and planning. Among the CWPP priorities were coordinated fuels management and improved planning (Page 37). Table 7 (page 38) further specified grazing, mowing and herbicide, and reforestation/restoration in shaded fuelbreaks as well as converting fuels to less fire-prone, preferably native plants. Longer-term actions (Table 9, page 46) identified working with large landowners to encourage fuels management, multi-use water storage and installing water and fencing for grazing.

Recommended actions in the NW Hawaii Island CWPP (Updated in 2016) identifies the need to reduce and/or convert fuels to less fire-prone vegetation, especially native plants, community planning at the regional and community/subdivision scale(Page 28). Reduction of fuel load and invasive species were ranked as high priorities across multiple communities in the CWPP (page 29) and also specified that wherever possible incorporate native plants as well as the use of vegetated fuel break corridors with an emphasis on native plants (page 32). Additional input from the 2016 CWPP update included an Action Plan for increased fencing and water for grazing corridors, resource maps, and developing community-specific plans.

Importance: In working towards these place-based objectives, the project will achieve outcomes that have region-wide impacts. Through the process of onboarding and orienting project funded, county-level Extension Agents, the Project Lead will offer training in fire mitigation and best practices to the entire University of Hawaii's

Cooperative Extension Program (29 employees statewide), whos relationships with stakeholders will increase program impact and create future opportunities for community engagement and on-the-ground projects. Specific to the objectives described above, the development of infrastructure for data management, visualization, and access will be useable by future and concurrent projects and available to fire response agencies through their dispatch systems (i.e. CODES) meeting a need identified in the State Forest Action Plan. Developing Fireshed Partnerships and MOUs with long-term plans will not only provide a template for future and concurrent statewide action, it will facilitate additional partnerships since many of the agencies, utilities, and large landowners involved in this project manage lands and resources around other communities in the state. For example, the coordinators for Hawaiian Association of Watershed Partnerships have established agreements with both the state and many private landowners, but focus on higher elevation, intact ecosystem conservation. The project will therefore leverage these relationships to forge new agreements through the Fireshed Partnerships to expand land management efforts into lower elevation, high fire risk areas. Finally, using Extension Agents to implement and document place-based fuels reduction projects as demonstrations will create opportunities for dissemination of best practices for multiple strategies and multiple audiences by coordinating with the Pacific Fire Exchange project (www.PacificFireExchange.org) and concurrent outreach efforts by HWMO via FireWise and others such as the Watershed Partnerships.

Certificate of Completion

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