# LEEWARD HALEAKALĀ COMMUNITY WILDFIRE


ISLAND OF MAUI, COUNTY OF MAUI, HAWAIʻI

## ORIGINAL PLAN: 2020

This document represents the collective efforts of community members, agencies, and stakeholders to reduce wildfire risks and enhance resilience. Originally developed in 2020, 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;
Maui Fire Department; and Maui Emergency Management Agency.

This plan:

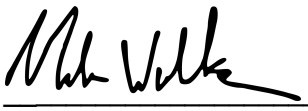
- Was collaboratively developed by agencies, entities, community members, and individuals with interest or jurisdiction within the CWPP area.
- Describes wildfire hazards in the natural and built environment.
- Provides the concerns, recommended actions, and priorities of those who live and work in the 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.



12/19/2024

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

Date

Bradford Ventura

12/27/2024

Brad Ventura, Fire Chief
County of Maui
Maui Fire Department

Date

Amos Lonokailua-Hewett

12/27/2024

Amos Lonokailua-Hewett, Administrator
Maui Emergency Management Agency

Date

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# LEEWARD HALEAKALĀ
## COMMUNITY WILDFIRE PROTECTION PLAN

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***ACRONYMS***

DLNR-DOFAW: Department of Land and Natural Resources, Division of Forestry and Wildlife

HWMO: Hawai'i Wildfire Management Organization

LHFTF: Leeward Haleakalā Fire Task Force

MFD: Maui Fire Department

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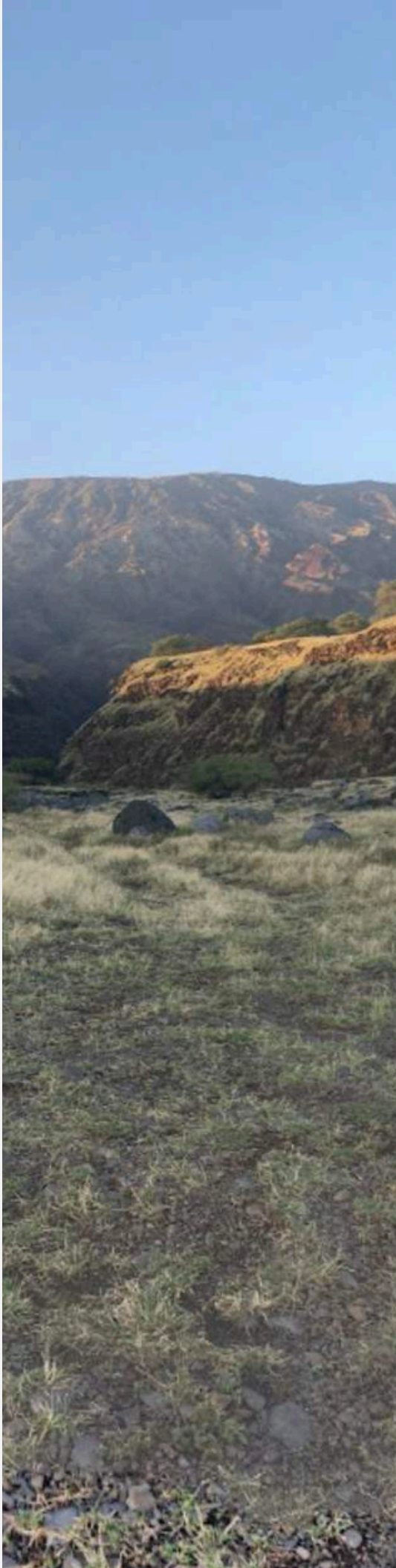
# EXECUTIVE SUMMARY

This Community Wildfire Protection Plan (CWPP) was developed by the Hawai'i Wildfire Management Organization (HWMO) with guidance and support from government agencies and representatives, private resource management entities, community members, and decision makers concerned about wildfire issues in Leeward Haleakalā, Maui, Hawai'i. State of Hawai'i Department of Land and Natural Resources- Division of Forestry and Wildlife (DLNR-DOFAW) was the primary partner in carrying out this CWPP process.

The Leeward Haleakalā CWPP focuses on wildfire preparedness and readiness, hazard assessment and reduction, and the wildfire mitigation priorities of those who live and work in the area. The process used to develop this plan engaged a diversity of agencies and individuals concerned with the at-risk area, following the guidelines and requirements of federal programs such as the Federal Emergency Management Agency (FEMA) Pre-Disaster Mitigation program and the National Fire Plan (NFP).

Stakeholder participants in the development of this plan agree that wildfire threats are imminent and can have widespread damage to Leeward Haleakalā watersheds, natural resources, and human communities. The danger of fire is related to high numbers of human-caused fires, dry conditions, steep slopes, high fire potential of vegetation, and challenging firefighting conditions. In the last decade, numerous areas of Leeward Haleakalā have burned. While CWPPs serve mainly as a mechanism for assessing, communicating, and preparing for wildfire collaboratively, they are not enforceable or funded. The action plans are voluntary and rely on all parties understanding they play a role in wildfire safety and protection, and taking appropriate actions toward risk reduction. A CWPP is a first step toward increased public-private collaboration toward these goals.



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# PART I
# OVERVIEW

# INTRODUCTION

*The communities, lands, and waters of Leeward Haleakalā, Maui, Hawai'i, have been classified as "at high risk" of wildfire occurrence and impacts. The safety of residents, and the protection of private property, community infrastructure, and natural and cultural resources, is a shared responsibility between residents and communities; owners, developers and associations; private businesses and municipal service operators; and county, state and federal governments. The aim of this Community Wildfire Protection Plan (CWPP) is to carry out wildfire protection planning and subsequent actions for Leeward Haleakalā.*

## THE PURPOSE OF WILDFIRE PROTECTION PLANNING IS TO...

- Motivate and empower local government, communities, and property owners to organize, plan, and take action on issues impacting the safety and resilience of values at risk.
- Enhance levels of fire resilience and protection to the communities and infrastructure.
- Identify the threat of wildland fires in the area.
- Identify strategies to reduce the risks to structures, infrastructure and commerce in the community during a wildfire.
- Identify wildfire hazards, education, and mitigation actions needed to reduce risk.
- Transfer practical knowledge through collaboration between stakeholders toward common goals and objectives.

## OUTCOMES OF WILDFIRE PROTECTION PLANNING...

***1. Improve community safety through:***

- Coordination and collaboration
- Public awareness and education
- Increased wildfire prevention and preparedness
- Widespread hazard reduction efforts
- Improved wildfire response capacity
- Development of long term strategies

***2. Catalyze efforts to guide planning and sustained implementation of actions toward***:

**FIRE ADAPTED COMMUNITIES**

**RESILIENT LANDSCAPES**

**SAFE & EFFECTIVE WILDFIRE RESPONSE**

## PROCESS- HOW A CWPP IS DEVELOPED

1. The project is launched, partnerships are established, administrative and funding processes are completed.
2. The community risk assessment is reviewed, updated, or performed as necessary.
3. Opportunities are coordinated and offered for interested parties (community members, government agencies, other relevant/concerned individuals and entities) to review wildfire information, discuss concerns, identify strategies, and prioritize recommended actions.
4. Wildfire information and community input results are used to develop the CWPP document.
5. The CWPP is finalized via review and signatures of Fire, Forestry, and Emergency Management departments to meet federal compliance requisites.

## TIMELINE- THE DEVELOPMENT OF THE LEEWARD HALEAKALĀ CWPP

| | |
|---|---|
| January 2020 | DLNR-DOFAW initiated the project and worked with HWMO to complete all contract and administrative components. |
| February 2020 | An introductory meeting was held with the Leeward Haleakalā Fire Task Force, to lay the groundwork for a collaborative all-partner effort, agree on the process and timeline, and establish exact planning area boundaries. |
| March - Aug 2020 | HWMO developed fire weather and other maps for the planning document |
| August 2020 | Planning meeting with Leeward Haleakalā Task Force and other relevant parties to:<br>- Review the purpose, intent, and next steps for the CWPP.<br>- Plan collaborative workshop with relevant agencies, organizations, and community members for discussion of wildfire concerns. Select dates and times.<br>- Discuss and determine strategy for adapting the process to COVID-19 social distancing and travel restrictions. |
| October 2020 | Input Meeting 1: Friday Oct 23, 2020 Focus: Kanaio, Kaupo, Kipahulu,<br>Input Meeting 2: Friday Oct 30, 2020 Focus: Kahikinui |
| November 2020 | Community CWPP input survey was launched and circulated via email with closing date of December 15, 2020. |
| December 2020 | HWMO completed all background information, research, mapping, and processing of workshop input and community survey results. CWPP draft was completed. |
| September 2021 | Partner review of CWPP was completed. Plan was submitted for signatures. |

## PARTNERSHIPS AND COLLABORATIONS

This CWPP was developed in close collaboration with members of the Leeward Haleakalā Fire Task Force. Primary collaborators were:

Lance De Silva
Department of Land and Natural Resources
Division of Forestry and Wildlife

Andrea Buckman
Leeward Haleakalā Watershed Partnership

Bobby Ferreira

Kaimi Kona'aihele,
Ulupalakua Ranch

Donna Sterling
Ka 'Ohana O Kahikinui (KOOK)

Mike Werner
Maui Fire Department

Nani Barretto
Hawai'i Wildfire Management Organization

Elizabeth Pickett
Hawai'i Wildfire Management Organization

## STATEMENT OF LIABILITY

A CWPP helps communities clarify and refine priorities for the protection of life, property, and critical infrastructure. It is intended to create a foundation of collaboration and communication among diverse parties toward achieving wildfire risk reduction goals.

A CWPP is not a binding, regulatory document. The action plans are voluntary. The process and the associated document are mechanisms for assessing risk, discussing, learning, and planning collaboratively across sectors and neighboring communities. This is not a pre-determined, top-down, outside-expert or single-agency-driven determination of future activities, but rather a compilation of information and priorities to inspire, inform, and guide wildfire preparedness activities. This is in line with the improved understanding across the country that everyone who lives and works in a fire prone areas has a role to play when it comes to preventing ignitions, reducing hazards, and ensuring a wildfire-informed, wildfire-ready, and wildfire-resilient community. A CWPP does not provide or guarantee funding, but does qualify entities in the area to apply for certain wildfire mitigation funding opportunities.

The activities suggested by this document, the assessments and recommendations of fire experts and officials, and the plans and projects outlined by the community, are made in good faith according to information available at this time. HWMO and DLNR-DOFAW assume no liability and make no guarantees regarding the level of success users of this plan will experience. Despite efforts to prevent or contain wildfires, fires still occur. The intention of all decisions and actions made under this plan is to reduce the potential for, and the consequences of, wildfire.

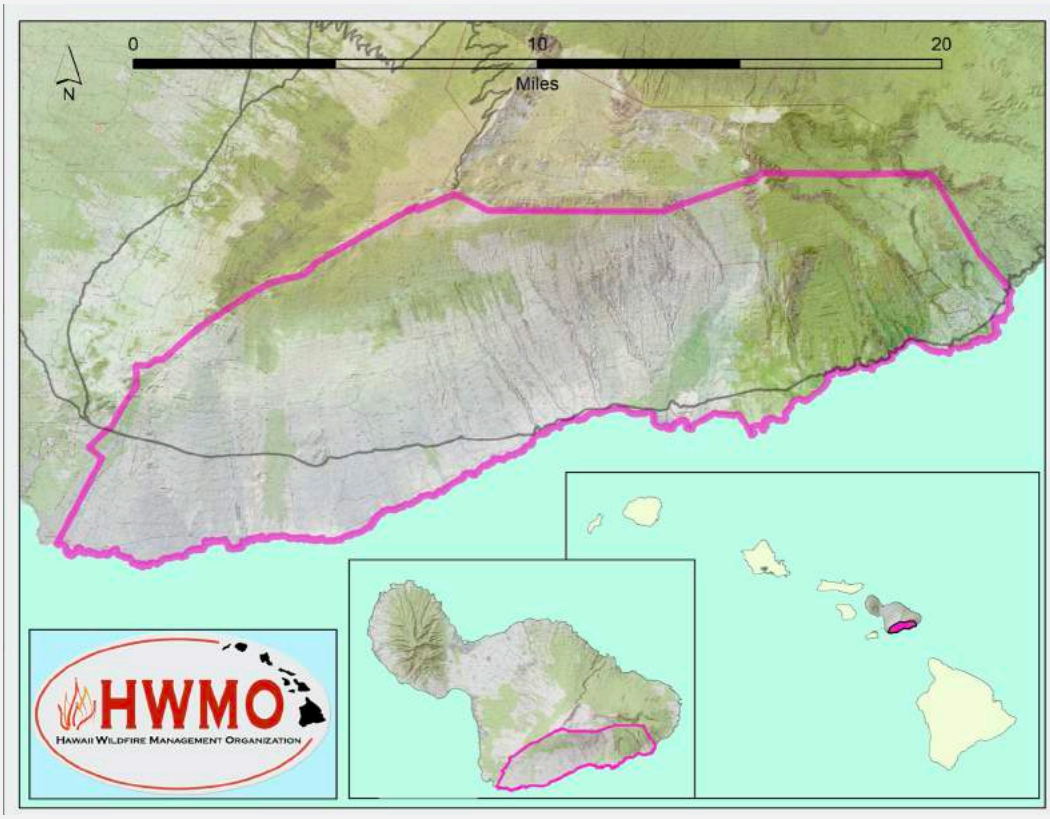
## COVID-19 STATEMENT

In an effort to maintain a highly collaborative, effective, and safe CWPP process during several variations of social and travel restrictions across the county and state, the majority of this CWPP was using virtual alternatives to in-person activities. To adapt for COVID-19, several virtual workshops were held with agency and community representatives, and a web-based survey went out to those who live and work in Leeward Haleakalā for 30 days. Any additional information, community input, and/or action plans generated will be added to this document as updates. The collaborators involved in the development of this CWPP are committed to a long-term process of community engagement and partnership.

# PLANNING AREA

## CWPP BOUNDARIES

The Leeward Haleakalā CWPP is part of a series of CWPPs across the County of Maui. Since 2014, CWPPs have been developed for the entire western portion of Maui, Upcountry Maui, Central Maui, and Moloka'i. The CWPP boundaries established for the Leeward Haleakalā plan abut the boundaries of the Central Maui CWPP (generally covering the Kihei area) to the west-northwest, and the Upcountry Maui CWPP to the north-northwest. The remaining boundaries follow the ridgeline to the eastern boundary of Haleakalā National Park (Map 1).

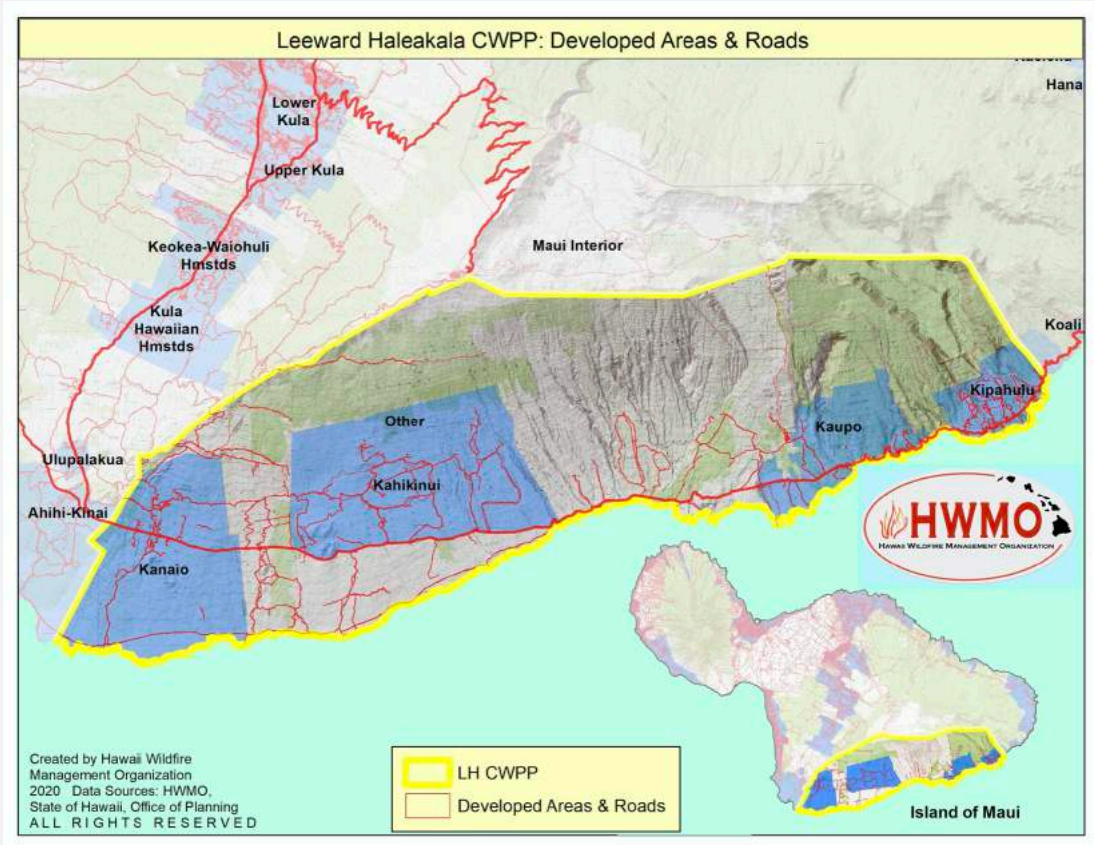



***Map 1. Leeward Haleakalā CWPP Planning Boundaries.***

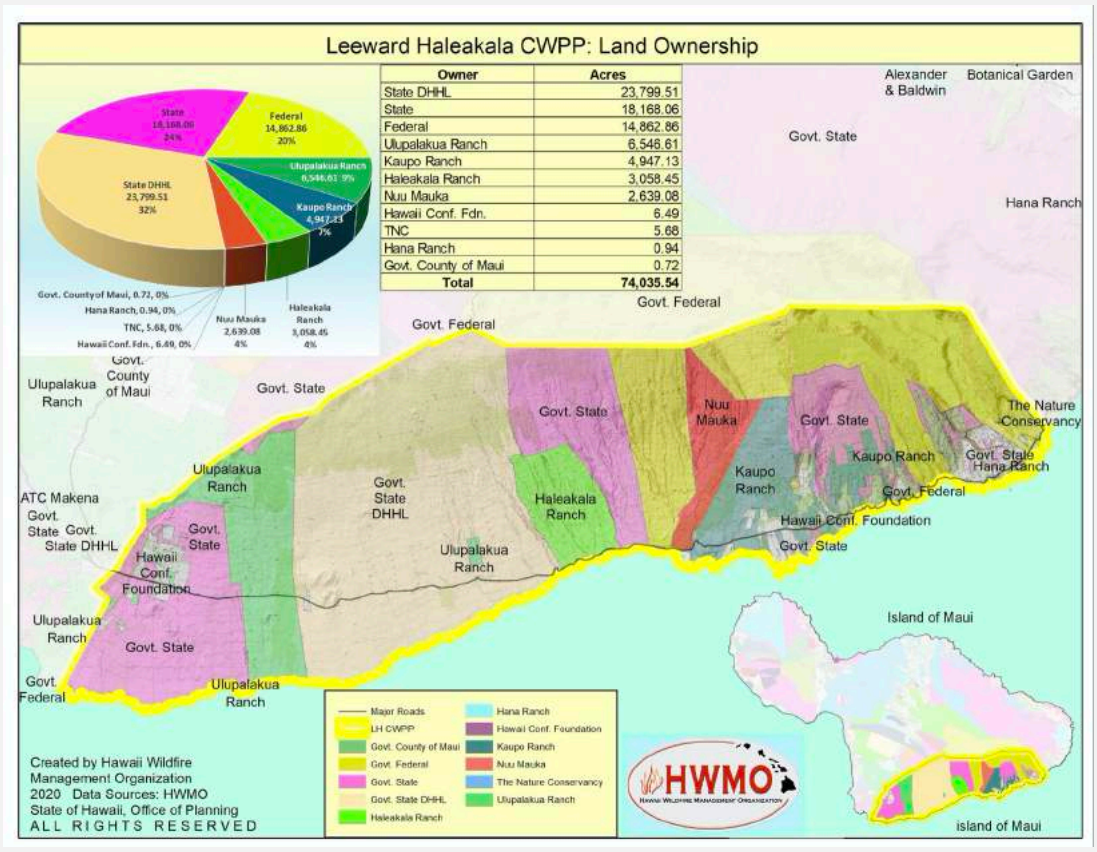
## COMMUNITIES AT RISK

Located in an area of Maui that is less developed and less accessible than many other parts of Maui, the region is considered at high risk of wildfire due to its arid landscape, steep slopes, frequent human-caused ignitions, long distances and emergency response times, lack of water for firefighting, copious amounts of overgrown and unmanaged fire-prone vegetation, and challenging ingress/egress.

There are four main clusters of residential communities, all with populations below 1000, as per 2010 census data. For the purposes of this CWPP, they are referred to as Kanaio, Kahikinui, Kaupo, and Kipahulu (Map 2). The planning area includes government and privately owned lands (Map 3)




***Map 2: Residential community areas in Leeward Haleakalā.***




***Map 3: Landownership in Leeward Haleakalā.***

# PART II

# WILDFIRE CHARACTERISTICS AND CONSIDERATIONS

# FIRE HISTORY

## WILDFIRE OCCURRENCE

The majority of wildfires on Maui are caused by human error or arson, especially near developments, power line right of ways, and along roadsides. Additionally, sprawling dry nonnative grasslands surround many communities. These are both true for Leeward Haleakalā. Once ignited along the interface, wildfire can spread rapidly through and around residential areas, threatening property, life, critical infrastructure, and both natural and cultural resources.

When CWPP workshop participants weighed in regarding wildfire occurrence, they noted that ignitions tend to take place along highway, that they are very likely set deliberately leading to an increase in investigations, and that abandoned cars are a huge contributing factor to fire ignitions.

Recent notable fires per area are described below:

**Kahikinui Area**

| | |
|---|---|
| Aug 2020 | Nine separate fires between miles 23 and 27 along the Piilani Highway. Evacuation of Kahikinui homestead for 3 hours, 65 acres burned. |
| Nov 2019 | 300 acres in the area of MP 26 of Pi'ilani Highway scorched an estimated 300 acres and was fueled by strong winds. The cause of this fire is undetermined. The fire resulted in area evacuations and a temporary highway closure from Piilani Highway Milepost 25 through Kipahulu National Park. |
| Aug 2018 | 20 Acre Fire Near Auwahi Windfarm on Maui. Pi'ilani Highway (Hwy 31) at Mile Marker 20 in 'Ulupalakua was temporarily closed. |
| Feb 2016 | 5,300 acre wildfire that threatened homes in Kahikinui. Evacuations ordered. Smoke impacted Leeward Haleakalā as well as Kihei. |
| Nov 2015 | 25 acres The fire is located on the mauka side of the Pi'ilani Highway between mile 24.5 and 26. The cause is undetermined. |
| Apr 2015 | 2 acre fire started accidentally by a welder. |
| Jul 2013 | More than 65 acres of brush were scorched on the Ulupalakua side of Manawainui Gulch in Kaupo. may have been intentionally set because firework remnants were found at the scene. |

**Kaupo Area**

Oct 2019 Abandoned car fire. Contained before significant spread.

**Kipahulu Area**

Nov 2019 Structure completely burned down. Contained before significant spread. Cause undetermined.

**Kanaio Area**

Dec 2018 600 square foot structure completely burned down. Contained before significant spread. Cause undetermined.

Jul 2018 25 acres. Upper Kanaio Road off of Pi'ilani Highway.

# FIRE ENVIRONMENT
## WILDFIRE DRIVERS

The factors that contribute to wildfire occurrence and spread are a combination of fuels, topography, climate, and weather conditions during a fire event. In Leeward Haleakalā, these can stack up to yield a high risk of wildfire, rapid spread, and significant impacts from summit to sea.

Fire intensity and spread rate depend on the fuel type and condition (live/dead), the weather conditions prior to and during ignition, and the topography. Generally the relationships between fire behavior, fuel, weather, and topography are as follows.

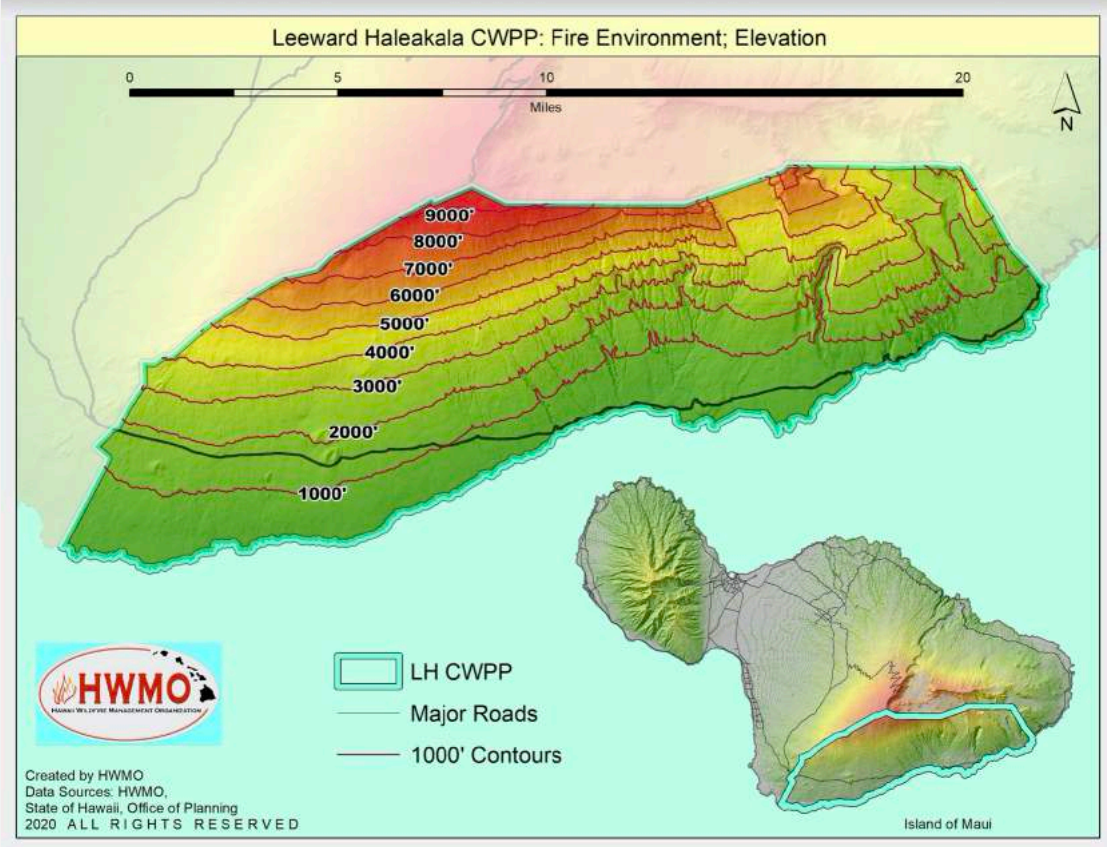
***TOPOGRAPHY***

Topography influences fire behavior principally by the steepness of the slope. However, the configuration of the terrain such as narrow draws, saddles and so forth can influence fire spread and intensity. In general, the steeper the slope, the higher the uphill fire rate spread and intensity.

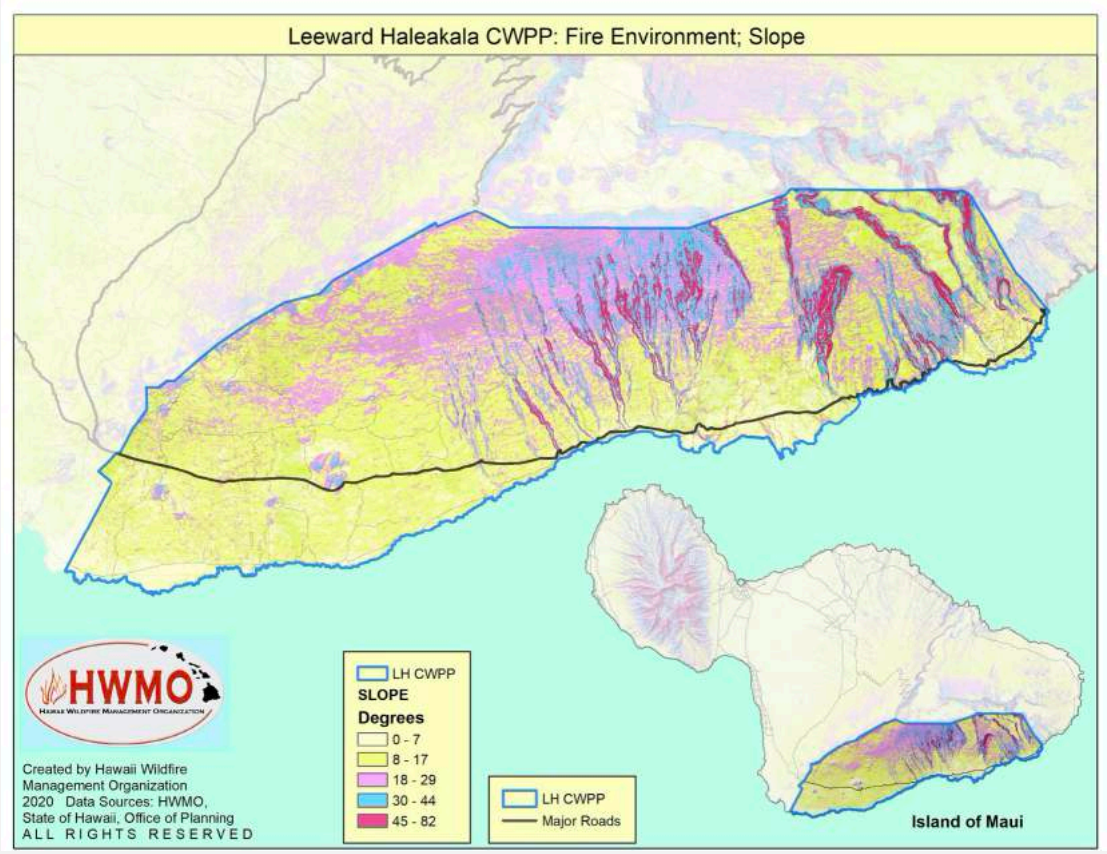
Topography influences wildfire behavior in Leeward Haleakalā in critical ways. Due to their location on the southern flank of Haleakalā, a 10,023-foot shield volcano, the residential communities across the CWPP region are mostly built on gentle to steep slopes. Homes in the region are built in a wide range of elevations spanning from 1,500 to 4,500 feet above sea level. There are several small gulches that act as drainages, and a few much larger gulches in the wildland areas surrounding the community. It is important to note that although gulches can act as an important water resource, they can also help channel winds either upslope or downslope. Upslope fires can be highly dangerous, especially when combined with dense, unmanaged, flammable vegetation. Slope is a high hazard for Leeward Haleakalā.

***Photo 1. The entire CWPP area is sloped from sea to summit, from gentle slopes to hills to steep ravines.***

Map 4 depicts the span of elevations across the planning area. Map 5 depicts slope across the Leeward Haleakalā CWPP area. Note that elevation rises from 0 to 10,000 ft in less than 8 miles.




***Map 4. Elevation across Leeward Haleakalā CWPP area.***

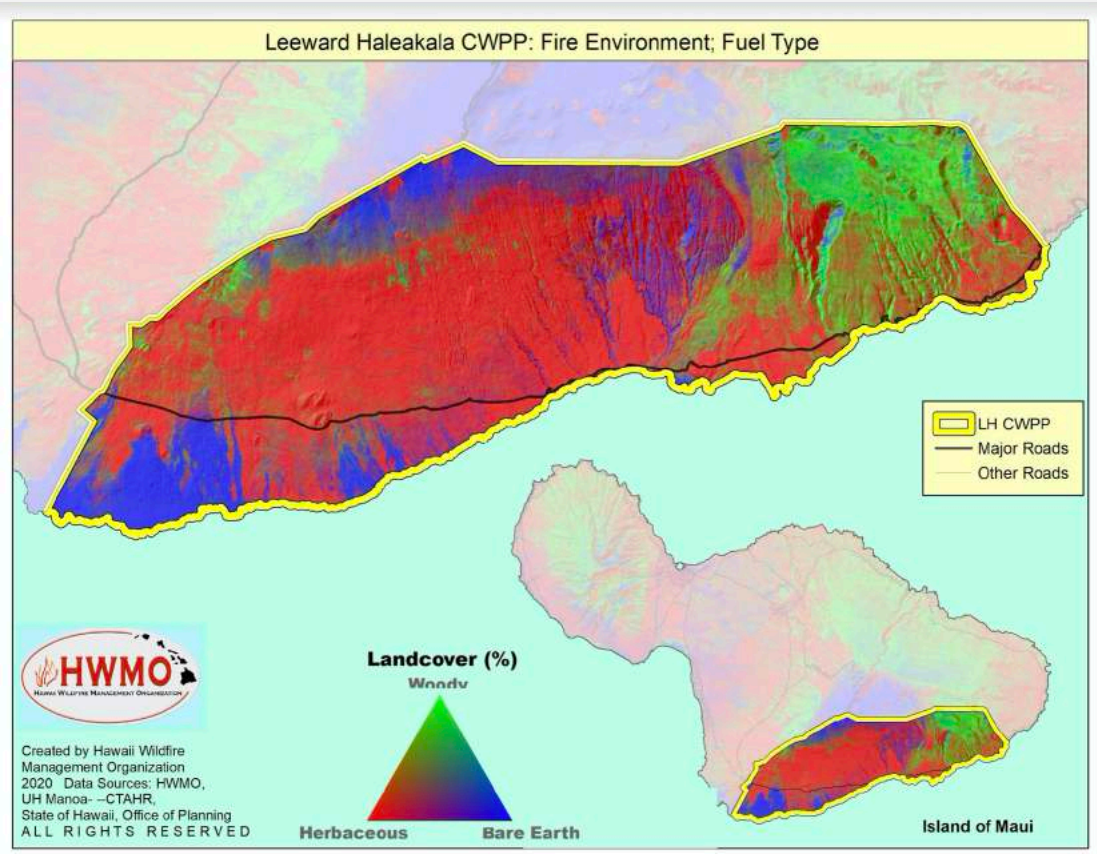



***Map 5. Slope across the Leeward Haleakalā CWPP planning area. Note that the entire area is sloped, some areas with extreme gradients, due to ravines and gulches.***

***FUEL***

Fine "flashy" fuels ignite more easily and spread faster with higher intensities than coarser fuels. For a given fuel, the more there is and the more continuous it is, the faster the fire spreads and the higher its intensities. Fine fuels take a shorter time to burn out than coarser fuels.

Since Leeward Haleakalā covers a vast stretch of topographic and climatic characteristics from summit to sea, a mosaic of landcover types exist within the area. Map 5 below characterizes fuels in the CWPP area by indicating whether it is grass, woody, or bare ground. While the species also indicate level of fire hazard (detailed below), visualizing by class of vegetation such as in Map 5 is useful for understanding how easily fire will ignite (grasses are flashy, dry easily and ignite readily) and how quickly fire might spread (what type and whether it is contiguous or patchy). Patchy or non-contiguous fuels can slow the spread of fire and/or provide options for fire control.




***Map 5. Fuel type: Woody/green, herbaceous (grass, shrubs, forbs)/red, and bare earth.***

A large amount of land is covered by mixed grass-shrublands dominated by introduced, fire-prone species. These fuels encroach the residential areas less than 40 feet around homes and are especially prolific on unmanaged, vegetated corridors, vacant lots, and in Wildland areas.

There are three main grasses found in the direst, most fire prone areas of the Leeward Haleakalā CWPP planning area– kikuyu (Cenchrus clandestinus), redtop (Agrostis gigantea), and molasses (Melinis minutiSlora) – that all reseed and spread after wildfires. Kikuyu is the predominant grass and although it makes for great forage, it can pose difficulties for fire suppression efforts. For one, they act as one continuous fuel bed (as opposed to bunch grasses), are notorious for restarts of fires, and

are tedious to mop-up (firefighters need to dig deep to create fire lines and pull grass from between large rocks). Molasses grass will usually be the first to resprout after a fire, but the there are pockets where kikuyu has replaced molasses after the large fires.

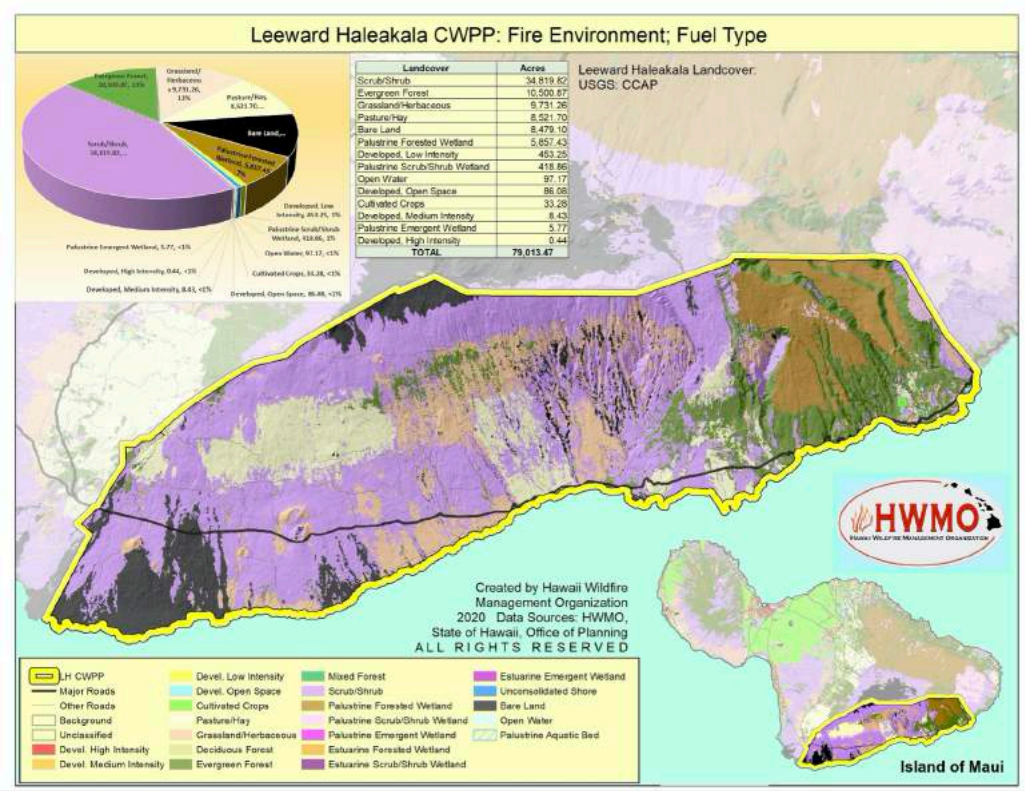
Shrubs such as lantana (Lantana camara), tree poppy (Bacoonia frutescens) , and gorse (Ulex europaeus) have spread vigorously throughout Kahikinui and other areas and regenerate quickly after fires. Gorse is of particular concern– LHWRP and the community have worked hard over the years to eradicate it. The herbaceous plant, fireweed (Chamerion angustifolium), is another flammable species that has grown prolifically in the region and is unpalatable for most grazing animals.

In combination with grasses, the collection of flammable herbaceous plants and shrubs create a continuous fuel bed on unmanaged lots and bordering lands that, when dry, could carry fires to the edge of homes or into the canopies of trees. There are also silk or silver oak (Grevillea robusta) trees that are fire hazards growing within the upper stretches of Kahikinui. Adding to the wildfire threat is tinaroo glycine (Glycine wightii), which is a vine originally introduced as grazing forage and is especially prolific when left un-grazed. The vines have spread rapidly throughout the region, spreading over shrubs and the canopies of trees, eventually smothering and killing them. During dry periods, they can become a major fuel hazard, especially a connective agent between fuels. The flammable vegetation in Kahikinui can cure, or dry, very rapidly. Especially on sloped areas, these fuels can carry a wildfire much more quickly than a flat area due to convection, or the preheating of adjacent upslope fuels. According to the County Fire Authority, for every 10 degrees of slope, a fire can double its speed.

On the lower elevation stretches from Kanaio to to past Kahikinui, especially on the makai side of the highway, the dominant landscape changes to kiawe (Prosopis pallida) forests with grass/shrublands of ʻekoa or koa haole (Leucaena leucocephala), kikuyu grass, and other invasive grasses

Kiawe is a species of mesquite tree that is introduced to Hawaiʻi, but considered to be naturalized. Though invasive, the trees have uses including shade cover and firewood that are attractive to many residents and visitors. However, kiawe are very flammable, adapted to fire and have been a driver of canopy fires that have threatened (and burned) homes in leeward areas. ʻEkoa can transfer heat well through convection, be difficult to navigate around for ;ire suppression purposes, and its pods have been known to travel several miles during strong wind events, according to local firefighters. These pods can act as firebrands and ignite vegetation near the house or the structure directly. Together, exotic grasses, ʻekoa, and kiawe can form a chain of ladder fuels that can be an extreme fire hazard

Map 6 depicts the geographic distribution of vegetation species across the Leeward Haleakalā CWPP planning area.



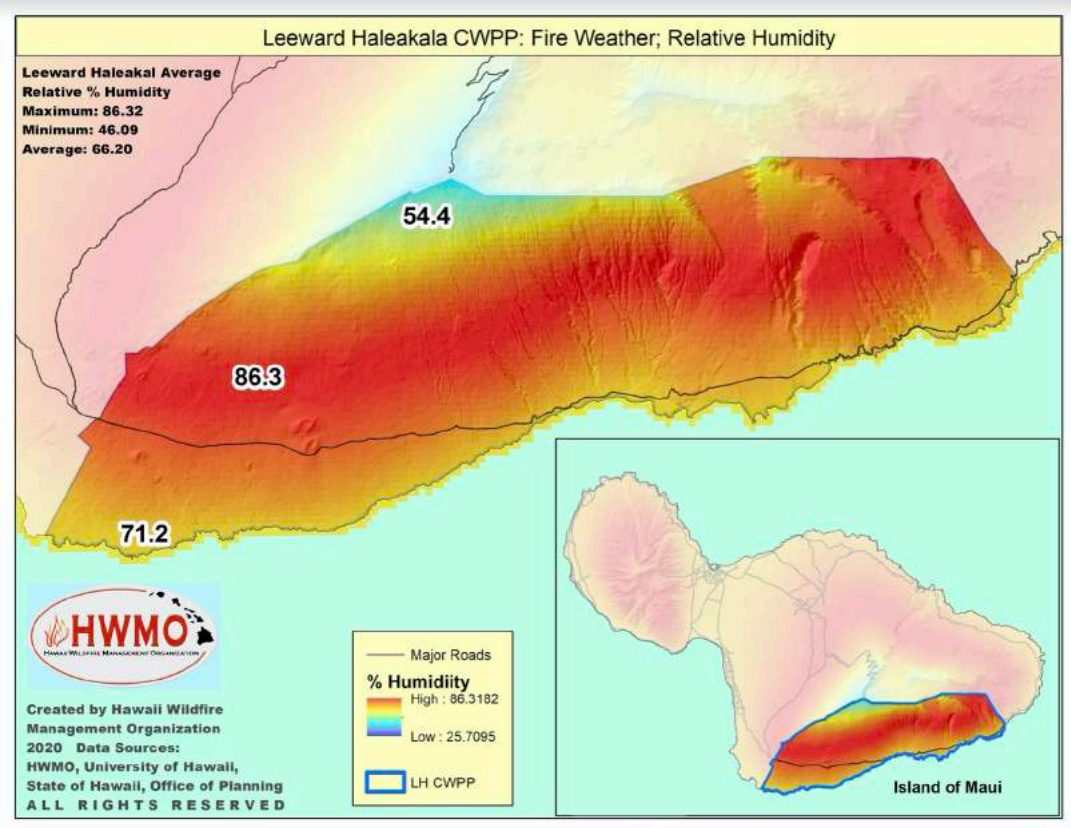

***Map 6. Fuel types across the CWPP area. Note that all areas except for those that are black or green are considered high fire hazard.***

### *CLIMATE AND WEATHER*

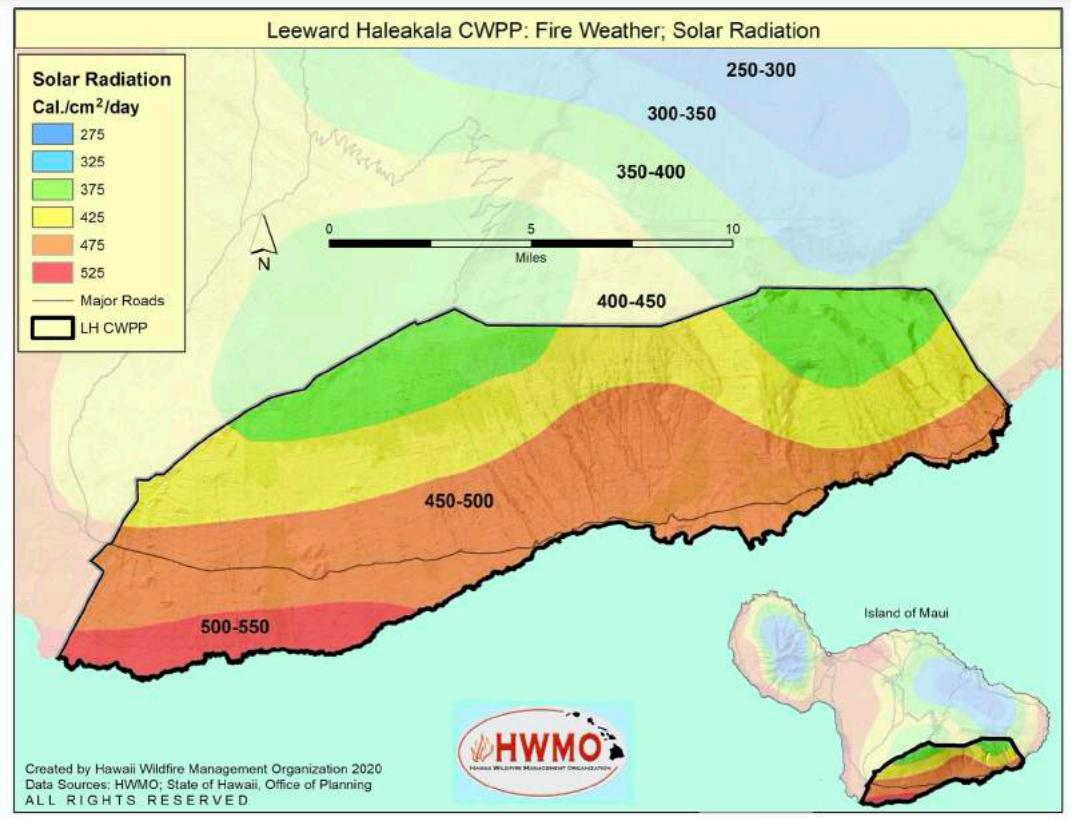
The majority of Leeward Haleakalā is dry and windy. Rainfall totals are typically at their highest from December through March due to cold fronts and kona storms during the winter, but they are highly variable each year. Being the leeward side of Haleakalā with a south-facing slope, the conditions are drier than on the north- and east-facing slopes.

The weather conditions affect the moisture content of the dead and live vegetative fuels. Dead fine fuel moisture content is highly dependent on the relative humidity and the degree of sun exposure. The lower the relative humidity (Map 8) , the greater the sun exposure (map 9), the less rainfall (map 10). The greater the temperature (Map 11), the lower the fuel moisture content. Lower fuel moistures produce higher spread rates and fire intensities.

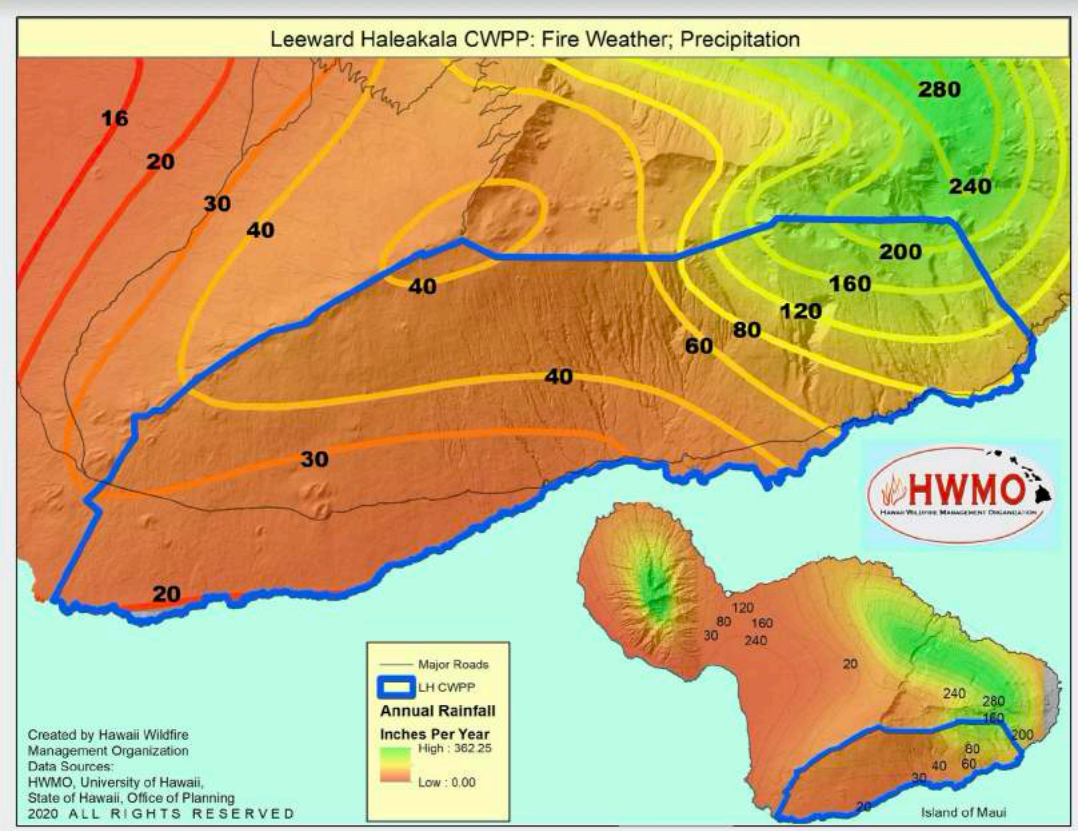
Wind speed significantly influences the rate of fire spread and fire intensity. The higher the wind speed, the greater the spread rate and intensity. Wind speeds across Leeward Haleakalā can vary dramatically throughout the year and even throughout a single day and night, depending on where the winds are coming from and what force is generating the wind, which can be daily, seasonal, or storm-driven. At the higher elevations, average wind speeds hover between 5-8mph, while at the coast, average wind speeds can exceed 20mph, with gusts 30-40mph. For these reasons, wind is a high hazard (Maps 12, 13).



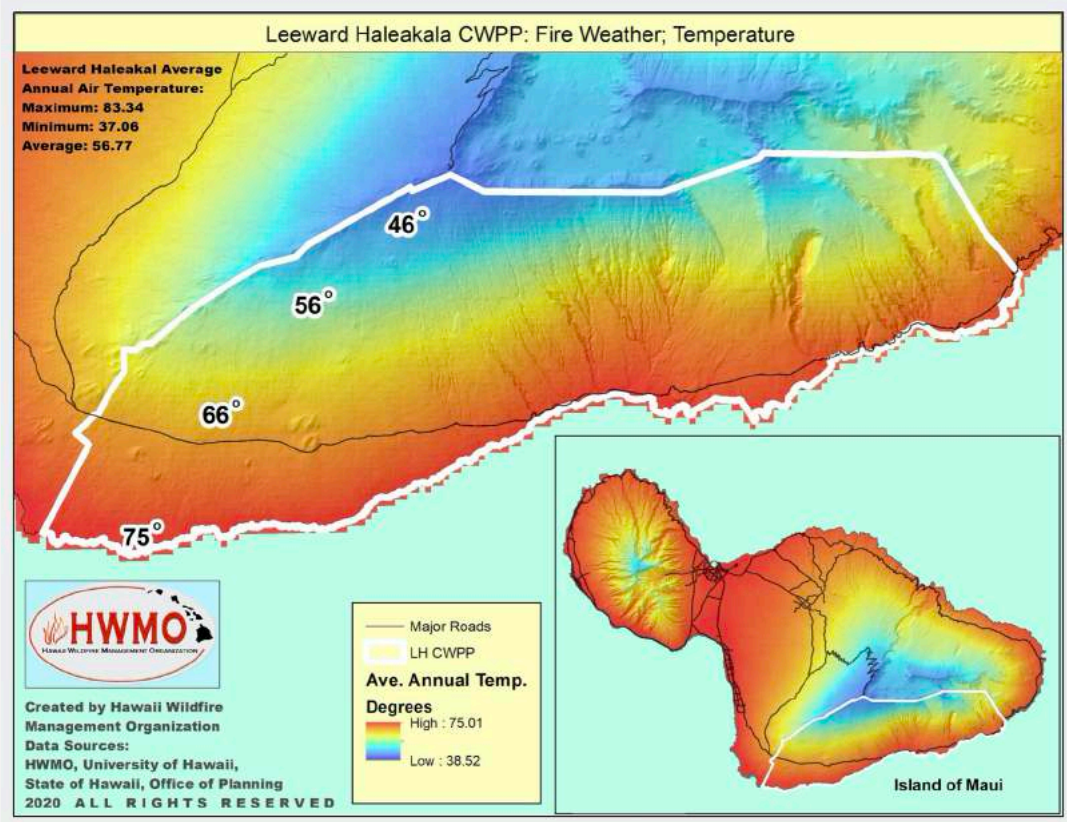

***Map 8. Relative Humidity. Note that in Hawai'i, wildfires can ignite and carry across the landscape even in high humidity.***



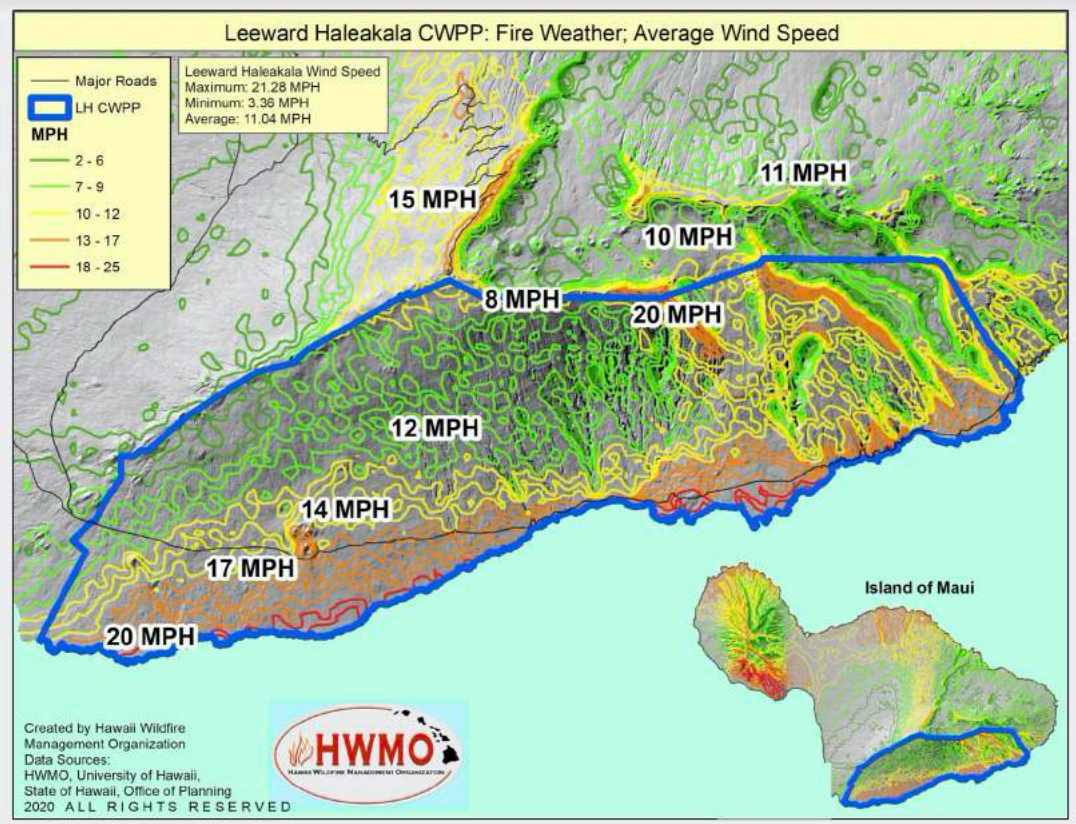

***Map 9. Solar radiation. Note the high incoming solar radiation across this area. This is due to its south facing position, slope, and consequent exposure to sun throughout the day.***



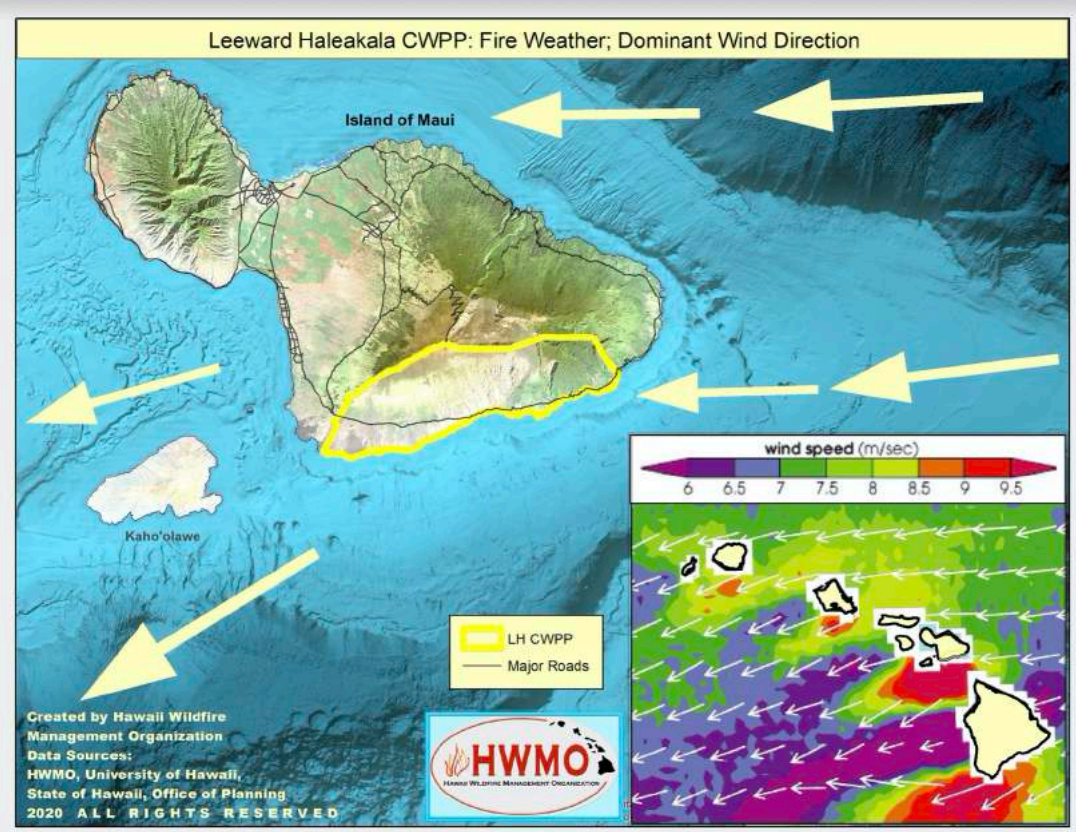

***Map 10. Precipitation gradients across Leeward Haleakalā. Note that two-thirds of the region is less than 50 inches per year, even as the range stretches from less than 20 inches to over 200 inches.***




***Map 11. Average Air Temperature across Leeward Haleakalā.***




***Map 12. Average wind speeds. The area experiences land-sea breezes as well as tradewind and storm-associated wind patterns.***




***Map 13. Dominant wind direction. Winds are driven by the trade wind pattern with localized disruptions due to topography, seasonal anomalies, and storms, often making then erratic.***

# WILDFIRE IMPACTS

Many of the community, economic, natural, and cultural resources in Leeward Haleakalā are exposed to wildfire impacts. These impacts are compounded by the fact that land-based, aquatic, and marine-based natural and cultural resources all lie within close proximity across the region.

***IMPACTS TO NATURAL RESOURCES***

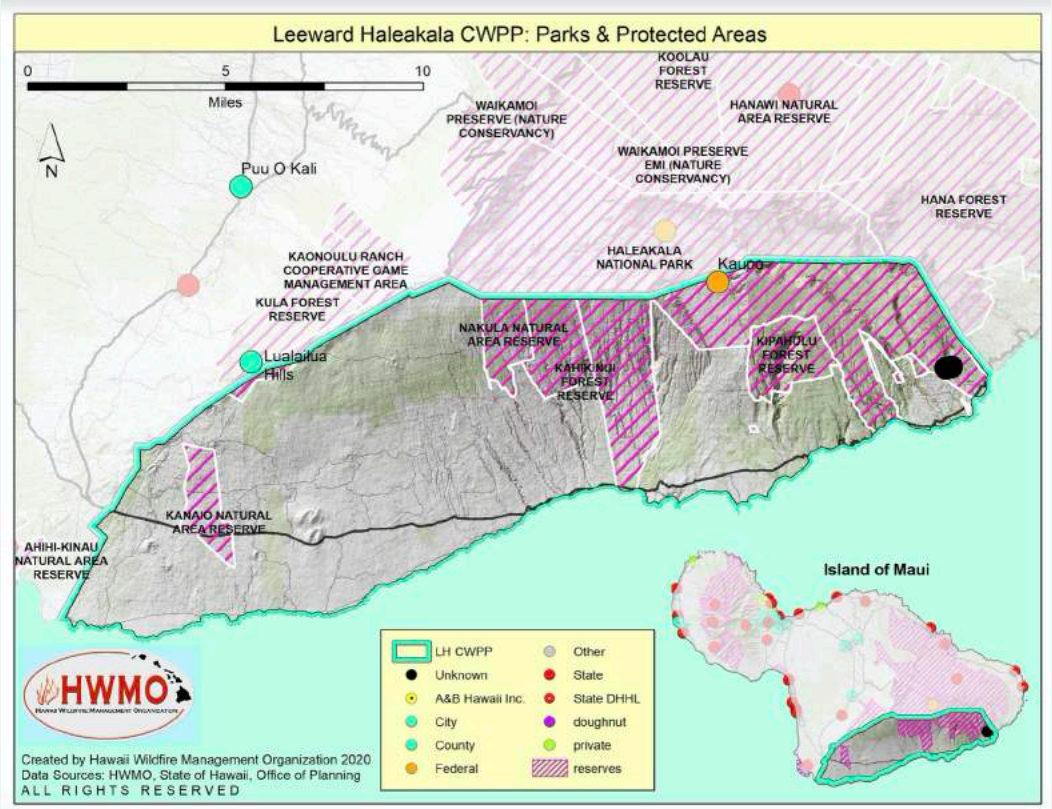
Across Hawai'i, recurrent wildfires result in the conversion of both native and nonnative forested areas to fire-adapted grasslands and shrublands – and are one of the reasons these fire-prone ecosystems are expanding in many parts of the state (this is part of the explanation for why so much of Map 6 is purple/shrublands). Wildfire is a major cause of the loss and degradation of native forest and other habitat. Most of the plant and animal species within native ecosystems in Hawai'i do not survive and/or recover from wildfires. More generally, the conversion of forest from fire and the conversion of active agriculture into fallow unmanaged weed fields increases the potential for future and larger fires by expanding the availability of fine fuels.

Wildfire also increases the potential for erosion and sediment delivery from upland to coastal and nearshore areas. The immediate loss of vegetation after a wildfire directly exposes soils to rainfall, which can dramatically increase erosion. Wildfire can also alter the physical and chemical properties of soils, making them more prone to surface run-off which can increase downstream flooding and sediment delivery. Forest conversion to grassland due to recurrent wildfires over the long-term also alters water cycling. The replacement of deep-rooted trees by shallow, matted root systems of grasses results in a higher water table and reduces the ability of rainfall to infiltrate into the soil. This causes an increase in surface runoff during rainfall events and thus increases the risk of flooding and sediment delivery downstream.

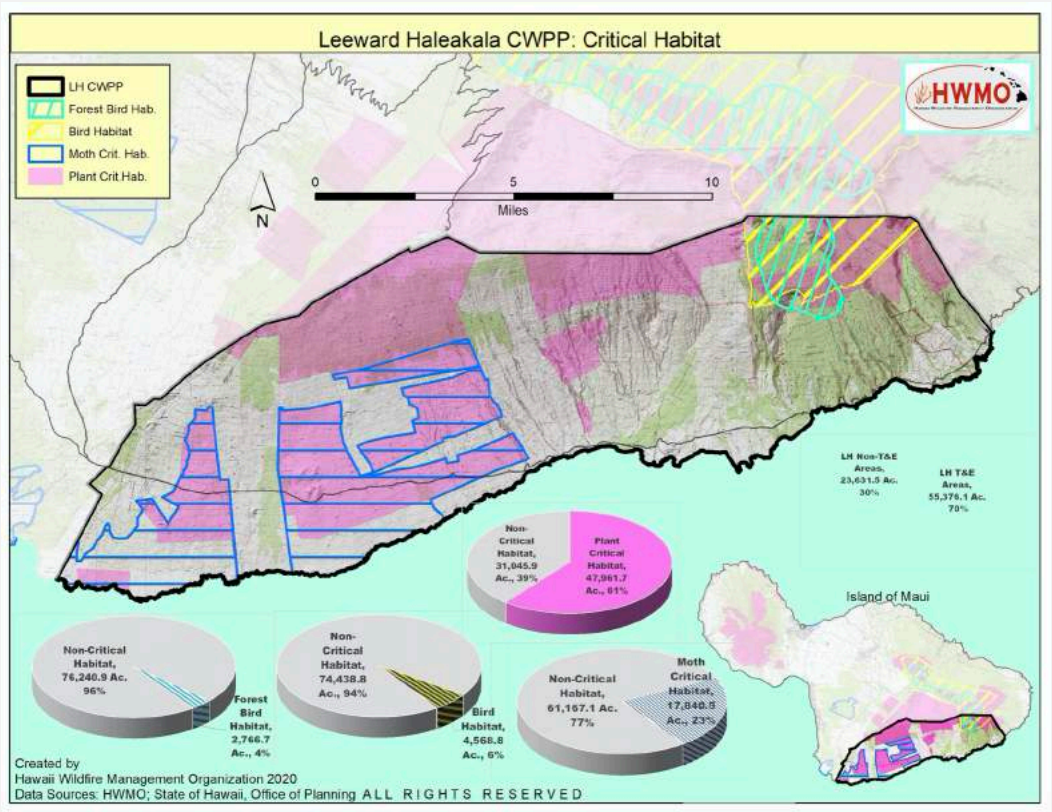
Forest loss and increased downstream sediment delivery to nearshore reefs have important implications for cultural and civic resources, as well, in terms of tourism, recreation, food resources, and cultural practices (See Map 18 for marine and coastal resource information). Sediment loading destroys reefs and impacts nearshore fisheries which are critical subsistence resources to many Maui families. Burned areas can remain closed to the public for days to months due to landslide and tree-fall danger, limiting access to areas for hiking, hunting, gathering plants, and tending cultural sites. Even when nearby fires do not have immediate or direct impacts on these resources, there are often indirect or longer term impacts. For example, suppression efforts, such as the use of bulldozers, can damage important landscape features and alter water flow patterns. Frequent fires also impact powerlines, communication infrastructure, and can lead to road closures – exacerbating already congested traffic areas.

Parks and protected areas lie within the CWPP boundaries (Map 14), as well as critical habitats (Map 15), and threatened and endangered plants (Map 16). The area includes several US Fish and Wildlife

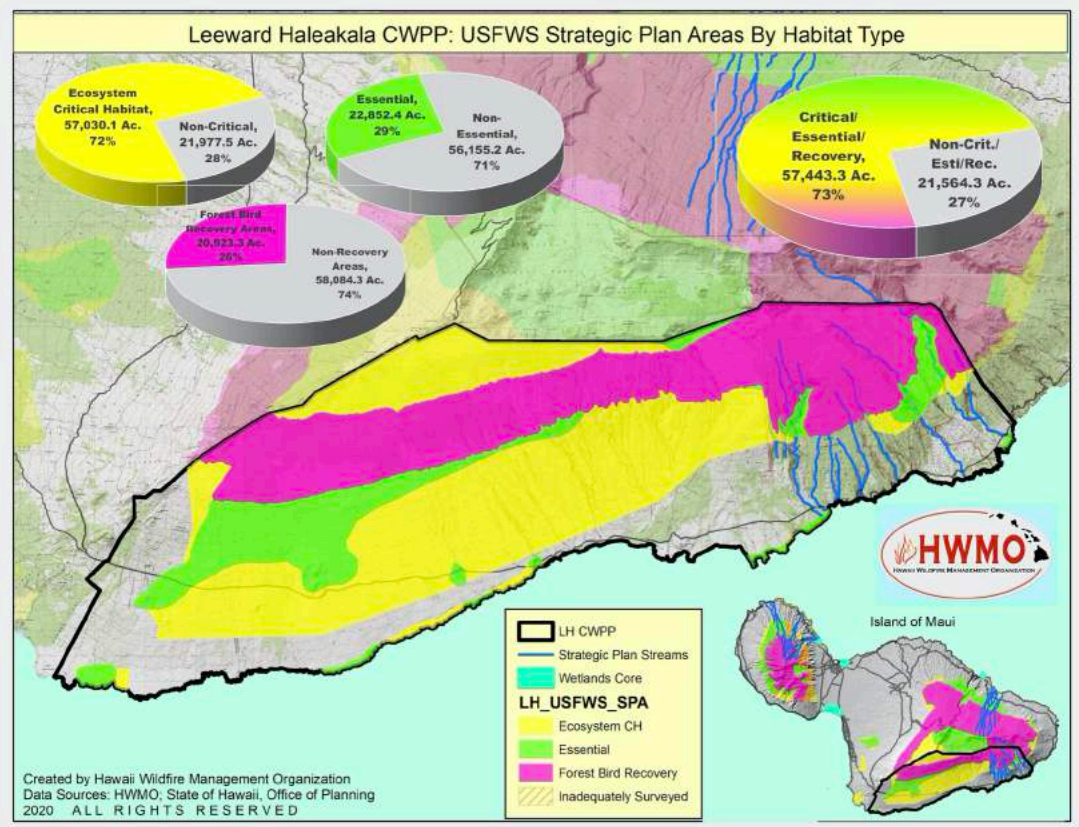
Service strategic plan designation areas (Map 17) due to the protection needs of these sensitive and important natural resources.



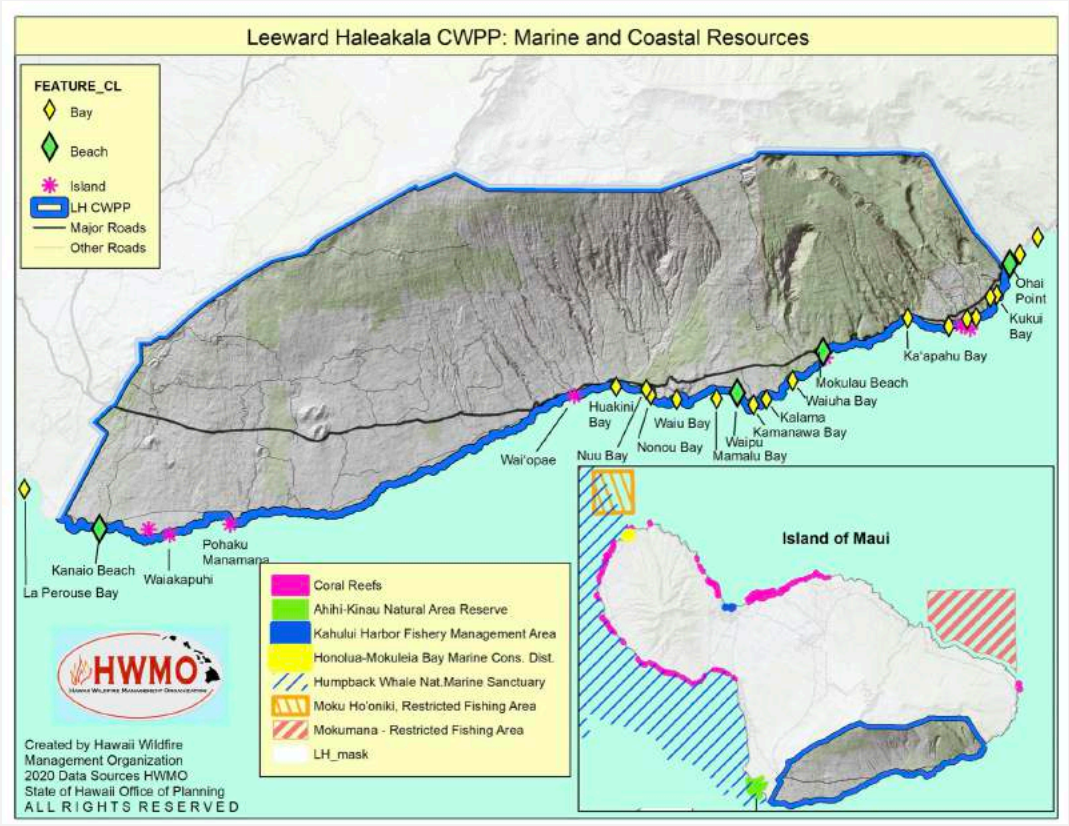

***Map 14. Parks and protected areas within the Leeward Haleakalā CWPP area.***



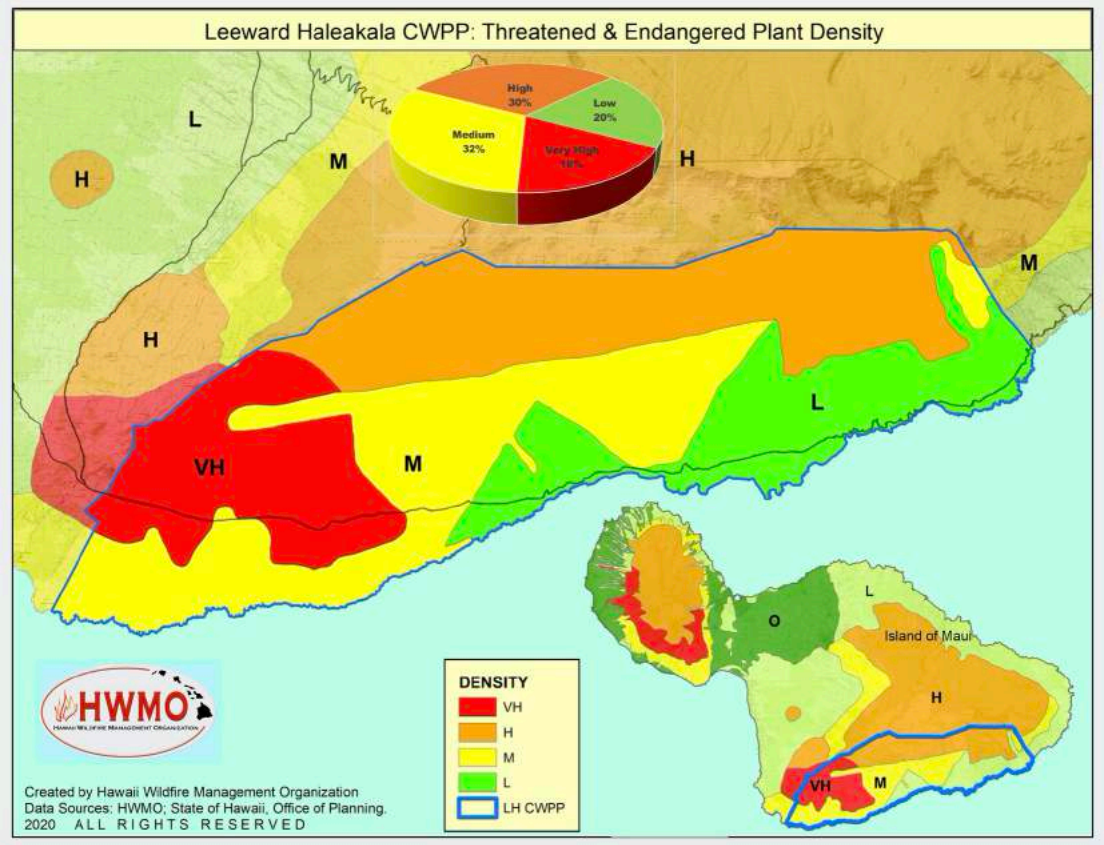

***Map 15. Critical Habitat within the Leeward Haleakalā CWPP area.***




***Map 16 . Density of Threatened and Endangered Plants within the CWPP boundaries.***




***Map 17. USFWS Strategic Plan areas by habitat type.***




***Map 18. Marine and Coastal resources and designations within the CWPP boundaries.***

### *IMPACTS TO COMMUNITIES AND MUNICIPAL RESOURCES*

Wildfires threaten lives, homes, and human health in several ways. Many neighborhoods have unmanaged/untended fire fuels interspersed within developed areas, promoting fire spread through communities and into surrounding areas. This creates an increased hazard to lives and homes in the area. Air quality is greatly reduced from smoke during fires and for months to years after fire due to high levels of wind-born dust. This dust is due to fire-caused changes to soil that leaves it water-repellant, and therefore easily lifted into the air.

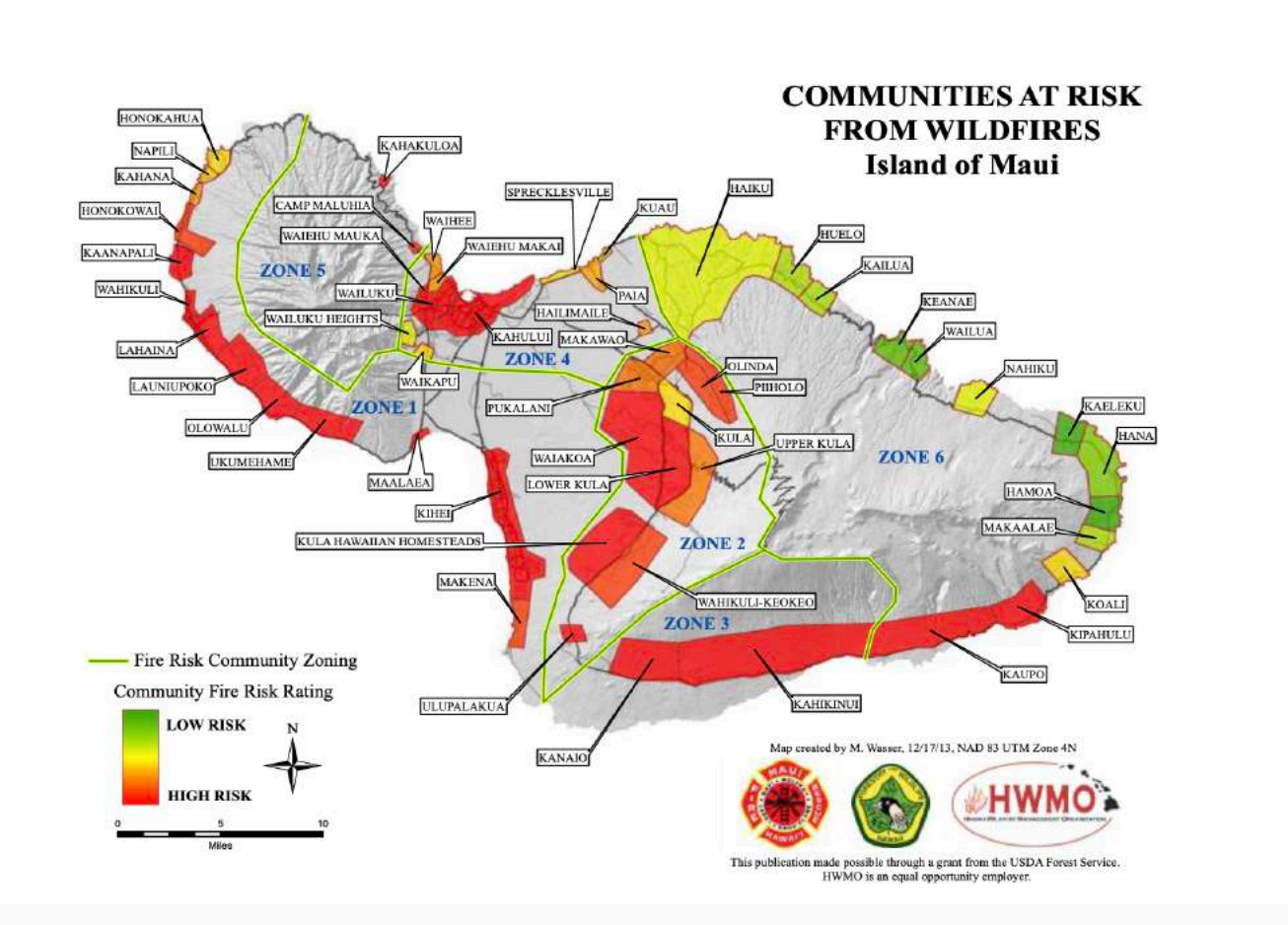
Wildfires also impact economic and municipal infrastructure and activities. Burned soil from wildfires decreases groundwater recharge, which can affect drinking water supplies. As noted above, post-fire rain events cause erosion that damages nearshore resources (coral reefs, fisheries; Map 18), which can have effects on one of the area's primary economic bases– coastal and marine-based tourism, as well as resident and visitor recreational activities. Traffic and road closures during fire events and post-fire flooding can block access routes and keep people from their homes and work, and are costly to local government. Finally, agricultural, ranching, and energy production (e.g. Auwahi Wind Farm) all face disruptions in operations during wildfire events and face the threat of catastrophic damage in the face of any future significant wildfire events.

# HAZARD ASSESSMENT

### *COMMUNITIES AT RISK FROM WILDFIRE*

For the purposes of assessing hazards and wildfire threats to resources, residential areas within the CWPP planning area were simplified into four "communities" (Map 2). The boundaries depict the areas determined by DLNR-DOFAW to have similar features in terms of wildfire hazard characteristics and have long been the boundaries used in the DLNR-DOFAW's Communities at Risk from Wildfire maps, maps created from comprehensive assessments to depict wildfire threats to developed areas and communities.

In the 2013 Communities at Risk from Wildfires map (the most recent), the communities within Leeward Haleakalā are all rated as high risk (Map 19). (Please note this map ONLY rates areas where there are residents living built structures, neighborhoods, and established communities. Gray areas on the map indicate that no humans inhabit the area, and therefore were not assessed using this method).




***Map 19. Communities at Risk from Wildfires Map for Maui. Note Kanaio, Kahikinui, Kaupo, and Kipahulu are all assessed and rated as high risk.***

### *WILDFIRE HAZARD ASSESSMENT*

The purpose of the required community risk assessment is to:

- Provide site-specific information to the public to promote wildfire awareness.
- Help identify and prioritize areas for treatment.
- Determine the highest priority uses for available financial and human resources.

The methods for this plan's community wildfire risk assessment followed the guidelines established by the HFRA. The wildfire risk assessment also follows the guidelines and requirements of the FEMA Pre-Disaster Mitigation program and the National Fire Plan. Locally, we have opted to name the effort Wildfire Hazard Assessment, rather than Wildfire Risk Assessment.

In partnership with DLNR-DOFAW, HWMO assessed the communities within Leeward Haleakalā using a process that rates 36 wildfire hazard characteristics, which have been further grouped into 5 categories. The five categories assessed for wildfire hazard are, Subdivision Hazard, Vegetation Hazard , Building Hazard, Fire Environment Hazard, and Fire Protection Hazard.

The purpose of looking in depth at each category and specific hazard is to identify the factors that put each community most at risk, and to enable mitigation action plans and activities that are targeted toward reducing risk in the factors that most need attention per area.

Table 1 provides the ratings per area per hazard category. Table 2 below provides the detailed categories assessed within each of the five categories. A weighted calculation determines the final rating for the category.

| Community Area | Subdivision Hazard | Vegetation Hazard | Building Hazard | Fire Environment Hazard | Fire Protection Hazard |
|---|---|---|---|---|---|
| **Kanaio** | High | High | Moderate | High-Extreme | High |
| **Kahikinui** | High | High | Moderate | Extreme | High |
| **Kaupo** | Moderate | High | Moderate | Moderate-High | High |
| **Kipahulu** | Moderate | High | Moderate | Moderate | High |
| **Entire Leeward Haleakalā CWPP Area** | **Moderate-High** | **High** | **Moderate** | **High** | **High** |

***Table 1. Hazard assessment ratings per subdivision/community area within the Leeward Haleakalā CWPP planning boundaries. Priority hazards to address are shown in red.***

| Hazard Category | Individual Hazards Assessed Within Category |
|---|---|
| **Subdivision Hazard** | Fire Service Access<br>Home Setbacks<br>Ingress/Egress<br>Private/Landowner Firewise Landscaping and Defensible Space<br>Proximity of Subdivision to Wildland Areas<br>All Season Road Condition<br>Road Maintenance<br>Road Width<br>Street Signs<br>Structure Density<br>Unmanaged, Untended, Undeveloped Land |
| **Vegetation Hazard** | Defensible Space: Fuels Reduction Around Homes & Structures<br>Fuel Loading<br>Fuel Structure & Arrangement<br>Proximity of Flammable Fuels Around Subdivision<br>Vegetation Within 300‘ of Homes |
| **Building Hazard** | Siding/Soffits<br>Roofing Assembly<br>Structural Ignitability<br>Under-Skirting Around Decks, Lanai, Post & Pier Structures<br>Utilities Placement: Gas & Electric |
| **Fire Environment Hazard** | Average Rainfall<br>Prevailing Wind Speeds & Direction<br>Slope<br>Topographic Features that Adversely Affect Wildland Fire Behavior<br>Seasonal or Periodic High Hazard Conditions<br>Ignition Risk |
| **Fire Protection Hazard** | Response Time<br>Community Planning Practices & Ordinances<br>Community Fire Safe Efforts & Programs Already in Place<br>Fire Department Structural Training & Expertise<br>Local Emergency Operations Group or Citizen Group<br>Proximity to Fire Stations<br>Water Source Availability<br>Wildland Fire Response Capacity of Initial Response Agency<br>Interagency Cooperation |

***Table 2. Overview of hazard assessment categories and the individual hazards that comprise them.***

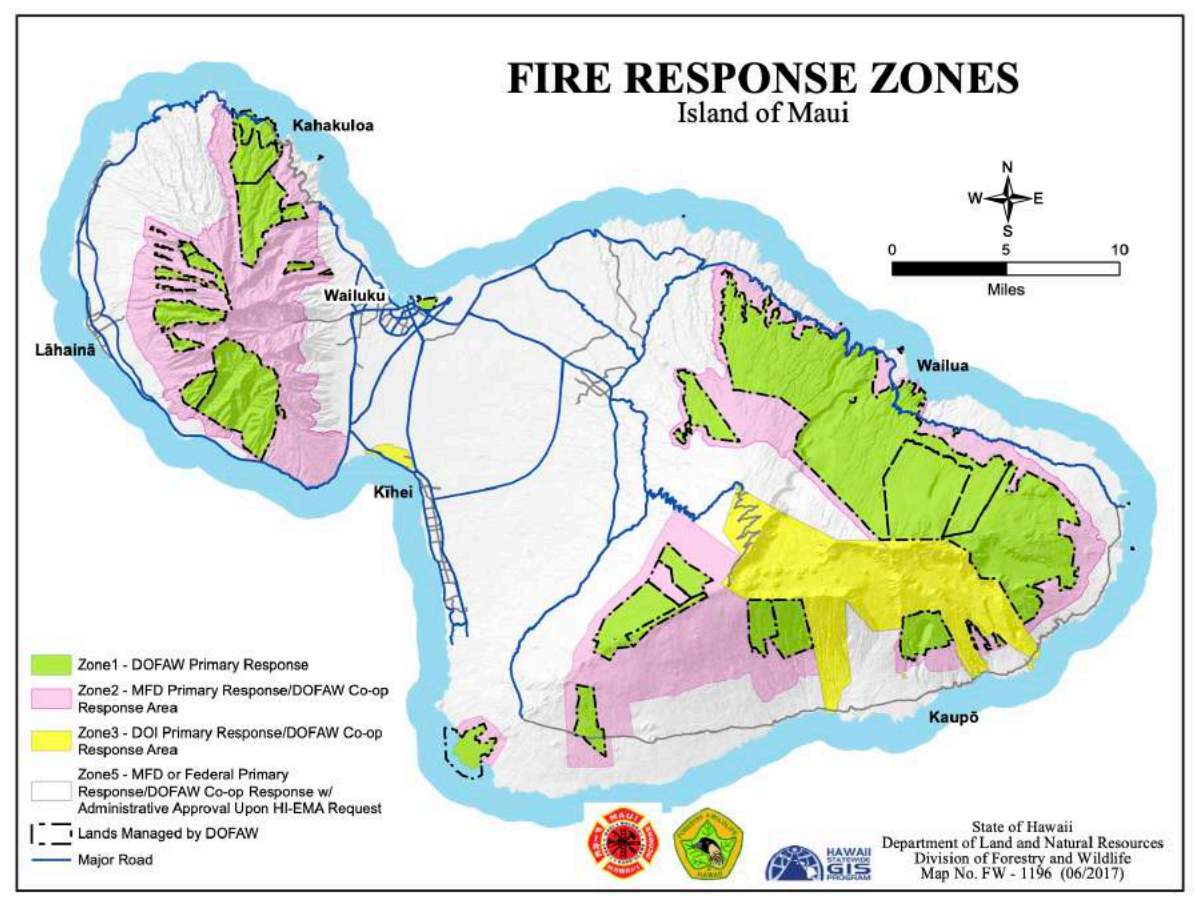
# EMERGENCY RESPONSE

***FIRE SUPPRESSION CAPABILITIES AND RESOURCES***

Maui Fire Department resources and equipment are spread across the entire county and are made available when needed if they are not already in use. MFD has 14 fire stations across the County of Maui. There are 10 fire stations on the Island of Maui, none of which are within the CWPP planning area. The closest fire station to the east side is located in Hana. Wailea to the west and Makawao to the north are the next closest stations.

Initial response to the majority of wildfires (as well as all medical and other emergencies) is the responsibility of MFD. DLNR-DOFAW responds to wildfire events on state lands and provides additional wildland firefighting assistance when state lands are threatened and/or mutual aid agreements are invoked.

Map 20 was developed by DLNR-DOFAW and demonstrates the independent and shared response zones of each agency in the CWPP planning area.




***Map 20. Fire Response Zones. Indicates areas where fires are suppressed by Maui Fire Department, DLNR-DOFAW, National Park Service/Federal, or a combination.***

### *EMERGENCY MANAGEMENT DOCUMENTS AND OTHER PLANS*

The CWPP is non-regulatory and cooperative in nature. The plan provides (1) a foundation for increased communication, coordination and collaboration among agencies and the public, (2) identification and prioritization of areas for hazardous fuel reduction projects and wildfire mitigation actions, and (3) assistance meeting federal and state planning requirements and qualifying for assistance programs.13 The CWPP is designed to work in conjunction with other county and state plans, operational policies, assessments, and programs, etc., including but not limited to:

#### ***County of Maui:***

County of Maui Drought Mitigation Strategies
County of Maui Multi-Hazard Mitigation Plan and Hazard Mitigation Plan Update (2015)
County of Maui Water Use and Development Plan Draft
Maui Island Plan

#### ***State of Hawai'i:***

State Drought Plan (2017)
State of Hawai'i Multi-Hazard Mitigation Plan
State Division of Forestry and Wildlife Operational Policy for Wildfire Control
DLNR Forest Action Plan (2016)

### *MULTIPLE-AGENCY AGREEMENTS*

Memoranda of Agreement, Memoranda of Understanding, and/or Mutual Aid Agreements are in place among MFD , DLNR-DOFAW, and Department of Interior (DOI). These agreements identify the suppression responsibilities of each party as well as other fire management activities such as joint participation in prevention, training, and equipment acquisition. Fire response zones are delineated on Map 20.

In the County of Maui, there is a coordinating group established to deal with and discuss wildfire issues, mitigation, and response. Federal, state, and local fire agencies have organized into the Maui Wildfire Coordinating Group. The Maui Wildfire Coordinating Group coordinates the programs of the participating wildland fire agencies on Maui and provides a forum for leadership, cooperation and the exchange of information. It also improves procedures to rapidly provide the most effective response to wildfires in the island. In coordination with County of Maui Civil Defense Agency, drought and other fire-hazard conditions are constantly monitored and actions such as burning bans and closures are instituted when needed. The public is informed of these restrictions by radio announcements and newspaper notices.

Several local/regional fire task forces also exist across Maui County to collaboratively discuss, coordinate, and implement on-the-ground wildfire mitigation projects. Comprised of fire and emergency response agencies, as well as additional local partners, organizations, and community

representatives, these task forces work on issues and goals specific to their focal areas. The Leeward Haleakalā Fire Task Force (LHFTF) is one such coordinating group, and was a primary partnership in the development of this CWPP.

### *EVACUATION PROTOCOLS AND NEEDS*

Evacuation protocols for neighborhoods and areas in Leeward Haleakalā have been determined for natural hazards such as tsunamis, and can be found in the documents listed below. However, fire safety zones for all neighborhoods and areas of Leeward Haleakalā are yet to be determined, and are a priority action determined by the public as part of this CWPP process.

The following resources are available for disaster preparedness information:

- County of Maui Civil Defense Agency Website
- Disaster Preparedness for Maui County: A Citizen's Guide
- Hurricane Information and Tips
- Tsunami maps information, and tips

### *STATE FIRE CODE*

The Hawai'i State Fire Code is adopted by the State of Hawai'i according to Chapter 132 of the Hawai'i Revised Statutes, with modifications to the 2018 National Fire Protection Association 1 Fire Code. The Fire Code of the County of Maui is adopted with modifications from the State Fire Code.

The State Fire Code that took effect most recently (January 19, 2021) can be found at: https://labor.hawaii.gov/wp-content/uploads/2021/02/2018-NFPA-1-Amendments-Jan_20_21.pdf

All county fire departments have two years from this date to adopt the State Fire Code as their county fire code and may amend this code as it applies to their jurisdiction.

### *WILDFIRE PREVENTION*

Several agencies are working both independently and collaboratively on wildfire prevention activities in the North Shore CWPP area.

**MFD Fire Prevention Bureau** The Fire Prevention Bureau works to abate fire and life-safety hazards before they can cause injury and property damage. Focal services include fire education programs to increase the public's awareness of fire safety, including an annual fire safety program for Maui County schools and the Smoke Alarm Maui Program. Other focal services include fire investigation, reviewing building plans and permits for fire safety, and issuing several special permits.

**DLNR-DOFAW** is statutorily mandated to take measures for the prevention of wildland fires within DLNR-DOFAW managed lands and to cooperate with county and federal fire agencies in developing plans and programs for prevention assistance of wildfires on additional lands. DLNR-DOFAW is involved with and committed to the following community risk reduction initiatives: supporting the development and action plans of Community Wildfire Protection Plans, locally administering the U.S.

Forest Service Wildland-Urban Interface grant program, serving as the state liaison for the Firewise USA™ community risk reduction program (in partnership with HWMO), and administering State Legislature Grant-In-Aid awards given to local organizations who are working on wildfire-related projects (in 2021, these include HWMO and Ka'ala Farm, Inc.)

**HWMO** is a nonprofit organization founded in 2000 to focus on wildfire prevention and risk reduction activities. The organization serves as a hub of wildfire information, mitigation, and project assistance across Hawai'i. HWMO supplements and complements agency wildfire efforts, aims to meet community hazard reduction needs, and coordinates/leads multi-jurisdictional and multi-partner wildfire projects. HWMO develops and offers educational wildfire prevention, preparedness, and planning workshops for diverse audiences and stakeholder groups; leads the development of Community Wildfire Protection Plans and fire management plans; serves as the community liaison for the Firewise USA program (in partnership with DLNR-DOFAW), assisting communities with their applications, renewals, and offering learning and connecting opportunities among the 15 Firewise-recognized communities across Hawai'i; leads multi-partner wildfire collaboration projects and groups; and implements cross-boundary fuels management projects. HWMO also collaborates closely with the Cohesive Wildland Fire Management Strategy, Western Region and the Fire Adapted Communities network, liaising with and sharing best practices between Hawai'i and national partners. HWMO works together with the University of Hawai'i to implement the Pacific Fire Exchange project, a fire science communication project that develops, collates, and shares best available wildfire information on behalf of a broad partnership that includes DLNR-DOFAW, USDA Forest Service, County Fire Departments, and other forestry and fire entities.

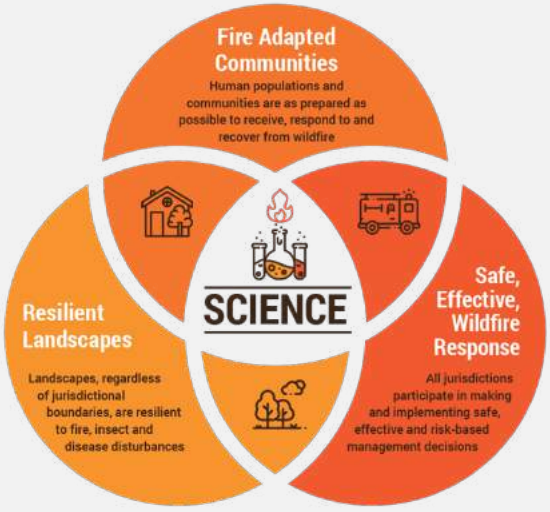
**University of Hawai'i at Mānoa College of Tropical Agricultural and Human Resources (UHM-CTAHR)** has several researchers, extension specialists, and some graduate students who synthesize and develop new information on topics pertaining to wildfire. Faculty expertise includes range management, forestry, ecology, social science, and fire science which has contributed to a range of wildfire-related products such as fuels data, maps, risk models, and other information. HWMO and UHM-CTAHR Cooperative Extension partner to implement the Pacific Fire Exchange project (PFX). PFX is a fire science communication project that works to improve the availability and sharing of fire science relevant to the Pacific Island region to support and inform the wildfire mitigation work of land managers and emergency responders.

Together, **all of the above entities** participate in and support the multi-agency statewide Wildfire and Drought Lookout! awareness and preparedness campaign each year; conduct wildfire hazard assessments (often in partnership with each other); and collaborate whenever possible to protect life, property, and natural resources from the impacts of wildfire.

# PART III
# WILDFIRE ACTION PRIORITIES

# WILDFIRE ACTION PRIORITIES

## NATIONAL COHESIVE WILDLAND FIRE MANAGEMENT STRATEGY




The ***National Cohesive Wildland Fire Management Strategy*** (subsequently referred to as Cohesive Strategy) encourages communities to develop a dynamic approach to planning for, responding to, and recovering from wildland fires. It provides a framework for wildfire-related discussion, efforts, and goals across the United States. The overarching national strategy is further divided into three regions for tighter collaboration and coordination in each area. Hawai'i falls into the Western Region. The three categories are: Fire-Adapted Communities; Resilient Landscapes, and Safe and Effective Wildfire Response. ***Considering each and addressing all three is necessary for effective wildfire preparedness and protection***.

Public and government agency participants identified hazard reduction priorities for Leeward Haleakalā within the Cohesive Strategy categories, after first having an opportunity to learn more about each category's wildfire preparedness and safety challenges and goals. This participant input was collected via two live virtual workshops and a web-based survey. The live workshops were facilitated toward the discussion and recording of wildfire-related concerns, priorities, and recommended actions per category. Additional focused conversations were also facilitated per residential area, to capture each area's unique wildfire issues and next-step priorities. A web-based survey followed the format of the live workshops, asking participants who were unable to attend the workshops for their highest priority wildfire-related concerns per category, along with suggested actions for addressing those concerns.

Both live-workshop and web-survey input has been combined and integrated into the discussion and priorities provided below for addressing wildfire in Leeward Haleakalā. An independent summary of data from the web-based survey is provided in Appendix B.

***RESILIENT LANDSCAPES***

DISCUSSION

Across Leeward Haleakalā, vegetation is dense, dry, and very flammable. Workshop participants discussed the need for sustained maintenance of fuels and an increased capacity to manage vegetation for the long-term. A critical lack of water impacts grazing, agriculture and farming, and firefighting. The area is remote, with long distances to travel along a lone highway, impacting fuels management, firefighting response time, and creating a challenging combination of illegal dumping and the abandonment of cars without consistent enforcement or regulation.

GOALS

Landscapes (natural and culture resources) across all jurisdictions and land ownerships must be supported to become resilient to fire-related disturbances in accordance with management objectives. This includes the following:

1. Risk of wildfire occurring and impacting lands and waters is diminished.
2. Pre-fire hazards are managed and mitigated (reducing ignitions/managing vegetative fuels).
3. Sensitive resources are minimally or not damaged during wildfire events by the firefighting effort.
4. Post-fire recovery, rehabilitation, and restoration are supported.

ACTION PRIORITIES*

- Implement fuel reduction projects to reduce ignition and spread, to include all methods where appropriate: mechanical, chemical, animal, by-hand, etc.
- Mitigate roadside/highways fuels, especially by grazing.
- Support increased grazing for sustained fuels management .
- Pursue projects that increase/improve water availability for grazing, farming, and firefighting use.
- Add animal husbandry projects/operations in strategic places, such as Kahikinui. Projects can include goats, fencing, ranching, etc.
- Reach out to community about fuels management needs, explaining initial commitment vs. sustainability and maintenance; establish long-term agreements.
- Pursue funding for DLNR-DOFAW firefighting teams that do fuels management and other fire mitigation/ pre-suppression work (also listed in Wildfire Response category).
- Define, determine, maintain and prioritize fuelbreaks, especially those made during fires.
- Develop clear corridors that also serve as firefighting access.
- Establish green breaks where appropriate.
- Conduct collaborative planning and mapping of firefighting resources, infrastructure, sensitive areas, water resources, access, fuelbreaks, etc. Develop a fire management plan, which includes all these aspects.

* *The majority of action priorities in the resilient landscapes category address the treatment of hazardous fuels. This is a major priority for Leeward Haleakalā.*

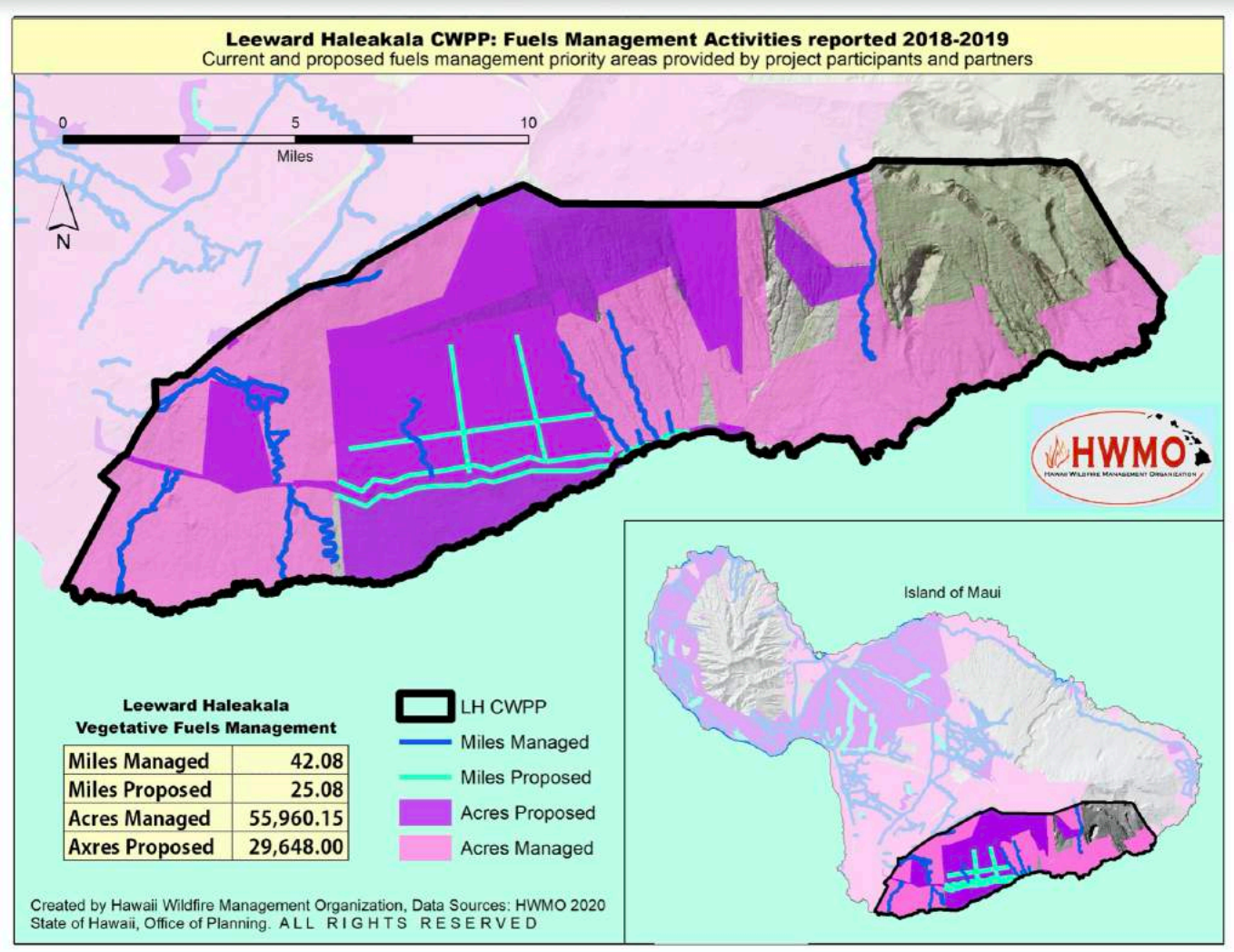
Additionally, a CWPP must identify and prioritize areas for hazardous fuel reduction treatments and recommend the types and methods of treatment that will protect one or more at-risk communities and essential infrastructure. Based on the fuel hazard ratings acquired during the hazard assessment, recommendations for the type and method of vegetative fuels reduction treatments for high fuel hazard areas are listed in Table 3 below:

| Resource, Structure, or Value at Risk | Fuel Hazard Rating | Type of Treatment |
|---|---|---|
| **Mauka forest lands, parks, reserves** | High or Extreme if unmanaged and weather conditions dry | Mechanical, hand labor, chemical, fuels conversion, animals if strategically managed |
| **Gentle sloping grasslands and scrublands** | High or Extreme if unmanaged and weather conditions dry | Mechanical, hand labor, chemical, fuels conversion, animals if strategically managed |
| **Homes, structures with large lots or heavy vegetation, and historical sites** | Moderate to Extreme | Firewise strategies around the home/ structure ignition zones. Reduce fuel along property boundaries and roadsides. Weedwhip, hand-pull, mow, grazing, herbicide, trim branches. Clear debris piles. Convert fuels to drought-tolerant, fire-resistant (preferably native) plants. Reduce ladder fuels. Complement vegetation management strategies with home hardening (replace ignitable/burnable materials with non combustible materials). |
| **Roadsides** | Moderate to Extreme (depending on location and weather conditions) | Conduct roadside fuels treatments at frequency that matches fuel growth (keep low), maximize width of roadside reduction areas. Develop a grazing corridor/buffer for long-term fuels management. Convert roadside fuels to fire-resistant plants that require little or no maintenance and are less ignitable. |
| **Unmaintained Agricultural lands** | Moderate to Extreme (depending on location and weather conditions) | Mechanical, animal, chemical, re-establish active agriculture. |

***Table 3(above). Hazardous Fuels Treatments***

In 2018, land managers across Hawai'i contributed to a fuels management mapping project, wherein those who chose to participate indicated areas that have some level of active fuels management occurring. The project was coordinated by HWMO, also the coordinator and writer of this CWPP. Participants in the mapping project also indicated areas additional areas they believe would be necessary to address with fuels management activities to achieve optimal fire mitigation. While participation was voluntary, and therefore, not a complete representation of all that is occurring and

needed in Leeward Haleakalā, it does provide a starting point for discussion and fuels management project planning (Map 21).




**Map 21. 2018-19 Voluntary reporting of current and proposed/needed hazardous fuels management activities.**

### *FIRE ADAPTED COMMUNITIES*

DISCUSSION

Despite frequent fires, many residents across Leeward Haleakalā are not as informed, engaged, or active in wildfire preparedness and hazard reduction as is necessary for optimal safety and prevention. Community outreach and education programs, technical assistance, opportunities, and capacity-building are needed. Abandoned vehicles and rubbish are building up in remote areas. Many areas are not designed for safe and effective firefighting.

GOALS

Human populations and infrastructure must be able to withstand wildfires without loss of life or property. Communities must become as prepared as possible to endure, respond to, and recover

from wildland fire. Everyone must knows they play a role in prevention and safety and must do their part. This includes the following:

1. Roles and responsibilities established in all jurisdictions and across al communities and landownership for mitigating fire threats and impacts.
2. People accept and act upon their responsibility to prepare families and properties.
3. Risk to community areas and resources, including municipal resources, is diminished.
4. Effectiveness of activities is monitored and shared and is relevant to local mitigation and other plans.

ACTION PRIORITIES

- Support residential/homeowner actions via:
  - Outreach and education
  - Firewise programming
  - Other safety campaigns
  - Technical assistance and resources (chipper days, etc.)
  - Grants to help build capacity (equipment and tools)
  - Programs that build community awareness, group mentality/culture, and attitudes toward wildfire prevention and preparedness
- Improve enforcement to reduce deliberate ignitions and abandoned vehicles:
  - Increase and maintain substantial cooperative and collective action by agencies for enforcement.
  - Consider seasonal increases in enforcement and increased presences of DOCARE and other relevant agencies.
  - Explore options for infrastructure to be based in more remote areas.
- Improve signage at access points.
- Explore the potential for community/volunteer firefighting (also in Wildfire Response section).
- Improve ingress and egress for firefighting and evacuation (also in Wildfire Response section).
  - Ingress and egress
  - Wider roads
  - Adequate turnarounds
  - Staging areas
  - Road and fuelbreak signs
- Provide information, and pursue outreach and eduction programs for residents and area managers to treat structural ignitability of homes and buildings.*

** Strategies for treating structural and home/yard ignitability in Hawai'i have been established through the Hawai'i version of the Ready, Set, Go! Action guide. This informational resource is included as Appendix A of this document and should be used by residents in Leeward Haleakalā to treat structural, home, and yard ignitability.*

## *SAFE AND EFFECTIVE WILDFIRE RESPONSE*

DISCUSSION

Due to the remoteness of the area and the limited infrastructure throughout, many residential areas are poorly set up for wildfire response. The most pressing issue is a lack of water, but long response times due to distance, ingress/egress issues, inadequate road signage for location homes, and an increasing number of lots being developed contribute to firefighting challenges.

GOALS

All jurisdictions will continuously work together toward making and implementing safe, effective, efficient risk-based wildfire management decisions to ensure that:

1. Injuries and loss of life for public and firefighters is diminished.
2. Adequate infrastructure and capacity: water, access, equipment, training.
3. Pre-fire multi-jurisdictional planning occurs.
4. Response, esp. when jurisdiction is shared, is efficient and effective.

ACTION PRIORITIES

- Increase firefighting capacity, including personnel/staffing and additional fire stations in remote/rural areas.
- DLNR-DOFAW pursue the development of a team that does brush abatement as well as suppression.
- Advocate and work toward increased firefighting budgets.
- Develop better systems for mutual aid reimbursements among agencies.
- Increase communication between Kahikinui and DLNR-DOFAW re firefighting budgets .
- Create designated points of contact for each landowner for keys and access, establish lockboxes where appropriate.
- Establish additional water resources.
- Restore and reline existing water infrastructure.
- Install fuel stations for helicopters in strategic areas to reduce response time and decrease travel time required for refueling of helicopters.
- Consider/explore radio communications for community leads/points of contact.
- Improve infrastructure design and access for firefighting and evacuation (also in Communities section):
    - Ingress and egress
    - Wider roads
    - Adequate turnarounds
    - Staging areas
    - Road and fuelbreak signs
- Conduct collaborative planning and mapping of firefighting resources, infrastructure, sensitive areas, water resources, access, fuelbreaks, etc. Develop a fire management plan, which includes all these aspects. (Also in Resilient Landscapes section).
- Include more people, including residents and community members in fire response planning, coordination, and communications.

# ACTION PRIORITIES PER AREA

***KANAIO***

- Engage and support the community to coordinate the development of a community association.
- Work to organize a hui to establish a culture of being proactive.
- Work on community development to better understand and address social issues that add to fire and safety hazards.
- Protect and engage people via safety programs and working directly with residents.
- Increase enforcement, rules, regulations, and ordinances.
- Enhance county program for abandoned vehicles.
- Address road labeling to improve locating people during emergencies.
- Update maps to show roads, fuelbreaks, houses.
- Install signage to navigate roads during emergencies.
- Establish water resources.
- Establish and/or improve water system:
    - Hydrant system
    - Storage tank to feed hydrant system
    - Improve, maintain, and repair existing water lines and water supply
- Make a task force planning session to pursue these projects and build support:
    - Keep these needs and projects active with elected officials through coordinated follow-up and outreach at least every 3 months, invite them to task force meetings
    - Apply for GIA or CIP funding to develop water infrastructure
    - Approach County for water to serve Kanaio and firefighting
    - Explore and pursue CARES Act funding for these projects

***KAUPO-KIPAHULU***

- Prioritize establishing and improving the water situation.
    - Work on reservoirs
    - Work on issue of water not being a public water system
    - Reline reservoirs and add a second smaller reservoir
- Map out where helicopter can land
- Establish a firefighting staging area, and over time, how to get a fire station in the area.
- Improve community awareness via outreach and education:
    - Firewise
    - Hunter campaigns
    - Campfire safety workshops
    - Fire extinguisher training
    - Equipment safety
    - Passive information stations (that community owns/sustains)
- Improve road maintenance, access, and signage for firefighters.
- Explore how conservation crews could help with reporting fire or responding.

- Establish practice of letting MFD/MPD know when crews are in high fire danger areas and out of communication range.
- Establish mechanisms (dumpsite or other) for dumping waste of different kinds that are currently limited:
    - Household trash (dump station)
    - Green waste (Hold chipper days or chipper/veg waste station for community)
    - Abandoned vehicles and other equipment

***KAHIKINUI***

- Improve access to water and water infrastructure:
    - Conduct planning for water resources.
    - Install and/or reactivate reservoirs.
    - Research options for water resources to improve water availability for both homesteaders and firefighting.
    - Add water resources and infrastructure to support grazing.
- Improve firefighting access, safety, and response operations:
    - Widen access road from main highway to community center.
    - Increase width of the corridor (50-100ft).
    - GPS newly paved roads, Jeep/Fuelbreak Road.
    - Install road signage for streets and fuel break roads.
    - GPS and map out infrastructure, including water sources, roads, gates.
    - Establish system for locks and points of contact.
    - Explore options and establish community access to secondary egress for emergencies.
    - Improve forest access roads for safe evacuation from forest.
- Increase and improve community outreach and education:
    - Provide outreach and training programs regarding fire mitigation strategies and to build capacity to address immediate needs, implement stop-gap measures, and establish a long-term vision and action plan.
- Create firebreak system that can be sustainably maintained, prioritizing fire suppression tactics, firefighter safety, and long-term fuels management capacity (by community, agencies, and all responsible entities):
    - Re-establish dozer breaker (regrade, resurface).
    - Coordinate ongoing maintenance for breaks.
    - Create grazing corridors and water/infrastructure for long-term grazing.
    - Conduct regular roadside fuels management via reduction, grazing, and/or green-breaks (as secondary buffer and to reduce regrowth).
    - Establish additional firebreaks that are compartmentalized and manageable.
    - Increase passive fuels reduction.
    - Install fencing along community boundaries to control wild cattle and aid fuels management.
    - Create a strategic grazing area around the community.
- Establish safe, enforced, and less hazardous means for green waste disposal.

# CWPP IMPLEMENTATION AND MAINTENANCE

HFRA requires that the MFD, County of Maui Civil Defense Agency, and DLNR-DOFAW all agree on the final contents of the Leeward Haleakalā CWPP. The plan is signed by each agency in order to meet HFRA and FEMA requirements.

Across the state and country, there is a changing understanding and paradigm related to wildfire: reducing wildfire occurrence and impacts takes the participation and action of all who live and work in an area. There is a role for everyone to play to reduce risk, enhance preparedness, and ensure the safety and integrity of our community and natural resources. Firefighting is the last line of defense, with much to also be done ahead of time to reduce fire's ability to ignite and spread, and to prepare homes and people to withstand wildfire.

It is for these reasons that the Leeward Haleakalā CWPP was developed: to collaborate, co-determine priorities, and encourage participation by all parties. ***Because of the non-regulatory nature of the CWPP, the relevance and effectiveness of the North Shore CWPP will rely heavily upon initiative and involvement by individuals, groups, organizations, and government in the North Shore area.***

Participants in the Leeward Haleakalā Fire Task Force (LHFTF) and HWMO intend to provide technical support, identify and coordinate funding when possible, and serve as a centralized resource for wildfire risk reduction efforts in Leeward Haleakalā. Together, representatives will identify sources of funding for projects, document the successes and lessons learned from those projects, and evaluate and update the CWPP as needed and as possible. Area residents are urged to contribute time and effort toward creating defensible space, reducing structural ignitability, and working at the community level to initiate and maintain wildfire protection projects. Decision makers and elected officials are encouraged to support these efforts through appropriate budgets and policies.

Additionally, as Hawai'i's community liaison to the national Firewise program, and in partnership with MFD and DLNR-DOFAW, HWMO will work with any community in Leeward Haleakalā that is interested in undergoing the Firewise USA® recognition process. This includes forming a local Firewise committee and action team, completing a comprehensive hazard assessment specific to their subdivision, and sustaining neighborhood-level action toward risk reduction. Kahikinui is already a recognized Firewise USA® community, and has kept its recognized status through successful mitigation efforts for several years now, with no anticipated change in that effort. There is a statewide network of such communities available for inspiration, the sharing lessons learned, and next-level learning.

Many Leeward Haleakalā CWPP action items will require continuing support for wildfire risk mitigation projects. This will involve actively pursuing funding for projects, staying informed and in contact with one another, and updating this CWPP regularly so that it remains a "living" document. All who have been involved in the development of this CWPP are committed to building community awareness of these issues so that Leeward Haleakalā will continue to make progress toward the goals of having Fire Adapted Communities, Resilient Landscapes, and Safe and Effective Wildfire Response in Leeward Haleakalā.

# APPENDIX

APPENDIX A:

READY, SET, GO! HAWAI'I VERSION WILDFIRE ACTION GUIDE

APPENDIX B:

WEB-BASED SURVEY RESULTS

APPENDIX C:

2024 PRIORITY PROJECTS AND ACTIONS

# APPENDIX A

## READY, SET, GO! HAWAI'I VERSION WILDFIRE ACTION GUIDE

Includes the following key information:

- Wildfire in Hawai'i Overview
- 🏠 Firewise Landscaping Recommendations
- 🏠 Home Hardening
- Family Emergency Planning
- Situational Awareness
- Evacuation

🏠 *Items with this symbol fulfill the CWPP requirement for strategies to reduce structural ignitability.*

# READY, SET, GO!

## YOUR PERSONAL WILDLAND FIRE ACTION GUIDE

Rev. 2021


HWMO
HAWAII WILDFIRE MANAGEMENT ORGANIZATION
HawaiiWildfire.org

This guide was developed by Hawaii Wildfire Management Organization, in partnership with:

READY, SET, GO!

# READY, SET, GO!

## Wildland Fire Action Guide

Saving Lives and Property
Through Advanced Planning

The fire season is now a year-round reality in many areas across the Hawaiian Islands, requiring firefighters and residents to be on heightened alert for the threat of wildland fire.

Each year, wildland fires consume hundreds of homes across the nation in the Wildland-Urban Interface (WUI), and Hawaii is at a similar risk. Studies show that as many as 80 percent of the homes lost to wildland fires could have been saved if their owners had only followed a few simple fire-safe practices. In addition, wildland fire related deaths occur because people wait too long to leave their home.

In the event of a wildland fire, our first responders take every precaution to help protect you and your property. However, the reality is that in a major wildland fire event, there will simply not be enough fire resources or firefighters to defend every home.

Successfully preparing for a wildland fire enables you to proactively take personal responsibility for protecting yourself, your family and your property. In this Action Guide, we hope to provide the tips and tools you need to prepare for a wildland fire threat (Ready), have situational awareness when a fire starts (Set), and to act early (Go!).

The Ready, Set, Go! Program works in complimentary and collaborative fashion with the Firewise USA® program and other existing wildland fire public education efforts. Utilizing firefighters and local wildland fire prevention expertise, it amplifies their messages to individuals to better achieve the common goal of wildland fire preparedness.

Many residents have built homes and landscaped without fully understanding the impact a fire can have on them and few have adequately prepared their families for a quick evacuation.

It's not a question of **if** but **when** the next major wildland fire will occur. Through advanced planning, understanding and preparation, we can all be partners in the wildland fire solution. We hope you find the tips in the following pages helpful in creating heightened awareness and a more fire-safe environment for you, your family and firefighters.

## INSIDE



This publication was produced by Hawaii Wildfire Management Organization (HWMO), made possible through a grant from the USDA Forest Service and with the help of HWMO's partners from Hawaii Department of Land and Natural Resources - Division of Forestry and Wildlife, College of Tropical Agriculture and Human Resources of the University of Hawaii at Manoa, Hawaii Fire Department, Honolulu Fire Department, Kauai Fire Department, and Maui Fire Department, and the Pacific Fire Exchange project, in a cooperative effort with the International Association of Fire Chiefs. HWMO is an equal opportunity employer. The national RSG! Program is managed by the International Association of Fire Chiefs, funded by the United States Department of Agriculture Forest Service, the United States Department of the Interior, with partner support from the United States Fire Administration, Firewise USA, and the Insurance Institute for Business and Home Safety. For more information on the RSG! Program, please visit www.wildlandfireRSG.org. This Hawaii version of the RSG Action Plan is being funded in part by The Cooperative Fire Program of the U.S. Forest Service, Department of Agriculture, Region 5. In accordance with Federal law and U.S. Department of Agriculture policy, this institution is prohibited from discriminating on the basis of race, color, national origin, sex, age, or disability. (Not all prohibited bases apply to all programs.) To file a complaint of discrimination, write USDA, Director, Office of Civil Rights, Room 326-W, Whitten Building, 1400 Independence Avenue, SW, Washington, DC 20250-9410 or call (202) 720-5964 (voice and TDD). USDA is an equal opportunity provider and employer.

# Living in the Wildland Urban Interface and the Ember Zone

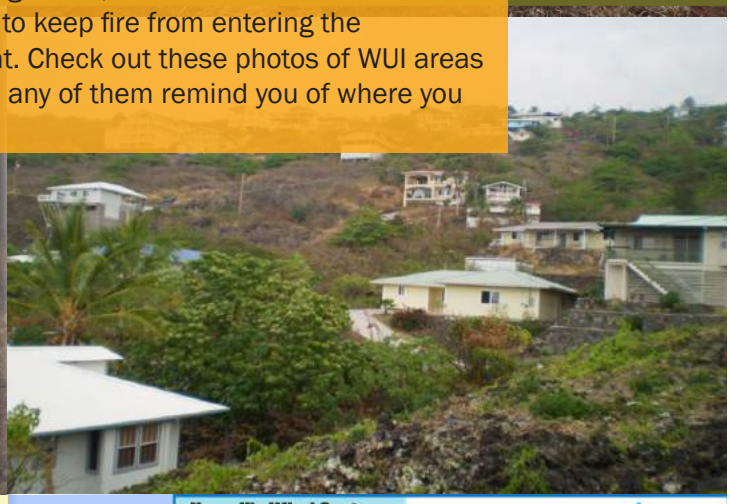
Ready, Set, Go! Begins with a House That Firefighters Can Defend

## Defensible Space Works!

If you live next to a natural area, the Wildland Urban Interface, you should provide firefighters with the defensible space they need to protect your home. The buffer zone you create by removing weeds, brush and other vegetation helps keep the fire away from your home and reduces the risk from flying embers. Firewise Communities and other wildland fire preparedness education programs provide valuable guidance on property enhancements.

## Consider This

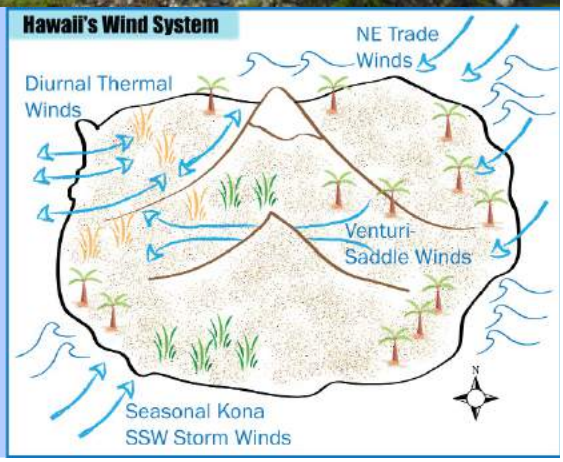
Unmanaged vegetation between and around homes increases the risk of wildland fire spreading throughout the community, endangering lives and property. Pre-fire planning, fuels management, and sufficient fuelbreaks allow firefighters the space they need to keep fire from entering the community during a wildland fire event. Check out these photos of WUI areas from different parts of the islands. Do any of them remind you of where you and your family live?



### Not Only the Homes on the Wildland Boundary are at Risk

A home within one mile of a natural area is in the Ember Zone. Wind-driven embers can attack your home. You and your home must be prepared well before a fire occurs. Ember fires can destroy homes or neighborhoods far from the actual flame front of the wildland fire. These threats are amplified in Hawaii due to the culmination of thermal, saddle, storm, and trade winds that create a complex system of strong, erratic winds (see diagram on right).

Fire is wind-driven.
Know your wind-related risks.

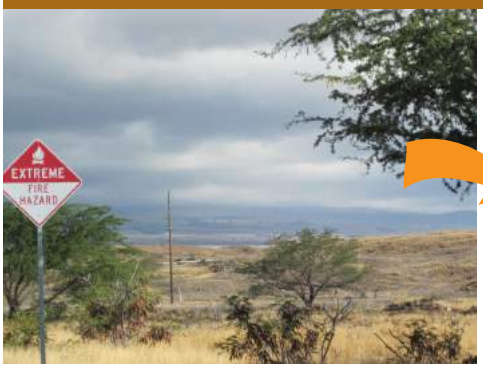


# Hawaii's Growing Wildland Fire Problem

## And Why We Should Be Concerned

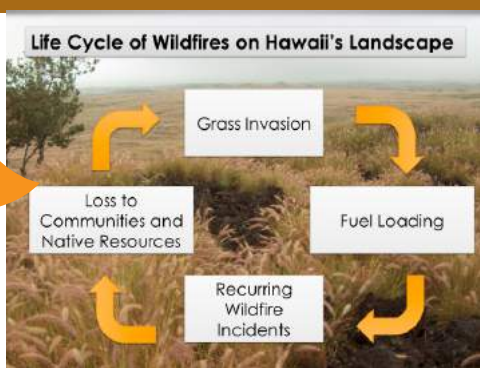
Traditionally, Hawaii ecosystems existed with a very limited presence of wildland fire. However, as climate conditions and land uses have changed over recent time, non-native, fire-adapted vegetation have rapidly spread through our wildland landscapes and toward community boundaries. In addition, communities are expanding further into fire-prone areas, increasing the risk of wildland fires that threaten natural resources, including native habitats, and people's lives and homes.

## Impacts on Natural Resources




Invasive vegetation such as guinea and fountain grass spread easily and rapidly.

These plants also ignite easily. After the fire, they re-sprout and out-compete native plants, spreading over a larger area than before.




All it takes is another spark and the same area will burn hotter, more intensely, and over a larger area than before. This creates a vicious fire cycle.

Wildland fire, fueled by the build-up of dry vegetation and driven by a complex system of hot dry winds, are extremely difficult, expensive, and dangerous to control. Hawaii's wide diversity of challenging terrains add to the challenge for firefighters.

### Did You Know?

26% of the state land cover is nonnative grassland. These grasses are fire-prone and spread more and more with each fire.

## Mauka Fires Affect Makai Health and Safety


Large fires destroy vegetation that help hold down soil. Heavy winds can lift the soil and create dust storms that impact air quality and human health.

In addition, Hawaii's high-intensity rain events can sweep away soil through erosion, runoff and landslides.

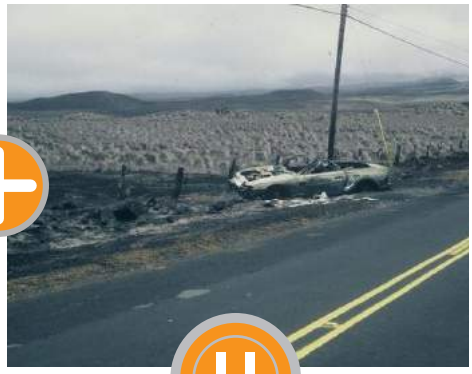
Rivers and streams carry the debris and sediment into the ocean polluting coral reefs and negatively affecting sea life. This adversely affects commerce such as fishing and marine/coastal-based tourism.

# Impacts on People & Communities

Towns and cities expanding outwardly into formerly undeveloped areas...

and large areas of fallow, invasive, or un-managed vegetation...

and a steady increase in human ignition sources via human error and intention...



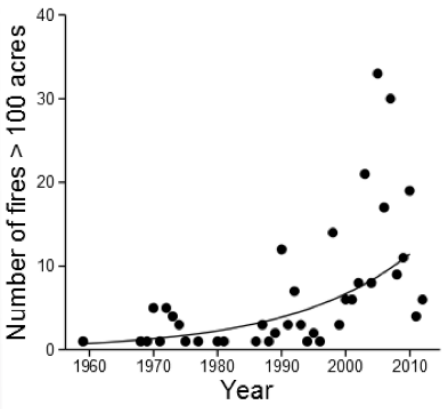
## Did You Know?

Hawaii experiences more than 1,000 wildfires per year, burning an average of 20,000- 40,000 acres each year.

On average, every island has at least one 1,000 acre fire every year.

Wildfires in Hawaii are increasing in size, frequency, and impacts.

Every island and every area (windward, leeward, mauka, makai) can be at risk under the right conditions, mainly during periods of dry weather and high winds.

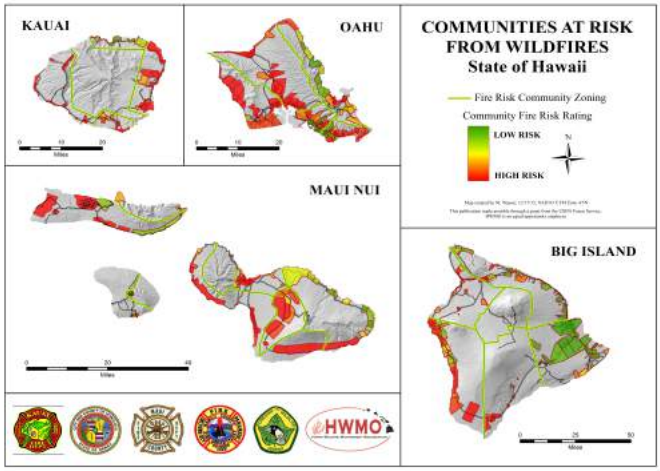



...are increasing the size, frequency, and intensity of fires across all of the islands on both wet and dry sides.

# Future Outlook

Climate change is increasing the length and frequency of drought periods, creating drier conditions. Scientists predict these trends will continue and even worsen, which will result in larger fires that are more severe and intense. As more areas become drier, they will become more prone to wildfire. If your area is currently low risk in the map below, it likely is still at risk during very dry periods. Under certain conditions, such as dry periods and heavy winds, anywhere can burn, and we are seeing that occur. As a result, it's best if you take action now, rather than later, when it may be too late.

The Communities at Risk from Wildfires Map (on right) was the result of an effort that looked at 36 hazard characteristics that contribute to wildfire risk for neighborhoods and communities (gray areas were NOT assessed). Many of Hawaii's communities are at moderate to high risk of wildfire for reasons ranging from climate to lack of water to lack of community awareness and action. Many of the challenges are ones we can address with collaborative action.




## How You Can Make a Difference

We need to create **resilient landscapes and communities** across Hawaii. You can play a significant role by increasing resilience in and around your own home and preparing your family for a potential wildland fire event. Use the following pages as a guideline.

# What is Defensible Space?


Defensible space is the required space between structures and the wildland area that, under normal conditions, creates a sufficient buffer to slow or halt the spread of wildfire to a structure. It protects the home from igniting due to direct flame or radiant heat. Defensible space is essential for structure survivability during wildland fire conditions. For more information about defensible space zones and preparedness techniques within each, visit the Firewise USA® website, www.firewise.org.

## ZONE ONE

Zone One extends 30 feet out from buildings, structures, decks, etc.

- Remove all dead or dying vegetation.
- Remove "**ladder fuels**" (low-level vegetation that allows the fire to spread from the ground to the tree canopy). Create at least 6 feet of separation between low-level vegetation and tree branches. This can be done by reducing the height of low-level vegetation and/or trimming low tree branches.
- Create "fire-free" area within 5 feet of home, using non-flammable landscaping materials and/or high-moisture content, drought-resistant vegetation.
- Trim tree canopies regularly to keep their branches a minimum of 10 feet from structures and other trees.
- Remove leaf litter (dry leaves/pine needles) from yard, roof and rain gutters.
- Relocate woodpiles or other combustible materials into Zone Two.
- Remove combustible material and vegetation from around and under decks, lanai, or the entire house if foundation is post-and-pier.
- Remove or prune vegetation near windows.

## ZONE TWO *

Zone Two extends 30 to 100 feet out from buildings, structures and decks. You can minimize the chance of fire jumping from plant to plant by removing dead material and removing and/or thinning vegetation. The minimum spacing between vegetation is three times the dimension of the plant.

- Remove "ladder fuels."
- Cut or mow annual grass down to a maximum height of 4 inches.
- Trim tree canopies regularly to keep their branches a minimum of 10 feet from other trees/cluster of trees.

* For larger properties, consider areas outside of Zone Two as a third zone to address. Continue reducing ladder fuels, managing fuels, hardening structures, and properly storing combustible materials.

# Actions You Can Take Today!

Weed around the property regularly, especially areas that a lawn mower is not appropriate for (tall dry grasses, rocky terrain, etc.)

Remove leaf litter and other debris that accumulate around the building, under vegetation, and other collection areas.

Remove leaf litter, straw and other debris from under and around propane tanks to create 10 feet of clearance around it.

Eliminate ladder fuels by pruning tree branches on trees around the property to within at least 6 feet of the ground, using a bypass lopper (seen above), pruner saw, or long reach/hand pruner.

Remove flammable materials from underneath the house, decks, porches, and lanai. Common flammables include scrap-wood, firewood, and combustible furniture.

Mow the lawn regularly to keep grasses shorter than 4 inches tall around the home. Do not mow in the heat of the day or when the wind is blowing. Never mow in dry vegetation.

## Watch Out for Exotic Vegetation

Non-native trees, such as ironwood (seen below) constantly drop needles, leaves, branches, and other debris, so it's best to stay on top of removing them from the ground before the pile becomes a major project. Consider reforesting these areas with native trees that don't drop large amounts of debris.

Invasive grasses such as guinea and fountain grass grow rapidly when un-managed and can dry out very quickly, creating a major fire hazard. Weed them often and consider replanting with low-lying, drought-tolerant, native ground cover.

# Defensible Space - Hawaiian Style

**Consider selecting native plants from this list that are most relevant to your area:**


Mamaki


Kolea


Maia Pilo


‘Ilima Papa


Bonamia


‘Ākia


‘A‘ali‘i


‘Akoko


‘Ihi


Nānū


Pōhinahina


Ma‘o Hau Hele


Koki‘o


‘Ūlei


Wiliwili


Koai‘a


Uhiuhi


Hala Pepe


‘Ohi‘a Lehua


Ko‘oko‘olau


‘Ohe Makai


‘Iliahi


Nehe


Alahe‘e


‘Ala‘ala Wai Nui


Kolomona


Koai‘a

Creating defensible space does not necessarily mean eliminating the presence of greenery on your property. You can still landscape around your home to make it fire-safe without compromising beauty and aesthetics. By planting native, drought-tolerant plants (**xeriscaping**) around your home, you can:

- Protect your home from wildland fire ignition and spread
- Beautify your property
- Perpetuate an important natural and cultural resource
- Decrease the maintenance needs of your landscaping

For the drier areas of Hawaii, consider that native dryland plants are specially adapted to local conditions and require less upkeep, water, and fire maintenance, saving yourself a great deal of time, money, and resources. Non-native, lush plants often drop hazardous debris and can become fire prone in drought conditions.

## Homes with Great Xeriscaping

### Did You Know?

The same winds that blow hazardous debris toward a collection area (underneath shrubs, under the lanai, next to outer edges of home, etc.) will likely carry embers during a wildland fire to that same spot, and ignite that pile. That’s why it’s incredibly important to consistently remove debris from these areas long before a wildland fire occurs.

# What is a Hardened Home?

Construction materials and the quality of the defensible space surrounding it are what give a home the best chance to survive a wildland fire. Embers from a wildland fire will find the weak link in your home's fire protection scheme and gain the upper hand because of a small, overlooked or seemingly inconsequential factor. However, there are measures you can take to safeguard your home from wildland fire. While you may not be able to accomplish all the measures listed below, each will increase your home's, and possibly your family's, safety and survival during a wildland fire.

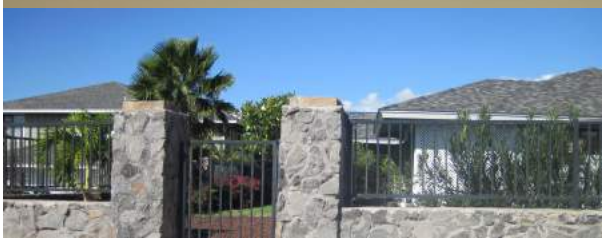
## Home Improvements

Gutter Guards or Screens

Enclosed Eaves

Screened Vents

Non-Combustible Fencing



Windows Clear of Vegetation

### ROOFS

Roofs are the most vulnerable surface where embers land because they can lodge and start a fire. Roof valleys, open ends of barrel tiles and rain **gutters** are all points of entry.

### EAVES

Embers can gather under open **eaves** and ignite exposed wood or other combustible material.

### VENTS

Embers can enter the attic or other concealed spaces and ignite combustible materials. Vents in eaves and cornices are particularly vulnerable, as are any unscreened **vents**.

### WALLS and FENCING

Combustible siding or other combustible or overlapping materials provide surfaces or crevices for embers to nestle and ignite. Combustible **fencing** can become engulfed and if attached to the home's sidings can carry the fire right to the home.

### WINDOWS and DOORS

Embers can enter gaps in doors, including garage doors. Plants or combustible storage near **windows** can be ignited from embers and generate heat that can break windows and/or melt combustible frames.

### BALCONIES and DECKS

Embers can collect in or on combustible surfaces or the undersides of decks, lanai, and balconies, ignite the material and enter the home through walls or windows. Post-and-pier homes, common throughout Hawaii, are especially vulnerable since most, if not all, of the underside of the house is exposed.

To harden your home even further, consider protecting your home with a residential fire sprinkler system. In addition to extinguishing a fire started by an ember that enters your home, it also protects you and your family year-round from any fire that may start inside your home.

# Creating a Safe Ho

**Roof:** Your roof is the most vulnerable part of your home because it can easily catch fire from wind-blown embers. Homes with wood-shake or shingle roofs are at high risk of being destroyed during a wildland fire.

Build your roof or re-roof with fire-resistant materials such as composition, **metal** (as seen in picture) or tile. Block any spaces between roof decking and covering to prevent ember intrusion.

Clear pine needles, leaves and other debris from your roof and gutters.

Cut any tree branches within ten feet of your roof.

**Deck/Patio Cover**: Use heavy timber or non-flammable construction material for decks.

Enclose the underside of balconies and decks with fire-resistant materials to prevent embers from blowing underneath.

Keep your deck clear of combustible items, such as baskets, dried flower arrangements and other debris.

The decking surface must be ignition resistant if it's within 10 feet of the home.

**Inside**: Keep working fire extinguishers on hand.

Install smoke alarms on each level of your home and near bedrooms. Test them monthly and change the batteries twice a year.

**Non-Combustible Fencing:** Make sure to use non-combustible fencing to protect your home during a wildland fire.

**Home Site and Yard:** Ensure you have at least a 100-foot radius of defensible space (cleared vegetation) around your home. Note that even more clearance may be needed for homes in severe hazard areas. This means looking past what you own to determine the impact a common slope or neighbors' yard will have on your property during a wildland fire.

Cut dry weeds and grass before noon when temperatures are cooler to reduce the chance of sparking a fire.

Landscape with fire-resistant plants that have a high moisture content and are low-growing.

Keep woodpiles, propane tanks and combustible materials away from your home and other structures such as garages, barns and sheds.

Ensure that trees are far away from power lines.

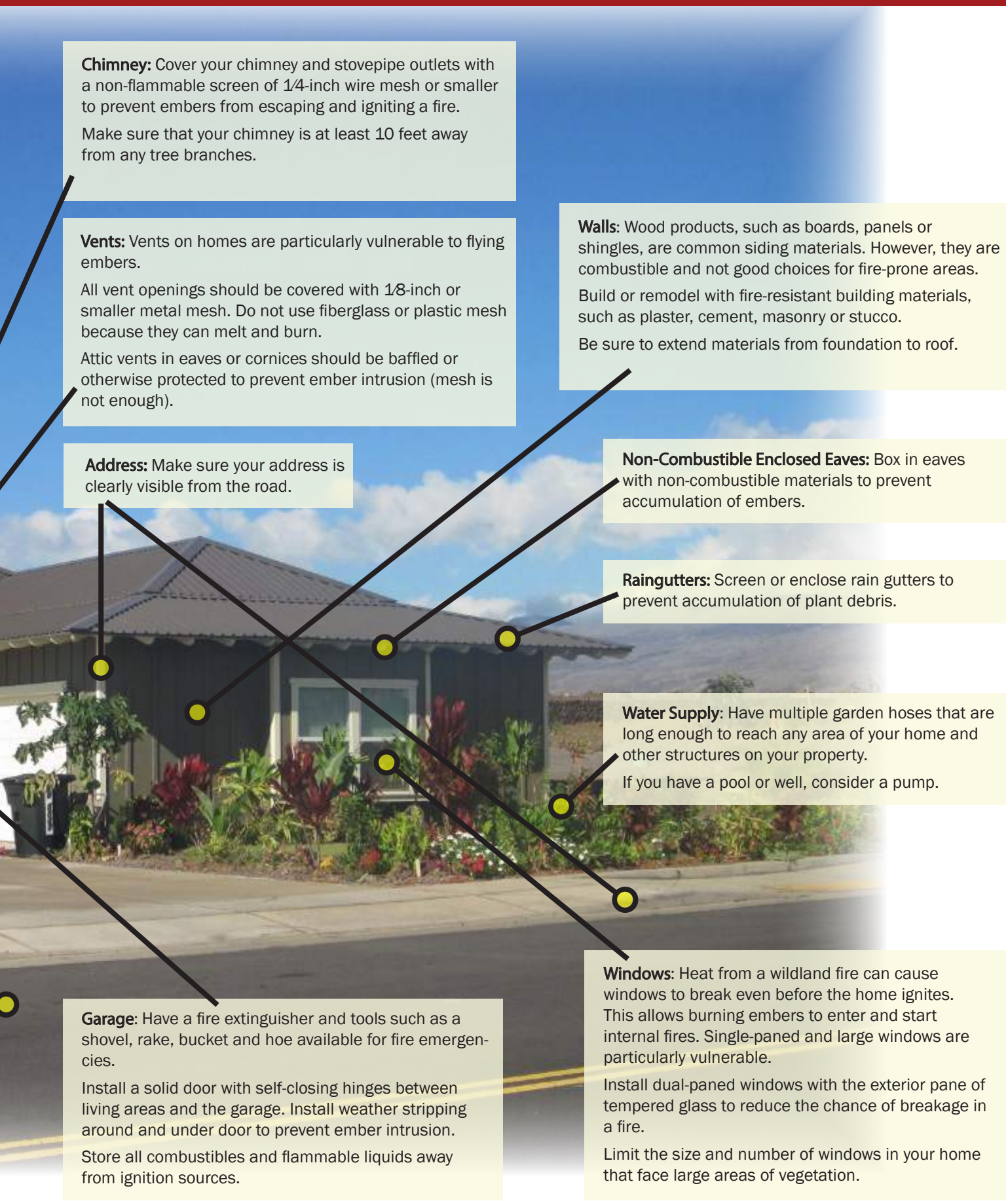
**Driveways and Access Roads**: Driveways should be designed to allow fire and emergency vehicles and equipment to reach your house.

Access roads should have a minimum 10-foot clearance on either side of the traveled section of the roadway and should allow for two-way traffic.

Ensure that all gates open inward and are wide enough to accommodate emergency equipment.

Trim trees and shrubs overhanging the road to a minimum of 13 1⁄2 feet to allow emergency vehicles to pass.

# ome in the WUI



**Chimney:** Cover your chimney and stovepipe outlets with a non-flammable screen of 1⁄4-inch wire mesh or smaller to prevent embers from escaping and igniting a fire.

Make sure that your chimney is at least 10 feet away from any tree branches.

**Vents:** Vents on homes are particularly vulnerable to flying embers.

All vent openings should be covered with 1⁄8-inch or smaller metal mesh. Do not use fiberglass or plastic mesh because they can melt and burn.

Attic vents in eaves or cornices should be baffled or otherwise protected to prevent ember intrusion (mesh is not enough).

**Address:** Make sure your address is clearly visible from the road.

**Walls**: Wood products, such as boards, panels or shingles, are common siding materials. However, they are combustible and not good choices for fire-prone areas.

Build or remodel with fire-resistant building materials, such as plaster, cement, masonry or stucco.

Be sure to extend materials from foundation to roof.

**Non-Combustible Enclosed Eaves:** Box in eaves with non-combustible materials to prevent accumulation of embers.

**Raingutters:** Screen or enclose rain gutters to prevent accumulation of plant debris.

**Water Supply**: Have multiple garden hoses that are long enough to reach any area of your home and other structures on your property.

If you have a pool or well, consider a pump.

**Garage**: Have a fire extinguisher and tools such as a shovel, rake, bucket and hoe available for fire emergencies.

Install a solid door with self-closing hinges between living areas and the garage. Install weather stripping around and under door to prevent ember intrusion.

Store all combustibles and flammable liquids away from ignition sources.

**Windows**: Heat from a wildland fire can cause windows to break even before the home ignites. This allows burning embers to enter and start internal fires. Single-paned and large windows are particularly vulnerable.

Install dual-paned windows with the exterior pane of tempered glass to reduce the chance of breakage in a fire.

Limit the size and number of windows in your home that face large areas of vegetation.

# READY, SET, GO!

## Create Your Own Action Guide

Now that you've done everything you can to protect your house, its time to prepare your family. Your **Wildland Fire Action Guide** must be prepared with all members of your household well in advance of a fire. Use these checklists to help you gain a situational awareness of the threat and to prepare your Wildland Fire Action Guide. For more information on property and home preparedness before a fire threat, review the preparedness checklist on the Firewise Communities website, www.firewise.org.

# Ready – Preparing for the Fire Threat

### Take Action for Your Community

- ☐ Talk to your community members and community association about creating a Community Wildfire Protection Plan (CWPP). Hawaii Wildfire Management Organization can assist with this process.
- ☐ Coordinate with local county CERT teams.
- ☐ Get to know your neighbors. If there are any elderly or handicapped residents, or others with limited mobility, plan with them on how you can best assist them in the event of a wildland fire.

- ☐ Create a **Family Disaster Plan** that includes meeting locations and communication plans and rehearse it regularly. Include in your plan the evacuation of pets and large animals such as horses.
- ☐ Have fire extinguishers on hand and train your family how to use them.
- ☐ Ensure that your family knows where your gas, electric and water main shut-off controls are and how to use them.
- ☐ Plan several different evacuation routes.
- ☐ Designate an emergency meeting location outside the fire hazard area.
- ☐ Assemble an emergency supply kit as recommended by the American Red Cross (www.redcross.org).
- ☐ Appoint an out-of-area friend or relative as a point of contact so you can communicate with family members who have relocated.
- ☐ Maintain a list of emergency contact numbers posted near your phone and in your emergency supply kit.
- ☐ Keep an extra emergency supply kit in your car in case you can't get to your home because of fire.
- ☐ Have a portable radio or scanner so you can stay updated on the fire.
- ☐ Have a clear list and easy access location for necessary medications, glasses and other health aids.

# Set – Situational Awareness When a Fire Starts

- [ ] Evacuate as soon as you are set! Do not wait for evacuation orders. Get out early - you can always return home if it is safe. This protects you, decreases traffic, and allows firefighters to focus on fire suppression. See more under the "Go" section.
- [ ] Alert family and neighbors.
- [ ] Dress in appropriate clothing (i.e., clothing made from natural fibers, such as cotton, and work boots). Have goggles and a dry bandana or particle mask handy.
- [ ] Ensure that you have your emergency supply kit on hand that includes all necessary items, such as a battery powered radio, spare batteries, emergency contact numbers, and ample drinking water.
- [ ] Stay tuned to your TV or local radio stations for updates, or check the fire department Web site.
- [ ] Remain close to your house, drink plenty of water and keep an eye on your family and pets until you are ready to leave.

## If You are Trapped: Survival Tips

- [ ] Shelter away from outside walls.
- [ ] Bring garden hoses inside house so embers don't destroy them.
- [ ] Patrol inside your home for spot fires and extinguish them.
- [ ] Wear long sleeves and long pants made of natural fibers such as cotton.
- [ ] Stay hydrated.
- [ ] Ensure you can exit the home if it catches fire (remember if it's hot inside the house, it is four to five times hotter outside).
- [ ] Fill sinks and tubs for an emergency water supply.
- [ ] Place wet towels under doors to keep smoke and embers out.
- [ ] After the fire has passed, check your entire property and extinguish any fires or embers.
- [ ] If there are fires that you can not extinguish with a small amount of water or in a short period of time, call 9-1-1.

## Outside Checklist

- [ ] Gather up flammable items from the exterior of the house and bring them inside (e.g., patio furniture, children's toys, door mats, etc.) or place them in your pool.
- [ ] Turn off propane tanks.
- [ ] Don't leave sprinklers on or water running - they can waste critical water pressure.
- [ ] Leave exterior lights on.
- [ ] Back your car into the driveway. Shut doors and roll up windows.
- [ ] Have a ladder available.
- [ ] Patrol your property and extinguish all small fires until you leave.
- [ ] Seal attic and ground vents with pre-cut plywood or commercial seals if time permits.

## Inside Checklist

- [ ] Shut all windows and doors, leaving them unlocked.
- [ ] Remove flammable window shades and curtains and close metal shutters.
- [ ] Remove lightweight curtains.
- [ ] Move flammable furniture to the center of the room, away from windows and doors.
- [ ] Shut off gas at the meter. Turn off pilot lights.
- [ ] Leave your lights on so firefighters can see your house under smoky conditions.
- [ ] Shut off the air conditioning.

# Go – Leave Early

By leaving early, you give your family the best chance of surviving a wildland fire. You also help firefighters by keeping roads clear of congestion, enabling them to move more freely and do their job in a safer environment.

## WHEN TO LEAVE

Leave early enough to avoid being caught in fire, smoke or road congestion. Don't wait to be told by authorities to leave. In an intense wildland fire, they may not have time to knock on every door. If you are advised to leave, don't hesitate!

## WHERE TO GO

Leave to a predetermined location (it should be a low-risk area, such as a well-prepared neighbor or relative's house, a Red Cross shelter or evacuation center, motel, etc.). Your local Community Wildfire Protection Plan will also have locations listed.

## HOW TO GET THERE

Have several travel routes in case one route is blocked by the fire or by emergency vehicles and equipment. Choose an escape route away from the fire.

## WHAT TO TAKE

Take your emergency supply kit containing your family and pet's necessary items.

## EMERGENCY SUPPLIES

The American Red Cross recommends every family have an emergency supply kit assembled long before a wildland fire or other emergency occurs. Use the checklist below to help assemble yours. For more information on emergency supplies, visit the American Red Cross Web site at www.redcross.org.

- ☐ Three-day supply of water (one gallon per person per day).
- ☐ Non-perishable food for all family members and pets (three-day supply).
- ☐ First aid kit.
- ☐ Flashlight, battery-powered radio, and extra batteries.
- ☐ An extra set of car keys, credit cards, cash or traveler's checks.
- ☐ Sanitation supplies.
- ☐ Extra eyeglasses or contact lenses.
- ☐ Important family documents and contact numbers.
- ☐ Map marked with evacuation routes.
- ☐ Prescriptions or special medications.
- ☐ Family photos and other irreplaceable items.
- ☐ Easily carried valuables.
- ☐ Personal computers (information on hard drives and disks).
- ☐ Chargers for cell phones, laptops, etc.

Note: Keep a pair of old shoes and a flashlight handy in case of a sudden evacuation at night.

# READY, SET, GO!

## For Large Landowners & Land Managers

# Ready

### Prepare Your Family, Employees, and Visitors

- ☐ Go through the previous guidelines (pgs. 12-14) with your family in addition to this section.
- ☐ Have at least two exits for your headquarters and primary residence for your evacuation plan.
- ☐ If you have a GPS device, pre-program it with multiple escape routes.
- ☐ Keep an emergency supply kit in all ranch and personal vehicles.

### Prepare Your Animals

- ☐ Create a livestock evacuation plan.
- ☐ Ensure proper registering and branding of livestock.
- ☐ Establish a back-up plan for feeding livestock if grazing land is destroyed by fire.

### Know Your Area's Conditions

- ☐ Track the weather daily. Take note of changing conditions.
- ☐ If the weather is too dry: close the area, avoid risky equipment operations, or driving over dry vegetation. Fires can start by simply idling your car over grass. Make sure all vehicles' catalytic converters are in working order.

### Prepare Your Property

- ☐ Create and maintain firebreaks (vegetation removed down to bare, mineral soil) each year prior to fire season around pastures and structures. This will allow access for suppression. The width of the firebreaks should be at least 3x the fuel height.
- ☐ Reduce vegetation and remove combustible material around all structures.
- ☐ When selecting for understory vegetation (below trees), choose those that are less fire-prone and don't dry out quickly, and those that don't create ladder fuels.
- ☐ Prioritize assets by assessing the risk and value of each and the effort it would take to protect them.
- ☐ Maintain your equipment (power tools, mowers, catalytic converters, etc.) Make sure working spark arrestors are installed and maintained on equipment.
- ☐ Reinforce fences with metal posts, if applicable.
- ☐ Create a safe zone clear of all vegetation for equipment.
- ☐ Clear vegetation around fuel tanks and other highly combustible equipment.
- ☐ Create a fire pre-plan for your property that includes insights from your fire department and wildland fire experts. Discuss your plan and property specifics with local firefighters ahead of time. (See pre-plan insert on next page).

# For Large Landowners & Land Managers

## Set

### Your Family, Employees, and Visitors

- ☐ Follow guidelines from page 13.
- ☐ Alert family, ranch hands, field workers, or anyone else who is on your property.
- ☐ Make sure you have a contact list or meeting location coordinated ahead of time to ensure everyone's safety.

### Your Animals

- ☐ Hook up your stock trailer and load your animals.
- ☐ Unlock and open gates so livestock can escape flames and firefighters can gain access.
- ☐ Close all barn doors so horses and livestock will not go into a burning building.

### Your Property

- ☐ Follow guidelines from page 13.
- ☐ Move equipment into a safe zone that is clear of combustible fuels.
- ☐ Close all doors, windows, and turn on exterior/interior lights in barns and other structures.
- ☐ Shut off gas supply and propane tanks.

#### Catch the Fire Before it Burns Out of Control

Have suppression tools & methods available on site:

- ☐ Fire extinguisher
- ☐ Water
- ☐ Fire tools
- ☐ Phone on site
- ☐ Keys to the dozer

## Go

- ☐ Follow guidelines from page 14.
- ☐ Ensure all people have safely evacuated.
- ☐ Stay in communication with fire operations. Ask questions, offer assistance, and give permission. Your invaluable knowledge of the area will prove useful for firefighters who are there to help protect your land and resources. Fire crews can then run an operation that meets your needs as well as theirs.

#### Pre-Plan: Ensure Firefighters Have Access

- ☐ Make sure address posts are clearly visible and marked in contrasting colors.
- ☐ Keep copies of gate keys and a written list of combinations in a known location.
- ☐ Make sure your property is properly mapped out and that your county fire department has a copy of the map.
- ☐ Maintain roads far in advance of fire season. Make sure there is enough room for fire trucks to drive through and that large turn-outs for emergency vehicles are available. Hazards to look out for include: overhanging trees, low power lines, bridges with weight restrictions, boggy areas, and rural residence internal fencing.
- ☐ Establish "safety zones" (large areas free of vegetation and other hazardous conditions for firefighters to retreat to).
- ☐ Maximize water source access and availability (hydrants, ditches, reservoirs, water tanks, etc.). Ensure pumps and hoses are available and that the size and type of outlets are standard fittings.
- ☐ If you would like to offer your equipment (water, tank, tractor) for firefighting, make arrangements and contacts prior to use for proper tracking and reimbursement.

Post in a location where **every** member of your family can see it, such as on the fridge or front door.

# Our Family's Wildland Fire Action Guide

Well before fire danger is HIGH, prepare your family and residence for potential wildfires. Monitor your local media for the latest information on any incident, and make certain your mobile phones have "In Case of Emergency" (ICE) information loaded.

**Our family members will call this out-of-area/state contact to report that we are safe:**
Name: _____ Phone number(s): _____
Pre-program this into cell phones. Keep it current. Make sure the person agrees to be available/responsive.

**If separated and unable to access our home or neighborhood, our family will meet at this safe location:**
Primary: _____
Secondary: _____

**If our children are in school during an emergency, they will be evacuated to this/these locations:**
School 1: _____
Child(ren): _____ School Contact Info: _____
School's Evacuation Protocol: _____

School 2: _____
Child(ren): _____ School Contact Info: _____
School's Evacuation Protocol: _____

**Our emergency go-bag is located:** _____

**Essential items to grab before leaving (medication, glasses, etc.):** _____
_____

**We will do this with our pets:** _____
Our pet emergency go-kit (food, water, bowl, leash, crate, etc.) is located: _____

**Neighbors/others in our area we have agreed to help or check on during an emergency or evacuation:**
Name: _____ Address: _____ Phone: _____
How we have agreed to assist and/or make sure they are ok: _____
_____

Name: _____ Address: _____ Phone: _____
How we have agreed to assist and/or make sure they are ok: _____

## Local Fire Department Information Numbers
## (Circle the appropriate contact)

| Hawaii (County) Fire Dept. | Honolulu Fire Dept. | Maui Fire Dept. | Kauai Fire Dept. |
|---|---|---|---|
| (808) 932-2912 | (808) 723-3473 | (808) 876-4690 | (808) 241-4985 |

### Safety Tip

Remember to PRACTICE your evacuation plan each year with your family, and keep it up to date!

# Emergency Plan Notes

Use the space below to add any additional information to your family's evacuation plan.

# Off-island plans during fire season? Plan ahead!

If you are a seasonal resident or property owner, or if you know you will be away, it is critical that you take personal responsibility for your property and the safety of those who may occupy it during your absence. Unmitigated hazards on your property can significantly affect an entire neighborhood, especially adjacent homes and yards. Remember, if an ember lands and ignites a fire on your property, that fire can easily spread and threaten additional lives and homes within the community, whether you are physically present or not. It is up to you to ensure your home, yard, and property are READY at all times.

## Essential preparedness actions for part-time and traveling residents:

**1. Ensure your vegetation and structures will be managed and maintained to withstand embers and mitgate wildfire ignition and spread while you are away.**

Keeping your yard lean (via strategic, Firewise planting methods and trimmed grasses and trees), green (meaning watered and alive, not dry or dead), and clean (regularly maintained, no debris or leaf piles) applies all year long. What is your property and vegetation maintenance plan? How will you know if your plan is successfully occurring?

**2. Create a wildfire information packet for any seasonal or temporary guests who will be staying at your property, familiarizing yourself with all potential evacuation routes and how they may have changed over the year.**

Introduce your guests to neighbors that may need their help evacuating. Who are those neighbors, in which houses do they live, and what are their contact numbers? Where can guests find your emergency supplies box or evacuation go-bag?

**3. Be a good neighbor. Be active in your community, even if you only consider yourself a part-time or seasonal resident.**

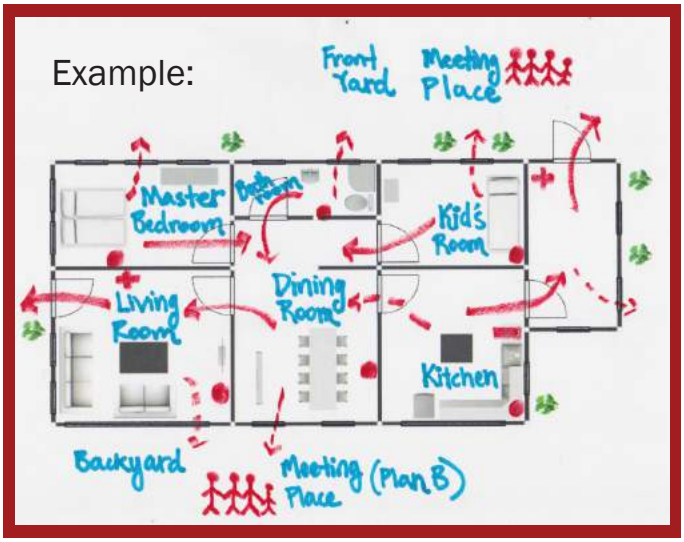
Get to know your neighbors and provide your contact information to them, so that you can work together to find solutions to unexpected risks or hazards within the community, particularly any stemming from your property or that may endanger your property while you are away.

Post in a location where **every** member of your family can see it, such as on the fridge or next to a phone.

# Our Family's Home Evacuation Plan

Draw a floor plan or map of your home with the space provided below:

- Show all doors and windows.
- Mark two ways out of each room with arrows (1st choice: solid and 2nd choice: dotted).
- Mark all smoke alarms in the house with a ● . Mark all fire extinguishers with a ▬ .
- Mark your emergency kit with a ✚ . Keep kits close to your 2 main exits.
- Pick and mark a main meeting place (and a backup alternative) outside the house where everyone can meet, away from any hazards.
- Remember to practice your plan at least twice a year.



# READY, SET, GO!

Residential Safety Checklist

Tips To Improve Family and Property Survival During A Wildland Fire

| Home | Yes | No |
|---|---|---|
| 1. Does your home have a metal, composition, or tile (or other non-combustible) roof with capped ends and covered fascia? | ☐ | ☐ |
| 2. Are the rain gutters and roof free of leaves, needles and branches? | ☐ | ☐ |
| 3. Are all vent openings screened with 1/8 inch (or smaller) mesh metal screen? | ☐ | ☐ |
| 4. Are approved spark arrestors on chimneys? | ☐ | ☐ |
| 5. Does the house have non-combustible siding material? | ☐ | ☐ |
| 6. Are the eaves "boxed in" and the decks, lanai, and/or pier-and-posts enclosed? | ☐ | ☐ |
| 7. Are the windows made of at least double-paned or tempered glass? | ☐ | ☐ |
| 8. Are the decks, porches, lanai, and other similar areas made of non-combustible material and free of easily combustible material (e.g. plastic furniture)? | ☐ | ☐ |
| 9. Is all firewood at least 30 feet from the house? | ☐ | ☐ |

| Defensible Space | Yes | No |
|---|---|---|
| 1. Is dead vegetation cleared 100 feet from the house? (Consider adding distance due to slope of property.) | ☐ | ☐ |
| 2. Is there separation between shrubs? | ☐ | ☐ |
| 3. Are ladder fuels removed? | ☐ | ☐ |
| 4. Is there a clean and green area extending at least 30 feet from the house? | ☐ | ☐ |
| 5. Is there a non-combustible area within five feet of the house? | ☐ | ☐ |
| 6. Is there separation between trees/tree clusters? | ☐ | ☐ |

| Emergency Access | Yes | No |
|---|---|---|
| 1. Is the home address visible from the street? | ☐ | ☐ |
| 2. Is the home address made of fire-resistant materials? | ☐ | ☐ |
| 3. Are street signs present at every intersection leading to the house? | ☐ | ☐ |
| 4. Are street signs made of fire-resistant materials? | ☐ | ☐ |
| 5. Is flammable vegetation within 10 feet of the driveway cleared and are overhanging obstructions removed? | ☐ | ☐ |
| 6. If a long driveway is present, does it have a suitable turnaround area? | ☐ | ☐ |

--This is a high value resource-- Please pass this on to others instead of throwing in the trash. It could save a life or home!

Ready, Set, Go!
www.wildlandfireRSG.org

Hawaii Wildfire Management Organization
www.hawaiiwildfire.org

# APPENDIX B

## WEB-BASED SURVEY RESULTS

# APPENDIX B

## WEB-BASED SURVEY RESULTS

### BACKGROUND

Using a web-based survey, input was gathered from community members as to their highest priority concerns related to wildfire, along with suggested actions for addressing those concerns. Survey responses were solicited in each of the National Wildland Fire Management Strategy categories- **Resilient Landscapes**, **Fire Adapted Communities**, and **Safe & Effective Firefighting**, to correspond to, and mimic, the discussion that took place during live/virtual workshops for seamless integration of all participant input. An invitation to complete the survey was circulated via email and in person by key community contacts and leaders in November and December, 2020. The invitation letter included an overview of the project, a link to the survey, and contact information of the lead coordinator (HWMO).

### RESULTS

Overall, 27 community members of the Leeward Haleakala area completed the survey. 14 (51.9%) described themselves as residents; 9 (33.3%) as agricultural operators/farmers/ranchers; 4 (14.8%) as representatives of a community group or nonprofit organization; 4 (14.8%) as private company/business representatives; 4 (14.8%) as something else ("homesteader", "part-time resident", "former ranch manager", and "descendant"); 3 (11.1%) as government agency representatives; 3 (11.1%) as natural resource/forestry/soil managers; and, nobody identified as a professional in the public utility sector (or, public works, infrastructure, or water) as well as no planners, architects, engineers, developers, or builders.

### PARTICIPANT INPUT FOR RESILIENT LANDSCAPES CATEGORY

| Resilient Landscapes Concerns | |
|---|---|
| **Top Concerns** | **% Reporting it as a Top 3 Concern** |
| Agriculture and farming are impacted by fire and/or are needed for managing vegetation | 62.1 |
| Flammable vegetation/fuels that are creating the high fire hazard | 59.3 |
| Water quality and availability are impacted by fire and are needed for fighting fires and prevention | 59.3 |
| Sensitive natural and cultural resources that are threatened by fire | 55.6 |
| Ecological restoration in needed to prevent fires or overcome its impacts | 44.4 |
| Other | 7.5 |

When respondents were asked to select their top three highest priority concerns related to protecting natural and cultural resources from wildfire (also referred to as working toward resilient landscape), 62.1% of respondents indicated that "agriculture and farming are impacted by fire and/or are needed for managing vegetation" was among the public's highest priorities, followed by the "flammable vegetation/fuels that are creating the high fire hazard" (59.3%), "water quality and availability are impacted by fire and are needed for fighting fires and prevention" (59.3%), the "sensitive natural and cultural resources that are threatened by fire" (55.6%), "ecological restoration is needed to prevent fires or overcome its impacts" (44.4%), and something else not listed (7.4%).

Respondents were asked one open-ended question about what they thought could be done to protect natural and cultural resources from wildfire in the area. 19 individuals (70.4%) responded to the question, and responses were coded and the following categories emerged (from the most to least number of related responses).

| Resilient Landscapes: Vegetation-related (8 related responses) | |
|---|---|
| **Recommendation** | **Specific written comments** |
| Install new and/or maintain already existing firebreaks | "Firebreaks in flammable vegetation/fuels"<br>"Control fuel load with grazing, maintain fire breaks"<br>"Maintained fire breaks"<br>"Create more fire and green breaks" |
| Strategically manage the vegetation | "Maintenance of surrounding areas"<br>"removal of invasive species"<br>"Vegetation management along the road" |

| Resilient Landscapes: Pre-fire planning and action (12 responses) | |
|---|---|
| **Recommendation** | **Specific written comments** |
| Do more planning for wildfires in general | "Planning and prevention measures"<br>"Being More Proactive vs. Just Being Reactive"<br>"Ability to obtain/apply fire suppression materials" |
| Do more planning, in general, around the protection of natural and cultural sites | "The preservation of all natural resources in and around Kahikinui"<br>"Identify and map high priority protection sites" |
| Improve/increase access to water for suppression purposes | "Strategic reservoirs for water"<br>"Adequate access and supply of water"<br>"Having water tanks available in different locations incase of fires for accessibility" |

| | |
|---|---|
| Plan for and reduce risks ahead of wildfire season | "Control the ungulates, fencing, fire breaks, gates, control access"<br>"Identifying it and removing fire hazards!" |
| Improve infrastructure (for suppression and evacuation) | "Alternate established legal access/ evacuation routes"<br>"Improve road access and expand road systems" |

| Resilient Landscapes: Community-related (4 related responses) | |
|---|---|
| **Recommendation** | **Specific written comments** |
| Build community awareness/ action | "Aware and responsible neighborhood"<br>"Increase community outreach"<br>"Community outreach programs" |
| Monitor suspicious activity | "Create community watch programs"<br>"Install remote cameras to monitor for vandals, dumping, and abandoned vehicles" |

| Resilient Landscapes: Policy-related (1 related response) | |
|---|---|
| **Recommendation** | **Specific written comments** |
| Creates policies that reduce roadside ignition potential | "Start by limiting the number of tourists going around the road to Hana" |

| Resilient Landscapes: During and post fires (2 related responses) | |
|---|---|
| **Recommendation** | **Specific written comments** |
| Closer monitoring and better management of wildfires | "Closer monitoring and better management" |
| Have a post-fire plan | "Accelerate restoration efforts" |

Participants were also given the opportunity to provide additional comments and/or suggestions related to managing the vegetation/fuels in the area. Those included the following:

- Come up with a proactive plan regarding arson (automated cameras), community response and awareness etc.
- Do not allow any more wind farms to be installed in the area! They are an abomination to the aina and the seabirds.
- The reference ecosystem, which had much less frequent fire, had significantly more bare ground and rock with significantly less biofuels, especially at lower elevations. To recover vegetation cover with much lower biomass, prioritize ecological restoration with the goal of grass suppression through native vegetation cover.
- Seems like certain areas, specifically near roads, would benefit from brush management by mechanical removal, physical grazing/browsing, and or chemical control.
- Volunteer fire personnel and appropriate wildland fire apparatus stationed in the area
- How do you prevent fires when they are deliberately done? This is a frustrating issue we face
- Controlled/managed grazing is critical for reducing the fuel load
- Funds for brush abatement
- Improve signage for safety of responders and community members, prioritize restoration, firebreak creation, and water source establishment
- It's wild over there and the wind is usually nuking, often the fires burn themselves out before crews get there. I'd bet 99.9% of ignitions over there are from lit cigarettes thrown from cars, or a car on fire.

**PARTICIPANT INPUT FOR FIRE ADAPTED COMMUNITIES CATEGORY**

When respondents were asked to select their top three highest priority wildfire concerns related to the people and communities of Leeward Haleakala, 63.0% of respondents indicated that "the need for water (for grazing, planting, firefighting, etc.)" was among the public's highest priority concerns, followed by "more enforcement of laws (e.g., abandoned car dumping)" (40.7%), "lack of funding for wildfire-related projects" (29.6%), "residents need more training and support for residents to get their homes, yards, and families prepared" (29.6%), "human-caused wildfire ignitions need to be addressed" (25.9%), "community planning needs to include more focus on wildfire readiness" (25.9%), "more training is needed related to wildfire mitigation strategies on wildland areas" (18.5%), "the need for better roads, more road signs, and community/firefighter access around communities" (18.5%), "farmers and/or large landowners need to be more engaged in fire issues" (14.8%), "the need for better garbage and green waste dumping options" (7.4%), "the need for elected officials to be more involved in fire issues" (7.4%), something else not listed

(7.4%), and a "general lack of awareness around wildfire issues" (3.7%). Nobody indicated that "private businesses need to be more engaged in fire issues" as a top concern.

| Fire Adapted Communities Concerns | |
|---|---|
| **Top Concerns** | **% Reporting it as a Top 3 Concern** |
| The need for water (grazing, planting, firefighting, etc.) | 63.0 |
| More enforcement of laws (e.g. abandoned car dumping) | 40.7 |
| Lack of funding for wildfire-related projects | 29.6 |
| Residents need more training and support to get their homes, yards, and families prepared for wildfire | 29.6 |
| Human-caused wildfire ignitions need to be addressed | 25.9 |
| Community planning needs to include more focus on wildfire readiness | 25.9 |
| More training is needed related to wildfire mitigation strategies on wildland areas | 18.5 |
| The need for better roads, more road signs, and community/ firefighter access around communities | 18.5 |
| Farmers and/or large landowners need to be more engaged in fire issues | 14.8 |
| The need for better garbage and green waste dumping options | 7.4 |
| The need for elected officials to be more involved in fire issues | 7.4 |
| Other | 7.4 |
| General lack of awareness around wildfire issues | 3.7 |

Respondents were asked one open-ended question about what they thought could be done to address the community (residents, businesses, schools, infrastructure, etc.) part of wildfire issues in Leeward Haleakala. 17 individuals (63.0%) responded to the question, and responses were coded and the following categories emerged (from the most to least number of related responses).

| Fire Adapted Communities: Preparedness outreach/education (11 related responses) | |
|---|---|
| **Recommendation** | **Specific written comments** |
| Conduct more awareness campaigns | "Public awareness campaigns about danger and awareness"<br>"Be aware no throwing out of cigarettes"<br>"Since arson is frequently a cause of fires we need to make everyone aware of the need for vigilance"<br>"Teaching and education around this subject"<br>"Education and awareness training on preventive measures"<br>"Educate about invasive species and restoration"<br>"Conduct presentations at community centers or perhaps try to do some outreach with schools or youth of the area to inform them and have them engage their parents with conversations and readiness plans etc." |
| Get information into the hands of those that need it | "Provide the community "the location of fire hydrants or other water sources"<br>"Provide the community the website and phone contact for emergency fire situations"<br>"Education about wildfire control, dumping issues" |
| Prioritize wildfire outreach/ education in the budget | "Funding for awareness |

| Fire Adapted Communities: Preparedness planning and action (8 related responses) | |
|---|---|
| **Recommendation** | **Specific written comments** |
| Put things into place so that communities are better prepared ahead of time | "We should consider something along the lines of a rapid response phone number."<br>Install and activate "unique fire alarm warning sirens"<br>Plan for "alternate legal evacuation routes through private roadways" |

| | |
|---|---|
| Have a community plan in place ahead of time | "Emergency protocols and contacts"<br>"A plan" and "create community response plans and public monitoring programs"<br>"Each District should have a plan with maps and a Contact phone tree. Bring awareness and a plan of where we would go, landing zones, where the commanding post would be, how we work with operations in providing food or items to assist, etc." |
| Install roadside signage | "Perhaps establish signs at strategic locations along the road, something like US Forest Service uses in some areas to inform people about current fire risks based on recent weather trends, biomass accumulation, etc"<br>"Increase signage and warning systems during droughts and in wet months to create awareness of fuels" |

| **Fire Adapted Communities: More community/agency engagement (6 related responses)** | |
|---|---|
| **Recommendation** | **Specific written comments** |
| Build/maintain positive community/agency relationships | "Better engagement by all"<br>"Meet with the community associations"<br>"Reaching out"<br>"Attend the Kaupo Community Association meetings and ask to be on their agenda"<br>"Assurance of government's preliminary involvement for insurance and legal protection of good Samaritan efforts during dire situations" |
| All hands, all lands approach | "All-hands approach" |

| **Fire Adapted Communities: Capacity building (2 related responses)** | |
|---|---|
| **Recommendation** | **Specific written comments** |
| Build capacity of wildfire professionals and practitioners | "Zoom meetings & trainings"<br>"Trainings" |

**PARTICIPANT INPUT FOR SAFE & EFFECTIVE FIREFIGHTING CATEGORY**

When respondents were asked to select their top three highest priority concerns related to safe and effective firefighting in the area, adequate water and/or water infrastructure for firefighting (77.8% top priority) was among the public's highest priorities, followed by adequate access for firefighters to be able to fight fires (59.3%), communications during fire between agencies or to the community (40.7%), response time it takes for firefighters to arrive (37.0%), safety of firefighters (29.6%), adequate equipment/training of responding fire agencies (25.9%), evacuation of community (22.2%), adequate personnel and staffing of responding fire agencies (14.8%), and something else not listed (7.4%) (Road G improvements and need a 2" hydrant). Agency jurisdiction issues were not a priority concern for any respondents.

| Safe & Effective Firefighting Concerns | |
|---|---|
| **Top Concerns** | **% Reporting it as a Top 3 Concern** |
| Adequate water and/or water infrastructure for firefighting | 77.8 |
| Adequate access for firefighters to fight fire | 59.3 |
| Communications during fires between agencies and communities | 40.7 |
| Response time (for firefighters to respond to fire) | 37.0 |
| Safety of firefighters | 29.6 |
| Adequate equipment and/or training of agency responders | 25.9 |
| Evacuation of community | 22.2 |
| Adequate personnel and staffing of agency responders | 14.8 |
| Other | 7.4 |
| Agency jurisdiction issues | 0.0 |

When respondents were asked to select their top three highest priority concerns related to safe and effective firefighting in the area, adequate water and/or water infrastructure for firefighting (77.8% top priority) was among the public's highest priorities, followed by adequate access for firefighters to be able to fight fires (59.3%), communications during fire between agencies or to the community (40.7%), response time it takes for firefighters to arrive (37.0%), safety of firefighters (29.6%), adequate equipment/training of responding fire agencies (25.9%), evacuation of community (22.2%), adequate personnel and staffing of

responding fire agencies (14.8%), and something else not listed (7.4%) (Road G improvements and need a 2" hydrant). Agency jurisdiction issues were not a priority concern for any respondents.

Respondents were asked one open-ended question about what they thought could be done to improve emergency response and firefighting in the area. 17 individuals (58.6%) responded to the question, and their responses were coded and the following categories emerged (from the most to least number of related responses).

| Safe & Effective Firefighting: Firefighting personnel (6 related responses) | |
|---|---|
| **Recommendation** | **Specific written comments** |
| Prioritize new fire stations | "We need a fire station in Kaupo!"<br>"Have a volunteer fire fighting outpost in the area."<br>"Fire emergency vehicles [are] too far away."<br>"Improve rapid response capability by [building] a fire substation"<br>"Fire emergency vehicles [are] too far away" |
| Ensure adequate fire-fighting capacity | "Have appropriate personnel to address fire needs" |

| Safe & Effective Firefighting: Water (5 related responses) | |
|---|---|
| **Recommendation** | **Specific written comments** |
| Ensure adequate water supplies | "Have appropriate water sources."<br>"Help with installing water tanks." |
| Improve access to water | "Water to Kahikinui homestead"<br>"Better access to water"<br>"Helicopter availability" |

| Safe & Effective Firefighting: Planning, coordination, and communications (5 related responses) | |
|---|---|
| **Recommendation** | **Specific written comments** |
| Do more of it | "Planning and coordination"<br>"Get a good map of all roads and water tanks to the fire stations of Kula and Hana." |

| | |
|---|---|
| Include more people | "Inclusive agencies communications to landowner and the enclaved community"<br>"Involve residential community, not just stakeholders"<br>"Education of emergency personnel on the leeward areas (often they don't know there way around back here)" |

| Safe & Effective Firefighting: Road improvements (4 related responses) | |
|---|---|
| **Recommendation** | **Specific written comments** |
| Do more of it | "Road improvements"<br>"Continuing the road to lots 103"<br>"Improve road conditions for residents and emergency vehicles" |
| Be strategic about it | "Travel time from Kula to the leeward side cannot be much improved due to the road. Paving the last mile or two into Kaupo would help a bit." |

| Safe & Effective Firefighting: Vegetation management (2 related responses) | |
|---|---|
| **Recommendation** | **Specific written comments** |
| Maintain fuel loads on state lands | "Control of fuel load on state lands" |
| Maintain fire breaks | "Maintenance of fire breaks" |

### STRENGTH, ASSETS, AND OPPORTUNITIES

15 participants provided their perspectives on the strengths, assets, and opportunities that exist for addressing wildfire issues in Leeward Haleakala.

| Strengths, Assets, and Opportunities | |
|---|---|
| **Category** | **Examples of specific written comments** |
| Fire department/agency | "We have a great fire department"<br>"Experienced fire professionals willing to help" |
| Leadership | "DLNR District Leadership (Lance)" |

| | |
|---|---|
| Community | "Positive momentum with Kahikinui Homestead"<br>"Landowners willing to collaborate" |
| Ranching community | "Willingness of local large ranchers to help our local communities"<br>"We have several large ranchers with livestock in the area that are capable of managed grazing if given the opportunity." |
| Shared vision | "Community awareness"<br>"It seems like a topic that all community members agree on as a threat and something to work together to prevent, respond to, and mitigate after fire. These emergency situations seem like opportunities to build community and communication around common goals of safety and protecting resources." |
| Resources | "I know Maui uses helicopters to fight fires. I think this is an asset for the leeward side."<br>"Accessing private community resources to help" |
| Partnerships | "Involvement of residents and citizens to work on a common problem"<br>"Bridging together the divided community"<br>"LHWRP can implement large-scale native habitat restoration with funding increases" |
| Landscape | "Its remote enough that if we implement something, not too many people would need to be consulted" |

Other affiliations, partnerships, and/or projects that might connect to this wildfire planning effort for the Leeward Haleakala area that were noted by participants included: Ka 'Ohana O Kahikinui (KOOK), Leeward Haleakalā Watershed Restoration Partnership (LHWRP), Ulupalakua Ranch, Maui Cattlemen's Association, Kahikinui Hawaiian Homes Association, Aha Moku O Kaupō, Wakiu Community Development Corporation, independent contractors, the Hawai'i Green Growth Local2030 Hub, Friends of St. Joseph Catholic Church at Kaupo, Maui Fire Department personnel, University of Hawaii, Maui Conservation Alliance, and residents of Kahikinui Hawaiian Homelands in Kahikinui and Kanaio residents.

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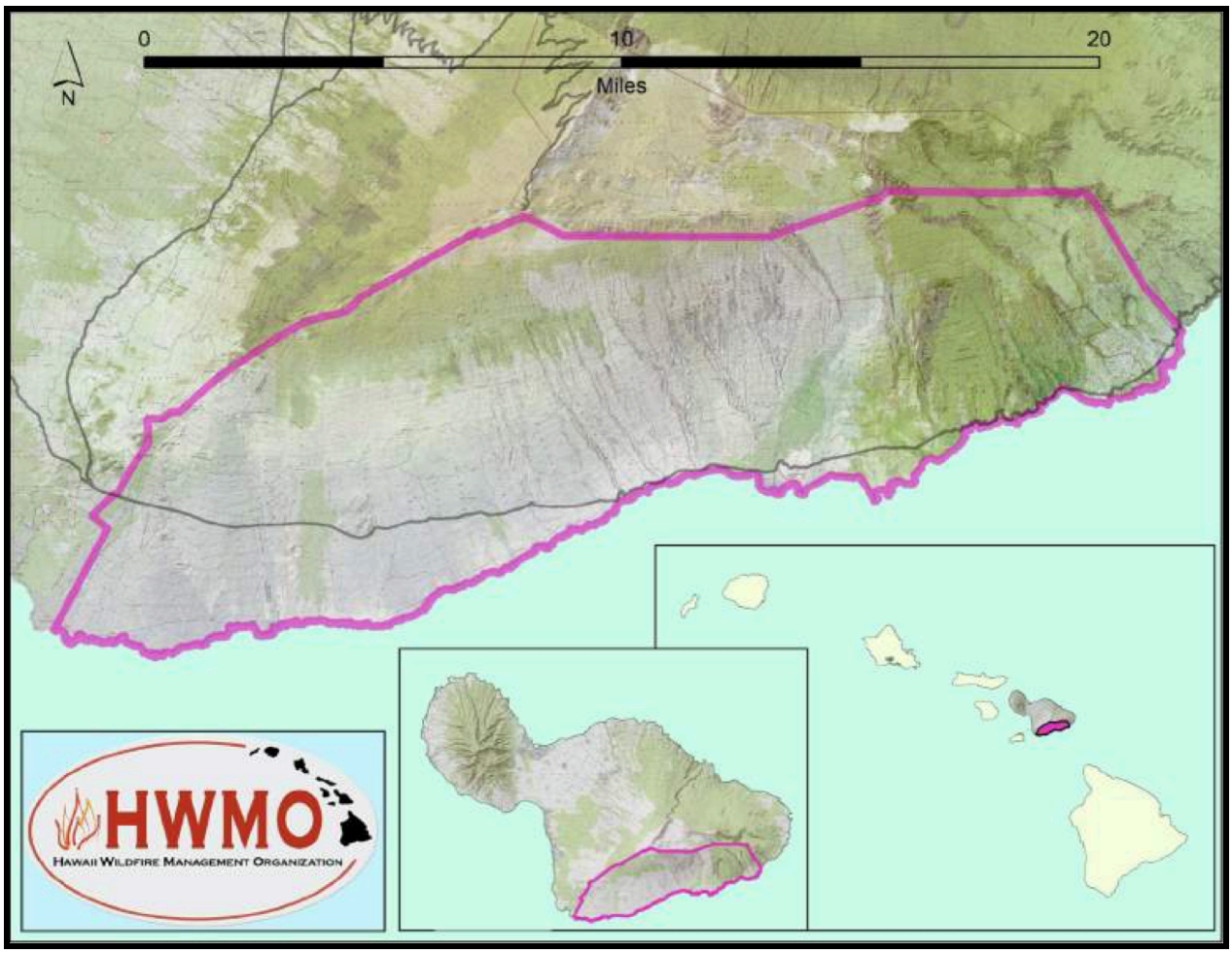
# APPENDIX C:

# 2024 LIST OF PRIORITY PROJECTS AND ACTIONS LEEWARD HALEAKALA, MAUI

# 2024 LIST OF PRIORITY PROJECTS AND ACTIONS




## Leeward Haleakala, Maui
## State of Hawaii

Drafted by Hawaii Wildfire Management Organization, in cooperation with the Department of Land and Natural Resources - Division of Forestry and Wildlife, Maui Fire Department, and Maui Emergency Management Agency

# 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 Maui | |
| **Communities and Neighborhoods that will benefit from this project:** Lahaina, Kula, Kihei, Kahikinui, Maunaloa | |
| **Affiliation:** Hawaii Wildfire Management Organization (HWMO) | **Project Lead:** HWMO<br>**Partners:** DLNR-DOFAW, Maui Fire Department |
| **CWPP Area:** Leeward Haleakala, Maui | **Cost:** $1,395,296 |

**Project Description:** The proposed project is for HWMO to lead the following four programs for Maui's CWPP-covered areas (Western Maui, Upcountry Maui, South Maui, and Leeward Haleakala).

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 by HWMO, in close communication and partnership with Hawaii Dept. of Land and Natural Resources, State Division of Forestry and Wildlife (DLNR-DOFAW), Maui Fire Department (MFD), and others.

Hawaii's August 2023 fires 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, where infrastructure is not designed or built with wildfire safety in mind, and ecosystems are not adapted to fire.

The project also 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. There is a strong emphasis in the project for prioritizing low income communities for assistance with vegetation removal projects in the Firewise Communities program.

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 Maui's CWPP covered areas, 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 on Maui 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, which are designated as underserved Tribal areas in the CWDG tool.

**Importance:** Why this project is important: 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 for all CWPP-covered areas. The request for participation in these two programs has increased 1,500% since our recent devastating fires. People 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 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:** Leeward Haleakala, Maui | **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:** Kahikinui Community Grazing Project

**Communities and Neighborhoods that will benefit from this project:**
Kahikinui, Kaupo, Kanaio & Auwahi

| | |
|---|---|
| **Affiliation:** Kahikinui Community Firewise Committee | **Project Lead:** Desiree Graham<br>**Partners:** HWMO, DHHL, Ulupalakua Ranch, Kaupo Ranch, Kaonaolu Ranch, DLNR, DOFAW, Auwahi Winds, MFD, MPD, LHWRP, KOOK, Eco Products Maui, Rojac Trucking |
| **CWPP Area:** Leeward Haleakala, Maui | **Cost:** $7,000,000 |

**Project Description:** The primary goal of this project is to establish a grazing cooperative that utilizes livestock for the strategic grazing of fire fuels, thereby reducing wildfire risks while promoting sustainable land management practices. The project will be implemented in several key phases:

1. Training and Capacity Building:
   - The team will undergo comprehensive training on effective grazing practices, focusing on techniques that enhance land health and reduce fire risk. This training will cover topics such as pasture management, animal health, and the ecological impacts of grazing. By building expertise in these areas, team members will be equipped to make informed decisions that align with both fire mitigation and sustainable agricultural practices.
2. Development of a Grazing Plan:
   - Following the training, the team will collaborate to develop a detailed grazing plan. This plan will outline specific goals for fire fuel reduction, identify suitable grazing areas, and determine the appropriate type and number of livestock needed. The grazing plan will incorporate best management practices and consider factors such as seasonal grazing patterns, wildlife habitats, and the overall health of the ecosystem. Engaging local stakeholders and experts during this phase will ensure that the plan is well-informed and tailored to the unique characteristics of the land.
3. Implementation of the Grazing Plan:
   - Once the grazing plan is finalized, the cooperative will begin implementation. This phase will involve introducing livestock to designated areas, monitoring grazing patterns, and adjusting practices as necessary to achieve fire fuel reduction objectives. The team will work collaboratively to manage the animals, ensuring they are rotated appropriately to optimize land recovery and maintain soil health. Regular assessments will be conducted to evaluate the effectiveness of grazing in reducing fire fuels and enhancing biodiversity.

**Importance:** Through these activities, the grazing cooperative aims to create a sustainable model for fire fuel management that not only mitigates wildfire risks but also fosters community engagement, agricultural viability, and environmental stewardship.

| | |
|---|---|
| **Project Name:** Kahikinui Community Abandoned Vehicle Removal | |
| **Communities and Neighborhoods that will benefit from this project:** Kahikinui | |
| **Affiliation:** Kahikinui Community Firewise Committee | **Project Lead:** Desiree Graham<br>**Partners:** DHHL, HWMO, Kahikinui Homestead Road Crew, DLNR, KOOK |
| **CWPP Area:** Leeward Haleakala, Maui | **Cost:** $86,000 |
| **Project Description:** Remove 35 abandoned/broken vehicles from within the homestead of Kahikinui. | |
| **Importance:** It's important because it's a fire hazard. While these vehicles sit on our land gasoline and other fluids start to leak onto the land and eventually poison our land. We are stewards of our aina and we want to keep this land healthy for the next generations. | |

| | |
|---|---|
| **Project Name:** Kahikinui Community Lot # Signage | |
| **Communities and Neighborhoods that will benefit from this project:** Kahikinui | |
| **Affiliation:** Kahikinui Community Firewise Committee | **Project Lead:** Desiree Graham<br>**Partners:** DHHL, HWMO, MFD, MPD, Kahikinui Homestead Road Crew, KOOK |
| **CWPP Area:** Leeward Haleakala, Maui | **Cost:** $35,000 |
| **Project Description:** Post Lot # reflective signs on metal poles at the entrance to all 99 lots. And at the top of the pole we'll install a flashing beacon type light so emergency response can get to that lot even quicker. | |
| **Importance:** So that Emergency response people can easily locate the person needing assistance. | |

| | |
|---|---|
| **Project Name:** Kahikinui Community Fire Escape Road Repair | |
| **Communities and Neighborhoods that will benefit from this project:** Kahikinui | |
| **Affiliation:** Kahikinui Community Firewise Committee | **Project Lead:** Desiree Graham<br>**Partners:** DHHL, HWMO, Kaonaolu Ranch, Ulupalakua Ranch, Kaupo Ranch, DLNR, MFD, MPD, Kahikinui Homestead Road Crew, Rojac Trucking, KOOK |
| **CWPP Area:** Leeward Haleakala, Maui | **Cost:** $25,000,000 |
| **Project Description:** Repair our communities fire escape road and make it accessible for everyone even those residents that do not have a 4 wheel drive vehicle. | |
| **Importance:** So residents can safely leave the homestead when a fire is encroaching into our neighborhood. | |

| | |
|---|---|
| **Project Name:** Implementing Strategic Watershed and CWPP Plans to Restore Priority Hawaiian Lands in Leeward Haleakala, Maui | |
| **Communities and Neighborhoods that will benefit from this project:** Kahikinui Hawaiian Home Lands | |
| **Affiliation:** Uhiwai O Haleakala | **Project Lead:** Uhiwai O Haleakala<br>**Partners:** HWMO, DLNR, PFX, LHWRP, UH, KOOK |
| **CWPP Area:** Leeward Haleakala, Maui | **Cost:** $7,895,360 |
| **Project Description:** After the catastrophic fires on Maui in 2023, this funding enables implementation of existing strategic plans designed to prevent, mitigate, respond to, and safely address and recover from the wildfires that frequent East Maui's Leeward slopes. Working over more than a decade, Hawaii's experts in wildfire, climate change, hydrology, and fire response have collaborated with community members, landowners, land managers, and conservation organizations to develop comprehensive plans that acknowledge the risks, opportunities, and capacity available to address wildfire in this long-overlooked, underfunded, remote and vulnerable region, especially within and around the Hawaiian communities struggling to resettle and manage lands that have changed dramatically since the original approaches to land management that Hawaiian people established prior to western contact.<br><br>Improve access/escape improving and maintaining roads and firebreaks; Implement fuels | |

conversion along a 5 mile firebreak within watershed forest restoration areas of along; establish new firebreaks and shaded fuel breaks around vulnerable areas
such as community infrastructure and access roads, cultural/archaeological sites, remnant native habitat containing rare native species, and landscape-level native watershed forest restoration sites (fog drip, main road, Lua lai lua dry forest, mauka forest, Hale Pili); plan shaded fuel breaks to also serve as seed orchards with eco-region specific species, thereby establishing consistent sources of seeds for plants required to maintain and expand firebreaks

Improve communications, monitoring, safety, and emergency contact by installing satellite WIFI, remote cameras. Convene partners and community members 2x/year to provide ongoing education on fire prevention and response in concert with local
organizations and agencies (HWMO, DLNR, PFX, LHWRP, UH, KOOK); work with landowners and agencies to ensure any remaining compliance is completed.

Provide field crews and residents training essential for project, such as helicopter safety/crew member, wilderness first aid, GIS mapping, and safe pesticide use; develop capacity and provide tools and equipment for residents to adequately and safely manage their water sources, firebreaks, and fuel reduction grazing programs
Install approximately 10 water tanks from 300gal - 30,000 gal depending on the terrain, elevation, and access to establish and/or supplement water sources at existing fog drip capture sites, reservoirs, and wells (UR, DHHL, Nuu)provide water for fire response and fuels reduction, as well as along grazed firebreaks and shaded firebreaks

Hire staff and contractors to install 10-15 miles of strategic fencing to manage feral and domestic ungulates and facilitate grazed fuelbreaks

Demonstrate potential for converting tracts of invasive species to shaded firebreaks and fuels conversion using a range of native, agriculturally/culturally/economically useful, and non-invasive ornamental species with community volunteers
Dedicate staff, equipment, transportation and maintenance capacity to ensure consistent leadership, collaboration, and project management for the duration of the funding; establishing a plan for longer-term site maintenance and additional firebreak establishment; work with County and local officials to address and plan for continual wildfire threats by PSAs, signage, removal of abandoned vehicles, and reduction of fuels along public roads where the bulk of fires start.

Work with local fire departments and emergency responders to select sites and establish and maintain 2 fire response hubs with secure storage for dedicated UTV, herbicide, tanks, etc. fire extinguishers, hand tools, maps, first aid, and other basic supplies needed when fires happen in this remote area.

**Importance:** The purpose of this project is to consult, consolidate and implement fire prevention and response plans based on years of experience, collaboration, community input, and on the ground management.The project will implement, update, and and establish best management practices to maintain and expand firebreaks along existing but unmaintained roads and fire breaks; increase freshwater availability and watershed restoration potential; engage community in strategic planning, training, and implementation of essential practices to mitigate fire risk.

| | |
|---|---|
| **Project Name:** Leeward Haleakala Resilient Landscapes | |
| **Communities and Neighborhoods that will benefit from this project:** Kula, Keokea, Kihei, Wailea, Makena | |
| **Affiliation:** Malama Haleakala Foundation | **Project Lead:** Malama Haleakala Foundation<br>**Partners:** DLNR-DOFAW, Maui Fire Department, HWMO, and ranches |
| **CWPP Area:** Leeward Haleakala, Maui | **Cost:** $2,818,200 |

**Project Description:** The Leeward Haleakala Resilient Landscapes Project will reduce wildfire risk in and around two Upcountry Maui and three South Maui communities including Kula, Keokea, Kihei, Wailea, and Makena, all of which are considered at-risk and have between a 95.2 and 98.4 percent higher Wildfire Hazard Potential when compared to all other communities in the nation. Malama Haleakala Foundation, in partnership with Kaonoulu, Haleakala, and Ulupalakua Ranches, will implement strategic fuel reduction and establishment of 92-acres of fire breaks to reduce hazardous fuels along 19 miles of shared boundaries with residential communities, access roads, and utility corridors spanning the 46,000-acre Project area. These communities have extremely limited ingress and egress routes, which are immediately threatened by wildfire in these areas.

Fire break treatment intervals will be conducted biannually for a five year period. Fire break locations (based on road, neighborhood, and/or pasture names) and distances in feet are provided here: DePonte - 1,500 ft, Hapapa - 3,600 ft, Upper Kimo - 7,000 ft, Kula Kai/Lwr Kimo - 12,400 ft, Carter/Wong - 2,400 ft, Naalae - 5,900 ft, Small Puu, Kakae - 4,300 ft , Laakea/Pulehu Rd - 4,800 ft, Ah Mo/Jacintho - 9,800 ft, Morey - 2,200 ft, Kaimanu - 1,500 ft, Piilani Hwy - 5,800 ft, Waiohuli/Kula Highway - 27,150 ft, Maui Meadows - 12,000 ft.

Nine 50,000-gallon cisterns will be installed at strategic locations throughout all three ranches in close proximity to the surrounding communities listed above. Establishment of these cisterns/dip tanks will serve to increase firefighting preparedness while simultaneously reducing the time it takes for helicopter firefighters to suppress wildfires. These tanks will also serve as a cached water supply in support of ground-based firefighting efforts.

Maui's municipal firefighting agencies are limited in their ability to access and effectively control wildland fires, especially in situations where multiple fires simultaneously occur over large, remote and rugged areas. Essential fire suppression equipment is needed by key landowners, including Kaonoulu, Haleakala, and Ulupalakua Ranches. These landowners, who collectively and collaboratively manage 46,000-acres within the Project area have historically been the first personnel onsite for fire suppression efforts. They know the roads, gates, terrain, etc. needed to rapidly

respond and support fire suppression personnel when wildfires occur. This equipment will also be used to maintain fuel breaks and reduce fuel loads as needed over the five-year performance period of the grant. Equipment will include six (6) 200 gallon skid-mounted sprayers, six (6) 10 foot by 15 foot covered trailers, and six (6) sets of field tools including but not limited to chainsaws, pulaskis, shovels, flappers, backpack sprayers, etc.

Maps of the Project Boundary with fire break and cistern locations can be found at: https://www.mauiwatershed.org/leewardhaleakalaresilientlandscapes

**Importance:** The project will have numerous activities associated with establishing a resilient landscape on leeward Haleakala. These activities include implementing 100,350 linear feet of fire breaks at key locations in the WUI on 46,000-acres of land managed by Kaonoulu, Haleakala, and Ulupalakua Ranches.

| **Project Name:** Leeward Maui Cisterns | |
|---|---|
| **Communities and Neighborhoods that will benefit from this project:** Kanaio, Kahikinui, Kaupo, Kipahulu | |
| **Affiliation:** DLNR-DOFAW | **Project Lead:** DLNR-DOFAW<br>PArtners: Maui Fire Department, DHHL, the FireWise community of Kahikinui, and Haleakala Ranch |
| **CWPP Area:** Leeward Haleakala, Maui | **Cost:** $1,500,000 (subject to market costs) |

**Project Description:**
Project Area - The 2020 Leeward Haleakala Community Wildfire Protection Plan (CWPP) planning area sits entirely on the southern slopes of Haleakala, a 10,023 ft. tall shield volcano, which makes up more than 75% of the island of Maui. Steep slopes, rough terrain, strong winds, and a large percentage of highly ignitable invasive grasses characterize the landscape.

Coupled with warm weather, recurring drought conditions and a history of human-caused fires put the area at increased risk of wildfire. The proximity of development to fire-prone wildlands present hazardous conditions. Overgrown vegetation close to homes, pockets of open space within subdivisions, and an increase of non-native high fire-intensity plants around developed areas pose increasing threats to commercial, community, natural and residential resources. The closure of the Hawaiian Commercial & Sugar Company in 2016 left 35,000 acres on Maui susceptible to invasion by fast growing fire adapted grasses.

Approximately 10,000 acres has been put back into cultivation but there have been multiple fires on old plantation lands. Recent major fires have occurred on Maui: 2007 Polipoli Fire 2,378 acres, 2018 Pukalani Fire, 672 acres, 2019 Pukalani 1 Fire: 3,249 acres, 2020 Haliimaile Fire 3,818 acres, 2023 Olinda fire 1,084 acres, 2023 Kula Fire 330 acres, and the 2023 Pulehu Road Fire 5,688 acres. Specifically for the Leeward Haleakala CWPP planning area fires occurred in: 2003 Kahikinui fire 2,661 acres, 2006 Kahikinui 2,771 acres, 2016 Kahikinui fire, 4547 acres.

The project supports the State of Hawaii Forest Action Plan (FAP), specifically objective 3.3. Assist communities in planning for and reducing wildfire risks. Page 124 of the FAP states: To adequately address the wildfire issues in Hawaii, it is important that DOFAW continue to secure funds and strengthen collaborative partnerships across areas of expertise and jurisdictional boundaries. This project supports the FAP by providing a funding opportunity to address wildfire issues in Hawaii by strengthening collaborative partnerships across areas of expertise and jurisdictional boundaries. Collaborating with Haleakala Ranch and The State of Hawaii DHHL, The project will address the wildfire-related goals in the FAP to reduce the threat from wildfires to native ecosystems, forests, watersheds, and threatened and endangered species as well as communities within WUI areas through developing a fuel break between the Kula FR and the DHHL Waiohuli community. Furthermore the project supports the FAP goal to mitigate the impacts of wildfires on natural and built environments through management by installing the cisterns.

The project supports the Safe and effective Fire Response tenant of The Cohesive Wildland Fire Management Strategy by installing the cisterns and providing a critical component of fire response that is lacking in Leeward Maui. The project also supports the new wildland fire critical emphasis areas of: (1) community resilience, and (2) diversity, equity, inclusion (DEI) and environmental justice (EJ) by focusing efforts around the Waiohuli community, a DHHL community of native Hawaiians that is historically underserved (Source: Council on Environmental Quality. (2022). Climate and Economic Justice Screening Tool, version 1.0. As reported by the CWDG Data Tool, https://wildfirerisk.org/cwdg-tool/1505286).

The Leeward Maui Cisterns project was developed to meet two goals: 1) Provide high risk areas with limited water infrastructure for aerial and ground fire suppression with three cisterns across the landscape . 2) Create a fuel break between an area of state land with high fuel loads adjacent to communities that need fire protection.

The cistern section of the project is described in the 2020 Leeward Haleakala CWPP on beginning on page 44, within the Action Priorities Per Area to install water tanks around margins of communities to serve as dip tanks for helicopter fire suppression and water for grazing to reduce fuels.

With the assistance of cooperators Haleakala Ranch, Ulupalakua Ranch, and Department of Hawaiian Homelands, a total of three sites have been identified to install cisterns on 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. The estimated cost to develop each cistern site is $120,000 per location.

A request for proposals (RFP) will go out through the state of Hawaii Procurement system HiEPRO for the installation of the three cisterns, where the contractor will be responsible for the full installation of the tanks. Contractor must provide proof of Commercial Liability Insurance listing the State of Hawaii as additional insured.

Tank Locations:
Kahikinui: 20.674423165953833, -156.26233964426214
Kanaio:20.64784043459824, -156.35778336826453
Kaupo: 20.67450346927155, -156.2240591593948

**Importance:** Kahikinui Hawaiian Home Land meets the "wildfire hazard potential" criteria and has a higher wildfire hazard potential than 96.9% of tribal areas and counties in the nation.

| | |
|---|---|
| **Project Name:** Maui Fire Department - Inspection Program | |
| **Communities and Neighborhoods that will benefit from this project:** Western Maui, Molokai, South Maui, Upcountry Maui and Leeward Haleakala | |
| **Affiliation:** County of Maui, Department of Fire and Public Safety | **Project Lead:** County of Maui, Department of Fire and Public Safety<br>**Partners:** Maui Emergency Management, DLNR-DOFAW, and HWMO |
| **CWPP Area:** Leeward Haleakala, Maui | **Cost:** $4,495,197 |

**Project Description:** Maui Fire Department (MFD) is requesting $4,495,197 over 5 years to provide a year-round workforce of 4 Inspectors to work toward code education, compliance, enforcement, and defensible space educational home assessments. A combined workforce of MFD inspectors who carry out inspections and enforcement, and community-based educators/ home assessors at the residential level coordinated by an existing community cooperator, will provide a solid foundation to build a holistic Defensible Space Inspection program to address the growing number of parcels in high fire risk areas of Maui County that are not in compliance with vegetation management laws, including 16.04D.230-250 of the Maui County Fire Code.

This project will complete property inspections and enforce applicable defensible space laws and 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.

Lack of defensible space was likely a major factor in the loss of over 2,200 structures in Maui in August 2023, and has contributed to the major fires across Maui County for more than two decades. The combination of code inspection and enforcement capacity for those not in compliance, as well as community-based educational support to encourage voluntary compliance within high-risk neighborhoods will aid greatly in our ability to reduce the extreme risk posed to our communities from unmanaged vegetation.

The primary goal of this project is to implement a defensible space inspection and enforcement program for high fire risk areas (target area), that is capable of inspecting 100% of complaint driven inspection requests (upward of 200 annually, many of which currently take several months or longer to inspect due to capacity limitations), and 80% of the large landowners (those who own 1% of each island or more) whose unimproved parcels threaten improved parcels in the target area.

Follow-up enforcement activities will be completed on the 20 (est.) large land parcels each year that remain non-compliant after the inspectors make multiple attempts to work with the property owner. Inspections and enforcement will be performed at least twice in the 5-year period. Community-based educational home assessments to 750 residents over the 5-year period will also be conducted using the Firewise Home Assessment program collaboratively implemented by MFD and our nonprofit cooperator Hawaii Wildfire Management Organization (HWMO).

The 4 inspectors will conduct initial and follow-up property evaluations on both a proactive and complaint-driven basis. The community cooperator 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 properties. Some examples of community events include community and HOA meetings, hazard preparedness events and planning meetings, and local festivals. They will also coordinate the educational home assessments.

The Inspectors will engage owners of non-compliant parcels in a constructive, education-focused process to bring the parcel into compliance. For landowners who request assistance bringing the parcel into compliance, the inspectors will refer them to our community wildfire preparedness cooperator HWMO, who leads mitigation best practices educational programs, and can connect them to available programs and grant opportunities for risk reduction/mitigation. The inspectors will remain in contact with the parcel owner to guide them through the process of self-mitigation. Those parcels that remain non-compliant after multiple on-site assessments will be evaluated and referred through the legal enforcement process as governed by Maui County Fire Code and Hawaii revised Statutes Duties of the Fire Chief, which govern the enforcement process.

MFD will oversee the entire program, including the supervision and direction of the inspectors, handling public inquiries that cannot be adequately addressed by an inspector, ensuring documentation and records are completed properly, and determining which parcels will be referred for legal follow up. The Community Cooperator, Hawaii Wildfire Management Organization, will oversee the public outreach, educational home assessments, training and coordinating community assessors to perform the walk-around assessments and review of the home ignition zones of residents in the target area.

Inspectors will file and follow through to completion any appropriate legal actions such as citation up to and including court-ordered forced abatement, voluntary compliance is, by far, the primary objective of this program. Ensuring we have capacity for consistent and firm, but fair enforcement of defensible space and hazard reduction requirements is a critical factor moving forward after the massive structure loss and loss of life experienced during our recent disasters.

4 inspectors total is the minimum that would be required to complete the number of inspections necessary over the course of the 5-year project life. This will enable MFD to educate the public regarding applicable vegetation management and defensible space laws as well as pursue enforcement action on those parcels that do not bring their parcels into compliance.

Performing this set of community education and voluntary defensible space compliance, coupled with code inspection and enforcement is a cohesive and strategic set of actions designed to meet CWPP priorities. In Hawaii, our CWPP priorities are organized and developed directly following the goals and tenets of the Cohesive Strategy (CS). The priority actions of Maui County CWPPs addressed by this project are:

Western Maui CWPP: top priority action (#1) for emergency response agencies to pursue outreach and education to homeowners, landowners, and communities regarding brush abatement; and several top priorities for fire adapted communities: fuels management and fuel reduction around and within communities; education and outreach regarding defensible space and hazardous fuels management, and code enforcement (# 1, 2, 3, 4, 5, 7, and 14).

Molokai CWPP: increasing/ensuring enforcement of wildfire codes, ordinances, brush abatement; increasing community awareness via outreach and education; increasing community capacity to address wildfire issues and take action; and assisting and supporting enforcement of fire safety and prevention laws. (# 2, 3, and 4, and legislation and enforcement sub-priority #2).

South Maui CWPP: top priorities for resilient landscapes are fuel reduction on the boundaries of large landholdings, and improved community participation of vegetation management within and around residential areas. All five resilient landscape actions are addressed with this project, as well as the hazardous fuels treatment

recommendations for fallow agricultural lands and home lots and structures (Table 12).

Upcountry Maui CWPP: increasing education and fuels management, community awareness, enforcement, and capacity for MFD, through increases in personnel. This project meets those priorities using a strategic, integrated approach.

Leeward Haleakala: top priorities and actions for Fire Adapted Communities, including: Support residential/homeowner actions via outreach and education, and pursue outreach and education programs for residents and area managers to treat structural ignitability of homes and buildings (page 43).

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 Maui County. The personnel proposed here will be focused on the communities with the highest fire threat, that are the most vulnerable and underserved WUI communities, 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 pg. 104 of the Forest Action Plan.

**Importance:** We have collectively identified priority areas with unmanaged fuels and inadequate defensible space, vulnerable high risk communities, and underserved areas for this DSI and connected partner projects. Collectively, our projects are supported by all of our CWPPs which identified these issues as priorities to address. We understand that it will take a multi-faceted approach to protect our at-risk communities and our sensitive landscapes, given jurisdictional boundaries and mandates across agencies, and the complicated combination of private land ownership and state lands on Maui (very little federal lands and no national forest).

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The following county, state, and federal representatives have a high level of interest in the protection of the Leeward Haleakalā area from wildfire, and have reviewed and support this Community Wildfire Protection Plan.

State Department of Land and Natural Resources- Division of Forestry and Wildlife
Kalanimoku Building
1151 Punchbowl St. Room 325 Honolulu, HI 96813

Maui Fire Department
200 Dairy Road Wailuku, HI 96793

Maui Emergency Management Agency
200 S. High Street Wailuku, HI 96793

For inquiries related to the development of this plan, to add action plan projects, or for printed copies, please contact:
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Funding for this project was provided by USDA Forest Service-
State and Private Forestry- Landscape Scale Restoration Program.