# MOLOKA'I COMMUNITY WILDFIRE PROTECTION PLAN


ISLAND OF MOLOKA'I, COUNTY OF MAUI, HAWAI'I

## ORIGINAL PLAN: 2016

This document represents the collective efforts of community members, agencies, and stakeholders to reduce wildfire risks and enhance resilience. Originally developed in 2016, 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.

Michael J. Walker, State Fire Protection Forester — Date: 12/19/2024
Department of Land and Natural Resources
Division of Forestry and Wildlife

Bradford Ventura — Date: 12/27/2024
Brad Ventura, Fire Chief
County of Maui
Maui Fire Department

Amos Lonokailua-Hewett — Date: 12/27/2024
Amos Lonokailua-Hewett, Administrator
Maui Emergency Management Agency

ACKNOWLEDGEMENTS From the orginal plan development in 2016

***Project Developed and Coordinated by:*** Hawai'i Wildfire Management Organization (HWMO), a 501 (c)3 nonprofit organization dedicated to protecting communities and natural resources in Hawai'i and the Pacific from wildfire. hawaiiwildfire.org

***Project Carried Out in Close Partnership with***: Molokai Fire Task Force, which includes Maui Fire Department, The Nature Conservancy, State of Hawai'i (Department of Land and Natural Resources-Division of Forestry and Wildlife, Department of Hawaiian Home Lands, Highways Division, Airports Division, Department of Human Services), Moloka'i Ranch, County of Maui (Public Works, P&R, Water), Moloka'i Irrigation System, Kawela Plantation, Maui Police Department, American Medical Response, National Park Service, Moloka'i EOC, Goodfellow Bros., and various community residents and professionals.

***Plan written by:*** Elizabeth Pickett and Pablo Beimler, HWMO.

***Public Input Process Coordinated and Led by:*** Elizabeth Pickett and Ilene Grossman, HWMO, and Lance De Silva, DLNR-DOFAW, with assistance and participation from the Moloka'i Fire Task Force.

***Maps Created by:*** Orlando Smith, HWMO.

***Special Thanks to:*** Lance De Silva, Department of Land and Natural Resources- Division of Forestry and Wildlife. Clay Trauernicht, University of Hawai'i, CTAHR.

***Completed using funds from:*** 2014-16 US Forest Service Competitive Western WUI Grant from the Cooperative Fire Program of the U.S. Forest Service, Department of Agriculture, Pacific Southwest Region. 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.


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## GOALS AND OBJECTIVES

This Community Wildfire Protection Plan (CWPP) was developed by the Hawaiʻi Wildfire Management Organization (HWMO) in partnership with the Molokaʻi Fire Task force. Its contents are a result of input, guidance, and support from federal, state, and county agencies and representatives, private resource management entities, community members, and decision makers concerned about wildfire issues in Molokaʻi. State of Hawaiʻi Department of Land and Natural Resources- Division of Forestry and Wildlife (DLNR-DOFAW) facilitated much of the effort to coordinate stakeholders and contributors.

This plan includes elements of fire protection, hazard assessment, wildfire mitigation priorities, and community outreach and education. 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).

The goals and objectives of this plan follow the intent and requirements of the *Healthy Forests Restoration Act (HFRA) of 2003 – HR 1904,* which describes a CWPP as a fire mitigation and planning tool for an at-risk community that:

- Is developed within the context of the collaborative agreements and the guidance established by the Wildland Fire Leadership Council and agreed to by the applicable local government, local fire department, and state agency responsible for forest management, in consultation with interested parties and the federal land management agencies managing land in the vicinity of the at-risk community.
- Identifies and prioritizes areas for hazardous fuel reduction treatments and recommends the types and methods of treatment on federal and non-federal land that will protect one or more at-risk communities and essential infrastructure.
- Recommends measures to reduce structural ignitability throughout the at-risk community.[1]

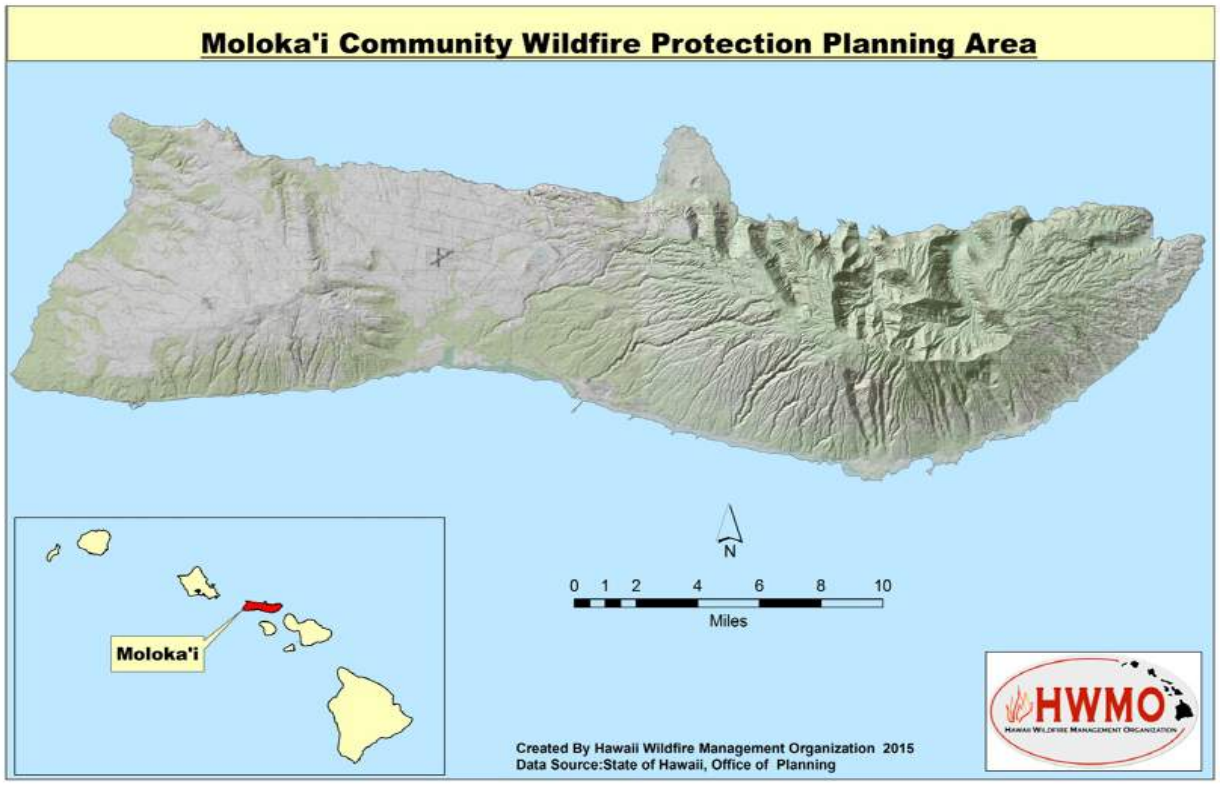
Stakeholder participants in the development of this plan agree that wildfire threats are imminent and can have widespread damage to Molokaʻi watersheds, natural resources, and human communities. The danger of fire is related to high numbers of human-caused fires, dry conditions, strong winds, and high fire potential of vegetation. In the last decade, numerous areas of Molokaʻi have burned. The CWPP is an important step toward supporting collaborative wildfire protection on Molokaʻi.

## PLANNING AREA BOUNDARIES

The Molokaʻi CWPP planning area includes the entire island of Molokaʻi, which lies in Maui County, Hawaiʻi (Map 1).

The plan includes federal, state, county, and privately owned lands. The CWPP comprehensively defines the entire island of Molokaʻi as a WUI at-risk area. The simultaneous WUI designation and CWPP planning area is delineated to ensure adequate protection of natural areas and human communities from the threat of wildfire. The Molokaʻi planning area was chosen through agency meetings and addresses one of the Maui County's fire prone regions.

The Molokaʻi CWPP is part of a series of CWPPs in Maui County that also includes Western Maui, Upcountry Maui, South Maui, and Kahikinui. Additional CWPPs may be developed as communities gain interest in wildfire preparedness planning and as funds become available to complete the planning processes.




***Map 1.*** *Molokaʻi CWPP Planning Area Map.*

## PLANNING PROCESS, METHODS, AND PARTICIPANTS

*CWPP PROCESS AND METHODS*

The process of developing a CWPP helps to clarify and refine priorities for the protection of life, property, and critical infrastructure in the wildland-urban interface areas. Local residents, landowners, fire suppression agencies, and community leaders have participated in valuable discussions regarding wildfire history, resources at risk, areas of concern, and priority mitigation actions. The methods used to create this CWPP followed the guidelines established by the HFRA, which requires the following actions during the planning process:

- Contact Decision Makers
- Involve Federal, State and Local Agencies
- Engage Interested Parties

This CWPP followed these guidelines and additionally satisfies the requirements of the FEMA Pre-Disaster Mitigation program and the NFP.

***Photo 1.*** *Moloka'i Task Force representatives worked in small groups to identify and discuss wildfire related concerns and priority wildfire mitigation activities. Photo Credit: HWMO.*

*PARTICIPANTS*

### State of Hawai'i and Local Agencies

The representatives of the State of Hawai'i and local agencies that have jurisdictional responsibilities in the vicinity of the Moloka'i CWPP planning area, and who have been involved in the development of the Moloka'i CWPP are:

| Agency | Representative(s) |
|---|---|
| Maui Fire Department | Jeffrey Murray, Fire Chief |
| Hawai'i Department of Land and Natural Resources- Division of Forestry and Wildlife | Lance De Silva, Forest Management Supervisor I<br>David G. Smith, Administrator<br>Robert Hauff, State Protection Forester |
| County of Maui Civil Defense | Anna Foust, Emergency Management Officer |
| Additional agency members of the Moloka'i Fire Task Force | Maui Police Department, State Department of Hawaiian Home Lands, State Highways Division, State Airports Division, State Department of Human Services, County of Maui (Public Works, P&R, Water), |

***Table 1.*** *CWPP Participants: State of Hawai'i and Local Agencies.*

### Federal Agencies

The following federal agencies (See Table 2) were consulted for area-specific and regional fire and environmental information and expertise:

| Agency | Representative(s) |
|---|---|
| National Park Service (NPS) | James Courtright, National Park Service Fire Management Officer<br>Ross Williams, National Park Service Fire Management Officer |
| US Fish and Wildlife Service (USFWS) | Dawn Bruns, Acting Assistant Field Supervisor Section 7 & Habitat Conservation Plans |

***Table 2.*** *CWPP Participants: Federal Agencies.*

### Decision Makers

The decision-makers contacted for input and involvement in the development of the Molokaʻi CWPP are represented in Table 3.

| Local Government | Name | Representing |
|---|---|---|
| Maui County Council | Stacey Crivello | Molokaʻi |

***Table 3.*** *CWPP Participants: Decision Makers.*

***Photo 2****. Several agencies and private organizations worked together to recommend wildfire projects and next steps. Photo credit: HWMO.*

***Photo 3.*** *Lance De Silva, DLNR-DOFAW, helped to facilitate the CWPP community and agency input. Photo credit: HWMO.*

### Interested Parties

The parties from the Molokaʻi community that have shown interest in forest/fire management and contributed input into the Molokaʻi CWPP are:

| Interested Parties | Affiliation |
|---|---|
| Molokaʻi Fire Task Force, non-agency private party representatives | The Nature Conservancy, Molokaʻi, Ranch, Molokaʻi Irrigation System, Kawela Plantation, American Medical Response, Molokaʻi EOC, Goodfellow Bros. |
| Private Citizens | General Public |

***Table 4.*** *CWPP Participants: Interested Parties.*

***Photo 2****. The public at large was invited to participate in the process, and identified several concerns related to wildfire. Photo credit: HWMO.*

***Photo 3.*** *Community ideas for wildfire protection projects were discussed among public meeting participants. Photo credit: HWMO.*

## WILDFIRES IN MOLOKA‘I
## BACKGROUND

Steep slopes, rough terrain, strong winds, and a large percentage of highly ignitable invasive grasses characterize the Moloka‘i landscape. This, coupled with warm weather, recurring drought conditions, changes in land use and maintenance, and a history of human-caused fires put the area at increased risk of wildfire. The proximity of development to high hazard fire-prone wildlands present hazardous conditions that now threaten Moloka‘i communities and natural resources. 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, environmental, and residential resources. Together, these factors create the fire environment that puts Moloka‘i at risk of wildfire. This section discusses those factors in detail.

### FIRE ENVIRONMENT

*CLIMATE*

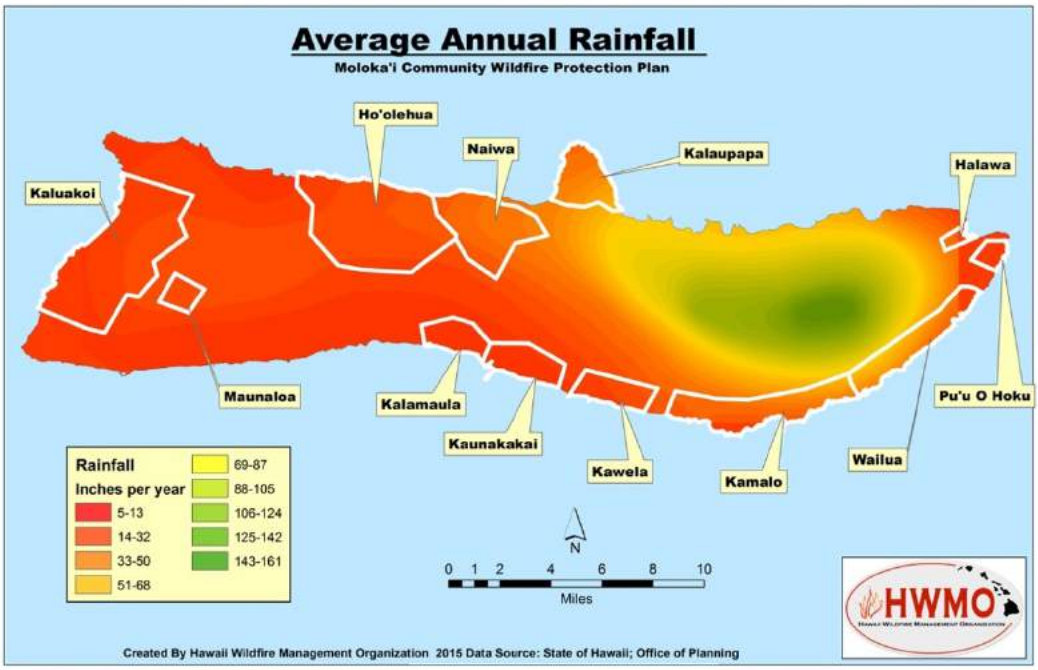
Wildfire occurrence in Moloka‘i is tied to broad climate patterns, in that more and larger fires typically occur according to a combination of low relative humidity, high winds, and/or drought conditions. Rainfall in Moloka‘i is variable over space and time and can greatly influence fire risk. For instance, there is a greater likelihood of large wildfires in the island’s lee areas, but broader areas are at risk during drought episodes. Wet periods also contribute to high hazard, in that precipitation may increase the quantity of vegetation that becomes fire fuel during drier periods. These climatic variables increase both fire risk and the frequency that mitigation measures such as firebreaks and fuels reduction need to be applied and maintained.

Daily and seasonal weather patterns also influence fire risk. Figure 1 provides monthly temperature and rainfall averages from the airport at Kaunakakai.[2] Maps 2 and 3 show typical geographic patterns of average rainfall and wind speeds across the island.

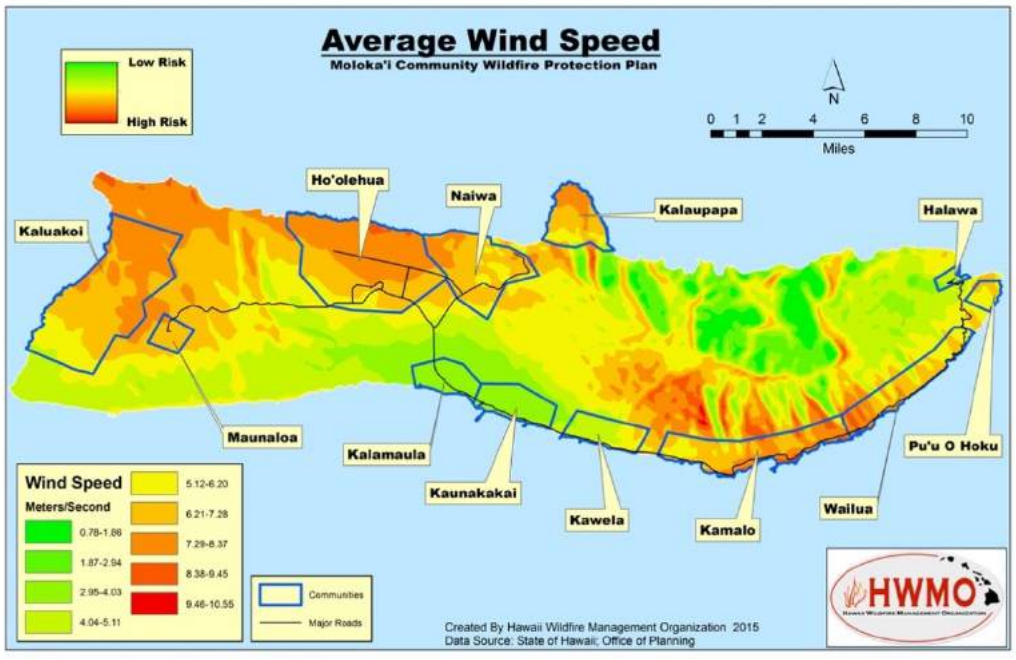
*TOPOGRAPHY*

Moloka‘i is characterized by a combination of residential, commercial, and agricultural areas, and rugged, often inaccessible terrain. This topography (see Map 4) creates dangerous conditions when wildfires occur and often limits the ability of emergency response agencies to effectively contain and suppress wildfires. Topography influences fire behavior, as wildfires spread more quickly as they progress upslope and drier areas burn at higher intensity. Moloka‘i’s diverse and steep topography also places constraints on emergency access and evacuation options for local communities. When wildfires spread, suppression

options are often limited by lack of access and difficult terrain, and can require costly aerial operations (i.e., bucket drops by helicopters).




***Map 2.*** *Average annual precipitation map.*



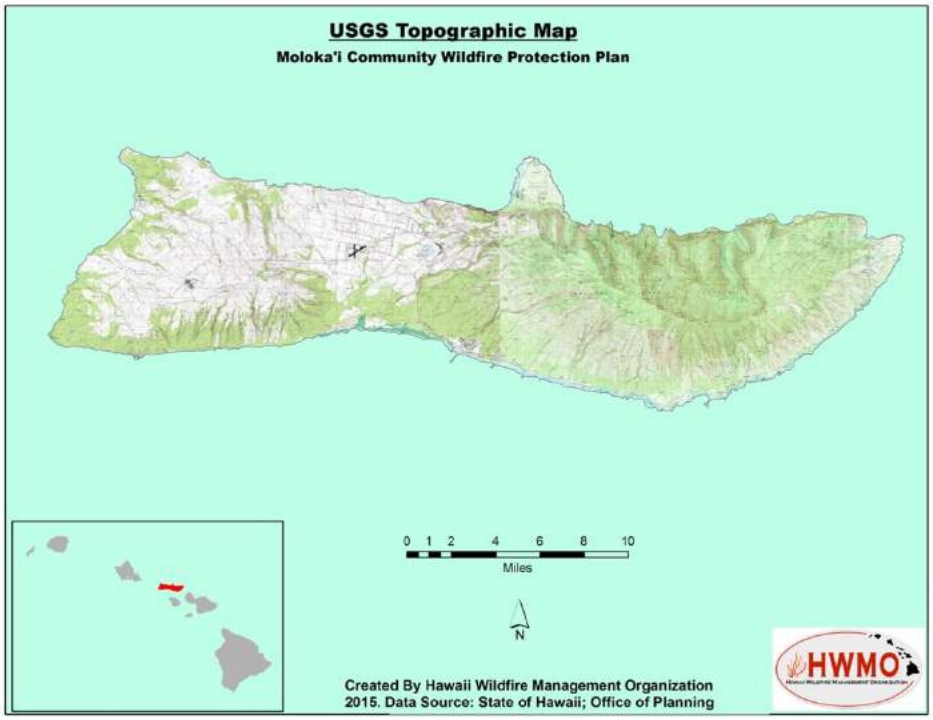

***Map 3.*** *Average wind speed map.*

| Average Maximum Temperature | | |
|---|---|---|
| | °C | °F |
| Jan | 25.2 | 77.4 |
| Feb | 25.2 | 77.4 |
| Mar | 25.8 | 78.4 |
| Apr | 26.3 | 79.3 |
| May | 27.5 | 81.5 |
| Jun | 28.3 | 82.9 |
| Jul | 28.9 | 84.0 |
| Aug | 29.6 | 85.3 |
| Sep | 29.7 | 85.5 |
| Oct | 29.0 | 84.2 |
| Nov | 27.5 | 81.5 |
| Dec | 26.0 | 78.8 |
| Year | 27.5 | 81.5 |

| Average Minimum Temperature | | |
|---|---|---|
| | °C | °F |
| Jan | 17.8 | 64.0 |
| Feb | 17.5 | 63.5 |
| Mar | 18.1 | 64.6 |
| Apr | 19.0 | 66.2 |
| May | 19.8 | 67.6 |
| Jun | 20.9 | 69.6 |
| Jul | 21.5 | 70.7 |
| Aug | 21.7 | 71.1 |
| Sep | 21.6 | 70.9 |
| Oct | 21.2 | 70.2 |
| Nov | 20.1 | 68.2 |
| Dec | 18.6 | 65.5 |
| Year | 19.8 | 67.6 |

| Average Rainfall | | |
|---|---|---|
| | mm | inches |
| Jan | 107.8 | 4.2 |
| Feb | 85.7 | 3.4 |
| Mar | 78.7 | 3.1 |
| Apr | 55.9 | 2.2 |
| May | 33.3 | 1.3 |
| Jun | 12.1 | 0.5 |
| Jul | 18.4 | 0.7 |
| Aug | 17.6 | 0.7 |
| Sep | 21.4 | 0.8 |
| Oct | 57.5 | 2.3 |
| Nov | 85.1 | 3.4 |
| Dec | 114.1 | 4.5 |
| Year | 688.6 | 27.1 |

***Figure 1**. Climate data from the Molokai Airport. Located at about 449 feet / 137m above sea level. Measurements represent a 25 year average.*[2]




**Map 4.** Topographic Map of Molokaʻi CWPP planning area, based on US Geological Survey data.

*VEGETATION AND NATURAL RESOURCES*[10]

Moloka'i has areas that are agricultural areas, nonnative grasslands and shrublands, and mixed and native forests. Natural resources from forests to coral reefs face threats from the pressures of commercial operations, poor land-use planning and management, benign neglect, and positive feedback loops that include wildfires, which then exacerbate and perpetuate issues. For instance, over 90% of native lowland shrubland areas have been lost due to a series of land use practices (i.e. overgrazing, sugar and pineapple cultivation, and unmanaged fallow lands). This has led to invasion by nonnative species, which in many areas promotes large fires, leads to post-fire erosion that smothers coral reefs, and creates conditions on the landscape that promote further invasion by fire prone nonnative species.

***Photo 4.*** *Nonnative fire-prone grasses and shrublands, as well as areas of bare soil dominate are part of the fire environment of Moloka'i. Photo credit: HWMO.*

A few small areas of native lowland coastal dry forest and shrubland communities still exist in West Moloka'i, however the region is generally dominated by non-native vegetation such as Christmas berry, Kiawe, and several fire-promoting shrubs and grasses. These nonnative, fire-prone grass, shrub, and tree species provide abundant fine fuels that cure quickly in dry conditions, are easily ignitable even in humid conditions, and allow fires to spread rapidly, creating dangerous conditions for communities and fire responders. The widespread establishment of nonnative grasslands and shrublands is a leading cause of increased fire risk in Moloka'i. These species often act as uninterrupted 'wicks' that allow fires to spread from communities and roads (where ignition risk is highest) into areas that have contiguous fuels and more challenging access for firefighting efforts.

***Photo 5.*** *Seasonal rain promotes the growth of grasses, which dry out and leave abundant and hazardous fine fire fuels. Photo credit: HWMO.*

The Kamakou Forest Reserve and the West End of the island both contain rare and endangered plant species as well as an important native dominated montane mesic forest and wet forest. Reforestation of native dryland forests is an

ongoing priority of local natural resource protection efforts. Drought episodes, fire, and invasive species are continuing challenges in these areas.

Erosion is a significant problem on the West End, with numerous bare soil areas that carry sediment into nearby waters during and after seasonal rain events. Wildfires can intensify erosion issues by removing soil-stabilizing plants and changing soil properties to become more erodible. The worst erosion and sediment pollution of nearshore waters occurs along the south shore from Punakou to Hālena, but the entire West End experiences erosion and sedimentation issues. Coral reef and marine ecosystem health are thereby quite connected to land use and management practices, as well as wildfire mitigation and post-fire soil stabilization.

***Photo 6.*** *Erosion and land-based sediment pollution on coral reefs. Photo credit: HWMO.*

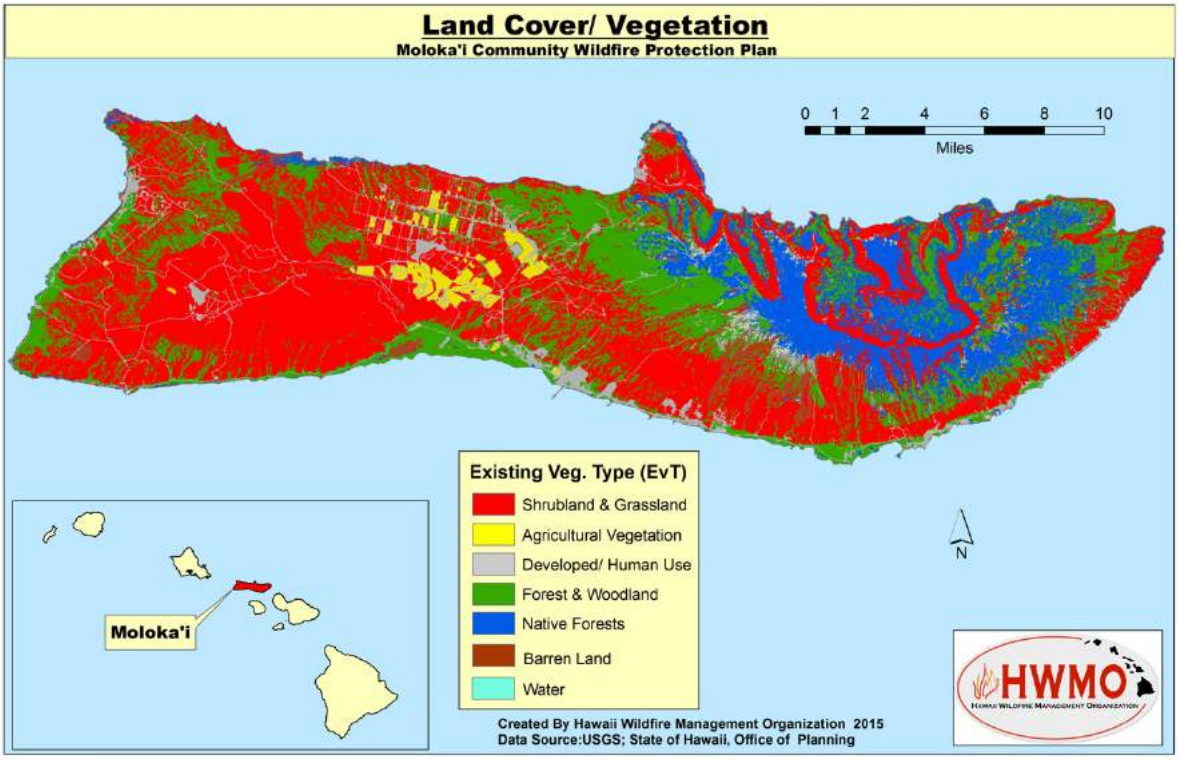
Maps 5-8 provide geographic details about the fire environment and natural resources of Molokaʻi:

Map 5- Land cover types and vegetation categories across the island.

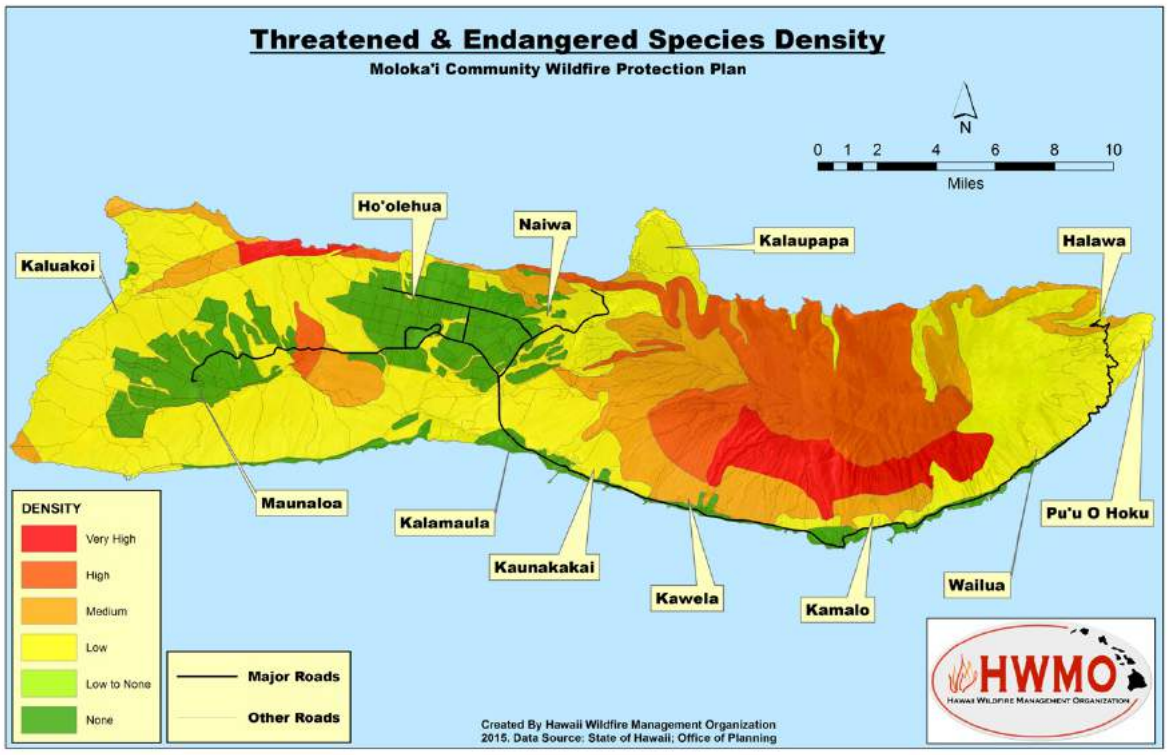
Map 6- Densities of Threatened and Endangered species.

Map 7- Areas classified by USFWS as priority habitat conservation areas.

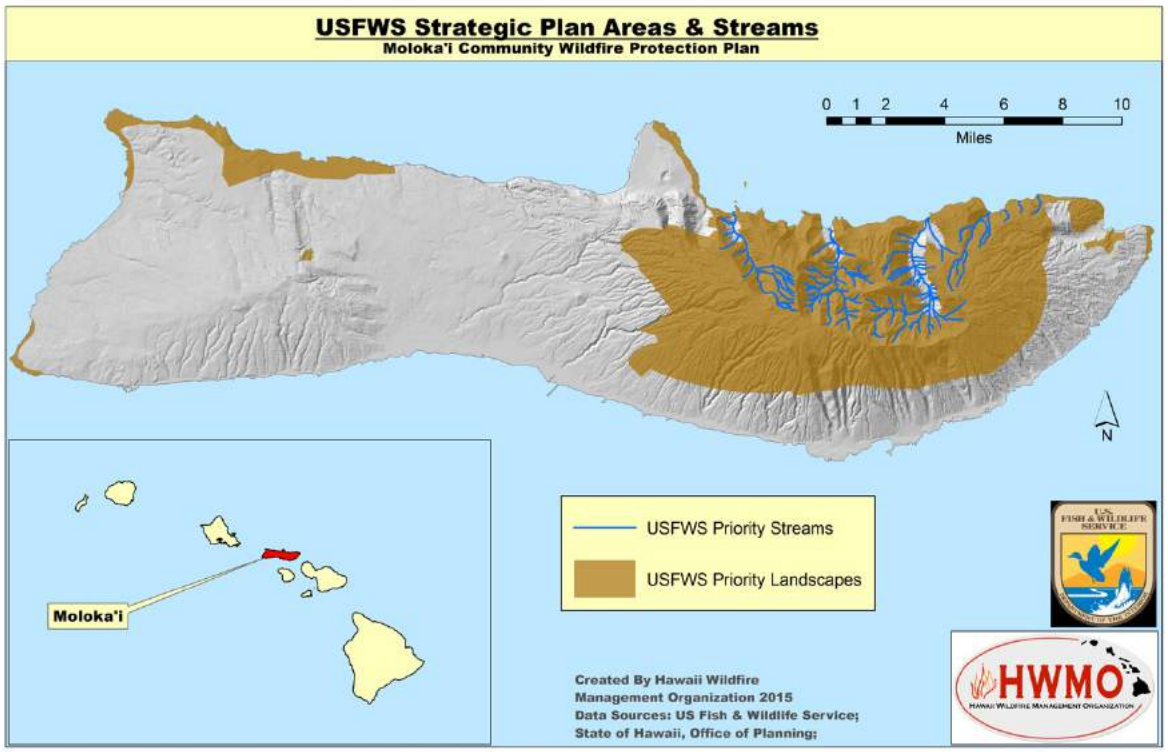
Map 8- Types of vegetation within the USFWS priority landscapes area.



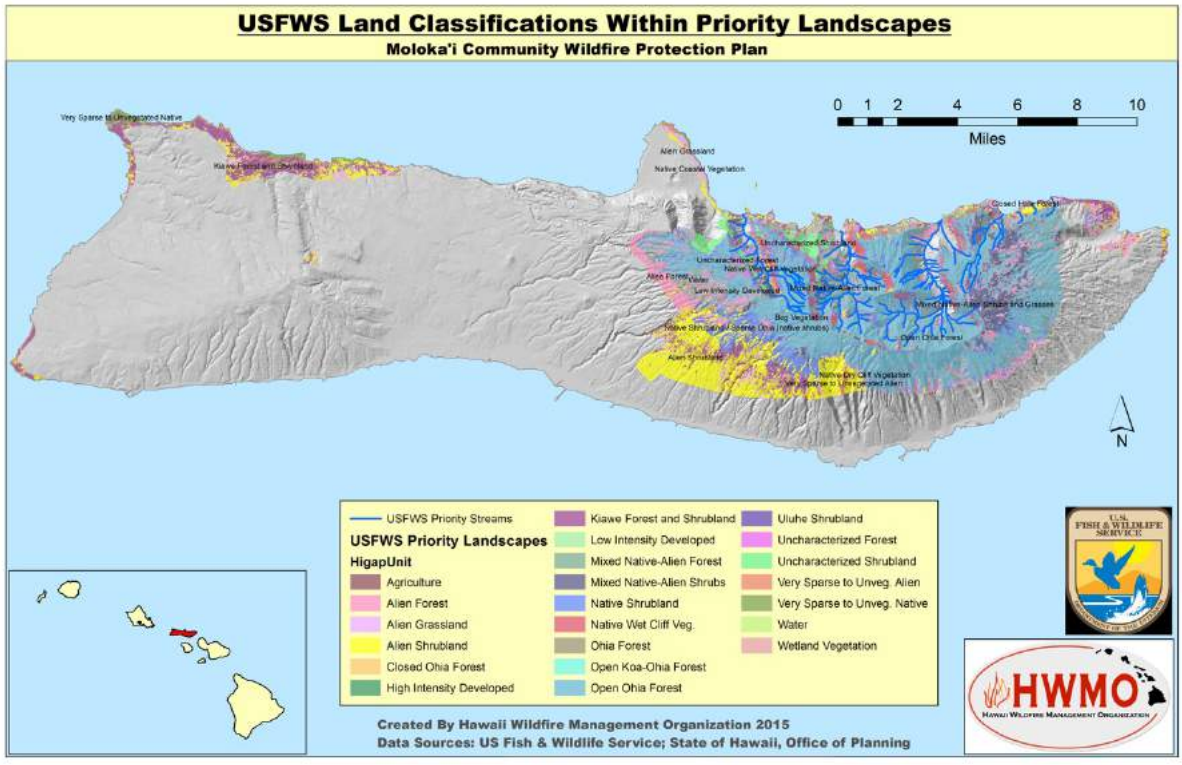

***Map 5.*** *Land cover/ vegetation map for Moloka'i CWPP planning area.*




***Map 6.*** *Threatened and Endangered Species densities map for the Moloka'i CWPP planning area.*




***Map 7.*** *USFWS map of Priority Landscapes within the CWPP planning area.*




***Map 8.*** *USFWS map of land cover type within their Priority Landscapes areas of Moloka'i.*

## FIRE HISTORY

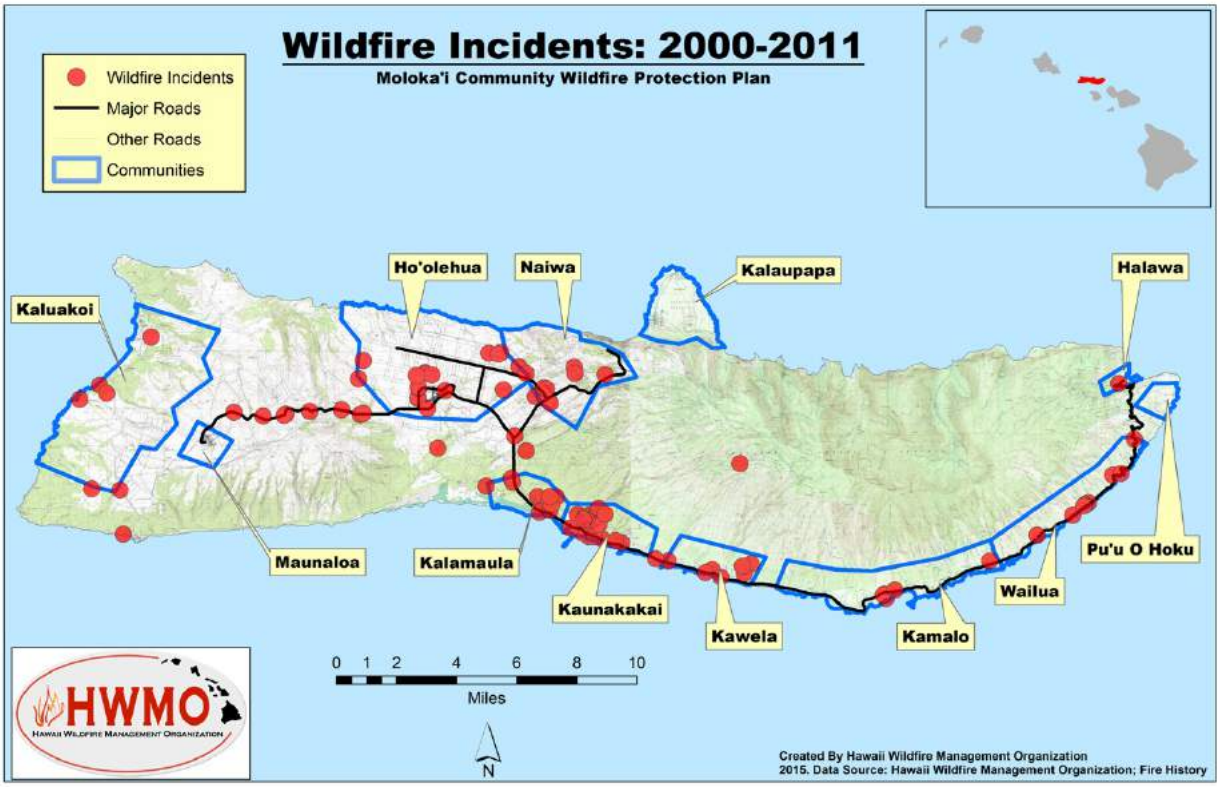
*IGNITIONS*

The WUI— the wildland-urban interface area along which developed areas, roads, and community infrastructure abut undeveloped land— is where the majority of wildfire ignitions occur in all of Hawai‘i. Moloka‘i CWPP is no exception. Because of this, WUI areas often experience the greatest risk of loss of property, life, and natural resource function due to wildfire. The majority of wildfires on Moloka‘i 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 unmanaged fire fuels create a significant hazard. Once ignited along the interface, wildfire can spread rapidly through and around residential areas, threatening both property and life. Wildfires in lesser developed areas, fallow agricultural lands, and in the higher elevations also spread and threaten natural areas, and the native and protected species they may contain.

*FIRE INCIDENT MAP*

The Moloka‘i Wildfire Incident Map (Map 9) displays results from an HWMO-led effort to compile wildfire records from fire suppression agencies across the state, which resulted in a statewide wildfire database, as well as region-specific wildfire incident maps. It includes MFD’s documented responses to wildfires between January 2000 and January 2011 and wildfire ignition points recorded by DLNR-DOFAW from 1998-2012. The map displays ignition points, and does not indicate the final perimeter of burned areas.

Ignitions are important for understanding trends and patterns of fires. Map 9 demonstrates that WUI, roadside, and human access area fire starts are important trends across the island. While larger fires tend to occur in the drier areas with unmanaged vegetative fuels, the high frequency of ignitions along every WUI is of concern. As drought conditions become more frequent (and they are predicted to increase), there are concerns that large fires in dense unmanaged vegetation will correspondingly increase.




***Map 9.*** *Moloka'i Fire Incident Map. Incidents recorded from 1988-2012. Note: points displayed are ignition sites only and do not indicate perimeter boundaries of burned areas.*

*SIGNIFICANT FIRES*

Several large wildfires (over 1000 acres) have taken place on Moloka'i. Detailed records are scant before 2000, but many since that time have received media attention or been noted for their significant impacts. Table 5 highlights the fires on record that were significant in terms of size, media coverage, or impact.

| Incident Name | Location | Date | Acres | Cause | Property/ Vegetation | Notes |
|---|---|---|---|---|---|---|
| **Molokai '98 or Kawela Flats** | Kaunakakai (mauka of town) | Date Started: August 23, 1998 (4:32 p.m. first alarm) Date Contained: August 28, 1998 Date Controlled: August 29, 1998 | 12,453 | Undetermined | Open land or field | HDF Cost: $250,975 Damage Costs: $43,502,300 Structures/ Homes Lost: 1 |
| **Kaunakakai** | Kaunakakai (mauka of town) - Kikipua St. | Date Started: August 29, 2009 (12:02 p.m. first alarm) Date Contained: September 3, 2009 Date Controlled: September 7, 2009 | 7,800 | Undetermined | Open land or field; Pine, native shrubs, kiawe, molasses grass | HDF Cost: >$75,000 Damage Costs: $1,410,000 Structures/ Homes Lost: 1 |
| **Keonelele Road** | Kaunakakai - Keonelele Road | Date Started: June 4, 2007 (12:12 p.m. first alarm) Date Contained: June 6, 2007 | 1,000 | Undetermined | Open land or field: Brush and grass | |
| **Molokai '04** | 25 Moomomi Ave. | July 24, 2004 (10:40 a.m. - first alarm) | 600 | Accidental | Open land or field; brush or brush-and-grass mixture | |
| Molokai '03 | Moomomi Ave. | June 25, 2003 (1:59 p.m. - first alarm) | 400 | Undetermined | Open land or field; brush or brush-and-grass mixture | |
| Molokai '08 | Moomomi Ave. | March 29, 2008 (9:33 a.m. - first alarm) | 350 | Undetermined | Open land or field; brush or brush-and-grass mixture | |
| Molokai July '07 | Maunaloa Hwy. | July 23, 2007 (7:30 a.m. - first alarm) | 240 | Undetermined | Open land or field; brush or brush-and-grass mixture | |
| Molokai '05 | Maunaloa Hwy. | July 6, 2005 (4:17 p.m. - first alarm) | 200 | Undetermined | Open land or field; brush or brush-and-grass mixture | |
| Hoʻomalu | 327 Hoomalu | January 29, 2012 (1:05 p.m. - first alarm) | 150 | Fireworks | Open land or field; brush or brush-and-grass mixture | |
| Launui | 171 Launui St. | August 19, 2005 (10:31 p.m. - first alarm) | 100 | Undetermined | Open land or field; brush or brush-and-grass mixture | |

***Table 5.*** *Molokaʻi large and significant wildfires.*

Narrative accounts including published photos of these fires are provided below:

***Molokai '98 or Kawela Flats Fire[3]***

The island of Molokai's largest wildfire between 1998 and 2012 occurred in late August of 1998. Starting on August 23rd, the brushfire became destructive to native forests managed by The Nature Conservancy. The 2,775-acre Kamakou preserve lost dozens of acres of native ohia-pukiawe shrublands, one of the "few remaining intact examples" of one in the entire state. Ed Misaki, director of The Nature Conservancy's Molokai programs remarked at the time, "Walking through the burned area is very depressing. It's heartbreaking to see any part of our ancient forest destroyed by fire." Within six days, the fire was under control but a total of 12,453 acres were burned, including 1,584 acres of commercial forest.

***Kaunakakai Fire 2009[4]***

A combination of gusty winds, a dry landscape, and large expanses of abandoned agricultural lands created a difficult-to-control wildfire on August 29, 2009. Initially, the fire threatened dozens of homes and businesses in Kaunakakai, coming to within 20 feet of some residences. Many residents stayed to protect their homes with garden hoses despite evacuation calls from emergency responders. Maunaloa Highway, Molokai High School and Middle Schools, Kaunakakai Elementary School, and Kualapuu Elementary Public Charter School were all closed due to firefighting efforts.


***Photo 7.*** *Fire crews battle the Kaunakakai Fire in 2009. Photo credit: Jeff Zuckernick/Honolulu Advertiser.*

Hard-to-reach valleys and gullies in the Makakupaia section of Molokai State Forest created challenging conditions for firefighters.

***Photo 8.*** *Fire prone grasses such as these burning in the Kaunakakai 2009 fire, are both a cause and a result of wildfires on Moloka'i. They desiccate easily, spread fire rapidly, and regenerate quickly after wildfire. This leads to what is known as the grass-fire cycle. Photo credit: Honolulu Advertiser.*

The Kamakou Preserve, an important watershed home to native trees, plants, insects and birds was impacted by the fire. In total, 7,800 acres burned mostly in open fields, though 450 acres burned in commercial forest, according to DLNR-DOFAW fire records. Firefighters worked to create firebreaks to stop the fire from encroaching the forest preserves. A carport and an abandoned structure were

destroyed, but all others escaped loss or damage. One firefighter was treated for smoke inhalation during the firefighting efforts. FEMA funding was approved to cover a portion of the expensive firefighting costs.

### *Keonelele Road Fire 2007*[5, 6, 7]

The Keonelele Road brush fire began on June 4th, 2007 on the makai side of Maunaloa Highway near mile marker 11 but quickly spread due to strong winds. "The wind (was) not helping us," explained Timmy Gapero, Police Lieutenant at the time. "It was really blazing," Gapero said. "It spread rapidly because of the winds."

Fortunately, the winds drove the fire away from homes but burned nearly 1,000 acres of brush. Some Kaluakoi residents lost power on the first night as the fire jumped Kaluakoi Road. Firefighters later to contained the 3-acre spot fire that was headed towards homes. Evening rains and additional personnel and resources from Maui helped put an end to the fire.

***Photo 9.*** *Smoke and flames from the Keonelele Fire move across nonnative grass and shrublands. Credit: Leo Azambuja/Star-Bulletin.*


***Figure 2.*** *Area burned by the Keokelele Fire. Credit: Honolulu Advertiser.*

## WILDFIRE IMPACTS

Many of the community, economic, natural, and cultural resources in Molokaʻi 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 Hawaiʻi, 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. 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. 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.

*IMPACTS TO COMMUNITIES AND MUNICIPAL ACTIVITIES*

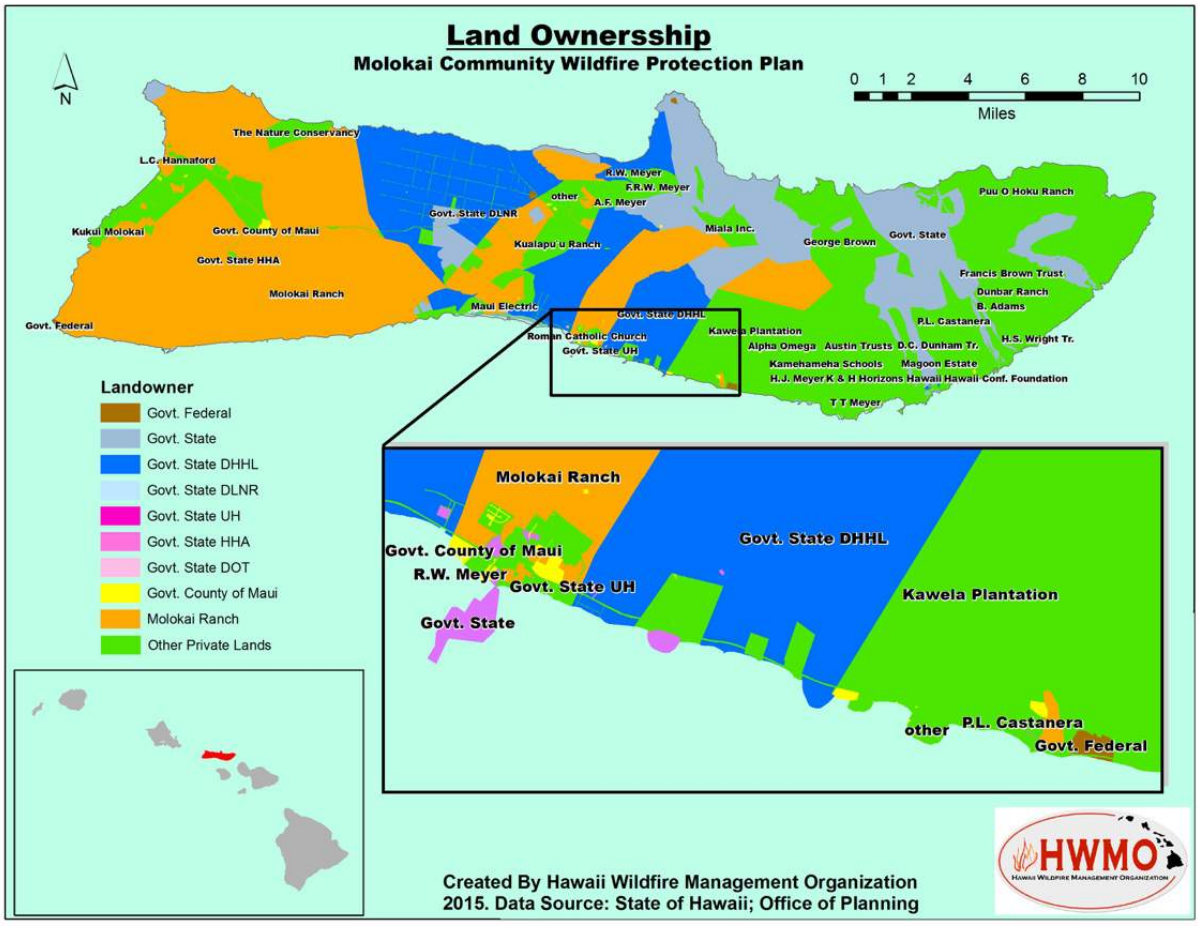
Wildfires threaten lives, homes, and human health in several ways. Many neighborhoods have unmanaged/untended fire fuels interspersed within developed areas, promoting fire spread through communities and into surrounding areas. This creates an increased hazard to lives and homes in the area. Air quality 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), 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.

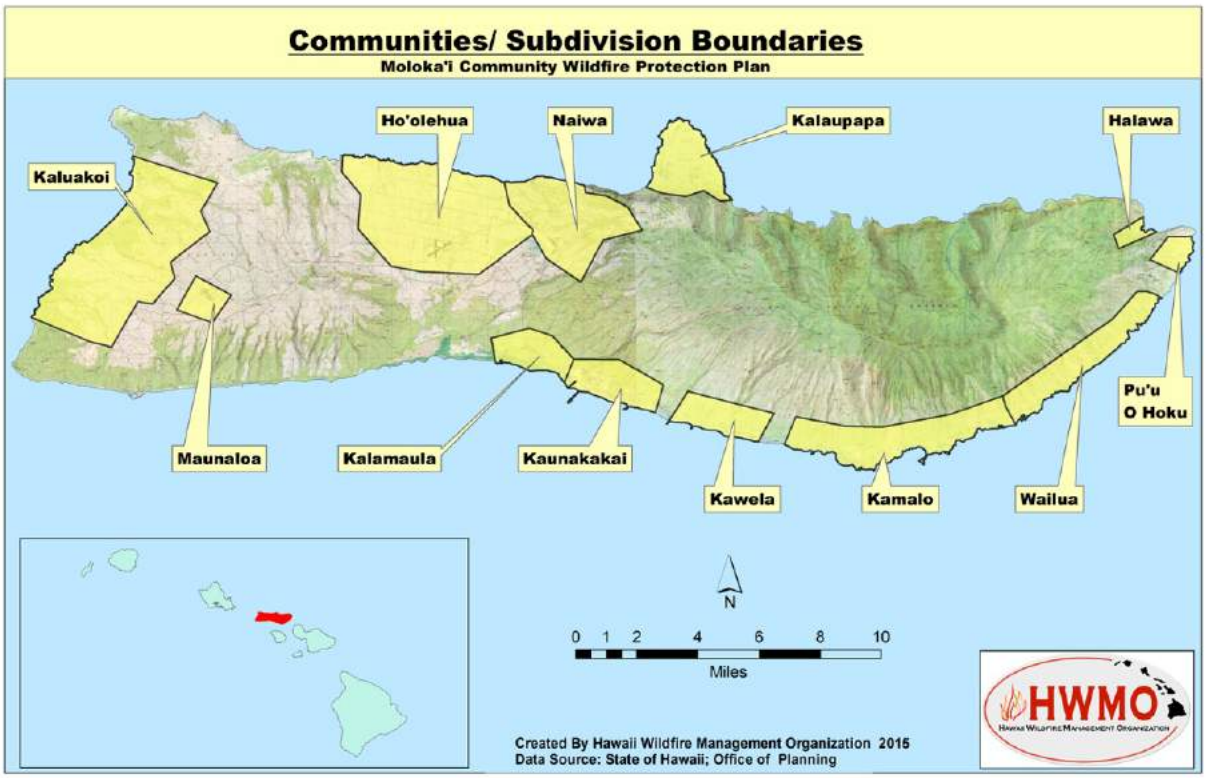
## GENERAL OVERVIEW OF CWPP PLANNING AREA
### MOLOKA‘I

The island of Moloka‘i includes federal, state, county, and privately owned lands (Map 10). The CWPP planning boundaries and the defined WUI at-risk area boundaries cover the entire island of Moloka‘i. The entire island was included to ensure adequate protection of both natural areas and human communities.



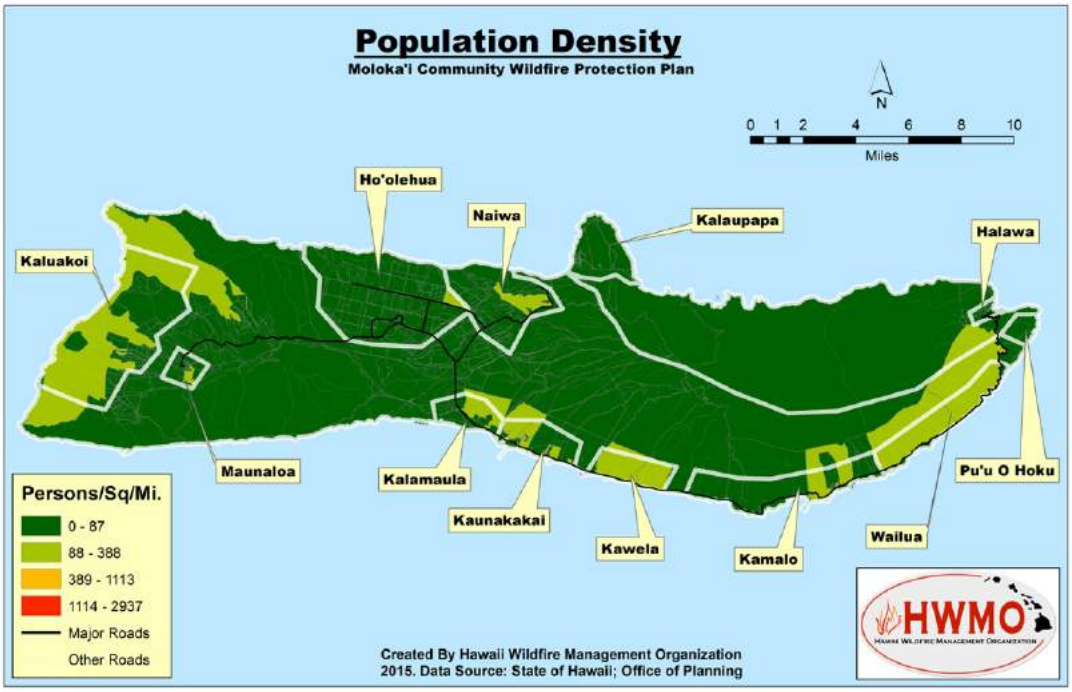

***Map 10.*** *Land ownership map for Moloka‘i CWPP planning area.*

For the purposes of assessing hazards and wildfire threats to resources, residential areas on Moloka‘i were simplified into twelve “communities” (Map 11). 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 DLNR-DOFAW‘s Communities at Risk from Wildfire maps, which are developed every few years to demonstrate wildfire threats to Hawai‘i’s (See *Communities at Risk from Wildfires* section, for more information and detailed hazard maps).

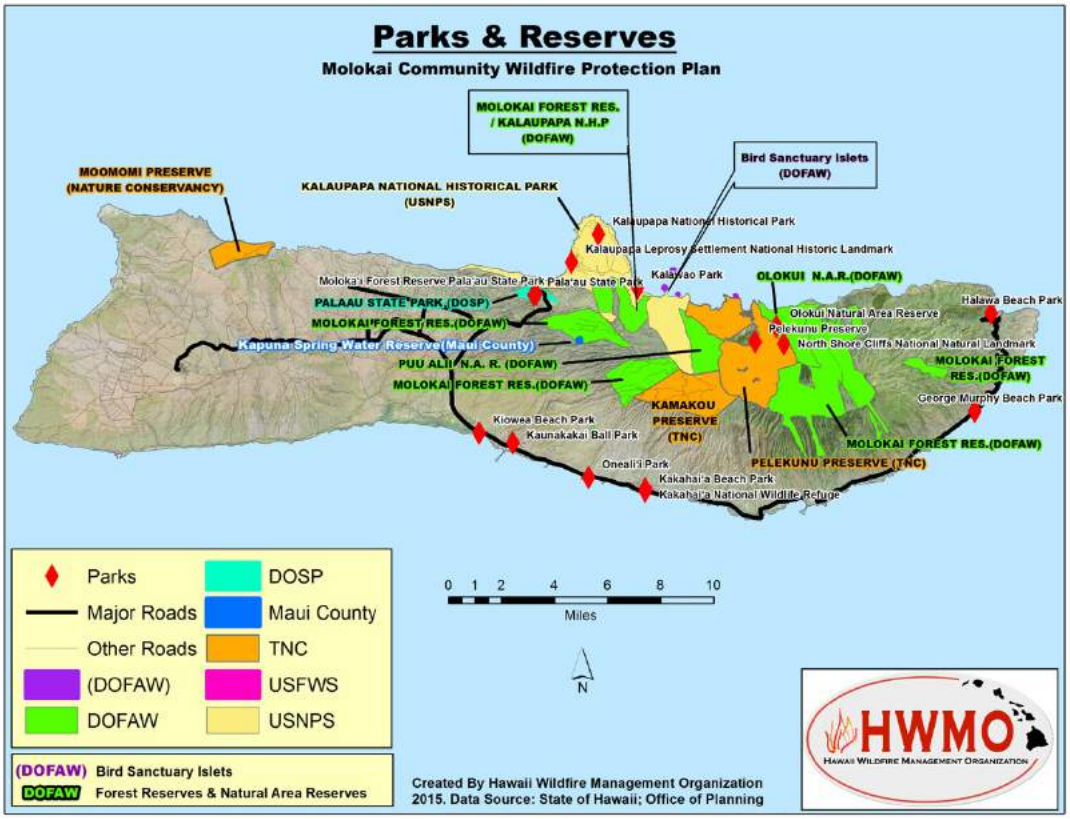



***Map 11.*** *Simplified community delineations used within the Moloka'i CWPP planning area.*

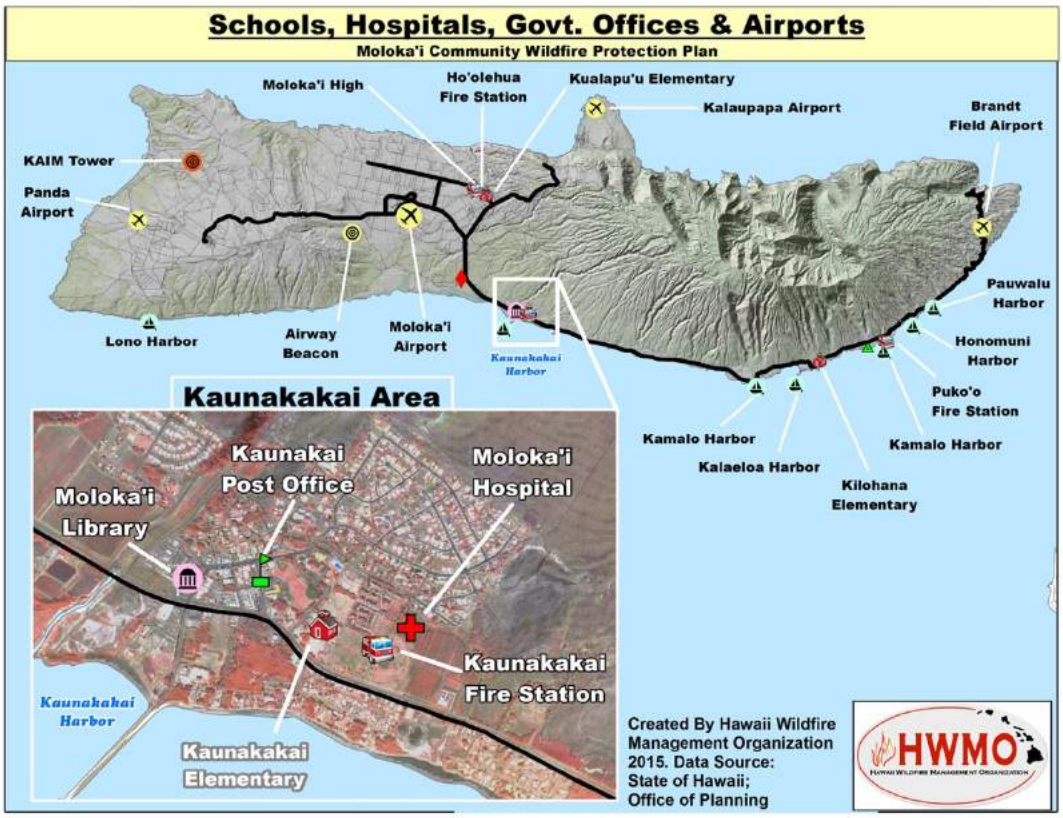
Moloka'i exemplifies a WUI, in that it contains both undeveloped fire prone wildland areas adjacent to populated subdivisions and commercial areas (see Map 12). There are numerous community assets, resources, and infrastructural features at risk of wildfire in Moloka'i, to include civil, industrial, medical, educational, recreational, and environmental features. These are depicted on Maps 13-16. These features may or may not be directly threatened by the flames of wildfire, but all are subject to the broader impacts of wildfire, such as changes in water quality and availability, post-fire erosion and mudslides, smoke and dust, changes in access, traffic, and more.



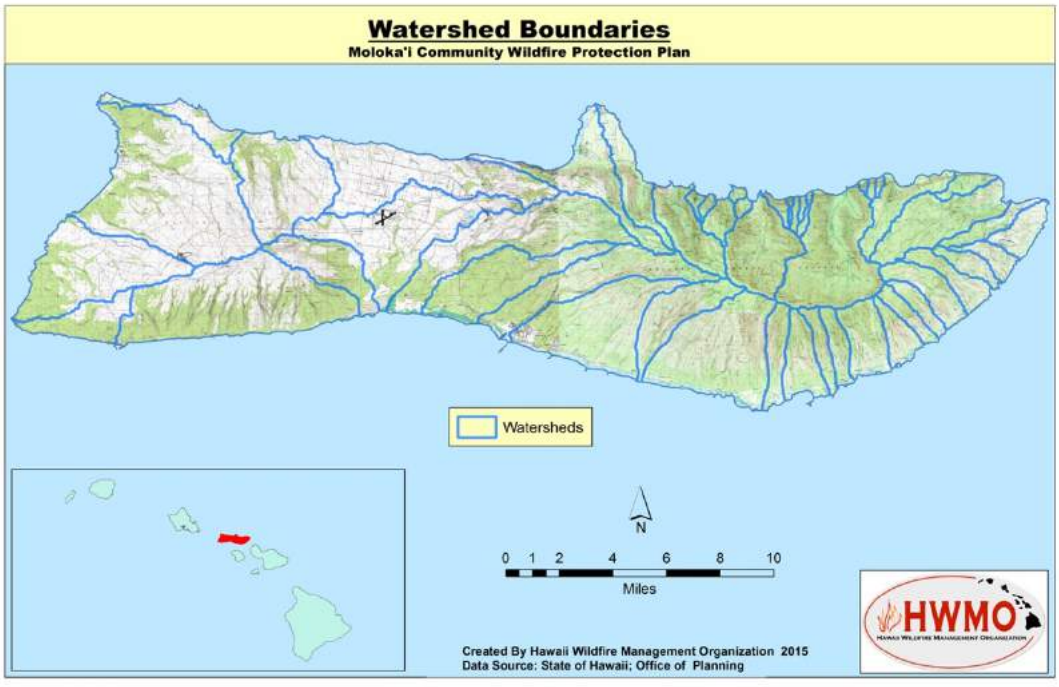

***Map 12.*** *Moloka'i population density map.*



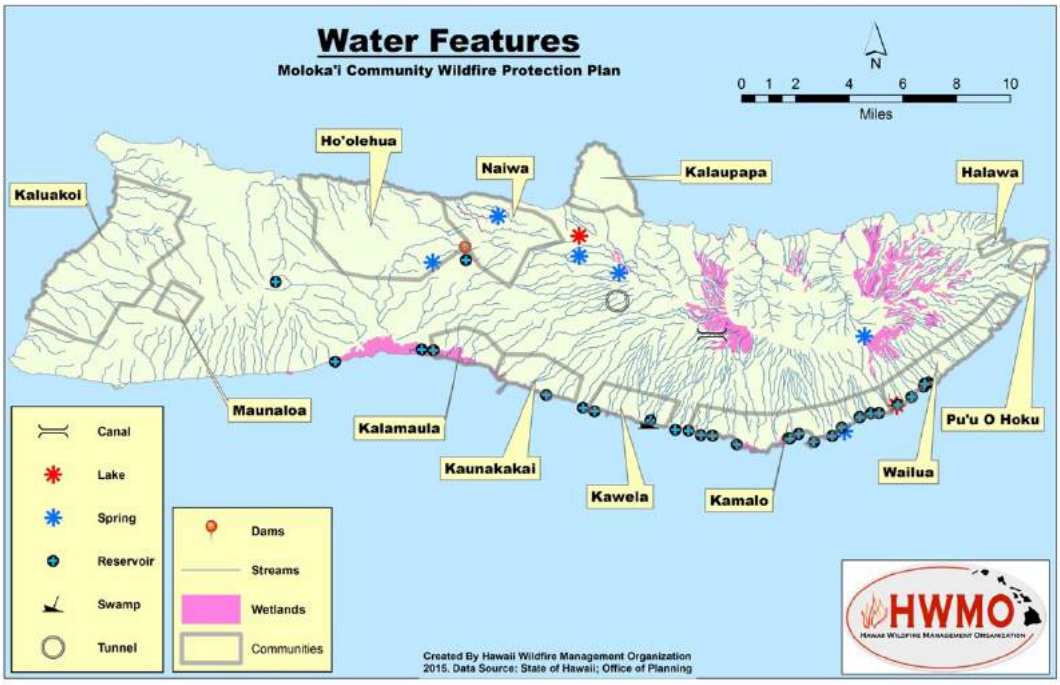

***Map 13.*** *Parks and reserves on Moloka'i.*




***Map 14.*** *Community/government service features on Moloka'i.*



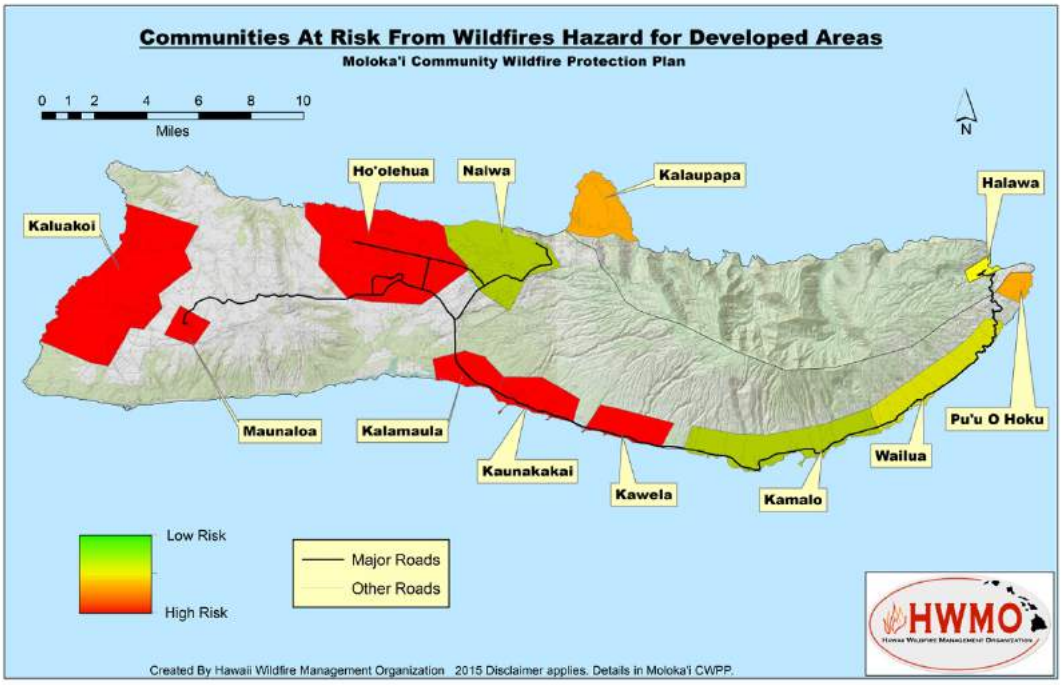

***Map 15.*** *Watershed areas on Moloka'i.*




***Map 16.*** *Water features in the Moloka'i CWPP planning area.*

## COMMUNITIES AT RISK FROM WILDFIRE

Nationally, Communities at Risk from Wildfires (CARW) Maps delineate communities that share similar environmental conditions, land use characteristics, fuel types, hazards, and general wildfire issues, and provide ratings to characterize generalized hazards in each area. DLNR-DOFAW has been developing Hawai'i CARW maps for more than a decade, and has developed streamlined community boundaries for the purposes of the Hawai'i CARW map. In 2013, HWMO partnered with DLNR-DOFAW and the county fire departments across Hawai'i to update the Hawai'i CARW maps. The original community boundaries were replicated in the 2013 map update, with changes made to reflect current hazards and subdivision expansions. Map 17 depicts the hazard ratings for Moloka'i developed areas. It is important to note that many factors were weighed into developing the hazard level, so areas with like environmental conditions may be rated differently based on their differing assessments of hazards or protection factors, like ingress/egress, community Firewise activities, etc.




***Map 17.*** *Moloka'i Communities at Risk from Wildfires Map- Overall weighted hazard ratings for developed areas based on 36 hazard characteristic ratings.*

## WILDFIRE RISK ASSESSMENT

*PURPOSE AND METHODS*

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, which requires the following actions:

- Establish a Community Base Map (Maps 14-16 and 23).
- Develop a Community Hazard Assessment (see *Wildfire Hazard Assessment section*, Maps 18-22, and Appendix B).
- Identify Overall Community Priorities (see *Hazard Reduction Priorities* section).

The wildfire risk assessment also follows the guidelines and requirements of the FEMA Pre-Disaster Mitigation program and the NFP. Locally, we have opted to name the effort Wildfire *Hazard* Assessment, rather than Wildfire *Risk* Assessment.

*WILDFIRE HAZARD ASSESSMENT*

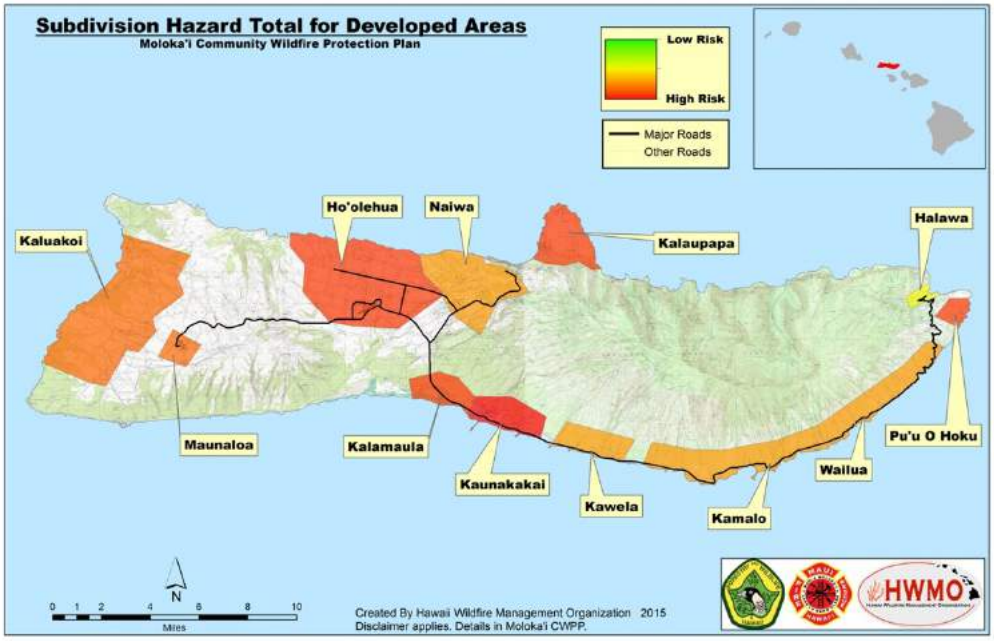
In partnership with DLNR-DOFAW and MFD, HWMO assessed the communities within Molokaʻi for 36 wildfire hazard characteristics, which have been further grouped into 5 categories. As described in detail above, community delineations for the assessment followed those for the CARW map. The five categories assessed for wildfire hazard are as follows.

- Subdivision Hazard
- Vegetation Hazard
- Building Hazard
- Fire Environment Hazard
- Fire Protection Hazard

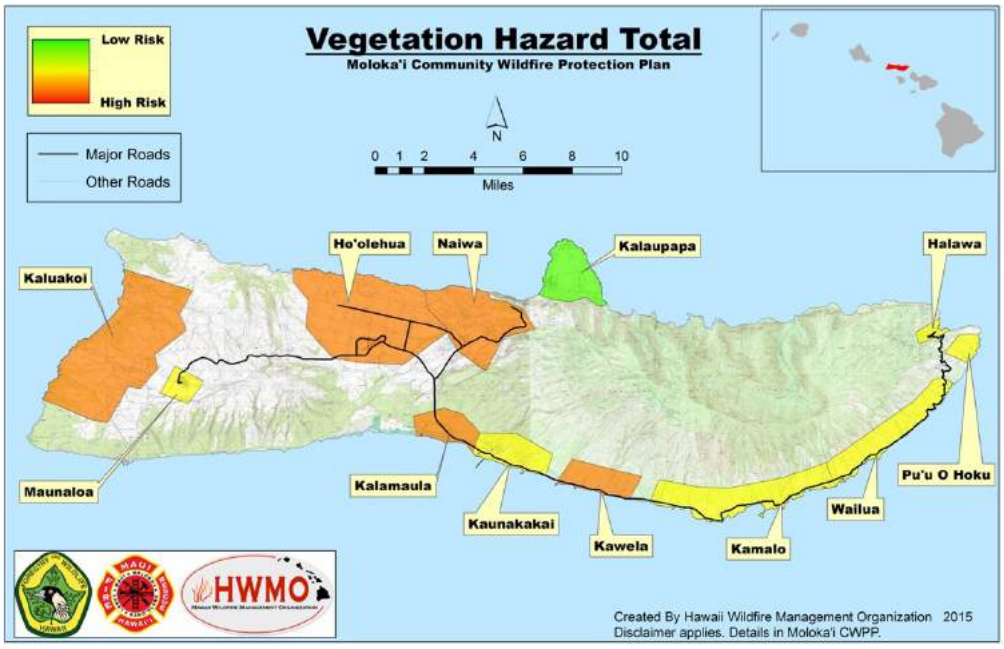
Maps are provided for each of the five categories, and demonstrate the total hazard per category based on a weighted calculation of that category's individual hazards, as detailed in Table 6.

| Hazard Category | Individual Hazards Assessed<br>(Maps for each individual hazard included in Appendix B) |
|---|---|
| Subdivision Hazard Total | • Fire Service Access<br>• Home Setbacks<br>• Ingress/Egress<br>• Private Landowner Firewise landscaping & 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 Lands |
| Vegetation Hazard Total | • 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 Total | • Siding/Soffits<br>• Roofing Assembly<br>• Structural Ignitability<br>• Under skirting Around Decks, Lanais, Post & Pier Structures<br>• Utilities Placement; Gas & Electric |
| Fire Environment Hazard Total | • 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 Total | • 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 Firefighting Capacity of Initial Response Agency<br>• Interagency Cooperation |

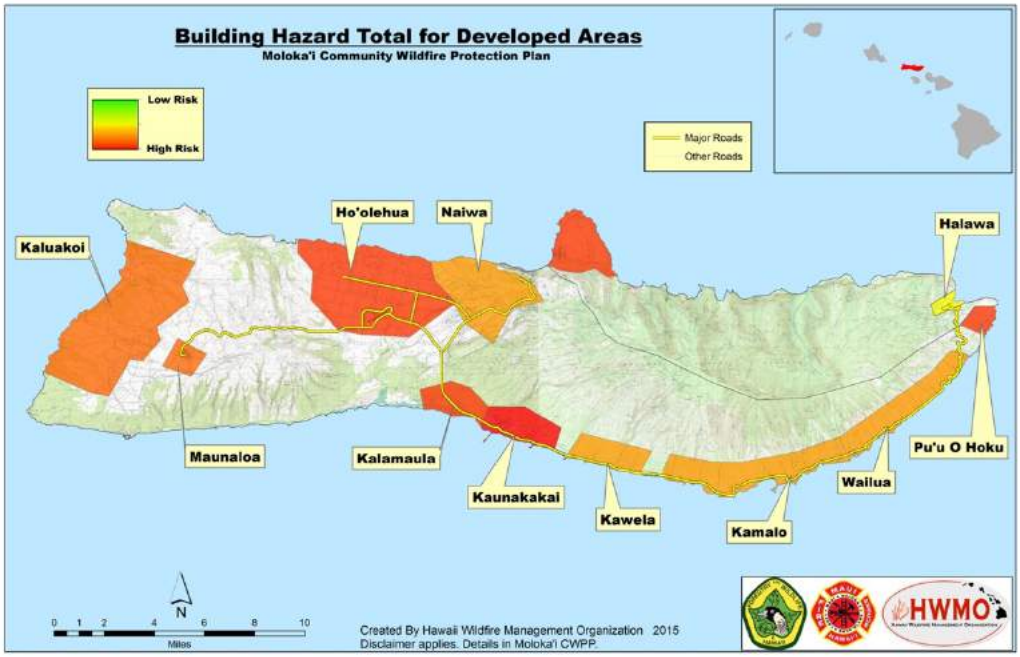
***Table 6.*** *Overview of hazard assessment categories and the individual hazards that comprise them.*



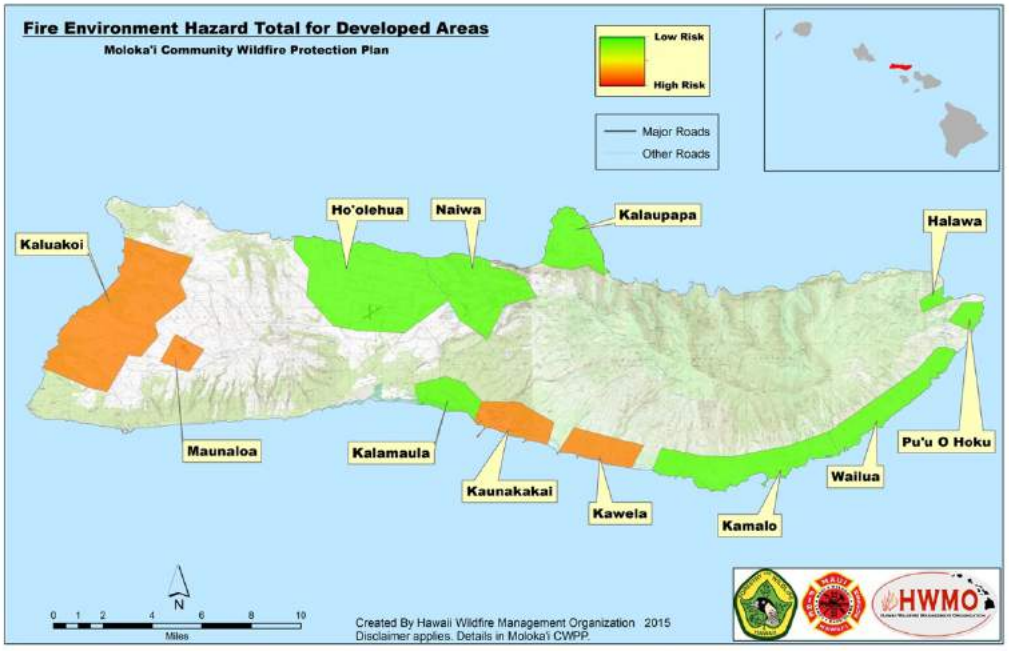

***Map 18. Subdivision Hazard Total for Developed Areas of Moloka'i CWPP planning area.*** *Reflects hazard assessment findings related to the following categories: Fire Service Access; Home Setbacks; Ingress/Egress; Private Landowner Firewise landscaping & Defensible Space; Proximity of Subdivision to Wildland Areas; All Season Road Condition; Road Maintenance; Road Width; Street Signs; Structure Density; and Unmanaged, Untended, Undeveloped Lands.*



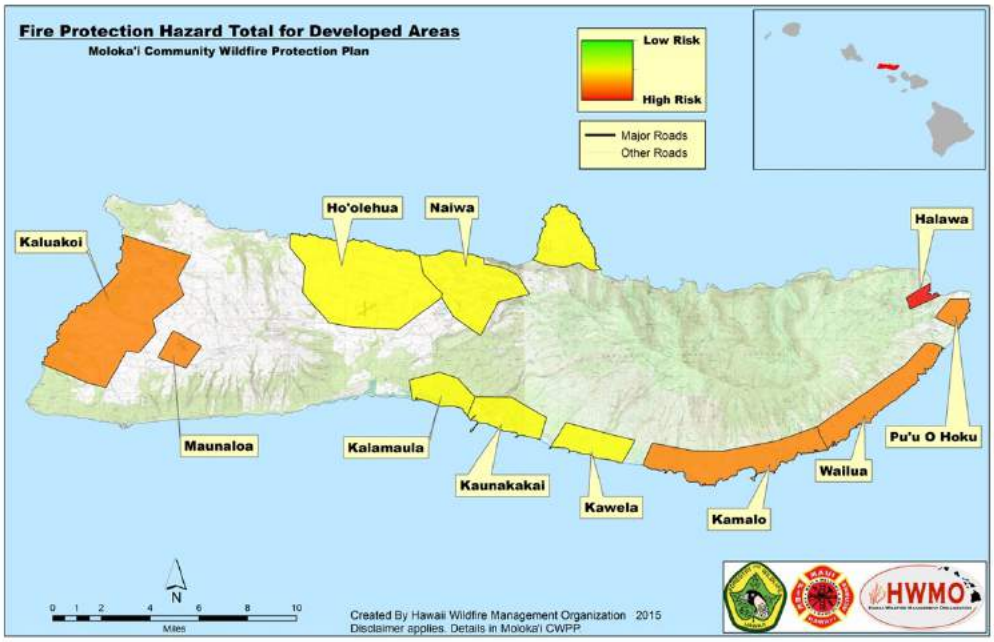

***Map 19. Vegetation Hazard Total for Developed Areas of Moloka'i CWPP planning area****. Reflects hazard assessment findings related to the following categories: Defensible Space: Fuels Reduction Around Homes & Structures; Fuel Loading; Fuel Structure & Arrangement; Proximity of Flammable Fuels Around Subdivision; Vegetation Within 300' of Homes.*




***Map 20. Building Hazard Total for Developed Areas of Moloka'i CWPP planning area****. Reflects hazard assessment findings related to the following categories: Siding/Soffits; Roofing Assembly; Structural Ignitability; Under Skirting Around Decks, Lanais, Post & Pier Structures; and Utilities Placement for Gas & Electric.*



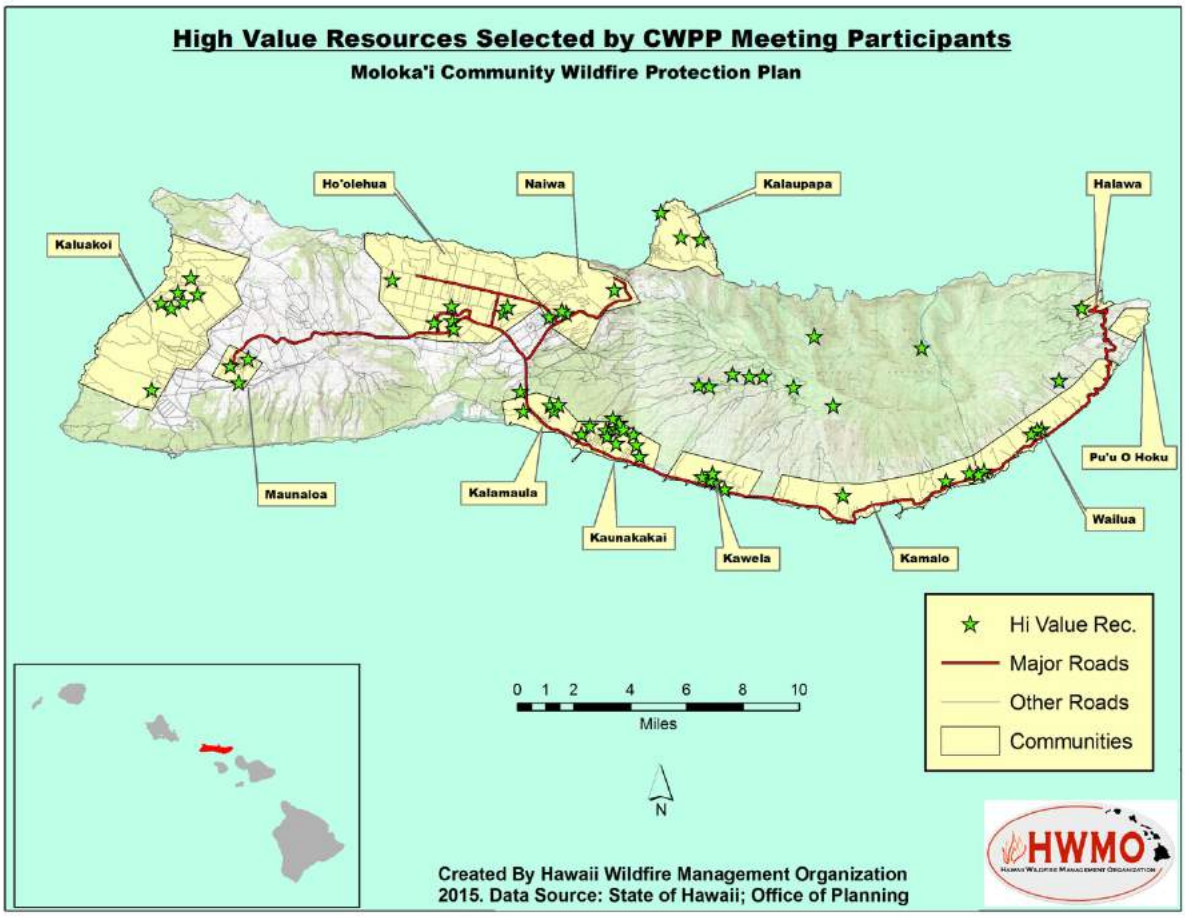

***Map 21. Fire Environment Hazard Total for Developed Areas of Moloka'i CWPP planning area****. Reflects hazard assessment findings related to the following categories: Average Rainfall; Prevailing Wind Speeds & Direction; Slope; Topographic Features that Adversely Affect Wildland Fire Behavior; and Seasonal or Periodic High Hazard Conditions; and Ignition Risk.*




***Map 22. Fire Protection Hazard Total for Developed Areas of Moloka'i CWPP planning area.*** *Reflects hazard assessment findings related to the following categories: Firefighter Response Time; Community Planning Practices & Ordinances; Community Fire Safe Efforts & Programs Already in Place; Fire Department Structural Training & Expertise; Local Emergency Operations Group or Citizen Group; Proximity to Fire Stations; Water Source Availability; and Wildland Firefighting Capacity of Initial Response Agency*

*COMMUNITY VALUES*

Civic, environmental, and cultural values were determined by stakeholders during input meetings. Meeting participants placed stickers on the Moloka'i map to indicate their highest priority areas, community assets and natural resources geographically. Map 23 demonstrates the points on the map selected by the public and agency participants during CWPP meetings as high priorities for mitigation and protection based on their personal, cultural, and community values and priorities, as well as overall risk of wildfire. Due to the sensitive nature of cultural resources in Hawai'i, participants were not required to name the priority resources, only to share the area or location of the valued resources by marking the map poster with stickers.




***Map 23.*** *Stakeholder-determined High Value Priority Resources to Protect from Wildfire in the Moloka'i CWPP planning area.*

## EMERGENCY MANAGEMENT

*FIRE SUPPRESSION CAPABILITIES AND RESOURCES*

Maui Fire Department (MFD) has two fire stations on Moloka'i. MFD resources and equipment are spread across the entire county of Maui and are made available when needed if they are not already in use. MFD has 14 fire stations across the Maui County. Table 7 provides location information for Moloka'i fire stations.

A complete list of MFD apparatus and vehicles is provided in Appendix C. DLNR-DOFAW wildland fire suppression resources that are available for use in the event of a wildfire are listed in Table 8.

| Maui Fire Department (MFD) Molokaʻi-Based Fire Stations | |
|---|---|
| Fire Station Location | Address |
| Kaunakakai | 130 Ainoa St<br>Kaunakakai, Molokai, HI 96748<br>(808) 553-5601 |
| Hoʻolehua | 2190 Farrington Ave<br>Hoʻolehua, Molokai, HI 96729<br>(808) 567-6525 |

***Table 7.*** *MFD fire stations on Molokaʻi.*

| Department of Land and Natural Resources – Division of Forestry and Wildlife (DLNR – DOFAW) Suppression Resources- Maui County | |
|---|---|
| Helicopters (contract services) | Air 1 (MFD) (Type III)<br>Air 2 (Type III)<br>Air 3 (Type III)<br>Huey (Type II)<br>Huey (Type II) |
| Engines/Tenders/Trucks | 1 x 6x6 tender (4000 gal)<br>1 x M62 engine (500 gal)<br>1 x M5 CDF engine (450 gal)<br>3 x Gamma Goat engine (350 gal)<br>3 x 4WD Trucks (Type 6 - 125 gal to 300 gal capacity)<br>2 x UTV units (100 gal - high psi) |
| Other Resources | 4 x portable pumps<br>2 x Helicopter tanks 6' (3000 gal)<br>3 x Helicopter mop up tanks (300 gal)<br>1 x D6 dozer<br>2 x backhoe<br>1 x T320 bobcat |

***Table 8.*** *DLNR-DOFAW suppression resources.*

Initial response to the majority of wildfires (as well as all medical and other emergencies) is the responsibility of the 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. DLNR -DOFAW has established Memorandums of Agreement, Memorandums of Understanding, and/or Mutual Aid Agreements in place with all four county fire departments as well as with federal land management agencies, such as National Park Service, U.S. Fish and Wildlife Service, and U.S. military. According to DLNR -DOFAW[8], these "are the cornerstones by which DLNR -DOFAW's Fire Management Program is based. These. . . identify the responsibilities of each party as well as other fire management activities such as joint participation in prevention, training, and equipment acquisition."

Map 24 was developed by DLNR-DOFAW and demonstrates the independent and shared response zones of each agency in the CWPP planning area.


***Map 24.*** *Fire suppression response zones. (Source: DLNR-DOFAW).*

*EMERGENCY MANAGEMENT DOCUMENTS AND 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[9].

The CWPP is designed to work in conjunction with other local, county, or state plans, operational policies, assessments, and programs, etc., including but not limited to:

- Moloka'i Community Plan[10] and Update[11]
- Moloka'i Forest Reserve Management Plan[12]
- County of Maui Drought Mitigation Strategies[13]
- County of Maui Multi-Hazard Mitigation Plan[14] and Hazard Mitigation Plan Update (2015)[15]
- County of Maui Water Use and Development Plan Draft[16]
- State Drought Plan and the County Drought Mitigation Strategies[17]
- State of Hawai'i Multi-Hazard Mitigation Plan[18]
- State Division of Forestry and Wildlife Operational Policy for Wildfire Control[19]
- Hawai'i Statewide Assessment of Forest Conditions and Resource Strategy[20]

*MULTIPLE-AGENCY COORDINATION*

The Molokaʻi Fire Task Force was formed in the early 2000's, out of a desire to develop more cohesive collaboration among the agencies and entities whose area of jurisdiction, management, or interest dealt with wildfire in order to more efficiently and effectively address wildfire issues. Its main objective is to ensure interagency coordination and communication regarding wildfires on Molokaʻi. The group is coordinated by MFD, DLNR-DOFAW, and The Nature Conservancy, with active participation from many other team members, including: Molokaʻi Ranch, Department of Hawaiian Home Lands, County of Maui (Public Works, P&R, Water), State of Hawaiʻi (Highways Division, Airports Division, Department of Human Services), Molokaʻi Irrigation System, Kawela Plantation, Maui Police Department, American Medical Response, National Park Service, Molokaʻi EOC, Goodfellow Bros., and various community residents and retired professionals.

Additionally, there is a county-wide coordinating group established to deal with and discuss wildfire issues, mitigation, and response. Federal, state, and county agencies have organized into the Maui Wildfire Coordinating Group. The Maui Wildfire Coordinating Group coordinates the programs of the participating wildland fire agencies across Maui County 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.

*EVACUATION PROTOCOLS AND NEEDS*

Evacuation protocols for neighborhoods and areas on Moloka'i 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 Molokaʻi 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[21]
- Disaster Preparedness for Maui County: A Citizen's Guide[22]
- Hurricane Information and Tips[23]
- Tsunami maps information, and tips[24]

*FIRE CODE*

The Hawaii State Fire Code is the 2012 NFPA 1, Uniform Fire Code, which has both state and county amendments. The state amendments contribute to the State Fire Code. Each county then adopts amendments to the State Fire Code to create the County Fire Code.

Most relevant to the discussion and public input for the Molokaʻi CWPP Update is the chapter on the WUI, which is described in 2012 NFPA 1, Chapter 17.

## HAZARD REDUCTION PRIORITIES
## MOLOKA‘I

*PURPOSE AND METHODS*

Public and agency participants during the CWPP planning process identified hazard reduction priorities for Moloka‘i. The wildfire-related concerns and actions provided by stakeholders were focused toward enhancing wildfire response capabilities, addressing priority public concerns and wildfire impacts, and reducing hazards through pro-active wildfire mitigation. Community and agency discussion covered the following topics and more:

- Increasing community, decision maker, and professional knowledge about wildfire risk through education and outreach.
- Encouraging the treatment of structural ignitability.
- Prioritizing fuel reduction projects.
- Increasing opportunities for collaboration and coordination to implement wildfire mitigation projects.

HFRA guidelines were followed by including community hazard reduction priorities, hazardous fuels reductions, and recommendations to reduce structural ignitability.

### STAKEHOLDER CONCERNS AND RECOMMENDED ACTIONS

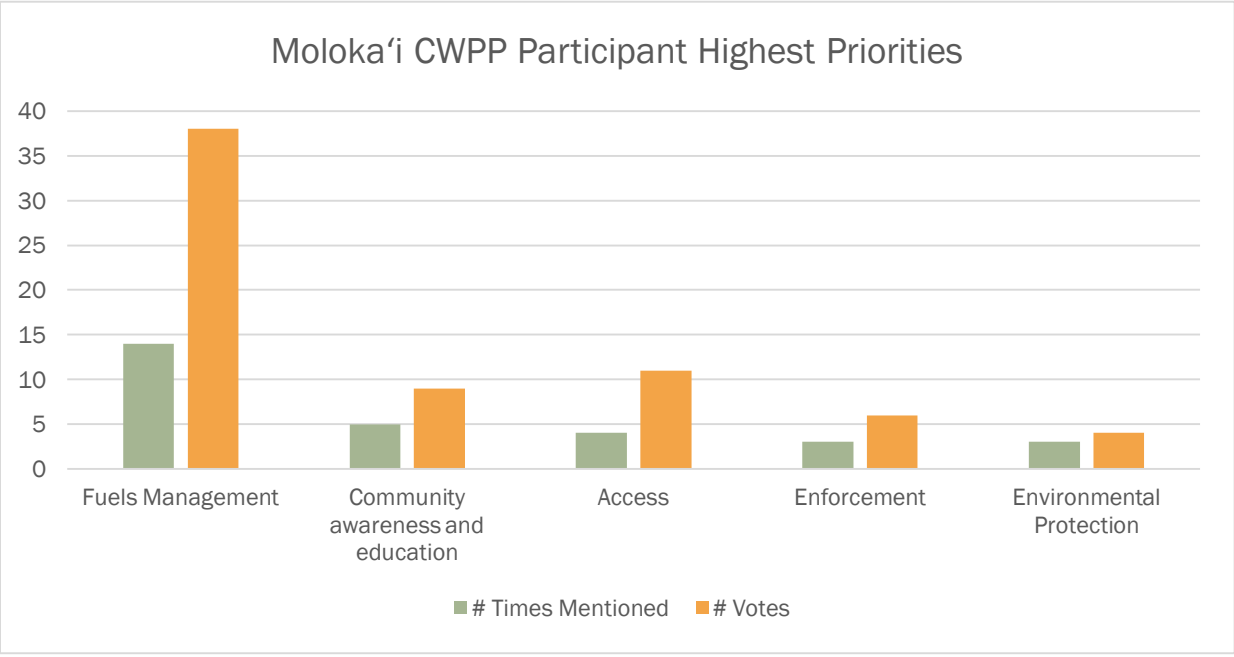



***Figure 3.*** *Moloka‘i CWPP participant top five wildfire-related concerns.*

HWMO and the Molokaʻi Fire Task Force worked with partner agencies, natural resource managers, and others to collect input and record wildfire-related concerns and recommended actions. Together, they coordinated a community meeting, to which the public-at-large was invited to provide wildfire-related input regarding priority concerns and projects.

While Molokaʻi CWPP participant input yielded diverse and broad concerns and recommended actions, certain topics came up with greater frequency. All input was aggregated and analyzed to capture an overview of the most frequently raised concerns. Concerns were recorded two ways: 1) number of times it was mentioned as an issue, and 2) number of overall votes it received once participants were asked to vote on the comprehensive set of topics to indicate their highest priorities. Figure 3 displays the top five concerns that CWPP participants prioritized through the voting process.

*THREE CATEGORIES OF STAKEHOLDER CONCERNS AND RECOMMENDED ACTIONS*

Public and agency input was extensive and has been organized to align with the categories used within the National Cohesive Wildland Fire Management Strategy.[25] Refer to Appendix A for detailed public input statements per category.

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. Hawaiʻi falls into the Western Region. Public input details for Molokaʻi are organized as follows, according to the following categories so that they fit into the national and regional Cohesive Strategy framework of priorities and funding opportunities.

- Fire-Adapted Communities
- Resilient Landscapes
- Safe and Effective Wildfire Response

Figure 4 indicates how much of the participant concerns for Molokaʻi fall within each category. Each category is explored more fully in subsequent sections.

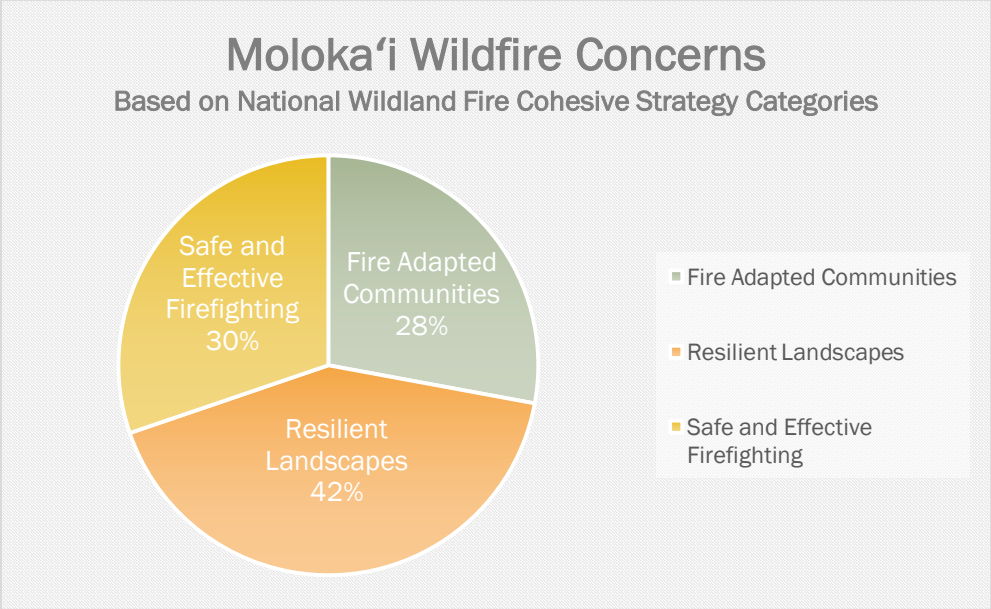



***Figure 4.*** *Community Concerns Organized by Cohesive Strategy Categories.*

*FIRE-ADAPTED COMMUNITIES*

28% of Moloka‘i CWPP participant input was related to the need to work toward greater fire awareness, readiness, prevention, and general fire-adaptation by communities and residents. These goals support the concept of Fire-Adapted Communities, defined by the United States Forest Service as "a knowledgeable and engaged community in which the awareness and actions of residents regarding infrastructure, buildings, landscaping, and the surrounding ecosystem lessens the need for extensive protection actions and enables the community to safely accept fire as a part of the surrounding landscape."[26] The Wildland-Urban Interface Mitigation Committee of the National Wildfire Coordinating Group defines a Fire-Adapted Community as "a human community consisting of informed and prepared citizens collaboratively planning and taking action to safely coexist with wildland fire."[27]

The primary goal of working toward fire adaptation is that wildfire preparedness and readiness efforts in a community become an ongoing and broadly supported part of living in, working in, and civically managing an area, and that all activities— from roadside fuels management and agriculture to development designs and community activities— work together to consistently and regularly support wildfire protection. This is opposed to the idea that wildfire preparedness is seasonal or can wait until the last minute, or that it is the responsibility of only one party (community association, fire department, etc.) to aid the community in wildfire preparedness. Generally across Hawai‘i, wildfires are addressed on an as-needed, reactive basis. With the development of this and other CWPPs across Hawai‘i, communities, organizations, and agencies are coming together to move toward becoming proactive, consistent, and collaborative. These all are

aligned with the framework and objectives for Fire-Adapted Communities. Figure 5 depicts the roles and responsibilities of all members of society toward becoming fire-adapted.

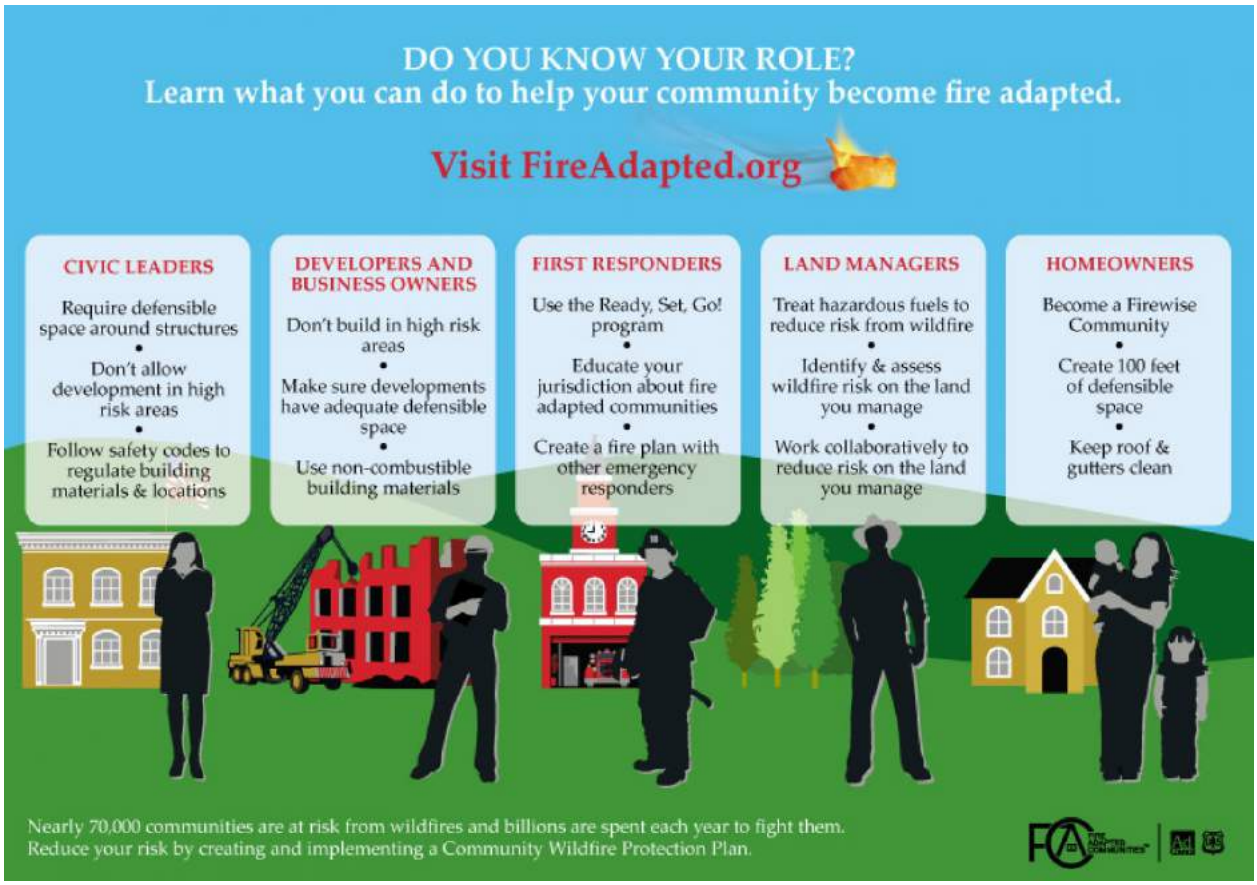



***Figure 5.*** *Fire-Adapted Communities Infographic.*[28] *There is a role for everyone when working toward a region becoming Fire-Adapted, as seen in this infographic from the Fire-Adapted Communities website, FireAdapted.org.*

This CWPP was developed with a diversity of stakeholders with homes, businesses, personal interests, and jurisdictions on Molokaʻi. The wildfire-related concerns and recommendations demonstrate the range of responsible parties, timelines, and actions that need to be taken toward comprehensive wildfire prevention, preparedness, and protection of Molokaʻi. These are the basic tenets of becoming fire-adapted. For the purposes of analyzing and presenting the Molokaʻi CWPP stakeholder input, stakeholder concerns and recommendations related to the human side of fire adaptation are presented in this section. Managing vegetation and increasing fire suppression capacity are presented individually (See *Resilient Landscapes* and *Safe and Effective Wildfire Response* sections).

The Molokaʻi input related to the human side of wildfire preparedness is prioritized as follows:

1. Improving planning efforts (of many types and scales) to include wildfire prevention and risk reduction.

2. Increasing or ensuring enforcement of wildfire-related codes, ordinances, brush abatement, etc.
3. Increasing community awareness via outreach and education.
4. Increasing community capacity (knowledge and funding) to address wildfire issues and take action.

Figure 6 depicts the breakdown of wildfire-related concerns pertaining to better protecting Molokaʻi communities.

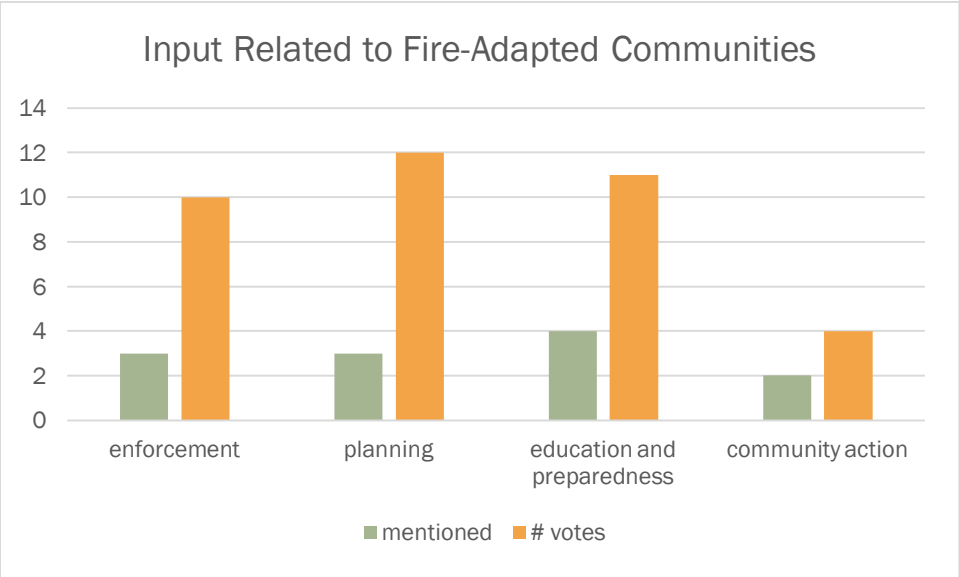



***Figure 6.*** *Community Concerns Related to the human side of wildfire preparedness and protection, as part of working toward Fire-Adapted Communities goals.*

46% of all community-focused input was related to planning. There was an urgency and emphasis from participants regarding the general lack of inclusion of wildfire issues and protective actions in planning efforts. Participants discussed the need for detailed pre-fire and post-fire fire management plans, an established process for addressing wildfire related concerns and fuels management needs by communities, and a substantial increase in participation of planners and policy makers in wildfire protection, particularly as it pertains to community development plans.

The Molokaʻi Fire Task Force recommends the following for each of these priorities:

Planning:

1. Incorporate fire mitigation and maintenance plans during the entitlement and permitting process as a requirement for approval in moderate to high fire hazard areas to include residential homes, subdivisions, businesses, including a mandatory use of fire resistant building materials.
2. Incorporate the CWPP, its maps, data, and other Molokaʻi Fire Task Force-provided resources for making determinations for the Molokaʻi Community Plan.

Enforcement and Legislation:

1. Assist and support efforts to create stronger laws concerning violation of fire prevention and mitigation efforts.
2. Assist and support enforcement of fire safety and prevention laws.

Education and Community Action:

1. Incorporate the CWPP as part of the Molokaʻi Community Plan.
2. Support and increase community awareness and education on wildfire prevention and mitigation.

*RESILIENT LANDSCAPES*

The Resilient Landscapes category focuses on all input related to restoring, protecting, or maintaining landscapes. Of the three broader categories of wildfire-related concerns, Resilient Landscapes made up 43% of all community and agency input. For Molokaʻi, this primarily included the management of vegetation to reduce the ignition capacity and spread of wildfire and the protection of native species and watersheds from wildfire impacts, followed by MECO involvement and increased enforcement on those responsible for maintaining fuels. (Figure 7).

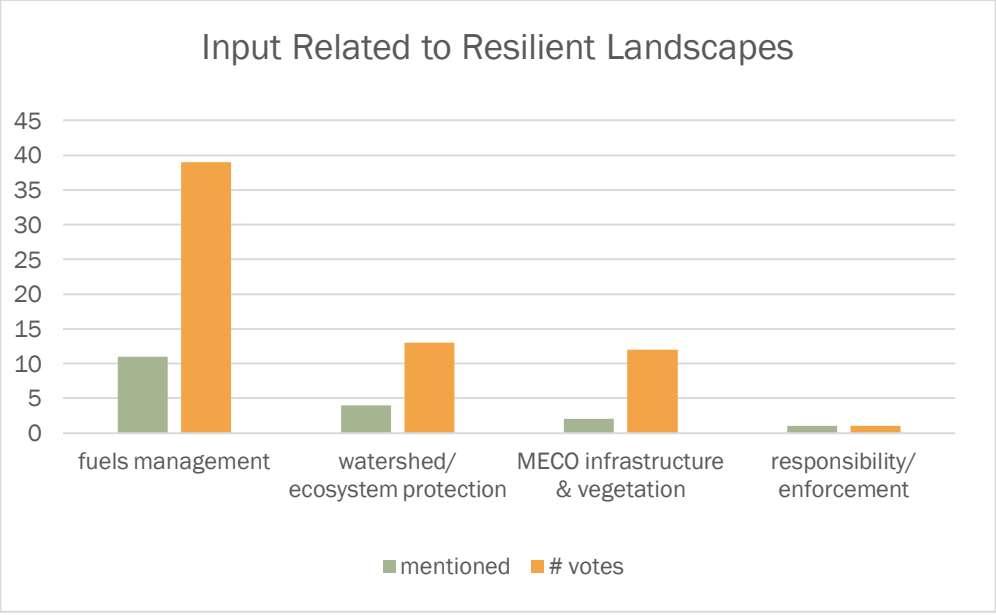



***Figure 7.*** *CWPP participant concerns and priorities related to restoring and maintaining landscapes to reduce wildfire threats and impacts.*

Among the concerns raised by Molokaʻi participants, vegetative fuels management made up 77% of all input in the Resilient Landscape category. The priorities were:

1. Installing and/or maintaining fuelbreaks and buffers around communities.
2. Increased roadside fuels management.
3. Fuel reduction on the boundaries of large landholdings.
4. Improved community participation of vegetation management within and around residential areas.
5. Increasing MECO's involvement in fuels management.

*SAFE AND EFECTIVE WILDFIRE RESPONSE*

Comprehensive and effective wildfire preparedness and protection includes preventing ignitions, minimizing the ability of fire to travel across structures and landscapes, and maximizing the likelihood for fires to be suppressed quickly to keep them as small and minimally impacting as possible. Since the majority of all fires in Moloka'i (and Hawai'i in general) are human-caused, ignition prevention largely is a matter of community outreach and education (addressed in *Fire-Adapted Communities* section). Minimizing vegetative fuels and structural ignitability can help keep fires from spreading (addressed in *Resilient Landscapes* and *Reducing Structural Ignitability* sections). Once a fire is ignited, however, the responsibility for taking action rests solely on fire suppression and emergency management departments and personnel. While prevention and preparedness are key to reducing the threats and impacts of wildfire, suppression is the final piece of the protection equation that needs to be proficient, equipped, effective, and adequately supported.

Moloka'i CWPP participants provided their concerns and priorities related to wildfire response. The input resulted in the following set of priorities related to Safe and Effective Wildfire Response (Figure 8):

1. Increase water resource infrastructure and availability for suppression.
2. Improve and increasing firefighting access (through road and firebreak development and maintenance).
3. Improve access via road development and improvement (This specifically made up 23% of participant input, with an additional 8% of input focused on concurrently developing fuelbreaks that might also serve as additional access options).
4. Improve detection of wildfires.

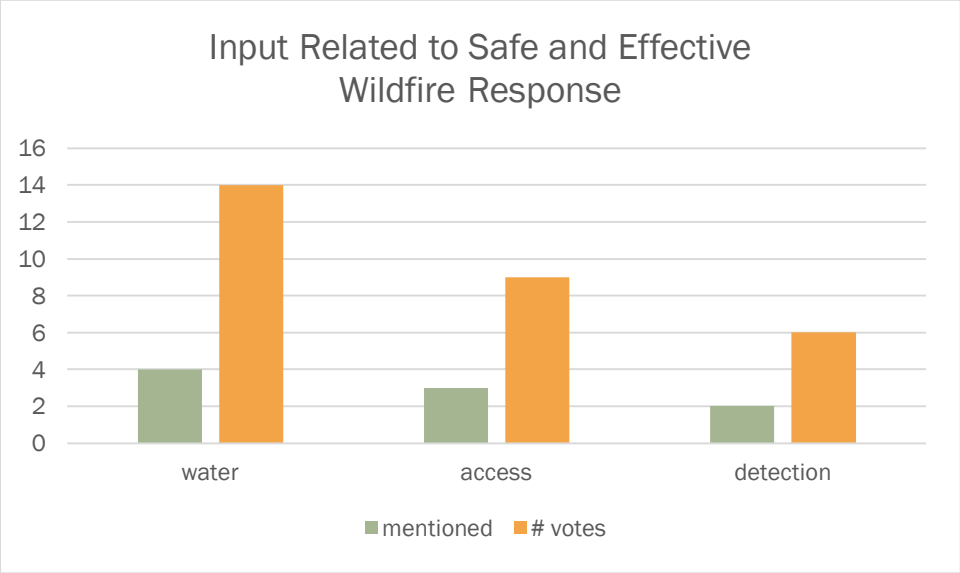



***Figure 8.*** *Public input related to safe and effective wildfire response.*

## HAZARDOUS FUELS REDUCTION

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 9.

| Community Resource, Structure, or Value at Risk | Fuel Hazard Rating | Type of Treatment | Treatment Method Options |
|---|---|---|---|
| Mauka forested lands, parks, and reserves | HIGH OR EXTREME IF UNMANAGED | Mechanical, hand labor, chemical, animal, fuels conversion | Utilize well-managed grazing, weed whip, mow, hand-pull, herbicide where appropriate with follow-up vegetation removal. Reforestation and restoration. Fuels conversion and "living" or "shaded" fuelbreaks. |
| Homes and structures with large lots | MOD-EXTREME | Mechanical, hand labor, chemical, animal, fuels conversion | Firewise home ignition zones. Reduce fuel along property boundaries and roadsides. Convert fuels to drought-tolerant, fire-resistant (preferably native) plants. Reduce ladder fuels. |
| Densely arranged homes and structures | MOD-EXTREME | Mechanical, hand labor, chemical, fuels conversion | Firewise home ignition zones. Weed whip, mow, hand-pull, and herbicide where appropriate. Convert fuels to drought-tolerant, fire-resistant (preferably native) plants. Reduce ladder fuels. |
| Historical sites throughout Molokaʻi | MOD-EXTREME | Hand labor, chemical, animal, fuels conversion | Weed whip, mow, hand-pull, well managed grazing, and herbicide where appropriate. Convert fuels to drought-tolerant, fire-resistant plants. |
| Roadsides | MOD-EXTREME IF UNMANAGED | Mechanical, chemical, animal, fuels conversion | Conduct roadside fuels treatments in accordance with fuel growth (keep low), maximize width of roadside reduction areas. Convert roadside fuels to fire-resistant plants that require little or no maintenance and are less ignitable. |
| Resorts | LOW-MOD | Mechanical, hand labor, chemical, fuels conversion | Continue regular maintenance and irrigation. Convert fuels to drought-tolerant, fire-resistant plants. |
| Fallow Agricultural lands | HIGH OR EXTREME IF UNMANAGED | Mechanical, animal, chemical, re-establish active agriculture | Install fuelbreaks along roads and property boundaries, or in lines perpendicular to slope to provide access and minimize erosion. Reduce fuels in patches to create fuel mosaics. Utilize well-managed grazing. Re-establish active agriculture. Initiate reforestation and/or restoration while also maintaining fuels. |

***Table 9.*** *Hazardous Fuels Treatment Recommendations.*

## REDUCING STRUCTURAL IGNITABILITY

A CWPP must recommend measures that homeowners and communities can take to reduce the ignitability of structures. Individuals and community associations can reduce structural ignitability throughout their community by taking the following measures recommended by the Firewise, Ready, Set, Go!, and HWMO outreach programs, summarized below.[29, 30, 31]

The following pages are written with the resident in mind, and can be removed and used independently from the CWPP as a general set of guidelines for reducing hazards in the home ignition zone. It is highly recommended that individuals and communities conduct a simple native vegetation assessment and/or consult with appropriate biologists or foresters before clearing trees and significant amounts of vegetation that may be important to protect.

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 Hawai‘i, 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.

*DEFENSIBLE SPACE ZONES AROUND STRUCTURES*

To reduce structural ignitability, it is recommended that residents think in zones around their home, and begin addressing risk reduction activities in Zone 1, working out from there to Zone 2 and beyond (Figure 9).

The following actions are recommended per zone:

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, see Figure 10). 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.


***Figure 9.*** *Defensible space zones around structures.*[28]

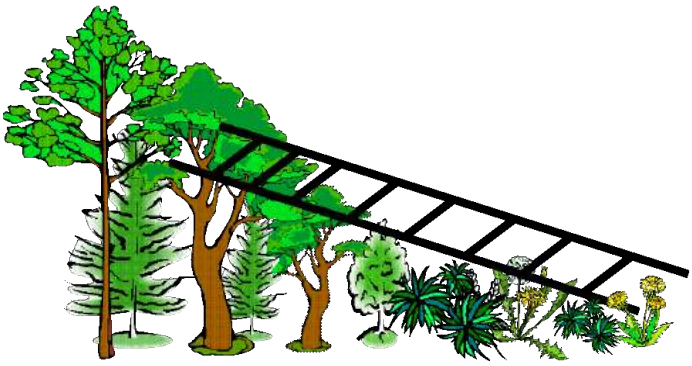


***Figure 30***. Ladder Fuels Diagram.[1] Ladder fuels form a pathway for ground fires to climb vegetation and become crown fires, which are much more difficult to suppress. It is important to limb low hanging branches and keep ground vegetation short so that vegetation is separated inhibiting fire from easily "climbing" up to canopy where wind is often stronger.

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" (see Figure 10).
- 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.

*GENERAL DEFENSIBLE SPACE RECOMMENDATIONS*

- As stated above, ensure you have at least a 100-foot radius of defensible space (cleared, managed, and maintained 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 drought-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.
- 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, 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.
- Non-native trees, such as ironwood 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.

*HARDEN YOUR HOME*

Creating defensible space, as detailed above, decreases the likelihood of wildfire spreading through vegetation that surrounds structures on the home site or yard. The second and equally important set of actions to reduce wildfire-caused ignitions of residences and structures is to harden the home or structure with non-combustible building materials and ignition-reducing strategies. The following is a step-by-step list of recommended actions per component of a structure or home. Some of these actions are inexpensive and some are costly. All are important. It is recommended that residents take the simple and easier steps right away, and prioritize hardening the rest of the home or structure as soon as possible. Note: relying on the ability to water the roof when fire is approaching will not necessarily provide adequate structural protection, and it puts you in danger. It also takes water and personnel resources away from firefighters, who need the water and full attention toward firefighting rather than search and rescue for late evacuators. Preparation and early evacuation are key actions recommended by the national Ready, Set, Go! Program. Prepare your home as follows:


***Figure 11****. Covering vents with 1/8-inch or smaller metal mesh blocks embers from entering a home or structure.*


***Figure 12.*** *Keep windows free of vegetation to reduce likelihood of heat-caused breakage that lets embers into your home.*


***Figure 13.*** *Make sure your eaves are enclosed with non-combustible materials to prevent ember entry.*


***Figure 14****. Rain gutters should have screens to keep leaf debris from accumulating. Maintain gutters to keep them clear and clean.*

***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 composite, metal, or tile. Block any spaces between roof decking and covering to prevent ember intrusion. Clear leaves and other debris from your roof and gutters. Cut any tree branches within 10 feet of your roof.

***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).


***Figure 15.*** *Wood fencing can act like a fire wick straight to a home. Use non-combustible materials for all fencing and yard structures.*

***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.

***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.

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

***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.

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

***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.

***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.

***Non-Combustible Fencing:*** Make sure to use non-combustible fencing materials, and to keep combustible fences away from homes. Wooden fences leading straight to the home act as wicks and bring the fire straight to the structure, greatly increasing the likelihood of the home igniting.

***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.

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

***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 getting a pump.

***Inside***: Keep fire extinguishers on hand and in good working order. Install smoke alarms on each level of your home and near bedrooms. Test them monthly and change the batteries twice a year.

The Moloka'i CWPP Action Plan follows the guidelines of HFRA, which includes developing an action plan along with an implementation and maintenance strategy.

was developed through an analysis of the issues identified in the hazard assessments and overall risk assessment, public and agency meetings, and through a review of other Community Wildfire Protection Plans throughout Hawai'i. Federal, state, and county land management agencies, private entities and landowners, and area residents and homeowners were invited to submit projects that provide protection and reduce risk. Public concerns and input served as the basis for the projects listed below that will guide hazard reduction efforts in the future. Landowners and agencies are invited to continue to submit projects that provide community protection and mitigate wildfire risk. The Moloka'i Fire Task Force and HWMO intend to regularly evaluate progress on projects. Additional projects and project ideas can be attached as appendices.

## NEAR-TERM ACTION PLAN

The following table details the projects that have been prioritized for the next five years.

| Project | Anticipated Cost | When | Lead |
|---|---|---|---|
| Wildfire Prevention and Smokey Bear signage – Install and maintain "Smokey Bear, Prevent Wildfire Signs" throughout project area | $10,000/year | ASAP | DLNR-DOFAW |
| Assist interested communities in completing Firewise Communities certification process | $5,000/community | Ongoing | HWMO |
| Provide outreach to students at schools in fire prone communities | Varies, part of broader workplan and set of expenses | Ongoing | HWMO |
| Develop wildfire prevention and drought awareness and preparedness materials | Variable | In Initial Phases | HWMO, DLNR-DOFAW |
| Launch wildfire and drought awareness campaign | Variable | In Initial Phases | HWMO, MFD, DLNR-DOFAW |
| Host wildfire preparedness information and materials for residents and decision makers on website | Variable | Ongoing | HWMO, MFD, DLNR-DOFAW |
| Utilize social media to promote wildfire awareness | Variable | Ongoing | HWMO, MFD, DLNR-DOFAW |
| Green waste removal and recycle program | Variable on area and frequency of pickup | ASAP | TBD |
| Work with large landowners to encourage access management | TBD | TBD, various | |
| Fuel treatment mitigation along major roadways (treatment with foam gels, etc.) | | | Variable |

***Table 10.*** *Near-Term Action Plan and Projects.*

## LONGER-TERM ACTION PLAN

In addition to projects that are ongoing or being initiated at the time of writing this CWPP, numerous other longer-term priority projects were proposed by participating agencies and organizations involved in the CWPP planning process. Table 11 details the proposed longer term (5+ years) projects in no priority order. Projects are to be completed as funding, personnel, and opportunities become available.

| Proposed Project | Anticipated Cost | Lead |
|---|---|---|
| Improve national reporting of wildfires in Hawai'i | TBD | DLNR-DOFAW, USFS, HWMO |
| Improve initial attack capacity | Project dependent | TBD |
| Work to appropriately graze fallow areas where fuels are building, Fund fencing and water troughs to make lease areas more economically feasible to graze | 200,000 for fencing multiple areas | TBD |
| Install water tanks around margins of communities to serve as dip tanks for helicopter fire suppression. Have tanks double as water troughs for ranching and conservation/restoration efforts | $20-60,000 per diptank | TBD |
| Increase outreach to community associations | Variable | HWMO, DLNR-DOFAW, MFD |
| Provide wildfire education for decision makers | TBD | HWMO, DLNR-DOFAW, MFD |
| Seed collection and storage for post fire replanting | TBD | DLNR-DOFAW |
| Work with large landowners to encourage fuels management | TBD | HWMO, DLNR-DOFAW, MFD |
| Maintain and add RAWS | TBD | DLNR-DOFAW |
| Work with partners and residents to garner support for increasing DLNR-DOFAW's budget for fire response | TBD | HWMO, DLNR-DOFAW, MFD, Public |
| Submit WUI proposals for projects in the CWPP area | TBD | DLNR-DOFAW |
| Work with state and federal land-owner assistance programs to incorporate wildland fire concerns | TBD | TBD, Possibly DLNR-DOFAW |
| Work with large landowners to encourage access management | TBD | TBD, various |
| Fuel treatment mitigation along major roadways (treatment with foam gels, etc.) | TBD | Variable |
| Kalaupapa NHP Settlement WUI Fuels Management | $40-50,000 | National Park Service |

***Table 11.*** *Proposed Future Projects.*

## CWPP IMPLEMENTATION AND MAINTENANCE

*PLAN 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 Molokaʻi CWPP. The plan is signed by each agency in order to meet HFRA and FEMA requirements. Because of the non-regulatory nature of the CWPP, the relevance and effectiveness of the Molokaʻi CWPP will rely heavily upon community initiative and involvement. Expertise, technical support, and implementation assistance will be provided by the appropriate agencies and organizations involved in fire issues on Molokaʻi. Molokaʻi 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.

Molokaʻi Fire Task Force, HWMO, and the Maui Wildfire Coordinating Group will provide technical support, identify and coordinate funding when possible, and serve as a centralized resource for wildfire risk reduction efforts on Molokaʻi. 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.

HWMO will provide outreach and educational programs to youth and adults through school programs, community events, homeowners/community association programs, and workshops in the coming year to kickstart community involvement in implementing the actions identified in this plan. Additionally, HWMO will be working with interested communities to go through the Firewise certification process, to include forming local Firewise committees and action teams and completing comprehensive hazard assessments and plans specific to their subdivisions.

Many Molokaʻi 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 the CWPP regularly so that it remains a “living” document. Continuing to build community awareness of these issues and actions will assist with fostering individual and community investment in projects.

Note: This page and its information are part of the original plan and have been retained to preserve the record from the base document. The current signatories can be found on the mutual agreement page at the beginning of this plan.

## SIGNATORY CONTACT INFORMATION

The following county and state representatives have a high level of interest in the protection of the Moloka'i area from wildfire, and have reviewed and support this CWPP. Contact information for principal government stakeholders is listed below.

### Maui Fire Department

**Jeffrey Murray, Fire Chief**
200 Dairy Road
Wailuku, HI 96793

### Civil Defense Agency, County of Maui

**Anna M. Foust, Emergency Management Officer**
200 S. High Street
Wailuku, HI 96793

### State Department of Land and Natural Resources- Division of Forestry and Wildlife

**David G. Smith, Administrator**
Kalanimoku Building
1151 Punchbowl St. Room 325
Honolulu, HI 96813

The Signature Page presented at the beginning of this document demonstrates the required multi-agency participation and acknowledgement of this plan.

For inquiries related to the development of this plan, to add action plan projects to this plan, or for printed copies, please contact:

Hawai'i Wildfire Management Organization
65-1279 Kawaihae Rd. Ste 211
Kamuela, HI 96743
Email: admin@hawaiiwildfire.org
Website: Hawaiiwildfire.org

## LIST OF FIGURES, TABLES, PHOTOS

### TABLES



### FIGURES

MAPS

## PHOTOS



## REFERENCES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## APPENDICES

**Appendix A:** Public and Agency Concerns and Recommendations

**Appendix B:** Wildfire Hazard Assessment Maps

**Appendix C:** Maui Fire Department 2016 Apparatus and Vehicle Inventory

Appendix D: 2024 List of Priority Projects and Actions

Appendix A
Moloka'i Community Wildfire Protection Plan
Public and Agency Concerns and Recommendations

The following tables represent the cumulative priorities of CWPP participants. They are organized per category: Fire Adapted Communities, Resilient Landscapes, and Safe and Effective Wildfire Response.

| Moloka'i Public and Agency Input: Fire Adapted Communities Category | |
|---|---|
| *Concern (in order of priority)* | *Recommended Action* |
| **Enforcement** | |
| Inadequate authority & enforcement of fire safety concerns | Legislation efforts to resurrect & fund State Fire Marshall's Office |
| Vacant lots from residential & businesses (Kawela Plantation - hot/dry/windy) | Enforcement |
| Arson | Develop better ways to catch them |
| **Planning** | |
| Inter-connect with Molokai Community Plan | Meet with planners and prioritize inclusion of CWPP |
| Communication between communities and agencies regarding fire plans and practices | Liaison between agencies & communities |
| Insufficient planning for new development in fire prone areas | Create mandatory ordinance requiring greater WUI protection |
| **Education and Preparedness** | |
| Unpermitted fires at home | Develop community education & outreach materials (fill the fire prevention position) |
| Agencies & communities need to be prepared and ready for fire | Training, general preparedness, know where/who to call (local, County, State, Federal, Trained volunteers) |
| Building material hazard | Community education & outreach |
| Lack of knowledge about potential grant funding | Provide information, technical support, follow up with applicants |
| **Community Action** | |
| Vacant lots from residential & businesses | Subdivisions put in fuel breaks |
| Lack of follow through with community projects | Provide incentives and resources to residents and communities |

*Appendix A- Participant Input Table 1 of 3. Fire Adapted Communities.*

| Moloka‘i Public and Agency Input: Resilient Landscapes Category | |
|---|---|
| *Concern (in order of priority)* | *Recommended Action* |
| **Fuels Management** | |
| Large areas of Kiawe trees on high hills - no access | Fuel break |
| Need fire breaks and buffers around communities | Take initial action and maintain buffers around communities |
| Heavy fuel loads along main roads are ignition hazard | Cut grass along the roads - keep it low |
| Manage vegetation - dense, dry, heavy fuel loads | Reduce fuel load levels: weed whack, remove brush |
| Mitigation of fire hazards and fuel loads around communities, on high hills, in the wildland-urban interface, along roads | Increase fuel management & related code enforcement activities specific to land use category & size of acreage |
| Mitigation of fire hazards in the wildland-urban interface | Provide tax incentives for creating buffer zones and restoring native plant habitat |
| Vacant lots from residential & businesses (Kawela Plantation - hot/dry/windy) | Reduce fuel load levels: weed whack, remove brush, Consider coordinating prescribed burns |
| Proper mitigation effort in specific areas | Change type of fire breaks & education |
| **Watershed/Ecosystem Protection** | |
| Protecting watershed forest from wildfire | Increase awareness |
| Vacant lots from residential & businesses (Kawela Plantation - hot/dry/windy) | Protection of E. Molokai watersheds and 6000 acres of common land |
| Controlling invasive species | Greater focus on restoring native habitat/water use reduction |
| Vegetation changing to more fire prone species | Game management control in high native forest areas |
| Saving native plants (i.e. Wiliwili) | Planting for firebreak - wind/dust control |
| **Responsibility/ Enforcement** | |
| Each district has different concern: Bigger lots = bigger issues, heavy trade winds; Lease land vs. fee simple | DHHL & homesteaders taking responsibility for enforcement & management |
| **Electric infrastructure** | |
| MECO infrastructure – power lines/old infrastructure | Vegetation management around poles |
| | Talk to PUC to psi MECO on (to?) mitigate issues |

*Appendix A- Participant Input Table 2 of 3. Resilient Landscapes.*

| Moloka‘i Public and Agency Input:<br>Safe and Effective Wildfire Response Category | |
|---|---|
| *Concern (in order of priority)* | ***Recommended Action*** |
| **Water Resources for Firefighting** | |
| Inadequate water supply and infrastructure in high priority response areas | Develop a plan for access to major water resources throughout the island (MIS, all swimming pools) |
| | Upgrade water infrastructure |
| | Install dip tanks, pumpkins, etc. in problem areas |
| | Creating mid slope water supplies for aircraft response (diptanks, water sources, taps) |
| Low water pressure (leaks) in Kaluakol | Optimal management of water system, repair leaks |
| **Firefighting Access** | |
| Inadequate suppression access in remote/mauka areas | Pave infrastructure, improve conditions |
| | Road/fire break improvement |
| | Increase & improve road maintenance |
| **Pre-fire planning and Detection** | |
| Need earlier detection of fires | Fire detection cameras, alarms, smoke detectors |
| | Have a fire response plan (ex. If > 10 acres = military help; If subdivision lives are in danger = get extra help) |

*Appendix A- Participant Input Table 3 of 3. Safe and Effective Wildfire Response.*

APPENDIX B

MOLOKA'I COMMUNITY WILDFIRE PROTECTION PLAN

WILDFIRE HAZARD ASSESSMENT MAPS

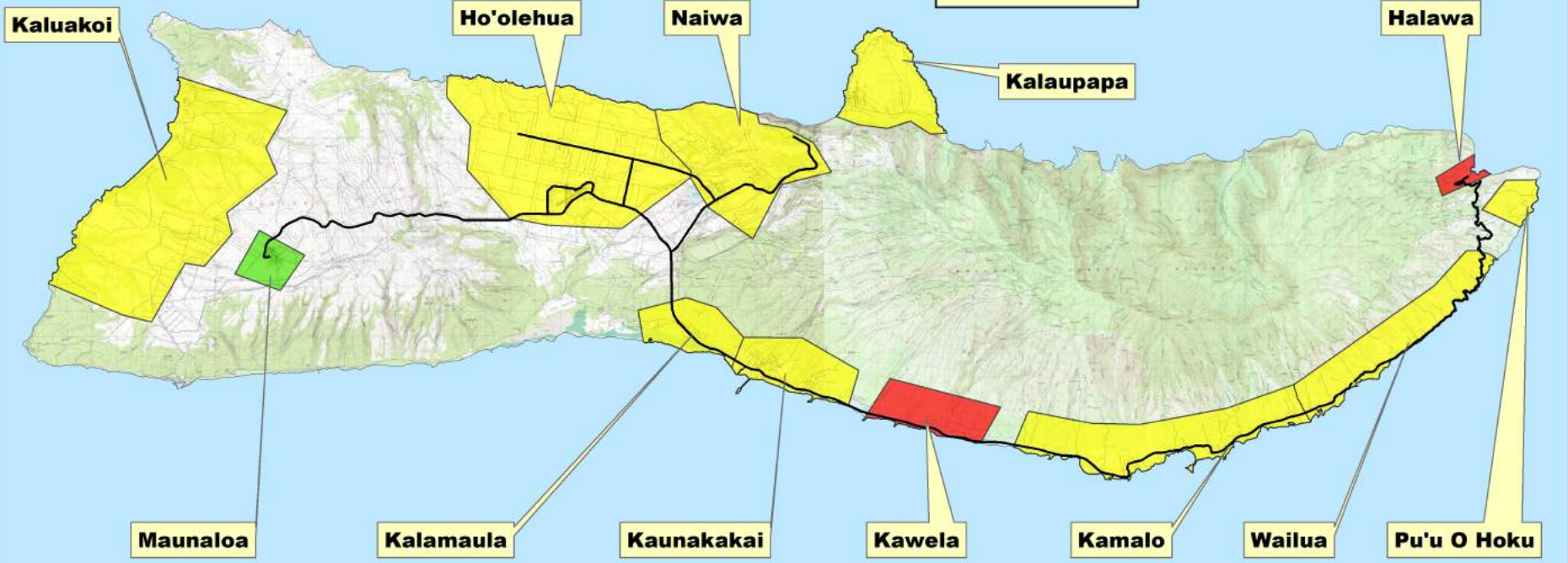
| Hazard Category (Maps provided in CWPP main document) | Individual Hazard Maps (Maps provided below in the following order) |
|---|---|
| Subdivision Hazard Total | • Fire Service Access<br>• Home Setbacks<br>• Ingress/Egress<br>• Private Landowner Firewise Landscaping & Defensible Space<br>• Proximity 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 Lands |
| Vegetation Hazard Total | • 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 Total | • Siding/Soffits<br>• Roofing Assembly<br>• Structural Ignitability<br>• Under Skirting Around Decks, Lanais, Post & Pier Structures<br>• Utilities Placement; Gas & Electric |
| Fire Environment Hazard Total | • 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 Total<br><br>(high capacity and capability= low 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 Firefighting Capacity of Initial Response Agency<br>• Interagency Cooperation |

# SUBDIVISION HAZARD FOR DEVELOPED AREAS

# Fire Service Access Hazard for Developed Areas

**Moloka'i Community Wildfire Protection Plan**

| Fire Service Access | | |
|---|---|---|
| Low Hazard | Moderate Hazard | High Hazard |
| Adequate turnaround space is available for large fire equipment. | <300' with no turnaround. Short or dead-end streets will become crowded with homeowner's vehicles. | 300'+ with no turnaround. Long dead-end streets will become crowded with vehicles. Two-way visibility is an issue. |

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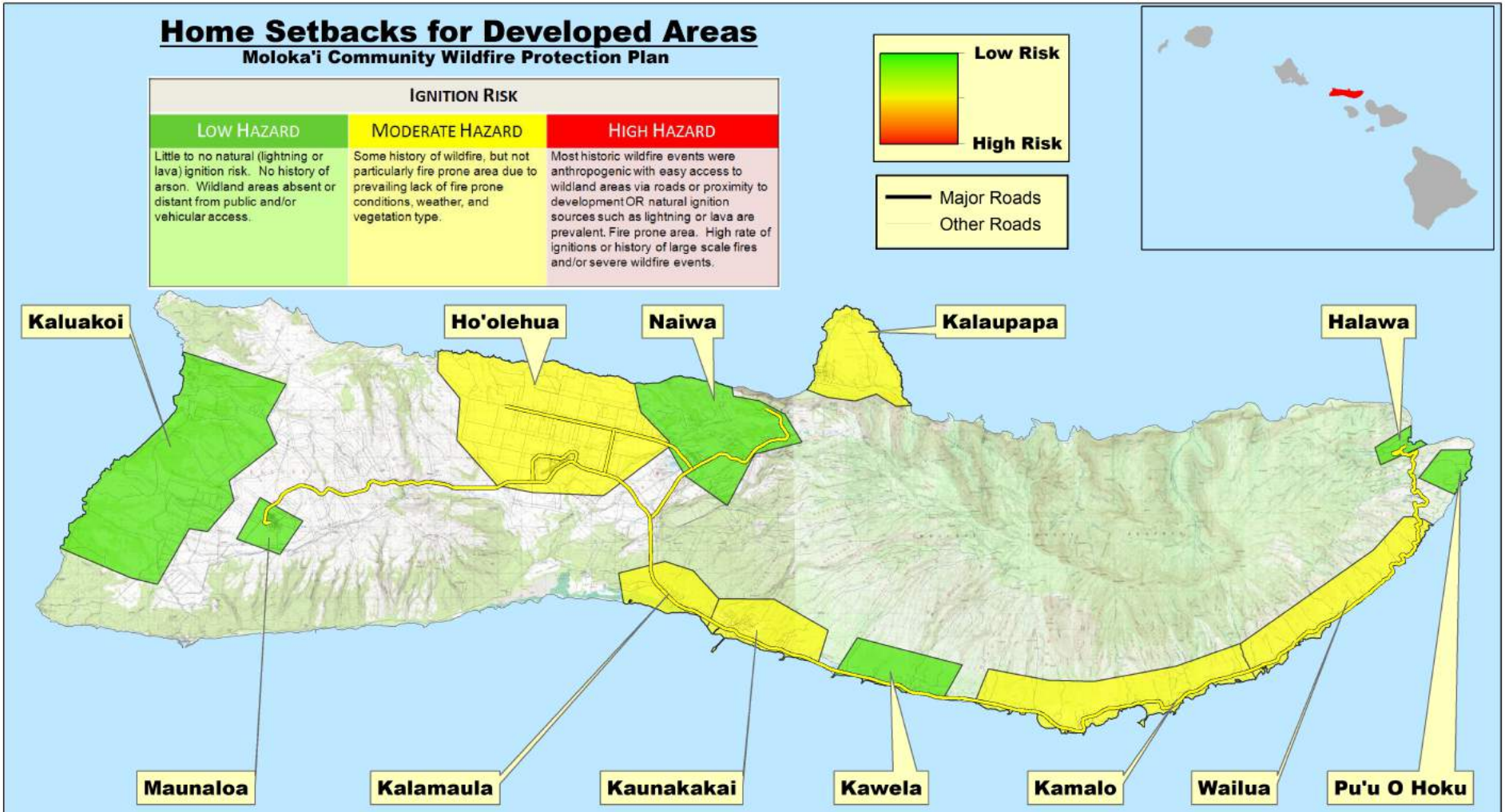
# Home Setbacks for Developed Areas

**Moloka'i Community Wildfire Protection Plan**

| Ignition Risk | | |
|---|---|---|
| Low Hazard | Moderate Hazard | High Hazard |
| Little to no natural (lightning or lava) ignition risk. No history of arson. Wildland areas absent or distant from public and/or vehicular access. | Some history of wildfire, but not particularly fire prone area due to prevailing lack of fire prone conditions, weather, and vegetation type. | Most historic wildfire events were anthropogenic with easy access to wildland areas via roads or proximity to development OR natural ignition sources such as lightning or lava are prevalent. Fire prone area. High rate of ignitions or history of large scale fires and/or severe wildfire events. |

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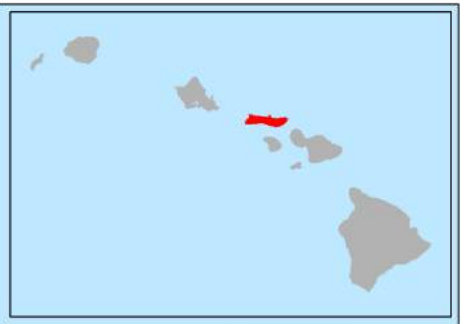
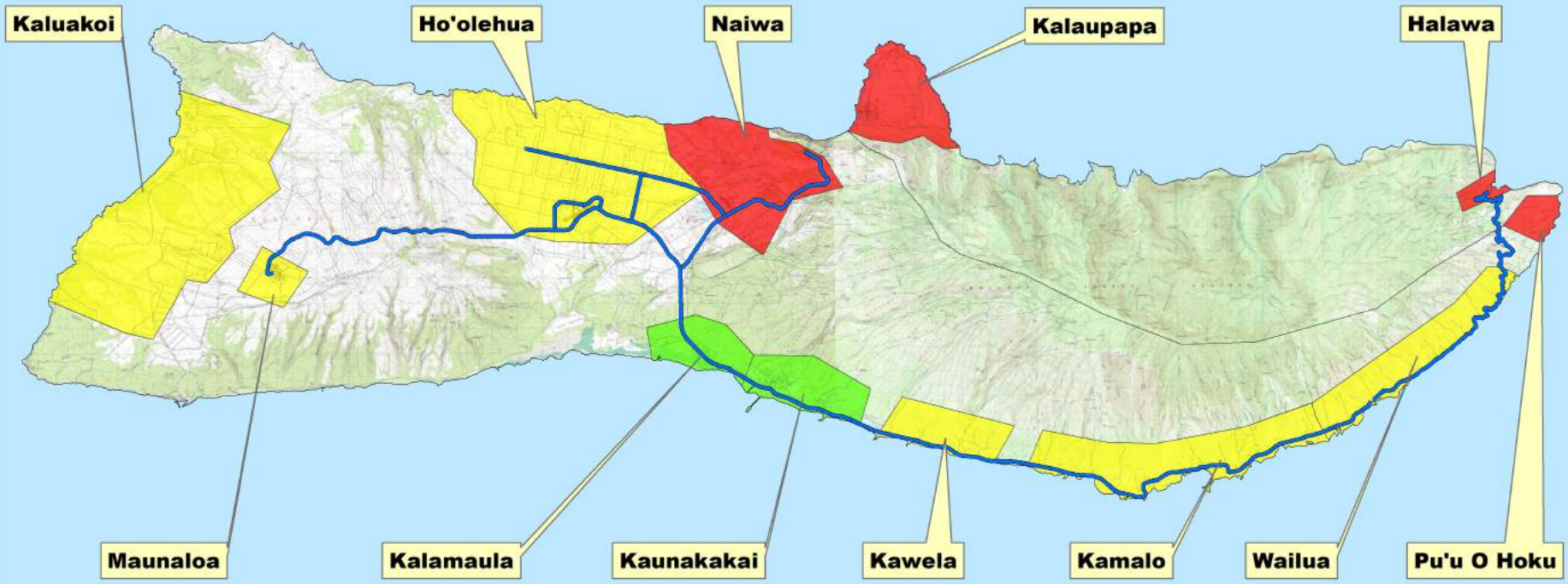
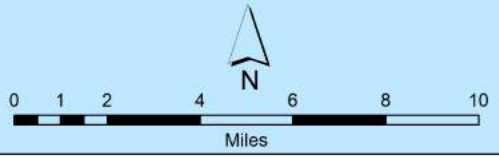
# Ingress/Egress Hazard for Developed Areas

**Moloka'i Community Wildfire Protection Plan**

| Ingress / Egress | | |
|---|---|---|
| Low Hazard | Moderate Hazard | High Hazard |
| Multiple entrances and exits are well equipped for fire trucks with turnarounds. | Limited access routes. Two ways in and two ways out. Moderate grades. | Narrow, dead end roads or one way in, One way out. Steep grades. |

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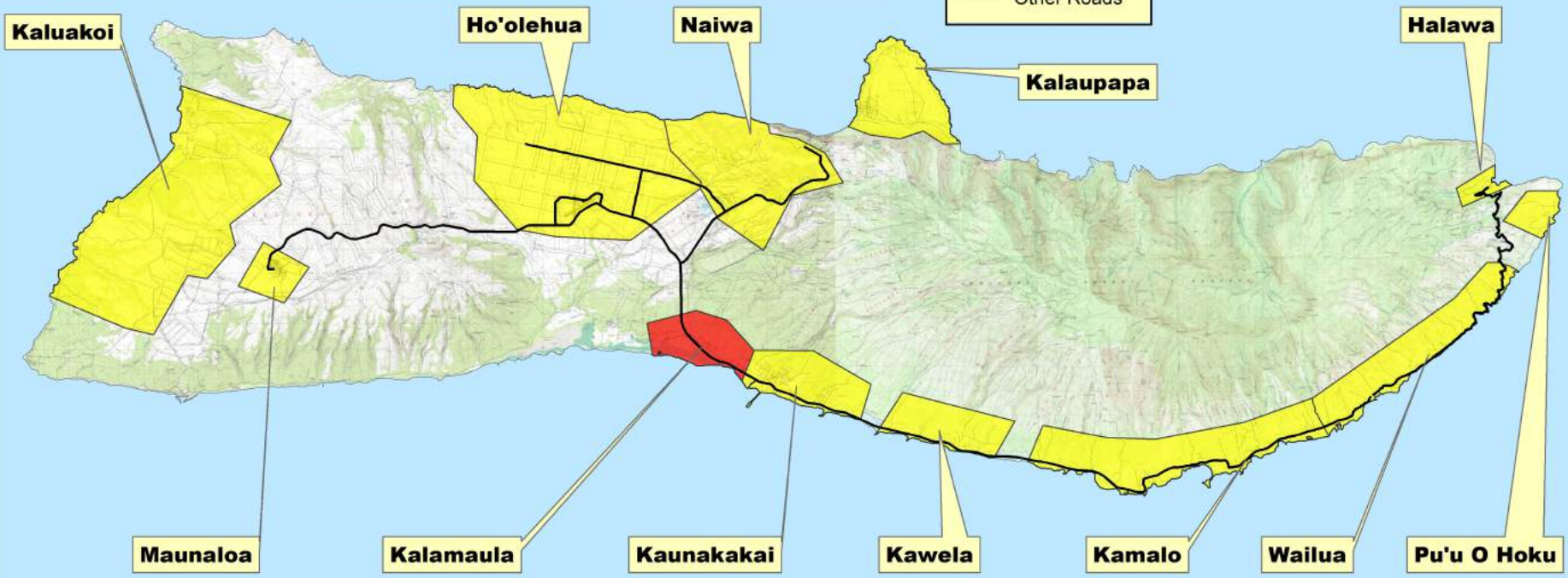
# Private Landowner Actions Hazard for Developed Areas

**Moloka'i Community Wildfire Protection Plan**

| Private Landowner Firewise Landscaping/ Defensible Space | | |
|---|---|---|
| **Low Hazard** | **Moderate Hazard** | **High Hazard** |
| 70% of homes have improved survivable space around property, reduced ignition risk, hardened homes, and no ladder fuels. | 30-70% homes have improved survivable space around property and well-maintained landscapes. | <30% of homes have defensible space, hardened home features, or Firewise landscaping |

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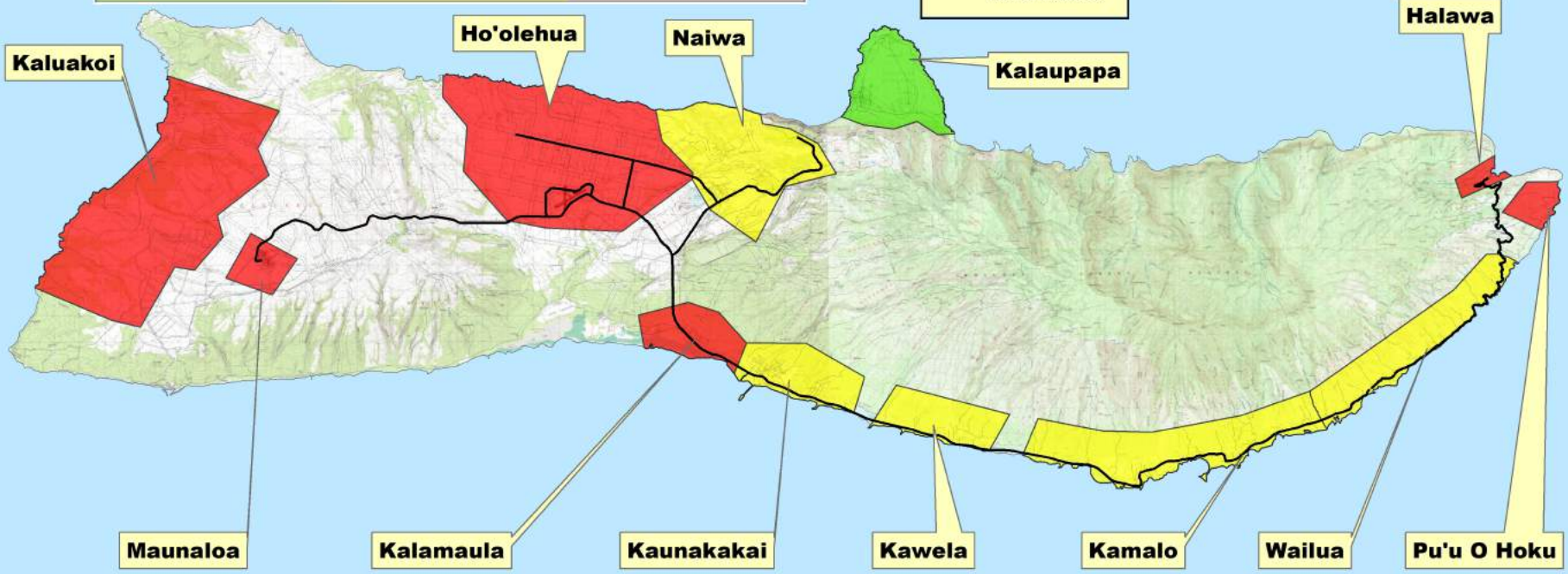
# Proximity To Wildland Areas Hazard for Developed Areas

**Moloka'i Community Wildfire Protection Plan**

| Proximity to Wildland Areas | | |
|---|---|---|
| Low Hazard | Moderate Hazard | High Hazard |
| Wildland areas share no borders with the subdivision. Little to no undeveloped and unmaintained vegetated areas within community. Little to no ladder fuels along community boundaries. | Wildland areas adjoin subdivision on 1-2 sides. | Wildland areas surround subdivision on at least 3 sides. |

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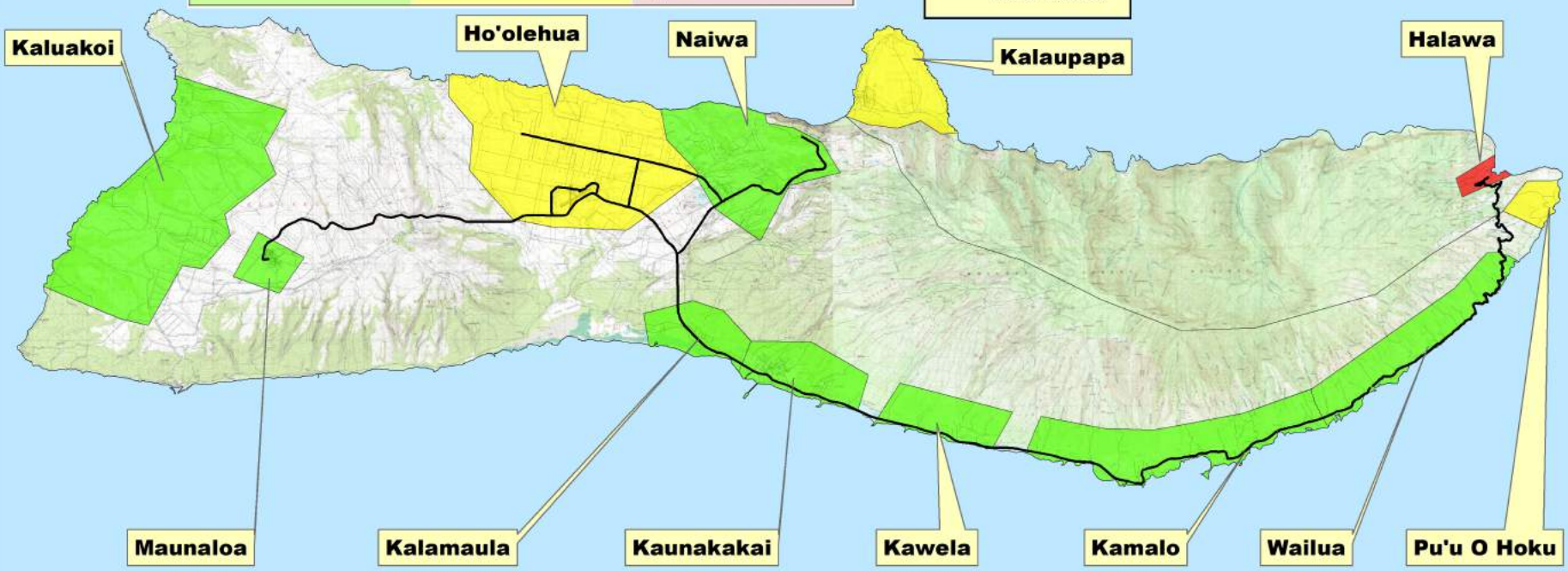
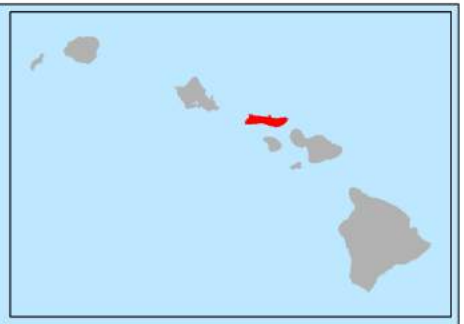
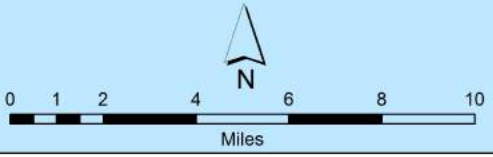
# All Season Road Condition Hazard for Developed Areas

**Moloka'i Community Wildfire Protection Plan**

| All Season Road Condition | | |
|---|---|---|
| Low Hazard | Moderate Hazard | High Hazard |
| Flat or gently sloping surfaced roads can support high volumes of large fire equipment. | Surfaced road with 5%+ grade or non-surfaced road with <5% grade that can still support fire equipment. Road and right-of-way maintenances is essential for access and visibility. | Narrow, steep, or non-surfaced roads are difficult to access. One-way traffic is a hazard. Overhanging brush may damage fire equipment. Jeep trails and seasonal roads limit 2wd emergency response equipment. |



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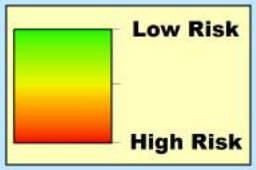
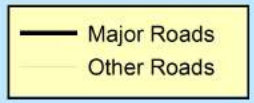
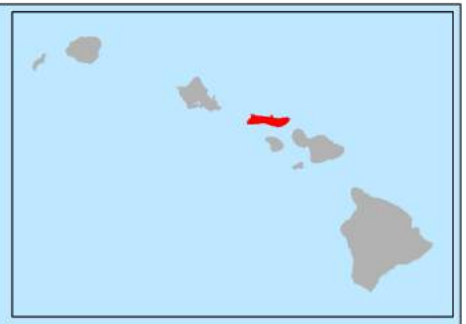
# Road Maintenamce Hazard for Developed Areas

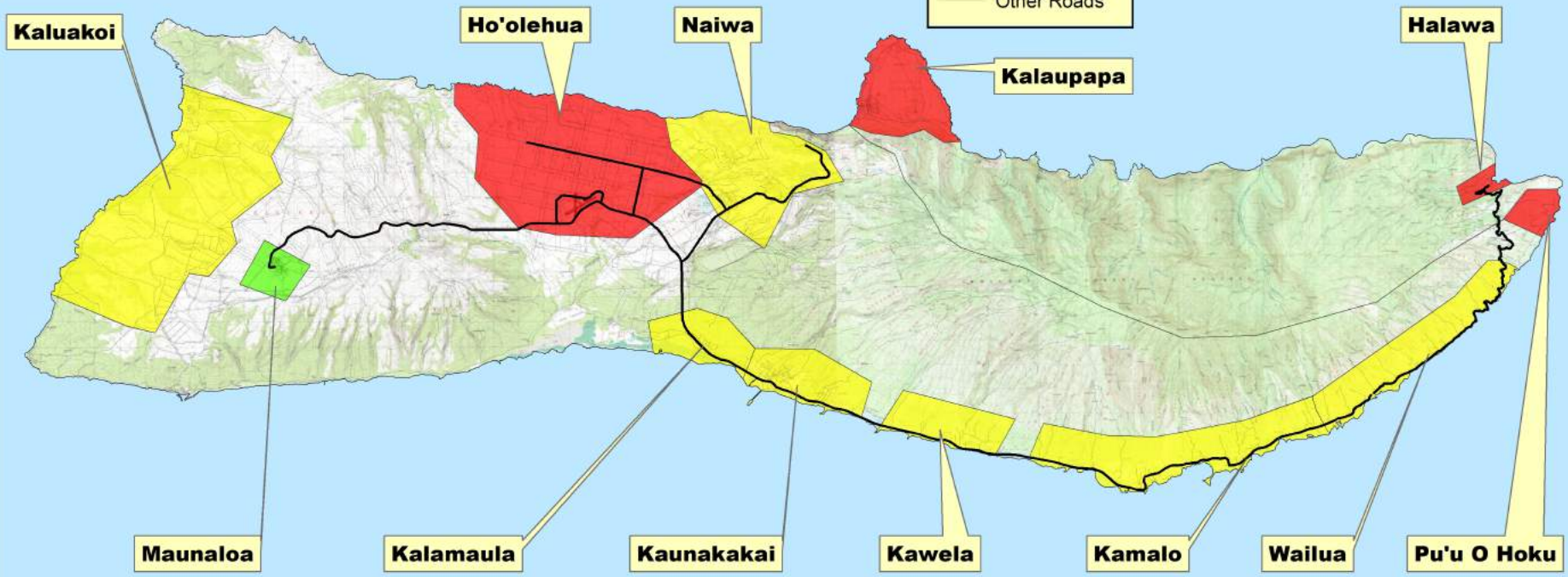
**Moloka'i Community Wildfire Protection Plan**

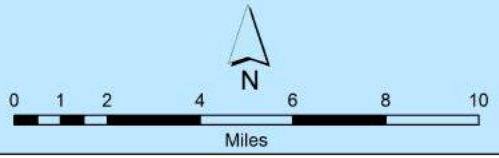
| ROAD MAINTENANCE | | |
|---|---|---|
| LOW HAZARD | MODERATE HAZARD | HIGH HAZARD |
| Wide loop roads that are maintained, paved or solid surface with shoulders. | Roads maintained. Some narrow two lane roads with no shoulders. | Narrow and or single lane, minimally maintained, no shoulders. |



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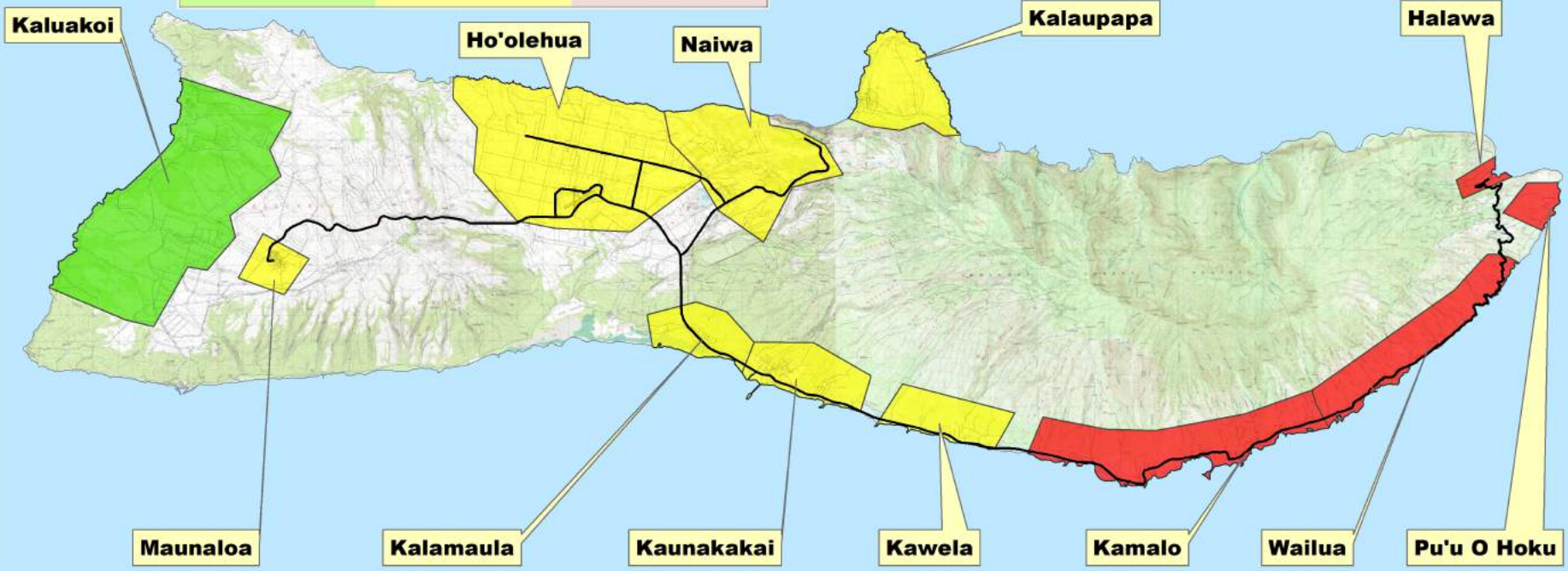
# Road Width Hazard for Developed Areas

**Moloka'i Community Wildfire Protection Plan**

| Road Width | | |
|---|---|---|
| Low Hazard | Moderate Hazard | High Hazard |
| 24'+ wide. Wide roads with drivable shoulders and good visibility allow two-way traffic. Streets in the downtown area are the widest streets in town. Interior streets are smaller and are easily blocked by parked vehicles. | 20'-24' wide. Medium width roads with drivable shoulders and good visibility, support evacuation and emergency response time. | Less than 20 feet wide. Narrow roads coupled with poor visibility limit evacuation and emergency response. Traffic problems will occur. Entrapment is likely. |

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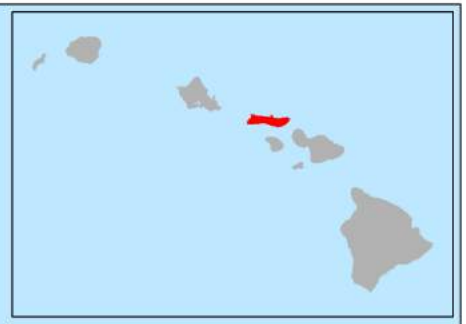
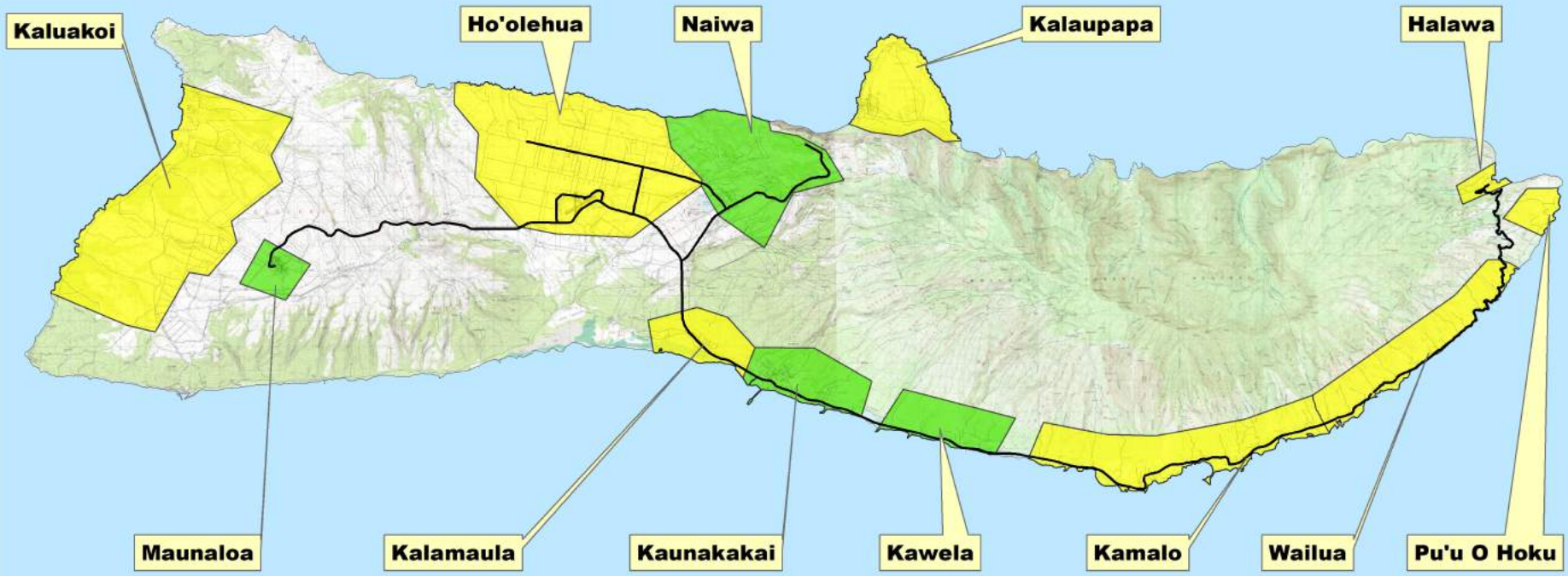
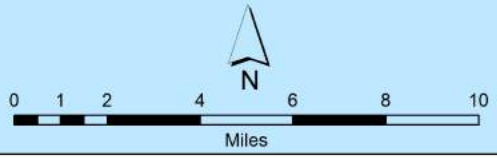
# Street Signs Hazard for Developed Areas

**Moloka'i Community Wildfire Protection Plan**

| Street Signs | | |
|---|---|---|
| Low Hazard | Moderate Hazard | High Hazard |
| Present. Most are at least 4' in size and are reflectorized. | Present and reflectorized with some exceptions. | Not present. |

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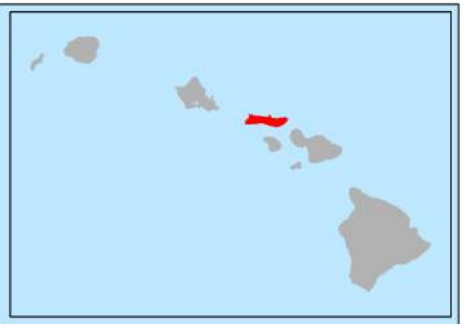
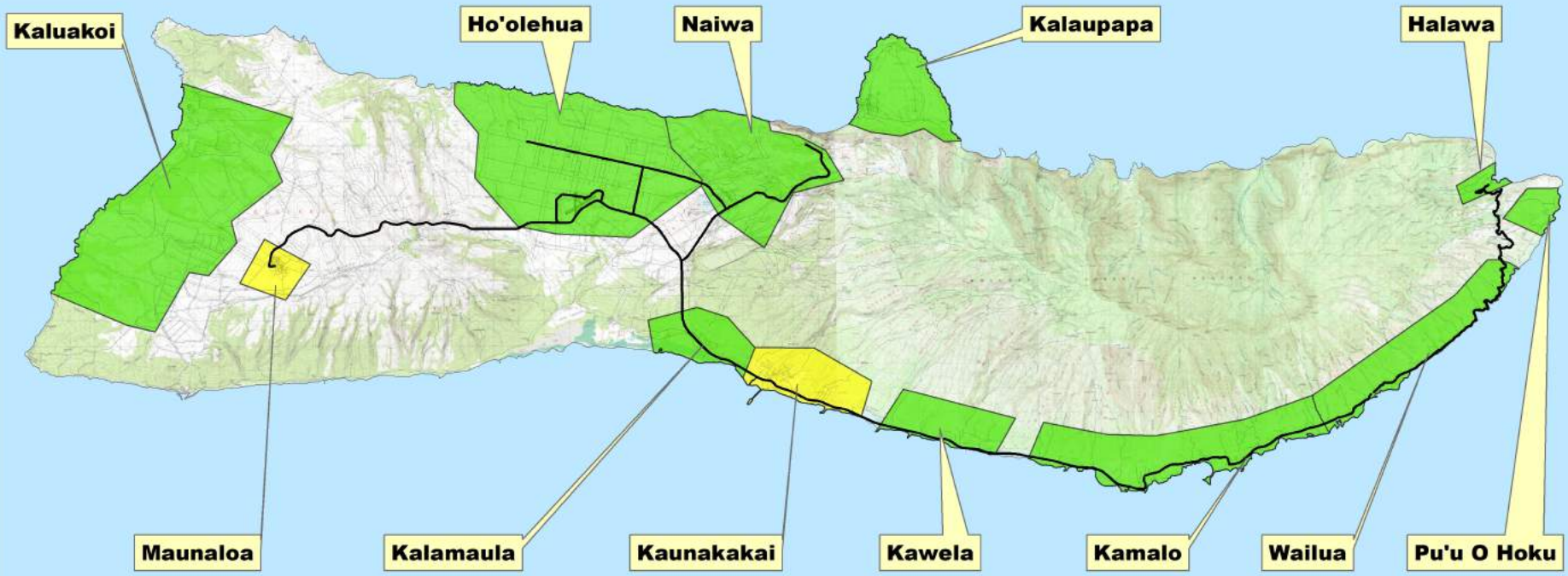
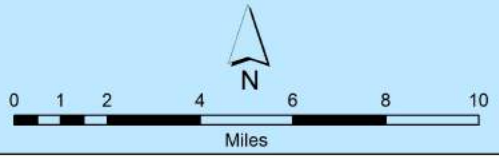
# Structure Density Hazard for Developed Areas

**Moloka'i Community Wildfire Protection Plan**

| Structure Density | | |
|---|---|---|
| Low Hazard | Moderate Hazard | High Hazard |
| Low structure density and low ignition probability. | Density and ignition probability are both moderate, or one is high but is balanced by the other being low. | Dense structures with high ignition probability. |

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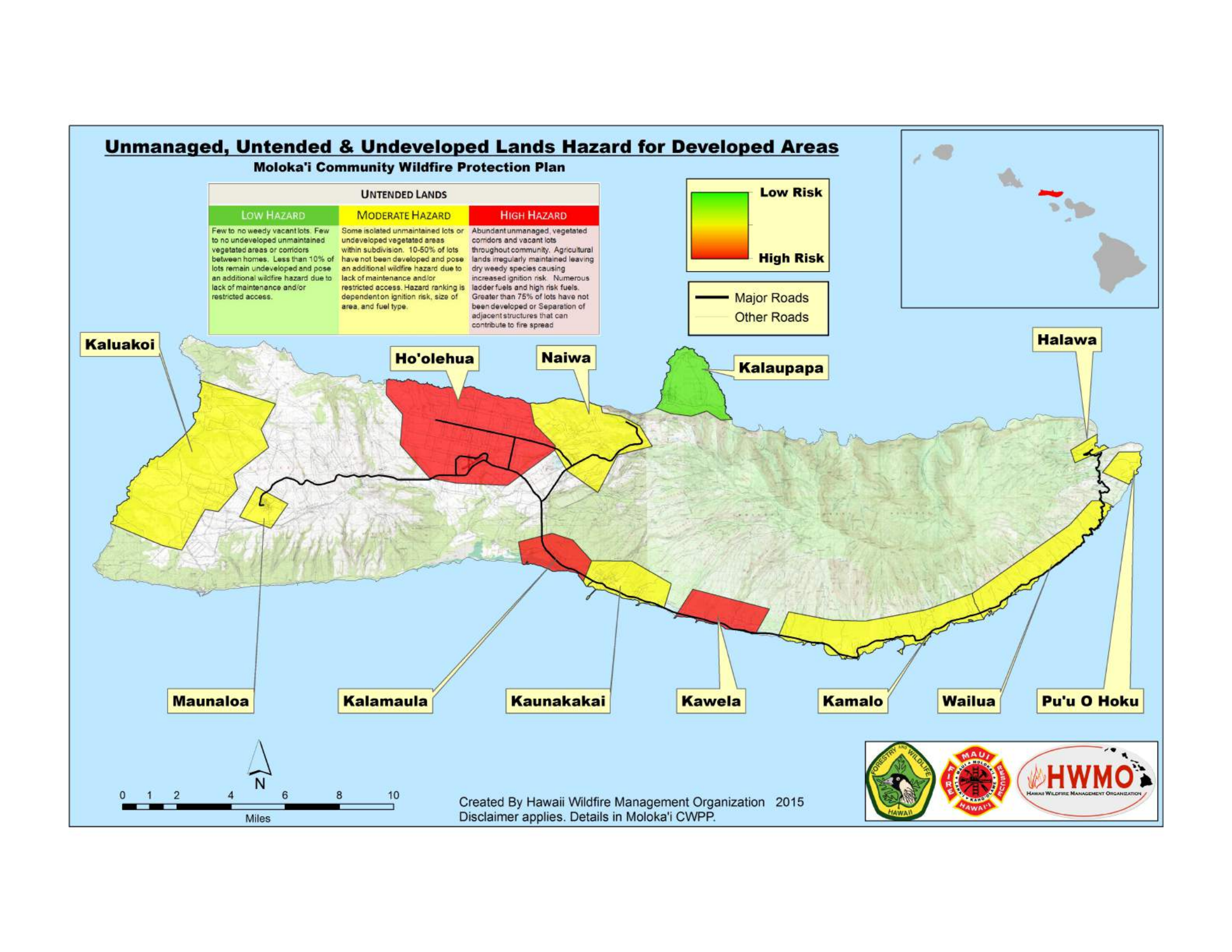
# Unmanaged, Untended & Undeveloped Lands Hazard for Developed Areas

## Moloka'i Community Wildfire Protection Plan

| Untended Lands | | |
|---|---|---|
| Low Hazard | Moderate Hazard | High Hazard |
| Few to no weedy vacant lots. Few to no undeveloped unmaintained vegetated areas or corridors between homes. Less than 10% of lots remain undeveloped and pose an additional wildfire hazard due to lack of maintenance and/or restricted access. | Some isolated unmaintained lots or undeveloped vegetated areas within subdivision. 10-50% of lots have not been developed and pose an additional wildfire hazard due to lack of maintenance and/or restricted access. Hazard ranking is dependent on ignition risk, size of area, and fuel type. | Abundant unmanaged, vegetated corridors and vacant lots throughout community. Agricultural lands irregularly maintained leaving dry weedy species causing increased ignition risk. Numerous ladder fuels and high risk fuels. Greater than 75% of lots have not been developed or Separation of adjacent structures that can contribute to fire spread |

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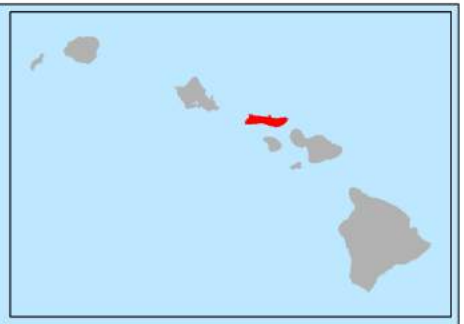
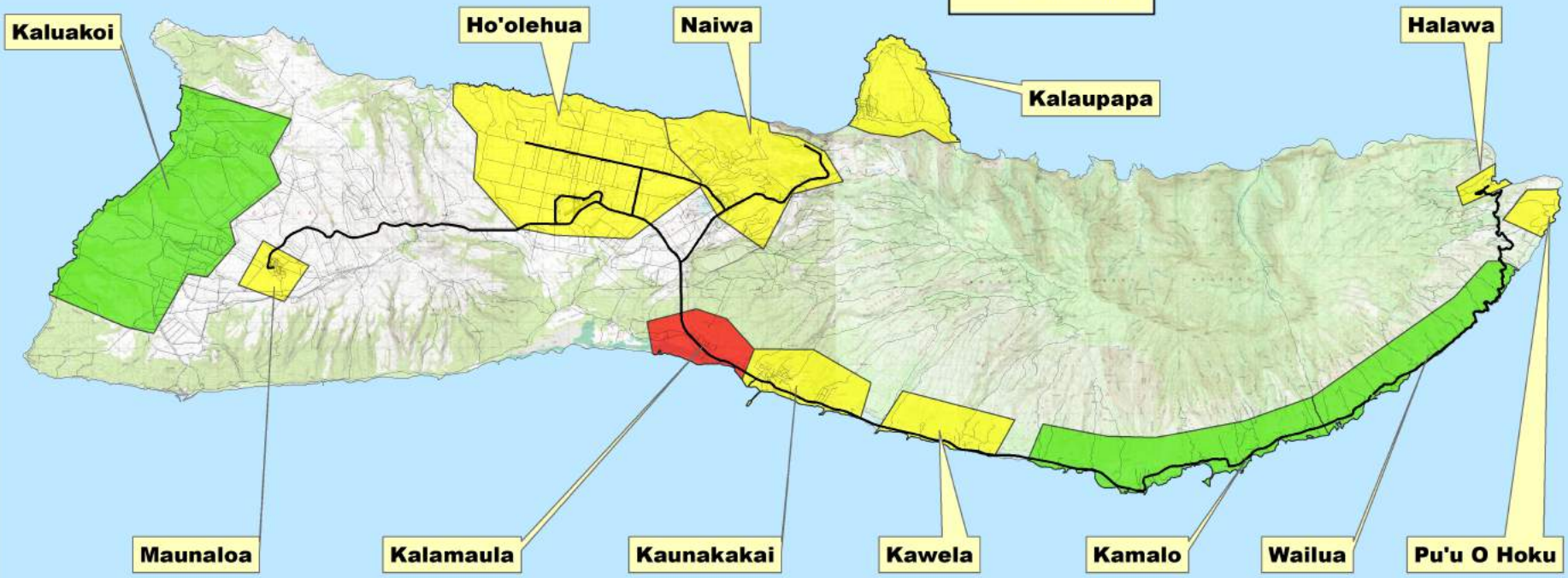
# VEGETATION HAZARD FOR DEVELOPED AREAS

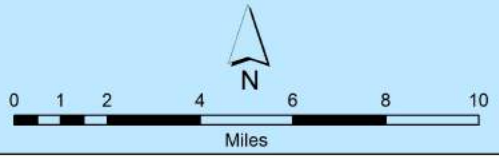
# Defensible Space: Fuels Reduction Around Homes Hazard for Developed Areas

**Moloka'i Community Wildfire Protection Plan**

| Defensible Space- Fuels Reduction Around Homes | | |
|---|---|---|
| Low Hazard | Moderate Hazard | High Hazard |
| Vegetation is treated 100 feet or more from structures. | 31-100 ft. of vegetation treatment from structures. | Less than 30 ft. of vegetation treatment from structures. |

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# Fuel Loading Hazard for Developed Areas

**Moloka'i Community Wildfire Protection Plan**

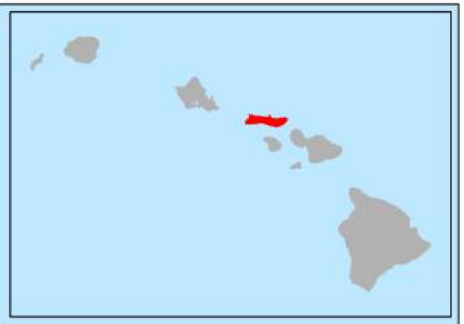
| Fuel Loading | | |
|---|---|---|
| Low Hazard | Moderate Hazard | High Hazard |
| 0-30% vegetated cover | 31-70% vegetated cover | 71-100% vegetated cover |

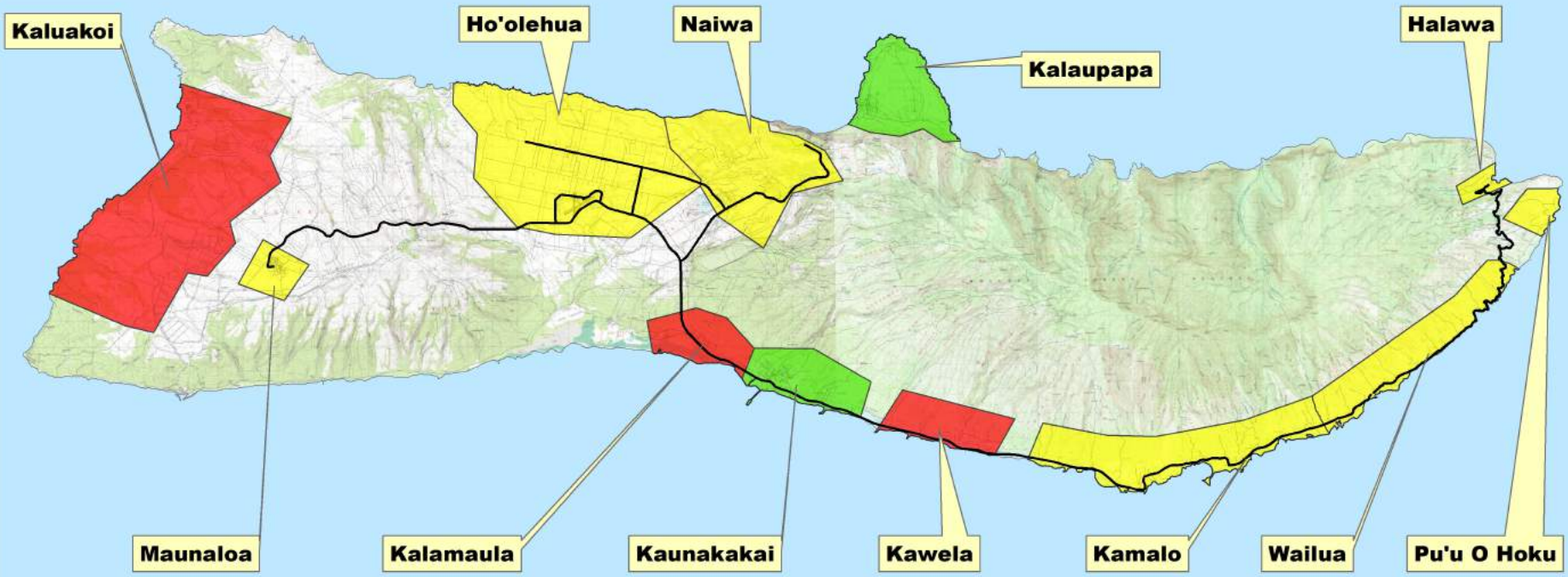
Low Risk

High Risk

Major Roads

Other Roads



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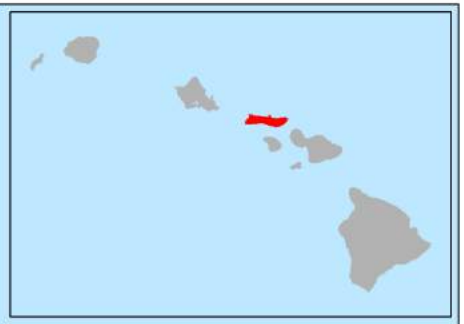
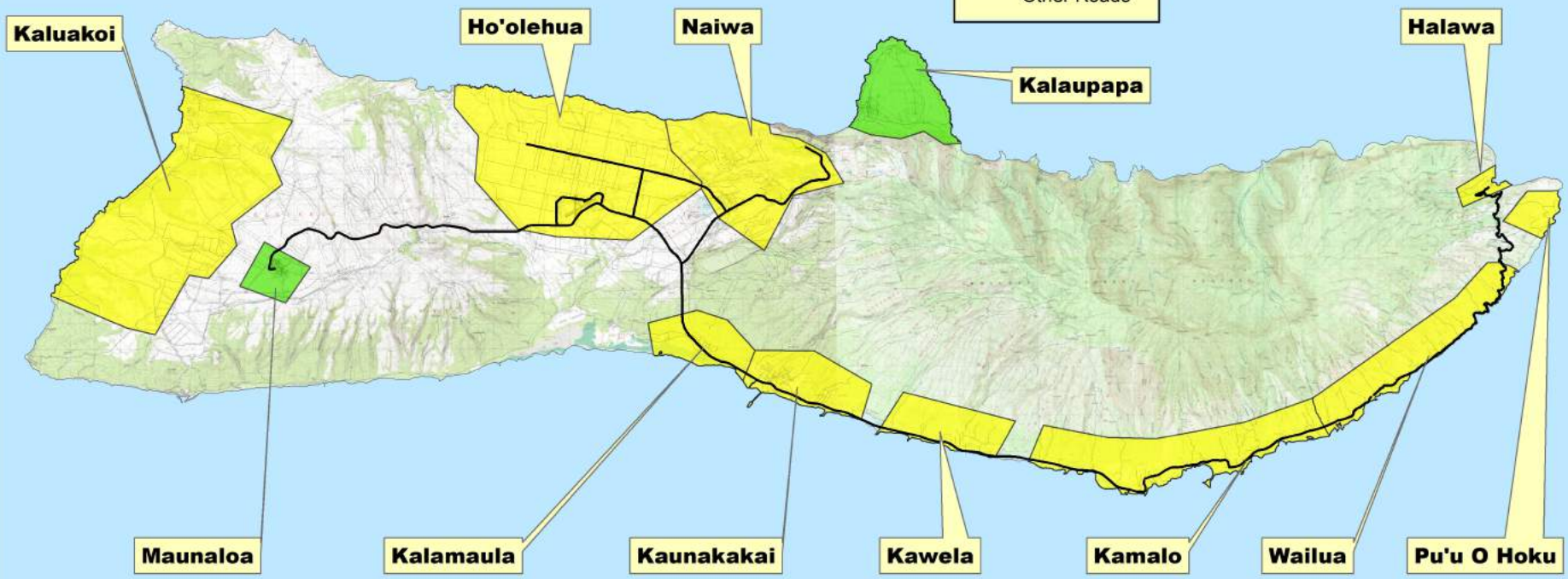
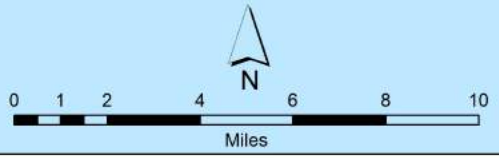
# Fuel Structure & Arrangement Hazard for Developed Areas

**Moloka'i Community Wildfire Protection Plan**

| Fuel Structure and Arrangement | | |
|---|---|---|
| Low Hazard | Moderate Hazard | High Hazard |
| Non-contiguous or patchwork arrangement. Little to no ladder fuels. | Some areas of contiguous vegetation. Few ladder fuels. | Uninterrupted vegetation, pervasive ladder fuels. |

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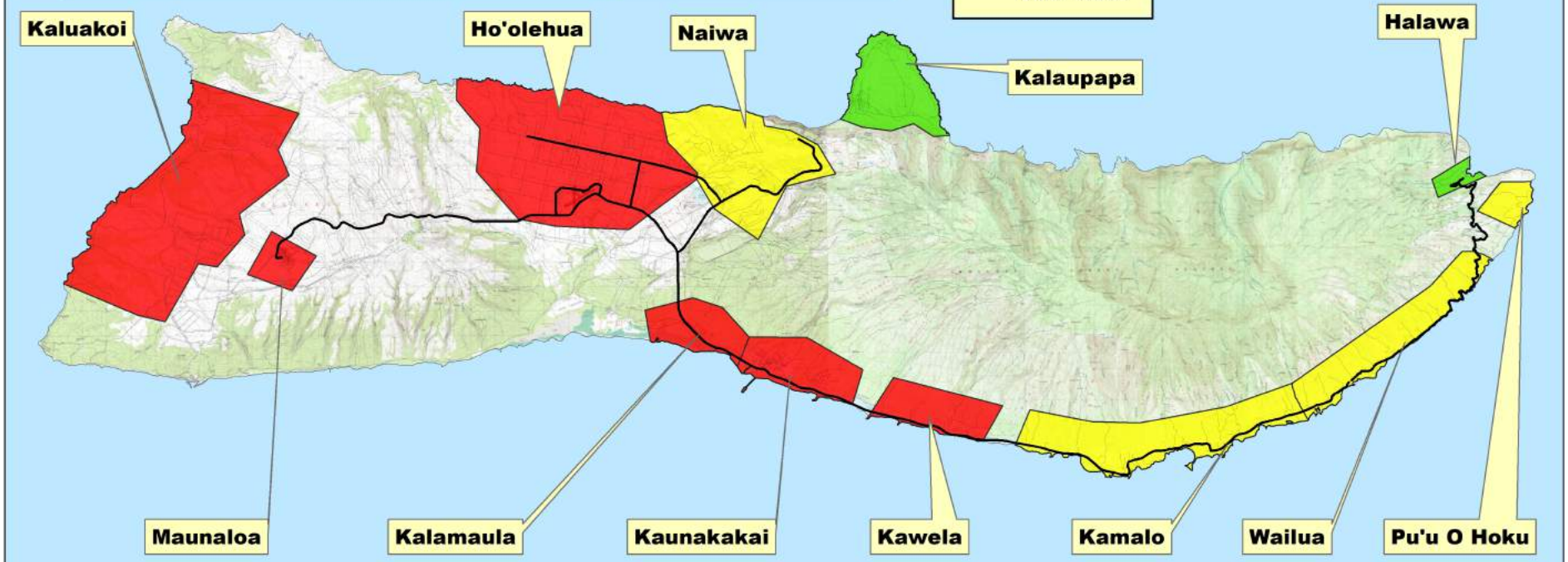
# Proximity To Flammable Fuels Around Subdivision Hazard for Developed Areas

**Moloka'i Community Wildfire Protection Plan**

| Proximity of Flammable Fuels Around Subdivision | | |
|---|---|---|
| Low Hazard | Moderate Hazard | High Hazard |
| Greater than 100' | 40-100' | Less than 40' |

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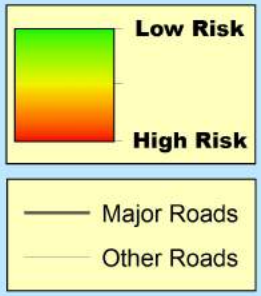
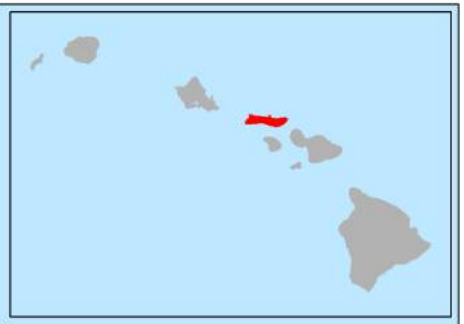
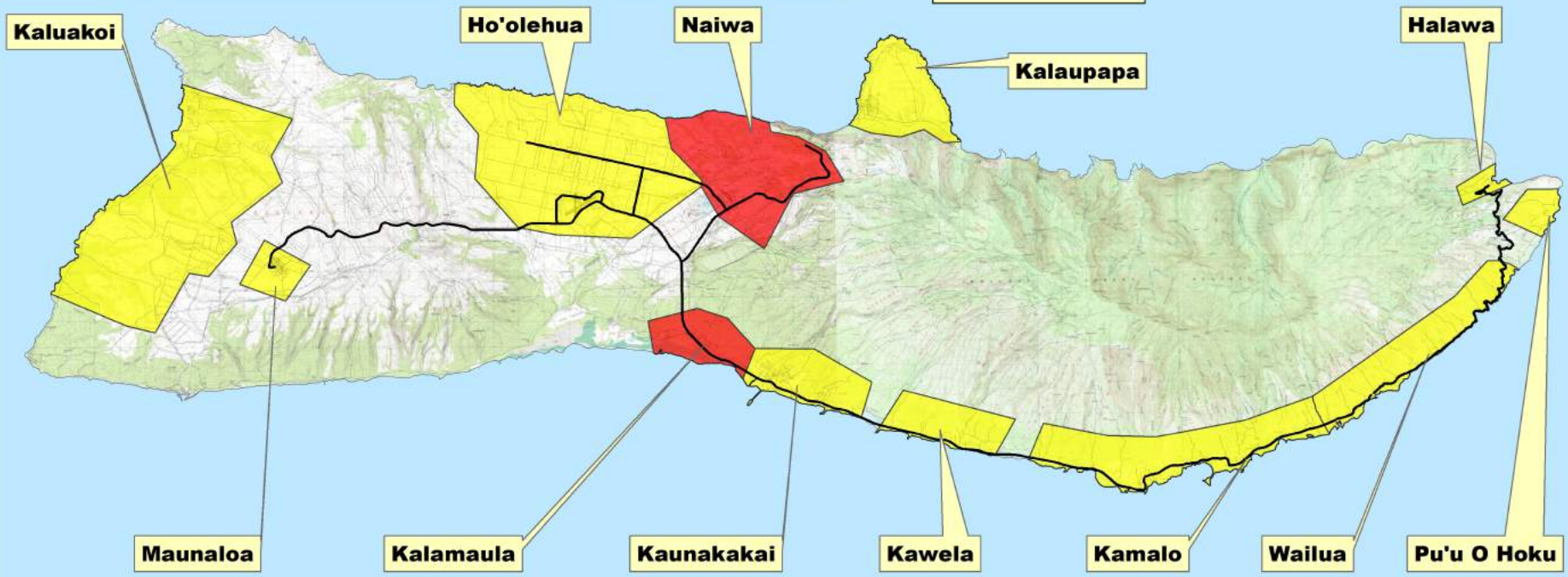
# Vegetation Type Within 300' Of Homes

## Moloka'i Community Wildfire Protection Plan

| Vegetation Type Within 300' of Homes | | |
|---|---|---|
| Low Hazard | Moderate Hazard | High Hazard |
| Grasses less than 6 inches in height. Light leaf litter. | Grasses 6–12 inches in height. Light brush and small trees. Patchy fuels. | Dense grass, brush, timber, and/or hardwoods. Moderate to heavy dead and downed vegetation. Fuels greater than 12 feet tall. Heavy vegetation. |



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# BUILDING HAZARD FOR DEVELOPED AREAS

# Siding & Soffits Hazard for Developed Areas

**Moloka'i Community Wildfire Protection Plan**

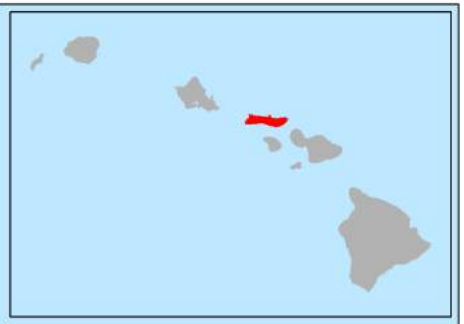
| Siding and Soffits | | |
|---|---|---|
| Low Hazard | Moderate Hazard | High Hazard |
| Greater than 75% of homes have fire resistant siding and soffits. | 50-75% of homes have fire resistant siding and soffits. | Less than 50% of homes have fire resistant siding and soffits. |

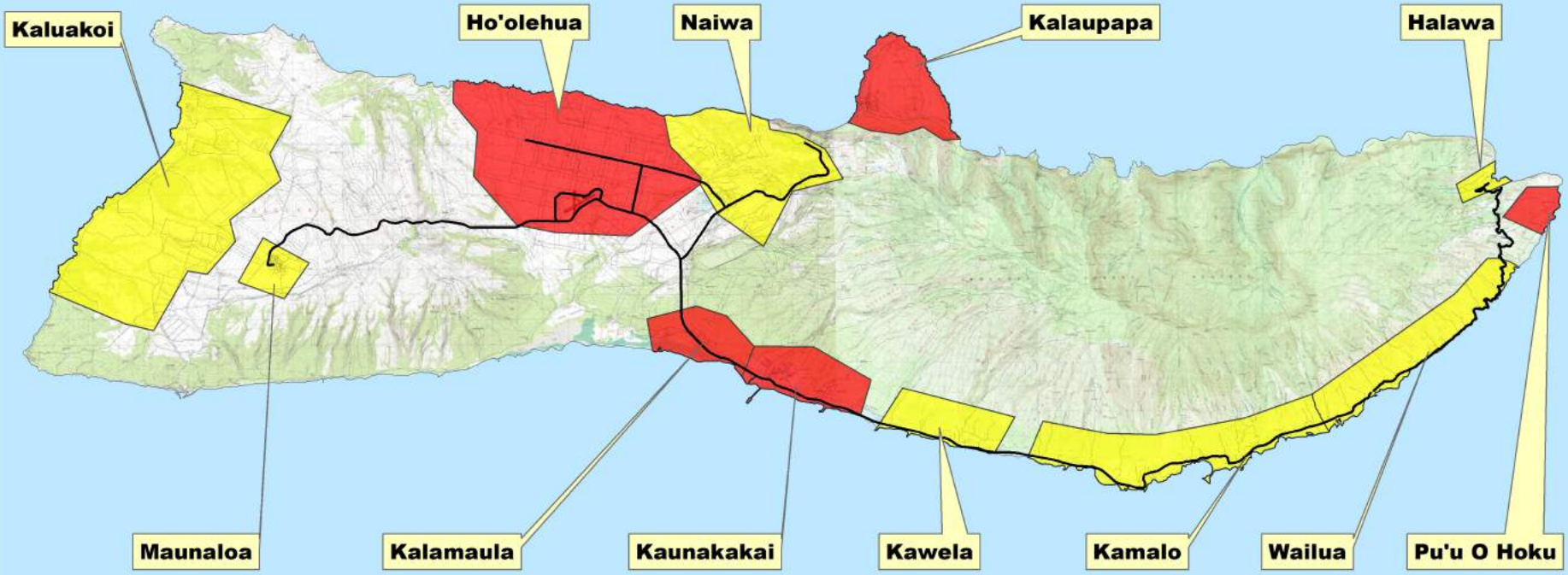
Low Risk

High Risk

Major Roads

Other Roads



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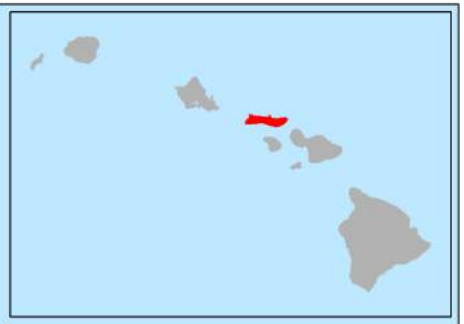
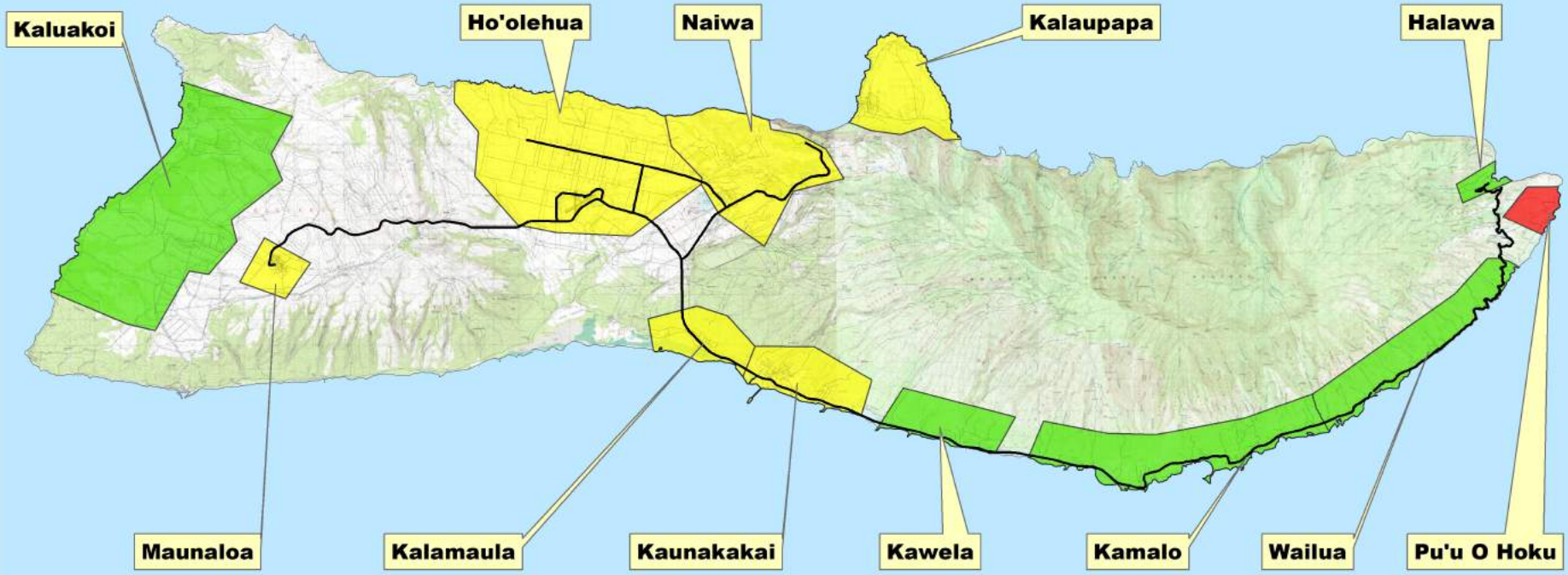
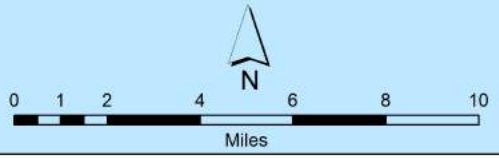
# Roofing Asembly Hazard for Developed Areas

**Moloka'i Community Wildfire Protection Plan**

| Roofing Assembly | | |
|---|---|---|
| Low Hazard | Moderate Hazard | High Hazard |
| Greater than 75% of homes have Class A roofs (metal, asphalt, or fiberglass roofing material). | 50-75% have Class A roofing. | Less than 50% of homes have Class A roofing. |

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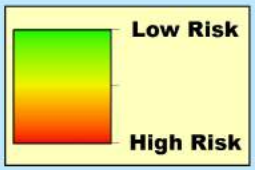
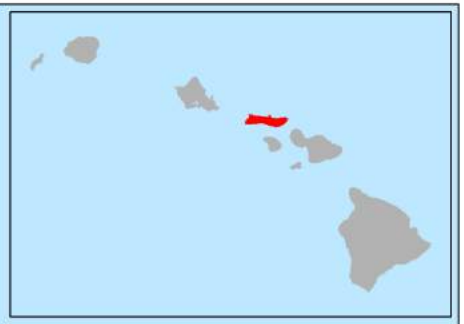
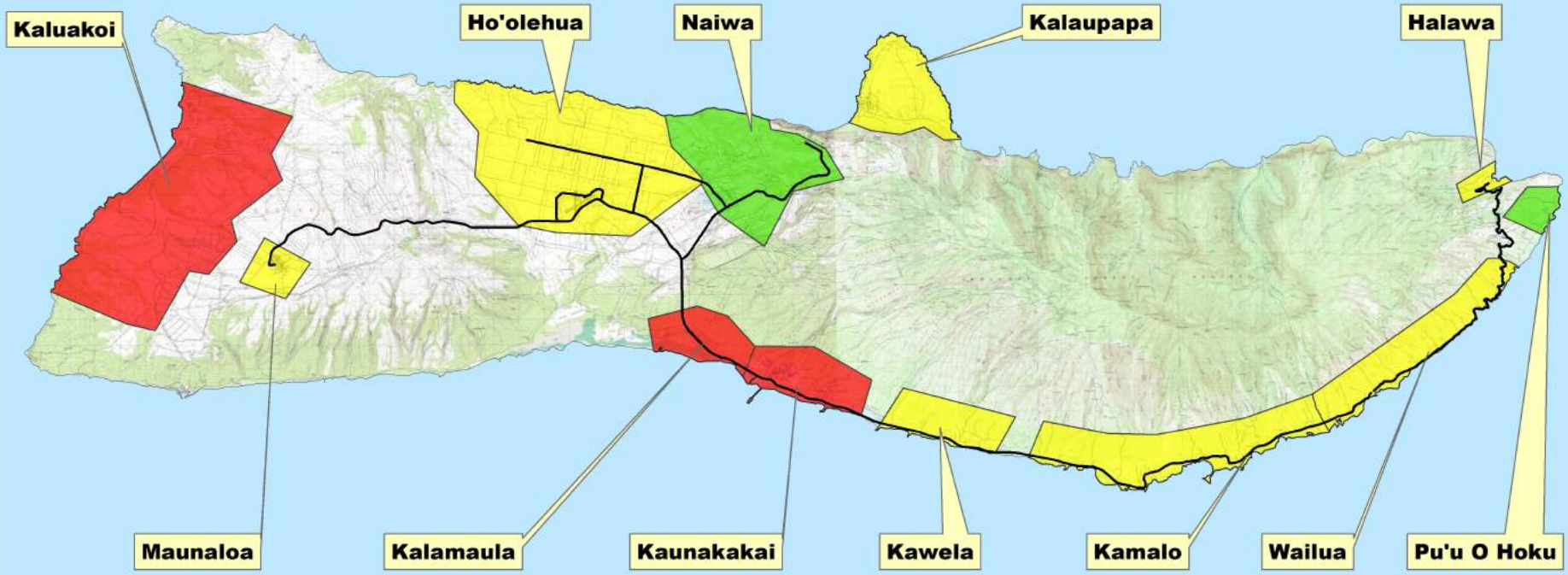
# Structural Ignitability Hazard for Developed Areas

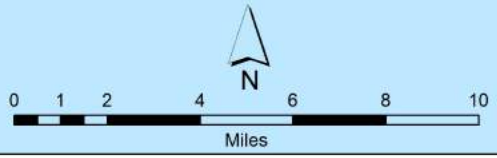
**Moloka'i Community Wildfire Protection Plan**

| Structural Ignitability | | |
|---|---|---|
| Low Hazard | Moderate Hazard | High Hazard |
| Greater than 75% or houses are spaced with cleared boundaries. Flammables and combustible materials stored according to fire-safe principles. | 50-75% of homes store combustibles properly. | Less than 50% of homes store combustibles properly. Houses close to each other. |



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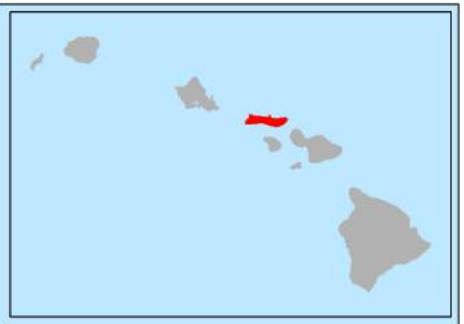
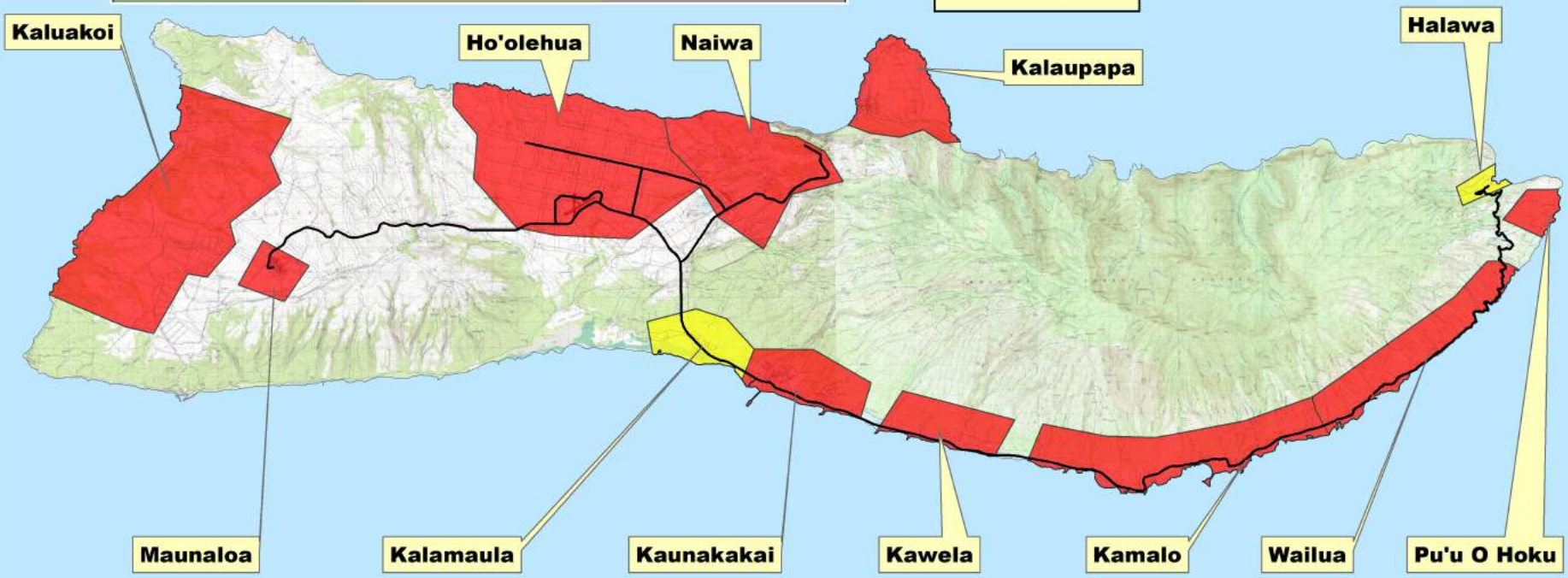
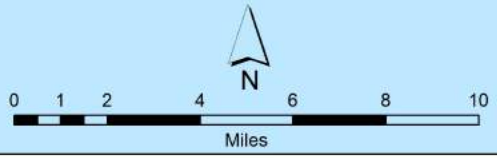
# Underskirting Around Decks, Post & Pier Structures Hazard for Developed Areas

**Moloka'i Community Wildfire Protection Plan**

| Underskirting Around Decks/ Post-and-Pier Structures | | |
|---|---|---|
| Low Hazard | Moderate Hazard | High Hazard |
| Greater than 75% of homes have the equivalent of fine non-combustible mesh screening to protect underneath from flying embers and ignition. | 50-75% of homes have the equivalent of fine non-combustible mesh screening. | Less than 50% of homes have the equivalent of fine non-combustible mesh screening. |

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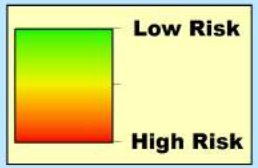
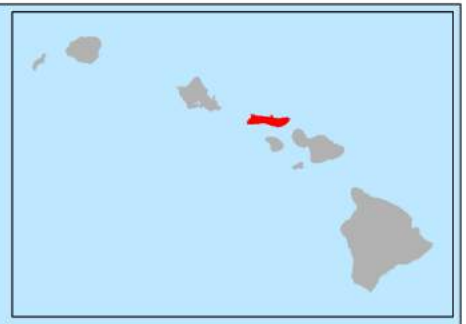
# Utilities Placement: Gas & Electric Hazard for Developed Areas

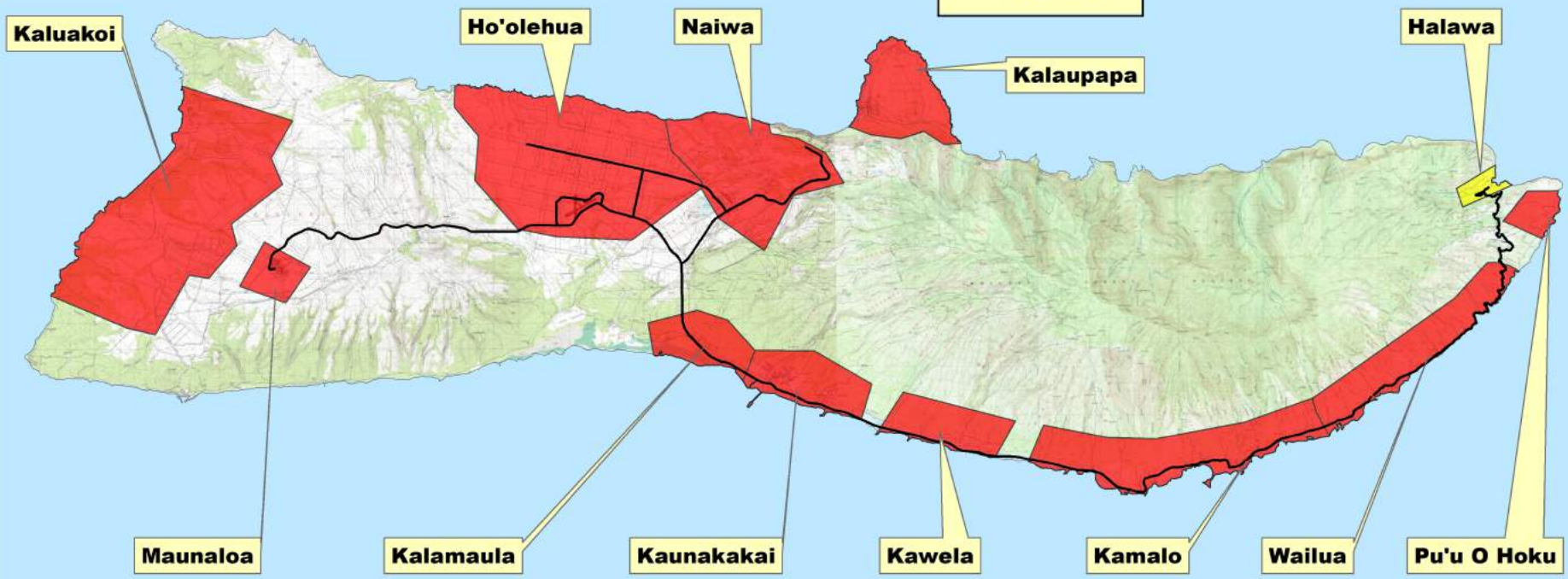
**Moloka'i Community Wildfire Protection Plan**

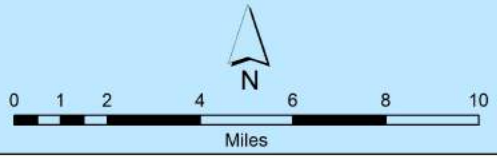
| Utilities Placement- Gas and Electric | | |
|---|---|---|
| Low Hazard | Moderate Hazard | High Hazard |
| All underground or none. | One underground, one above ground. | Both above ground. |







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# FIRE ENVIRONMENT HAZARD FOR DEVELOPED AREAS

# Average Rainfall Hazard for Developed Areas

**Moloka'i Community Wildfire Protection Plan**

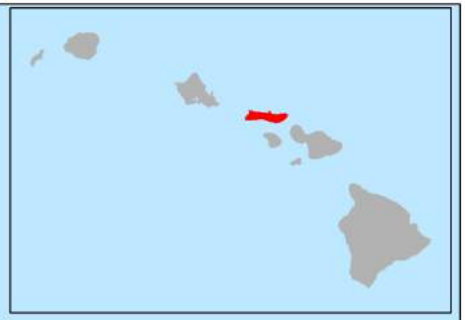
| Average Rainfall | | |
|---|---|---|
| Low Hazard | Moderate Hazard | High Hazard |
| High Precipitation | Moderate Precipitation | Low Precipitation |

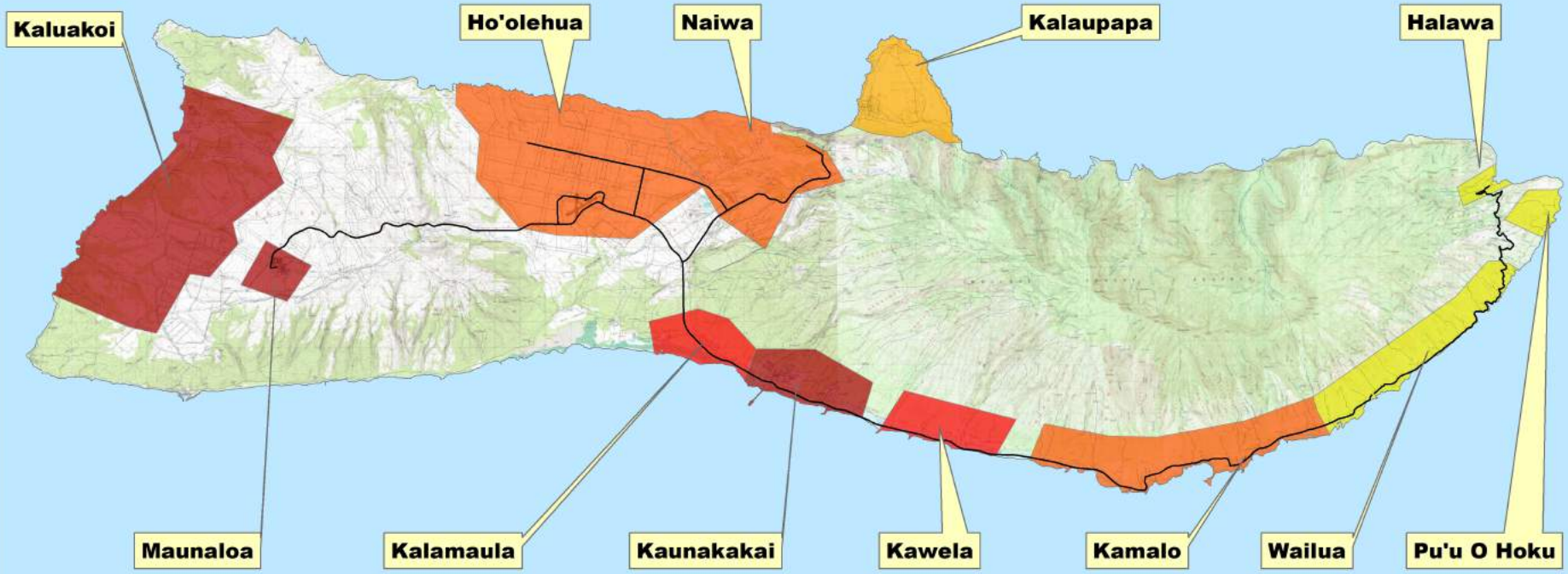
Low Risk

High Risk

Major Roads

Other Roads



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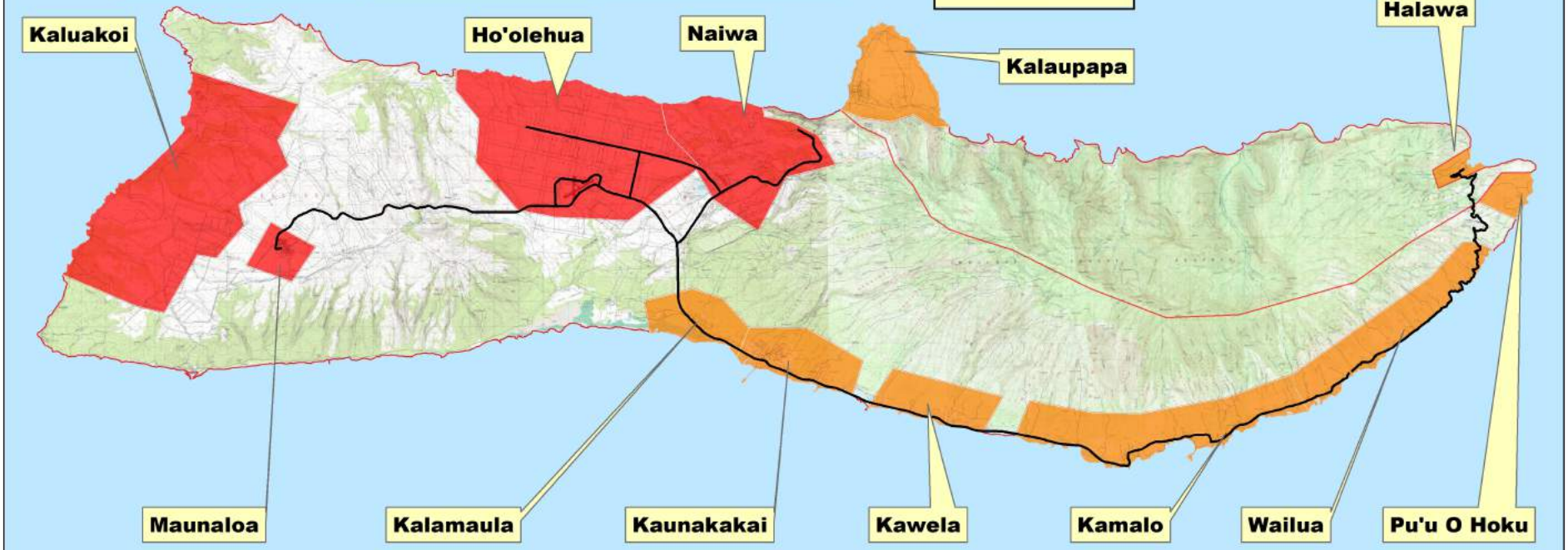
# Prevailing Wind Speeds & Direction Hazard for Developed Areas

**Moloka'i Community Wildfire Protection Plan**

| Prevailing Wind Speeds and Direction | | |
|---|---|---|
| Low Hazard | Moderate Hazard | High Hazard |
| Wind rarely (less than 10% of time) exceeds 15 mph. Protection from predominant winds. | Wind rarely (less than 10% of time) exceeds 15 mph. | Wind frequently (50% or more of time) exceeds 15 mph or frequent exposure to predominant winds or transitional/converging wind directions. |

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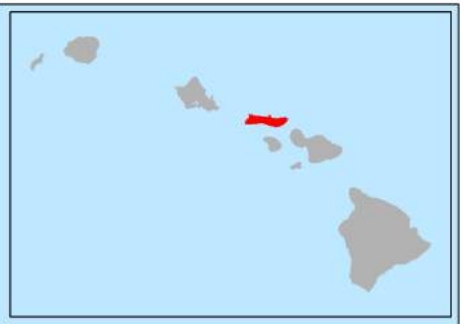
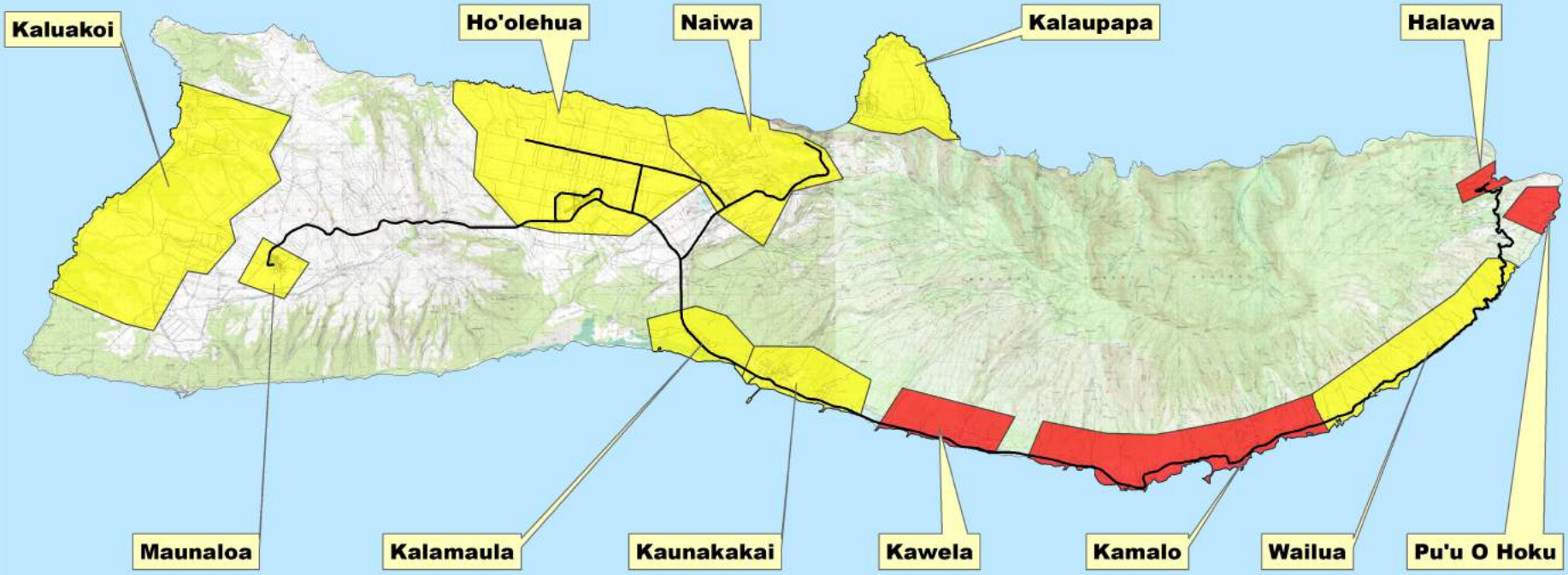
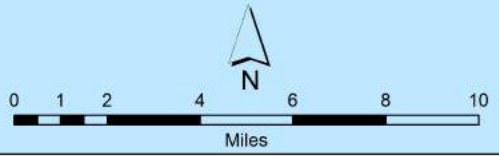
# Slope Hazard for Developed Areas

**Moloka'i Community Wildfire Protection Plan**

| SLOPE | | |
|---|---|---|
| LOW HAZARD | MODERATE HAZARD | HIGH HAZARD |
| Flat to slight slope (10%) | Moderate slopes (10-30%) | Steep slopes (>30%) |

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# Topographic Features That Adversely Affect Wildland Fire Behavior Hazard for Developed Areas

**Moloka'i Community Wildfire Protection Plan**

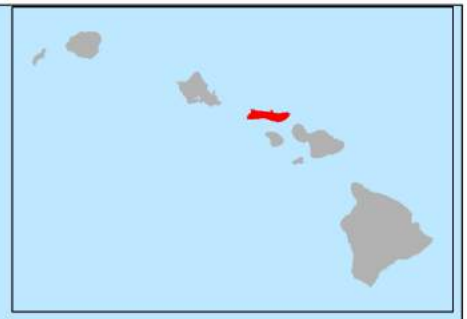
| Hazardous Topographical Features | | |
|---|---|---|
| Low Hazard | Moderate Hazard | High Hazard |
| None. | Minor features, such as low or occasional hills. | Major feature such as box canyon, ravines, chutes, saddles, transition zones. |

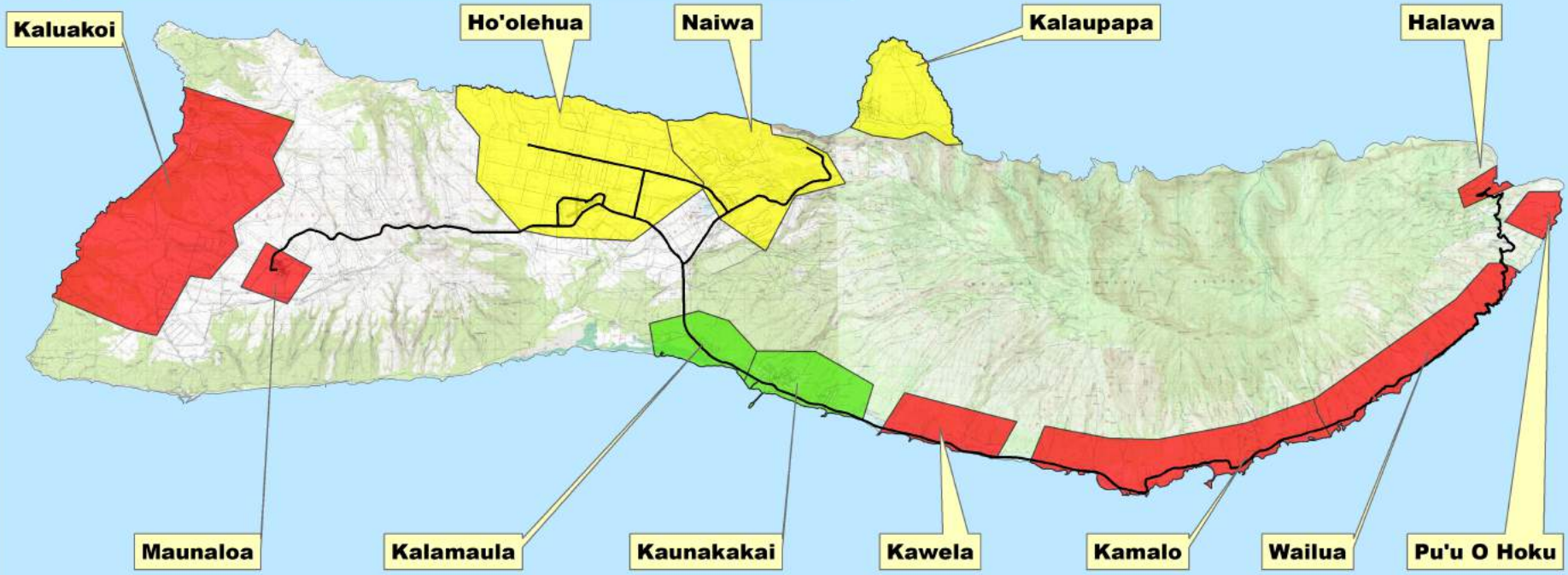
Low Risk

High Risk

Major Roads

Other Roads



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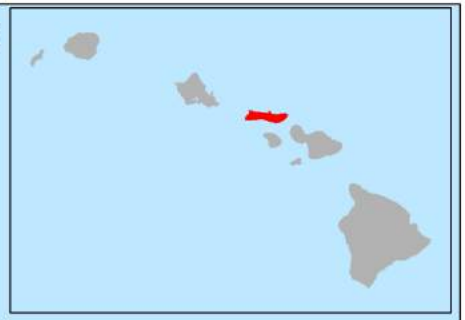
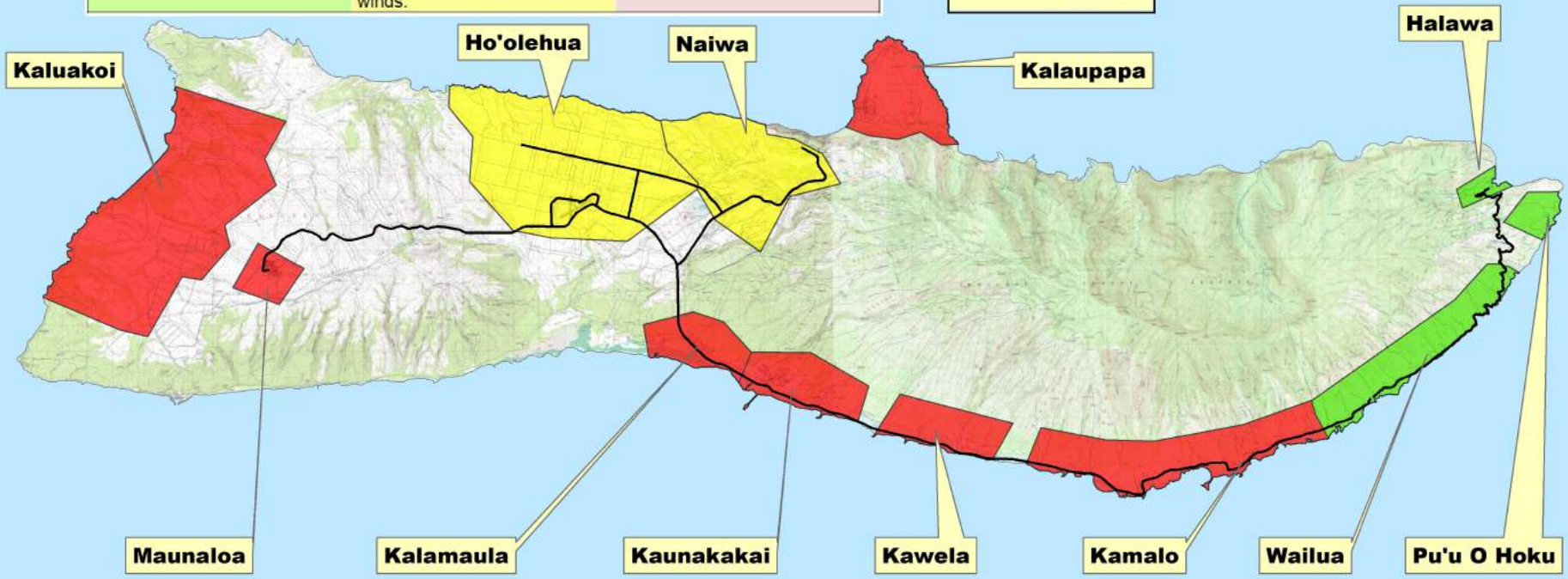
# Seasonal Or Periodic High Hazard Conditions Hazard for Developed Areas

**Moloka'i Community Wildfire Protection Plan**

| Seasonal Or Periodic High Hazard Conditions | | |
|---|---|---|
| **Low Hazard** | **Moderate Hazard** | **High Hazard** |
| Area has no major seasonal increase of fire hazard. | Area is occasionally (e.g., once per decade) exposed to fire prone conditions: drought, lightning storms, desiccated vegetation, and/or strong dry winds. | Area is seasonally exposed to unusually severe fire weather, drought conditions, lightning storms, desiccated vegetation, and/or strong dry winds. |



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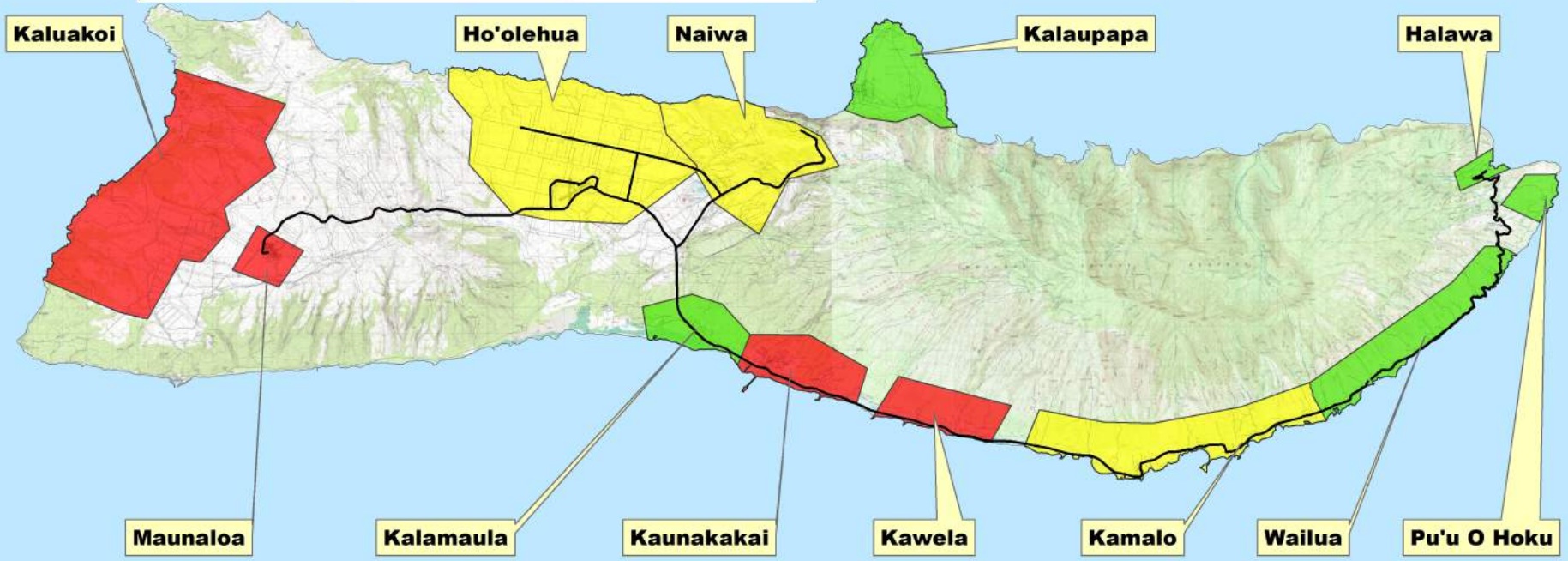
# Ignition Risk Hazard for Developed Areas

**Moloka'i Community Wildfire Protection Plan**

| Ignition Risk | | |
|---|---|---|
| Low Hazard | Moderate Hazard | High Hazard |
| Little to no natural (lightning or lava) ignition risk. No history of arson. Wildland areas absent or distant from public and/or vehicular access. | Some history of wildfire, but not particularly fire prone area due to prevailing lack of fire prone conditions, weather, and vegetation type. | Most historic wildfire events were anthropogenic with easy access to wildland areas via roads or proximity to development OR natural ignition sources such as lightning or lava are prevalent. Fire prone area. High rate of ignitions or history of large scale fires and/or severe wildfire events. |

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# FIRE PROTECTION HAZARD FOR DEVELOPED AREAS

# Response Time Hazard for Developed Areas

**Moloka'i Community Wildfire Protection Plan**

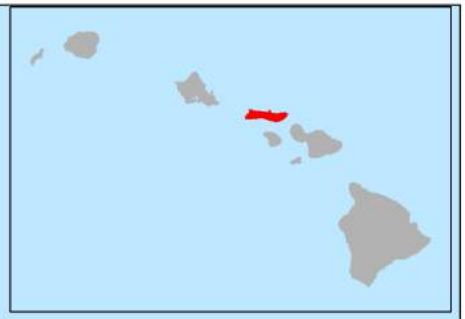
| Response Time | | |
|---|---|---|
| Low Hazard | Moderate Hazard | High Hazard |
| Within 15 minutes | 16-30 minutes | Greater than 30 minutes |

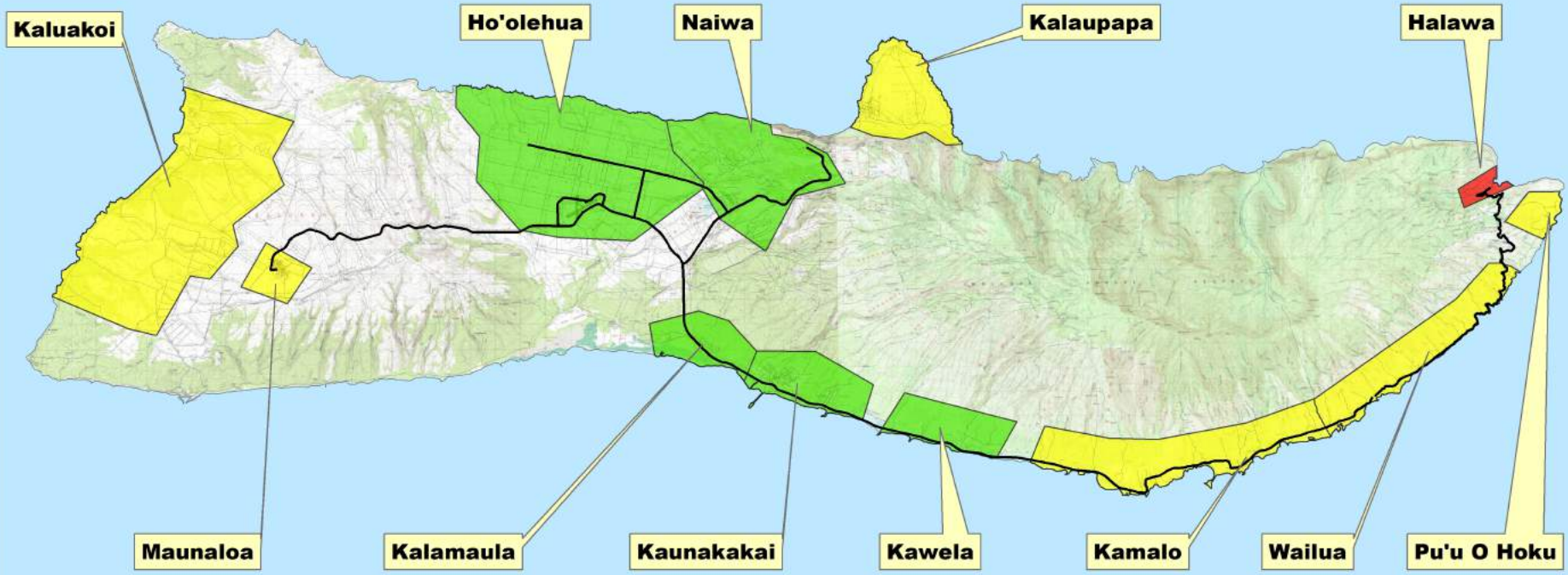
Low Risk

High Risk

Major Roads

Other Roads



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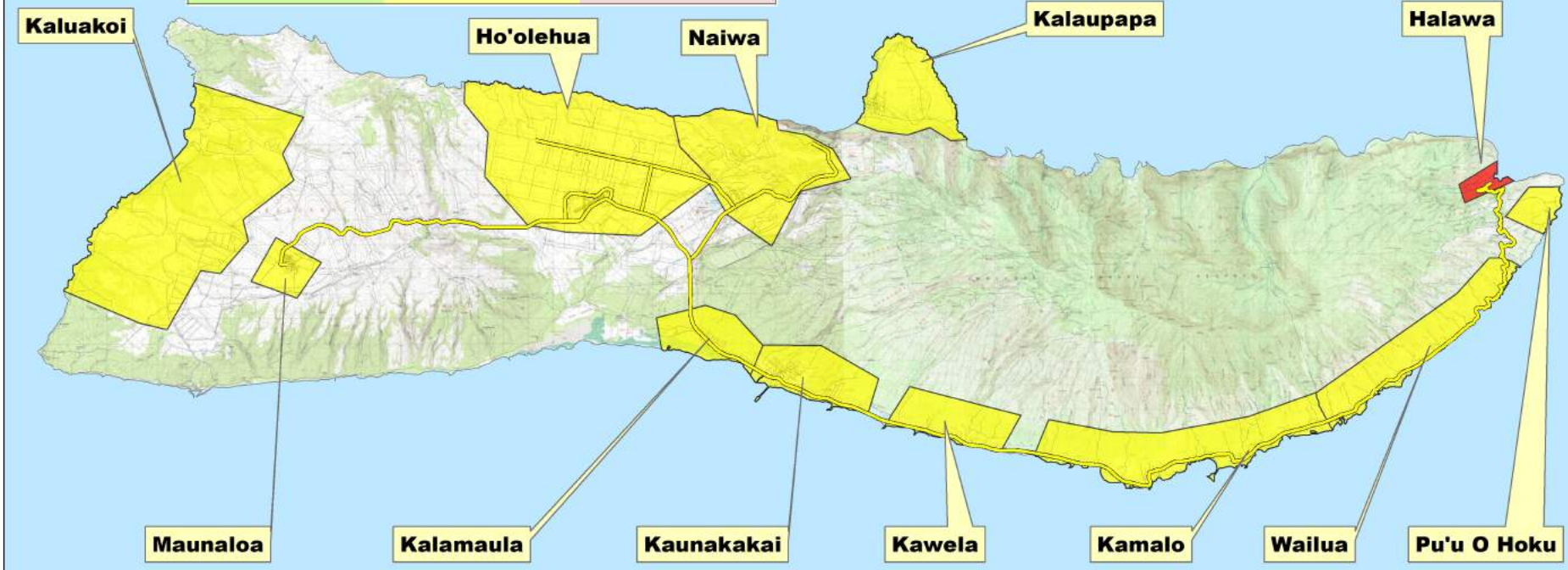
# Community Planning Practices & Ordinances Hazard for Developed Areas

## Moloka'i Community Wildfire Protection Plan

| Community Planning Practices and Ordinances | | |
|---|---|---|
| **Low Hazard** | **Moderate Hazard** | **High Hazard** |
| County/local laws, zoning ordinances, and codes require use of fire safe residential and subdivision designs. Fire department actively participates in planning process and enforces ordinances. Residents are compliant. | Have voluntary ordinances for fire safe practices. Local officials have an understanding of appropriate wildfire mitigation strategies. Fire department has limited input to fire safe planning and development efforts and limited enforcement. Residents are mostly compliant. | No local codes, laws, or ordinances requiring fire safe building or practices. Community standards for fire safe development and protection are marginal or non-existent. Little to no effort has been made in assessing and applying measures to reduce wildfire impact. Ordinances are not enforced and/or residents are not compliant. |

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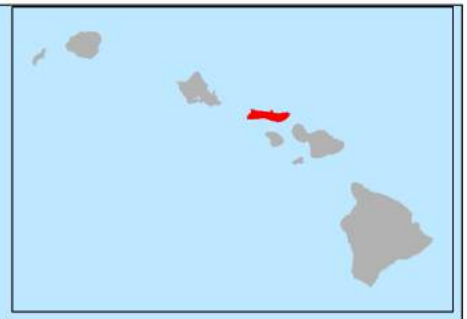
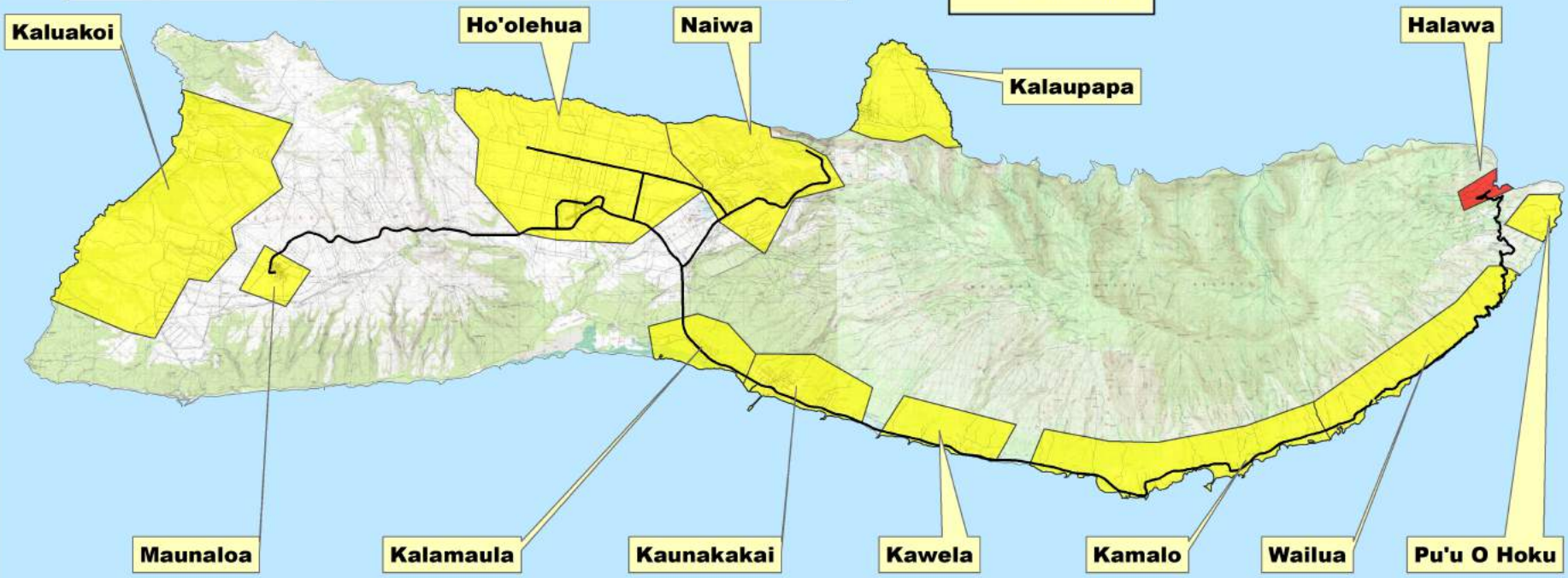
# Community Fire Safe Efforts & Programs In Place Hazard for Developed Areas

**Moloka'i Community Wildfire Protection Plan**

| Community Fire Safe Efforts and Programs in Place | | |
|---|---|---|
| Low Hazard | Moderate Hazard | High Hazard |
| Organized and active groups provide educational materials and programs throughout the community. | Limited provision of or interest in educational efforts. Fire Department or local group does some limited prevention and public education. | No interest or participation in educational programs. No prevention education by local fire department. |

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Miles

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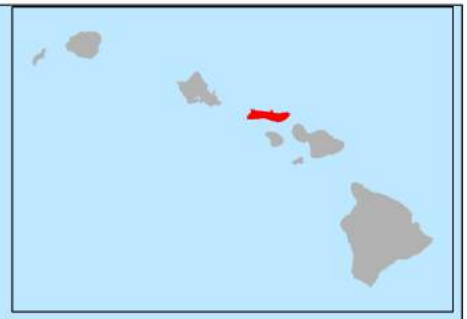
Disclaimer applies. Details in Moloka'i CWPP.

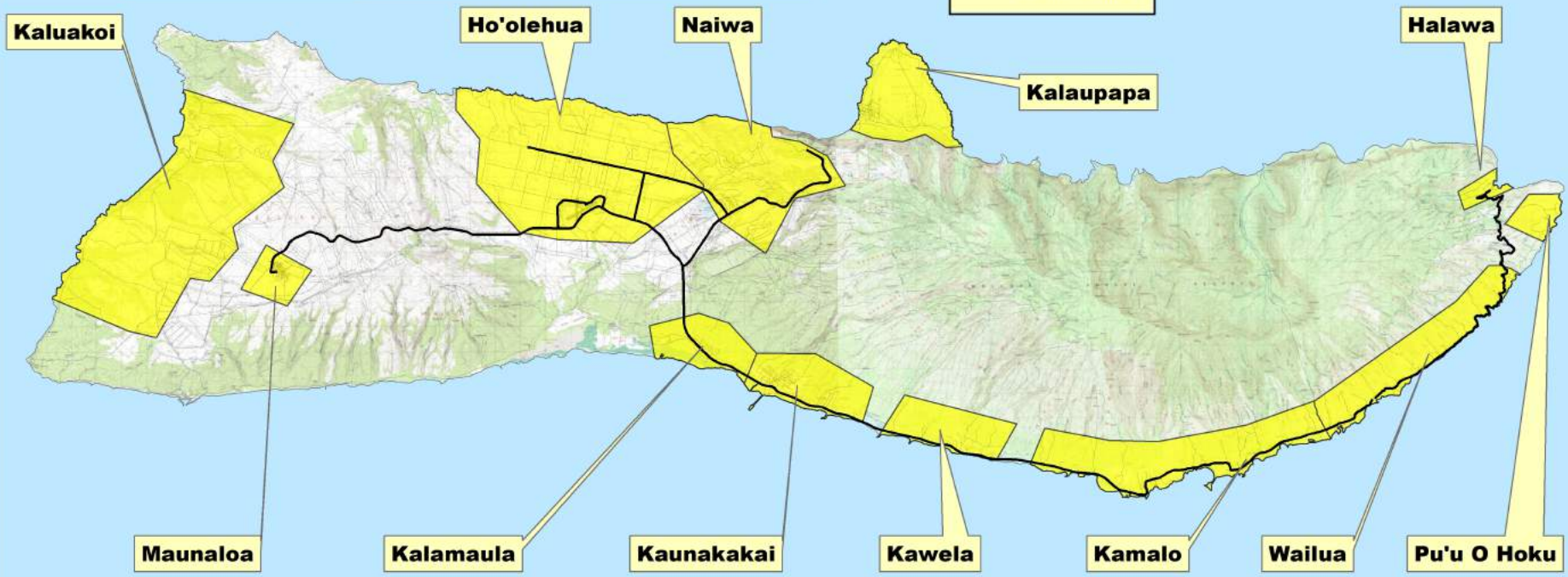
# Fire Department Structural Training & Expertise Hazard for Developed Areas

**Moloka'i Community Wildfire Protection Plan**

| Fire Department Structural Training and Expertise | | |
|---|---|---|
| Low Hazard | Moderate Hazard | High Hazard |
| Large fully paid fire department with personnel that meet NFPA or NWCG training requirements and have adequate equipment. | Mixed fire department. Some paid and some volunteer personnel. Limited experience, training, and equipment to fight fire. | Small, all volunteer fire department. Limited training, experience, and budget with regular turnover of personnel. Do not meet NFPA or NWCG standards. |







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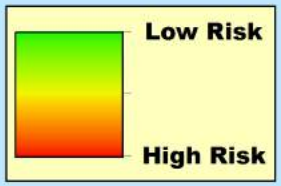
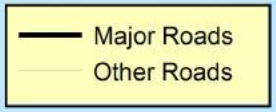
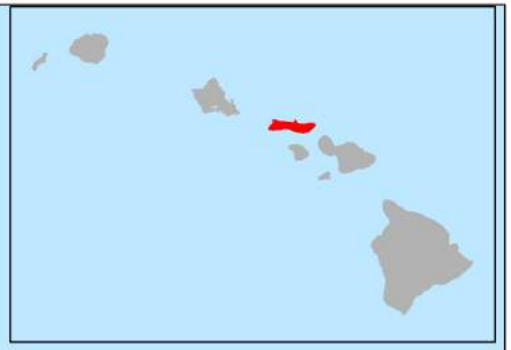
# Citizen Or Local Emergency Operations Group Hazard for Developed Areas

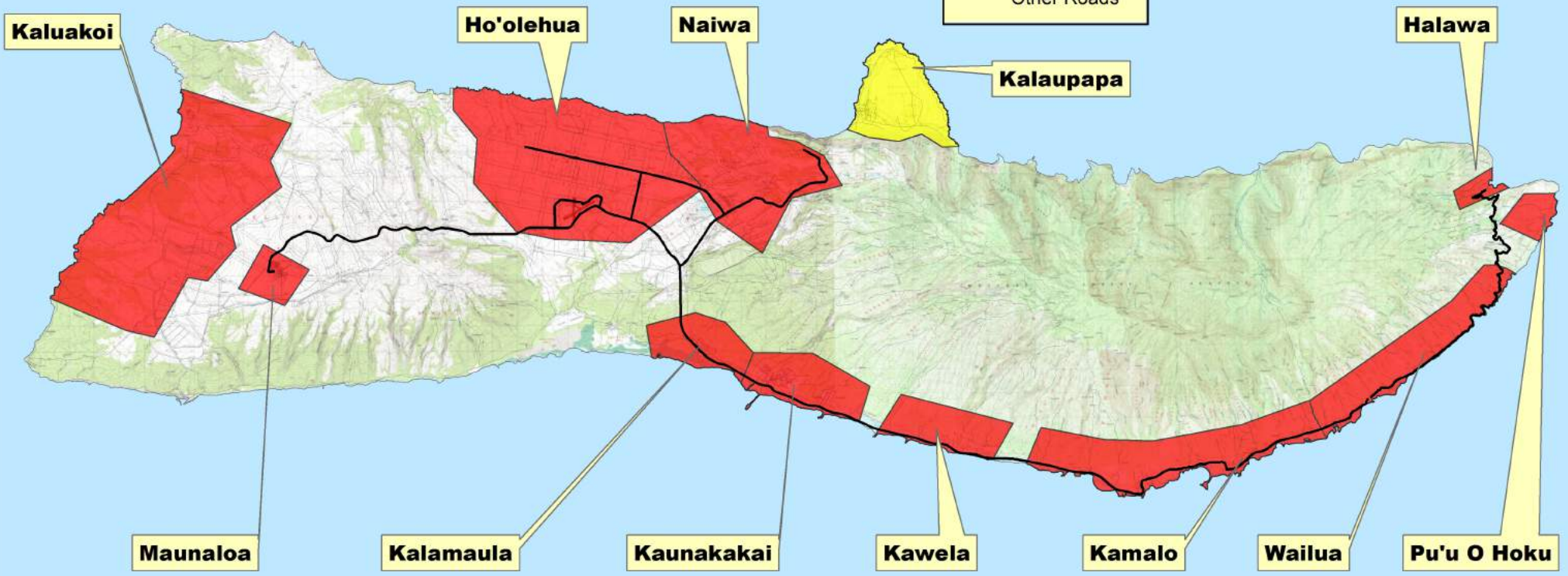
**Moloka'i Community Wildfire Protection Plan**

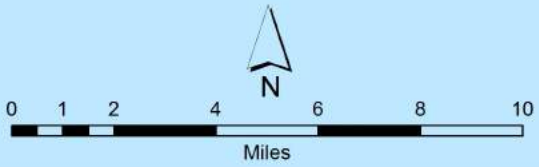
| Citizen or Local Emergency Operations Group | | |
|---|---|---|
| Low Hazard | Moderate Hazard | High Hazard |
| Active EOG or CERT. Evacuation plan in place. | Limited participation in EOG or similar. Have some form of evacuation process. | No effective activity or strategy in place. |



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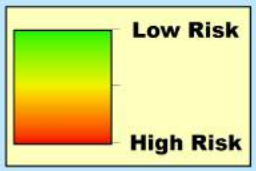
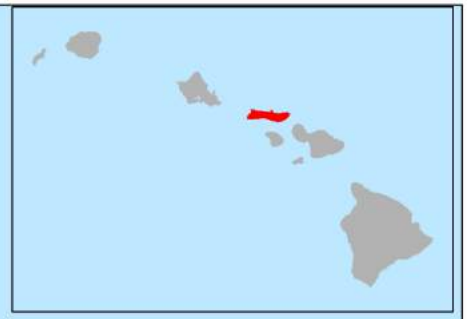
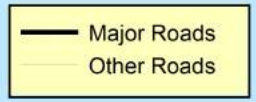
# Proximity To Fire Station Hazard for Developed Areas

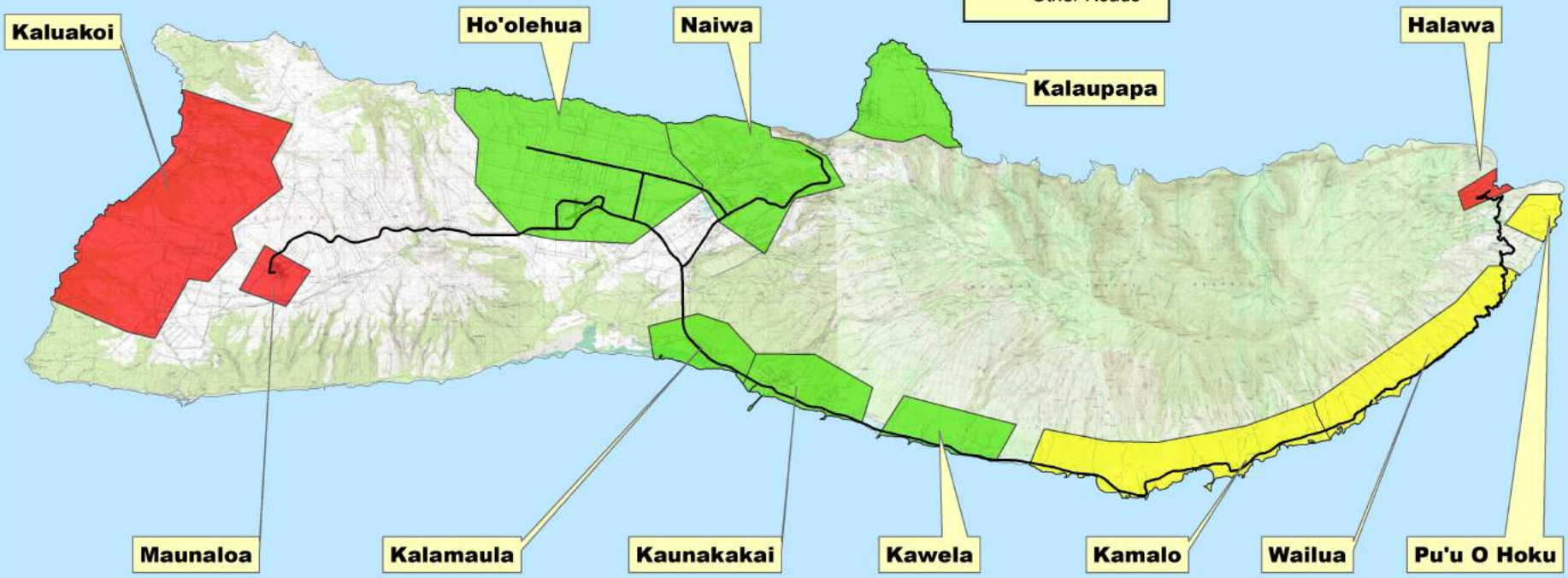
**Moloka'i Community Wildfire Protection Plan**

| Proximity To Fire Station | | |
|---|---|---|
| Low Hazard | Moderate Hazard | High Hazard |
| Less than 5 miles | 6-10 miles | More than 10 miles |







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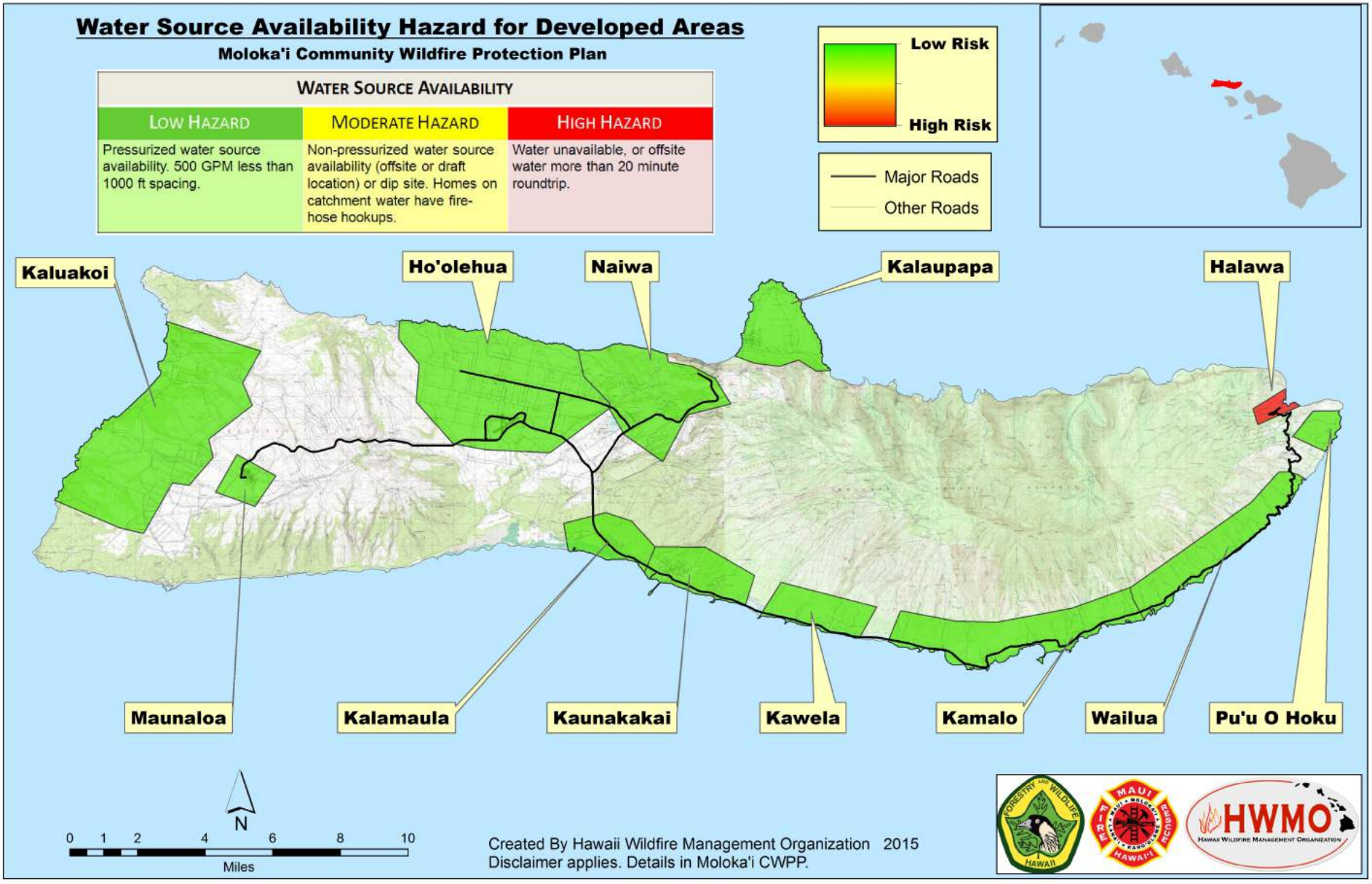
# Water Source Availability Hazard for Developed Areas

**Moloka'i Community Wildfire Protection Plan**

| Water Source Availability | | |
|---|---|---|
| Low Hazard | Moderate Hazard | High Hazard |
| Pressurized water source availability. 500 GPM less than 1000 ft spacing. | Non-pressurized water source availability (offsite or draft location) or dip site. Homes on catchment water have fire-hose hookups. | Water unavailable, or offsite water more than 20 minute roundtrip. |

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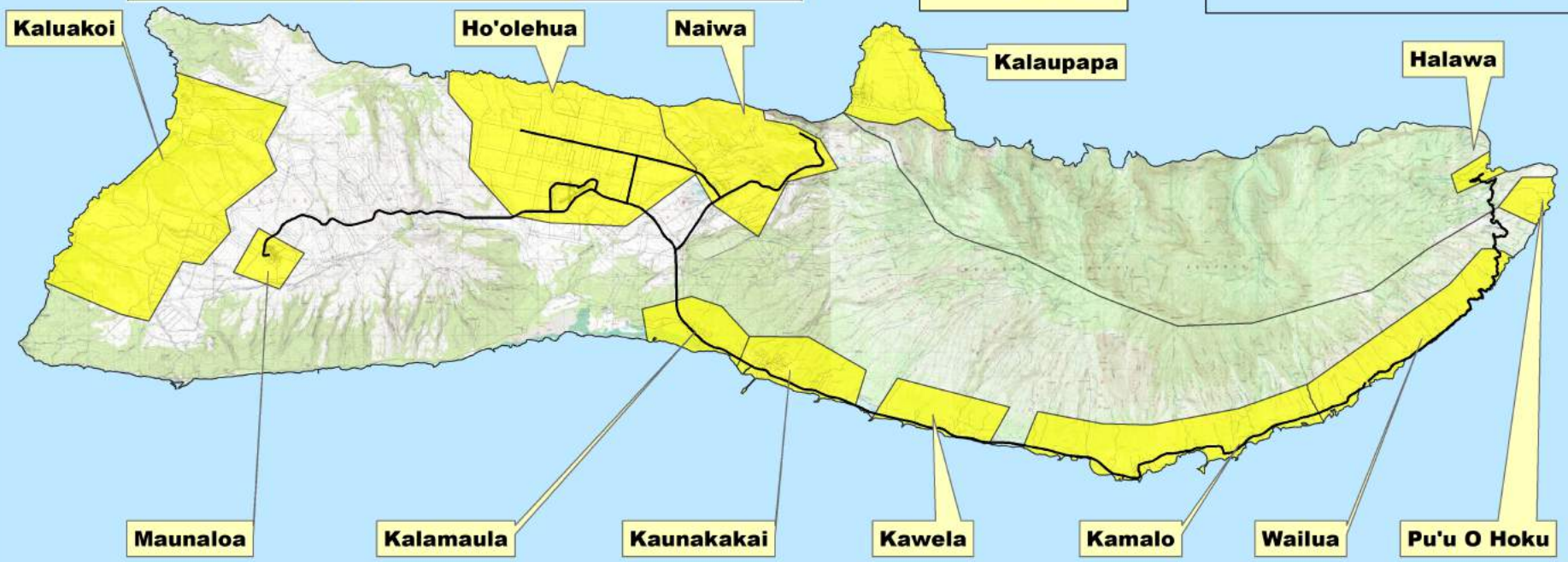
# Wildland Firefighting Capacity Of Initial Response Agency Hazard for Developed Areas

**Moloka'i Community Wildfire Protection Plan**

| Wildland Firefighting Capacity of Initial Response Agency | | |
|---|---|---|
| Low Hazard | Moderate Hazard | High Hazard |
| Sufficient personnel, equipment, and wildland firefighting capability and experience. Good supply of structural and wildland fire apparatus and misc specialty equipment | Limited personnel, and or equipment but with some wildland firefighting expertise and training. Smaller supply of fire apparatus in fairly good repair with some specialty equipment. | Fire department non-existent or untrained/unequipped to fight wildland fire. Minimum amount of fire apparatus, which is old and in need of repair. None or little specialty equipment. |

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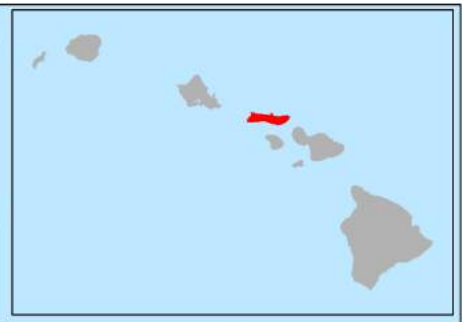
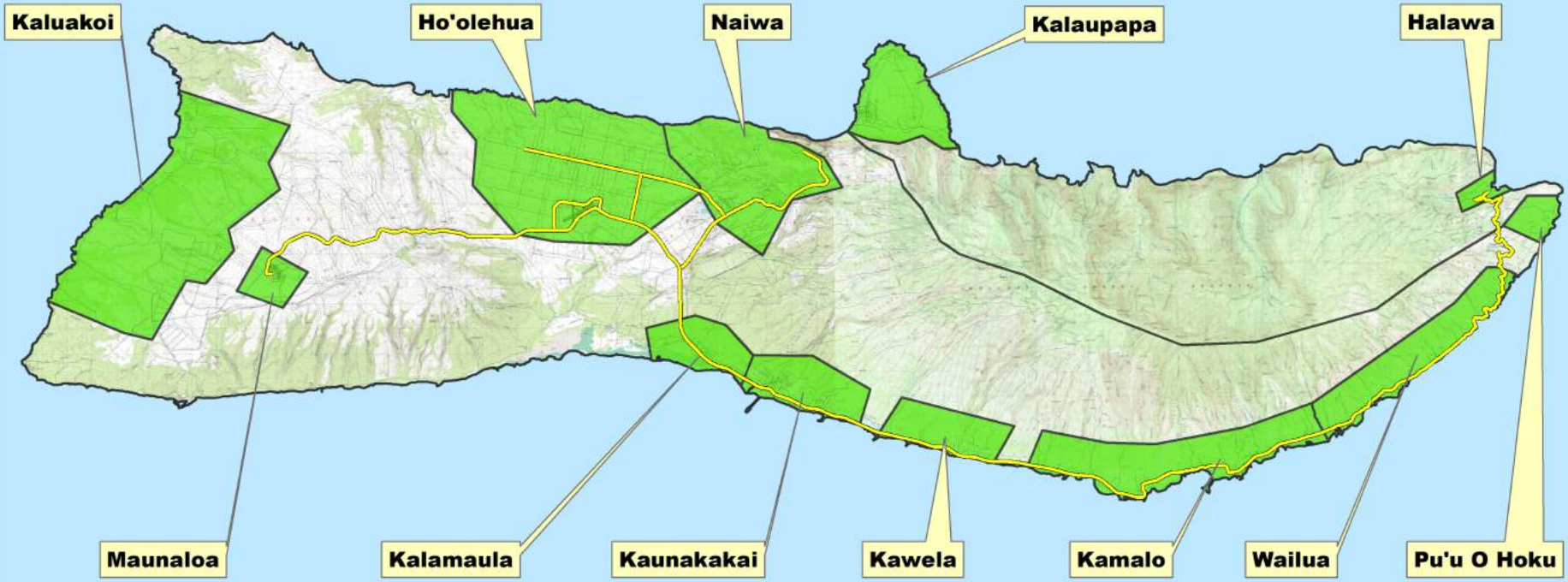
# Interagency Cooperation Hazard for Developed Areas

**Moloka'i Community Wildfire Protection Plan**

| Interagency Cooperation | | |
|---|---|---|
| Low Hazard | Moderate Hazard | High Hazard |
| Mutual aid agreements and resources available to deploy. | Mutual aid agreements but limited resource availability. | No mutual aid agreements. |





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# Appendix C
# Moloka'i Community Wildfire Protection Plan
# Maui Fire Department 2016 Apparatus and Vehicles Inventory

| Make | Utilization | MFD # | Location | Mileage as of 4/6/16 | Year | Target Replacement Date |
|---|---|---|---|---|---|---|
| | | | | | | |
| **EMERGENCY APPARATUS 1-5 YEARS OLD** | | | | | | |
| PIERCE LADDER 105' L3 | LADDER | 229 | LAHAINA | 10,946 | 2015 | FY 2029 |
| PIERCE PUMPER E14 | PUMPER | 228 | WAILEA | 10,030 | 2015 | FY 2029 |
| PIERCE PUMPER E5 | PUMPER | 215 | MAKAWAO | 11,553 | 2015 | FY 2029 |
| PIERCE/PETERBILT TANKER T14 | 3500 G | 213 | WAILEA | 7,946 | 2014 | FY 2025 |
| W.MARK/PETERBILT TANKER T10 | 3500 G | 212 | KAHULUI | 12,674 | 2013 | FY 2022 |
| PIERCE PUMPER E4 | PUMPER | 209 | KAUNAKAKAI | 13,957 | 2011 | FY 2022 |
| SVI/TATRA TANKER T3 (2500G) | 6x6 TANKER | 224 | LAHAINA | 16,855 | 2010 | FY 2021 |
| E-ONE/INTL TANKER T7 (2500G) | 4x4 TANKER | 225 | HANA | 5,771 | 2010 | FY 2021 |
| SVI/TATRA TANKER T8 (2500G) | 6x6 TANKER | 218 | LANAI | 8,726 | 2010 | FY 2021 |
| SVI/DODGE MINI PUMPER M11 | 4x4 MINI PUMPER | 222 | NAPILI | 17,012 | 2010 | FY 2021 |
| SVI/DODGE MINI PUMPER M13 | 4x4 MINI PUMPER | 223 | KULA | 27,974 | 2010 | FY 2021 |
| E-ONE/DODGE MINI PUMPER M2 | 4x4 MINI PUMPER | 217 | PAIA | 31,162 | 2010 | FY 2021 |
| E-ONE PUMPER E2 | PUMPER | 216 | PAIA | 63,818 | 2010 | FY 2021 |
| E-ONE PUMPER E13 | PUMPER | 199 | KULA | 44,876 | 2010 | FY 2021 |
| CHEVY/TAHOE/SUV | 4x4 SUV | 220 | BATTALION 2 | 61,844 | 2010 | FY 2020 |
| **EMERGENCY APPARATUS 6-10 YEARS OLD** | | | | | | |
| SVI/SPARTAN PUMPER E3 | PUMPER | 200 | LAHAINA | 69,797 | 2009 | FY 2020 |
| SVI/SPARTAN RESCUE R10 | RESCUE | 198 | KAHULUI | 30,749 | 2009 | FY 2020 |
| SVI/FREIGHTLINER AIR/LIGHT | AIR/LIGHT | 193 | HEALTH/SAFETY | 7,368 | 2009 | FY 2020 |
| PIERCE PUMPER E7 | PUMPER | 205 | HANA | 20,853 | 2007 | FY 2018 |
| PIERCE PUMPER E1 | PUMPER | 204 | WAILUKU | 74,840 | 2007 | FY 2018 |
| PIERCE/GMC MINI PUMPER M1 | 4x4 MINI PUMPER | 203 | WAILUKU | 20,591 | 2007 | FY 2018 |
| SVI/SPARTAN HAZMAT HM10 | HAZMAT | 192 | KAHULUI | 25,044 | 2007 | FY 2018 |
| PIERCE WILDLAND PUMPER E11 | 4x4 PUMPER | 180 | NAPILI | 46,027 | 2006 | FY 2017 |
| PIERCE WILDLAND PUMPER E9 | 4x4 PUMPER | 181 | HO'OLEHUA | 19,854 | 2006 | FY 2016 |
| PIERCE WILDLAND PUMPER E8 | 4x4 PUMPER | 202 | LANAI | 18,881 | 2006 | FY 2017 |
| PIERCE PUMPER E10 | PUMPER | 177 | KAHULUI | 81,270 | 2005 | FY 2017 |
| PIERCE PUMPER E6 | PUMPER | 178 | KIHEI | 84,415 | 2005 | FY 2017 |
| CHEVY/TAHOE/SUV | 4x4 SUV | 195 | BATTALION 1 | 69,697 | 2008 | FY 2020 |
| **EMERGENCY APPARATUS 11-15 YEARS OLD** | | | | | | |
| PIERCE/KENWORTH WILDLAND E12 | 4x4 PUMPER | 174 | PUKO'O | 48,122 | 2004 | FY 2016 |
| PIERCE/FORD MINI PUMPER M7 | 4x4 MINI PUMPER | 176 | HANA | 9,308 | 2004 | FY 2015 |
| PIERCE/LADDER 95' L14 | TOWER | 163 | WAILEA | 45,600 | 2002 | FY 2013 |
| PIERCE/OSHKOSH TANKER T4 (2800G) | RT4 6x6 | 183 | KAUNAKAKAI | 35,410 | 2002 | FY 2016 |
| **RELIEF EMERGENCY APPARATUS 6-10 YEARS OLD** | | | | | | |
| CHEVY/TAHOE/SUV RB2 | 4x4 RBATT 2 | 197 | KAHULUI | 119,820 | 2009 | Used as Bkup only |

| | | | | | | |
|---|---|---|---|---|---|---|
| **RELIEF EMERGENCY APPARATUS 11-15 YEARS OLD** | | | | | | |
| PIERCE LADDER 105' RL3 | RL3 | 173 | WAIKO | 59,145 | 2003 | Relief Apparatus |
| PIERCE PUMPER RE5 | RE5 | 161 | KAHULUI | 101,936 | 2002 | Relief Apparatus |
| PIERCE PUMPER RE14 | RE14 | 162 | WAILEA | 79,100 | 2002 | Relief Apparatus |
| OMCO/PETERBILT TANKER RT10 (3500G) | RT10 | 168 | KAHULUI | 64,766 | 2002 | Relief Apparatus |
| **RELIEF EMERGENCY APPARATUS 16+ YEARS OLD** | | | | | | |
| PIERCE PUMPER | RE13 | 145 | KAHULUI | 105,723 | 1994 | Relief Apparatus |
| PIERCE PUMPER | RE8 | 146 | LANAI | 48,307 | 1994 | Relief Apparatus |
| PIERCE PUMPER | RE7 | 143 | LAHAINA | 57,760 | 1993 | Relief Apparatus |
| PIERCE PUMPER | RE4 | 159 | KAUNAKAKAI | 50,543 | 2000 | Relief Apparatus |
| | | | | | | |
| **UTILITY VEHICLES 1-7 YEARS OLD** | | | | | | |
| FORD F350 Crew Cab R10UT | 4x4 | 232 | KAHULUI RESCUE | 442 | 2015 | FY 2026 |
| FORD F350 Crew Cab UT3 | 4x4 | 230 | LAHAINA | 476 | 2015 | FY 2026 |
| FORD F150 Extra Cab UT8 | 4x4 | 239 | LANAI | 1,104 | 2015 | FY 2026 |
| FORD F150 Extra Cab UT12 | 4x4 | 241 | PUKO'O | 297 | 2015 | FY 2026 |
| FORD F150 Extra Cab UT7 | 4x4 | 242 | HANA | 234,781 | 2015 | FY 2026 |
| WILDLAND WL8 | WILDLAND 8 | 214 | LANAI | 2,005 | 2014 | FY 2025 |
| FORD F-350 UT14 | UTILITY 14 | 210 | WAILEA | 9,492 | 2012 | FY 2023 |
| FORD F-350 WL1 | WILDLAND 1 | 227 | KAHULUI | 6,835 | 2011 | FY 2022 |
| CHEVY 2500 UT9 | UTILITY 9 | 221 | HO'OLEHUA | 39,993 | 2011 | FY 2022 |
| **UTILITY VEHICLES 8-14 YEARS OLD** | | | | | | |
| CHEVY 3500 HM10UT | HAZMAT UTILITY | 187 | KAHULUI | 45,153 | 2006 | FY 2017 |
| FORD F-350 UT4 | UTILITY 4 | 186 | KAUNAKAKAI | 64,178 | 2005 | FY 2016 |
| | | | | | | |
| **STAFF VEHICLES 1-7 YEARS OLD** | | | | | | |
| FORD F350 Crew Cab | 4x4 P/U | 231 | TRAINING | 1,623 | 2015 | FY 2026 |
| FORD F150 Extra Cab | 4x4 P/U | 240 | PREVENTION | 2,005 | 2015 | FY 2026 |
| FORD F150 Extra Cab | 4x2 P/U | 238 | FSO | 1,638 | 2015 | FY 2026 |
| CHEVY / SILVERADO / 4x4 w/LIFTGATE | 4x4 | 226 | MECHANICS | 18,281 | 2010 | FY 2021 |
| FORD F150 P/U | P/U | 219 | HEALTH/SAFETY | 53,380 | 2010 | FY 2021 |
| CHEVY / SILVERADO / 4x4 w/LIFTGATE | 4x4 | 196 | Educ PREVENTION | 17,842 | 2009 | FY 2020 |
| FORD EXPLORER | 4x4 SUV | 208 | PREVENTION | 103,637 | 2008 | FY 2016 |
| FORD EXPLORER | 4x4 SUV | 207 | PREVENTION | 52,220 | 2008 | FY 2019 |
| NISSAN TITAN P/U | P/U | 206 | SUPPLY | 84,581 | 2008 | FY 2018 |
| GMC ENVOY | 4x4 SUV | 191 | TRAINING | 97,537 | 2007 | FY 2017 |
| NISSAN FRONTIER P/U | 4x4 | 188 | PREVENTION | 47,108 | 2007 | FY 2018 |
| NISSAN FRONTIER P/U | 4x4 | 211 | PREVENTION | 113,724 | 2007 | FY 2016 |
| NISSAN FRONTIER P/U | 4x4 | 190 | PREVENTION | 76,752 | 2007 | FY 2018 |
| **STAFF VEHICLES 8-14 YEARS OLD** | | | | | | |
| CHEVY P/U 3500 | UTILITY | 179 | PREVENTION | 44,931 | 2006 | FY 2017 |
| FORD EXPLORER | SUV | 184 | PREVENTION | 107,853 | 2005 | FY 2016 |
| FORD EXPLORER | SUV | 185 | PREVENTION | 54,924 | 2005 | FY 2016 |
| CHEVROLET / CAVALIER | SEDAN | 175 | ADMIN. | 57,598 | 2004 | FY 2015 |
| TOYOTA / PRE-RUNNER | 4W DR P/U | 167 | SHOP | 88,196 | 2002 | Relief Apparatus |
| **STAFF VEHICLES 15+ YEARS OLD** | | | | | | |
| FORD / CROWN VICTORIA | SEDAN | 153 | BC7 | 117,467 | 1999 | Relief/Disposal |
| **MFD WATERCRAFT - BOATS** | | | | | | |
| | | **HA #** | **VIN #** | | | |
| 26 FT. RADON - RESCUE BOAT | RB10 | 0350XC | RAD 26511H515 | | 2015 | Repower FY 2026 |
| 26 FT. RADON - RESCUE BOAT | RB4 | 0310 XC | RAD 26506J010 | | 2010 | Repower FY 2021 |
| 26 FT. RADON - RESCUE BOAT | RB3 | 0276 XC | RAD 26504B808 | | 2008 | Repower FY 2019 |

| | | | | | | |
|---|---|---|---|---|---|---|
| 22 FT. AQUASPORT - RESCUE BOAT | RB4A | 0136 XC | ASP A0701C87 | | 1987 | Relief Apparatus |
| **MFD WATERCRAFT - FIRE SKIS** | | | | | | |
| | | **HA #** | **VIN #** | | | |
| YAMAHA FXHO 1.8 | FS14 | 0306XC | YAMA 1907H910 | | 2010 | FY 2016 |
| YAMAHA FXHO 1.8 | FS9 | 0307XC | YAMA 1939H910 | | 2010 | FY 2016 |
| YAMAHA FXHO 1.8 | FS10 | 0280XC | YAMA 4461H708 | | 2008 | FY 2014 |
| YAMAHA FXHO 1.8 - TRAINING | FS10 | 0281XC | YAMA 4480H708 | | 2008 | FY 2014 |
| YAMAHA XA 1200 | FS4 | 0273XC | YAMA 2049I304 | | 2004 | FY 2010 |

Vehicles that are assigned to stations that have fewer alarms will be evaluated by the Apparatus Committee at 10 years of age to determine if the replacement year can be extended out further. Final determination will be made by the Lead Mechanic who is the subject matter expert using the following criteria:

1. Overall condition and safety
2. Corrosion of critical components like the chassis, frame, plumbing, etc.
3. Future major repairs and costs
4. Annual PUC Inspection
5. Annual Pump test
6. Changes to NFPA 1901 Standard for Automotive Fire Apparatus

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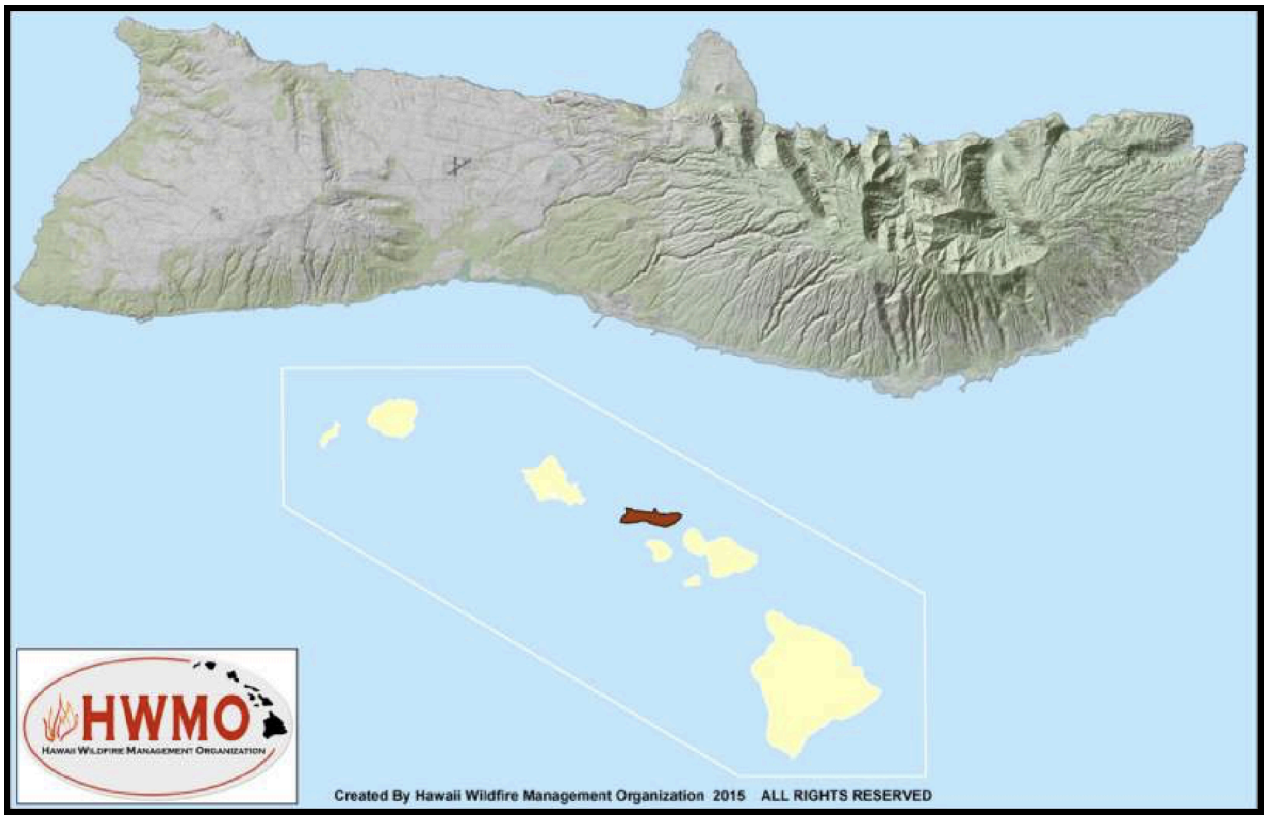
# APPENDIX D:

# 2024 LIST OF PRIORITY PROJECTS AND ACTIONS MOLOKAI, STATE OF HAWAII

# 2024 LIST OF PRIORITY PROJECTS AND ACTIONS




## Molokai, 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 County (including the island of Molokai) | |
| **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:** Molokai | **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.

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| **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:** Molokai | **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.

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| **Project Name:** Ranch Camp Mitigation | |
| **Communities and Neighborhoods that will benefit from this project:** Ranch Camp, Kaunakakai, Home Pumehana | |
| **Affiliation:** Molokai Properties Limited and State of Hawaii Department of Hawaiian Homelands | **Project Lead:** Erin Peyton |
| **CWPP Area:** Molokai | **Cost:** $80,000 |
| **Project Description:** Mitigation work would be cutting trees and grasses 50 feet from fence line along Kikipua St from Ilio Rd to Ala Malama Ave., as well as moving rocks to create access for emergency workers and vehicles (Fuels Reduction and Access) | |
| **Importance:** Identified high priority mitigation area in the CWPP and Chief Lindo. 50% of the population of Molokai live in this wildland urban interface. The only hospital, police station, town center, and wharf are within this interface. History of fires in this area. | |

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| **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:** Molokai | **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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| **Project Name:** Updating the CWPP for Molokai, HI | |
| **Communities and Neighborhoods that will benefit from this project:** Kaunakakai, Kualapuu, Maunaloa, Ualapue | |
| **Affiliation:** HWMO | **Project Lead:** HWMO<br>Partners: Maui Fire Department, DLNR-DOFAW |
| **CWPP Area:** Molokai | **Cost:** $140,155 |

**Project Description:**
Scope: The project will update the 2016 Molokai CWPP with a focus on identifying and prioritizing projects to implement in the Wildland Urban Interface (WUI) that will result in the greatest potential reduction in wildfire risk to the Island of Molokai. The Molokai CWPP 166,865-acre planning area includes the entire Island of Molokai, which lies in Maui County. The plan area includes federal, state, county, and privately owned lands. The CWPP comprehensively defines the entire Island of Molokai as a WUI at-risk area. The simultaneous WUI designation and CWPP planning area are delineated to ensure adequate protection of natural areas and human communities from the threat of wildfire. Many of the communities within the planning area are low-income, underserved, and at risk of wildfire communities: Hoolehua-Palaau Hawaiian Homeland, Kamiloloa-Makakupaia Hawaiian Homeland, Kapaakea Hawaiian Homeland, Kaunakakai, Kualapuu, Maunaloa, and Ulapue.

Background: Steep slopes, rough terrain, strong winds, and the dominance of highly ignitable invasive grasses characterize the Molokai landscape. This, coupled with warm weather, recurring drought conditions, changes in land management, and a history of human-caused fires put the area at increased risk of wildfire. The majority of wildfires on Molokai are caused by human error or arson, especially near developments, power lines right of way, and along roadsides. Fires destroy native watershed forests, increase fire-prone non-native species, and cause erosion that smothers coral reefs. Native ecosystems in Hawaii are not adapted to wildfire. Other than in volcanic areas, fire is not part of the natural life cycle of native Hawaiian ecosystems, and few native species are able to regenerate after a fire, especially in the presence of fast growing, fire adapted grasses. The proximity of development to high-hazard, fire-prone wildlands presents hazardous conditions that now threaten Molokai communities.

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, environmental, and residential resources. Together, these factors create the fire environment that puts Molokai at risk of wildfire.

The Island of Molokai needs to update its CWPP so that it reflects the current reality with respect to increasing drought and wildfire hazards, as well as more in-depth community and stakeholder action plans, especially toward resilient landscapes, fire-adapted communities, and safe and effective wildfire response. Hawaii Wildfire Management Organization (HWMO) worked with the Hawaii Department of Land and Natural Resources- Division of Forestry and Wildlife (DLNR-DOFAW) and other agency partners to develop the island's first CWPP in 2016. This effort engaged diverse parties and helped to develop collaborative action plans for that time period. Additional efforts are now needed in order to reassess wildfire hazards and to review progress on risk-reducing actions so that next-step concerns and actions can be identified, prioritized, and used to guide future wildfire-risk-reducing actions.

Project Strategy: The participants involved in the original CWPP process will participate in the plan update, as well as other interested individuals and entities. These include: Maui Fire Department (MFD), DLNR-DOFAW, County of Maui Emergency Management Agency (formerly County of Maui Civil Defense), Maui Police Department, State Department of Hawaiian Home Lands, State Highways Division, State Airports Division, State Department of Human Services, County of Maui (Public Works, Parks and Recreation, Water), National Park Service (NPS), US Fish and Wildlife Service (USFWS), Maui County Council, Molokai Fire Task Force non-agency private party representatives (The Nature Conservancy, Molokai, Ranch, Molokai Irrigation System, Kawela Plantation, American Medical Response, Molokai Educational Opportunity Center, Goodfellow Bros), and private citizens. It is expected that a larger group of private sector businesses and citizens will participate in the plan revision because of increased interest in community protection from wildfire in the 7 years since the plan was signed, most notably following the fires of August 2023.

To ensure consistent forward movement on CWPP implementation in the future, the process for updating the CWPP will include the convening of 2 community-level, multi-stakeholder working groups (one group for west Molokai and one group for east Molokai) and providing them with opportunities for meaningful learning, sharing, planning, and connecting on a regular, bi-monthly basis to ensure the action plan has detailed, achievable, and designated responsibilities. This process has previously been shown to bolster the ability of people to work together to reduce fire risk (fire-adapted communities) and to manage, safeguard, and restore our landscapes (resilient landscapes).

The Molokai CWPP update project supports the updated goals of the Cohesive Wildland Fire Management Strategy (CWFMS, 2023). By providing the opportunity for people to work together to reduce fire risk the project will support the goal of creating fire-adapted communities. By engaging members of the community who can contribute their traditional ecological knowledge (TEK) to inform 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 (DEI), and environmental justice (EJ) in creating fire-adapted communities. The CWPP process and the CWPP document will incorporate the following new management options of the CWFMS to support community resilience: (1) the CWPP process will prepare for and mitigate post-fire impacts, and focus on community mitigation, evacuation, and recovery planning by working inclusively with the whole community, in these historically underserved, low-income areas; (2) the CWPP will include fire-prevention programs to reduce accidental human-caused ignitions; (3) the CWPP process will work with public health agencies, Hawaiian Homelands, and private partners, in addition to land and fire management stakeholders for community resiliency, and
(4) local working groups will be created for communities to learn about, share and complete work. The CWPP and planning process will incorporate the following management action to address Diversity, equity, inclusion, and environmental justice in the underserved, low-income communities of Molokai: Engage the community in local solutions and decision-making.

In addition, the CWPP update process addresses the need for more integrated community and natural resource program planning and implementation at the national, regional, state, and local levels to bring more expertise and resources together to address the areas of greatest wildfire risk and to simultaneously produce multiple resource benefits (e.g., work products, improved wildlife habitat, reduced invasive insect and disease infestation impacts and community risk reduction to the built environment) identified in the CWFMS update.

By bringing together a diverse group of agencies, organizations, and the public, the CWPP update will support the State of Hawaii Forest Action Plan (FAP) by providing an opportunity to address wildfire issues in Hawaii by strengthening collaborative partnerships across areas of expertise and jurisdictional boundaries. The CWPP revision will address the wildfire-related goals in the FAP of prevention and pre-suppression by developing a strategy to: 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; mitigate the impacts of wildfires on natural and built environments through fuel assessment, modeling, reduction, and management.

The low-income communities of Molokai are traditionally underserved. Funding will enable community members to engage in the CWPP update process and receive training so that they can continue to play an active role in identifying and prioritizing actions to mitigate wildfire risk to their communities. Special attention will be given to traditionally underserved or marginalized communities and residents by sending out targeted requests for their participation during the community meetings. Since our intention is to not limit the voices heard to individuals who have the means for showing up (time, energy, resources), small nominal stipends will also be provided to residents or community leaders who participate in the meetings as residential volunteers.

**Importance:** Current conditions on Molokai make landscape-level, multi-ownership, and multi-jurisdictional treatments essential to reducing the risks of wildland fire. The CWPP process will bring together a diverse group of private and public entities to identify and prioritize those on-the-ground projects that will have the most effect on affecting fire behavior on the landscape scale. This bringing together of all perspectives and stakeholders has direct ties to broader landscape improvement in fire outcomes because it includes those who are actively reducing risk on the ground in communities and natural resource areas, learning of the current work being implemented, and directly building upon that work with next-level action planning. The CWPP document provides the pathway forward for all parties across Molokai.

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| **Project Name:** Collaborative Fuels Reduction for the island of Molokai | |
| **Communities and Neighborhoods that will benefit from this project:** Maunaloa and others | |
| **Affiliation:** HWMO | **Project Lead:** Shared leadership among partners - DLNR-DOFAW, HWMO, Maui County Fire Department, Paniolo Hale, and adjacent landowners |
| **CWPP Area:** Molokai | **Cost:** $120,000 |

**Project Description:**

Chosen mitigation site: Fairway 12, 13, 18 near Paniolo Hale

Access Road:
(https://www.nfpa.org/News-and-Research/Publications-and-media/Blogs-Landing-Page/NFPA-Today/Blog-Posts/2021/01/08/Fire-Apparatus-Access-Roads)

- Fire department access roads must be provided so fire apparatus can drive within 50 ft of an exterior door that allows access to the interior of the building
- Access roads need to allow adequate access to the building and room to setup and perform manual suppression operations. Fire department access roads require 20 ft of unobstructed width,13.5 ft of unobstructed vertical clearance and an appropriate radius for turns in the roads and dead ends for the fire apparatus to turn around
- Entrance of access roads - preference is 15 ft minimum unobstructed vertical clearance per Henry Lindo, Assistant Fire Chief at County of Maui Department of Fire and Public Safety
- The grade of the road also must not exceed 1 ft of elevation change every 20 ft
- 14 ft overhead clearance
- Access Road can be used as fuel break

- Molokai Ranch gave permission to clear vegetation for up to 50 ft from a structure

Mulch:

- The Fire-Free Zone: the first 5-10 ft around a structure should have very little to no flammable materials. The most optimal surfacing in this zone is paving, gravel, cinder, or other non-combustible materials
- Do not put mulch 0-5 ft from any structure as the embers are prone to glow and often cause structural fires 2 hours after a wildfire is contained/extinguished
- Mulch can not be thicker than 18 inches as it can smolder and catch on fire
- Spread mulch to a thickness of at least 4 inches but no more than 18 inches making sure it is a minimum of 5 ft from any structure
- The ideal mulch thickness for landscaping is 6 inches

Plants:

- If plants are in healthy condition/green, they can be a good radiant-heat absorber
- If plants are woody, dry, or dead, they are considered combustible materials
- The roof is the most vulnerable part of a structure to ignition; trim tree branches to keep a minimum of 10 ft from structures
- The driveway clearance must be 14 ft to allow for emergency vehicles
- Windows are a weak spots as heat from plants nearby can cause them to shatter; keep plant growth away from windows as much as possible
- Grasses should be cut to 3 inches or lower
- Ladder Fuels: vegetation that allows the fire to spread from the ground to the tree canopy or vegetation that are connected horizontally
- Vertical Spacing: Create at least 10 ft of separation between low-level vegetation and tree branches. This can be done by reducing the height of low-level vegetation and/ or trimming lower tree branches
- Horizontal Spacing: The minimum spacing between clusters of vegetation is 3 times the height of the tallest plants. Clusters of vegetation should also be kept as far away from structures, as possible
- It is more about the condition of the plant; if the plant is dead, woody, dry, or has a lot of leaf litter, it is combustible material

**Importance:** The intent is to reduce the intensity of an oncoming fire to one that would be slower moving and more easily extinguished. This is the zoom-out view and important in any effort to reducing fire behavior to a point where it can be suppressed safely by firefighters and not throw embers high in the wind to new areas. By dropping the fire low to the ground, there is more chance for residents to evacuate, and for a fire suppression response to get in there before the fire spreads to homes. Fuelbreaks do more than manage fuel- they also serve concurrent goals of firefighting access and a buffer between more fire prone fuels and the neighborhood edge.

**Project Name:** Molokai Coastal Resilience

**Communities and Neighborhoods that will benefit from this project:**
Kalamaʻula, Kapaʻakea, and Kamiloloa One Aliʻi

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| **Affiliation:** Shared partnership anticipated | **Project Lead:** Shared partnership anticipated |
| **CWPP Area:** Molokai | **Cost:** $1.5 million |

**Project Description:**

Public Access and Safety

- Evacuation Roads: Identify and possibly pave existing roads suitable for emergency use for each ahupuaʻa. Consideration of gravel parking lots, water tanks with spigots, and designated "resiliency areas" or "refugee areas." Install emergency facilities like water tanks and equipment staging areas with portable dipping ponds for wildfire.
- Helicopter landing area for emergencies like fires or floods, and ensure water access points.
- Potential for access roads, like the one from Kūlana ʻŌiwi, to extend further uphill to improve emergency evacuation routes and reduce fire hazards.
- Flooding concerns were linked to the lack of vegetation in mauka areas, where cattle and deer have degraded the land. Rebuilding the watershed with native plants and creating firebreaks or green breaks (vegetated areas that can reduce fire spread) were suggested as solutions.

Planting native vegetation to mitigate flooding and erosion

- Culvert maintenance needed for both mauka and makai sides of the highway.
- Controlled burns at Kapuaiwa.
- Development of evacuation plans and resilience hubs.
    - Townside vs. west side: plans on ETA, transportation (Spencer busses), river cutoffs
    - One staging area near Ranch Camp.
    - Resilience hub with shower, storage, tie this in with the programs you have now, like educational. Could be a community center to use for hula, cultural programs.
- Maintenance of Kalanianaole Hall for educational and historical purposes.

**Importance:** To address resilience and current hazards in the DHHL homestead communities of Kalamaʻula, Kapaʻakea, and Kamiloloa One Aliʻi.