Community Wildfire Protection Plan for Volcano, Hawaii

Sponsored by Hawaii Volcanoes National Park
in collaboration with the Big Island Wildfire Coordinating Group

September 2006

Written by Denise Laitinen

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Cover photo: An a'a lava flow in Hawaii Volcanoes National Park sparks a wildfire.
Picture: Greg Funderburk, HAVO staff.

Executive Summary:

The community of Volcano in Hawaii County on the island of Hawaii abuts Hawaii Volcanoes National Park (HAVO) and is in a wildland urban interface (WUI) environment - that is where wildlands and houses meet. These interface areas pose the highest risk of loss of life and property due to wildland fire. The risk of wildland fire impacting homes in the WUI is determined by several factors, including the ignitability of fuels, structural ignitability, weather conditions, and topographical features, such as slope. Unlike other parts of the United States, wildfire is not a natural part of Hawaii's ecosystem. In Hawaii, wildfires destroy native plants, which impacts the watershed and the habitat of threatened and endangered native Hawaiian animals. Wildfires in Hawaii also cause soil erosion, which leads to runoff that negatively impacts ocean reefs.

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

Principal stakeholders who have an interest in protecting Volcano from wildfire include Hawaii County Fire Department, Hawaii Volcanoes National Park, which sponsored this CWPP, as well as the Big Island Wildfire Coordinating Group, composed of federal, state, and county agencies, including Hawaii County Civil Defense, Department of Land and Natural Resources, U.S Army, and the U.S. Fish and Wildlife Service. These decision makers were invited to participate in the development of this Plan.

An assessment determined that WUI areas in this community have a high risk of wildland fire. Wildland fires originating within the Park via human or natural causes have threatened the community of Volcano, which encompasses the Volcano Village, the Volcano Golf Course Community, Mauna Loa Estates, and Ohia Estates. Conversely, wildfires caused by human error in neighboring towns, such as Volcano, could impact the Park. The community does not have municipal water with residents and businesses alike relying on catchment water basins. There has also been an increase in invasive, non-native plant species that are high-intensity burning fuels, further increasing the fire risk within the community.

Meetings with community members and fire agency personnel identified several priority mitigation measures to reduce the chances of a wildfire starting in Volcano. These include: (1) creation of secondary emergency egress roads; (2) reduction of fuel load along roadsides and in subdivision common areas; (3) reduction of invasive species that possess inherent fire or ignition properties; (4) need for additional pre-staged static water tanks; and (5) continued fire prevention education and outreach.

Hawaii County has been fortunate in controlling large wildland fires in the community to date. However, given the fire history of the area and the fact that HAVO is home to the world's most active volcano, one need only look at the community's fire history and fuel load to understand the severe wildfire risk. The mitigation measures outlined in this Plan will enable the community of Volcano to reduce its risk to wildfire and create more efficient fire-protection systems. The priority mitigation measures listed above identify pro-active projects the community and fire agencies can undertake to minimize losses from a major wildfire.

Background:

Covering a swath from sea level to a 13,000-foot mountaintop, the 377-square miles (333,000 acres) of Hawaii Volcanoes National Park (HAVO) on the island of Hawaii encompasses Mauna Loa, the world's largest volcano, as well as Kilauea, the world's most active volcano. The Park's ecological zones include coastal strand, dry lowland, mesic and wet rain forest, seasonally dry montane, sub-alpine, and alpine. It is home to more than 50 federally-listed endangered, threatened, and candidate endangered species, as well as numerous rare species.

Continually erupting for nearly 23 years, Kilauea has made HAVO the state's largest tourist attraction with more than 2.5 million visitors annually. The primary tourist attractions within the Park are on the south side of the Park, however, the bulk of Park lands extend north of Highway 11 for more than 40 miles as far west as Manuka State Park and as far north as the summit of Mauna Loa.

HAVO recently acquired 119,000 acres from Kahuku Ranch in Ka'u. Located at the 1,000 – 2,000 foot elevation, the area encompasses native Hawaiian forests, pasture lands, and three dormant volcanic craters. Park lands now stretch 50 miles from lower Puna to Ocean View. Given the right wind and fuel conditions wildland fire could travel the length of this land tract, causing substantial damage.

In the past, lava flows within the Park have caused several wildfires, some as large as 5,000 acres. Wildland fires originating within the Park have threatened the nearby community of Volcano, which encompasses Volcano Village, the Volcano Golf Course Community, including the Golf Course Subdivision, Mauna Loa Estates, and Ohia Estates. Conversely, wildland fires caused by human error in neighboring towns, such as Volcano, could impact the Park. The Kilauea Forest Reserve separates Volcano Village and the Golf Course Subdivision. To the east of Volcano Village is the Ola'a Forest Reserve, a land tract of Native Hawaiian forest largely untouched by invasive species.

Volcano has experienced tremendous development in recent years. Volcano Fairway Estates is a new subdivision currently under construction adjacent to the Volcano Golf Course and Country Club.

Fire History:

Below is a 2004-2005 fire history chart for Volcano. Since Hawaii County Fire Department is responsible for fire suppression in residential areas and HAVO is responsible for fire suppression within the Park, each organization maintains separate fire history statistics. However, the two agencies have a Memorandum of Understanding for mutual aid in fire suppression. Average size for all wildland fires responded to by Hawaii County Fire Department in Volcano during the past two years was 0.4 acres. Between 2004 and 2005 there were three fires within Park boundaries, the Kipuka Pepeaio fire that burned more than 600 acres, the Kahuku fire that burned less than 5 acres in Kahuku, and the Pinao fire that burned less than 1 acre. However, a 2002 wildfire burned more than 1,000 acres of Park land in eight hours on the

north side of Highway 11 in Volcano. The fire jumped Mauna Loa Strip Road, which runs in a north-south direction to the west of the Volcano Golf Course Subdivision and threatened several homes along the north boundary of the Golf Course Subdivision. In the past decade HAVO has experienced 54 fires within the Park with 5 of those burning more than 1,000 acres.

Volcano	
Hawaii County FD Fire history 2004-2005	Date
Building fire	15-May-05 23:54:04
Building fire	10-Oct-05 04:51:33
Trash or rubbish fire, contained	26-Feb-04 10:02:00
Trash or rubbish fire, contained	14-May-05 22:46:52
Fire in mobile property used as a fixed structure, other	24-Jul-04 02:12:37
Fire in mobile property used as a fixed structure, other	26-Jan-05 13:57:19
Passenger vehicle fire	29-Apr-05 19:32:27
Passenger vehicle fire	14-May-05 05:38:15
Passenger vehicle fire	30-Jul-05 22:02:24
Passenger vehicle fire	04-Nov-05 22:11:28
Forest, woods or wildland fire	23-Feb-05 09:55:31
Brush, or brush and grass mixture fire	04-Sep-05 16:37:39
Brush, or brush and grass mixture fire	29-Dec-05 14:07:14
Brush, or brush and grass mixture fire	30-Dec-05 18:44:55
Outside rubbish, trash or waste fire	07-Aug-05 14:22:56
Outside rubbish, trash or waste fire	25-Sep-05 13:58:47
Outside rubbish, trash or waste fire	21-Nov-05 16:08:11
Outside gas or vapor combustion explosion	18-Aug-05 12:28:57
Unauthorized Burning	14-Mar-05 20:39:43
Unauthorized Burning	23-May-05 10:01:00
Unauthorized Burning	27-Aug-05 15:35:39
Unauthorized Burning	25-Nov-05 22:48:50
HAVO Fire History 2004-2005	Date
Pinao – human cause	7/29/04
Kipuka Pepeaio - lightening	12/6/04
Kahuku - human cause	8/14/05

Stakeholders:

Stakeholders are individuals or groups who have a high level of interest in the protection of their assets from wildfire. HAVO shares nearly 11 miles of boundary with the Volcano community in wildland-urban interface areas. Additional lands adjoining Volcano include those managed by federal, state, county, and private entities.

The State of Hawaii's Department of Land and Natural Resources (DLNR) Division of Forestry and Wildlife (DOFAW) manages the 'Ola'a Forest Reserve that lies adjacent to the Volcano

community. The state-owned Kilauea Forest Reserve separates Volcano Village and the Golf Course Subdivision. There are also several large-scale private landowners in the area, who in turn lease land to other organizations. For example, Kamehameha Schools leases land to Ohia Ranch and owns large tracts of land near Volcano Village. The Keauhou Bird Conservation Center - Hawaii Endangered Bird Conservation Program is located next to the Volcano Golf Course Subdivision. Contact information for principal stakeholders is listed below.

Federal:

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

State:

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

County:

Hawaii County Fire Department
Fire Chief Darryl Oliveira
25 Aupuni St., Hilo, HI 96720
(808) 961-8297
Hcfdf1@co.hawaii.hi.us

Hawaii County Civil Defense
Troy Kindred
Civil Defense Administrator
920 Ululani St., Hilo, HI 96720
(808) 961-8229
tkindred@co.hawaii.hi.us

Base Map of Volcano:

Figure 1 is a base map of the community of Volcano and adjacent landowners. The inhabited areas at potential risk to wildfire include Mauna Loa Estates, Ohia Estates, Volcano Village, and the Volcano Golf Course Community, which includes a golf course and subdivision.

Areas containing critical human infrastructure, such as escape routes and communication structures include Volcano Village and the Golf Course Community. Within Volcano Village, the Peter Lee School and the Cooper Community Center could be used as "defend in place" zones if deemed necessary by fire officials given wildfire conditions.

Areas on community importance include: Cooper Community Center, Volcano Winery, Kilauea Lodge and Restaurant, Shipman Ranch House, Lee House, Ola'a Forest Reserve, 'Ola'a Rain Forest Tract, Thurston Rain Forest, Keauhou Ranch, Ohia Ranch, Keauhou Bird Conservation Center - Hawaii Endangered Bird Conservation Program, local bed and breakfasts, farms, restaurants, and schools.

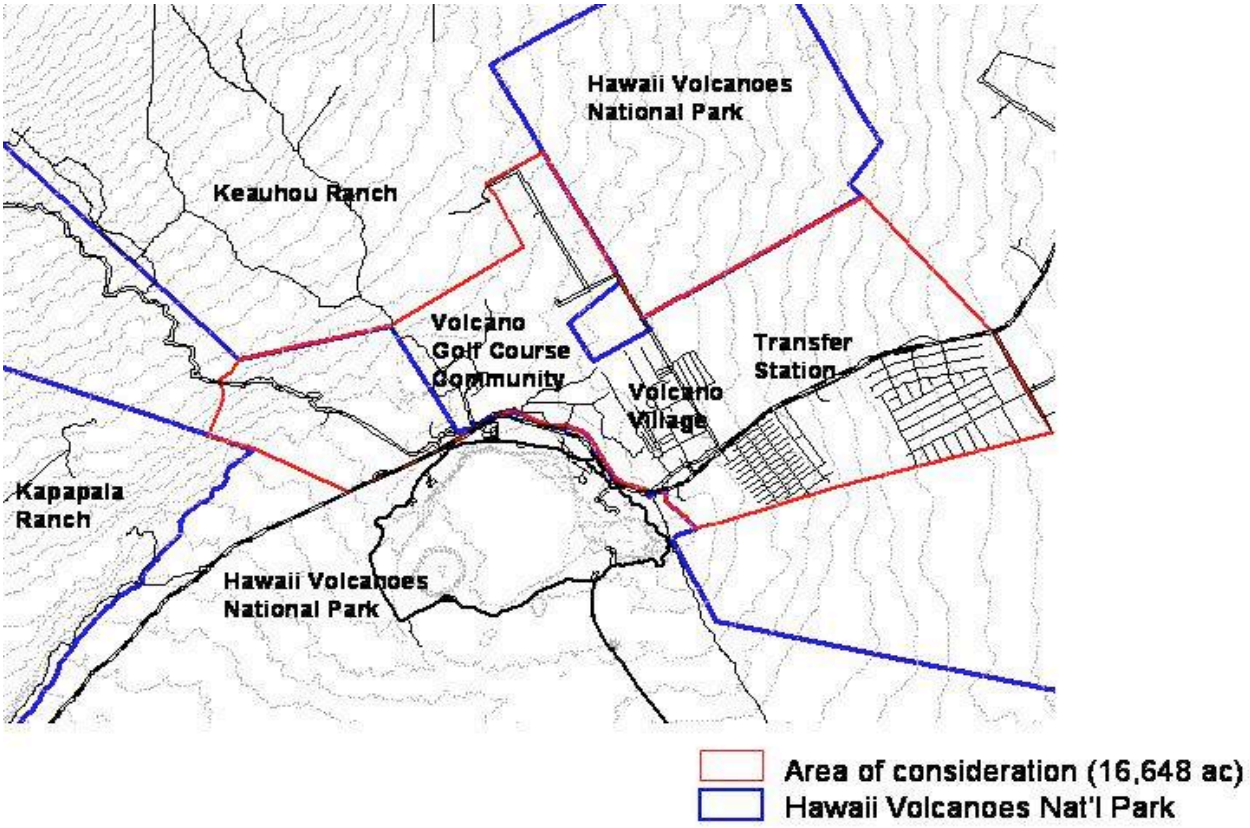

Figure 1: Area of consideration for the Volcano CWPP encompasses more than 16,000 acres and is outlined in red.

Fire Risk Assessment for Volcano:

The Volcano community, a federally listed community at risk, is at the 4,000-foot elevation and is composed of Volcano Village, including the commercial district within the Village, the Volcano Golf and Country Club and its neighboring subdivision to the east, Mauna Loa Estates and Ohia Estates to the southeast on the south side of Highway 11. There are several commercial agricultural farm lots north of the residential units in Volcano Village. Both the Village and the Golf Course Subdivision are densely populated with lots generally smaller than an acre. Houses are spaced slightly farther apart in Mauna Loa Estates and Ohia Estates. There are two main roads each out of Volcano Village and Mauna Loa Estates and one means of ingress and egress from the Golf Course Subdivision and Ohia Estates. Roads within Volcano Village are extremely narrow, roughly ten feet in width with little or no shoulders. Roads within Mauna Loa Estates, Ohia Estates, and the Golf Course Subdivision are 18 - 20 feet wide with shoulders. Volcano Village, Ohia Estates, and the Golf Course Subdivision have little to no slope within the community. There is a slight slope within Mauna Loa Estates, although most lots are on flat land. There is no municipal water in any of the residential or commercial areas of Volcano, with homeowners and businesses relying on catchment water. A volunteer fire station is located in Volcano Village at the Cooper Community Center and a County fire station is located within the Park at the Kilauea Military Camp. There is no community association for any of the subdivisions in Volcano.

Typical road width in Volcano Village.

Much of Volcano Village is within densely vegetated rain forest. The state-owned Kilauea Forest Reserve separates Volcano Village and the Golf Course Subdivision. To the east of Volcano Village is the state ‘Ola’a Forest Reserve and the Park’s ‘Ola’a Rain Forest Tract. These native rain forests provide critical habitat for a number of endangered plant and animal species.

Extensive land clearing has removed most of the native forest in the Volcano Golf Course Subdivision. Several fire-adapted alien grasses, such as bushy beardgrass (*Schizachyrium condensatum*), broomsedge (*Andropogon virginicus*), and molasses grass (*Melinis minutiflora*) have become widespread and increased the wildfire potential in the subdivision. The Faya tree (*myrica faya*) has also invaded the Golf Course Subdivision, pushing out native ohia (*Metrosideros polymorhpa*) trees. Its rapid invasion into common areas that were originally set-aside as defensible spaces in the event of wildfire has resulted in increased fuel loads and the conversion of open spaces to dense alien forest. Keauhou Ranch, owned by Kamehameha Schools, lies to the north of the Golf Course Subdivision. The recent cessation of cattle operations is expected to result in increased fuel loads of invasive fire-adapted grasses.

A Hawaii Wildland Fire Risk and Hazard Severity Assessment based on the Assessment in Appendix A of NFPA 1144, *Standard for Protection of Life and Property from Wildland Fire*, was conducted by the Hawaii Firewise Coordinator and HAVO firefighting personnel on April 26,

2006 to identify the level of wildland fire risk of Volcano Village, the Golf Course Subdivision, Mauna Loa Estates, and Ohia Estates.

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

Community Assets at Risk:

Assets at risk are valued resources that can be damaged or destroyed by wildfire. In addition to ensuring firefighter safety and protecting residents and visitors, the following assets warrant consideration in pre-incident planning: watersheds; forest reserves; wildlife; rare and endangered plants and animals; scenic, cultural, and archeological sites; ranchlands; and structures.

The following were identified as valued resources within the Volcano community that would be adversely affected by wildfire.

Commercial resources:

Volcano Winery, Kilauea Lodge and Restaurant, local bed and breakfasts, farms, restaurants, and schools.

Historical resources:

Shipman Ranch House and Lee House. There are several structures within the Village more than 50 years old. The State of Hawaii classifies buildings over 50 years old as historical structures in accordance with National Park Service Administrative Rule Chapter 6E.

Natural Resources:

Ola'a Forest Reserve, 'Ola'a Rain Forest Tract, Thurston Rain Forest, Keauhou Ranch, Ohia Ranch, Keauhou Bird Conservation Center - Hawaii Endangered Bird Conservation Program. Native Hawaiian plants and animals, including rare and endangered species.

This Plan focuses on structures within the wildland urban interface in Volcano. Overgrown vegetation, narrow streets, and a lack of water create unsafe fire conditions. While the majority of homes in Volcano have metal roofs, a large number of homes within Volcano Village, the Golf Course Subdivision, Ohia Estates, and Mauna Loa Estates have wood siding and lanais (decks), further enhancing the fire problem. House lots vary greatly in the degree of defensible space around the homes from little to no defensible space to more than 30 feet of clearance. Several driveways do not have 15 feet of vertical clearance for emergency vehicle access due

to overgrown vegetation. Fewer still have turnaround access for emergency vehicles. Signage for interior roads within the Village, Golf Course Subdivision, Mauna Loa Estates, and Ohia Estates is metal and reflectorized.

Houses within Volcano Village differ dramatically in their amount of defensible space. Both houses pictured above have metal roofs and wood siding.

In addition, all residential areas within Volcano are experiencing rapid development. A new subdivision, Volcano Fairway Estates, is being built adjoining Volcano Golf Course and Country Club. The developer and/or lot owners are often clear cutting individual lots and dumping the green waste in common areas within the community, greatly increasing the community's fire risk. Associated with land clearing is the increased potential for invasive plants to establish. Some of these invaders (e.g. fire-adapted grasses) may have the potential to increase fuel loads and alter fire regimes.

Community Concerns for Volcano:

Multiple meetings with community members and fire agencies specifically on the CWPP process between April and June 2006 identified the most pressing fire concerns in Volcano. These include in order of priority:
1. Lack of water;
2. Community egress and firefighting vehicle ingress during a wildfire;
3. Fuel load in common areas;
4. Reduction of invasive species possessing inherent fire or ignition properties; and
5. Public awareness of wildfire threat.

Recommended Action for Volcano:

Multiple meetings with community members and fire agencies specifically on the CWPP process between April and June 2006 identified the most pressing fire concerns in Volcano. These include in order of priority:
1. Lack of water;
2. Community egress and firefighting vehicle ingress during a brushfire;
3. Fuel load in common areas;
4. Reduction of invasive species possessing inherent fire or ignition properties; and
5. Public awareness of wildfire threat.

Based on the results of the community risk assessment, the following mitigation measures were identified to reduce wildfire risk in Volcano. The community and fire agencies collaborated to prioritize mitigation efforts in the following order of importance:

1. Creation of secondary emergency ingress/egress roads;
2. Reduction of fuel load along roadsides and in common areas;
3. Need for additional pre-staged static water tanks;
4. Reduction of invasive species; and
5. Continued fire prevention education and outreach.

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

Community, structure or area at risk	**Type of Treatment**	**Method of Treatment**	**Overall Priority**
Volcano Village	Mechanical	Creation of secondary emergency ingress/egress roads	Very High
Volcano Village	Mechanical / Chemical / Hand Labor	Reduction of fuel load along roadsides and in common areas	Very High
Volcano Village	Mechanical	Need for additional pre-staged static water tanks	High
Volcano Village	Mechanical / Chemical / Hand Labor	Reduction of invasive species	High
Volcano Village	Public Education and Outreach	Continued fire prevention education and outreach	High
Golf Course Community	Mechanical	Reduction of fuel load along roadsides and in common areas	High
Golf Course Community	Mechanical / Chemical / Hand Labor	Need for additional pre-staged static water tanks	High
Golf Course Community	Mechanical / Chemical / Hand Labor	Reduction of invasive species	High
Golf Course Community	Public Education and Outreach	Continued fire prevention education and outreach	High
Mauna Loa Estates	Mechanical / Chemical	Reduction of fuel load along roadsides	Medium
Mauna Loa Estates	Mechanical / Chemical	Reduction of invasive species	Medium
Mauna Loa Estates	Public Education and Outreach	Continued fire prevention education and outreach	High
Ohia Estates	Mechanical / Chemical	Reduction of fuel load along roadsides	Medium
Ohia Estates	Mechanical / Chemical / Hand Labor	Reduction of invasive species	Medium
Ohia Estates	Public Education and Outreach	Continued fire prevention education and outreach	High

Community Federal agencies and private landowners surrounding Volcano were invited to submit projects that provide protection and reduce wildland fire risk. The following table displays a list of projects based on recommendations from community and fire-related organizations. HAVO intends to assess the progress annually and invite agencies and landowners to submit projects that provide community protection.

Community, structure or area at risk	Project	Agency	Funding Needs	Timetable	Community Recommendation
Volcano Village	Creation of secondary emergency ingress/egress roads	HAVO	Cooperative Funding	2006 - 2007	Yes
Volcano Village	Reduction of fuel load along roadsides and in common areas	Private	Cooperative Funding	2006 - 2007	Yes
Volcano Village	Reduction of invasive species	HAVO	Cooperative Funding	2006 - 2007	Yes
Volcano Village	Need for additional pre-staged static water tanks	Multiple agencies: federal, state, county, and private	Cooperative Funding	2006 - 2007	Yes
Volcano Village	Continued fire prevention education and outreach	Multiple agencies	Cooperative Funding	2006 - 2007	Yes
Golf Course Community	Reduction of fuel load along roadsides and in common areas	Multiple agencies	Cooperative Funding	2006 - 2007	Yes
Golf Course Community	Need for additional pre-staged static water tanks	Multiple agencies	Cooperative Funding	2006 - 2007	Yes
Golf Course Community	Reduction of invasive species	Multiple agencies	Cooperative Funding	2006 - 2007	Yes
Golf Course Community	Continued fire prevention education and outreach	Multiple agencies	Cooperative Funding	2006 - 2007	Yes
Mauna Loa Estates	Reduction of fuel load along	Private	Cooperative Funding	2006 - 2007	Yes

	roadsides				
Mauna Loa Estates	Reduction of invasive species	Multiple agencies	Cooperative Funding	2006 - 2007	Yes
Mauna Loa Estates	Continued fire prevention education and outreach	Multiple agencies	Cooperative Funding	2006 - 2007	Yes
Ohia Estates	Reduction of fuel load along roadsides	Private	Cooperative Funding	2006 - 2007	Yes
Ohia Estates	Reduction of invasive species	Multiple agencies	Cooperative Funding	2006 - 2007	Yes
Ohia Estates	Continued fire prevention education and outreach	Multiple agencies	Cooperative Funding	2006 - 2007	Yes

Secondary road for ingress/egress

With narrow interior roads and only two roads connecting to the main highway, a secondary emergency access road for emergency vehicles is needed for more effective fire suppression. Currently there is an unpaved access road parallel to Mauna Loa Strip Road that runs along the western border of the golf course subdivision. This firebreak is on HAVO land and the Park maintains the road, removing overgrown vegetation twice a year. However, this fuel break dead ends behind golf course homes adjacent to the Volcano Winery. An additional access road is needed to connect the end of this fuel break to the interior roads within the Golf Course Subdivision to increase effective safe firefighting operations.

In order to remain effective, the secondary emergency access road must also be maintained on a regular basis. Funding should be secured to ensure that the road is maintained (cleared of overgrown vegetation) at least twice a year. The organization that is determined to be responsible for the access road may want to consider the purchase of a chipper to remove vegetation on the access road.

Reduction of fuel load

Reducing vegetation along roadsides will improve accessibility of emergency vehicles. Reduction of green waste in common areas within the community will also reduce the wildfire threat. The creation of fuel breaks in common areas, as well as green waste pick-up projects are recommended to reduce fuel load. It is also strongly recommended that outreach efforts include alerting residents and developers to the fire risk of dumping green waste. The organization that is determined to be responsible for fuel load reduction may want to consider the purchase of a chipper to remove vegetation. For examples of how communities in other states have developed effective green waste removal projects, please go to www.firewise.org.

Pre-staged static water tanks
Given that area residents rely on catchment water and there are no fire hydrants within Volcano, lack of water for fire suppression was identified as one of the most important challenges facing the community. Pre-staged static water tanks for ground and aerial fire suppression will greatly increase effective fire suppression and firefighting efficiency.

Reduction of invasive species
Invasive non-native plant species have the potential to alter fire regimes, and inhibit the recovery of native plants and animals from wildfire. Invasive fire-adapted grasses are high-intensity burning fuels that carry fire to other fuels. Faya trees rapidly displace native ohia trees as the dominant canopy tree after wildfire. Its invasion into common areas within the Golf Course Community has increased fuel loads, converted open areas to dense forest, and compromised defensible spaces used in wildfire suppression.

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

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

2. Develop educational materials specific to community fire threat and continue outreach in local publications. HAVO staff and the Firewise coordinator are currently providing monthly editorial to local publications on fire prevention. Continued outreach is needed with large numbers of new residents moving into the area. A handbook "How to Build in the Forest" is currently available to area residents. Handbook should be updated to include Firewise recommendations for defensible space and fire-resistant building materials.

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

Reduce Structural Ignitability:

As part of its fire prevention education efforts, Firewise provides recommendations to reduce structural ignitability. Individuals and the Volcano community can reduce structural ignitability throughout the community by taking the following measures.

• Create a buffer zone of defensible space around a property of at least 30 feet or to the property line if the house has less than 30 feet of yard. Remove flammable vegetation and combustible growth within 30 feet of the house.

• Prune tree limbs 6 – 10 feet above the ground.

• Space trees and shrubs ten feet apart in the yard.

• Make sure that plants closest to the house are low-lying. And whenever possible use native Hawaiian or succulent plants.

• Routinely remove dead leaves and other organic matter from the yard.

• Sweep and/or clean gutters, eaves, and roofs regularly to prevent the build-up of leaves and other matter.

• Use fire-resistant building materials for the roof, siding, and decks, such as metal, stucco, tile, brick, and cement.

Appendix A:

Please see attached Hawaii Wildland Fire Risk and Hazard Severity Assessment Form.

Appendix B:

Updated Project List 2008-2009

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

Community, structure or area at risk	Project	Agency / landowner	Funding Needs	Timetable	Community recommendation
Volcano Village	Maintenance of secondary emergency access road	HAVO	Cooperative Funding	2008-9	Yes
Volcano Village, Golf Course Community, Mauna Loa Estates, Ohia Estates	Reduction of fuel load along roadsides and in common areas	Private	Cooperative Funding	2008-9	Yes
Volcano Village, Golf Course Community, Mauna Loa Estates, Ohia Estates	Reduction of invasive species	HAVO, Private	Cooperative Funding	2008-9	Yes
Volcano Village, Golf Course Community, Mauna Loa Estates, Ohia Estates	Continued fire prevention education and outreach	Multiple Agencies	Cooperative Funding	2008-9	Yes

Appendix C:

Please see attached Volcano CWPP Press Releases and Community Fliers.

Appendix D:

Pre-Attack Maps for Volcano, Hawaii

Maps courtesy of West Hawaii Wildfire Management Organization.

Addendum 1

Volcano Community Wildfire Protection Plan
January 2015 Update

Photo Credit: Greg Funderburk, HAVO

Coordinated and developed by:
Hawaii Wildfire Management Organization, a 501(c)3 nonprofit organization dedicated to protecting Hawaii's communities and natural resources from wildfire.

Updated in partnership with:
Hawaii County Civil Defense, Hawaii Fire Department, State of Hawaii Department of Land and Natural Resources Division of Forestry and Wildlife, and National Park Service utilizing new public input acquired during 2014 agency-included public meetings.

Written by:
Elizabeth Pickett and Ilene Grossman. Hawaii Wildfire Management Organization ©2015

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CWPP Update Overview

January 14, 2015

At the time of this update, there are currently five CWPPs for Hawaii Island including: Volcano, Kaʻū, Ocean View, South Kona and NW Hawaii Island. Although there is no requirement to update the CWPPs, Hawaii Wildfire Management Organization (HWMO) staff and technical advisors determined an update would be an important tool to revitalize community engagement and action in wildfire protection and hazard reduction activities. In addition, the community input and action projects needed to be updated. Wildfire hazard is predicted to increase with high vegetation and continued drought.

Within the last two years, HWMO conducted a statewide wildfire hazard assessment and a statewide wildfire history map that shows wildfire ignitions on each island between 2002-2011. The resulting maps and assessments for the Volcano CWPP planning area are included are included in this addendum.

Community input is critical to making the plan a living document that can be used as a resource to help guide community associations, fire agencies, landowners, and natural resource agencies towards meeting their fire protection goals. The CWPP Update process provided a venue for residents and agency personnel to discuss wildfire concerns and brainstorm solutions together during four community meetings.

Volcano Wildfire Ignitions Map

The map below displays results from an HWMO-led effort to compile wildfire records from all fire suppression agencies across the state, which resulted in a quality-controlled wildfire database and region-specific wildfire incident maps. The Volcano Wildfire Incident Map (Figure 1 below) includes data from the following agencies between 2002-2012: Hawaii County Fire Department, Hawaii Volcanoes National Park, and Department of Land and Natural Resources Division of Forestry and Wildlife (DLNR-DOFAW). Statewide, 1,854 wildfire ignitions were mapped out of a total of 2,707 total fire records. Unmapped fires are a result of unavailable or ambiguous fire location information firefighting records. It is important to note that the map below displays ignition points, and does not indicate the size of wildfires or the final perimeters of burned areas. Ignitions are important for understanding trends and patterns of fires. From the map below it is clear that WUI, roadside, and human access area fire starts are important trends across the Volcano area.

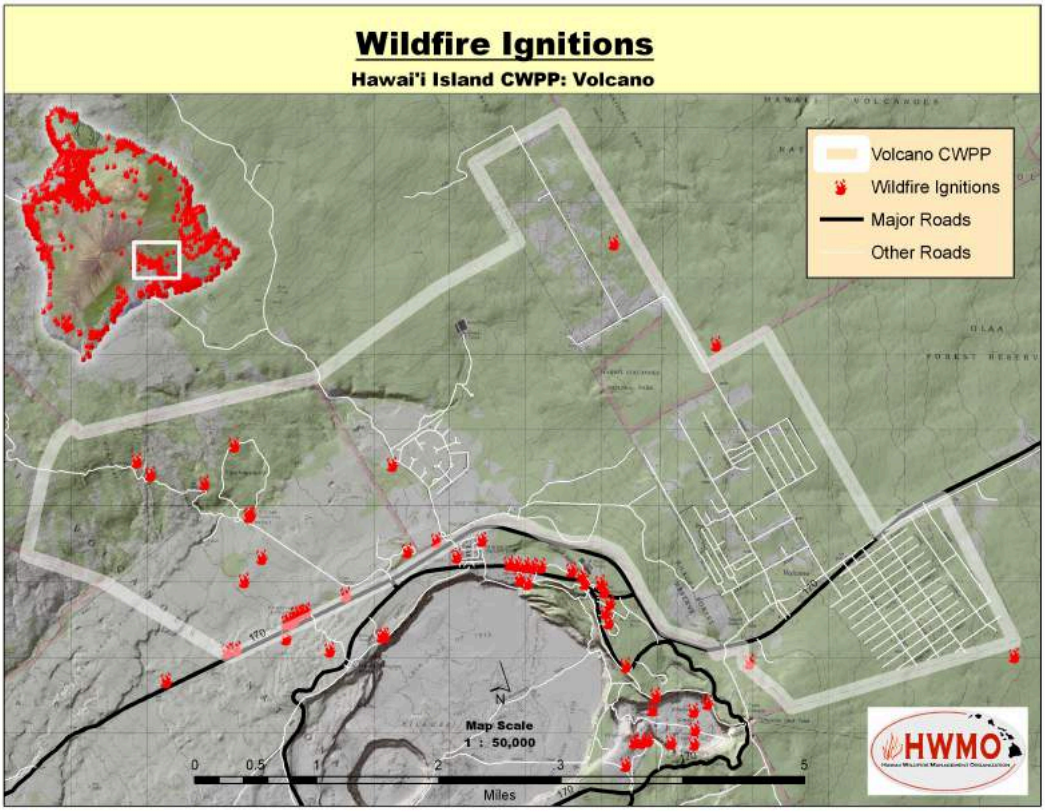

Figure 1. *Wildfire Ignitions Map*

Wildfire Hazard Assessment Maps and Ratings

In 2011-2013, HWMO staff assessed subdivisions across the state to rate wildfire hazards within the following categories: Vegetation, Building, Subdivision, Fire Environment and Fire Protection. Each of those categories is comprised of several contributing factors, all of which were assessed and ranked with a rating of high, moderate, or low hazard, depending on their characteristics. The categories and specific hazard ratings assigned to the subdivision areas with the Volcano CWPP planning area are below:

Subdivision Hazard Ratings

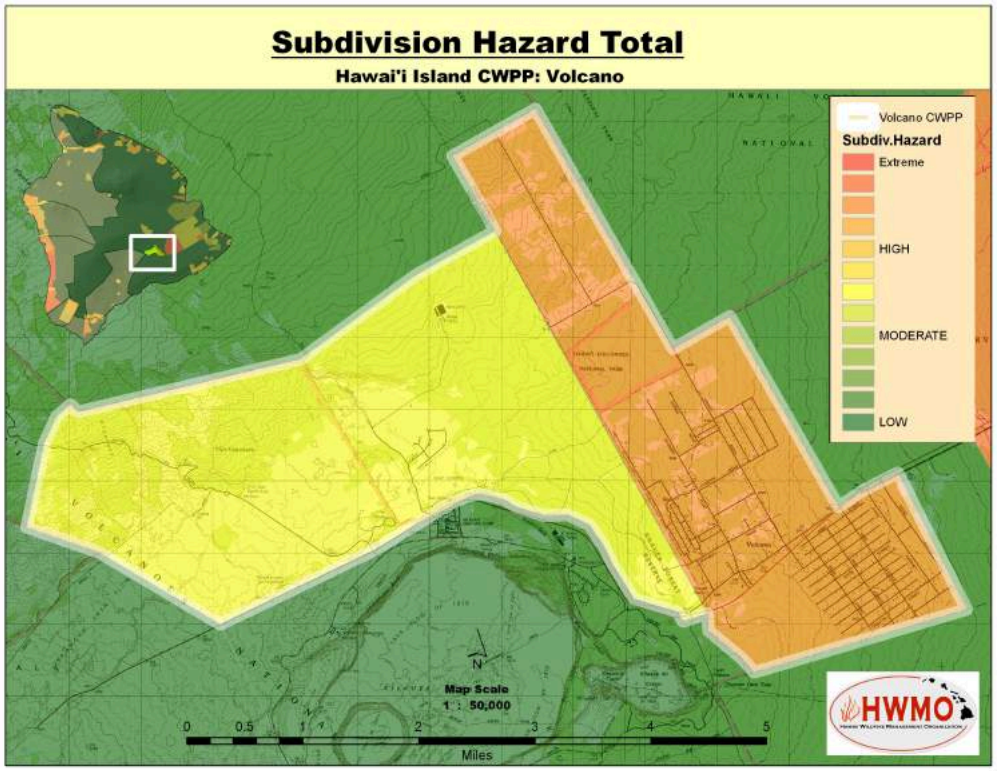

Figure 2. *Subdivision Hazard Total Map*

Subdivision Hazards		
Specific Hazard	**Subdivision**	**Hazard Rating**
Ingress/Egress	Volcano Country Club	**High -** Narrow, dead end roads or 1 way in, 1 way out. Steep grades
	Volcano Village	**Moderate -** Limited access routes. 2 ways in and 2 ways out. Moderate grades.
Road Maintenance	Volcano Country Club	**Low -** Wide loop roads that are maintained, paved or solid surface with shoulders.
	Volcano Village	**High -** Narrow and or single lane, minimally maintained, no shoulders.
Road Width	Volcano Country Club	**Moderate -** 20'-24' wide. Medium width roads with drivable shoulders and good visibility, support evacuation and emergency response time.
	Volcano Village	**High -** Less than 20 feet wide. Narrow roads coupled with poor visibility limit evacuation and emergency response. Traffic problems will occur. Entrapment is likely.
All-Season Road Condition	Volcano Country Club	**Low -** Flat or gently sloping surfaced roads can support high volumes of large fire equipment.
	Volcano Village	**Low -** Flat or gently sloping surfaced roads can support high volumes of large fire equipment.

Fire Service Access	Volcano Country Club	**Low -** Adequate turnaround space is available for large fire equipment.
	Volcano Village	**High -** 300'+ with no turnaround. Long dead-end streets will become crowded with vehicles. Two-way visibility is an issue.
Street Signs	Volcano Country Club	**Low -** Present. Most are at least 4' in size and are reflectorized.
	Volcano Village	**Moderate -** Present and reflectorized with some exceptions.
Structure Density	Volcano Country Club	**Low -** Low structure density and low ignition probability.
	Volcano Village	**Low -** Low structure density and low ignition probability.
Home Setbacks	Volcano Country Club	**Low -** Majority (50%+) of homes are set back from property lines and slopes by at least 30 feet.
	Volcano Village	**Low -** Majority (50%+) of homes are set back from property lines and slopes by at least 30 feet.
Unmanaged, Untended, Undeveloped Lands	Volcano Country Club	**High -** 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.
	Volcano Village	**Moderate -** 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.
Private Landowner Actions/Firewise Landscaping and Defensible Space	Volcano Country Club	**Moderate -** 30-70% homes have improved survivable space around property and well-maintained landscapes.
	Volcano Village	**Moderate -** 30-70% homes have improved survivable space around property and well-maintained landscapes.
Proximity of subdivision to wildland areas	Volcano Country Club	**High -** Wildland areas surround subdivision on at least 3 sides.
	Volcano Village	**High -** Wildland areas surround subdivision on at least 3 sides.

Table 1. *Subdivision Hazards*

Vegetation Hazard Ratings

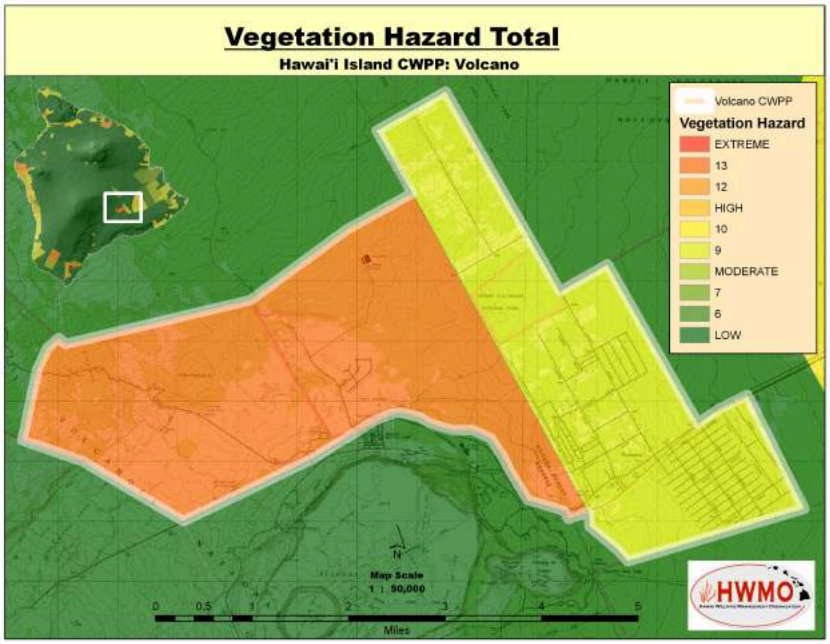

Figure 3. *Vegetation Hazard Total Map*

Photo 2. *Volcano Ladder Fuels*

Vegetation Hazards		
Specific Hazard	**Subdivision**	**Hazard Rating**
Proximity of flammable fuels around subdivision	Volcano Country Club	**High -** Less than 40'
	Volcano Village	**Low -** Greater than 100'
Type of predominant vegetation within 300' of homes	Volcano Country Club	**High -** Dense grass, brush, timber, and/or hardwoods. Moderate to heavy dead and downed vegetation. Fuels greater than 12 feet tall. Heavy vegetation.
	Volcano Village	**Moderate -** Grasses 6–12 inches in height. Grasses 6-12" tall. Light brush and small trees. Patchy fuels.
Fuel loading	Volcano Country Club	**Moderate -** 31-70% cover
	Volcano Village	**Moderate -** 31-70% cover
Fuel structure and arrangement	Volcano Country Club	**Moderate –** Some areas of contiguous vegetation. Few ladder fuels.
	Volcano Village	**Moderate -** Some areas of contiguous vegetation. Few ladder fuels.
Defensible Space/ Fuels reduction around homes & structures	Volcano Country Club	**High -** Adequate turnaround space is available for large fire equipment.
	Volcano Village	**Moderate -** 300'+ with no turnaround. Long dead-end streets will become crowded with vehicles. Two-way visibility is an issue.

Table 2. *Vegetation Hazards*

Building Hazard Ratings

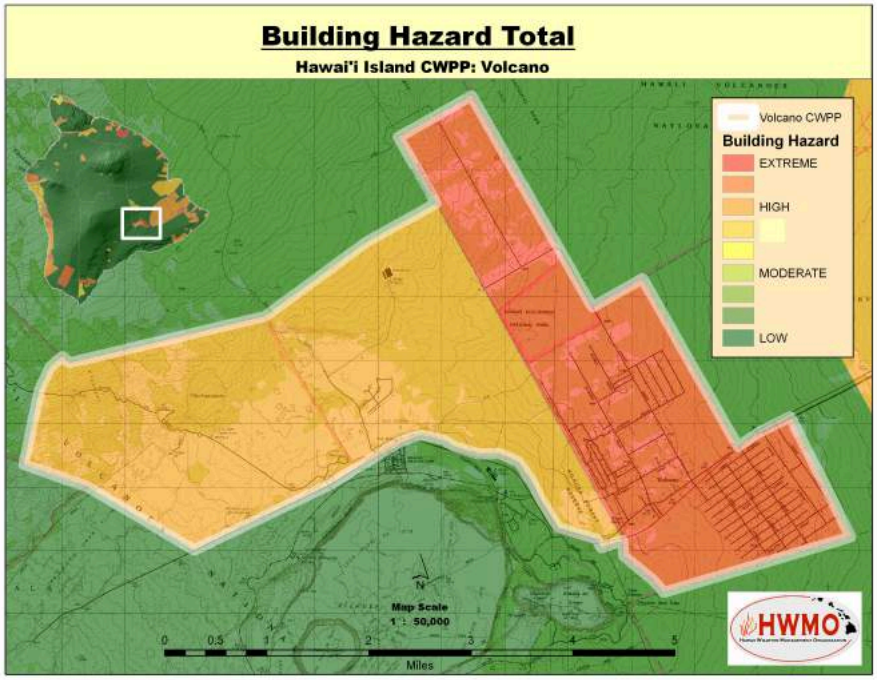

Figure 4. *Building Hazard Total Map*

Building Hazards		
Specific Hazard	**Subdivision**	**Hazard Rating**
Roofing Assembly	Volcano Country Club	**Low -** Greater than 75% of homes have Class A roofs (metal, asphalt, or fiberglass roofing material).
	Volcano Village	**Low -** Greater than 75% of homes have Class A roofs (metal, asphalt, or fiberglass roofing material).
Siding/ Soffits	Volcano Country Club	**Moderate -** 50-75% of homes have fire resistant siding and soffits.
	Volcano Village	**High -** Less than 50% of homes have fire resistant siding and soffits.
Under-skirting around decks, lanais, post-and-pier structures.	Volcano Country Club	**Moderate -** 50-75% of homes have the equivalent of fine non-combustible mesh screening
	Volcano Village	**High -** Less than 50% of homes have the equivalent of fine non-combustible mesh screening
Utilities Placement- Gas and Electric	Volcano Country Club	**High -** Both above ground.
	Volcano Village	**High -** Both above ground.
Structural Ignitability	Volcano Country Club	**Moderate -** 50-75% of homes store combustibles properly.
	Volcano Village	**Moderate -** 50-75% of homes store combustibles properly.

Table 3. *Building Hazards*

Fire Environment Hazard Ratings

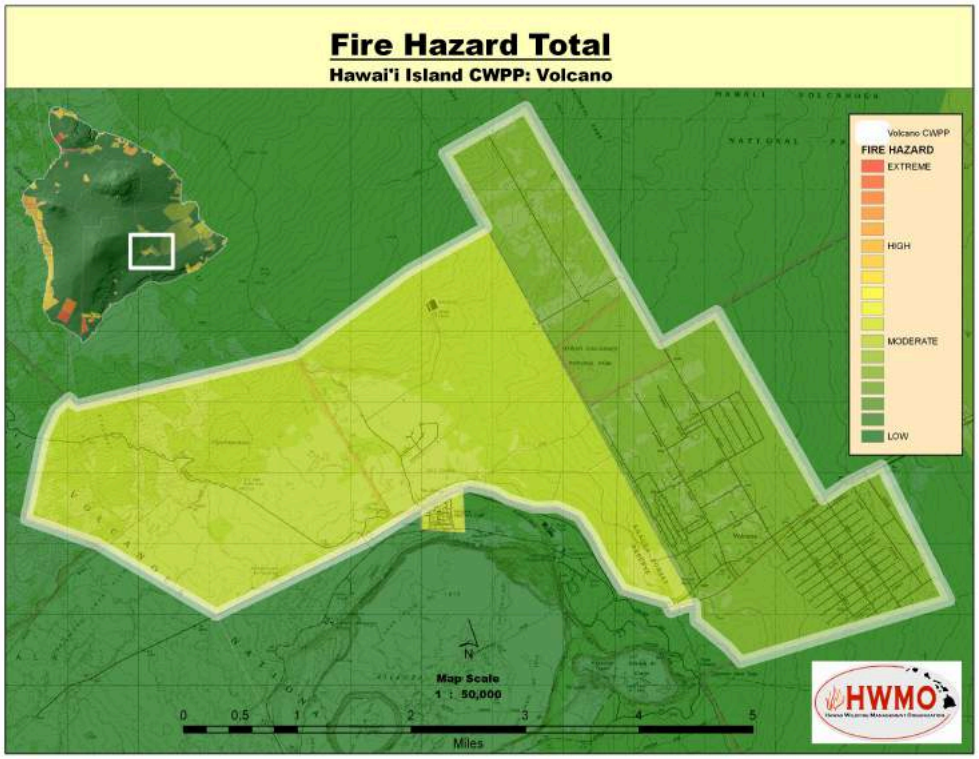

Figure 5. *Fire Environment Hazard Total Map*

Fire Environment Hazards		
Specific Hazard	**Subdivision**	**Hazard Rating**
Slope	Volcano Country Club	**Low -** Flat to slight slope (10%)
	Volcano Village	**Low -** Flat to slight slope (10%)
Average rainfall *Score 1-6 instead	Volcano Country Club	**Moderate -** Moderate precipitation 3
	Volcano Village	**Low -** High precipitation 2
Prevailing wind speeds and direction *Score 1-4 instead	Volcano Country Club	**Moderate -** Wind rarely (less than 10% of time) exceeds 15 mph.
	Volcano Village	**Low -** Wind rarely (less than 10% of time) exceeds 15 mph. Protection from predominant winds.
Seasonal or periodic high hazard conditions	Volcano Country Club	**Moderate -** Area is occasionally (e.g., once per decade) exposed to fire prone conditions: drought, lightning storms, desiccated vegetation, and/or strong dry winds
	Volcano Village	**Low -** Area has no major seasonal increase of fire hazard.
Ignition risk	Volcano Country Club	**Low -** Little to no natural (lightning or lava) ignition risk. No history of arson. Wildland areas absent or distant from public and/or vehicular access.
	Volcano Village	**Low -** Little to no natural (lightning or lava) ignition risk. No history of arson. Wildland areas absent or distant from public and/or vehicular access.
Topographical features that adversely wildland fire behavior	Volcano Country Club	**Low -** None
	Volcano Village	**Low -** None

Table 4. *Fire Environment Hazards*

Fire Protection Hazard Ratings

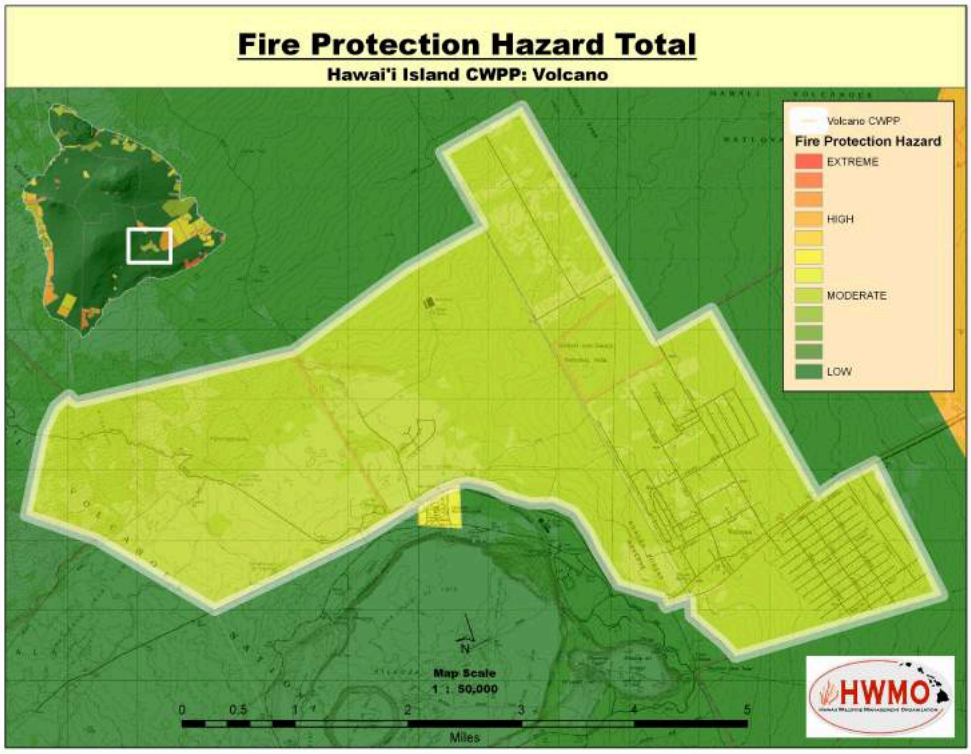

Figure 6. *Fire Protection Hazard Total Map*

Volcano Fire Protection Hazards		
Specific Hazard	**Subdivision**	**Hazard Rating**
Water source availability	Volcano Country Club	**Low -** Pressurized water source availability. 500 GPM less than 1000 ft. spacing.
	Volcano Village	**Moderate -** Non-pressurized water source availability (offsite or draft location) or dipsite. Homes on catchment water have fire-hose hookups.
Response time	Volcano Country Club	**Low -** Within 15 minutes
	Volcano Village	**Low -** Within 15 minutes
Fire Station Proximity	Volcano Country Club	**Low -** Less than 5 miles
	Volcano Village	**Low -** Less than 5 miles
Fire department structural training and expertise	Volcano Country Club	**Low -** Large fully paid fire department with personnel that meet NFPA or NWCG training requirements and have adequate equipment.
	Volcano Village	**Low -** Large fully paid fire department with personnel that meet NFPA or NWCG training requirements and have adequate equipment.
Wildland firefighting capability of initial response agency	Volcano Country Club	**Low -** Sufficient personnel, equipment, and wildland firefighting capability and experience. Good supply of structural and wildland fire apparatus and misc specialty equipment
	Volcano Village	**Low -** Sufficient personnel, equipment, and wildland firefighting capability and experience. Good supply of structural and wildland fire apparatus and misc specialty equipment
Interagency Cooperation	Volcano Country Club	**Low -** Mutual aid agreements and resources available to deploy.
	Volcano Village	**Low -** Mutual aid agreements and resources available to deploy.
Local emergency operations group or other similar	Volcano Country Club	**High –** no EOG or CERT team, etc. that is organized or active, underprepared for evacuation processes
	Volcano Village	**High –** no EOG or CERT team, etc. that is organized or active, underprepared for evacuation processes

Community planning practices and ordinances	Volcano Country Club	**Moderate -** 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.
	Volcano Village	**Moderate -** 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.
Community fire-safe efforts and programs already in place	Volcano Country Club	**Low -** Organized and active groups provide educational materials and programs throughout the community.
	Volcano Village	**Moderate -** Limited provision of or interest in educational efforts. Fire Department or local group does some limited prevention and public education.

Table 5. *Fire Protections Hazards*

Community Concerns & Recommendations

The Volcano Community Input meetings were held at the Cooper Center in 2014 on October 27th and 28th from 2-4pm and included a short presentation followed by a facilitated public input process. Community members, volunteer firefighters, HFD firefighters, and National Park Service fire staff were split into two groups wherein they shared their wildfire concerns and recommended actions during the input process. Each group presented to the whole group and then each person voted with 3 stickers on their priority concerns/actions. Then each person was given another 3 stickers to place on the enlarged Volcano map for their most valued areas or community resources (home, park, cultural sites, etc.) The community input was organized in two ways, first by Cohesive Strategies and second by Subject Area.

Photo 3. and Photo 4. *Volcano participants work in small groups to identify wildfire concerns and prioritize recommended actions*

Input Organized According to Cohesive Strategy

The National Cohesive Wildland Fire Management Strategy (or Cohesive Strategy) encourages communities to develop a dynamic approach to planning for, responding to, and recovering from wildland fires. It provides a framework for wildfire-related discussion, efforts, and goals across the United States. The overarching national strategy is further divided into three regions for tighter collaboration and coordination in each area. Hawai'i falls into the Western Region that delineates its goals into the flowing categories:

- Restore and Maintain Landscapes
- Fire-Adapted Communities
- Improve Wildfire Response

The results of the public meeting have been organized according to this framework to mesh with this national planning strategy. The following figure and tables depict the results relative to the Cohesive Strategy. The pie chart is based on the number of votes each community member cast for each concern/recommendation: 76% of the community concerns and recommendation votes focused on the Cohesive Strategy "Improving Wildfire Response," 24% on "Fire Adapted Communities," and 0 votes for "Restore and Maintain Landscapes."

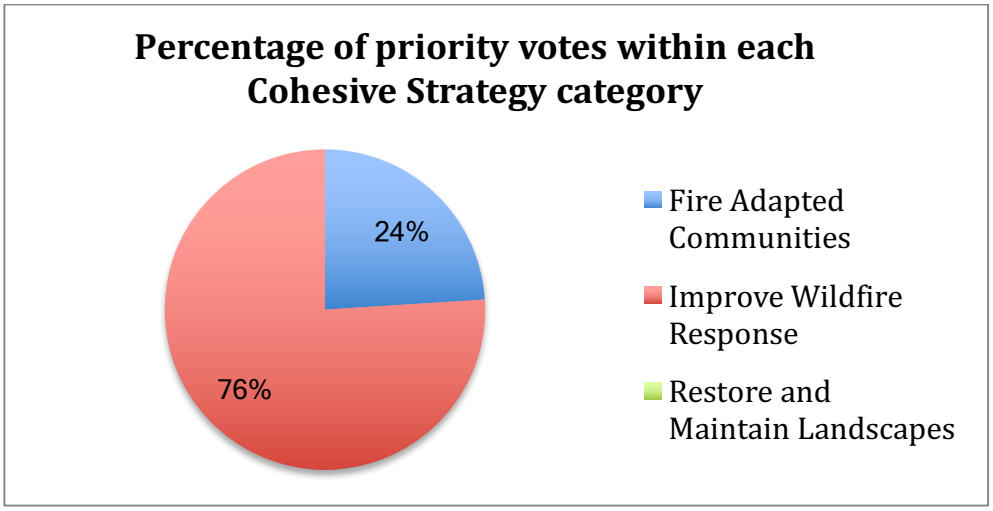

Figure 7. *Percentage of Concerns/Recommendations in each Cohesive Strategy*

Input per Cohesive Strategy Category

The following tables articulate all concerns and recommended actions that were provided at the input meetings. All input was put into priority order by participants.

Public Input – Prioritized Concerns and Recommended Actions Category: Improve Wildfire Response	
Wildfire Concern (In priority order)	**Recommended Action**
1. Fire Fighting Capacity & Resources	• Statistical analysis, awareness, and funding to secure proportionate wildland fire fighting equipment and training • Increase Incident Command training to improve initial attack
2. Firefighter Access in Volcano Village & Wildlands	• Open up roadways (but people like heavy vegetation and don't want to trim trees/shrubs • Improve signage • Buy county brush truck for improved access

3. Escape Routes & Fire Breaks	• Secondary escape route for Volcano Golf Course
	• Fill in puka on Vineyard Road and have NPS agree to gate on park boundary
	• Peregrine Fund Aviaries (no escape routes nor firebreaks)
	  ○ Create firebreaks
	  ○ Create access roads

Table 6. *Public Input Improve Wildfire Response Cohesive Strategy*

Public Input – Prioritized Concerns and Recommended Actions Category: Fire Adapted Communities	
Wildfire Concern (In priority order)	**Recommended Action**
1. Firefighter Access, Fuels Management & Firewise Properties	• Enforce brush clearance laws around structures • Improve ingress/egress (driveways) • Makes homes and landscapes more "Firewise"
2. Community Planning for Wildfire Preparedness	• Bring in all participants to ensure that everyone is on the same page (residents, landowners, County Departments, HELCO, insurance companies, etc.)
3. Fuels Management on Roads	• County or State ordinance to address brush management on

	roads • Improve government road management for ingress/egress and fuels management
4. Education & Outreach	• Take action immediately after fire-scare • Improve community awareness, participation, cooperation, and collaboration

Table 7. *Public Input Fire Adapted Communities Cohesive Strategy*

Public Input – Prioritized Concerns and Recommended Actions Category: Restore and Maintain Landscapes	
Wildfire Concern (in priority order)	**Recommended Action**
1. Education & Outreach	• Improve adult education and outreach about native ecosystems, impacts of fire on those ecosystems, and fire prevention.

Table 8. *Public Input Restore and Maintain Landscapes Cohesive Strategy*

Input Organized by Subject Matter

The community input results were tallied and organized by subject area to aid the development of a priority projects list. The graph below demonstrates how many times each topic was addressed or referred to within the participant input. The most frequently discussed issue was Firefighter and Community Access. Fuels management followed. Additional topics addressed with frequency were Firefighter Capacity, Education/Outreach and Community Planning. See tables above for participant concern/recommendation details related to each subject.

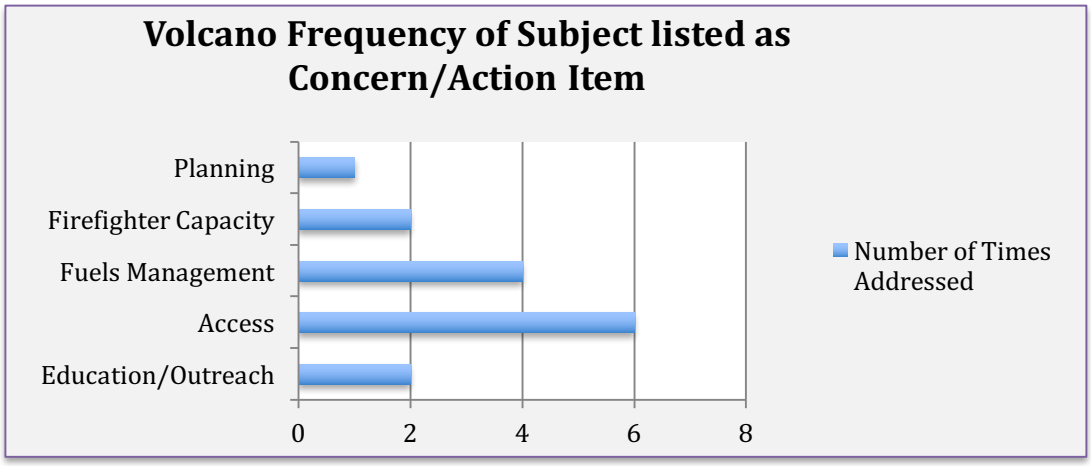

Figure 8. *Frequency of Subject listed as Concern/Action Item*

Community Resources Map

During the Community Meetings, participants were asked to place 3 stickers on the areas of greatest concern within or near the CWPP boundaries. The areas selected are starred in the map below. Firefighters circled two areas that are of particular concern where the roads are narrow and have sharp corners making them difficult to access. This map is referenced in the sections above, "Community Concerns & Recommendations," and in the section below "Recommended Next Steps."

Photo 5. *Volcano participants select areas and resources of high value on the community base map*

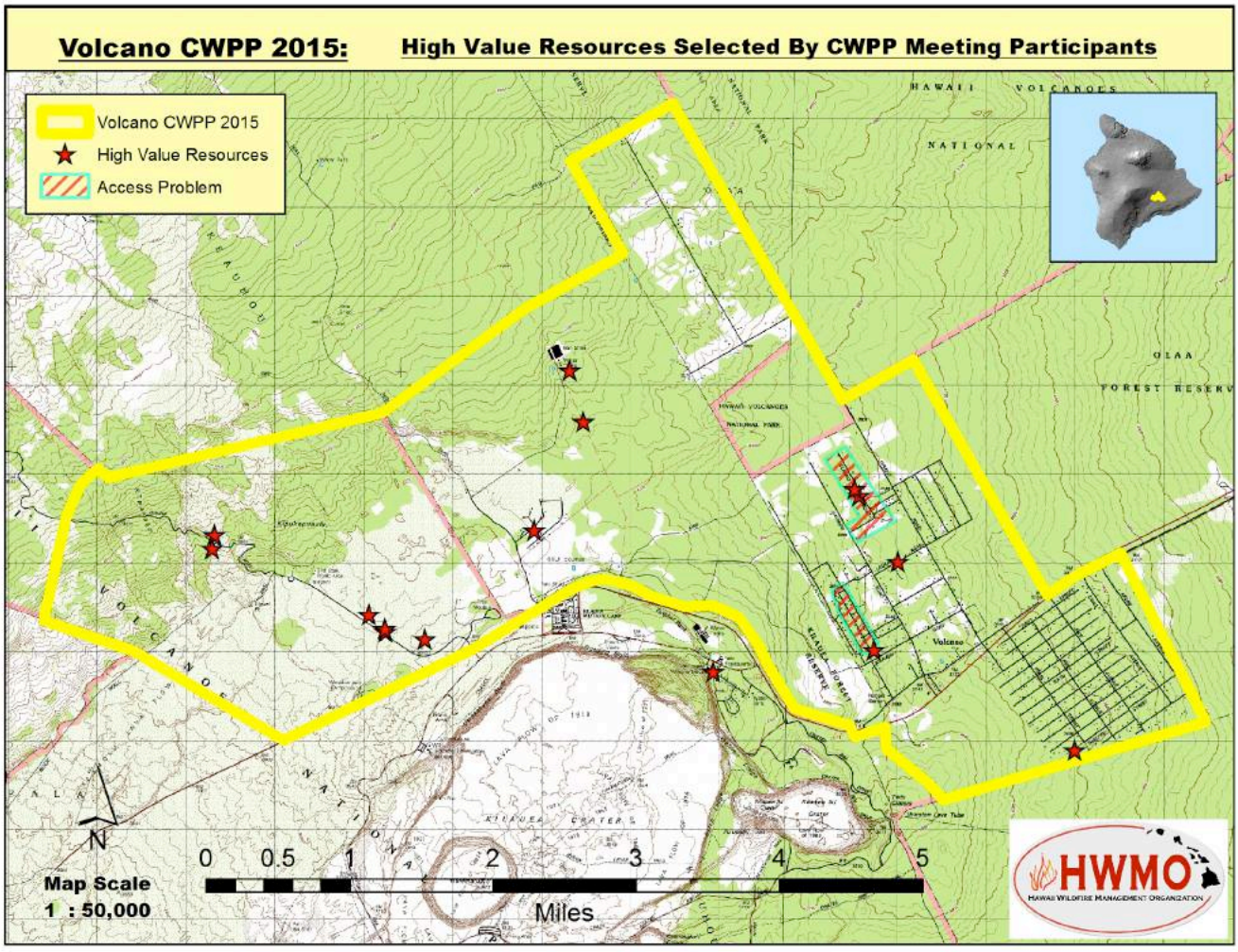

Figure 9. *High Value Resources Map*

Agency Concerns

HWMO requested input from state, federal, and county agencies in addition to community members to provide their priority wildfire concerns and recommended actions. They also provided updates to community members on the status of wildfire preparedness projects in the Volcano CWPP area, and contributed to the projects list. Agency concerns added to complement the public meeting input were noted as follows:

Wildfire Concern (in priority order)	**Recommended Action**
Access	• Improve problem spots for access • Improve defensible space and driveway clearance • Improve road signage
Community Engagement	• Encourage or support homeowners and residents to get involved in community hazard reduction at the neighborhood level
Natural Resource Management	• Provide information and education to residents related to fire impacts on natural resources • Mitigate invasive fire prone species

Table 9. *Agency Input*

Recommended Next Steps

The Volcano CWPP updated action plan was developed through an analysis of the issues identified in the risk assessment, community and agency input, and through a review of other Community Wildfire Protection Plans. Private landowners, Federal, State, and County agencies and were invited to submit projects that provide protection and reduce risk. The community concerns and action items listed above 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. HWMO and the Big Island Wildfire Coordinating Group intend to meet annually to evaluate progress on projects and mutually agree on treatment priorities. Additional projects will be displayed as appendices in updated versions of this plan.

The following table lists initial projects suggested to address community hazard reduction priorities.

Immediate Projects (1-3 Years)
In Priority Order:

Proposed Project	Anticipated Cost	When	Lead
1. Improve wildland fire fighting equipment, training, & Incident Command Training	$150,000 Cooperative Funding	ASAP	HFD
2. Improve firefighter access (open up roadways), improve signage, purchase a brush truck	$ 50,000 + brush fire truck		HFD, County, Community
3. Create secondary escape route for Volcano Golf Course	$ Cooperative Funding	ASAP	HFD
4. Make communities more 'Firewise' (homes, defensible space, improve ingress/egress)	$	ASAP	HWMO/Private
5. Create fire breaks and access roads for Peregrine Fund property	$	ASAP	Land Managers

Table 10. *Next Steps: Immediate Projects*

The projects listed below are considered lower priority but have a goal of completion within 3-5 years.

Future Projects (3-5 Years)
In Priority Order:

Proposed Project	Anticipated Cost	When	Lead
1. Community Planning for Wildfire Preparedness	$150,000 for outreach, any needed impact studies and education	TBD	Multiple Agencies: federal, state, county, and private

2. Fuels Management on Roads – Ordinance needed; Improve government maintenance	$TBD	TBD	Hawaii County
3. Wildfire Education	Cooperative Funding $30,000	TBD	HWMO

Table 11. *Next Steps: Future Projects*

The following 2006 and 2008-9 project lists were revisited by participants of the 2014-15 CWPP update process, with projects that remain a priority noted within each table.

Original Volcano Projects List 2006						
Community, structure or area at risk	**Project**	**Agency**	**Funding Needs**	**Timetable**	**Community Recommendation**	**Remains a 2014-15 priority project?**
Volcano Village	Creation of secondary emergency ingress/egress roads	HAVO	Cooperative Funding	2006 - 2007	Yes	Yes
Volcano Village	Reduction of fuel load along roadsides and in common areas	Private	Cooperative Funding	2006 - 2007	Yes	Yes
Volcano Village	Reduction of invasive species	HAVO	Cooperative Funding	2006 - 2007	Yes	Yes
Volcano Village	Need for additional pre-staged static water tanks	Multiple agencies: federal, state, county, and private	Cooperative Funding	2006 - 2007	Yes	Yes
Volcano Village	Continued fire prevention education and outreach	Multiple agencies	Cooperative Funding	2006 - 2007	Yes	Yes
Golf Course Community	Reduction of fuel load along roadsides and in common areas	Multiple agencies	Cooperative Funding	2006 - 2007	Yes	Yes
Golf Course Community	Need for additional pre-staged static water tanks	Multiple agencies	Cooperative Funding	2006 - 2007	Yes	Yes
Golf Course Community	Reduction of invasive species	Multiple agencies	Cooperative Funding	2006 - 2007	Yes	Yes
Golf Course Community	Continued fire prevention education and outreach	Multiple agencies	Cooperative Funding	2006 - 2007	Yes	Yes
Mauna Loa Estates	Reduction of fuel load along roadsides	Private	Cooperative Funding	2006 - 2007	Yes	Yes
Mauna Loa Estates	Reduction of invasive species	Multiple agencies	Cooperative Funding	2006 - 2007	Yes	Yes
Mauna Loa Estates	Continued fire prevention education and outreach	Multiple agencies	Cooperative Funding	2006 - 2007	Yes	Yes
Ohia Estates	Reduction of fuel load along roadsides	Private	Cooperative Funding	2006 - 2007	Yes	Yes
Ohia Estates	Reduction of invasive species	Multiple agencies	Cooperative Funding	2006 - 2007	Yes	Yes
Ohia Estates	Continued fire prevention education and outreach	Multiple agencies	Cooperative Funding	2006 - 2007	Yes	Yes

Table 12. *Original Volcano Projects List 2006*

Updated Volcano Project List 2008-2009						
Community, structure or area at risk	**Project**	**Agency / landowner**	**Funding Needs**	**Time-table**	**Community recommend ation**	**Remains a 2014-15 priority project?**
Volcano Village	Maintenance of secondary emergency access road	HAVO	Cooperative Funding	2008-9	Yes	Yes
Volcano Village, Golf Course Community, Mauna Loa Estates, Ohia Estates	Reduction of fuel load along roadsides and in common areas	Private	Cooperative Funding	2008-9	Yes	Yes
Volcano Village, Golf Course Community, Mauna Loa Estates, Ohia Estates	Reduction of invasive species	HAVO, Private	Cooperative Funding	2008-9	Yes	Yes
Volcano Village, Golf Course Community, Mauna Loa Estates, Ohia Estates	Continued fire prevention education and outreach	Multiple Agencies	Cooperative Funding	2008-9	Yes	Yes

Table 13. *Updated Volcano Projects List 2008-2009*

Plan Implementation and Maintenance

Because of the non-regulatory nature of the CWPP, the relevance and effectiveness of the Volcano CWPP and its subsequent updates rely heavily upon community initiative and agency involvement. Expertise, technical support, and implementation assistance will be provided by the appropriate agencies and organizations involved in fire issues in the Volcano Area, and area residents are urged to contribute their time and effort to implement the actions they self-identified in Volcano CWPP planning and update processes.

Hawaii Wildfire Management Organization, in cooperation with the Big Island Wildfire Coordinating Group, is available to provide technical support, identify and coordinate funding when possible, and serve as a centralized resource for wildfire risk reduction efforts in Volcano. Together, representatives will continue to prioritize and recommend funding for projects, document the successes and lessons learned from those projects, and evaluate and update the CWPP as needed.

Hawaii Wildfire Management Organization 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 additional community involvement in implementing the actions identified in this plan.

Many Volcano 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.

The following County, State, and Federal representatives have a high level of interest in the protection of the Volcano area from wildfire, and have reviewed and support this CWPP. Contact information for principal government stakeholders is listed below.

County:

Hawaii Fire Department
Darren Rosario, Fire Chief
25 Aupuni St. #2501 Hilo, HI 96720
(808) 932-2903

Hawaii County Civil Defense
Darryl Oliveira, Administrator
920 Ululani St. Hilo, HI 96720
(808) 935-0031
doliveira@co.hawaii.hi.us

State:

Department of Land and Natural Resources, Division of Forestry and Wildlife
Lisa J. Hadway, Administrator
1151 Punchbowl St., Room 325, Honolulu, HI 96813
(808) 587-4173
Lisa.J.Hadway@hawaii.gov

Federal:

National Park Service
James Courtright, Fire Management Officer
Hawaii Volcanoes National Park & Pacific Islands Network
(808) 985-6042
James_Courtright@nps.gov