

Glenwood Community Wildfire Protection Plan



October 2007

Signatories


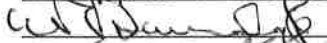



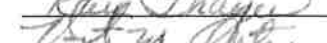
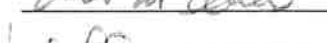


	Glenwood Community Council Chair
	Glenwood Fire Commissioner
	Glenwood Fire Commissioner
	Glenwood Fire Commissioner
	Klickitat County Commissioner
	Klickitat County Commissioner
	Klickitat County Commissioner
	Fuels Manager, Yakama Nation
	State Forester, Washington State DNR

Table of Contents

Executive Summary and Recommendations	1
Introduction	2
Background on CWPP Development.....	2
CWPP Objectives.....	2
Planning Process	3
Community Overview	6
Community Description.....	6
Land Management-Ownership.....	7
Climate.....	7
Population and Demographics.....	8
Transportation.....	8
Additional Infrastructure.....	9
Fire History in the Glenwood Area.....	10
Community Assessment	12
Structure Ratings/SCA Findings.....	12
Ignition Sources and Risks.....	13
Emergency Preparedness	16
The Bi-County Plan and Klickitat County Emergency Management Plan.....	16
Evacuation Routes.....	17
Incident Access (Ingress/Egress).....	17
Local Suppression Resources.....	17
Staging Areas and Safety Zones.....	18
Mitigation Strategy	18
Define Boundaries.....	19

Define Zones.....	19
Structure Preparation/Defensible Space.....	20
Maintenance and Follow Up.....	22
Enhance Local Response Capabilities.....	22
Community Education.....	23
Appendices	24
Appendix A: Glossary of terms and acronyms.....	24
Appendix B: Participants List.....	25
Appendix C: Ownership Map.....	26
Appendix D: Glenwood Climate Data.....	27
Appendix E: Glenwood Community Census Data.....	28
Appendix F: Infrastructure.....	30
Appendix G: Fire Starts (2000-2006).....	32
Appendix H: Fire Regime and Condition Class.....	33
Appendix I: SCA Risk Rating Maps.....	34
Appendix J: Glenwood RAMS Assessment Background Data and Community Information from Bi-County Plan.....	35
Appendix K: Emergency and Other Contact Information.....	37
Appendix L: Suppression Resources.....	37
Appendix M: Sample Washington DNR Specifications for Shaded Fuel Breaks.....	38
Appendix N: Potential Projects List.....	39
Appendix O: Current and Recent Fuel Breaks.....	40
Appendix P: Defensible Space Information (insert) from Firewise Communities and Applegate Fire Plan.....	42
Appendix Q: Resources for Local Landowners.....	43

Executive Summary

Background on the Glenwood community and physical characteristics of the area are given in an effort to describe the setting in which planning for wildfire risk reduction and suppression will occur. The planning area has averaged over six fires per year from 2000-2006, yet has avoided any wildfires larger than 44 acres in this time period. The most common ignition source is debris burning. Fifteen structures (6%) were rated as “extreme” in an analysis of fire risk conducted by a survey crew in 2005.

Recommendations resulting from the development of this plan are summarized as the following:

- Continue to develop and maintain strategically placed fuel breaks focusing projects in high priority areas (p. 20) and using community developed project list (Appendix M);
- Provide support to landowners desiring to address issues of individual property risk and structural ignitability;
- Enhance local response capabilities through improved communications, equipment, infrastructure and training;
- Conduct community outreach activities to raise awareness as to the need for individual and community action to address wildfire risk;
- Periodically review and revise this Community Wildfire Protection Plan in order to most accurately reflect needs and concerns related to wildfire in the Glenwood Valley.

I. Introduction

Background on CWPP Development

Nationwide, Community Wildfire Protection Plans (CWPP's) have received increasing attention since the enactment of the **Healthy Forests Restoration Act (HFRA)** in 2003. Via the CWPP, the Act provides communities with a tool for addressing wildfire hazards in the wildland-urban interface (WUI). In the spirit of the HFRA and CWPP, fuel reduction project planning for WUI areas should be linked to CWPP's that identify areas for treatment through a transparent and public process.

At the county level, in 2005 Klickitat County officials undertook a process jointly with Skamania County to develop a bi-county CWPP that among other things would serve as a framework within which more localized CWPP's would be created¹. Interest in a Glenwood CWPP surfaced at roughly the same time. The Washington State Department of Natural Resources had received a sizable grant through the Bureau of Indian Affairs to reduce hazardous fuels in wildland-interface zones near the communities of Glenwood and Georgeville. Local representatives were concerned that there was little input in identifying potential projects and requested that some of the funding be allocated to support the development of a CWPP. A contract was awarded to Mt. Adams Resource Stewards, a local non-profit organization, in the spring of 2006, to work with the local fire district officials and the community and ultimately write the plan.

CWPP Objectives

The bi-county plan discusses how, "Risk reduction strategies are most effective when organized at the local level. Through community-based fire planning it is possible to address the specific values and needs of a local community and to build citizen awareness of the dangers of living in a fire prone area."² It is with this goal in mind that the Glenwood CWPP has been developed.

Supportive of this goal, the HFRA outlines at a minimum three objectives for the CWPP.

- Collaboration
- Prioritized fuel reduction projects
- Treatment of structural ignitability

First, **collaboration** is to guide the development of the CWPP. Collaboration should involve local and state governments, state entities responsible for forest management, local fire departments, relevant federal agencies and other interested parties.

¹ Klickitat and Skamania County, Washington Community Wildfire Protection Plan (CWPP) *Draft*, March 28, 2006

² Klickitat and Skamania, Washington CWPP.....

Prioritized fuel reduction projects are a second requirement of a CWPP. Identified and prioritized areas for fuel reduction also should be accompanied by recommended types and methods of treatments.

Lastly, **treatment of structural ignitability** needs to be addressed. The CWPP needs to suggest measures that home owners and community members can take to reduce the risk of loss to property from wildfire.

II. Planning Process

The planning process for development of the CWPP is clearly outlined in the publication: “Preparing a Community Wildfire Protection Plan: A Handbook for Wildland-Urban Interface Communities”, produced in 2004 with the sponsorship of the National Association of State Foresters, Society of American Foresters, National Association of Counties and Communities Committee. The process does allow for flexibility, and drawing from other CWPP’s and feedback from individuals with plan development experience, the following process resulted:

Step One: Convene Decision Makers

The initial step involved the formation of a steering committee with representation from local government, the Glenwood Volunteer Fire Department and relevant land management agencies. These core members are to guide the development of the plan, as well as mutually agree on the contents of the final plan.

The Glenwood CWPP Steering Committee included:

Jim Schleusner, Chief, Glenwood Volunteer Fire Department/Glenwood Community Council

Gary Anderson, Assistant Chief, Glenwood Volunteer Fire Department

Molly Linville, Conboy Lake NWR (USFWS)

Pete Stocks, Washington State DNR, Klickitat District Manager

Joe Weeks, Washington State DNR

Brent Demko, Yakama Nation Fuel Program Manager

Bob Beveridge, Chair, Glenwood Community Council

Step Two: Establish Planning Area and Initial Prioritization of Areas for Treatment

The Glenwood CWPP planning area was derived from the Glenwood polygon used in the bi-county plan. Slight alterations were made to this polygon given the opportunity for more thorough local input. Considerations of dominant weather patterns that would influence fire behavior, ingress/egress routes, safety zones and local economic values led to these alterations.

Specific to the Glenwood CWPP, steering committee members also discussed pre-incident/preparatory planning that will identify important access and escape routes, safety zones, accessible water resources, heli-spots, specific measures for resource and property protection (such as locating range cattle) and other features that would be of use to an incident management team. Furthermore, the Glenwood CWPP seeks to satisfy a number of needs identified in the bi-county plan that were left to be specified by individual community plans.

Treatment areas were prioritized based on their proximity to structures and areas of high value to the community (i.e. water sources – domestic and agricultural supplies, campgrounds, powerlines, roads, etc.).

Step Three: Community Outreach and Education

Outreach was conducted to community members and relevant landowners, groups and organizations to seek their input and feedback throughout the plan development process. Initial contact was made through phone calls, a newsletter and a community meeting. A general timeline of events and efforts made to involve community input and inform them of progress is listed below.

Table 1. Timeline for community outreach and notification efforts for Glenwood.

Timeline	Activity
May 2006	Brief description of project in Mt. Adams Resource Stewards newsletter sent to all community members followed by a general community meeting in which the project was briefly introduced
September-October 2006	Contacted local landowners individually to inform of process and invite to meeting
November 2006	Fliers posted in community inviting residents to participate in planning meetings
March 2007	Community outreach meeting to publicize draft and seek additional input
July 2007	Request to stakeholders for final input and suggested modifications to draft

A list of participants at the meetings is included in Appendix B.

Step Four: Community Risk Assessment and Feedback

Data as part of a community risk assessment were obtained by the Glenwood Fire District with the help of a Student Conservation Association (SCA) crew during the summer of 2005. The SCA crew conducted surveys that included home visits and structural ratings according to a standardized National Fire Protection Association rating form. More detailed information from their report can be found in the “Community Assessment” portion of this CWPP, as well as in Appendix H.

The community outreach efforts associated with the development of this CWPP will share some of this information in an effort to gain feedback from the community as to the accuracy of the data.

Step Five: Review Emergency Preparedness

Steering committee members engaged other interested parties in a prioritization process for potential projects. Recommendations for reducing the ignitability of structures were discussed and additionally, emergency preparedness and fire response capability was addressed. A list of available equipment was also produced.

Step Six: Develop Mitigation Strategy and Recommendations

Steering committee members worked to identify timelines, responsibilities and funding opportunities for implementation of the CWPP.

Step Seven: Finalize the Community Wildfire Protection Plan

Final draft was generated for approval by all steering committee members. Approval of the final CWPP by the appropriate state/federal agencies is then pursued. The CWPP will be made available to the public through the Glenwood Fire Department.

Step Eight: Periodic Review Process

Ideally, the plan will be reviewed on an annual basis with major reviews every five years. Annual reviews will allow for assessment of how the plan is being implemented and what near term changes have occurred that need to be considered in wildfire protection planning. Major five year reviews will allow for more significant modifications in the CWPP that will be necessary for a community reacting to new residential and industrial developments, as well as changing attitudes and needs of the population base.

III. Community Overview

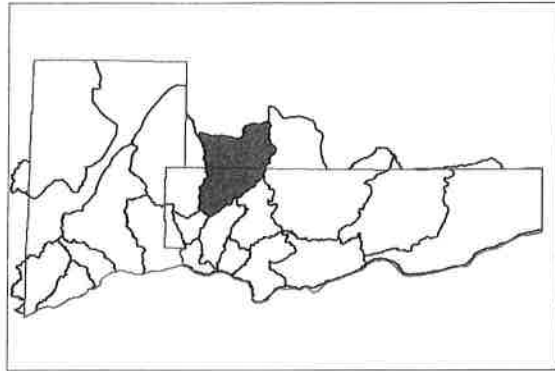


Fig. 1. Location base map: The Glenwood “polygon” is depicted in red (Source: The Klickitat and Skamania County Community Wildfire Protection Plan 2006). *Note:* Slight modifications were made to this polygon by participants in the Glenwood CWPP development process to better reflect concerns held by area residents and land managers.

A. Community Description

The town of Glenwood is located in the northwestern portion of Klickitat County in southcentral Washington. Glenwood is approximately 37 road miles north-northeast of Hood River, Oregon. The community is scattered across a broad valley running southwest-northeast, with dramatic views of Mt. Adams to the northwest. The landscape is dominated by forestland, both industrial and public, agricultural lands and wet meadows associated with the Conboy Lake National Wildlife Refuge. Elevation of the town of Glenwood is approximately 1900 feet. Other notable features include the Klickitat River Canyon several miles to the east, the Gifford Pinchot National Forest to the west and the Columbia River Gorge to the south.

The Glenwood Community Wildfire Protection Plan addresses wildfire protection concerns across over 117,000 acres of wildland urban interface and rural lands spanning two counties (Klickitat and Yakima County). This “polygon” of the Glenwood Area is referred to herein simply as “Glenwood”. These lands are viewed as relevant to the Glenwood community because of their economic, cultural, historical and practical relations to those living in the Glenwood Valley today. They are also not part of lands considered under a CWPP developed by another community.

B. Land Management - Ownership

Specific ownership data were gathered for Glenwood lands that fall within Klickitat County and close approximations were made for lands within Yakima County. Appendix C includes a map of Glenwood lands broken into four categories:

- public-tribal
- industrial timberland
- non-industrial private

Presented in figure 2 is a relative comparison of the amount of land under each ownership category. Nearly half of Glenwood lands are considered publicly or tribally owned and managed, with the principal public agencies involved being the Washington State Department of Natural Resources, the United States Fish and Wildlife Service (Conboy Lake National Wildlife Refuge) and the Yakama Nation/Yakama Agency Bureau of Indian Affairs.

The primary industrial landowners/managers are Hancock Timber Resources, SDS Lumber and Longview Fiber. The largest non-industrial private landowner in Glenwood is the Kreps Family.

It should also be noted that the Yakama Nation, Hancock Forest Management and the US Fish and Wildlife Service have fire management plans for lands they manage in the Glenwood Area.

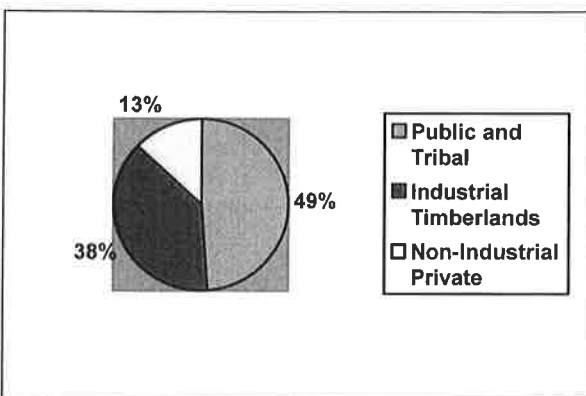


Fig. 2. Approximate ownership comparison for Glenwood.

C. Climate

Climate data for Glenwood is summarized in tabular form in Appendix D. The Columbia River Gorge plays a major role in local weather patterns, funneling systems off the Pacific to the interior Columbia Basin. Glenwood's climate is typified by cool, wet winters and warm, dry summers with annual precipitation averaging 31 inches per year – the majority occurring between the months of October and March. The valley experiences a mountain effect, with weather systems influenced by the 12,000 plus foot

Mt. Adams. A mild orographic effect induced by the Cascade Range is responsible for the drier climate compared with areas at similar elevations to the west.

Especially relevant to wildfire concerns are local wind patterns. In addition to typical diurnal movements, three distinct wind patterns can affect Glenwood. The most common are westerly winds that accompany the passage of cold fronts and marine systems moving in from the Pacific. During periods when high pressure ridges are present over the Pacific Northwest, easterly winds may occur. The Klickitat River Canyon is a significant enough geographical feature to influence local wind patterns as well, with up and down canyon winds associated with the canyon occurring somewhat regularly.

D. Population and Demographics

A summary of this census data is presented in Appendix E.³ Glenwood has just begun to experience demographic changes similar to many areas in the rural western United States, but to a much lesser extent than other communities in the area, such as Trout Lake to the west. Many of Glenwood's residents continue to have deep ties to the valley as second or third generation inhabitants. Anecdotally, it appears that the population has remained fairly stable over the past decade, with a loss of working class families and an increase in numbers of people retiring to the area. The 2000 census data for the Glenwood area indicated a population of 522 residents and 244 housing units.

The Glenwood population is dominated by middle class Caucasian families. Native Americans comprise a significant group in the community (13.2% - 2000 census), due in large part to the proximity of Glenwood to the Yakama Indian Reservation.

E. Transportation

Transportation infrastructure is one of many factors likely responsible for the rural nature of the Glenwood Valley and the fact that it has undergone less development than similar communities. The Glenwood Valley has no shortage of roads, but many of them are unpaved, seasonal roads constructed mainly to support logging operations that have occurred in the valley for decades. In fact, someone not familiar with the area might be deceived by several Glenwood roads labeled "highways" – that are in fact county roads that have many of the hazards typical of roads in out-of-the-way places (poor visibility, no shoulders, range cattle, etc.). Figure 3 illustrates the complex network of Glenwood roads.

³ Source: Census 2000 Summary File 3/prepared by the U.S. Census Bureau, 2002 (www.census.gov). September 17, 2002. Prepared by: Patrick Malone, INW Program Associate, Partnership for Rural Improvement, 509.533.4706

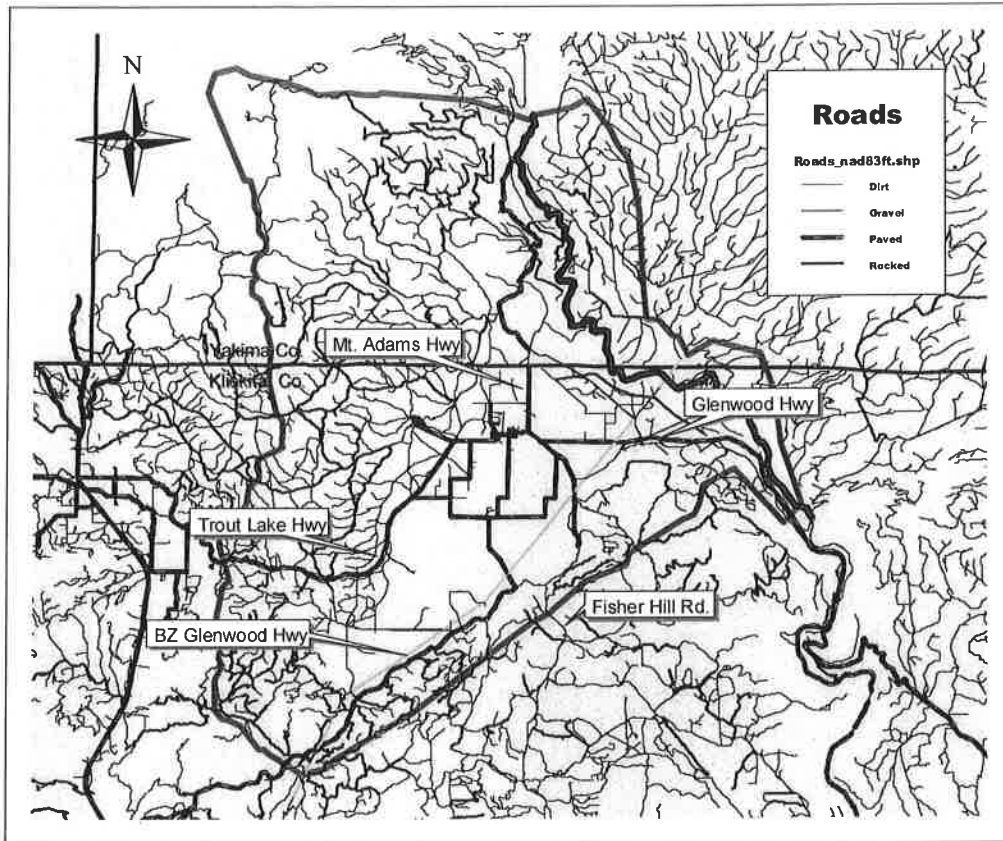


Fig. 3. The Glenwood road network with more major roads appearing as heavier lines. The BPA Transmission Line corridor appears as a yellow line and the Klickitat River in blue.

The Klickitat River, while not used for commercial transportation, is an active transportation corridor in so much that rafters, kayakers and outdoors enthusiasts run the river or its banks in pursuit of their sport. It is also an important anadromous fishery.

Effective transportation routes are essential to effective fire suppression and response, and they must be protected for access and evacuation purposes. Yet they can also be problematic in acting as sources of ignitions. Several small fires in recent years have been associated with road corridors and the Klickitat River.

F. Additional Infrastructure

“Facilities critical to emergency response and recovery activities include 911 centers, emergency operations centers (EOCs), police and fire stations, public works facilities, sewer and water facilities, hospitals, bridges, roads, and shelters.”⁴

⁴ Josephine County Integrated Fire Plan

Additional infrastructure exists that is essential to wildfire planning and includes:

Glenwood K-12 School
Glenwood Ranger Station, Yakama Agency, Bureau of Indian Affairs
Klickitat County P.U.D. Sub-station
Klickitat County Public Works Department, Glenwood Shop
Bird Creek Campground and Island Camp Shelter
Hellroaring Irrigation Ditch
Klickitat Salmon Hatchery
Glenwood Post Office
McCumber Springs/Glenwood domestic water supply
Local businesses that include two small groceries, a gas station, a hotel and two bed and breakfasts/retreats, a restaurant and a bar.
Camp Draper/Draper Springs
BPA Transmission Lines

Maps detailing some of this and other infrastructure in Glenwood are presented in Appendix F.

G. Fire History in the Glenwood Area

Historically, fire played a much greater role across the Glenwood Valley than it does today. Summer lightning storms and native peoples clearly established the presence of fire as a force that shaped the area's forest and non-forest habitats. Native peoples used fire to improve forage for wildlife and maintain forests in an open condition that facilitated hunting and traveling. Records from the late 1800's support the claim that many of the valley's forested stands were much more open grown and park-like, explainable by years of what were likely frequent, low-intensity underburns. One pine that was harvested near Trout Creek in 1959 and analyzed for fire scars indicated at least 13 different fires between the years of 1807 and 1935.⁵

With the arrival of Euro-American settlers in the 1870's and the large numbers of livestock (sheep and cattle) that soon followed, forest fuel conditions changed rapidly. Initially, the combination of reduced ground fuels due to widespread grazing, combined with what were likely crude but effective suppression methods by the valley's first non-native residents, the role of fire in the area was effectively reduced.

Between 1893 and 1895 a massive white pine butterfly (*Neophasia menapia*) outbreak, followed by a western pine beetle epidemic led to loss of an estimated billion board feet of mature ponderosa in the Cedar Valley area east of Glenwood.⁶ It would be expected that fuel loadings and fire severity would have increased in the years immediately following.

⁵ Weaver, H. 1961. Ecology, Vol. 42, No. 2.

⁶ Weaver, H. 1961...

With the emergence of the timber industry in the early twentieth century, Glenwood's forests experienced different changes. At first, widespread selective logging and the development of transportation infrastructure (by rail and road) likely increased the number of human caused ignitions. But suppression was also aided by these improvements in transportation, and fires would have rarely grown to a size that threatened the community or resources.

Forest structure and composition was also altered during this time period by the selective removal of more fire resistant, large diameter ponderosa pine, and the subsequent release of more shade tolerant Douglas and grand fir that had prospered in the absence of regular ground fires. Fuel loadings inevitably increased in this scenario.

In the latter part of the twentieth century a shift in industrial forest management to even-age management with a growing commercial preference for Douglas-fir over ponderosa pine again changed the dynamics in area forests. In many ways this has reduced the risk of wildfire, but it has been far from eliminated.

Forest health issues are still a major concern in the area with *Armillaria* and other root/tree pathogens, defoliators such as the western spruce budworm, bark beetles and dwarf mistletoes all playing major roles in stand dynamics. These issues tend to be more significant on public and tribal lands, many of which are still managed under the uneven-age management paradigm, that are dispersed across the Glenwood landscape.

Recent fire history includes several more significant incidents. None, however, impacted or threatened the wildland-urban interface. The Gifford Pinchot National Forest dealt with project fires in recent years: the Salt Creek Fire (2001) and the McDonald Complex (2004). These fires impacted resources with greater value to the Trout Lake Community than Glenwood. However, had they not been controlled they had the potential to burn into the Glenwood Valley.

In 2002, Glenwood experienced a significant fire event along the Klickitat River caused by river rafters. The fire was controlled through extended initial attack suppression efforts. It burned approximately 39 acres with fire spread from the bottom of the canyon to the top, toward Glenwood. Response to the incident was aggressive and effective with retardant and water drops provided by aircraft and hand crews lining the fire the first day. Losses were limited to a relatively small amount of timber, much of which would likely have never been logged due to its location on steep canyon slopes.

In September, 2006 lightning ignited the Jungle Butte Complex on Yakama Tribal lands to the northeast of Glenwood. A Washington State Type 2 Team managed the incident. Again, losses were limited to timber values, although a timber sale to salvage the material is already underway. However, strong winds from the north-northeast could have pushed the fires into Glenwood.

Dry conditions consistently bring small fires to the valley. Between 2000 and 2006 thirty-one fires were reported for the portion of the Glenwood polygon that lies within Klickitat County. The largest incident in acreage was 44 acres (a lightning caused fire on 8/13/01 for which a name was not available) and ignition sources were varied and dominated by human causes. Fires for Klickitat and Yakima County between 2000 and 2006 are presented in Appendix G.

Fire experts have developed rating systems for classifying specific areas by historic **fire regime** and the degree to which they have departed from historical cycles (**condition class**).⁷ Northwest Management Inc. recently completed a report for the Yakama Nation Fuels Program that rated the Glenwood Valley as having a **Fire Regime 1** – low intensity fires every 0 to 35 years. “Condition class is an area that maintains its historical fire regime. Condition Class II is an area that has departed from its fire regime by 1-2 cycles. Condition Class III is when an area is off by more than two natural fire intervals. **Condition Class II** occurs around much of Glenwood, with some outlying sections in **Condition Class III**, and a small patchwork of Class I, and a considerable amount of agricultural land.”⁸ A map from the Northwest Management report is visible in Appendix H. The Bi-County Plan includes maps on fire regime and condition class as well.

IV. Community Assessment

Crucial to any wildfire preparedness plan is a complete understanding of the degree of fire risk in the wildland-urban interface. This risk is described in terms of the structures that could be threatened, ignition sources typical to the area and local wildfire hazards. Hazards include a detailed description of fuels conditions in addition to an understanding of other local hazards.

A. Structure Ratings/SCA Findings

As mentioned, the Glenwood Fire Department collaborated with Student Conservation Association (SCA) crews interning with the Yakama Nation Fuels Program to survey the Glenwood Community’s structures in August of 2005. Teams of 2-3 people spent several days in the valley, coordinating with the local fire department, locating structures with global positioning system (GPS) equipment and rating structures using the standardized National Fire Protection Association (Revised NFPA 299) form for risk assessment. The following information is excerpted from the SCA report:

“The Glenwood community consists of approximately 253 structures”...”Most of the homes in the community are situated in the Wildland/Urban Interface putting them at an elevated risk to the threats of wildland fire. By completing an assessment of the structures in the community using the NFPA form, the overall risk for the area can be determined. Each structure is scored on the basis of the assessment and the scores are

⁷ <http://www.frcc.gov/>

⁸ Student Conservation Association (SCA) Report (2005)

categorized in order to determine the severity of the risk. The scores are divided as follows: 0-49 low risk, 50-68 is moderate risk, 69-83 high risk, and 84 and above is extreme risk.”

“After analyzing the data gained from completing the home assessments, it was determined that the community had an average NFPA score of 59.7. This correlates to the community having an overall moderate risk. Scores of the individual structures ranged from 25 to 102. While the average risk is moderate, a breakdown of the percentage of homes in each of the risk categories (shown below) shows that 32% of the homes are at high or extreme risk.”

Table 2. Summary table for Glenwood survey completed by SCA crew in 2005⁹.

Quantity	Percentage of Total	NFPA Score	Risk Rating
61	24%	0-49	Low
112	44%	50-68	Moderate
65	26%	69-83	High
15	6%	84+	Extreme

“The specific areas that have the highest and the lowest risk could also be determined from the data analysis. The most at-risk area is along Bird Creek Road. This includes all homes along Bird Creek Road as well as Surface Road, Scott Road, Bird Lane, McCutcheon Lane, Pine Vista Road, and the Glenwood Ranger Station. The average score for this area is 62. The other area that stood out as being a higher risk area was along Mt. Adams Highway. This area included all the homes along Mt. Adams Highway, Staack Lane, Stewardship Forest Lane, Hathaway Lane, Kuhnhausen Lane, Ladiges Road, Flying L Lane, and Lloyd Lane. The average score for this area is also 62. Other areas that had an elevated risk were along Lakeside Road, and the Southwestern portion of BZ-Glenwood Highway. The area with the lowest risk was the downtown area. The average score for that area was 53. The other area that had a lower risk was along the Northern portion of BZ-Glenwood Highway.”

A map generated by the SCA crew displaying the risk ratings for structures in the Glenwood Valley is included in Appendix I.

B. Ignition Sources/Risks

As is clear from the review of fire history in Glenwood Area, wildfire can be both natural and human caused. A thorough understanding of potential ignition sources is crucial to the planning process. Nationwide, more wildfire ignitions occur due to human activities versus natural causes, but both warrant consideration.

⁹ SCA Report

Appendix J illustrates responses used in the RAMS (Risk Assessment and Mitigation Strategies) modeling conducted for the Glenwood Area by Bill Alexander Forestry in conjunction with the Bi-County Plan. While the accuracy of some of these responses is debatable, this information provides some insight into how ignitions and risk can be assessed.

Figure 4 depicts a map that reflects the past six years of state data on fire ignitions in the Glenwood polygon. Point locations of past fire starts were not available, but location as specific as township-range-section was available. White (non-colored) sections experienced no reported ignitions since 2000; darker sections experienced multiple ignitions. Following is a more detailed discussion of specific sources of ignitions.

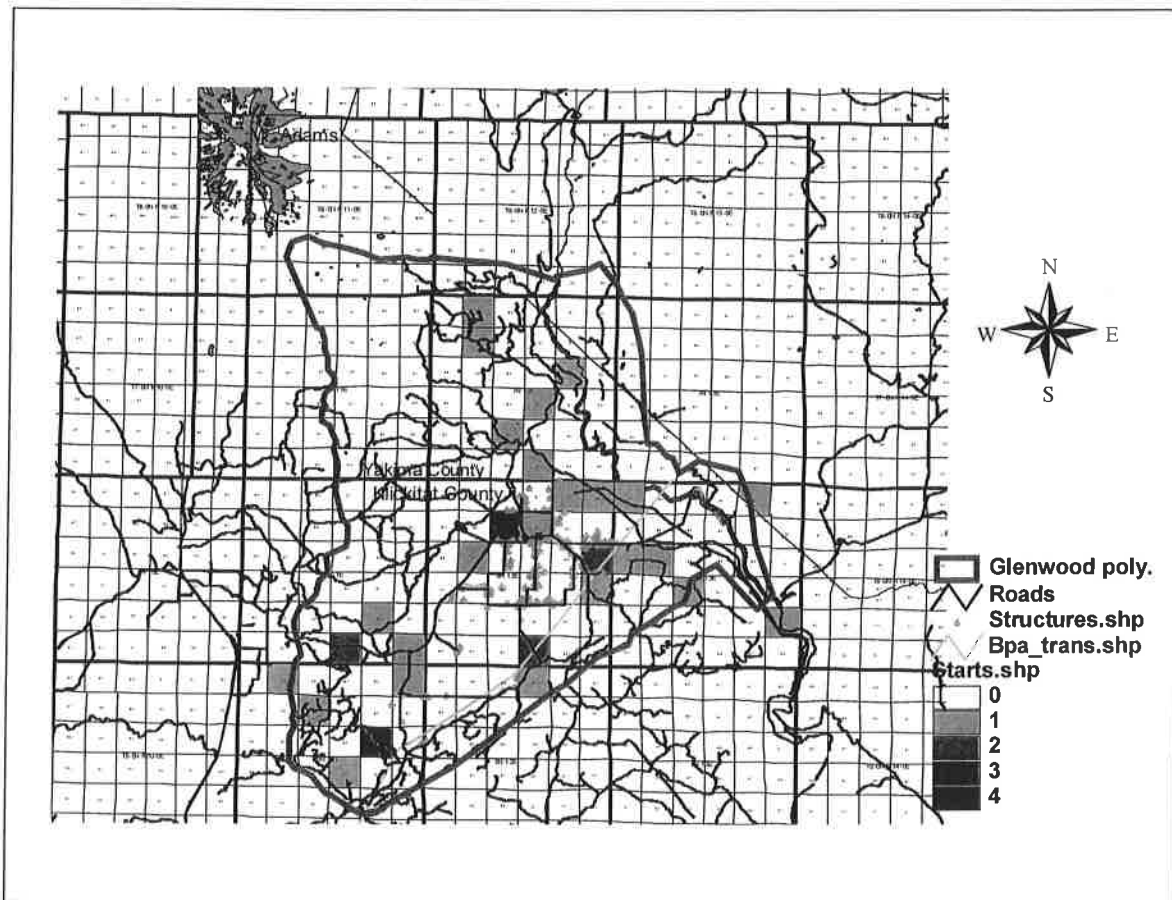


Fig.4. Ignitions per section for the Glenwood Polygon within Klickitat County, 2000-2006. Structures are visible as orange symbols, the BPA transmission line as a yellow line.

1. Lightning

Weather systems that bring lightning after dry, summer periods of weather are a common source of ignition in the Glenwood Area. Since 2000, of reported fire starts in the Glenwood polygon of Klickitat County, 3 out of 30 fires were due to lightning. Dry

lightning events are particularly threatening, but most systems that track through the Glenwood Area carry at least some precipitation. Any precipitation increases relative humidities and at least temporarily increases fine fuel moisture content – hopefully enough to give firefighting resources more time to suppress the start. The more significant fire events in the Glenwood Area over the last ten years that were lightning sparked occurred via the more unusual dry lightning events.

2. Debris Burning

Over the past six years in Glenwood, debris burning has been the most common human source of ignitions. Debris burning-caused fires range from holdover slash piles to fires that escape homeowners burning trash, grass and leaf litter. Burn bans try to alleviate much of this problem, but are sometimes ignored or put in place too late or lifted too early. Debris burning is an especially sensitive issue in the Glenwood Area as many landowners have effectively managed their lands for years using fire to reduce fuels and clean up waste. But there always exists the potential for human error or inexperience in the application of fire. The DNR has recently begun a more heavy-handed enforcement of rules governing debris-burning, requiring landowners to have permits and clearance before burning takes place. The unfortunate side effect is that some landowners may become discouraged from conducting their usual “maintenance burns” that effectively reduce fuels. An identified role for the local fire department is to work with landowners to burn more safely, possibly with support from the fire district.

3. Recreation

Recreation has been the second most common cause of fires in the Glenwood Area in recent years and responsible for the 2002 Big Muddy fire (caused by stranded kayakers). Recreational causes are often associated with campfires, hunters, fireworks and off road vehicles. While mitigation efforts can be made via fuels reductions around area campgrounds, more dispersed forms of recreation are much more difficult to manage as sources of fire ignitions. Extensive outreach, education and collaboration efforts to those recreating need to be made.

4. Travel Corridors

Roadways are another common source of ignitions and are usually responsible for a couple of fires per year in the Glenwood Area. The most common scenario involves burning material, such as cigarettes, discarded or dropped from passing vehicles and igniting roadside vegetation. Education and roadside fuel breaks are the most effective mitigation measures for this threat.

5. Forestry Operations

In addition to the burning of debris associated with timber harvesting and forest management activities, ignitions associated with equipment and people operating in the forest are a concern. Chainsaws, feller bunchers and other equipment with rapidly

moving metal parts can all produce sparks that under the right conditions can cause fires. A number of precautions are taken to avoid causing fires that include everything from spark arrestors to an industrial fire precaution level (IFPL) system that governs the timing of closed fire seasons and use of particular types of equipment. Contractors are often required to have fire suppression tools accessible near their forestry operations. The likelihood and severity of wildfire is effectively reduced through these measures, but fires do still occur. Continued diligence is essential. Given the prevalence of activities associated with forestry and timber harvesting in the Glenwood Valley this is a source worthy of consideration in wildfire protection planning efforts.

6. Power Lines

Powerlines are another important consideration in our CWPP development efforts, as they have been the source of at least two fires in recent history. Powerlines are not only a potential source of wildfire, but they can complicate fire suppression efforts due to the threat of arcing when engulfed by dense smoke, presenting a safety hazard to firefighters. These areas need maintained fuel breaks and buffers. One issue facing the Glenwood Valley is poor accessibility to many powerlines, particularly on the Conboy NWR where flooding inhibits access.

V. Emergency Preparedness

A. The Bi-County Plan¹⁰ and Klickitat Co. Emergency Management Plan

The Klickitat and Skamania County, Washington Community Wildfire Protection Plan (The Bi-County Plan) should provide a framework into which the local CWPP's are organized, providing context and greater meaning to a hierarchy of plans. The Bi-County Plan should also address wildfire protection issues that fall in between community emphasis areas to provide continuity for protection needs across the landscape. As the current Bi-County Plan stands in draft form, little of this is realized.

One of the useful products of this plan has been the RAMS modeling and resultant ranking of communities that has allowed for some prioritization to be given in addressing needs in the county. The Glenwood Community was identified as one of four communities rated as "extreme" in a hazard and risk composite ranking for Klickitat County.

A summary of Glenwood data that appeared in the Bi-County Plan is included in Appendix B. Population data provided are inaccurate, but some of the other information provided, such as the dominant fire regime and condition class, is helpful.

¹⁰ Klickitat and Skamania County, Washington Community Wildfire Protection Plan (CWPP) *Draft*, March 28, 2006

The Klickitat County Emergency Management Plan is currently being revised and is in draft form. Trout Lake's CWPP cited several elements included in the county emergency management plan, but this was decided against for the Glenwood CWPP given the current status of the county plan. The Glenwood CWPP could become an appendix to the new county emergency management plan.

Future revisions in the Glenwood CWPP should include items that are detailed in the county emergency management plan, such as communications. It is anticipated that future plans (the new county plan and revisions to this plan) will clearly identify means by which the county and local emergency response personnel will communicate. Some emergency contact information is provided in Appendix K.

B. Evacuation Routes

Evacuation routes are a necessary consideration given the possibility of an extreme fire event that would force the evacuation of part or all of the community. Logical evacuation routes are depicted in figure 3, and would take into consideration the location and direction in which the threat is moving. The most likely alternatives are the major transportation routes already discussed – the Glenwood-BZ Highway (southwest), Glenwood-Trout Lake Highway (west) and the Glenwood-Goldendale Highway (east).

Primary evacuation routes for the Glenwood Valley are the Glenwood-Goldendale Highway to the east and the Glenwood-Trout Lake and Glenwood-BZ Corner Highways to the west and southwest, respectively. These are paved county roads. A gravel road exits the valley to the south – Fisher Hill Road. The Mt. Adams Highway heads north to the closed portion of the reservation and is paved in sections until meeting up with the reservation boundary, at which point it turns to gravel.

C. Incident Access (Ingress/Egress)

There are numerous gravel and unimproved roads in the valley as well that could serve as ingress/egress options for incidents. Many private logging roads in the area are gated and access can often be obtained by contacting the appropriate owner. Also worthy of consideration are road abandonment plans that may be adopted by landowners and managers. Future CWPP revisions and updates need to take any road changes into consideration in an effort to provide the most up-to-date information possible.

Effective ingress/egress routes need to provide safe travel corridors for resources responding to an incident, and improving the quality of these corridors by developing roadside fuel breaks for essential routes is addressed in the "Fuel Breaks" section of the Mitigation Strategy.

D. Local Suppression Resources

Local suppression resources have been adequate when responding to single incidents in the absence of extreme fire weather conditions. However, there is concern that if multiple fire starts or extreme fire weather were to occur local capacities for response could quickly become exceeded. Local suppression resources are available through the

local, state and federal agencies as well as local private contractors with suppression capabilities. Response times depend on the location of both the incident and the responders and could vary from several minutes to hours. A detailed list of potential suppression resources is available in Appendix L.

E. Staging Areas and Safety Zones

Staging areas serve as an area to where people can be evacuated or can go to obtain more information. Resources can also be staged at this location and it could serve as an incident command post (ICP). The Glenwood School has the qualities of a good staging area and pre-incident coordination and planning with the school district needs to occur.

Safety zones are essential in incident and pre-incident action planning to prepare for a scenario where firefighting resources must retreat in a fire emergency. The discussion of safety zones is second nature for wildfire response personnel and is discussed as it relates to suppression tactics and retreat. Firefighting resources should always have access to safety zones via designated escape routes. Safety zones need to be of a sufficient size to where resources can avoid harm from extreme fire behavior without deploying emergency fire shelters. On active fires, black, recently burned areas are often used. For the purposes of pre-incident planning and community preparedness, we indicate a number of local features that could assist in safety zone designation.

VI. Mitigation Strategy

One of the most effective efforts that can be made to limit the spread and severity of a fire event by giving fire fighting resources the opportunity to efficiently suppress a fire is the strategic placement of fuel breaks. Fuel breaks, or fire breaks, are defined as “any natural or constructed discontinuity in a fuel bed utilized to segregate, stop and control the spread of fire or to provide a control line from which to suppress a fire.”¹¹

As described in the Introduction Section of this document, several fuel breaks have already been developed in the Glenwood Area via contracts let by the Washington State DNR with National Fire Plan funds administered through the Bureau of Indian Affairs office in Portland. From a local perspective, some of these fuel breaks make sense; some do not. Hence, one goal of the CWPP is to aid in determining the location and prioritization of future fuel reduction projects, as well as discuss needs to maintain past projects that the community values.

It needs to be understood that this CWPP is making recommendations as part of a planning process, not decisions to implement identified projects. Landowners and managers are encouraged to work with the local fire district and agencies responsible for land management activities, but it is understood that each owner operates under their own guidelines. The Washington State DNR, for example, cannot be held to implementing any proposed projects that are not consistent with existing or future management plans developed and approved through standard DNR proceedings.

¹¹ Wildland Fire Suppression Tactics Reference Guide, 1996

A. Define Boundaries

Initial to Glenwood's discussions of fuel break locations and prioritizations was a modification to the Bi-County Plan's Glenwood polygon – essentially, the area of consideration. The eastern boundary of the original Glenwood polygon was contracted to exclude the Cedar Valley and extended to the north along the Hellroaring Ditch into the Yakama Reservation Closed Area in order to advocate for protection of a resource of great value to the community's agricultural/ranching sector. This then becomes the exterior boundary that defines the Glenwood CWPP.

B. Define Zones

To help define areas of concern and prioritize areas of treatment a three-tiered system was developed to cover a range of activities within each zone or area.

- High priority fuel treatment areas
- Moderate to low priority fuel treatment areas
- Low to no priority fuel treatment areas

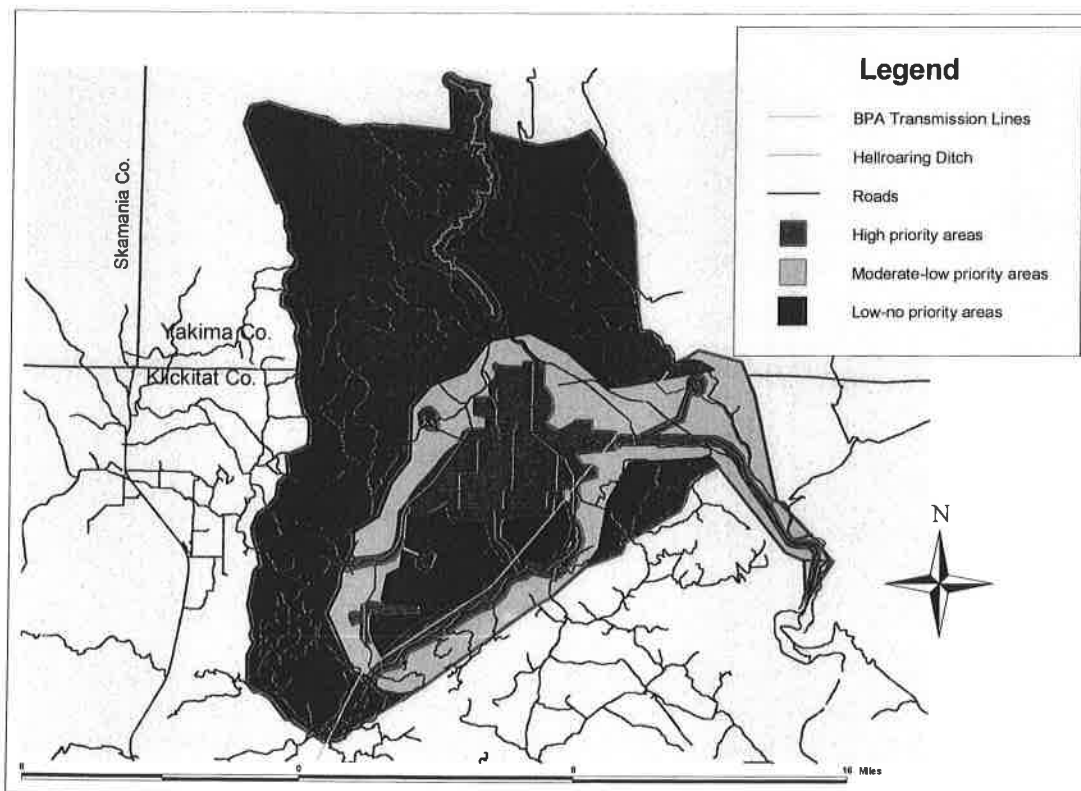


Fig. 5. Defined zones/areas reflecting priorities for mitigation strategies.

Figure 5 indicates the locations of these areas across the planning area. The prioritization of areas for mitigation strategies reflects the local concern that wildfires of greater threat would most likely approach the community from the west. Also of major concern is the threat posed by fast moving fires that could originate in flashy fuels typical of the Conboy National Wildlife Refuge. Ultimately, the community center, residences and essential infrastructure fall within high priority zones, while undeveloped lands near the CWPP boundary comprise the lowest priority zones.

High priority areas are defined as those areas where all immediate, pre-incident efforts should be focused on reducing fuels and other mitigation strategies. Fuel breaks should be wider and include more intensive treatments in order to reduce risk of fire and provide adequate ingress/egress. An example of a treatment for such an area is included in Appendix M. Logically, these areas are concentrated near structures, sources of ignition or hazards that have greater potential to threaten structures and primary transportation routes and electrical transmission lines.

Moderate to low priority areas are those areas that would benefit from fuel reduction and other mitigation efforts, but would only become higher priority if deemed to be a part of a specific incident action plan. Pre-incident fuel breaks in these areas may not involve as intense a treatment as we would recommend for our high priority areas (not as wide, less pruning, etc.).

Low to no priority areas are those areas where it would make little to no strategic sense to develop a fuel break before a fire breaks out. This would not preclude responding agencies from constructing fuel breaks in these areas as a part of their suppression efforts. The perspective that these areas have low to no priority is a reflection of their consideration in a pre-incident planning process focused on structures, infrastructure and geographic features that if planned around up front in developing fuel breaks would aid in fire suppression efforts. This area may also include fuel breaks that could be planned ahead of time, but are not implemented due to funding constraints.

An initial prioritization of Glenwood project areas is listed in Appendix N and recent and current fuel reduction projects are displayed on the map in Appendix O.

C. Structure Preparation/Defensible Space

Another important component of this plan's mitigation strategies relates to the direct protection of structures and creating defensible space.

Property owners need to understand that wildland firefighters rarely have extensive training in structure protection measures, and that structural protection efforts will be undertaken by structural firefighters when possible. When wildfire threatens an area including structures and is exceeding the capabilities of the provided suppression resources, emergency personnel engage the triage process. Triage is used in order to best focus overextended firefighting resources on structures where there is the greatest

likelihood of success. Available firefighting resources are then assigned to selected structures.

Property owners can assist firefighters and themselves by preparing their properties well in advance of a wildfire event. Property owners should create defensible space around structures and numerous guidelines exist that can assist property owners in this process. Again, an excellent resource for property owners is the Firewise website and much of the following information comes from this invaluable resource¹². The Applegate Fire Plan is also cited here for additional detail.¹³ Literature from both sources is included in Appendix P.

The Firewise Program talks about maintaining one's property in a "lean, clean and green" condition as an important step to creating defensible space. Well irrigated properties with less flammable vegetation and that are free of garbage and debris will have a much better chance of surviving a wildfire. Recommendations include creating a buffer ranging from 30 to 100 feet around structures (depending on the fuel/vegetation type and slope – see appendix), where vegetation is limited to well spaced, fire resistant species and ample space is provided for fire suppression equipment. Beyond this area, additional treatment zones should focus on breaking up continuous canopy cover and removing ladder fuels through pruning and spacing efforts. Beyond these areas of more intense treatments, forest owners should strive to maintain their forest in a healthy condition, selectively removing diseased and weakened trees, thinning stands to appropriate densities and managing to reduce surface fuels through slash abatement, prescribed fire, grazing, etc.

Additionally, emergency access needs to be provided for. This includes a driveway that is at least 12 feet wide and 15 feet of vertical clearance to provide for emergency vehicles and equipment. The vegetation should be treated along these ingress/egress routes to facilitate safe access, resembling a fuel break (thinning, pruning, removing fuels concentrations, etc.). If a suppression team were to have a structure with reasonably well prepared defensible space but dangerous access (i.e. continuous crowns that could rapidly carry a crown fire that would block their exit), safety and triage considerations would likely eliminate the structure from further consideration for protection.

Other property considerations include building materials (roofing and siding), property hazards (i.e. propane tanks, accumulations of firewood and junk/garbage, etc.) and availability of water resources.

Property owners with limited resources (i.e. funding, time, etc.) might choose to focus their efforts based on structure value, with residences and businesses garnering more preparation efforts than low value buildings.

¹² Firewise Communities: <http://www.firewise.org/>.

¹³ Balancing Act: Living with Fire in the Applegate. Applegate Communities' Collaborative Fire Protection Strategy, 2002.

D. Maintenance/Follow Up

Maintenance of fuel breaks and defensible space is a major concern. It can be difficult enough to secure funding to initially implement treatments, let alone fund the return of crews or equipment on a regular basis to maintain properties in a desirable condition. Unfortunately, it is human nature for our focus to lapse as years pass without “real life” reminders of the wildfire risk. As a community, we can strive to remain vigilant and proactive about wildfire issues, showing our interest and support in the issue and encouraging land owners and managers to do the same.

Areas of concern need to be brought forth when the Community Action Plan is updated (timeframe mentioned on p. 5). Funding needs to be aggressively pursued well in advance to take into account the time lags often associated with federal budgets that may fund maintenance efforts.

Maintenance of fuel breaks will also vary depending on the vegetation type in which they are constructed. A proposed schedule reflecting dominant understory vegetation types in Glenwood is as follows:

Table 3. Proposed maintenance schedule based on understory vegetation types.

Understory Vegetation Type	Frequency of treatment/maintenance
Canary grass	annually
Snowberry/spirea	every 2-5 years
Ceanothus/bitterbrush (locally known as chaparral/buckbrush)	every 5 years
Vine maple/California hazel	>5 years

The first two vegetation types are typical of the refuge and low, wetter parts of the valley. The ceanothus/bitterbrush types are associated with ponderosa pine dominated stands, and the vine maple/California hazel types are typical of more moist, productive sites often dominated by Douglas fir and grand fir. Additional vegetation types and plant associations are known for the area but tend to occur in areas not recommended to receive a fuel break.

E. Enhance Local Response Capabilities

Given the importance of initial attack efforts in suppressing small wildfires and preventing catastrophic occurrences, improved local infrastructure and response capabilities are an important part of this mitigation strategy. The local fire department is comprised solely of volunteers and staffing can be a problem. As the community grows, creating a paid position(s), at least seasonally/part time, would help alleviate this problem.

Currently, stakeholders to this plan communicate a need for the following:

- Communications equipment

- GPS/GIS capabilities
- Additional designated/staffed wildfire engine
- New/updated structural engine
- Hydrants
- Training

F. Community Education

The Glenwood Community has had the opportunity to benefit from outreach activities regarding wildfire preparedness in the past. In 2003 a Firewise presentation was made to the community through the WSU-Extension Office in Stevenson. Unfortunately, it was poorly attended and the majority of people that did attend already possessed at least some degree of experience in working with wildfire related issues.

The SCA crew made outreach efforts while conducting their project in 2005. Efforts included a display/booth at the Glenwood Ketchum Kalf Rodeo on Fathers' Day weekend, informative pamphlets left at the homes of residences they surveyed and interactions they had with individuals while surveying.

Additional outreach is necessary as part of the Glenwood mitigation strategy. It is hoped that the CWPP process – sharing the findings and recommendations of this report with the community – will support this need.

Community education, like updating the plan and maintaining fuel breaks, will need to be a continual process, as the community changes and more people move to the area that are unfamiliar with the relationship of the Glenwood landscape and wildfire.

VII. Appendices

Appendix A: Glossary of terms and acronyms

CWPP – Community Wildfire Protection Plan – A community derived, collaborative plan for addressing wildfire concerns within a designated planning area that at a minimum addresses fuel treatment and structural protection needs.

condition class – fire regime condition class (FRCC) is a classification of the amount of departure from the natural regime (Hann and Bunnell 2001); FRCC's include:

- low (FRCC 1),
- moderate (FRCC 2), and
- high (FRCC 3) departure from the central tendency of the natural (historical) fire regime

crown fire - The movement of fire through the crowns of trees or shrubs more or less independently of the surface fire, often associated with more extreme fire behavior

fire regime - A natural fire regime is a general classification of the role fire would play across a landscape in the absence of modern human mechanical intervention, but including the influence of aboriginal burning (Agee 1993, Brown 1995). Fire regimes are classified based on average number of years between fires (fire frequency) combined with the severity (amount of replacement) of the fire on the dominant overstory vegetation. These five regimes include:

- I – 0-35 year frequency and low (surface fires most common) to mixed severity (less than 75% of the dominant overstory vegetation replaced);
- II – 0-35 year frequency and high (stand replacement) severity (greater than 75% of the dominant overstory vegetation replaced);
- III – 35-100+ year frequency and mixed severity (less than 75% of the dominant overstory vegetation replaced);
- IV – 35-100+ year frequency and high (stand replacement) severity (greater than 75% of the dominant overstory vegetation replaced);
- V – 200+ year frequency and high (stand replacement) severity.

Firewise Communities – “The national Firewise Communities program is a multi-agency effort designed to reach beyond the fire service by involving homeowners, community leaders, planners, developers, and others in the effort to protect people, property, and natural resources from the risk of wildland fire - before a fire starts. The Firewise Communities approach emphasizes community responsibility for planning in

the design of a safe community as well as effective emergency response, and individual responsibility for safer home construction and design, landscaping, and maintenance.”¹⁴

fuel break – Any natural or constructed discontinuity in a fuelbed utilized to segregate, stop, and control the spread of fire or to provide a control line from which to suppress a fire

HFRA – Healthy Forests Restoration Act – Also known as the **Healthy Forests Initiative**, it was billed as “an initiative for wildfire prevention and stronger communities” when signed into law by President George W. Bush in 2003. Among its provisions are language directing the development of Community Wildfire Protection Plans.

surface fuels – Fuels that contact the surface of the ground, consisting of leaf and needle litter, dead branch material, downed logs, bark, tree cones, and low stature living plants

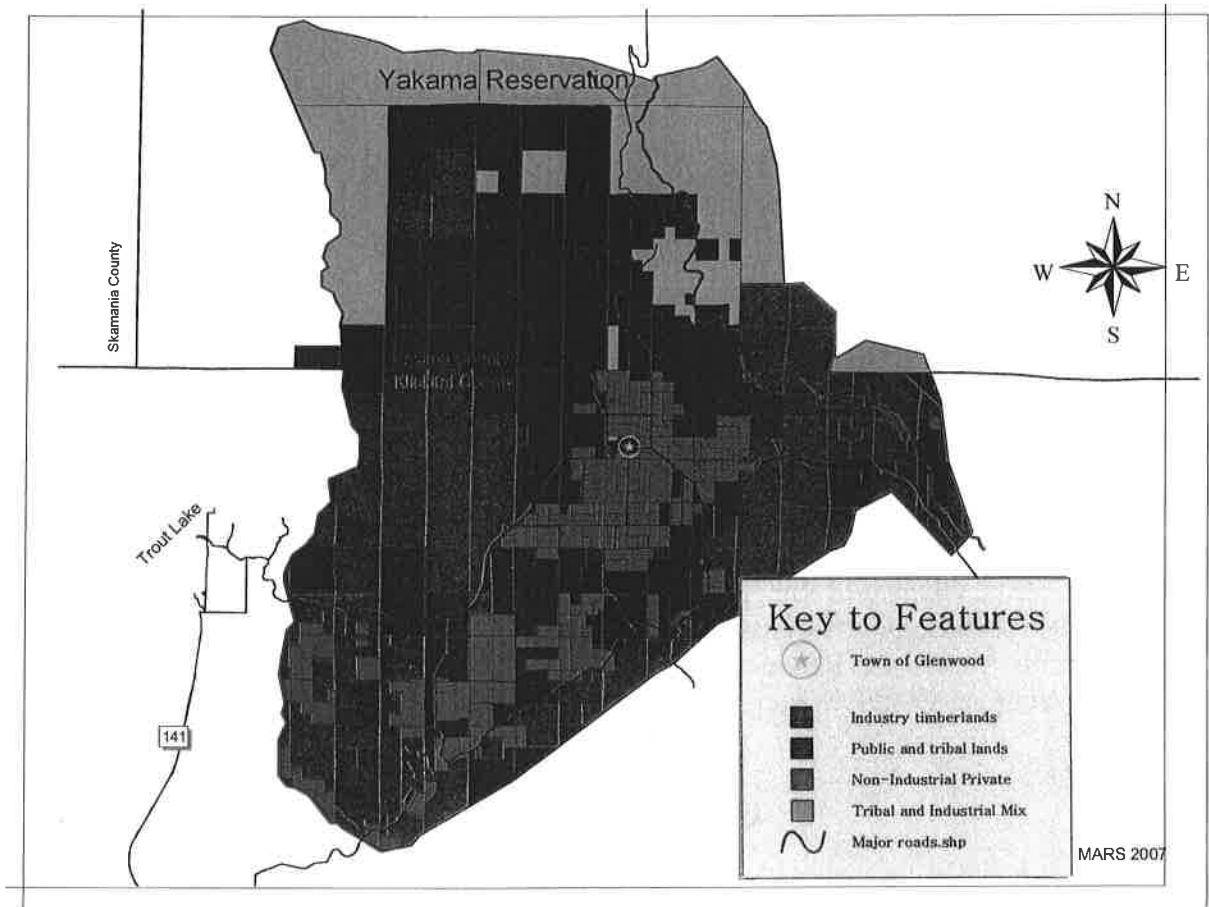
WUI – Wildland Urban Interface Area – The area where houses and wildland vegetation coincide (National Fire Plan definition)

Appendix B: List of Participants

Gary Anderson Glenwood Fire Department Deputy Chief
Jim Schleusner, Glenwood Fire Department Chief/Hancock Forest Management
Bob Beveridge, Glenwood Community Council Chair
Molly Linville, Conboy Lake National Wildlife Refuge Manager
Brent Demko, Yakama Nation Fuels Program Manager
Pete Stocks, Washington State Dept. of Natural Resources, Klickitat District Manager
Joe Weeks, Washington State Dept. of Natural Resources, Fire Prevention
Coordinator
Steve Brown, Klickitat County Emergency Planning Director
Bryan Keithly, Glenwood Ranger Station, BIA, Supervisory Forester
Ken Bales, SDS Lumber Company
Jensi Smith, Mt. Adams Resource Stewards
Jay McLaughlin, CWPP Writer, Mt. Adams Resource Stewards

¹⁴ <http://www.firewise.org/>

Appendix C. Ownership Map (Approximate)



Appendix D: Glenwood Climate Data¹⁵

GLENWOOD 2, WASHINGTON (453184)

Period of Record Monthly Climate Summary

Period of Record : 9/ 1/1979 to 12/31/2005

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
Average Max. Temperature (F)	38.3	42.5	50.5	57.3	65.2	71.5	79.5	80.6	73.2	61.2	45.5	36.6	58.5
Average Min. Temperature (F)	24.0	24.4	28.5	30.4	35.3	40.4	43.0	41.7	35.0	29.2	27.7	22.9	31.9
Average Total Precipitation (in.)	5.88	4.15	3.05	1.61	1.14	0.79	0.26	0.24	0.86	2.11	4.86	6.05	31.01
Average Total SnowFall (in.)	17.6	9.6	4.6	0.4	0.0	0.0	0.0	0.0	0.0	0.2	5.6	20.4	58.4
Average Snow Depth (in.)	6	3	0	0	0	0	0	0	0	0	1	4	1

Percent of possible observations for period of record.

Max. Temp.: 98.4% Min. Temp.: 98.3% Precipitation: 98% Snowfall: 97.8% Snow Depth: 97.3%

Check [Station Metadata](#) or [Metadata graphics](#) for more detail about data completeness.

Western Regional Climate Center, wrcc@dri.edu

¹⁵ Western Regional Climate Center: <http://www.wrcc.dri.edu/cgi-bin/cliMAIN.pl?waglen>

Appendix E. Glenwood Community Census (2000) Data

**Understanding the Community in Which We Live –
Town of Glenwood, Klickitat County, WA**

Community profiles generated for the Northwest Area Foundation Horizons Program to Assist in Understanding Poverty

The following data set for the community of Glenwood comes from the 2000 Federal Census.

POPULATION

Total:	522		
Male:	255	(49%)	Female: 267 (51%)
Married:	249	(61.1%)	Widowed: 19 (4.7%)
<18 yrs of age:	149	(28.5%)	>65 yrs of age: 67 (12.8%)

EDUCATION

	Total Population	
School Enrollment (%)	Number	Percent
Nursery/Preschool	6	5.5%
Kindergarten	4	3.6%
Grade 1-8	44	40.0%
Grade 9-12	45	40.9%
College	11	10.0%
Educational Attainment (population 25 years and over)		
Less than 9 th Grade	1	0.3%
9 th -12 th Grade, ND	30	8.9%
HS Grad/GED	157	46.7%
Some College	76	22.6%
Associate Degree	28	8.3%
Bachelor's Degree	32	9.5%
Graduate/Prof Degree	12	3.6%

EMPLOYMENT & OCCUPATION

Employment:	Total Population	
	Number	Percent
In Labor Force	239	60.7%
In Armed Forces	0	0%
Civilian Employed	200	50.8%
Civilian Unemployed	39	9.9%
Not In Labor Force	155	39.3%

Occupations for Employed Citizens Age 16 and Over: NA

Management, Professional & Related	38%
Professional & Related	NA %
Service Occupations	14.5%
Sales & Office Occupations	15.5%
Farming, Fishing & Forestry	12.5%
Construction, Extraction & Maintenance	11.0%
Moving Occupations	8.5%

Mean travel time: 22.4 minutes

HOUSEHOLD INCOME Total Households Income by Household (%):

	Number	Percent
<\$25,000	56	27.8%
\$25,000-\$49,999	76	37.8%
\$50,000-\$74,999	48	23.9%
\$75,000-\$99,999	9	4.5%
>\$100,000	12	5.9%

Source of 1999 Household Income:

Earnings/Wages	81.6%	Interest/Dividends	NA%
SSI	2.5%	Public Assistance	1.0%
Retirement	34.7%	Other	NA%

POVERTY STATUS (1999) Total Population

Poverty by Age (%):	Number	Percent
Total all ages	50	100%
5-17 Years	11	12.9%
18 Years & Over	39	10.4%
65 Years & Over	4	7.4%

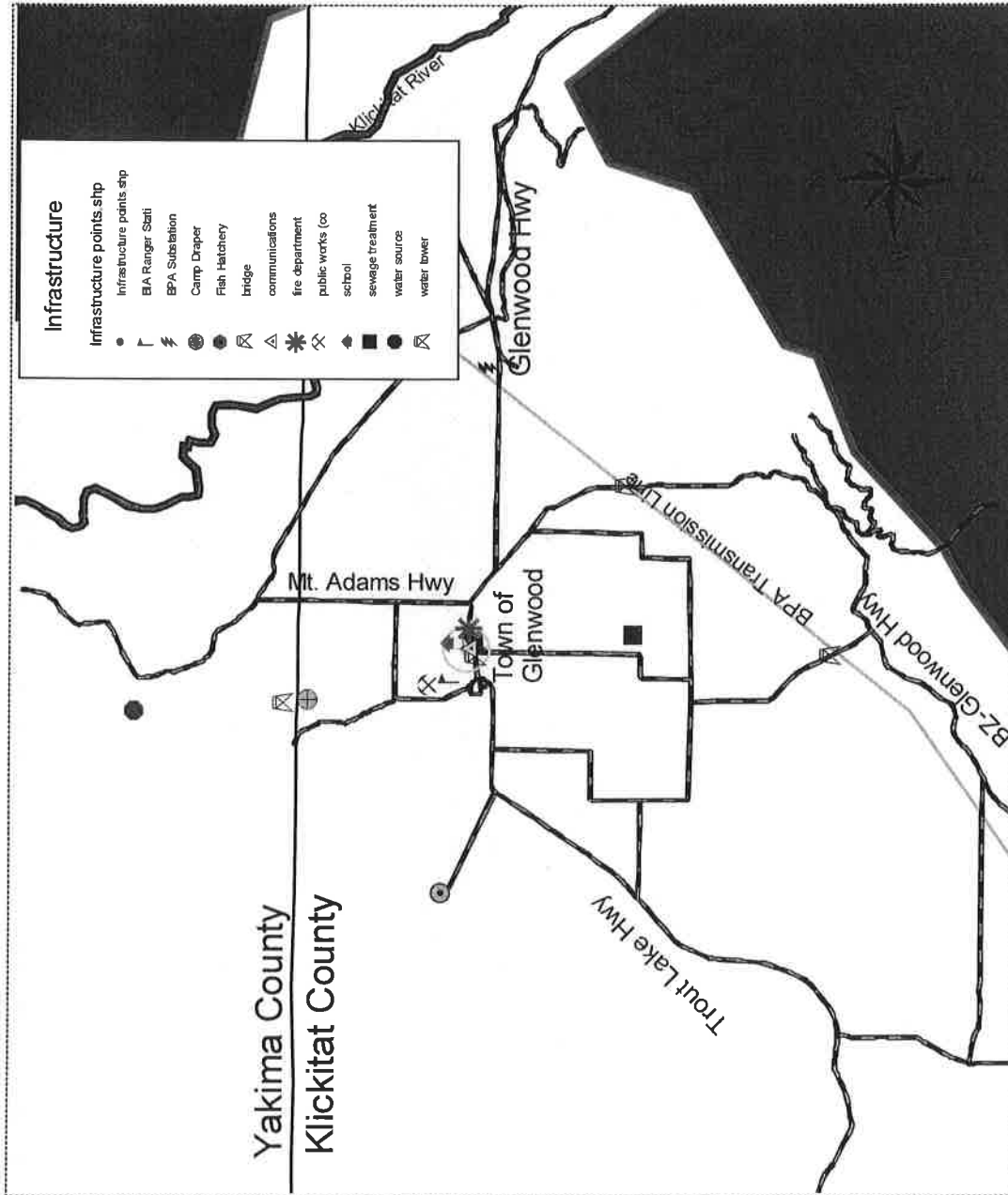
DISABILITY STATUS (by civilian noninstitutionalized population)

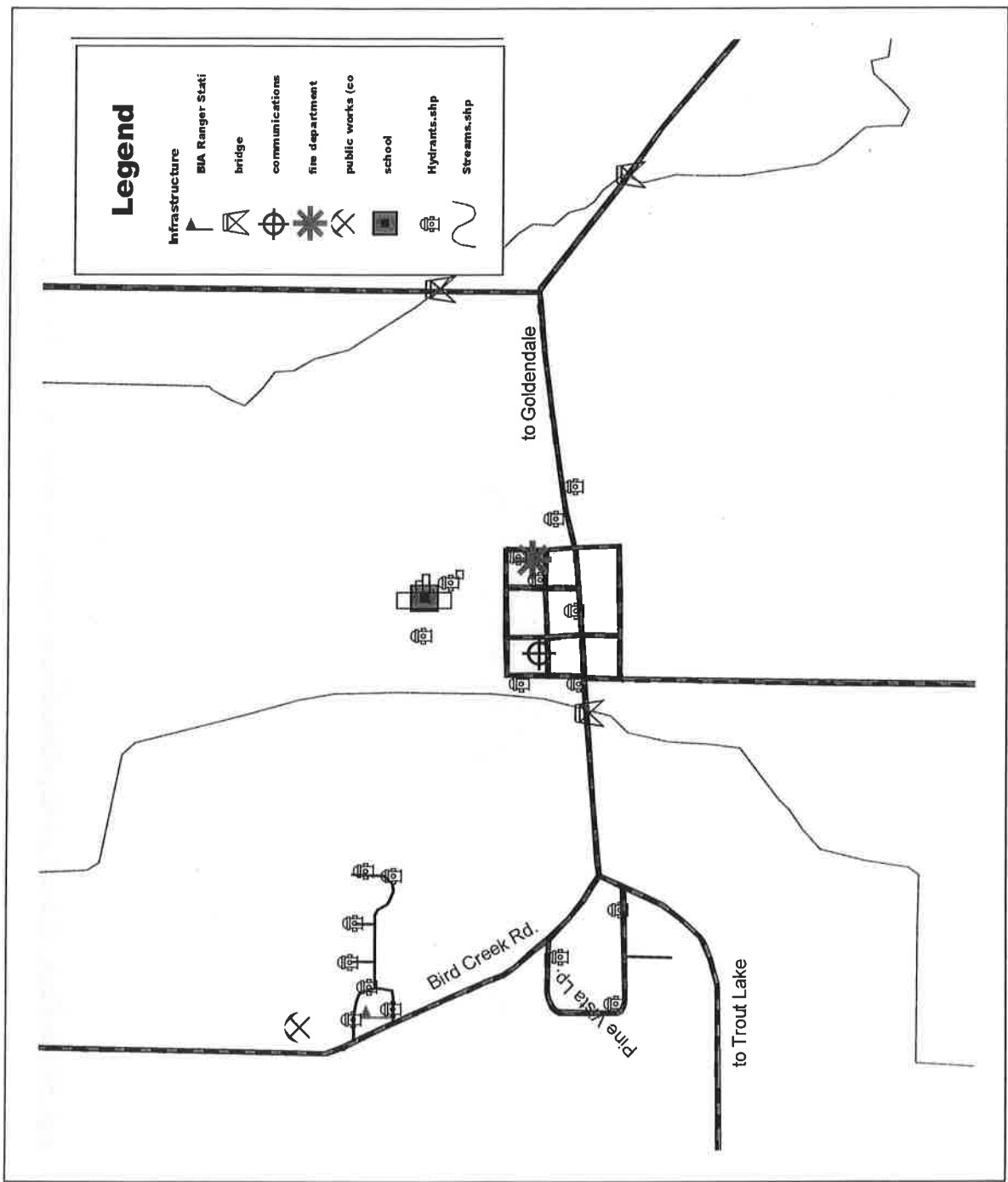
Disability by Age (%):	Number	Percent
Population 5-20 Years Old	1	1.0%
Population 21-64 Years Old (percent employed)	92	30.1% (65.2%)

Source: Census 2000 Summary File 3/prepared by the U.S. Census Bureau, 2002 (www.census.gov). September 17, 2002.

Prepared by: Patrick Malone, INW Program Associate, Partnership for Rural Improvement, 509.533.4706

Appendix F: Infrastructure



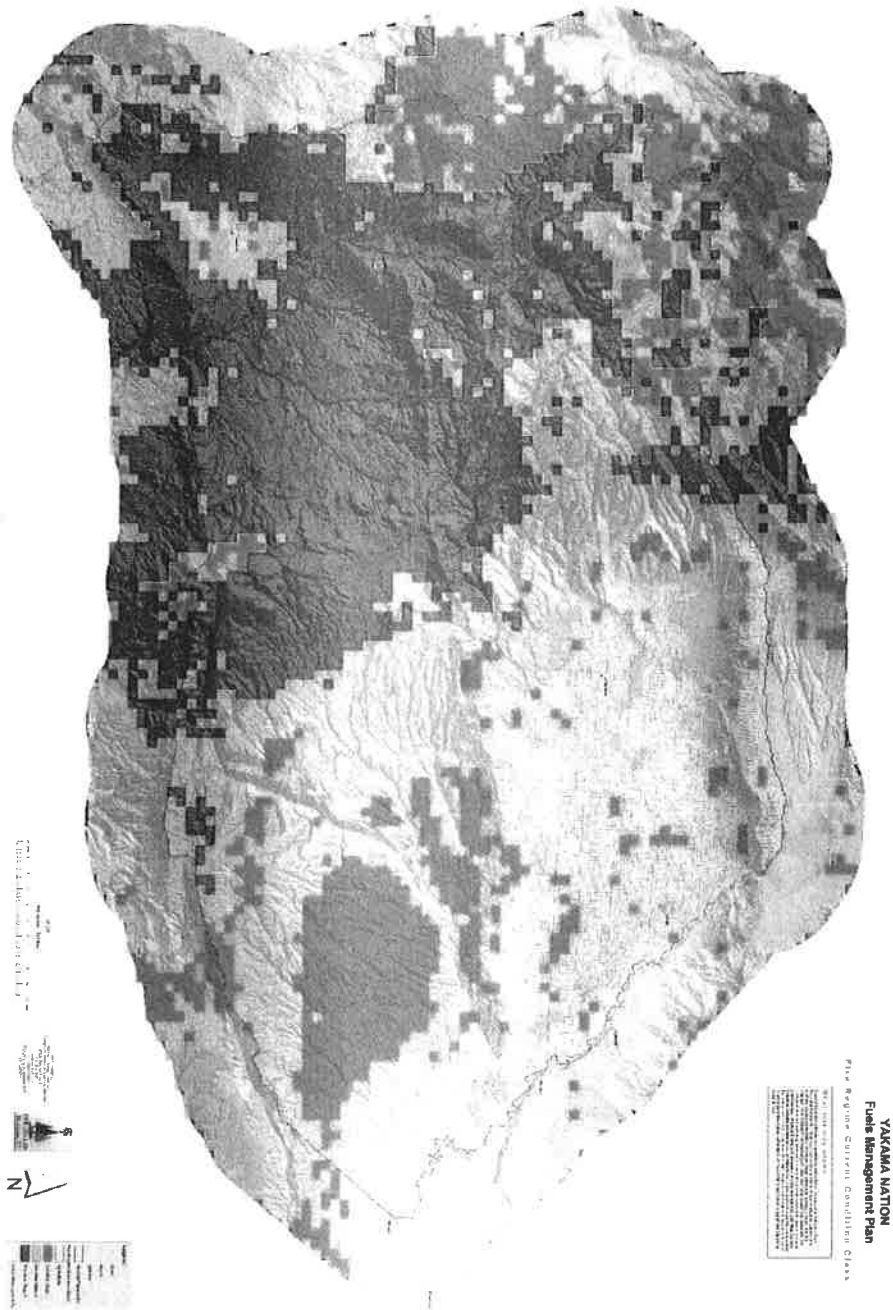


Infrastructure and hydrant locations in the Town of Glenwood. *Note: There are reported to be an additional two hydrants located at Camp Draper.*

Appendix G: Fire Starts (2000-2006)

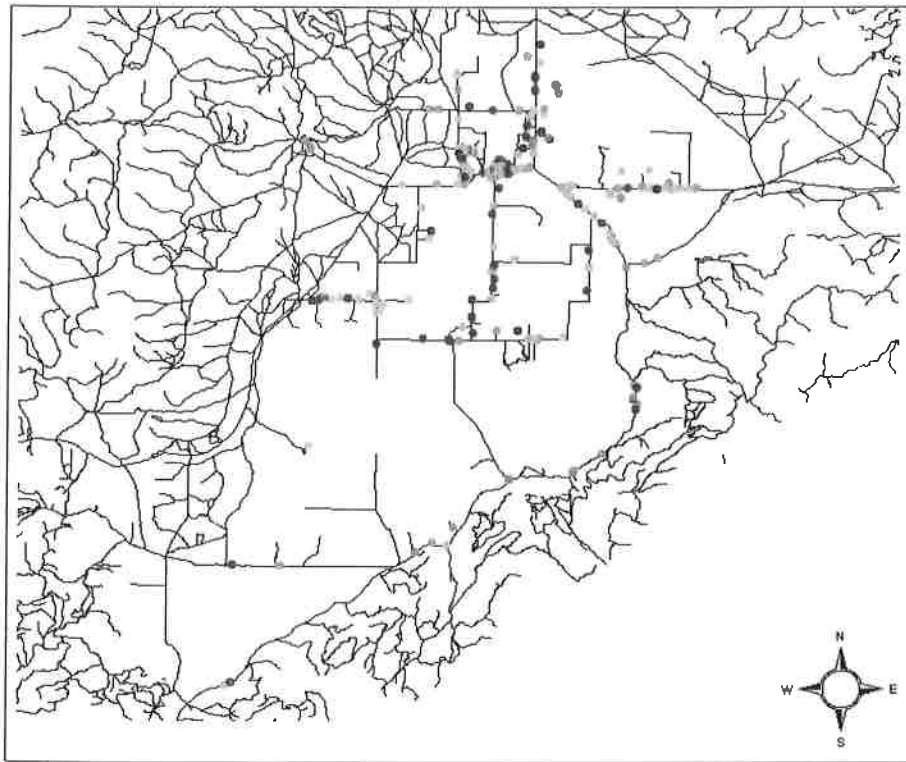
County	Cause	Fire Class	Reported Date	Acres	Fire Name	TownShip	Range	Section
Klickitat	Recreation	Classified	17-Oct-01	0.50		5	11	1
Klickitat	Recreation	Classified	22-Jul-01	0.10		5	11	5
Klickitat	Arson	Classified	17-Apr-04	0.50	RED ROAD	5	11	9
Klickitat	Debris Burning	Classified	16-Mar-05	10.00	RED ROCK	5	11	14
Klickitat	Debris Burning	Classified	03-Aug-05	0.10	BUD WORM	5	11	14
Klickitat	Logging	Classified	06-Jul-04	2.00	LAURAL	5	11	14
Klickitat	Debris Burning	Classified	29-May-01	0.10		5	11	22
Klickitat	Debris Burning	Classified	18-May-06	1.00	MEDLEY	5	12	3
Klickitat	Smoker	Classified	02-Oct-06	1.50	QUIGLEY BUTTE	6	11	26
Klickitat	Arson	Classified	01-Jun-03	0.10		6	11	34
Klickitat	Recreation	Classified	06-Sep-04	0.10	HOLMES CREEK	6	11	34
Klickitat	Recreation	Classified	11-Aug-00	2.00		6	11	36
Klickitat	Lightning	Classified	08-Aug-06	2.00	COMPANY ROAD	6	12	1
Klickitat	Debris Burning	Classified	18-May-06	1.00	KUHNHAUSEN LANE	6	12	2
Klickitat	Children	Classified	16-Jun-06	0.00	ANTS NEST	6	12	9
Klickitat	Debris Burning	Classified	20-Oct-06	0.10	BIRD CREEK	6	12	9
Klickitat	Lightning	Classified	13-Aug-01	44.00		6	12	9
Klickitat	Recreation	Classified	05-Aug-06	0.00	RODEO	6	12	9
Klickitat	Debris Burning	Classified	04-Apr-02	0.30		6	12	10
Klickitat	Miscellaneous	Classified	12-Aug-02	0.10		6	12	13
Klickitat	Miscellaneous	Classified	18-Aug-02	0.70		6	12	13
Klickitat	Miscellaneous	Classified	10-Jun-04	0.10	FENCE BUILDER	6	12	17
Klickitat	Debris Burning	Classified	06-May-06	0.00	LAKESIDE	6	12	24
Klickitat	Miscellaneous	Classified	30-Jul-01	25.00		6	12	34
Klickitat	Miscellaneous	Classified	09-Sep-05	0.10	BEAVER CHIP	6	12	34
Klickitat	Debris Burning	Classified	05-Jul-00	1.00		6	13	2
Klickitat	Recreation	Classified	12-Aug-02	39.00		6	13	6
Klickitat	Recreation	Classified	30-Jun-03	0.10		6	13	17
Klickitat	Debris Burning	Classified	16-Mar-05	0.75	MILL POND	6	13	18
Klickitat	Lightning	Classified	04-Sep-06	1.00	CANAL ROAD	6	13	21
Klickitat	Recreation	Classified	19-Oct-02	0.10		6	13	25
Klickitat	Recreation	Classified	31-Jul-06	0.00	THE DITCH	7	12	8
Yakima	Recreation	Classified	17-Jun-00	0.10		7	12	8
Yakima	Recreation	Classified	20-May-01	0.10		7	12	34
Yakima	Recreation	Classified	09-Jun-02	0.10		7	12	22
Yakima	Recreation	Classified	04-Jun-03	1.00		7	12	5
Yakima	Miscellaneous	Classified	22-Jul-03	0.50		7	12	2
Yakima	Recreation	Classified	25-May-04	0.10	CORRAL FIRE	7	12	28
Yakima	Recreation	Classified	27-Jul-04	3.00	OUTHOUSE	7	12	14

Appendix H: Fire Regime and Condition Class (taken from Yakama Nation Fuel Management Plan



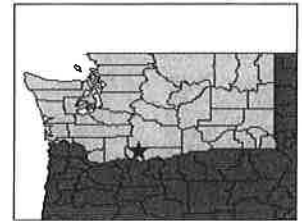
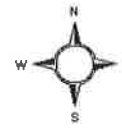
Appendix I: SCA Risk Rating Maps

Glenwood Risk Assessment--Overview



Fire District Structures

- Low (0-49)
- Moderate (50-68)
- High (69-83)
- Extreme (84 +)



Appendix J. Glenwood RAMS Assessment Background Data and Community Information from Bi-County Plan

**Compartment 3: Glenwood
Part I**

Compartment 3 contains 144890 acres in Fire Management Zone 01. The Compartment experiences 5.00 fires per year, totaling 1 acres. The characteristics of the compartment indicate that: Catastrophic Fire Possible.

Fuels Hazard characteristics are rated:

- Fuels (flame length produced): 4 - 6 Feet (**Moderate**)
- Crowning Potential: 3 - 5 (**Moderate**)
- Slope Percent: 0 - 20 (**Low**)
- Aspect: South (**High**)
- Elevation: 0 - 3500 (**High**)

Protection Capability ratings are:

- Initial Attack: 21 - 30 minutes (**Moderate**)
- Suppression Complexity: Average (**Moderate**)

Ignition Risk factors include:

- Population Density - Wildland Urban Interface
 - 301-500 Dwellings/structures
- Power Lines In Unit
 - Distribution Lines
- Industrial Operations
 - Debris/slash burning
 - Active timber sale
- Recreation
 - Off highway vehicle use
 - Dispersed camping areas, party areas, hunters, waterbased, hiking
- Transportation System
 - Public Access Road(s)
 - County road(s)
 - State/Federal highway(s)
- Commercial Development
 - Schools
 - Business, agricultural/ranching

**Compartment 3: Glenwood
Part II**

Compartment Values are characterized:

Recreation: Developed recreation site within or adjacent to area (**High**)

Administrative: Administrative sites are present (**Moderate**)

Wildlife/Fisheries: Highly significant habitat. (**High**)

Range Use: Range allotment within area, significant use (**High**)

Watershed: Stream Class PI, I. Important water use/riparian area. Domestic water use. (**High**)

Forest/Woodland: Standing timber/woodland on 51+% of area (**High**)

Plantations: 15% or less of area in or programmed for plantations (**Low**)

Private Property: High loss and threat potential due to numbers and placement (**High**)

Cultural Resources: Minimal archaeological/historical findings, potential for Native American use. (**Moderate**)

Special Interest Areas: Area is adjacent to a Special Interest area (**Moderate**)

Visual Resources: Partially retain existing character. (**Moderate**)

T&E Species

Soils (Erosion)

Airshed

Vegetation

Additional Glenwood Data

County: Klickitat and Yakima

Square miles: 226.4

Acres: 144,890

Population per Square Mile: 5.1

Total Population 1,155

General Aspect Southeast (154 degrees)

Average Slope 11%

Mean Elevation(AMSL) 2630 ft.

Percent Forest Cover >50%

Percent Public Ownership 63.9

Dominant Fire Regime: III – 35-200+ year frequency and mixed severity

Dominant Condition Class 3

Appendix K: Emergency and Other Contact Information

Emergency Contacts:

Steve Brown, Klickitat Co. Emergency Planning Director (509)493-6029 (office)
or (509)250-0528 (cell)

Fire District Contacts:

Jim Schleusner (Chief) 364-3331 (work), 364-3481 (home)
Gary Anderson (Deputy Chief) 364-3320 (home)

Shelters

Glenwood School 364-3438

Triage centers

Communications

Phone trees

Appendix L: Suppression Resources

Resources located in Glenwood and surrounding areas may include but are not limited to:

Glenwood Volunteer Fire Department
1 Type 6X Engine
1 Type 3 (Structural) Engine
2 Tenders (2000 plus gallons each)
Glenwood Ranger Station, Bureau of Indian Affairs (Dispatched through Yakama Nation Fire Dispatch at (509) 865-6653)
1 Type 6 Engine
Various staff with qualifications ranging from FFT2's to Division Supervisors
Conboy Lake National Wildlife Refuge, USFWS
1 Type 7 engine (staffed?)
Mt Adams Ranger District, Gifford Pinchot N.F., Trout Lake, WA
2 Type 6X Engines
2 Type 6X Prevention Models
Washington State DNR
1 Type 5 Engine (typically patrols Glenwood Area)

A number of Glenwood-based contract logging companies also have equipment and training to perform wildfire suppression activities. They would need to be dispatched through the appropriate authorities.

Appendix M: Sample Washington DNR Specifications for Shaded Fuel Breaks

1. Dead and down material up to 10 inches in diameter will be chipped and the chips scattered over the work site.
2. The limbs of dead and down trees greater than 10 inches in diameter will be removed and chipped and the remaining trunk will be left in place unless several trees have created a piled concentration. In this case, the remaining tree trunks will be separated by at least 10 feet from any other logs and left on site.
3. Standing dead trees with red needles still attached shall be felled and treated using the dead and down prescription as required in item 1 and 2 above.
4. Snags will be felled if within 50 feet of another snag and will be treated using the dead and down prescription as required in item 1 and 2 above. Snags that pose a hazard to crews working in the area will be felled.
5. The Contractor will not cut any green trees from the premises that are greater than 8-inch diameter at breast height without prior approval from the Landowner.
6. Trees 8 inches and greater in diameter (DBH) will be pruned (live and dead limbs) up to a height of 15 feet. Limbs will be pruned when branches are larger than 2 inches diameter (regardless of length) or greater than 2 feet in length (regardless of diameter). No pruning will be done to a height greater than 50% of total tree height. The cut limbs will be chipped on site.
7. Trees less than 8 inches DBH will be spaced leaving 2 feet - 5 feet between crowns. Live and dead limbs will be pruned up to a height of 15 feet. Limbs will be pruned when branches are larger than 2 inches diameter (regardless of length) or greater than 2 feet in length (regardless of diameter). No pruning will be done to a height greater than 50% of total tree height. The cut limbs and stems will be chipped on site. Trees < 3 feet high do not require pruning.
8. Non-coniferous brush will be cut and chipped/ mowed on site unless islands are pre-designated or agreed to by the contract administrator or his designee.
9. Ground disturbance from machinery use shall not exceed 15% on each acre and berms, ruts and other operator caused ground disturbance will be smoothed out to original contours before leaving the immediate work area.

Appendix N: Potential Projects List

Ignition Source List

1. Lightning

- a. Fuel breaks/reductions - design appropriate fuel reduction projects to counter threat of fire sparked by lightning strikes (see list below under “Fuels Reductions”)

2. Debris burning

- a. Educational activities – initiation of collaborative program with USFS and WADNR specific to rules and regulations on debris burning
- b. Biomass utilization – work with public agencies, local businesses and Mt. Adams Resource Stewards to develop appropriate biomass utilization strategies

3. Recreation

- a. Educational activities – develop, maintain and upgrade outreach materials and signs to reach recreational groups using the area
- b. Fuels reductions – reduce fuels in and around popular recreation sites (campgrounds, river access points, etc.)

4. Travel Corridors

- a. **Glenwood-BZ Hwy** – construct minimum fuel break on either side of the road to 100’ from shoulder, DNR shaded fuelbreak standards, extending to Glenwood WUI boundary
- b. **Glenwood- Trout Lake Hwy** – construct minimum fuel break on either side of the road to 100’ from shoulder, DNR shaded fuelbreak standards, extending to Glenwood WUI boundary
- c. **Glenwood-Goldendale Hwy** – construct minimum fuel break on either side of the road to 100’ from shoulder, DNR shaded fuelbreak standards, extending to Glenwood WUI boundary
- d. **Bench Lake County Road** – construct minimum fuel break on either side of the road to 100’ from shoulder, DNR shaded fuelbreak standards, extending to Glenwood WUI boundary

5. Forestry Operations

- a. Coordinate with Hancock and WADNR to continue offerings of “blue card” trainings for contractors

6. Power Lines

- a. Improve and develop roads to access main transmission lines through CLNWR
- b. Create a fuel break on either side of main transmission lines of 100’
- c. Create fuel breaks along auxiliary transmission lines of 100’ where necessary

Emergency preparedness

1. Communications

- a. Upgrade fire district radio system and integrate with federal, state and county

2. Local suppression resources

- a. Pursue acquisition of additional wildfire engine
- b. Upgrade structural and wildfire equipment

3. Staging areas and safety zones

- a. Establish cooperative agreement with Glenwood School District for use as a staging area, ICP and safety zone

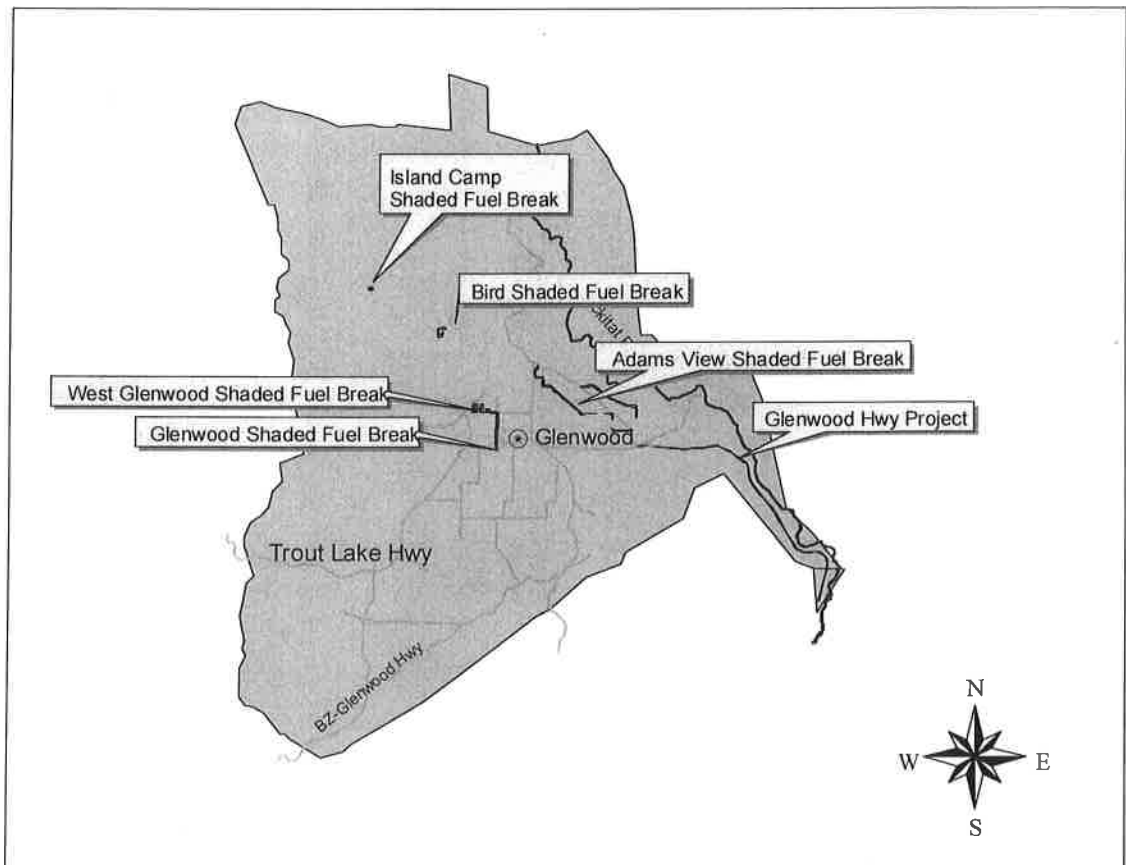
Structure preparation/defensible space

- 1. Education** - Annual offering of Firewise Program to community members/landowners
- 2. Education** - Ask county building department to include suggestions of appropriate building materials, emergency vehicle access and fire mitigation strategies for new structures in rural settings
- 3. Policy** - Collaboratively pursue county wide strategy to define appropriate ingress/egress standards
- 4. Infrastructure** – install additional fire hydrants in community and developing areas
- 5. Fuels reductions** – work with landowners to reduce fuels and create defensible space around structures (i.e. Xanadu/Baker residences, Troh Lane, new structures off of Glenwood-Trout Lake Rd.)

Fuels Reductions

- 1. Brumbaugh tract/south of Troh Lane** – work with USFWS to develop a shaded fuel break meeting WADNR standards for 100’ along northern boundary of Conboy NWR with private lands south of Troh Lane
- 2. Lakeside Road residences**– develop a shaded fuel break of 100’ between private residences, state and Hancock land (portions of sections 25 and 36, T6N, R12E)
- 3. Rodeo Grounds** –Complete fuels reduction activities that tie in with fuel break west of Bird Creek Rd.
- 4. Forested area east of Trohs** – work with USFWS to develop shaded fuelbreak 100’ feet in from Troh Lane
- 5. Maintenance** – maintain fuel breaks that have already been completed through regular mowing consistent with Table 3 on page 23. Additionally, mechanisms for funding fuel break maintenance over the long term need to be explored.
- 6. Evaluation** – maintain a program of evaluating wildland fuels conditions adjacent to structures and community infrastructure to develop future projects

Appendix O: Current and Recent Fuel Breaks



**Appendix P: (Insert) Defensible Space Information from Firewise Communities
and Applegate Fire Plan**

Appendix Q: Resources for local landowners

Funding sources for outreach and fuel reduction work

Funding for fuel reduction work has become more limited with constrained federal budgets in the last couple of years. Typical funding sources have included the following:

National Fire Plan – projects are becoming more restrictive, requiring that new projects are adjacent to past federal projects, etc. Typically, project proposals are made, then reviewed by a local steering committee for prioritization to the state/region. In recent years applications have been due February 15. For more information visit:

<http://www.nwfireplan.gov/CommunityAsst.htm>

Forest Land Enhancement Program (FLEP) – this may be one of the more promising funding mechanisms for non-industrial private forest owners, but the funding will be coming under a different program name in coming years. Funding levels vary dramatically from year to year, and come as a cost share. There are designated cost share levels for a variety of forest treatments to include thinning, chipping of residual material and pruning. Applications require that the landowner have a Forest Stewardship (Management) Plan on file with the local DNR service agent (Jesse Caulkins for Klickitat Co.). Generally speaking, parcels must be a minimum of 20 acres to receive consideration. More information can be obtained at:

<http://www.fs.fed.us/spf/coop/programs/loa/flep.shtml>

Washington State DNR, Fuels Program – Joe Weeks, Program Director, has communicated that the state may have discretionary funds to allocate toward community-generated fuels reduction projects in the future.

Yakama Nation Fuels Program – The Yakama Nation Fuel Program has been very active in working with landowners in the Yakima Valley to develop protective spaces around structures, and has an interest in supporting similar projects in the Glenwood Valley. Projects of particular interest will likely be adjacent to Yakama Nation-owned lands. They would possibly contract out the work or use their own fuel program work crews. The contact for the program is Brent Demko, (509)865-5121 ext. 6024.

Contractors able to perform fuels reductions

The area has not had an abundance of contractors specifically targeting fuels reduction contracts. Recent DNR contracts have all been awarded to contractors from out of the county. However, local possibilities include (this list should not be viewed as exhaustive):

MNM Contractors (Glenwood), Mel Stanton/Marlene Pooler, (509)364-3599. Equipment includes a skidsteer mounted masticating head that is very effective at reducing fuels to a layer of mulch/chips with much reduced flammability.

Mt. Adams Tree Service (Trout Lake), Jon Caryl, 395-2321
Equipment includes chipper

AmeriCorps/Northwest Service Academy (Trout Lake), Jim Wells (509)395-3469.
May have crews available to do work for certain kinds of projects.