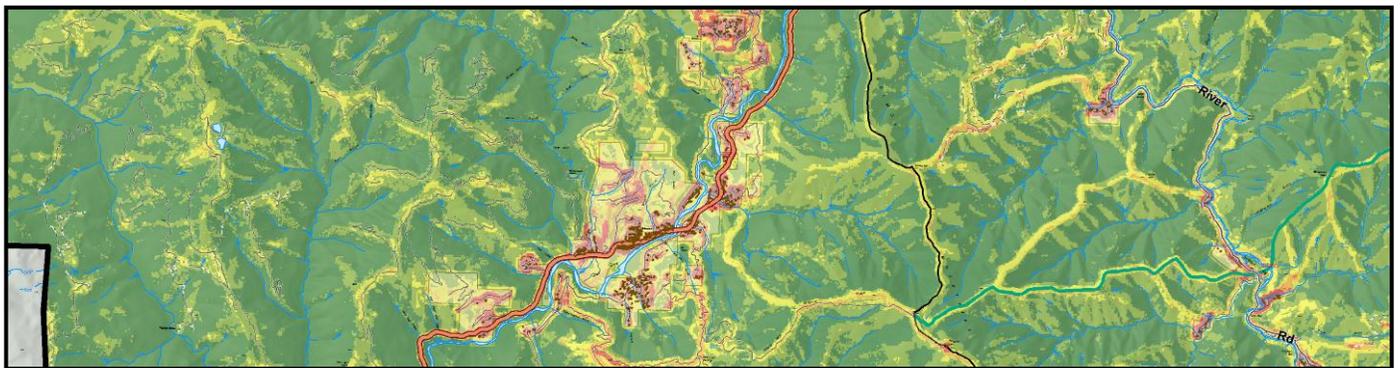




# Western Klamath Restoration Partnership

## *A Plan for Restoring Fire Adapted Landscapes*



*Including Descriptions of the:*

### **Somes Bar Integrated Fire Management Project**

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## Background and Introduction

This planning effort explores a path toward collaborative fire management in the Western Klamath landscape. It arose from a desire by the Karuk Tribe, the Mid Klamath Watershed Council, the US Forest Service, area Fire Safe Councils, environmental groups and other community-based stakeholders to explore what fire management could be like using a collaborative paradigm.

We utilized a two-pronged approach to shape the planning effort: GIS-based fire modeling, and an open and interactive planning process. Each prong engaged multiple stakeholders and multiple ecological and social values. Cash and in-kind funding for the effort included multiple local, regional and national sources. Ultimately the combination of approaches led the group to envision three integrated fire management projects that occur at the landscape-scale.



**Figure 1: Western Klamath Restoration Partnership members discuss strategies to address threats to the group's shared values/targets.**

A hallmark of this effort was the intensive participation by individuals and organizations with diverse and sometimes conflicting perspectives about how to shape fire management. Many feel the pain of a long history of unsatisfactory wildfire events, mistrust and failed attempts to work together. The primary outcome of the Western Klamath Restoration Partnership (WGRP) to date is the suggestion described in this report to pursue collaborative management on three project areas within the larger planning area. These include not only locations for fuel treatments, but also a new way of designing, implementing and learning from them.

While several participants came to the process with skills in ecology and land management, both contemporary and traditional (indigenous), few had expertise in developing landscape-scale management scenarios that honor the all-encompassing suite of stakeholder values and possible land management approaches. This report is our first effort to express the values identified through this process in terms of specific locations to design projects on the ground. This report is not a stand-alone project and should not be implemented outside of the collaborative effort it was developed through. Ongoing collaboration through all stages of project planning, implementation, monitoring and shared learning are key to building trust. Finally, the areas identified in this report as being a high priority for treatment may be excluded or modified due to cultural or environmental concerns that we were not aware of during the creation of this document.

In addition to the intensive planning effort of the WKRP, there were several other actions that were accomplished simultaneously that demonstrate Fire Adapted Communities principles. These include:

- The development of pre-attack map books in coordination between the Six Rivers NF, Orleans Somes Bar FSC, Karuk Tribe, and Orleans Volunteer Fire Department for the Orleans/Somes Bar area.
- The development of an existing firelines geodatabase for the entire 1.2 million acre planning area using Fire Incident Mapping Tool (FIMT) symbology for inclusion into the Wildfire Decision Support System (WFDSS). This geodatabase has been shared with fire planning staff from the Six Rivers and Klamath National Forests.
- An update of Red Zone surveys on the Salmon River in coordination with the Salmon River Fire Safe Council, Salmon River Volunteer Fire and Rescue, and the Salmon River Ranger District fire prevention staff.
- Short videos online documenting community efforts to reduce wildfire risk to communities through prescribed burning and volunteer community fuel reduction workdays:
  - Northern CA Prescribed Burn Training Exchange (TRES) burn at Martin Property in Orleans: <https://www.youtube.com/watch?v=cgSBqr2kgaA>
  - Lower Camp Creek – A Fire Wise Story <https://www.youtube.com/watch?v=C9vEVQnl6eM>

The recent fire season of 2013 has also increased the scope and scale of our various communities' commitments to creating more Fire Adapted Communities. There have been an incredible amount of actions, large and small, that have facilitated changes to fire preparedness, community fire education, increased coordination between local, state, federal and tribal entities, and actual acres treated on the ground. A partial list of these community commitments includes:

- 120 acres of prescribed burning on private lands in the Orleans/Somes Bar area in the Fall of 2013. 85 of these acres were burned in two days on nine separate parcels as part of the Fall 2013 Northern CA TRES, which had 40+ participants from around the country. (Orleans has it's own TRES planned for Fall 2014, and every fall for the next five years).
- Approximately 300 acres of manual fuel reduction on private lands in the WKRP planning area.
- 2013 Wildfires Community Sponsored After Action Reviews in Forks of Salmon and Orleans.
- 2014 Klamath Fire Ecology Symposium in Orleans, CA.
- Lower Camp Creek Fire Safe Demonstration Workdays in Orleans, CA.
- Selection of the Orleans Somes Bar Fire Safe Council as the 2013 Firewise Community for the state of California.
- Salmon River Community Fire Awareness Week and Volunteer Fuel Reduction and Chipping Workdays.
- 30 acres treated and 20 participants in Orleans fuels reduction cost reimbursement program (FLASH) in 2013/2014.
- 35 acres of mowing (mostly volunteer) in Orleans valley in 2013.

## *History of Fire and Fire Management in the Western Klamath Mountains*

Fire and fire management has had polarizing effects on Federal, State, Tribal and community interactions in the Western Klamath Mountains for many generations. The Karuk people once burned these lands frequently and for many reasons still not fully understood by fire managers and the general public today. In 1911, the Federal policy (Weeks Act) was enacted with a strict goal to “suppress all fires.” The written documents of this time speak to a history that most people today were never exposed to.

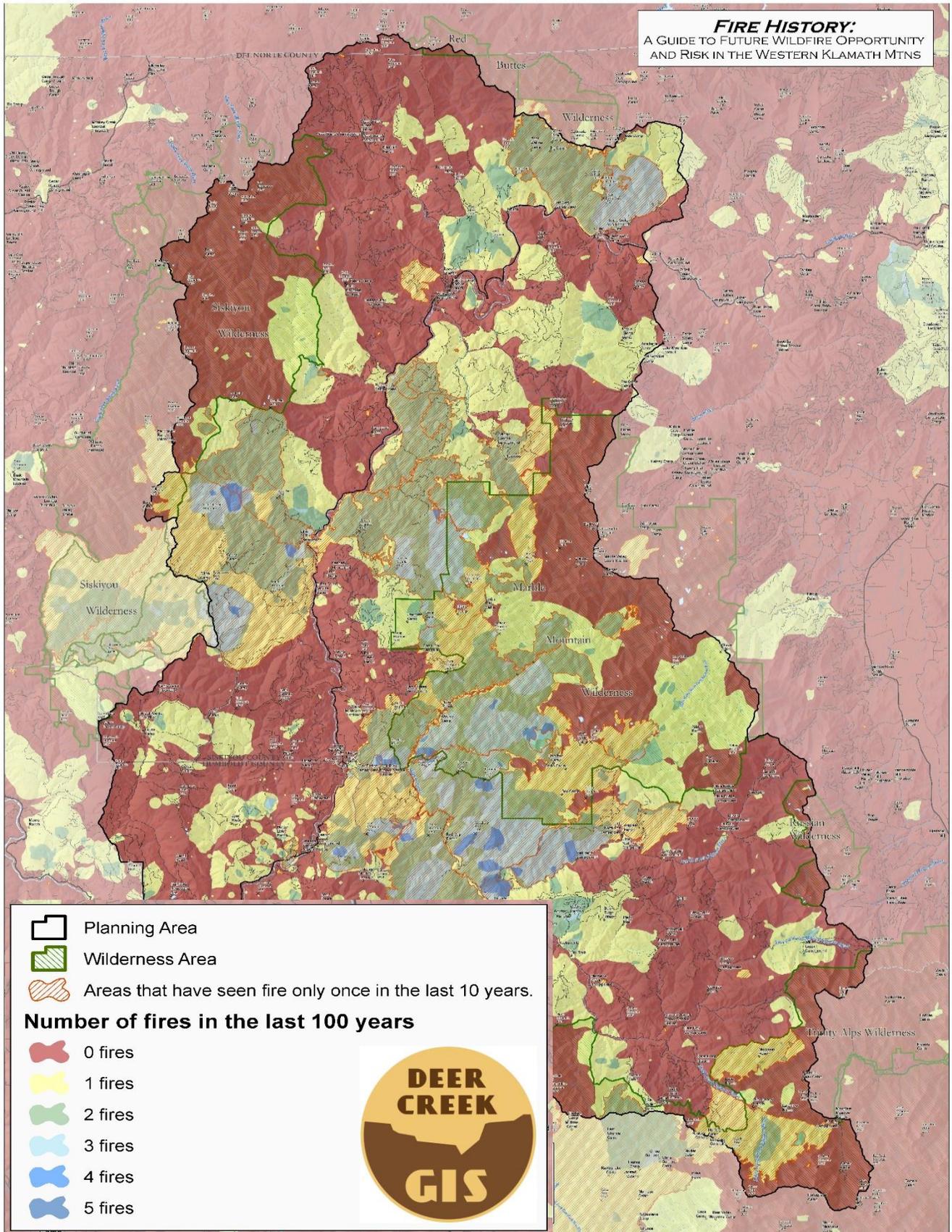


**Figure 2: Looking up the Klamath River from Ayuich (Sugarloaf Mountain). Photo: Baechtel 1912**

The pressure exerted on tribal and settler communities to discontinue fire use was immediate and intense. By 1932, the Forest Service was beginning to stamp out the last of the traditional burners, and the landscape has been building a fire deficit ever since.

We now have large swaths of land that have not seen fire in over 100 years, and few areas that have seen fire three times or more in this same time frame. In the few areas where fires have burned multiple times and fire regimes are most intact, continued suppression is preventing the restoration of fire process and the resilient forests it can create. This effectively defers risk to firefighters and communities in the future. In the 2014 Forest Service Chief’s letter of intent, he states that “we do not accept unnecessary risk or transfer it to our partners or future generations.” Consideration of this intent could allow forest managers to consider letting wildfires burn within recent fire footprints to restore historic fire return intervals in the planning area.

The following figure is based on recorded fire history since 1914. Very detailed records were taken that allow us to see how much of the landscape has burned in this time period. This map also highlights the number of times fires have overlapped. The most fires have overlapped is five times. This highlights the issue that forest types which require more frequent fire on the landscape to persist are being severely impacted by fire suppression policy. For instance, black oak and white oak woodlands should be burning every 3-10 years. Other places where ceremonial burning occurred, including Offield Mountain and Black Mountain, would show as many as 100 fire overlaps where ceremonial fires were lit every year. Imagining this map without a century of fire suppression, there would be little to no areas that had not been touched by fire, and fires would be greatly limited in severity and extent by past fire footprints. This map also shows that roughly a quarter of the planning area has had recent fires where prescribed fire or managed wildfires could be used to restore historic fire regimes in these areas.



**Figure 3: Fire history map showing number of fire overlaps in the Western Klamath Restoration Partnership planning area in the past 100 years.**

Overlapping Fires Since 1914 in the Klamath Mountains		
Number of Overlapping Fires	Sum of Acres	Percent of Planning Area
0	583,971	48.8%
1	362,278	30.3%
2	175,496	14.7%
3	67,048	5.6%
4	7,339	0.6%
5	618	0.1%
<b>Total Acres</b>	<b>1,196,750</b>	<b>100%</b>

**Figure 4: Percent of Planning Area with Number of Overlapping Fires Since 1914**

The chart in Figure 4 shows the extent to which we have shifted from our historic range of variability. Less than 16% of the planning area has had two fires in the past 100 years. This is a critical concept when describing forest resiliency to future fires as multiple fires are needed to reduce canopy bulk density, height to live crown and other factors that drive high intensity fires. Carl Skinner, geographer and fire ecologist with the Region 5 Pacific Southwest Research Station (USFS) at his keynote address at the 2014 Klamath Fire Ecology Symposium noted that the last time we have seen this little fire in the Western Klamath Mountains was when the glaciers were receding at the end of the last ice age.

### *History of Collaboration in the Western Klamath Mountains*

In recent years, agencies have engaged in collaboration with communities to plan projects that reduce the threat of wildfires, yet a true collaboration success has not been realized to date. Collaborations have not been maintained through implementation, monitoring, and feedback into future collaborative projects. These initial collaborative efforts have contributed to the further lack of trust between stakeholders in the planning area. Local organizations and individuals continue to seek the establishment of a lasting collaboration with all interested stakeholders to chart a way forward with land management in the Western Klamath Mountains. Through outreach and involvement of local, state, tribal and federal entities, the Western Klamath Fire Learning Network (WKFLN) was formed to address the need for increase education and communication around fire and fire management. In 2013, the US Fire Learning Network agreed to provide high level facilitation to convene the Western Klamath Restoration Partnership (WKRP, or Partnership).

### *Introduction to the WKRP and the Open Standards Process*

This Partnership allows diverse stakeholders to come together to work through the Open Standards Process for Conservation to identify Zones of Agreement where all parties

agree upslope restoration needs to occur. The Partnership was originally focused solely on the Middle Klamath subbasin and was called the Middle Klamath Restoration Partnership, which has been meeting since 2007. The Partnership’s initial focus was on instream fish habitat restoration, as there was significant funding available and a favorable socio-political climate for achieving success. In recognition of the controversial issues surrounding forest management in the region, participants chose to wait to focus on upslope restoration until facilitators capable of bringing the group from conflict to understanding and general conceptual agreement were identified.

Momentum for the WKRP grew to surrounding communities after the first meeting in May 2013, and stakeholder groups from the Salmon River attended the July 2013 meeting. Based on their participation and interest, the Partnership settled on a planning scope that included the entire Salmon River watershed. The name of the group changed to the Western Klamath Restoration Partnership to reflect this increase in geographic scope. The Open Standards Process for Conservation has been used around the world over 1,000 times to facilitate successful collaborative conservation efforts.

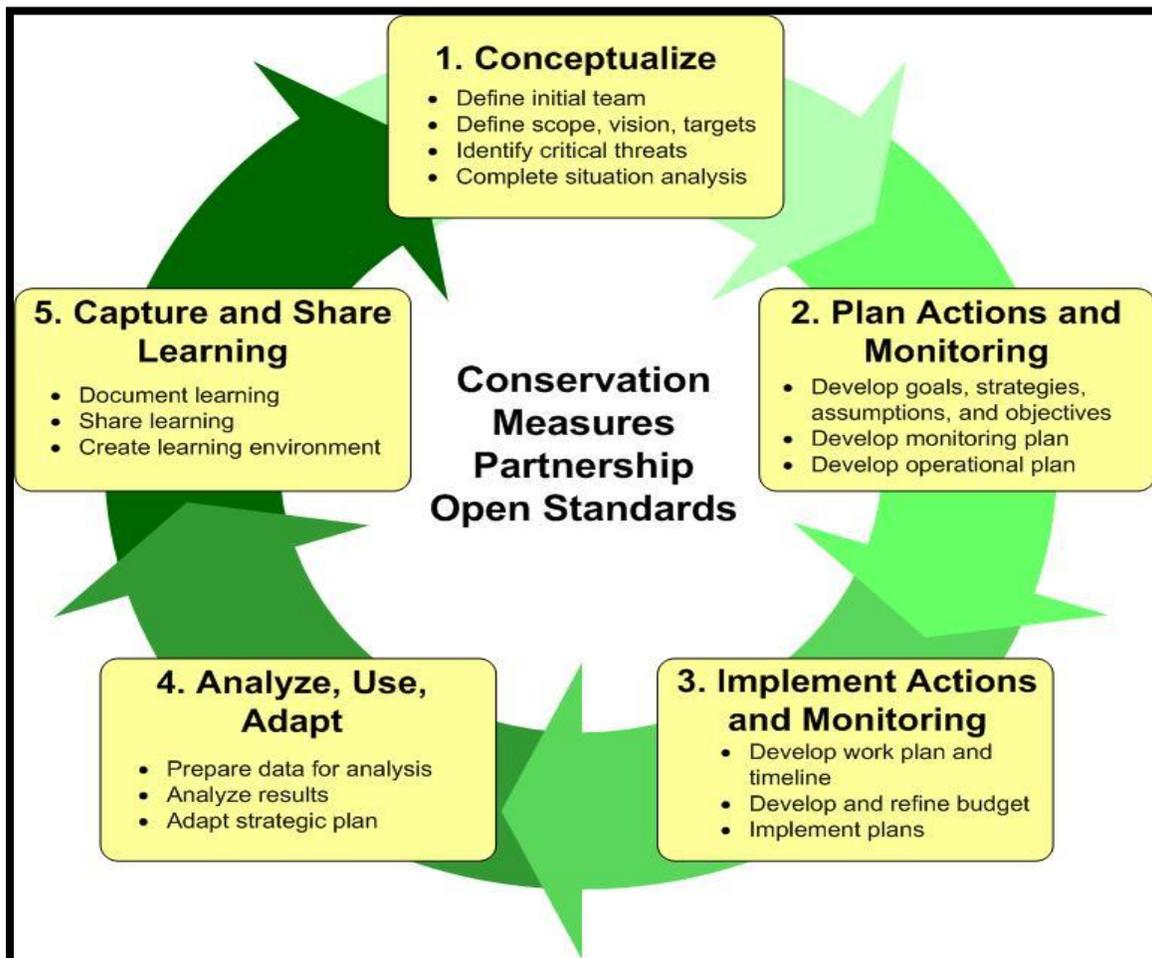


Figure 5. Diagram of the full Open Standards Process. Steps One and Two were completed through this planning effort to date.

## Conceptualizing a Path Towards Upslope Restoration

### *Defining our Planning Purpose and the Western Klamath Restoration Partnership*

The Western Klamath Restoration Partnership is an open group comprised of the Federal, Tribal, and Non-governmental Organization (NGO) participants with the inclusion of facilitators and additional invitees when entering the phase of initiating the facilitated Open Standards Process. Invitations were extended to all potentially interested parties from local, state, federal and tribal entities within the planning area, and meeting minutes are shared with a listserv that continues to grow. While many interested parties are not able to attend due to the extensive commitment of time this process has required, they have expressed support for the purpose of this planning effort: to build broad based support for upslope restoration actions that will expedite the creation of fire resilient communities and forests.

The Core Team for this process began with the Karuk Tribe (Tribe) and Mid Klamath Watershed Council (MKWC) assuming co-lead roles through integration of the Fire Adapted Communities Pilot Project, Western Klamath Mountains Fire Learning Network, and Region 5 Special Funds Planning Project. There has been great participation in this process by line officers from the Six Rivers and Klamath National Forests, but neither forest has chosen to designate co-leads. Other key partners that have extended core team representation have been the Karuk Tribe's Emergency Preparedness Department, Salmon River Restoration Council, Happy Camp Fire Safe Council, USFS personnel, and a few local community members and technical experts.

As we began to move forward with developing specific projects, the need to formalize Co-Leads and the composition of the Core Team prompted the WKRP to get nominations for these positions during Workshop #7. In June 2014, these were tallied and the following individuals were nominated for each group:

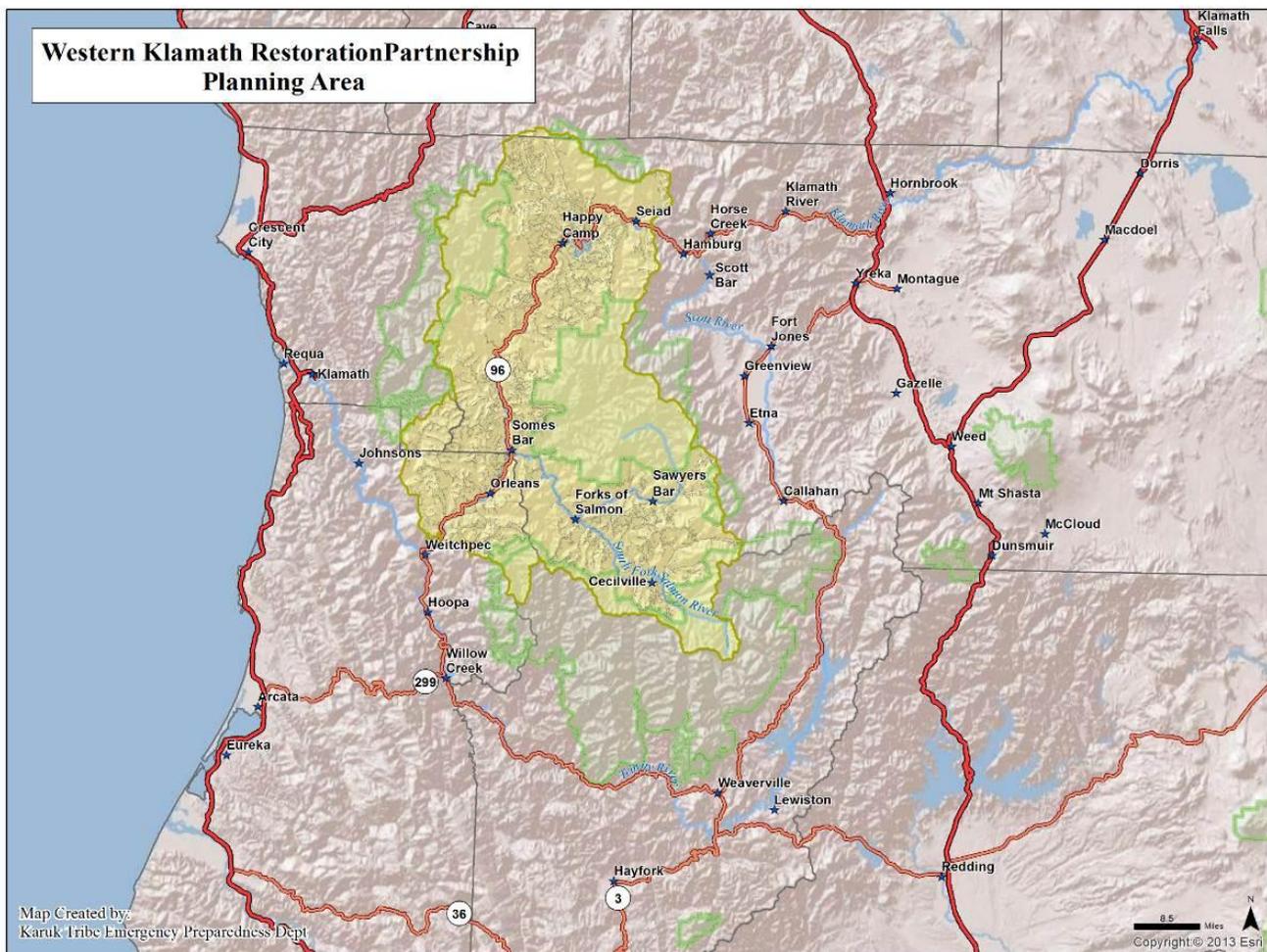
Co-Leads: Bill Tripp (Karuk Tribe), Will Harling (MKWC), Karuna Greenberg (SRRC), Clint Isbell (USFS KNF)

Core Team: Jill Beckmann (Karuk Tribe), Max Creasy (MKWC), Zack Taylor (USFS SRNF), Carol Sharp (HC FSC), Jon Grunbaum (HC FSC, USFS KNF), Cathy Meinert (HC FSC), Earl Crosby (Karuk Tribe), Tim Wilhite (EPA), Kimberly Baker (KFA/EPIC), Bill Estes (HCCC), Kevin Osborne (USFS KNF), Josh Saxon (Karuk Tribe/SRRC), and Frank Lake (USFS PSW).

Factors considered were: involvement and commitment to this process, geographic/organizational diversity, and number of votes. Realizing team members will change through time, there was zone of agreement that every attempt should be made to include representation of the multiple organizational interests involved in the WKRP while not letting the Core Team get too large and unwieldy.

## Defining our Scope, Vision, and Conservation Values

Our scope initially encompassed the Klamath Mixed Evergreen BpS layer, which roughly captures the extent of Tanoak in the planning area of the Middle Klamath Restoration Partnership. Then as we transitioned to the Open Standards process, the Geographic Scope was set collaboratively and expanded to include the external watershed boundaries surrounding the engaged communities and correlating tribal territory. The final scope is approximately 1.2 million acres and includes the entire Salmon River Watershed and the portion of the Middle Klamath River subbasin between Aikens Creek and Seiad Valley. This planning area includes portions of the Siskiyou, Marble Mountain, and Trinity Alps Wilderness areas. It also includes the communities of Orleans, Somes Bar, Forks of Salmon, Cecilville, Sawyers Bar, Happy Camp and Seiad Valley.



**Figure 6: Planning Area of the Western Klamath Restoration Partnership (tan area, surrounding wilderness areas in green)**

To establish the scope of the planning area, we broke out into subgroups and proposed various maps of potential scope on six separate maps. We discussed pro's and con's,

developed a rationale, and set the scope boundary to the area identified above. As for the thematic scope, it was hard to define in early stages. We decided it would emerge throughout the process. We did however move forward with the realization that we needed to consider all-encompassing restoration, not just fire, while recognizing that many other groups and collaborations are occurring that are currently addressing restoration actions other than fire. The Partnership chose collaboratively to focus on strategies that primarily address establishing Fire Adapted Communities.

The Partnership created our Vision by developing multiple drafts in breakout sessions, then merging them through follow-up homework sessions and whole group review:

**Establish and maintain resilient ecosystems, communities, and economies guided by cultural and contemporary knowledge through a truly collaborative process that effectuates the revitalization of continual human relationships with our dynamic landscape.**

Shared values emerged through identification of six Conservation Targets. Targets and Values are interchangeable terms in the Open Standards process; Though they are called targets in some places throughout the process and values in others, the intent is not only to consider these in what we do, but aim to achieve improvement of target viability. The Conservation Values/Targets we identified were:

1. Fire Adapted Communities
2. Restored Fire Regimes
3. Healthy River Systems
4. Resilient Bio-diverse Forests/Plants/and Animals
5. Sustainable Local Economies
6. Cultural and Community Vitality

### *Identifying Critical Threats to our Conservation Values*

In identifying Critical Threats we started with a threat mapping exercise. This was an interesting concept in getting the group thinking of how real world threats to the viability to our Values/Targets apply to our landscape. Some key threats emerged from this which included:

- Lack of stable jobs
- Erosion of community and cultural values, including Karuk traditional practices
- Lack of beneficial fire
- Altered forest structure and composition (overly dense forests)\*
- High fuel loading
- Lack of defensible space
- Habitat degradation (terrestrial and aquatic)
- Impaired fishery

\* Environmental groups were concerned that “overly dense forests” may be used to justify excessive thinning of specific stands. This highlights the differences between agreement in principle versus agreement in practice. Though all agreed that there are concerns as to the fact that there is a threat relating to overly dense forests (agreement in principle), there was also consensus that density in dynamic forested systems is also critical for many plants and animals. How we address this threat may need more focused interaction (agreement in practice). These and other concerns will need to be addressed during the subsequent phases of project planning when stand level prescriptions are developed.

### *Conducting a Situation Analysis*

Once critical threats were identified, we asked ourselves, what are the things that make this threat to our conservation targets real? Are there indirect threats that lead us to the root cause of the problem? This was a valuable exercise that helped us form problem pathways. In analyzing these pathways we were able to identify points of intervention where specific strategies could help us address these root causes and ultimately, the direct threats to our values/targets.

It also helped us to refine, add, or delete indirect threats in the pathways. These strategies, if implemented, would allow us to change the identified threats into the opposite of that threat, or the positive result of implementing our strategy. Strategies were identified that affected multiple threats, leading to a chain of results that will ultimately allow us to improve the condition of our targets/values.

Taking more time to go through these in the future with the larger group will help to refine the relationship between strategies, indirect threats, direct threats and our identified Values/Targets. The following diagram provides a valuable starting point and we should reflect back on this regularly in moving forward and modify pathways as we gain experience, find efficiencies, or identify new linkages that may be more effective in improving target viability. This is an evolving work in progress, and can be used over time to track the effectiveness of our implemented strategies. See diagram on the next page:

## Situation Diagram

This situation diagram reflects participants shared understanding of the relationships among their shared values, threats to the viability of those values, and strategies that the group would pursue in order to make things better.

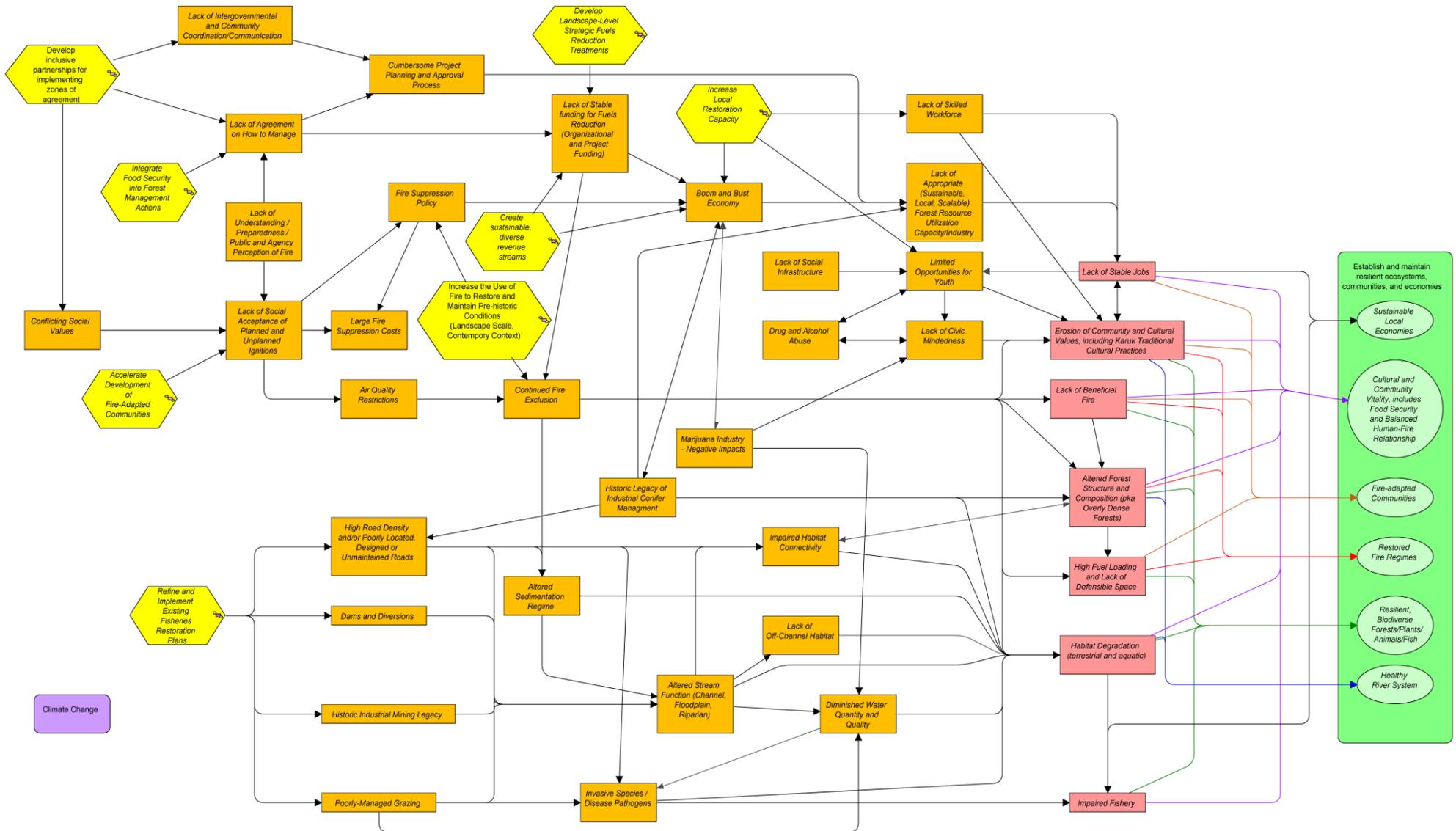


Figure 7: Draft Situation Analysis showing linkages between Strategies, Threats and Values.

## Developing a Formal Action Plan

Formal action planning is difficult to achieve in an expedited Open Standards process. Since this effort was combined with other funding sources to enable multi-organizational participation in the process, there were also points of insertion where we had to bring in products developed by WKRP partners, but in separate processes. The major components that were integrated in our workshops were the GIS Overlay Assessment maps, and the need to identify projects in the Happy Camp and Somes Bar areas as required by the Region 5 Special Program Funds, and the Fire Adapted Communities Pilot Project.

In order to come up with an integrated action plan that considered the needs of multiple organizations and funding sources, the Open Standards Workshop #6 incorporated an exercise to identify three projects on our case study maps from previous workshops that model integrated fire management principles. An initial action plan was created from our workshop activities to date, and has been refined to address real world considerations.

### *Defining our Goals and Objectives*

The overarching goal of the WKRP is to improve the viability of all of our conservation targets. The group reflected on the current status of the target, discussed the real world issues affecting the current status and our ability to change them. The Partnership came up with a goal for improving the potential future status of our targets. Though the metric of measurement is subjective, it provides a framework for bringing us back together if partners feel like we are not moving in a positive direction. These targets are long term and will likely still be applicable generations from now. The Table below provides an outline of a perceived current and potential future target viability that we hope to move through efforts of this Partnership and the broader community.

<b>Target/Value</b>	<b>Current Status</b>	<b>Potential Future Status</b>
Sustainable Local Economy	Poor	Fair
Cultural and Community Vitality	Poor/fair	Good
Fire Adapted Communities	Fair	Good
Restored Fire Regimes	Fair*	Good
Resilient, Biodiverse Forests, Plants & Animals	Fair	Good
Healthy River Systems	Fair	Fair

\* The group discussed that we may need to move the Fire Adapted Communities target to very good to enable us to move Restored Fire Regimes to good. The status of Fire Regimes as currently being in fair condition is in question as the argument could be made that it is actually poor due to nearly 50% of the planning area not seeing fire in the last 100 years.

Three big points that emerged throughout the workshops were: 1) the need to develop multi-organizational capacities; 2) the need for on-the-ground demonstration projects to prove we can go from agreement in principle to agreement in practice; and 3) the need to plan big, but start small, learn from the outcomes of our work, and have the ability to refine our prescriptions/descriptions as we progress. Establishment and maintenance of agreement in practice, progression of knowledge, and continual workforce improvement are key components of growing the success of the WKRP.

Another recurring theme was the intent to implement all three primary components of the National Cohesive Wildland Fire Management Strategy (Cohesive Strategy). These three components are:

- Restoring and Maintaining Resilient Landscapes
- Creating Fire-Adapted Communities
- Responding to Wildfires

It is the intent of the WKRP to align our actions in a manner that demonstrates implementation of the Cohesive Strategy in terms defined by tribal and local communities with consideration of regional and national goals. There are many aspects involved in this process which will require us to see the full scope of actions we must take to achieve these three components. This includes utilizing aspects of existing programs such as Firewise Communities, Fire Safe Councils, Ready, Set, Go!, Fire Adapted Communities, Fire Learning Networks, and Prescribed Fire Councils. We recognize this is a long-term process, and that it is critical we do not lose sight of these long-term goals in the pursuit of short-term achievements.

### *Refining Our Strategies*

In order to change the viability of our targets/values, strategies were discussed and decided upon and logical points of insertion in our results chains were identified. Basically, strategies were meant to reverse threats to our values into positive results which would affect other threats to ultimately increase the likelihood of achieving our targets. This forced us to identify the root causes of the problems facing us, and what could be done to address them strategically. The nine strategies that we ultimately settled on are listed below:

1. Develop and implement landscape level strategic fuels reduction treatments
2. Increase use of fire to restore & maintain Pre-European conditions in a contemporary context
3. Increase local restoration capacity
4. Create sustainable diverse revenue streams to address all threats and values
5. Accelerate development of Fire Adapted Communities
6. Integrate food security into forest management actions
7. Advocate for and support implementing existing fisheries restoration plans

8. Develop integrated, inter-generational education programs and activities that complement our identified strategies
9. Develop inclusive partnerships for implementing zones of agreement

These strategies help to broadly frame the zones of agreement that we sought to describe spatially in the GIS overlay assessment, but also added more information on how these efforts rely on education at multiple levels and sustained efforts to maintain inclusive partnerships that will continue to focus resources on presenting issues and threats. Future workshops will seek to define how particular strategies can get us to agreement in practice. WKRP participants were unanimous in focusing on getting things done on the ground, and decided to move forward with three community based integrated fire management projects. These projects integrate some or all of our strategies. Three strategies link to all others and apply most directly to one of the three projects the WKRP decided to move forward with. These are:

- Develop inclusive partnerships for implementing zones of agreement
  - Salmon River Integrated Large Fire Management Project
- Develop landscape level fuels reduction treatments
  - Somes Bar Integrated Fire Management and Capacity Development Project
- Accelerate development of Fire Adapted Communities
  - Happy Camp Integrated Community Protection and Workforce Development Project

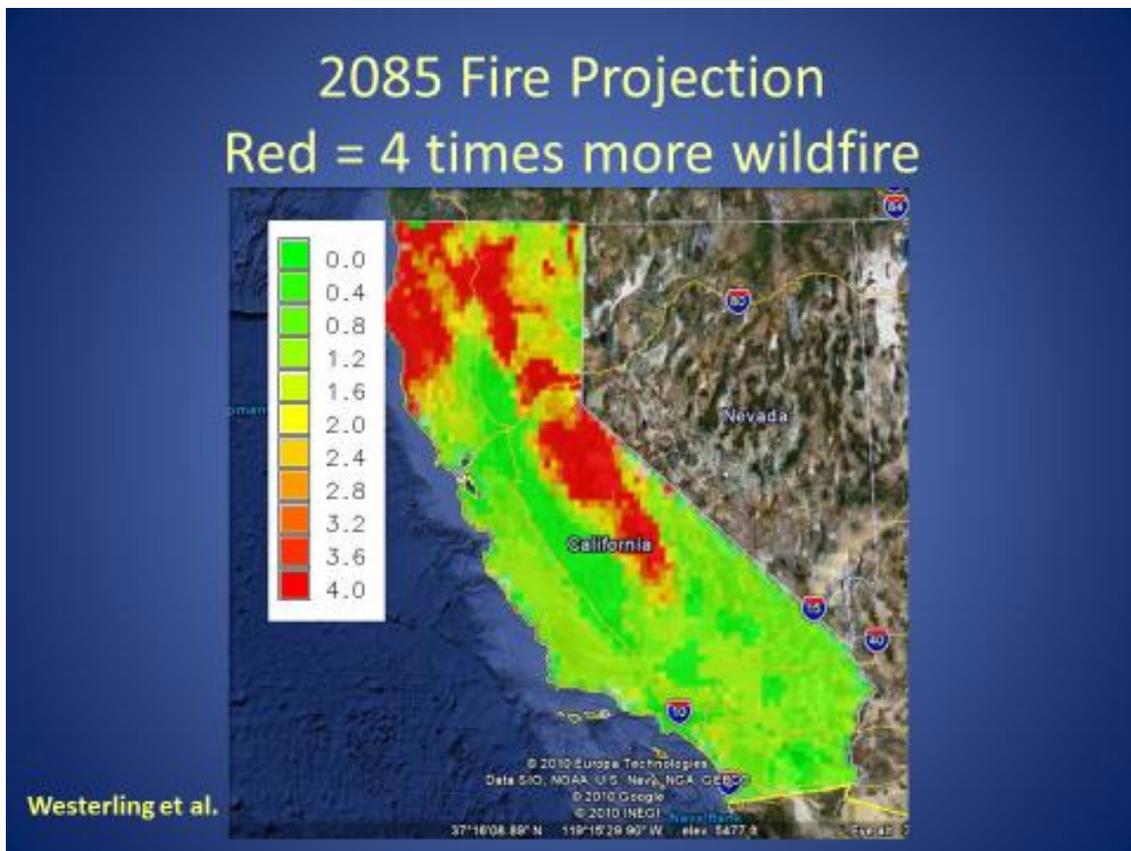
### *Guiding Principles: The Way We Work*

One of the final exercises we did in the WKRP workshops was to define the guiding principles of the group as we move forward through time. These are principles that we will use to guide our actions and base our achievements upon.

1. We are results-oriented.
2. We work toward having beneficial fire operating throughout our landscape.
3. We incorporate cultural values and traditional ecological knowledge into our work.
4. Our activities seek to build our local workforce.
5. We use the Open Standards for the Practice of Conservation as our guide to adaptive management and collaboration.

## *Defining Zones of Agreement and Clarifying Socially Beneficial Results*

Across the West, and in particular in Northwestern California where complex fire behavior mirrors our rugged topography, communities are learning how to relate to this most dynamic element, fire, again. Recent fire seasons have been a potent reminder of what is at stake. Hundreds of homes and many lives have been lost in our failed, but seemingly unavoidable battle with wildfires across the country. A hundred years of fire suppression on national forests, coupled with logging and development in the Wildland Urban Interface (WUI), have made fire suppression an increasingly dangerous and costly pursuit. For California, scientist Malcolm North recently predicted the rise of megafires across the state as fuel loading and climate change combine to overwhelm the most technologically advanced firefighting force in history. The Klamath region is predicted to have four times more fires by 2085 given current climate predictions.



**Figure 8: Figure from Westerling et al. 2011 showing the predicted increase in wildfire activity by 2085 across California.**

The problem rests not only with fire suppression, logging and development in the WUI. Fire historian Stephen Pyne identifies the lack of prescribed fire as another major factor in the current fire situation. “If contemporary fire agencies had the chance to replay the light burning controversy, they would almost certainly choose fire lighting over firefighting as a basis for wildland stewardship. They know the problem was not fire

suppression, but the abolition of controlled burning, that magnificent and misguided attempt at fire's wholesale exclusion.”

This understanding is shared by a majority of residents in the planning area and the need to increase the use of prescribed fire as a tool to protect communities was expressed throughout the Western Klamath Restoration Partnership workshops. To expand the use of controlled burning to the scale it is needed will require incorporating science, policy, public understanding and sentiment, economics, and mechanisms for risk management that are just now being developed. There is urgency to us creating this new vision, for the specter of climate change has made historic fire regimes a moving target; perhaps unattainable given the amount of current departure from the fire resilient forests of a century ago.

Communities across the country have, out of necessity, jump-started local planning efforts to protect themselves from intense wildfires. History has shown that real change occurs when grassroots movements connect to larger national shifts in policy and opinion. It appears that federal, tribal, and state governments, soured by the growing cost of wildland fire suppression and informed by a large volume of science and Traditional Ecological Knowledge, will use the recently published Cohesive Strategy to facilitate significant changes in current fire management. Funding for this Plan is a demonstration of the desire to more fully utilize local information and resources in crafting successful strategies for communities living with fire in national forestlands.

The communities of Orleans and Somes Bar, through the Orleans Somes Bar Fire Safe Council (OSB FSC), published a Community Wildfire Protection Plan (CWPP) in 2012 that gives a detailed example of how both community fire safety and fire resilient landscapes can be achieved through relatively low cost methods. (For a full text of the CWPP, go to: <http://mkwc.org/publications/index.html>). The CWPP identifies a prioritized series of actions to ultimately reduce the impacts of wildfires to the point where suppression will no longer be the primary choice for fire managers. Funding for this Plan has allowed for the incorporation of additional treatment prioritization factors from the Karuk Tribe's Eco-cultural Resource Management Plan, USFS Klamath Scheduler tool, and adjacent communities.

These factors were incorporated into a GIS overlay assessment that utilized both existing data and data created through this effort to visually represent where the WGRP felt work should be focused. The following overlay assessment description represents our basic zone of agreement for all treatment types. It can serve as a guide to planning and prioritizing projects on the landscape scale for multiple social, ecological, and economic factors:

1. Creating defensible space around structures and critical infrastructure through manual and prescribed burning fuels reduction treatments. Mechanical treatments were considered for the 500' buffer. The structures layer was updated 2014 for the entire planning area by the Karuk Department of Emergency Services:
  - a. Structures layer
    - i. 100 foot buffer: 1 point
    - ii. 500 foot buffer: 2 points



Figure 9. A shaded fuelbreak created in a tan oak forest benefits the landowner who lives just upslope, elk that frequent the stand to feed and bed down, and tribal members who gather tan oak acorns for subsistence and ceremonial use.

2. Safe and reliable access and egress routes will be maintained by manual, mechanical and prescribed burning treatments (if implemented, will also provide cost effective linear features to stop wildfires and start prescribed fires):
  - a. Critical access/egress routes (300' buffer): 2 points
  - b. Complete road system layer (public and private) (300' buffer): 1 point

3. Public/Private boundary layers (Green Line – buffer applied from edge of private property onto public lands). Revisiting residential properties to create fuelbreaks along the public-private boundary allows both federal and private landowners to have more certainty that fires, especially prescribed fires, don't inadvertently spread across property lines (see example from Orleans CWPP map of proposed treatments around Orleans on next page):
  - a. 200 foot buffer: 2 points
  - b. ¼ mile buffer: 1 point

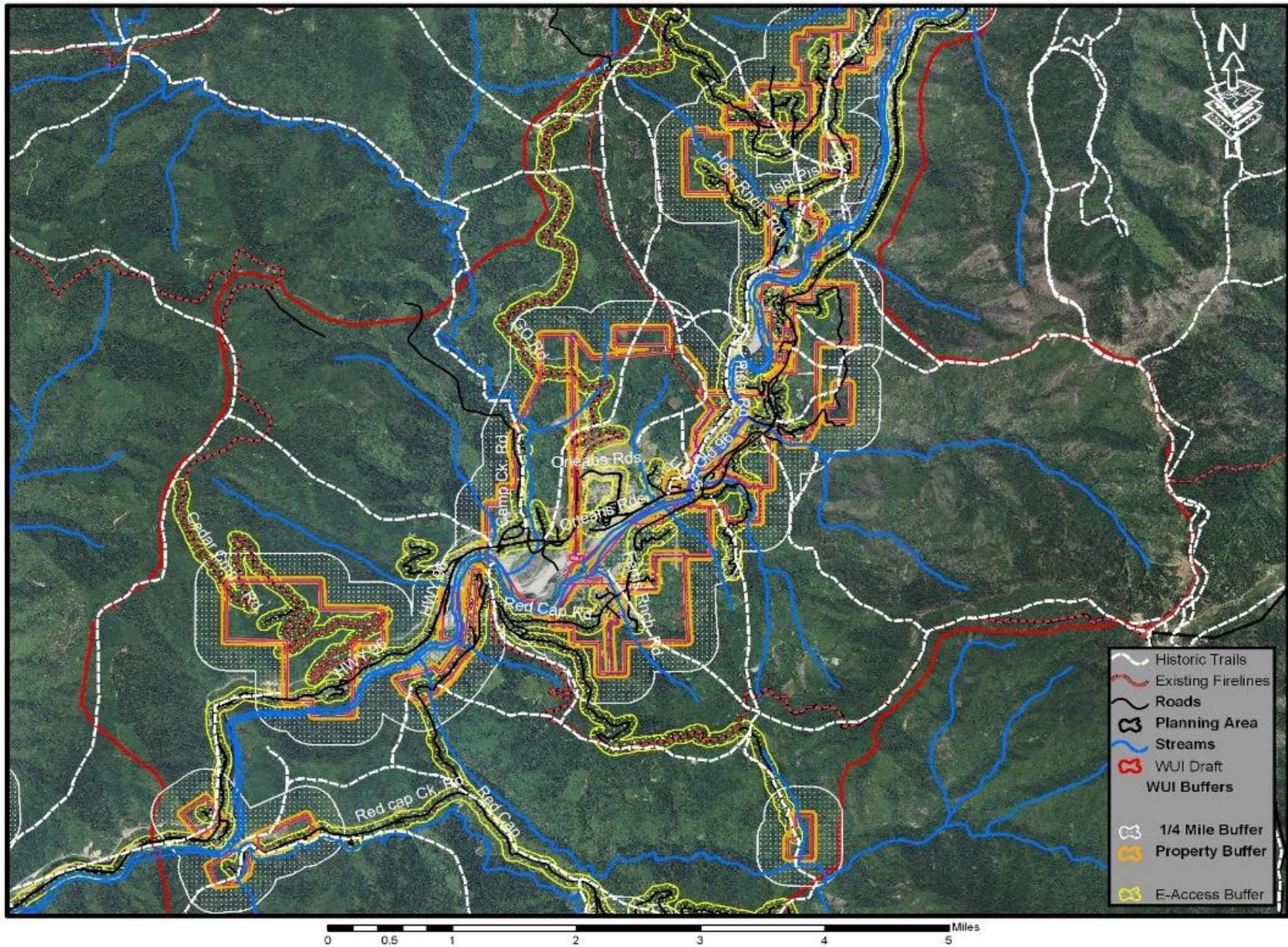


Figure 10. Map of Orleans Valley from Orleans/Somes Bar CWPP showing how roads, trails, ridges, firelines, rivers, and existing fuel breaks provide opportunities to stop wildfires and safely light controlled fires.



Figure 11: Firefighters initiate successful burnout from constructed fuelbreak along Seiad Creek Road.

4. Fuelbreaks along existing firelines, ridges, and trails. This helps tie in road and streams to establish Firesheds: areas where fires (both controlled and wildfires) can be contained or stopped. Control features outside the WUI should also be addressed to slow the spread of larger “megafires” through the backcountry. These actions could be as simple as conducting controlled burns in the Fall along significant ridges to break up fuels at the landscape level (see figure on page 23 describing the Trinity Alps Prescribed Fire Project).
  - a. Existing firelines (300 foot buffer): 2 points
  - b. Current and Historic Trails: 1 point
  - c. Upper 1/3<sup>rd</sup> Slopes: 1 point
  
5. Maintaining existing fuels treatments on public and private lands to increase fuelbreak effectiveness. This data was derived from private land treatment layers from Happy Camp, Salmon River and Orleans/Somes Bar FSC’s, and from the Region 5 Facts database, with additions from HCRD staff Kevin Osborne (Seiad FSC tx missing):
  - a. 0-3 Years Since Treatment – 1 points
  - b. 3-10 Years Since Treatment – 2 points
  - c. 11+ Years Since Treatment – 1 point



Figure 12. Prescribed burns increase the effectiveness of constructed fuelbreaks by consuming dead fuel on the ground, and consuming stump sprouts and new plant growth in the understory.

6. Targeted fuel treatments for cultural and ecological resource benefits to protect tribal practices dependent on the use of fire as a land management tool, and to preserve plant and animal species that depend on habitats maintained by frequent fires:
  - a. Wildlife Layers
    - i. Elk Winter Range Restoration Potential Layer
      1. Low (0.8): 1 point
      2. High (0.9 or 1.0): 2 points
    - ii. Spotted Owl Nest Sites Buffer (1/2mi. diameter) – 1 point
  - b. Vegetation Layers (Landfire Biophysical Settings (BpS))
    - i. Klamath Mixed Evergreen BpS (Tanoak Distribution) – 1 point
    - ii. Klamath Siskiyou Lower Montane Serpentine Woodland – 1 point
    - iii. Black Oak BpS Layer – 1 point
    - iv. White Oak Bps Layer – 1 point
    - v. Baker Cypress Stands – 2 points
    - vi. Meadow Restoration (GIS Layer Needed)\* – 1 point
    - vii. Willow/Riparian Stands (GIS Layer Needed)\* – 1 point
    - viii. Beargrass Areas (GIS Layer Needed)\* – 1 point
    - ix. Hazel Areas (GIS Layer Needed)\* – 1 point
    - x. Iris Areas (GIS Layer Needed)\* – 1 point
    - xi. Huckleberry Stands (GIS Layer Needed)\* – 1 point
  - c. Native American Cultural Use Areas (NACUA's) – 1pt.

\* GIS data of cultural use species is sensitive information and may or may not be appropriate in this format. If this data is created, protections should be put in place to prevent misuse.

# Trinity Alps Prescribed Fire: Proposed Treatments

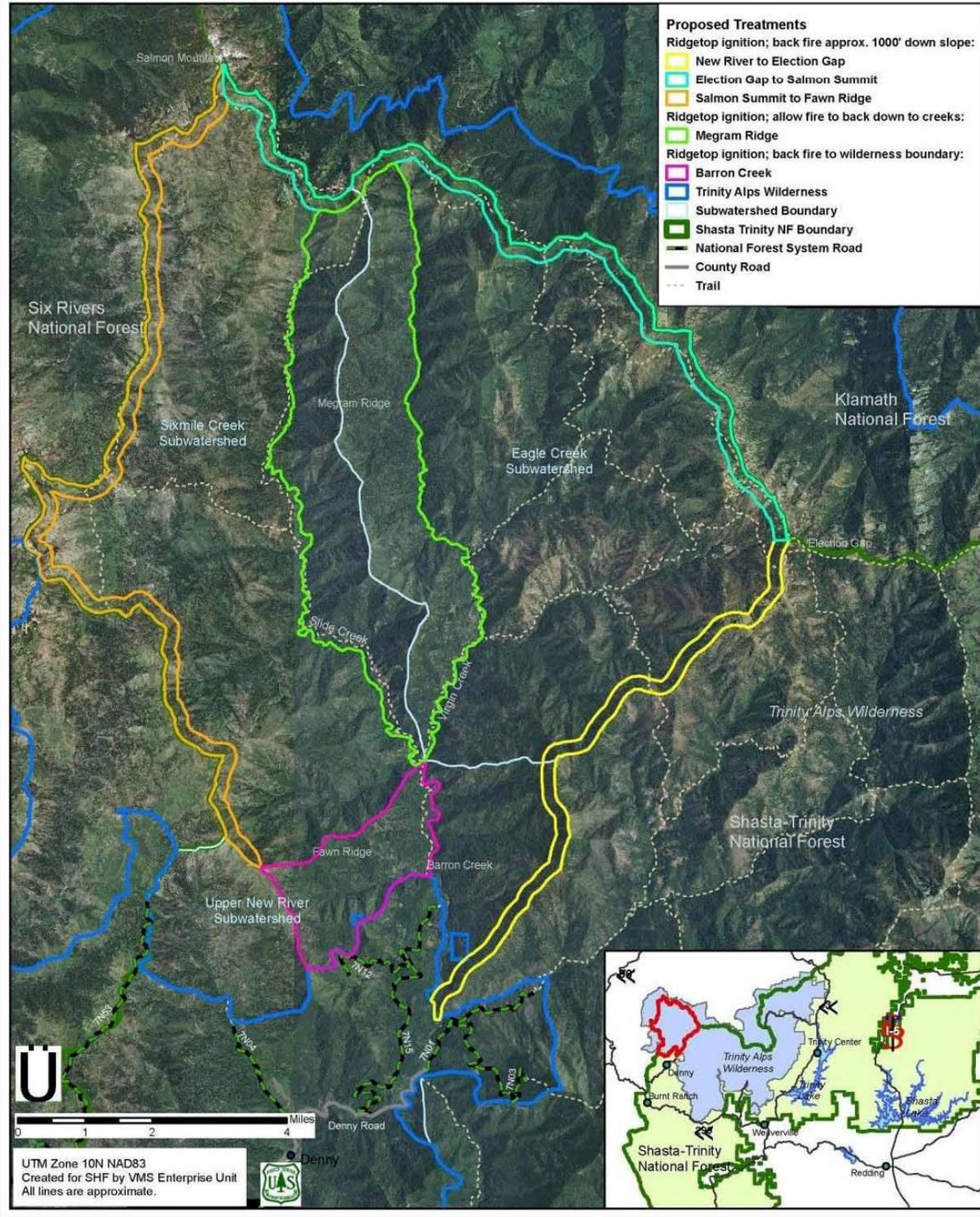


Figure 13. Map showing proposed controlled burn units in the Western Trinity Alps Wilderness Area.

Separate overlay assessments were done to better prioritize manual, mechanical and prescribed burn treatments based on specific timing, location, access, and other specific needs/factors relating to each treatment type. The following changes were made to the general overlay assessment and point scheme described above:

#### Manual Fuels Treatment:

- Only prioritized fuels treatments from 2002 and earlier, assuming they would need further thinning to allow for positive re-introduction of prescribed fire. One point.
- Did not consider insolation or south and southwest facing slopes (included too many inaccessible areas and brought focus away from communities).
- Did not include managed stands or mid-mature dense stands (these areas need mechanical thinning).
- Excluded from prioritization all areas with slopes over 80%.

#### Mechanical Fuels Treatment:

- No points for 100' structure buffer. Kept two points for 500' buffer. Assumed no mechanical treatments that close to homes.
- Only used ¼ mile community (neighborhoods) buffer, but gave it two points to reduce focus directly on the property lines.
- Did not include previous manual fuels treatment layers.
- Reduced the weight on the firelines buffer from two to one point. Most mapped firelines are not accessible for mechanical harvest.
- Did not include historic trails.
- Did not include insolation.
- Added a point to mid-mature dense stands layer (total of two points).
- Added layer for plantations over 40 years old and gave it two points.
- Did not include crown fire potential.
- Excluded serpentine (buck brush) veg type from Landfire BPS veg layer. These areas are proposed mid-winter prescribed burns.
- Excluded from prioritization: inner gorges, slopes over 40% except within 1500 feet of existing roads (allowing for potential skyline treatments), NSO activity center buffers, and existing landslides.

#### Prescribed Burning Treatments

- Critical access egress routes were only given one point instead of two.
- Recent wildfires (within past 10 years) were given two points instead of one.
- A new layer showing plantations over 20 years old was added and given one point.
- A new layer showing areas with predicted flame lengths over eight feet was added and given one point.
- Crown fire potential layer was removed.

Manual fuels treatments (public and private) are one of the strongest areas of agreement in principle that we have. Prescribed burning was also strongly supported, however the resources currently do not exist to implement prescribed burns at the scale identified in the WKRP planning process. This can also be said for manual fuels treatments. Additionally, while these treatments will save firefighting expenditures in the future, they do not generate funding by themselves and will require a significant investment to implement at scale.

Mechanical treatments were strongly supported by some participants, but strongly discouraged by others unless there was a clear path for collaboration as defined through the Open Standards process to allow for meaningful stakeholder involvement. Mechanical treatments have affected the viability of traditional food and fiber resources in some areas. Manual treatments may not be able to restore the potential natural vegetation on a site that has undergone a type level conversion due to lack of fire. In some cases, girdling of trees followed by prescribed fire was proposed by participants to restore potential natural vegetation in areas where mechanical treatments aren't an option.

Future WKRP workshops will focus on defining agreement on specific prescriptions for each of these practices that will inform the integrated fire management projects proposed in this Plan. We recommend that funding be sought for a series of field trips across the planning area to previously implemented manual, mechanical and prescribed burning treatments to ground this work in what has actually happened in specific vegetation types with site specific slope/aspect/elevation/soil type considerations.

Many of the Forest staff who implemented these treatments are now retired, but still live in the area and are keen to make sure that we learn from what has been done and not re-invent the wheel when it comes to designing prescriptions. Additionally, there are still tribal elders that remember how their parents or grandparents managed these lands traditionally. Combining these two important knowledge sets holds our best hope for success in the future management of this landscape.

Further discussions are needed to clarify what to do when social, cultural and ecological considerations conflict with economic development in identified treatment areas. This effort has focused initially on identifying specific treatment types in areas that were broadly supported by the WKRP. Continued engagement with all stakeholders is needed to successfully carry this effort through the full cycle of the Open Standards process. Mechanisms for providing collaborative input throughout the process of a specific project that does not trigger Federal Advisory Committee Act (FACA) will need to be explored and established. It is assumed that over time as trust is built and projects are implemented that we will revisit this planning effort and the prioritization process to figure out where further treatments are needed.

The Happy Camp Fire Safe Council is currently updating their CWPP using some of the same concepts described above through funding from the Klamath National Forest. These outlined treatments represent a significant step towards an All Lands approach to managing forest fuels and wildfires to maximize cost savings and the beneficial social

and ecological effects of restored fire regimes. This Plan is intended to complement their CWPP and existing CWPP efforts in Orleans, Somes Bar and the Salmon River.

Finally, it was expressed throughout the WKRP process that if even just a fraction of the hundreds of millions of dollars spent fighting wildfires in the Western Klamath Mountains over the past thirty years were spent implementing the CWPP's that local communities here have developed, we would no longer have to fear the puff of smoke from the ridge behind our house the day after that summer thunderstorm. The strategies outlined in this Plan and the CWPP's are a reflection of the growing grassroots support for a significant shift in how we prepare for and manage wildfires in the Western Klamath Mountains. We are greatly encouraged by the broad based participation in the WKRP and the support federal agencies have shown for this process. If we are successful, there is hope that future generations will no longer fear fire on this landscape, but will utilize it as a tool to increase the health and abundance of human and natural systems.



**Figure 14. Retired USFS burn boss John Gibbons shows residents how to safely ignite a controlled burn on a midslope property in the Rodgers Creek drainage.**

While the threat of catastrophic fire looms larger than ever, there is a chance we can shift to a more sustainable model of fire prevention and suppression, one that honors the role of fire in the ecosystems of Northern California while protecting human resources from further damage. This shift will entail residents of the north state to differentiate between

the little bit of smoke from a prescribed fire from the much larger smoke output of a wildfire, and to not buy in to the simple rhetoric of good fires and bad fires, but to see fire for what it is: a powerful tool for managing diverse ecosystems that, when used properly, can be one of the most cost effective methods of fuel reduction and ensuring the continuing resilience of our forests.

### *Developing a Monitoring Plan*

In Workshop # 6, the WKRP began developing a monitoring plan for project proposed through the Partnership. Worksheets defining information needs for each of the proposed integrated fire management projects were filled out, including clearly stated monitoring questions, who the audience is for the information, the information needed, and what specifically would be measured. Particular topics of interest for monitoring were:

- Implementation Monitoring: Did we implement the treatments as they were agreed upon during the planning process?
- Effectiveness Monitoring: Did our unit specific outcomes meet our objectives?
- Validation Monitoring: Are site specific/resource specific prescriptions achieving desired/predicted project outcomes?

Other monitoring information needs and questions related to the extent to which fuels were reduced strategically (such that wildfires could be used more frequently to maintain fire processes at the landscape scale), the restoration and enhancement of cultural resources, restoration of oak woodlands and elk habitat, local employment, and the effectiveness of constructed fuelbreaks. While there is still much more work to do, participants recognized that monitoring can be a powerful way to build trust and agreed that projects proposed from this planning effort should employ collaboratively developed monitoring protocols. This will allow for shared learning and discussion about the pro's and con's of implemented projects, and will provide a mechanism for these lessons to shape future projects.



**Figure 15: Monitoring the Orleans Community Fuels Reduction Project**

## *Developing an Operational Plan*

The WKRP has not begun the process of linking our strategic goals and objectives to tactical goals and objectives. We have yet to describe milestones, conditions for success, or how our strategic plan will be put into operation. The California Master Cooperative Wildland Fire Management and Stafford Act Response Agreement describes how Local Area Operating Plans can be used to establish working relationships between various entities. These local area operating plans have not yet been extended to include local and tribal partners, but are potentially a valuable way to utilize the unique resources that local, tribal, state and federal entities working in the WKRP planning area bring to the table. These local area operational plans would establish the activities and budgets for each participating organization for one to three year planning periods. They would link the strategic plan with the activities the organization will deliver and the resources required to deliver them. Questions to be answered through this planning effort would include:

- Where are we now?
- Where do we want to be?
- How do we get there?
- How do we measure our progress?

This level of planning is critical to requesting/securing the right amount of resources for each organizations annual operating budget and is based on capacity and the established need for services. These local area operating plans should be prepared by the people who will be involved in implementation. There is often a need for significant cross-departmental dialogue as plans created by one part of the organization inevitably have implications for other parts.

These operating plans should contain:

- clear objectives
- activities to be delivered
- quality standards
- desired outcomes
- staffing and resource requirements
- implementation timetables
- a process for monitoring progress



**Figure 16: Local, state, and federal organizations prepare to implement a prescribed burn in Somes Bar during the 2013 Prescribed Fire Training Exchange.**

## Preparing for Implementation

In Workshop #6, the WKRP identified three integrated fire management projects in the planning area. Each of these projects is unique in that they are at various levels of planning. The Happy Camp and Somes Bar projects describe potential areas where manual, mechanical and prescribed burning treatments can be implemented, while the Salmon River project will seek to establish a collaboratively defined project from start to finish when the new district ranger is appointed. There are factors outside of the WKRP and our planning process that will ultimately influence our ability to successfully carry this effort through planning, implementation, monitoring, analysis and shared learning. Some of these factors affecting our plan of action and the justifications for the proposed projects include:

1. Somes Bar area: The next large scale NEPA planning effort on the Ukonom Ranger District will be a modification of the Ukonom West Project. The Six Rivers National Forest (SRNF) has called for integrated projects and has expressed the desire to use our overlay assessment in determining what that project will become. The SRNF has also engaged in past planning efforts with the Karuk Tribe on the Ti Bar Cultural Management Demonstration Project, but did not move this forward to implementation. The Happy Camp pilot group and Orleans/Somes Bar pilot group both identified cultural resources/food security projects in the Cultural Management Areas (CMA) as the primary focus of one of our initial projects. The Katimiin CMA is in the vicinity of the Ukonom West area and has an MOU in place. The Inam CMA does not have an MOU in place, which would cause significant delays to implementation. With these considerations, the WKRP proposed an integrated project on the east and west side of the Klamath River in the Ukonom District between Somes Bar and Dillon Creek.
2. Happy Camp area: This area has the most NEPA ready project acres planned and ready for implementation in the WKRP landscape. While these projects were not developed through a collaborative effort, there are aspects of current projects that appear to fall within the Zone of Agreement of the WKRP. Considering that there are approximately 40,000 acres of treatments with existing NEPA, that there is funding for implementation available (Joint Chiefs), and the other pilots will take a significant level of organization and pre-planning, the logical choice for the Happy Camp project is a truly collaborative local workforce development, training, implementation and prescription/description refinement project
3. Salmon River area: In the past, communication, coordination, collaboration and consultation between the Tribe, NGO's, and the Forest Service on the Salmon River has hindered the development of projects through collaboration as defined through the Open Standards process. This project would seek to initiate a collaborative effort based on the Open Standards process for the Salmon River that will carry forward the Zones of Agreement defined by the WKRP. The Salmon River Restoration Council (SRRC) has recently been recognized by a Cohesive Strategy success story involving the Community Liaison Program. The Salmon River has experienced the most recent

large fires, has a high percentage of homes and properties with completed initial treatments, and has experienced a large area of recent large fire overlaps that can allow for the safe and effective reintroduction of managed wildfire in and adjacent to the 2005, 2006, 2007, 2008, and 2013 fire footprints. This integrated fire planning and implementation project will be dependent on improved relationship building and multi-organizational project planning to identify the best places for treatment and maintenance to enable fire to resume its role upon portions of Salmon River watershed.

*Developing a Short Term Workplan, Timeline and Budget*

During Workshop #6, the WKRP focused on developing realistic implementation goals with associated timelines and estimated costs based on our local workforce capacity, the need for treatments at larger scales, and the assumption that we can secure funds for significantly increasing the amount of acres treated annually through a variety of treatments. This exercise also made estimates for expanding local capacity through increased training opportunities and harnessing the private sector by providing longer term projects (five to ten year projects versus one to two year projects) that were based on our ability to agree to specific prescriptions across a diversity of vegetation types. In this Plan, we are going to focus solely on the Somes Bar area for developing workplans, timelines and budgets as the Happy Camp area and Salmon River area will be developing these locally for themselves in other Plans.

Somes Bar Integrated Fire Management and Capacity Development Project

This project combines planning accomplished for the Katimiin Cultural Management Area MOU, Ti Bar Demonstration Project, Ukonom West Thinning Project, and Ukonom Transportation Access Planning Project. The Orleans/Somes Bar CWPP and the Karuk Tribe’s Eco-Cultural Resource Management Plan also provided direction for project development. More than half of this project area will have LiDAR completed by December 2014, making quantification of the risk from existing fuels accumulations and the results of treatments very accurate. The short term workplan includes the following actions and estimated completions dates:

Action	Completion Date
Establish vegetation monitoring plots in prioritized areas from the GIS Overlay Assessment, focusing on areas where treatments will benefit cultural use species. (UC Davis, USFS PSW, MKWC, Karuk)	August, 2014
Work with SRNF to establish multi-organizational interdisciplinary team for project. Identify Tribal and Fire Safe Council Representative(s). (USFS SRNF, Karuk, MKWC, FSC)	September, 2014
Convene Orleans/Somes Bar members of the WKRP workgroup to hold monthly or bi-monthly (once every two months) meetings and develop Partnership input to planning process. (Karuk,	September, 2014

MKWC, FSC, OVFD, USFS, PSW, community)	
Secure resources from multiple sources to conduct NEPA for this project, and for two new leadership and support positions. (USFS, Karuk, MKWC)	February, 2015
Complete project Environmental Impact Statement (EIS). (USFS, Karuk, MKWC)	June, 2016
Develop Local Area Operating Plan for multi-organizational workforce implementation, training, and response. (USFS, Calfire, OVFD, Karuk, MKWC)	June, 2016
Complete baseline research/monitoring information on representative subset of all proposed treatments. (USFS, PSW, MKWC, FSC)	June, 2016
Implement 300 acres of manual fuels treatment on private property. (MKWC, Karuk)	June 2017
Maintain 500 acres of previously treated private land through prescribed burning. (MKWC, Karuk, Firestorm, US FLN, OVFD)	November 2017
Implement 4,000 acres of manual fuels treatment on public land. (USFS, Karuk, FSC, Contractors)	June 2018
Maintain 6,000 acres of previously treated fuelbreaks on public land with prescribed fire. (USFS, partners)	November 2018
Conduct prescribed burns on 400 acres of elk habitat on public and private lands. (USFS, Karuk, MKWC, FSC, OVFD, partners)	November 2018

This project describes three main treatment types that include a suite of treatment methods within them. For example, manual treatments could include more intensive thinning within the drip line of legacy oaks or conifers, but could also include minimal lop and scatter in more open stands that are receiving a follow up treatment with prescribed fire. While the cost of the first treatment could be over \$2,000 per acre, the cost of the latter would be closer to \$600 per acre. Mechanical treatments are also highly variable based on harvest methods, and the desire to implement treatments that factor in cost, but not at the expense of the project goals and objectives. Due to the proximity of the proposed mechanical units to existing roads, ground based methods including tractor logging and end lining will likely be the most common harvest methods.

At this stage in the planning process, these average costs were used to get an idea of the overall project cost by treatment type. We expect that as specific stand prescriptions are developed during the NEPA process, these costs will be refined. Feedback on these average costs from the larger WKRP group will be sought at the next workshop in the Fall of 2014.

Treatment Type	Per Acre Cost	Notes
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Manual	\$1,500	Primarily includes thinning 6" diameter and below and piling (\$1,200), and pile burning (\$300). More thorough treatments within the drip lines of legacy trees (thinning up to 20" dbh), lop and scatter treatments, girdling of firs, and coppicing of cultural use species are also included in this project.
Mechanical	\$3,000	Includes average of mechanical harvesting techniques with a bias towards cheaper ground based methods due to the units selected being along roads or in plantations older than 40 years (first harvested, easy to get) (\$2,000), jackpot piling (\$700) and jackpot burning (\$300)
Prescribed Burning	\$300	Averaged treatment cost. Will be higher in smaller units and linear burns where more firelines.

### *Developing a Longer Term Workplan*

This project describes nearly 11,000 acres of manual fuel reduction treatments, 14,000 acres of mechanical treatments, and over 25,000 acres of prescribed burning treatments. Unless significant resources are brought to bear in the next five to ten years to implement these treatments, we will likely be looking at longer time frames for implementation. The GIS Overlay Assessment has been used to prioritize units, and in future planning efforts can be modified to call out units and treatments that focus on specific variables (eg. Winter elk habitat restoration) for specific projects, or refined through addition of more accurate data (LiDAR, veg type). The WKRP is well suited to engaging in this longer term planning effort, as the targets and values this group set will only be achieved through sustained efforts in the coming decades to address the root causes of threats to our communities and ecosystems. Longer term workplans will be developed through the WKRP once the potential for scaling up to implement landscape level treatments is solidified.

### *Maintaining Strong Collaboration Through the Open Standards Process*

It has been voiced by WKRP participants throughout the series of workshops how important and essential to the overall success of this effort that professional facilitation from the US Fire Learning Network has been, and will continue to be. The FLN has made a long term commitment to the Partnership to provide facilitation as requested in the future, while also investing in developing local capacity to understand and implement the Open Standards process without their facilitation. The time tested framework of the Open Standards process will help us to avoid the pitfalls of collaboration that have caused past

efforts to fail. It can give us the tools to establish planning mechanisms that streamline collaboration, minimizing the costs of successful collaboration over time, while maximizing the outputs of shared learning from implemented projects.

The intensive workshops over the past year have helped us to jumpstart collaborative, landscape level fire planning efforts, however this level of investment by all partners will not be sustained over time due to financial and time constraints. The WKRP agreed at our last workshop to meet quarterly as we move through the planning and implementation of this first round of proposed projects in the Happy Camp and Somes Bar areas. Local subsets of the WKRP will likely meet more frequently to speed up development of these projects. We hope that involvement in WKRP workshops increases over time as partners that have previously not attended for various reasons see value in the work that is accomplished. We greatly appreciate the level of involvement from the USFS, local Fire Safe Councils, Karuk Tribe, and other local state and federal entities to date, and we will continue to reach out to the full audience of stakeholders as we continue down this path.

## Conclusion/Next Steps

There has been significant progress towards defining zones of agreement on where work can be done to bring the process of fire back to the Western Klamath Mountains. The Western Klamath Restoration Partnership brought diverse participants through a series of workshops that allowed us to see where we can move forward together. This effort coincides with a national push to increase the resiliency of communities and ecosystems in the face of climate change and the rise of megafires. At the 2014 national meeting of the Fire Learning Network and Fire Adapted Communities program, it was recognized that nowhere else in the country are all the components of the Cohesive Strategy being as actively developed as they are in this region.

This Plan delineates where manual, mechanical and prescribed burning treatments can be strategically implemented to quickly restore natural fire processes in the landscape between Somes Bar and Dillon Creek. There are maps in the appendix that show specifically where these treatments are, and using FlamMap, how they will reduce fire risk if implemented. This Plan also describes zones of agreement on a larger 1.2 million acre landscape to expedite landscape level restoration planning in adjacent communities. Map appendices include:

- GIS overlay assessment where manual, mechanical, and prescribed burning treatments could be implemented to achieve social, ecological and economic values.
- Fire history map showing past wildfires, fire overlaps, and recent wildfires within the past 10 years. This map shows where managed wildfires could be used for resource benefits, and where the greatest risk to communities and ecosystems exist on the landscape due to fire exclusion.

Next steps in the process will include in-person presentations to the Klamath and Six Rivers National Forests that summarizes the results of the WKRP workshops and this

Plan. These presentations will provide a venue for the Forest to provide feedback on this planning effort and logical next steps in this process. WKRP meetings will resume on a quarterly basis in the Fall of 2014 to continue the work of bringing our agreements in principle to agreements in practice. Additional funding from private, state and federal sources will be sought to continue the Open Standards process through implementation, monitoring, shared learning and feedback into the next round of projects.

Inherent in this process is the belief that through developing strong collaborative efforts that persist over time, we can minimize conflict between stakeholders. Working together, we can expand funding for implementing larger scale projects across land jurisdictions, like the ones described in this Plan. The key to this work is establishing and maintaining trust in a diverse partnership through implementation of all phases of the Open Standards process. We greatly appreciate the funding for this All Lands fire plan, and look forward to bringing fire back to the Klamath Mountains in a way that best protects and enhances the shared values identified through this planning process.

## Appendices

### ***MapBook of Prioritized Projects for Somes Bar Project Area***

This MapBook was sent separately as a pdf file, but will be included in the hard copy report on 11x17 folded pages in the appendices. These maps show the manual, mechanical and prescribed burning treatments separately with each of their respective GIS Overlay Assessment prioritization runs (version 8) behind them. The process for prioritizing units is as follows:

GIS Treatment Prioritization Description uses the zonal statistics tool in ArcMap. Each project polygon becomes a zone for which statistics are generated based on the overlay analysis layer. We used the Maximum statistic for ranking the polygons which calculates the most frequently occurring value for all the cells in that zone (or treatment unit). If there is a tie it assigns the lower of the values. The output generated is in tabular form which was joined to the projects in the attribute table. Next we added a priority field to the projects and populated it with the values from the Majority field in the zonal statistics table. Questions regarding the prioritization exercise can be directed to Paul Lackovic at Deer Creek GIS at: [paul@deercreekgis.com](mailto:paul@deercreekgis.com).

### ***Tables Describing Acreages and Prioritization of Delineated Projects***

These tables refer by the Unit ID to treatments on the maps in the previous appendix. Acres by treatment type within each category have been summarized. These include:

#### **Summary of Acres for Manual Treatments by Treatment Type**

Total Acres of Manual Treatments	15,311.08
Total Acres of Manual Treatments for Defensible Space	2,183.42
Total Acres of Manual Treatments Along Handlines	556.79
Total Acres of Manual Treatments In Plantations Under 40 Years Old	1,747.71
Total Acres of Manual Treatments Along Critical Access/Egress Routes	10,823.15

#### **Summary of Acres for Mechanical Treatments by Treatment Type**

Total Acres of Mechanical Treatments	14,001.46
Total Acres of Mechanical Tx for Primary Access and Adj. Plantations (40+)	4,871.11
Total Acres of Mechanical Tx for Secondary Access and Adj. Plant. (40+)	7,905.32
Total Acres of Mechanical Treatments Along Dozer Lines	1,225.03

#### **Summary of Acres for Prescribed Burning by Treatment Type**

Total for Prescribed Burning for Defensible Space	2,183.42
Total for Prescribed Burning in Wildland Urban Interface	23,491.33
Total for All Prescribed Burning	25,674.75

**Manual Fuels Reduction Treatment Prioritization and Acreage**

Defensible Space

Unit_ID	Tx_Type	Treatment_Class	Prioritization	Acres
1	Manual	Defensible Space	10	63.71
2	Manual	Defensible Space	7	15.98
3	Manual	Defensible Space	9	108.83
4	Manual	Defensible Space	10	87.69
5	Manual	Defensible Space	1	102.53
6	Manual	Defensible Space	5	38.42
7	Manual	Defensible Space	10	50.69
8	Manual	Defensible Space	4	39.85
9	Manual	Defensible Space	10	24.54
10	Manual	Defensible Space	5	88.81
11	Manual	Defensible Space	9	25.25
12	Manual	Defensible Space	7	42.79
13	Manual	Defensible Space	7	7.58
14	Manual	Defensible Space	11	27.61
15	Manual	Defensible Space	12	24.55
16	Manual	Defensible Space	7	28.80
17	Manual	Defensible Space	6	72.74
18	Manual	Defensible Space	8	32.28
19	Manual	Defensible Space	8	55.71
20	Manual	Defensible Space	8	19.48
21	Manual	Defensible Space	9	96.77
22	Manual	Defensible Space	9	48.83
23	Manual	Defensible Space	9	43.04
24	Manual	Defensible Space	8	14.27
25	Manual	Defensible Space	8	74.12
26	Manual	Defensible Space	8	20.64
27	Manual	Defensible Space	6	50.81
28	Manual	Defensible Space	8	74.84
29	Manual	Defensible Space	6	166.88
30	Manual	Defensible Space	4	168.63
31	Manual	Defensible Space	8	84.13
32	Manual	Defensible Space	5	39.41
33	Manual	Defensible Space	11	50.39
34	Manual	Defensible Space	6	128.52
35	Manual	Defensible Space	5	118.01
36	Manual	Defensible Space	6	46.34
Total Acres for Manual Treatments for Defensible Space				2,183.42

**Manual Fuels Reduction Treatment Prioritization and Acreage**  
Handlines

Unit_ID	Tx_Type	Treatment_Class	Prioritization	Acres
37	Manual	Handlines	8	16.51
38	Manual	Handlines	3	28.21
39	Manual	Handlines	5	9.11
40	Manual	Handlines	3	35.08
41	Manual	Handlines	3	59.44
42	Manual	Handlines	5	86.72
43	Manual	Handlines	4	14.12
44	Manual	Handlines	4	109.73
45	Manual	Handlines	2	20.00
46	Manual	Handlines	5	88.02
47	Manual	Handlines	3	15.97
48	Manual	Handlines	4	12.98
49	Manual	Handlines	7	33.42
50	Manual	Handlines	4	20.76
51	Manual	Handlines	8	6.72
Total Acres for Manual Treatments for Handlines				556.79

### Manual Fuels Reduction Treatment Prioritization and Acreage:

#### Plantations (under 40yrs) Adjacent to Access Roads

Unit_ID	Tx_Type	Treatment_Class	Prioritization	Acres
52	Manual	Plantations (under 40yrs) Adj. to Access Rds	1	5.04
53	Manual	Plantations (under 40yrs) Adj. to Access Rds	5	11.72
54	Manual	Plantations (under 40yrs) Adj. to Access Rds	2	54.80
55	Manual	Plantations (under 40yrs) Adj. to Access Rds	2	18.79
56	Manual	Plantations (under 40yrs) Adj. to Access Rds	2	13.23
57	Manual	Plantations (under 40yrs) Adj. to Access Rds	2	1.37
58	Manual	Plantations (under 40yrs) Adj. to Access Rds	6	3.69
59	Manual	Plantations (under 40yrs) Adj. to Access Rds	5	17.74
60	Manual	Plantations (under 40yrs) Adj. to Access Rds	4	4.41
61	Manual	Plantations (under 40yrs) Adj. to Access Rds	1	4.26
62	Manual	Plantations (under 40yrs) Adj. to Access Rds	2	9.30
63	Manual	Plantations (under 40yrs) Adj. to Access Rds	1	4.05
64	Manual	Plantations (under 40yrs) Adj. to Access Rds	1	1.91
65	Manual	Plantations (under 40yrs) Adj. to Access Rds	2	1.91
66	Manual	Plantations (under 40yrs) Adj. to Access Rds	4	11.56
67	Manual	Plantations (under 40yrs) Adj. to Access Rds	3	4.93
68	Manual	Plantations (under 40yrs) Adj. to Access Rds	2	3.30
69	Manual	Plantations (under 40yrs) Adj. to Access Rds	1	15.89
70	Manual	Plantations (under 40yrs) Adj. to Access Rds	3	1.12
71	Manual	Plantations (under 40yrs) Adj. to Access Rds	3	16.11
72	Manual	Plantations (under 40yrs) Adj. to Access Rds	1	8.92
73	Manual	Plantations (under 40yrs) Adj. to Access Rds	1	3.08
74	Manual	Plantations (under 40yrs) Adj. to Access Rds	1	11.44
75	Manual	Plantations (under 40yrs) Adj. to Access Rds	1	7.61
76	Manual	Plantations (under 40yrs) Adj. to Access Rds	3	3.16
77	Manual	Plantations (under 40yrs) Adj. to Access Rds	1	10.33
78	Manual	Plantations (under 40yrs) Adj. to Access Rds	2	9.21
79	Manual	Plantations (under 40yrs) Adj. to Access Rds	1	2.02
80	Manual	Plantations (under 40yrs) Adj. to Access Rds	3	22.32
81	Manual	Plantations (under 40yrs) Adj. to Access Rds	1	28.65
82	Manual	Plantations (under 40yrs) Adj. to Access Rds	4	9.03
83	Manual	Plantations (under 40yrs) Adj. to Access Rds	2	5.94
84	Manual	Plantations (under 40yrs) Adj. to Access Rds	3	2.40
85	Manual	Plantations (under 40yrs) Adj. to Access Rds	3	12.72
86	Manual	Plantations (under 40yrs) Adj. to Access Rds	2	3.26
87	Manual	Plantations (under 40yrs) Adj. to Access Rds	2	4.02

**Manual Fuels Reduction Treatment Prioritization and Acreage:**

Plantations (under 40yrs) Adjacent to Access Roads (Continued)

Unit_ID	Tx_Type	Treatment_Class	Prioritization	Acres
88	Manual	Plantations (under 40yrs) Adj. to Access Rds	3	7.38
89	Manual	Plantations (under 40yrs) Adj. to Access Rds	2	14.39
90	Manual	Plantations (under 40yrs) Adj. to Access Rds	2	12.85
91	Manual	Plantations (under 40yrs) Adj. to Access Rds	2	4.98
92	Manual	Plantations (under 40yrs) Adj. to Access Rds	1	8.76
93	Manual	Plantations (under 40yrs) Adj. to Access Rds	3	10.52
94	Manual	Plantations (under 40yrs) Adj. to Access Rds	1	6.07
95	Manual	Plantations (under 40yrs) Adj. to Access Rds	2	7.84
96	Manual	Plantations (under 40yrs) Adj. to Access Rds	3	4.22
97	Manual	Plantations (under 40yrs) Adj. to Access Rds	1	1.42
98	Manual	Plantations (under 40yrs) Adj. to Access Rds	1	16.55
99	Manual	Plantations (under 40yrs) Adj. to Access Rds	2	8.00
100	Manual	Plantations (under 40yrs) Adj. to Access Rds	2	13.83
101	Manual	Plantations (under 40yrs) Adj. to Access Rds	2	5.79
102	Manual	Plantations (under 40yrs) Adj. to Access Rds	1	3.92
103	Manual	Plantations (under 40yrs) Adj. to Access Rds	2	1.22
104	Manual	Plantations (under 40yrs) Adj. to Access Rds	1	1.90
105	Manual	Plantations (under 40yrs) Adj. to Access Rds	3	1.51
106	Manual	Plantations (under 40yrs) Adj. to Access Rds	2	5.33
107	Manual	Plantations (under 40yrs) Adj. to Access Rds	2	4.73
108	Manual	Plantations (under 40yrs) Adj. to Access Rds	1	5.62
109	Manual	Plantations (under 40yrs) Adj. to Access Rds	2	15.92
110	Manual	Plantations (under 40yrs) Adj. to Access Rds	1	24.78
111	Manual	Plantations (under 40yrs) Adj. to Access Rds	4	7.59
112	Manual	Plantations (under 40yrs) Adj. to Access Rds	3	6.80
113	Manual	Plantations (under 40yrs) Adj. to Access Rds	5	7.53
114	Manual	Plantations (under 40yrs) Adj. to Access Rds	3	3.54
115	Manual	Plantations (under 40yrs) Adj. to Access Rds	2	8.79
116	Manual	Plantations (under 40yrs) Adj. to Access Rds	1	7.59
117	Manual	Plantations (under 40yrs) Adj. to Access Rds	3	4.95
118	Manual	Plantations (under 40yrs) Adj. to Access Rds	3	5.16
119	Manual	Plantations (under 40yrs) Adj. to Access Rds	3	4.80
120	Manual	Plantations (under 40yrs) Adj. to Access Rds	1	1.50
121	Manual	Plantations (under 40yrs) Adj. to Access Rds	1	14.07
122	Manual	Plantations (under 40yrs) Adj. to Access Rds	4	16.86
123	Manual	Plantations (under 40yrs) Adj. to Access Rds	1	17.55
124	Manual	Plantations (under 40yrs) Adj. to Access Rds	1	25.08
125	Manual	Plantations (under 40yrs) Adj. to Access Rds	2	5.56
126	Manual	Plantations (under 40yrs) Adj. to Access Rds	2	9.93
127	Manual	Plantations (under 40yrs) Adj. to Access Rds	2	3.14

**Manual Fuels Reduction Treatment Prioritization and Acreage:**  
Plantations (under 40yrs) Adjacent to Access Roads (Continued)

Unit_ID	Tx_Type	Treatment_Class	Prioritization	Acres
128	Manual	Plantations (under 40yrs) Adj. to Access Rds	5	6.22
129	Manual	Plantations (under 40yrs) Adj. to Access Rds	2	5.07
130	Manual	Plantations (under 40yrs) Adj. to Access Rds	2	3.13
131	Manual	Plantations (under 40yrs) Adj. to Access Rds	2	8.01
132	Manual	Plantations (under 40yrs) Adj. to Access Rds	2	1.64
133	Manual	Plantations (under 40yrs) Adj. to Access Rds	2	36.17
134	Manual	Plantations (under 40yrs) Adj. to Access Rds	2	8.29
135	Manual	Plantations (under 40yrs) Adj. to Access Rds	4	6.56
136	Manual	Plantations (under 40yrs) Adj. to Access Rds	2	14.38
137	Manual	Plantations (under 40yrs) Adj. to Access Rds	3	12.45
138	Manual	Plantations (under 40yrs) Adj. to Access Rds	4	4.38
139	Manual	Plantations (under 40yrs) Adj. to Access Rds	4	3.66
140	Manual	Plantations (under 40yrs) Adj. to Access Rds	4	4.78
141	Manual	Plantations (under 40yrs) Adj. to Access Rds	4	7.26
142	Manual	Plantations (under 40yrs) Adj. to Access Rds	3	30.76
143	Manual	Plantations (under 40yrs) Adj. to Access Rds	2	2.47
144	Manual	Plantations (under 40yrs) Adj. to Access Rds	1	1.78
145	Manual	Plantations (under 40yrs) Adj. to Access Rds	2	13.49
146	Manual	Plantations (under 40yrs) Adj. to Access Rds	2	11.61
147	Manual	Plantations (under 40yrs) Adj. to Access Rds	4	28.32
148	Manual	Plantations (under 40yrs) Adj. to Access Rds	3	39.95
149	Manual	Plantations (under 40yrs) Adj. to Access Rds	2	6.31
150	Manual	Plantations (under 40yrs) Adj. to Access Rds	5	4.63
151	Manual	Plantations (under 40yrs) Adj. to Access Rds	7	3.94
152	Manual	Plantations (under 40yrs) Adj. to Access Rds	3	20.13
153	Manual	Plantations (under 40yrs) Adj. to Access Rds	3	5.45
154	Manual	Plantations (under 40yrs) Adj. to Access Rds	3	4.41
155	Manual	Plantations (under 40yrs) Adj. to Access Rds	2	6.84
156	Manual	Plantations (under 40yrs) Adj. to Access Rds	3	7.72
157	Manual	Plantations (under 40yrs) Adj. to Access Rds	2	7.56
158	Manual	Plantations (under 40yrs) Adj. to Access Rds	3	1.86
159	Manual	Plantations (under 40yrs) Adj. to Access Rds	2	7.93
160	Manual	Plantations (under 40yrs) Adj. to Access Rds	3	5.57
161	Manual	Plantations (under 40yrs) Adj. to Access Rds	2	4.36
162	Manual	Plantations (under 40yrs) Adj. to Access Rds	1	1.65
163	Manual	Plantations (under 40yrs) Adj. to Access Rds	3	8.81
164	Manual	Plantations (under 40yrs) Adj. to Access Rds	5	8.05

**Manual Fuels Reduction Treatment Prioritization and Acreage:**  
Plantations (under 40yrs) Adjacent to Access Roads (Continued)

Unit_ID	Tx_Type	Treatment_Class	Prioritization	Acres
165	Manual	Plantations (under 40yrs) Adj. to Access Rds	3	3.54
166	Manual	Plantations (under 40yrs) Adj. to Access Rds	3	1.48
167	Manual	Plantations (under 40yrs) Adj. to Access Rds	6	4.89
168	Manual	Plantations (under 40yrs) Adj. to Access Rds	3	5.37
169	Manual	Plantations (under 40yrs) Adj. to Access Rds	3	7.04
170	Manual	Plantations (under 40yrs) Adj. to Access Rds	4	12.12
171	Manual	Plantations (under 40yrs) Adj. to Access Rds	3	13.72
172	Manual	Plantations (under 40yrs) Adj. to Access Rds	1	1.10
173	Manual	Plantations (under 40yrs) Adj. to Access Rds	3	2.75
174	Manual	Plantations (under 40yrs) Adj. to Access Rds	2	11.55
175	Manual	Plantations (under 40yrs) Adj. to Access Rds	3	3.52
176	Manual	Plantations (under 40yrs) Adj. to Access Rds	3	4.83
177	Manual	Plantations (under 40yrs) Adj. to Access Rds	3	7.94
178	Manual	Plantations (under 40yrs) Adj. to Access Rds	2	13.05
179	Manual	Plantations (under 40yrs) Adj. to Access Rds	1	8.11
180	Manual	Plantations (under 40yrs) Adj. to Access Rds	1	6.41
181	Manual	Plantations (under 40yrs) Adj. to Access Rds	3	18.43
182	Manual	Plantations (under 40yrs) Adj. to Access Rds	2	21.66
183	Manual	Plantations (under 40yrs) Adj. to Access Rds	2	9.35
184	Manual	Plantations (under 40yrs) Adj. to Access Rds	1	4.02
185	Manual	Plantations (under 40yrs) Adj. to Access Rds	2	4.53
186	Manual	Plantations (under 40yrs) Adj. to Access Rds	4	13.63
187	Manual	Plantations (under 40yrs) Adj. to Access Rds	2	19.24
188	Manual	Plantations (under 40yrs) Adj. to Access Rds	3	2.68
189	Manual	Plantations (under 40yrs) Adj. to Access Rds	2	3.47
190	Manual	Plantations (under 40yrs) Adj. to Access Rds	6	6.39
191	Manual	Plantations (under 40yrs) Adj. to Access Rds	2	23.05
192	Manual	Plantations (under 40yrs) Adj. to Access Rds	1	4.03
193	Manual	Plantations (under 40yrs) Adj. to Access Rds	3	8.42
194	Manual	Plantations (under 40yrs) Adj. to Access Rds	2	11.85
195	Manual	Plantations (under 40yrs) Adj. to Access Rds	4	12.63
196	Manual	Plantations (under 40yrs) Adj. to Access Rds	3	17.02
197	Manual	Plantations (under 40yrs) Adj. to Access Rds	5	2.64
198	Manual	Plantations (under 40yrs) Adj. to Access Rds	3	39.54
199	Manual	Plantations (under 40yrs) Adj. to Access Rds	3	6.65
200	Manual	Plantations (under 40yrs) Adj. to Access Rds	1	6.91
201	Manual	Plantations (under 40yrs) Adj. to Access Rds	4	14.61
202	Manual	Plantations (under 40yrs) Adj. to Access Rds	2	20.64
203	Manual	Plantations (under 40yrs) Adj. to Access Rds	2	2.09

**Manual Fuels Reduction Treatment Prioritization and Acreage:**  
Plantations (under 40yrs) Adjacent to Access Roads (Continued)

Unit_ID	Tx_Type	Treatment_Class	Prioritization	Acres
204	Manual	Plantations (under 40yrs) Adj. to Access Rds	2	84.37
205	Manual	Plantations (under 40yrs) Adj. to Access Rds	2	2.99
206	Manual	Plantations (under 40yrs) Adj. to Access Rds	3	4.69
207	Manual	Plantations (under 40yrs) Adj. to Access Rds	2	6.40
208	Manual	Plantations (under 40yrs) Adj. to Access Rds	5	4.69
209	Manual	Plantations (under 40yrs) Adj. to Access Rds	2	1.04
210	Manual	Plantations (under 40yrs) Adj. to Access Rds	2	2.48
211	Manual	Plantations (under 40yrs) Adj. to Access Rds	2	5.96
212	Manual	Plantations (under 40yrs) Adj. to Access Rds	1	8.36
213	Manual	Plantations (under 40yrs) Adj. to Access Rds	3	3.26
214	Manual	Plantations (under 40yrs) Adj. to Access Rds	3	8.11
215	Manual	Plantations (under 40yrs) Adj. to Access Rds	2	40.80
216	Manual	Plantations (under 40yrs) Adj. to Access Rds	2	6.06
217	Manual	Plantations (under 40yrs) Adj. to Access Rds	3	2.93
218	Manual	Plantations (under 40yrs) Adj. to Access Rds	6	2.93
219	Manual	Plantations (under 40yrs) Adj. to Access Rds	3	1.85
220	Manual	Plantations (under 40yrs) Adj. to Access Rds	3	12.20
221	Manual	Plantations (under 40yrs) Adj. to Access Rds	2	1.80
222	Manual	Plantations (under 40yrs) Adj. to Access Rds	3	19.85
223	Manual	Plantations (under 40yrs) Adj. to Access Rds	2	2.06
224	Manual	Plantations (under 40yrs) Adj. to Access Rds	2	15.79
225	Manual	Plantations (under 40yrs) Adj. to Access Rds	2	6.66
226	Manual	Plantations (under 40yrs) Adj. to Access Rds	1	3.66
227	Manual	Plantations (under 40yrs) Adj. to Access Rds	2	5.80
228	Manual	Plantations (under 40yrs) Adj. to Access Rds	2	5.65
229	Manual	Plantations (under 40yrs) Adj. to Access Rds	5	3.46
230	Manual	Plantations (under 40yrs) Adj. to Access Rds	3	12.27
231	Manual	Plantations (under 40yrs) Adj. to Access Rds	6	4.53
232	Manual	Plantations (under 40yrs) Adj. to Access Rds	2	30.39
233	Manual	Plantations (under 40yrs) Adj. to Access Rds	3	12.95
Total Acres for Plantations (under 40yrs) Adjacent to Access Roads				1,747.71

**Manual Fuels Reduction Treatment Prioritization and Acreage:**

Access and Egress Roads

Unit_ID	Tx_Type	Treatment_Class	Prioritization	Acres
234	Manual	Access and Egress Rd	5	89.23
235	Manual	Access and Egress Rd	4	35.15
236	Manual	Access and Egress Rd	5	50.23
237	Manual	Access and Egress Rd	5	64.45
238	Manual	Access and Egress Rd	7	97.70
239	Manual	Access and Egress Rd	5	206.19
240	Manual	Access and Egress Rd	4	96.11
241	Manual	Access and Egress Rd	3	66.60
242	Manual	Access and Egress Rd	3	80.41
243	Manual	Access and Egress Rd	4	27.89
244	Manual	Access and Egress Rd	4	33.04
245	Manual	Access and Egress Rd	5	58.48
246	Manual	Access and Egress Rd	4	62.32
247	Manual	Access and Egress Rd	4	24.54
248	Manual	Access and Egress Rd	5	44.55
249	Manual	Access and Egress Rd	5	46.10
250	Manual	Access and Egress Rd	6	62.21
251	Manual	Access and Egress Rd	6	73.36
252	Manual	Access and Egress Rd	6	72.96
253	Manual	Access and Egress Rd	5	92.92
254	Manual	Access and Egress Rd	5	61.70
255	Manual	Access and Egress Rd	4	106.93
256	Manual	Access and Egress Rd	5	87.68
257	Manual	Access and Egress Rd	5	95.82
258	Manual	Access and Egress Rd	8	86.63
259	Manual	Access and Egress Rd	8	111.89
260	Manual	Access and Egress Rd	6	105.27
261	Manual	Access and Egress Rd	6	123.38
262	Manual	Access and Egress Rd	4	108.54
263	Manual	Access and Egress Rd	4	174.02
264	Manual	Access and Egress Rd	8	74.40
265	Manual	Access and Egress Rd	9	68.98
266	Manual	Access and Egress Rd	5	68.28
267	Manual	Access and Egress Rd	4	97.13
268	Manual	Access and Egress Rd	5	134.85
269	Manual	Access and Egress Rd	5	43.49
270	Manual	Access and Egress Rd	3	106.39
271	Manual	Access and Egress Rd	4	116.50

**Manual Fuels Reduction Treatment Prioritization and Acreage:**  
Access and Egress Roads (Continued)

Unit_ID	Tx_Type	Treatment_Class	Prioritization	Acres
272	Manual	Access and Egress Rd	8	89.83
273	Manual	Access and Egress Rd	4	91.34
274	Manual	Access and Egress Rd	4	173.72
275	Manual	Access and Egress Rd	4	173.59
276	Manual	Access and Egress Rd	5	93.96
277	Manual	Access and Egress Rd	3	75.58
278	Manual	Access and Egress Rd	4	45.42
279	Manual	Access and Egress Rd	3	80.43
280	Manual	Access and Egress Rd	3	137.15
281	Manual	Access and Egress Rd	4	107.01
282	Manual	Access and Egress Rd	4	143.84
283	Manual	Access and Egress Rd	5	103.25
284	Manual	Access and Egress Rd	4	94.11
285	Manual	Access and Egress Rd	5	40.35
286	Manual	Access and Egress Rd	4	49.05
287	Manual	Access and Egress Rd	5	55.05
288	Manual	Access and Egress Rd	12	52.76
289	Manual	Access and Egress Rd	5	72.34
290	Manual	Access and Egress Rd	4	81.34
291	Manual	Access and Egress Rd	4	162.34
292	Manual	Access and Egress Rd	4	98.45
293	Manual	Access and Egress Rd	3	111.55
294	Manual	Access and Egress Rd	5	128.04
295	Manual	Access and Egress Rd	4	66.09
296	Manual	Access and Egress Rd	4	81.83
297	Manual	Access and Egress Rd	4	71.61
298	Manual	Access and Egress Rd	4	72.79
299	Manual	Access and Egress Rd	4	78.75
300	Manual	Access and Egress Rd	4	79.21
301	Manual	Access and Egress Rd	4	80.95
302	Manual	Access and Egress Rd	4	99.37
303	Manual	Access and Egress Rd	6	87.77
304	Manual	Access and Egress Rd	5	109.68
305	Manual	Access and Egress Rd	6	69.77
306	Manual	Access and Egress Rd	6	82.22
307	Manual	Access and Egress Rd	6	70.08
308	Manual	Access and Egress Rd	5	116.71
309	Manual	Access and Egress Rd	7	83.75

**Manual Fuels Reduction Treatment Prioritization and Acreage:**  
Access and Egress Roads (Continued)

Unit_ID	Tx_Type	Treatment_Class	Prioritization	Acres
310	Manual	Access and Egress Rd	7	59.74
311	Manual	Access and Egress Rd	7	95.49
312	Manual	Access and Egress Rd	10	34.46
313	Manual	Access and Egress Rd	6	73.84
314	Manual	Access and Egress Rd	4	117.01
315	Manual	Access and Egress Rd	4	73.98
316	Manual	Access and Egress Rd	4	95.21
317	Manual	Access and Egress Rd	5	91.85
318	Manual	Access and Egress Rd	6	111.72
319	Manual	Access and Egress Rd	5	128.42
320	Manual	Access and Egress Rd	5	96.11
321	Manual	Access and Egress Rd	6	223.28
322	Manual	Access and Egress Rd	5	65.63
323	Manual	Access and Egress Rd	5	93.95
324	Manual	Access and Egress Rd	6	77.41
325	Manual	Access and Egress Rd	7	68.56
326	Manual	Access and Egress Rd	7	56.14
327	Manual	Access and Egress Rd	7	210.75
328	Manual	Access and Egress Rd	6	143.83
329	Manual	Access and Egress Rd	8	166.67
330	Manual	Access and Egress Rd	4	77.78
331	Manual	Access and Egress Rd	9	13.16
332	Manual	Access and Egress Rd	9	14.46
333	Manual	Access and Egress Rd	4	119.75
334	Manual	Access and Egress Rd	4	102.09
335	Manual	Access and Egress Rd	7	73.17
336	Manual	Access and Egress Rd	8	63.80
337	Manual	Access and Egress Rd	6	100.53
338	Manual	Access and Egress Rd	7	130.24
339	Manual	Access and Egress Rd	7	59.37
340	Manual	Access and Egress Rd	6	70.37
341	Manual	Access and Egress Rd	7	98.61
342	Manual	Access and Egress Rd	6	71.25
343	Manual	Access and Egress Rd	5	77.93

**Manual Fuels Reduction Treatment Prioritization and Acreage:**

Access and Egress Roads (Continued)

Unit_ID	Tx_Type	Treatment_Class	Prioritization	Acres
344	Manual	Access and Egress Rd	8	60.54
345	Manual	Access and Egress Rd	7	33.07
346	Manual	Access and Egress Rd	6	78.95
347	Manual	Access and Egress Rd	6	51.32
348	Manual	Access and Egress Rd	7	56.80
349	Manual	Access and Egress Rd	5	66.39
350	Manual	Access and Egress Rd	5	57.13
351	Manual	Access and Egress Rd	6	139.58
352	Manual	Access and Egress Rd	5	139.58
353	Manual	Access and Egress Rd	6	157.91
354	Manual	Access and Egress Rd	6	157.91
Total Acres of Manual Treatments Along Critical Access/Egress Routes				10,823.15

**Summary of Acres for Manual Treatments by Treatment Type**

Total Acres of Manual Treatments	15,311.08
Total Acres of Manual Treatments for Defensible Space	2,183.42
Total Acres of Manual Treatments Along Handlines	556.79
Total Acres of Manual Treatments In Plantations Under 40 Years Old	1,747.71
Total Acres of Manual Treatments Along Critical Access/Egress Routes	10,823.15

**Mechanical Fuels Reduction Treatment Prioritization and Acreage:**  
**Primary Access and Adjacent Plantations Over 40 Years Old**

Unit_ID	Tx_Type	Tx_Class	Prioritization	Acres
37	Mechanical	Primary Access and Adj. Plantations (40+)	6	91.72
38	Mechanical	Primary Access and Adj. Plantations (40+)	7	111.98
39	Mechanical	Primary Access and Adj. Plantations (40+)	7	213.21
40	Mechanical	Primary Access and Adj. Plantations (40+)	6	97.39
41	Mechanical	Primary Access and Adj. Plantations (40+)	5	124.67
42	Mechanical	Primary Access and Adj. Plantations (40+)	5	76.66
43	Mechanical	Primary Access and Adj. Plantations (40+)	7	67.33
44	Mechanical	Primary Access and Adj. Plantations (40+)	7	269.51
45	Mechanical	Primary Access and Adj. Plantations (40+)	7	191.68
46	Mechanical	Primary Access and Adj. Plantations (40+)	8	39.10
47	Mechanical	Primary Access and Adj. Plantations (40+)	7	631.88
48	Mechanical	Primary Access and Adj. Plantations (40+)	9	308.44
49	Mechanical	Primary Access and Adj. Plantations (40+)	8	69.02
50	Mechanical	Primary Access and Adj. Plantations (40+)	8	127.37
51	Mechanical	Primary Access and Adj. Plantations (40+)	9	47.99
52	Mechanical	Primary Access and Adj. Plantations (40+)	7	111.14
53	Mechanical	Primary Access and Adj. Plantations (40+)	8	221.51
54	Mechanical	Primary Access and Adj. Plantations (40+)	8	77.31
55	Mechanical	Primary Access and Adj. Plantations (40+)	8	312.39
56	Mechanical	Primary Access and Adj. Plantations (40+)	6	313.83
57	Mechanical	Primary Access and Adj. Plantations (40+)	7	118.46
58	Mechanical	Primary Access and Adj. Plantations (40+)	10	52.61
59	Mechanical	Primary Access and Adj. Plantations (40+)	8	63.18
60	Mechanical	Primary Access and Adj. Plantations (40+)	9	113.20
61	Mechanical	Primary Access and Adj. Plantations (40+)	6	225.40
62	Mechanical	Primary Access and Adj. Plantations (40+)	8	220.56
63	Mechanical	Primary Access and Adj. Plantations (40+)	9	124.41
64	Mechanical	Primary Access and Adj. Plantations (40+)	8	73.22
65	Mechanical	Primary Access and Adj. Plantations (40+)	6	78.01
66	Mechanical	Primary Access and Adj. Plantations (40+)	7	42.68
67	Mechanical	Primary Access and Adj. Plantations (40+)	9	77.13
68	Mechanical	Primary Access and Adj. Plantations (40+)	9	132.78
69	Mechanical	Primary Access and Adj. Plantations (40+)	6	45.36
Total Acres Mechanical Tx: Primary Access and Adj. Plantations Over 40 Yrs Old				4,871.11

**Mechanical Fuels Reduction Treatment Prioritization and Acreage:**  
Secondary Access and Adjacent Plantations Over 40 Years Old

Unit_ID	Tx_Type	Tx_Class	Prioritization	Acres
70	Mechanical	Secondary Access and Adj. Plantations (40+)	6	199.56
71	Mechanical	Secondary Access and Adj. Plantations (40+)	7	420.06
72	Mechanical	Secondary Access and Adj. Plantations (40+)	8	24.35
73	Mechanical	Secondary Access and Adj. Plantations (40+)	7	92.51
74	Mechanical	Secondary Access and Adj. Plantations (40+)	6	271.81
75	Mechanical	Secondary Access and Adj. Plantations (40+)	6	95.59
76	Mechanical	Secondary Access and Adj. Plantations (40+)	7	242.34
77	Mechanical	Secondary Access and Adj. Plantations (40+)	6	76.67
78	Mechanical	Secondary Access and Adj. Plantations (40+)	6	40.36
79	Mechanical	Secondary Access and Adj. Plantations (40+)	7	88.91
80	Mechanical	Secondary Access and Adj. Plantations (40+)	6	127.36
81	Mechanical	Secondary Access and Adj. Plantations (40+)	6	119.06
82	Mechanical	Secondary Access and Adj. Plantations (40+)	6	154.20
83	Mechanical	Secondary Access and Adj. Plantations (40+)	6	137.52
84	Mechanical	Secondary Access and Adj. Plantations (40+)	7	80.02
85	Mechanical	Secondary Access and Adj. Plantations (40+)	6	98.31
86	Mechanical	Secondary Access and Adj. Plantations (40+)	7	150.07
87	Mechanical	Secondary Access and Adj. Plantations (40+)	5	245.26
88	Mechanical	Secondary Access and Adj. Plantations (40+)	6	136.66
89	Mechanical	Secondary Access and Adj. Plantations (40+)	6	111.71
90	Mechanical	Secondary Access and Adj. Plantations (40+)	6	127.76
91	Mechanical	Secondary Access and Adj. Plantations (40+)	7	78.81
92	Mechanical	Secondary Access and Adj. Plantations (40+)	7	42.30
93	Mechanical	Secondary Access and Adj. Plantations (40+)	3	86.07
94	Mechanical	Secondary Access and Adj. Plantations (40+)	5	98.20
95	Mechanical	Secondary Access and Adj. Plantations (40+)	5	73.22
96	Mechanical	Secondary Access and Adj. Plantations (40+)	5	121.10
97	Mechanical	Secondary Access and Adj. Plantations (40+)	7	89.48
98	Mechanical	Secondary Access and Adj. Plantations (40+)	6	36.10
99	Mechanical	Secondary Access and Adj. Plantations (40+)	6	102.10
100	Mechanical	Secondary Access and Adj. Plantations (40+)	6	44.65
101	Mechanical	Secondary Access and Adj. Plantations (40+)	6	72.13
102	Mechanical	Secondary Access and Adj. Plantations (40+)	7	156.45
103	Mechanical	Secondary Access and Adj. Plantations (40+)	6	72.58
104	Mechanical	Secondary Access and Adj. Plantations (40+)	7	120.63
105	Mechanical	Secondary Access and Adj. Plantations (40+)	6	250.40
106	Mechanical	Secondary Access and Adj. Plantations (40+)	9	54.84
107	Mechanical	Secondary Access and Adj. Plantations (40+)	8	120.28
108	Mechanical	Secondary Access and Adj. Plantations (40+)	8	88.05
109	Mechanical	Secondary Access and Adj. Plantations (40+)	8	71.72
110	Mechanical	Secondary Access and Adj. Plantations (40+)	8	68.19
111	Mechanical	Secondary Access and Adj. Plantations (40+)	8	117.57
112	Mechanical	Secondary Access and Adj. Plantations (40+)	6	115.35
113	Mechanical	Secondary Access and Adj. Plantations (40+)	8	54.90
114	Mechanical	Secondary Access and Adj. Plantations (40+)	6	112.68

**Mechanical Fuels Reduction Treatment Prioritization and Acreage:**  
Secondary Access and Adjacent Plantations Over 40 Years Old (Continued)

Unit_ID	Tx_Type	Tx_Class	Prioritization	Acres
115	Mechanical	Secondary Access and Adj. Plantations (40+)	5	188.73
116	Mechanical	Secondary Access and Adj. Plantations (40+)	5	82.93
117	Mechanical	Secondary Access and Adj. Plantations (40+)	4	92.45
118	Mechanical	Secondary Access and Adj. Plantations (40+)	5	89.49
119	Mechanical	Secondary Access and Adj. Plantations (40+)	5	65.73
120	Mechanical	Secondary Access and Adj. Plantations (40+)	8	79.37
121	Mechanical	Secondary Access and Adj. Plantations (40+)	7	57.85
122	Mechanical	Secondary Access and Adj. Plantations (40+)	7	125.59
123	Mechanical	Secondary Access and Adj. Plantations (40+)	6	102.60
124	Mechanical	Secondary Access and Adj. Plantations (40+)	5	117.15
125	Mechanical	Secondary Access and Adj. Plantations (40+)	6	124.00
126	Mechanical	Secondary Access and Adj. Plantations (40+)	4	120.39
127	Mechanical	Secondary Access and Adj. Plantations (40+)	4	85.03
128	Mechanical	Secondary Access and Adj. Plantations (40+)	6	117.38
129	Mechanical	Secondary Access and Adj. Plantations (40+)	6	66.06
130	Mechanical	Secondary Access and Adj. Plantations (40+)	5	80.27
131	Mechanical	Secondary Access and Adj. Plantations (40+)	5	106.84
132	Mechanical	Secondary Access and Adj. Plantations (40+)	5	47.59
133	Mechanical	Secondary Access and Adj. Plantations (40+)	5	76.91
134	Mechanical	Secondary Access and Adj. Plantations (40+)	5	119.76
135	Mechanical	Secondary Access and Adj. Plantations (40+)	6	169.43
136	Mechanical	Secondary Access and Adj. Plantations (40+)	5	92.69
137	Mechanical	Secondary Access and Adj. Plantations (40+)	5	115.18
138	Mechanical	Secondary Access and Adj. Plantations (40+)	6	71.32
139	Mechanical	Secondary Access and Adj. Plantations (40+)	5	141.43
140	Mechanical	Secondary Access and Adj. Plantations (40+)	7	81.32
Total Acres Mechanical Tx: Secondary Access and Adj. Plantations Over 40 Yrs Old				7,905.32

**Mechanical Fuels Reduction Treatment Prioritization and Acreage:**  
Dozer Lines

Unit_ID	Tx_Type	Tx_Class	Prioritization	Acres
156	Mechanical	Dozer lines	4	152.99
157	Mechanical	Dozer lines	6	45.45
158	Mechanical	Dozer lines	5	130.24
159	Mechanical	Dozer lines	3	68.40
160	Mechanical	Dozer lines	8	54.45
161	Mechanical	Dozer lines	5	193.74
162	Mechanical	Dozer lines	4	127.40
163	Mechanical	Dozer lines	6	91.16
164	Mechanical	Dozer lines	5	60.43
165	Mechanical	Dozer lines	4	197.46
166	Mechanical	Dozer lines	8	75.67
167	Mechanical	Dozer lines	5	13.85
168	Mechanical	Dozer lines	8	13.78
Total Acres Mechanical Treatments: Dozer Lines				1,225.02

### Summary of Acres for Mechanical Treatments by Treatment Type

Total Acres of Mechanical Treatments	14,001.46
Total Acres of Mechanical Tx for Primary Access and Adj. Plantations (40+)	4,871.11
Total Acres of Mechanical Tx for Secondary Access and Adj. Plantations (40+)	7,905.32
Total Acres of Mechanical Treatments Along Dozer Lines	1,225.03

**Prescribed Burning Treatment Prioritization and Acreage:  
Defensible Space**

Unit_ID	Tx_Type	Tx_Class	Prioritization	Acres
353	Rx Burn	Prescribed Burning (Defensible Space)	11	63.71
354	Rx Burn	Prescribed Burning (Defensible Space)	11	15.98
355	Rx Burn	Prescribed Burning (Defensible Space)	11	108.83
356	Rx Burn	Prescribed Burning (Defensible Space)	12	87.69
357	Rx Burn	Prescribed Burning (Defensible Space)	6	102.53
358	Rx Burn	Prescribed Burning (Defensible Space)	8	38.42
359	Rx Burn	Prescribed Burning (Defensible Space)	9	50.69
360	Rx Burn	Prescribed Burning (Defensible Space)	7	39.85
361	Rx Burn	Prescribed Burning (Defensible Space)	10	24.54
362	Rx Burn	Prescribed Burning (Defensible Space)	7	88.81
363	Rx Burn	Prescribed Burning (Defensible Space)	10	25.25
364	Rx Burn	Prescribed Burning (Defensible Space)	7	42.79
365	Rx Burn	Prescribed Burning (Defensible Space)	9	7.58
366	Rx Burn	Prescribed Burning (Defensible Space)	12	27.61
367	Rx Burn	Prescribed Burning (Defensible Space)	12	24.55
368	Rx Burn	Prescribed Burning (Defensible Space)	10	28.80
369	Rx Burn	Prescribed Burning (Defensible Space)	8	72.74
370	Rx Burn	Prescribed Burning (Defensible Space)	8	32.28
371	Rx Burn	Prescribed Burning (Defensible Space)	11	55.71
372	Rx Burn	Prescribed Burning (Defensible Space)	10	19.48
373	Rx Burn	Prescribed Burning (Defensible Space)	12	96.77
374	Rx Burn	Prescribed Burning (Defensible Space)	8	48.83
375	Rx Burn	Prescribed Burning (Defensible Space)	8	43.04
376	Rx Burn	Prescribed Burning (Defensible Space)	10	14.27
377	Rx Burn	Prescribed Burning (Defensible Space)	9	74.12
378	Rx Burn	Prescribed Burning (Defensible Space)	9	20.64
379	Rx Burn	Prescribed Burning (Defensible Space)	6	50.81
380	Rx Burn	Prescribed Burning (Defensible Space)	9	74.84
381	Rx Burn	Prescribed Burning (Defensible Space)	9	166.88
382	Rx Burn	Prescribed Burning (Defensible Space)	8	168.63
383	Rx Burn	Prescribed Burning (Defensible Space)	8	84.13
384	Rx Burn	Prescribed Burning (Defensible Space)	5	39.41
385	Rx Burn	Prescribed Burning (Defensible Space)	12	50.39
386	Rx Burn	Prescribed Burning (Defensible Space)	9	128.52
387	Rx Burn	Prescribed Burning (Defensible Space)	7	118.01
388	Rx Burn	Prescribed Burning (Defensible Space)	10	46.34
Total for Prescribed Burning for Defensible Space				2,183.42

**Prescribed Burning Treatment Prioritization and Acreage:  
Wildland Urban Interface**

Unit_ID	Tx_Type	Tx_Class	Prioritization	Acres
389	Rx Burn	Prescribed Burning (WUI)	4	826.35
390	Rx Burn	Prescribed Burning (WUI)	5	196.95
391	Rx Burn	Prescribed Burning (WUI)	6	990.92
392	Rx Burn	Prescribed Burning (WUI)	3	1254.40
393	Rx Burn	Prescribed Burning (WUI)	3	1078.63
394	Rx Burn	Prescribed Burning (WUI)	5	49.48
395	Rx Burn	Prescribed Burning (WUI)	9	75.40
396	Rx Burn	Prescribed Burning (WUI)	7	63.44
397	Rx Burn	Prescribed Burning (WUI)	7	201.82
398	Rx Burn	Prescribed Burning (WUI)	6	129.84
399	Rx Burn	Prescribed Burning (WUI)	4	381.55
400	Rx Burn	Prescribed Burning (WUI)	5	243.52
401	Rx Burn	Prescribed Burning (WUI)	4	461.03
402	Rx Burn	Prescribed Burning (WUI)	5	595.85
403	Rx Burn	Prescribed Burning (WUI)	3	424.60
404	Rx Burn	Prescribed Burning (WUI)	8	95.21
405	Rx Burn	Prescribed Burning (WUI)	9	42.29
406	Rx Burn	Prescribed Burning (WUI)	7	58.18
407	Rx Burn	Prescribed Burning (WUI)	3	203.95
408	Rx Burn	Prescribed Burning (WUI)	4	318.23
409	Rx Burn	Prescribed Burning (WUI)	5	222.18
410	Rx Burn	Prescribed Burning (WUI)	4	417.75
411	Rx Burn	Prescribed Burning (WUI)	5	272.70
412	Rx Burn	Prescribed Burning (WUI)	4	211.71
413	Rx Burn	Prescribed Burning (WUI)	3	892.37
414	Rx Burn	Prescribed Burning (WUI)	4	702.11
415	Rx Burn	Prescribed Burning (WUI)	4	488.60
416	Rx Burn	Prescribed Burning (WUI)	5	704.60
417	Rx Burn	Prescribed Burning (WUI)	2	979.54
418	Rx Burn	Prescribed Burning (WUI)	3	2286.15
419	Rx Burn	Prescribed Burning (WUI)	3	773.52
420	Rx Burn	Prescribed Burning (WUI)	4	1039.58
421	Rx Burn	Prescribed Burning (WUI)	4	739.48
422	Rx Burn	Prescribed Burning (WUI)	4	627.02
423	Rx Burn	Prescribed Burning (WUI)	3	1570.36
424	Rx Burn	Prescribed Burning (WUI)	3	1293.39
425	Rx Burn	Prescribed Burning (WUI)	3	1689.91
426	Rx Burn	Prescribed Burning (WUI)	3	888.71
Total for Prescribed Burning in Wildland Urban Interface				23,491.33

### Summary of Acres for Prescribed Burning by Treatment Type

Total for Prescribed Burning for Defensible Space	2,183.42
Total for Prescribed Burning in Wildland Urban Interface	23,491.33
Total for All Prescribed Burning	25,674.75

## *MapBook of FlamMap Runs Pre- and Post-Project Implementation*

This MapBook was also sent separately as a pdf file, but will be included in the hard copy report on 11x17 folded pages in the appendices. Metadata for the FlamMap runs is as follows:

We started with 2010 LANDFIRE data for the Klamath Mountains downloaded from the USGS National Map servers. These datasets were created after the 2008 fires, and the 2008 fire polygons were used in the update to manipulate the earlier versions of the LANDFIRE data. The LANDFIRE data product is coupled with the Calveg mapping efforts, and many of the inputs from Calveg find their way into the model as USFS vegetation layers, so many of the managed stands are assigned fuel characteristics based on USFS stand inventory data.

The 2010 LANDFIRE data assumed that medium canopy cover areas within the 2008 burns would be a dry climate shrub-type surface fuel model (142). The data also assumes that large areas of the 2008 burns would be a moderate-load broadleaf litter fuel model. (186) In burned areas with dense cover and larger trees, the LANDFIRE data assumes a light conifer litter surface fuel model (188), while grass areas are mapped with the lightest possible fuel loads after the fires (101). It wasn't clear from either the LANDFIRE metadata or interpretation of the dataset if the 2010 LANDFIRE update took mapped burn intensity into account, but based upon the hard edges to the data at the fire perimeter edge, we assume that they did not use intensity data.

We ran the FlamMap simulations with weather conditions that were developed by retired USFS Region 5 fuels chief Barry Callenberger for the Eddy EIS project. This weather dataset is available in the project data archive. We assumed 15 mph uphill winds for all model runs, and selected Flame Length and Fire Type as the two main fire behavior outputs. We used the 2010 LANDFIRE update data and mapping of the proposed fuels treatment units to develop a conceptual post-treatment FlamMap landscape dataset that was based upon the following assumptions:

All proposed units are treated.

### **Prescribed Burning**

Crown Bulk Density (CBD) - decreases 20%

Canopy Closure (CC) - decreases 20% within Rx burning units

Crown Base Height (CBH) - goes up to 5m (in many places it was already higher than this in the pretreatment landscape - we selected the maximum of either the pretreatment or post-treatment datasets.

### **Mechanical Thinning**

Crown Bulk Density decreases 30% in mechanically thinned areas

Canopy Closure decreases 30%

Crown Base Height goes up to 5m

## **Manual Treatments**

Crown Bulk Density - decreases 5% in had-thinned areas

Canopy Closure - decreases 5%

Crown Base Height - goes up to 2m

## **Discussion**

There is significant contrast between 2008 burn areas and the adjacent unburned landscape that are not realistic 6 years postfire. We feel that the pre-treatment model runs underestimate the potential amount of crown fire on the landscape, calling it torching, instead. Based upon our observations along Highway 96, and in interpretation of postfire LANDSAT imagery, the predominant pattern in fire intensity in the canyon areas following the 2008 fires was one of scattered patches of torching fire, with localized crown fire runs occurring in places where the up and downcanyon winds are in alignment with areas of heavy contiguous fuel. The FlamMap model and LANDFIRE data were not effective in modeling this local-scale variation/patterning.

We encountered technical challenges in making changes to the LANDFIRE Crown Bulk Density data layer, and post-treatment runs showed some differences from the pretreatment runs in areas where we hadn't attempted to change the data (outside of proposed projects). We think that the changes in the intensity outside of the treated areas are due to rounding errors in the conversion from the original Crown Bulk Density values to the post-treatment ones - LANDFIRE uses a convoluted unit ( $\text{kg}/\text{m}^3 \cdot 100$ ) to store CBD, and we couldn't get ArcMap to change the CBD values inside of the treatment areas without converting the data to integer (non-decimal) numbers. You can change the settings in FlamMap to take CBD in  $\text{kg}/\text{m}^3$ , and we used this setting with the integer data after multiplying the original decimal values by 100 (on the advice of Chuck McHugh, the developer of FlamMap).

The changes in predicted fire type within the proposed prescribed burning units are an almost universal change from a mixed torching fire regime to one of surface fire. We feel that this is due to the blanket way in which we raised the crown base height values, while decreasing the crown bulk density and canopy closure. In reality, we feel that it is unlikely that the proposed rx burns will experience uniform ignition, and that on many of the steeper slopes, large contiguous areas of lightly-burned or unburned areas will remain, leading to more torching and short crown runs than are predicted in the model. Due to the difficulty in anticipating potential rx burning conditions and effects, we are unable to get what we feel are realistic outputs from FlamMap for the large burn units, though we feel that there will be a large-scale reduction in torching and crown fire potential after the projects.

In an attempt to introduce more torching and variation to the proposed prescribed burning units, we introduce synthetic variability into the models by randomly assigning 5% of the rx burned areas with low crown base heights. We were hoping that this would enhance scattered torching in the areas with aligned fuels and solar aspects, but this approach only gave us a 'salt and pepper' amount of torching within the burn units, and we decided not

to use this approach.

The pre and post treatment datasets for this modeling effort are available upon request from Deer Creek GIS - [zeke@deercreekgis.com](mailto:zeke@deercreekgis.com). This data includes the original and post-treatment FlamMap landscape files, ASCII files for the modeled fire type and flame length, and the fuel moisture files used to run the model.

### *Full Size Maps (in report binder sleeve)*

Full size maps of the products above, as well as the Fire History map will be included in the final hard copy report.

### *Notes from Open Standards Workshops*

The notes from the seven Open Standards workshops of the Western Klamath Restoration Partnership were sent as a separate digital file along with this final draft of the Plan. These notes will be included in the hard copy of the final Plan as an appendix.