

PAYETTE FOREST COALITION

RECOMMENDATIONS

HUCKLEBERRY RESTORATION PROJECT

August 18, 2016

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Huckleberry Project Vegetation Recommendations

The Payette Forest Coalition, over the span of the last three projects recommended, has developed a "zone of agreement" around what types of ecological outcomes we support and what types of forest vegetation treatments are needed to achieve these outcomes.

This "zone of agreement" has expanded with each subsequent project to the point where it covers the most common vegetation types within the WLSH CFLRP Landscape.

Treatment Objectives

Our recommended treatment objectives for forest lands within the Huckleberry Project area are shown in Table 1.

Table 1. Treatment Objectives

1. Retain or expand the amount of large tree size class stands containing predominately early seral species (ponderosa pine, western larch and Douglas-fir) with low canopy closure in PVGs 1, 2 and 5.
2. Accelerate the progression of medium tree size class stands to the large tree size class consisting of early seral species (see objective 1.) in PVGs 1, 2 and 5.
3. Maintain or re-establish early seral species in stands and plantations where they have been, or are at risk of being, extirpated in PVG 6 using commercial thinning, variable retention patch cuts, modified shelterwood or modified selection silvicultural prescriptions. Regenerate western larch in project area to help improve tree diversity in PVG 6&7 stands to make them more fire resilient and resistant to fire, insect, and disease.
4. Reduce patch size in PVG 7 and the moister habitat types in PVG 6 to more closely represent the historic patch size and pattern as identified from historical maps and aerial photography, with the goal of a creating a landscape which is more resistant and resilient to large scale, stand-replacing wildfires. Emphasize regenerating species other than subalpine fir in areas currently infected by Balsam Wolly Adelgid.
5. Restore bark beetle and wildfire resistance in whitebark pine stands within PVG 11 through mechanical removal of competing tree species and reducing surface fuels. Follow up mechanical treatments by planting blister rust-resistant whitebark pine seedlings in highly infected areas. Treatments are recommended both outside and inside Inventoried Roadless Areas.
6. Reduce surface and ladder fuels and reinvigorate native forbs, grasses and shrubs and promote aspen regeneration in all PVGs.
7. Where treatments recommended above are within the Wildland-Urban Interface zones or fuel breaks recommended to protect community infrastructure, as identified in the Adams County Fire Mitigation Plan, we recommend thinning prescriptions that significantly reduce surface and ladder fuels to allow fire suppression resources to safely engage wildfire and canopy closure and connectivity standards that significantly reduce the risk of sustained crown fire runs.

You may consider these recommendations generally to be in priority order, with the exception of objectives 6 and 7, because we believe the risk of a catastrophic impact to the area's ecology is greatest in vegetation types that have missed the greatest number of natural fire cycles, such as in the drier PVGs.

While project implementation has not progressed to the point that previous project implementation monitoring would reveal that each PFC member's expectations are being realized by our recommendations in PVGs 6 and 7, it's fair to say that in general PFC members are willing to continue recommending these treatments until such time that monitoring indicates a need to change either the desired outcomes, the types of treatments or the stand prescriptions.

In order to better understand and document the ecological benefits of treatments proposed in PVGs 6 and 7, in terms of reestablishing a more natural fire regime, the environmental review should include a qualitative comparison of the current and historic or desired landscape pattern and a quantitative analysis of the proposed landscape pattern on wildfire severity and resistance to control.

Treatment objectives 6 and 7 are intended to apply to any treatment location where they are applicable and feasible.

Landscape Metrics (Quantitative Objectives)

As stated in previous recommendations, the PFC supports the concept that forest landscapes are more resistant to and resilient following disturbance when they fall within the Historic Range of Variability (HRV), in terms of individual stand composition and structure, as well as landscape mosaic and functionality. Thus, the PFC continues to recommend restoration treatments at a scale that will move landscapes back into HRV over time.

Based upon preliminary data provided to the PFC regarding the vegetation condition, we recommend the level of treatment in Table 2 to bring these forest types back to the midpoint of their historic range.

Table 2. Approximate Level of Treatment Needed to Fully Achieve Objectives

PVG	Treatment Objective	Acreage
1, 2 & 5	Treat to achieve objective 1	5,635
1, 2 & 5	Treat to achieve objective 2	6,598
6	Treat to achieve objectives 3 & 4	4,304
7	Treat to achieve objective 4	**976
11	Treat to achieve objective 5	589
Total		18,102

** (Assumes 20% of PVG treated)

The area needing treatment to achieve objectives 6 and 7 is assumed to be within same treatment footprint as those needed to achieve objectives 1 through 5.

We also recognize the limitations that will likely restrict the number of acres that can realistically be treated at one point in time, including: other resource values that must be protected to achieve our other objectives, the overall cost of the needed treatments and limitations within the Payette National Forest Plan.

Additional Considerations

There are two additional considerations that we encountered with this project that have, for the most part, not been encountered on previous projects or are yet unresolved as to how much treatment is needed to restore resiliency.

Wildland Urban Interface

First, the amount of Wildland-Urban Interface within the project area and the recommendations provided in the Adams County Wildfire Mitigation Plan, raise a significant amount of uncertainty concerning how the vegetation treatments recommended in that plan would impact the ecological objectives contained herein.

It is our hope and expectation that the ecological objectives and the treatments to achieve those outcomes that the PFC has worked tirelessly to develop over the past 8 years will also achieve many of the WUI fuels treatment objectives recommended in the Adams County Wildfire Mitigation Plan.

We support additional fuels reduction treatment outside of areas recommended here for ecological restoration treatment within a reasonable distance of structures and community infrastructure. The Healthy Forest Restoration Act and research indicates that fuels reduction treatments are most effective within 1/2 mile of structures and when accompanied by fuels treatment and other wildfire risk reduction actions conducted on private lands.

Whitebark Pine

Second, the PFC provides recommendations for whitebark pine protection and restoration in the project area. We support the treatments outlined in Table 1 both inside and outside of Inventoried Roadless Areas. Obviously, only non-commercial treatments will occur within the IRA, however, we feel it's worth the investment to conduct these non-revenue generating treatments wherever whitebark stands are found to take full advantage of the Stewardship Contracting authorities to protect this valued and at-risk forest type.

Conclusion

A final note, the PFC continues to recognize that the treatments recommended in PVGs 1-5 will benefit some species, e.g. Whiteheaded woodpecker and associated species and, in some cases, Northern Idaho Ground Squirrel, more than others, e.g., Rocky Mountain elk. Previous project recommendations have included a caveat regarding maintaining or enhancing elk security habitat through a combination of careful vegetation treatment placement and road decommissioning and closure.

The PFC continues to recommend that large blocks be treated to a level that roaded access will not be required for treatment maintenance over the next 30 years so that enough road can be closed (either seasonally or permanently) or decommissioned to ensure that the desired level of big game security is achieved within the project area following treatment.

Payette Forest Coalition Vegetation Recommendations: General Objectives That Apply to All Projects

This document summarizes the Payette Forest Coalition's (PFC) overarching objectives for vegetation treatments during forest restoration projects. These objectives apply to all projects brought before the PFC and this document should be considered a supplement to all project-specific recommendations submitted by the PFC.

Ecological restoration, a primary goal of the PFC, focuses on reestablishing ecosystem function by modifying forest composition, structure, arrangement and process. The Forest Service defines restoration as “assisting in the recovery of resiliency and the capacity of a forest to adapt to change.” The PFC recognizes that carefully crafted management activities, including silvicultural treatments, prescribed and natural fire, and fuel alteration and reduction, are key to restoring forest resiliency. The PFC aims to recommend vegetative treatments that:

1. support the management direction provided by the Forest Plan,
2. implement conservation principles that use a historical reference which will result in more resilient, resistant and adaptable forests and help assure native vegetation and wildlife diversity can be sustained,
3. improve forest resiliency to disturbance by altering forest composition, structure and pattern while also enhancing fire management capability.

Other PFC goals also come into play when managing the vegetation, including:

1. provide protection to adjacent communities,
2. partially finance non-revenue generating activities through stewardship contracting, and
3. create employment opportunities and economic activity in local communities.

The expected benefits from restoration actions include:

- Improved habitat for terrestrial and aquatic species.
- Improved forest resiliency to natural disturbance, including wildfire, insects and disease.
- Return of fire to the landscape as an ecosystem process.
- Improved ability to manage wildfire and protect adjacent communities.

Desired Condition

Analysis of historical conditions for the Payette, Boise, and Sawtooth National Forests found that decades of fire exclusion, forest management, insect outbreaks and other factors have substantially altered forest structure within the non-lethal to mixed 1 fire regimes. On the Payette there is a substantial reduction in the abundance and extent of the large-tree size class and early seral species, and a substantial increase in tree densities and ladder fuels within stands. These conditions have resulted in reduced habitat quality and increased risk of habitat loss from future wildfire and insect events. The PFC supports the long-term goal to maintain or restore a representative, resilient and redundant network of habitats that will provide for a diversity of terrestrial wildlife species, as well as a short-term emphasis on restoring habitats associated with species of greatest conservation concern, including the white-headed woodpecker.

The historical range of variability (HRV) offers a guide to setting a desired forest condition because forests within their historic range for composition, structure and pattern are more resilient to disturbance, including wildfire and insect and disease outbreak. Important metrics include tree species composition, stand ages, stand structures, fuel loading, and patch size and arrangement on the landscape.

Desired condition for PFC projects at landscape and project scales is an increase in the abundance and spatial extent of low canopy density, large tree size class stands and early seral species. The PFC supports proposed actions that will change vegetation structure, composition, and patch size at the project scale to transition the forest towards the desired condition.

To identify opportunities to move toward desired conditions, the PFC recommends an analysis for each project area that quantifies (in acres):

1. desired conditions for the project area by Potential Vegetation Group (PVG), tree size class, and canopy closure of the large-tree size class,
2. current vegetation structural conditions in the above categories, and
3. departure from desired conditions.

The data source to characterize the current forest condition has been the Payette National Forest strata database (December 2004) updated with field data collection. Photo interpreters delineated strata from color aerial resource photography, and applied three visible criteria: crown density, trees size class, and past management. Combined with a model of PVG, the database enables resource specialists to characterize the forest by the parameters in Appendix A of the Forest Plan: acres by PVG, tree size class, and canopy density class. The strata database comprehensively covers three scales: watershed, project, and landscape.

Treatment Priorities

In general, PFC priorities align with the perceived risk associated with missed fire cycles, whereby forest types that have missed the most natural fire cycles are at the greatest risk of uncharacteristic impacts from wildfire, insects or disease. The PFC will issue project-specific priority recommendations that are based on the assessment of conditions reported by the Forest Service and as observed by PFC members during project field visits.

While recognizing that restoration treatments and natural growth and succession will all be required to create a more resilient landscape, the PFC recommends an aggressive treatment schedule to accomplish our goals in an expeditious manner. Recommended treatment levels will be included in each project-specific recommendation.

The PFC supports a mix of commercial and non-commercial treatments to restore vegetation structure and species composition within project areas. Some treatment types will move a project area towards the desired condition and also contribute revenue from stumpage value. Other treatments represent a restoration investment (cost) that will modify stand structure or composition in order to achieve a desired forest condition in the future. Silvicultural prescriptions will vary based upon actual site conditions. Descriptions of treatments supported by the PFC to achieve these objectives are found in Appendix A.

Riparian Conservation Areas

Riparian Conservation Areas (RCAs) are intended to protect water quality and fisheries habitat. Frequently RCAs include both riparian and upland vegetation types. Forested upland vegetation types are included in RCAs because they provide shade and large wood and nutrient inputs to the stream channel and because they filter sediment before it can reach the stream.

Because RCAs often contain upland vegetation types, they are integral to achieving desired future conditions as outlined in Appendix A of the Forest Plan.

In certain instances, RCA vegetation may also be at risk to high severity, stand-replacing wildfire due to the uncharacteristic density and fuel continuity resulting from years of fire exclusion. The PFC encourages the Forest Service to look for opportunities to reduce this risk using targeted treatments

within the RCA and use an adaptive management approach toward understanding how best to reduce wildfire risk without significantly reducing the value these forests provide in maintaining water quality and fish habitat.

The PFC understands that designating appropriate riparian conservation area boundaries requires a unique set of knowledge and skills and can be very time consuming. We also understand that intensive techniques across large landscapes are prohibitive due to Forest Service staffing and budget. However, to increase the potential to optimize both the protection of water quality and fisheries habitat and restoration of upland forest types, the PFC continues to recommend the following process be used to identify RCA boundaries where possible:

- Where upland forest types consistent with the vegetation restoration objectives recommended in this document are adjacent to riparian vegetation or stream channels, use Option 3 as described on page 34 of Appendix B to delineate RCA boundaries. Option 3 uses an on-site analysis process to define RCA width based on the distance that best encompasses the extent of riparian functions and ecological processes.
- Give additional priority to using Option 3 RCA delineation techniques within large restoration blocks.
- Only implement treatments within designated RCAs where doing so will maintain or improve water quality or aquatic habitat.

Large Tree Retention

The PFC supports full implementation of the Legacy Tree Program as outlined in the draft Wildlife Conservation Strategy (WCS). The PFC feels that the MCCM Marking Guide – December 2013 Version used for the Mill Creek-Council Mountain project, which included the criteria to retain large ponderosa pine and western larch trees, provides adequate protection of ponderosa pine and western larch legacy trees. We recommend the following improvements to ensure that the appropriate trees are retained following treatment.

1. Include Douglas-fir trees under the large tree retention guidelines in the Marking Guide.
2. Provide more comprehensive training for marking crews, particularly when using crews made up of seasonal Forest Service employees or contract markers (purchaser mark or 3rd party markers). Consider including conservation organizations and Society of American Foresters in designing and conducting this training.
3. The Forest Service should provide additional supervision and more intensive monitoring of contractor marking to ensure that Large Tree Retention guidelines are achieved.
4. Consider using 3rd party contractors to mark the legacy trees which are to be retained when Forest Service employees are not available to do this marking. This would be similar to 3rd party contracts used to scale Federal timber for payment and is intended to reduce the potential conflict of interest created when purchasers make decisions regarding which trees are harvested and which trees are retained on site. This issue pertains primarily to retaining large trees that exhibit legacy tree characteristics.

Spatial Considerations

There is a need to design a spatial prioritization scheme that will produce, post-treatment, a distribution of conditions reflecting the conservation principles referenced in the draft WCS. Those principles offer the following direction on spatial configuration of treatments relevant at the project scale:

1. Species well distributed across their range are less susceptible to extinction than species confined to small portions of their range.
2. Habitat in contiguous blocks is better than fragmented habitat.
3. Large blocks of habitat containing large populations of species are superior to small blocks of habitat containing small populations.
4. Blocks of habitat close together are better than blocks far apart.
5. Interconnected blocks of fragmented habitat are better than isolated blocks, and dispersing individuals travel more readily through habitat resembling that preferred by the species in question.
6. Blocks of habitat that are in areas where the direct or indirect effects of human disturbance are low are more likely to provide all elements of species' source environments than areas where it is not.

Some key species habitat presence, including lynx, goshawk and pileated woodpecker, merit priority at a finer scale than the general treatment priorities discussed above. In addition, the desired condition for vegetation may conflict with elk habitat management goals within a watershed. Reducing tree density, for example, may open conditions to the extent that elk security areas could be compromised. Mitigation measures that compensate should be addressed, e.g. reducing open road density, implementing seasonal road closures and enhancing winter and summer range. The PFC recommends that proposed actions incorporate a review of elk calving areas, winter range and summer range with the objective to enhance habitat components that will support elk populations.

Additional Considerations

Other factors to consider when determining which areas would provide the most opportunity to achieve restoration goals, including creating large blocks of habitat in PVGs 1, 2 and 5, include:

- Opportunities to increase connectivity between blocks of high quality habitat.
- Opportunities to clump leave trees within both commercial and pre-commercial thinning.
- Opportunities to increase the amount of aspen.
- Existing access to stands for mechanical treatment.
- Where road decommissioning may reduce opportunities for future treatment, particularly in existing plantations.

Roads & Recreation Recommendations

The PFC supports restructuring and rehabilitating the road, trail and recreation infrastructure to transition the Huckleberry project area toward desired conditions at the watershed and project scales.

The benefits expected from these restoration actions include:

- Improve habitat for terrestrial and aquatic species
- Improve water quality and watershed health
- Enhance the road and trail network to support access for resource management, recreation and public safety.

The Coalition supports a combination of treatments that are the least expensive, least intensive and least intrusive actions possible that will make the most progress in moving all three sub-watersheds toward Functioning Appropriately per Appendix B of the Forest Plan.

A) We recommend the following guidelines for achieving the benefit of improving habitat for terrestrial and aquatic species:

1. Use watershed condition class (and the watershed condition indicators) to prioritize at-risk watersheds and Geomorphic Road Analysis and Inventory Package to identify specific roads and road segments that are significant contributors to water quality in streams within high priority watersheds. Develop road improvement, relocation or decommissioning plans for these routes to reduce sediment delivery to impaired streams within prioritized at-risk watersheds to improve conditions for aquatic species.
2. Utilize the best available science and conservation principles that provide the foundation for the draft Wildlife Conservation Strategy.
3. Maintain or restore a representative, resilient and redundant network of habitats that will provide for a diversity of terrestrial and aquatic wildlife species.
4. Emphasize restoring habitats and protecting habitat components associated with species of greatest conservation concern.
5. Enhance habitat components that will sustain elk populations consistent with the Forest Plan. This includes using the best available science to move the project landscape towards recommended road density and elk security habitat guidelines. One potential method of moving towards effective road densities and enhancing elk security habitat is to target road closures in areas where there is route redundancy.
6. Consider seasonal road closures to address specific wildlife security concerns. For example, late spring road closures may increase security in known mule deer fawning areas, and fall road closures may reduce buck or bull vulnerability during hunting seasons.
7. Consider new motorized and non-motorized routes when doing so would not compromise objectives to improve water quality and watershed health or objectives to improve habitat for terrestrial and aquatic species.

B) We recommend the following actions and guidelines for enhancing the road and trail network in such a way as to improve water quality and watershed health while supporting access for resource management, recreation and public safety:

1. The Travel Analysis Process (TAP) will serve as a starting point for identifying roads to be maintained on the system or decommissioned. Actual route treatments will be determined with public involvement through the NEPA process, balancing resource protection with public access and forest management. Draft TAP recommendations can be changed in light of new information.

2. In order to better inform FS decisions about road treatments, achieve the greatest watershed improvement for the dollars invested, and promote consensus on a preferred alternative, the PFC recommends conducting the Geomorphic Roads Analysis and Inventory Package (GRAIP) within as much of the Huckleberry project area as possible before implementing road treatments.
 3. We encourage the line officer to be open to adaptive management, including modification of TAP categories of roads to maintain/improve, decommission or further evaluate, based on the results of GRAIP.
 4. The Coalition supports a range of treatments that are the least expensive, least intensive and least intrusive actions possible that will make the most progress to reduce sediment delivery to streams and move all three watersheds toward Functioning Appropriately. In no particular order, these options include:
 - a. Road surfacing
 - b. Re-routing of roads and trails
 - c. Road/stream crossing upgrades to improve hydrologic function and aquatic organism passage
 - d. Seasonal closures
 - e. Effectively blocking motorized access to closed roads
 - f. Decommissioning by returning road prisms to a more natural state
 - g. Rehabilitation of trails and recreational facilities
 5. The Coalition requests that the DEIS include an evaluation of the change in watershed condition post-treatment for the proposed action and alternatives.
 6. We encourage the FS to look for partnerships for road and trail maintenance.
- C) The PFC recommends that the environmental review includes an analysis of the impact of the proposed action on the recreation user and compares those impacts among alternatives. The PFC preference is to maintain a road and trail network that supports the current spectrum of recreation opportunities within the project area. Specifically:
1. Trails should be protected during vegetation treatments and left in as good or better condition after vegetation treatment.
 2. The Coalition supports additional signing of trails to guide users, especially where trails intersect or overlap roads.
 3. We encourage the FS to set aside funds from timber receipts and to continue to seek other funding sources for maintenance of motorized and non-motorized trails.
 4. According to the current Recreation Opportunity Spectrum analysis, there are 25 miles of 2-wheel motorized trail, 8 miles of non-motorized trail and zero miles of ATV/UTV trails within the project area. Where it is possible to do so while still moving towards wildlife habitat and watershed improvement objectives described above, evaluate authorized and unauthorized roads identified for decommissioning for possible conversion to either motorized or non-motorized trails. Include in this assessment the potential benefits and impacts of designating some trails for OHVs \leq 70 inches wide.
 5. Coordinate with Adams County before obliterating any roads that have been asserted as historic routes under RS2477.
 6. System roads that access trailheads should be improved and maintained.
 7. Develop or improve trailheads that are sufficient in size to accommodate several vehicles and allow for a stock truck and trailer turn-around at the trailhead.

8. FS should coordinate annual clearing of trails with private citizen volunteers, Idaho Department of Parks and Recreation state trail rangers and the Payette trail crew so they complement rather than overlapping each other's work area.
9. Evaluate spur roads, roads to be decommissioned, and log landings for parking and dispersed camping potential.
10. Firewood retrieval for personal use is economically and culturally significant in Adams and surrounding counties. The Coalition recommends a combination of measures to maintain long-term, sustainable access to firewood, including year-round and seasonally open roads, as well as firewood gathering as part of timber sales.
11. The PFC supports the personal use firewood policy as described in *Personal Use Fuelwood Brochure for the Payette and Boise National Forests (2014)*. Any changes to personal use firewood policy within the project area should involve public input.
12. The Coalition recommends that the FS analyze closed system roads and roads identified for year-round closure to determine the feasibility of opening some of these roads from May 15-August 30, either annually or on a rotating basis, for firewood retrieval where it can be done while still meeting wildlife and watershed restoration objectives. Coordinate with Idaho Department of Fish and Game to identify known mule deer fawning areas where opening certain seasonal roads June 15 may increase wildlife security.
13. When assessing seasonal road closures, consider hunter desires for a variety of opportunity types, which include both sizeable areas accessible by vehicles (trucks, ATVs or motorcycles) and sizeable areas inaccessible by vehicles.

Note: Numbers are for reference only. Items are not ranked by priority.

Wildland Urban Interface Committee Recommendations

Background Information

One of the Payette Forest Coalition's (PFC) goals is to improve the ability to manage wildfire and protect surrounding communities. Furthermore, the Collaborative Forest Landscape Restoration Program (CFLRP) directs participating national forests to take into account any applicable community wildfire protection plan. The PFC formed a Wildland Urban Interface (WUI) Committee March 2015 to coordinate with local communities and recommend treatments to create fire-adapted communities amid a more resilient forest landscape.

Adams County, Idaho, completed its Wildland-Urban Interface Wildfire Mitigation Plan in January 2004 and updated it in May 2016 to refine the designated WUI boundaries. Both the original plan and the update resulted from collaborative efforts involving the Adams County Commission and county employees, the Payette National Forest, Idaho Department of Lands and Southern Idaho Timber Protective Association, Bureau of Land Management, local fire departments, businesses and citizens. This planning team utilized the professional expertise of Northwest Management, Inc., of Moscow, Idaho. The Plan follows the priorities and principles outlined in the National Fire Plan—2002, and the Idaho Statewide Implementation Strategy for the National Fire Plan—2002:

- 1) Improve fire prevention and suppression
- 2) Reduce hazardous fuels
- 3) Restore fire-adapted ecosystems
- 4) Promote community assistance

Members of the PFC's WUI committee met with the Adams County Wildfire Mitigation Committee throughout the process of updating the county's Plan during the spring of 2016. In addition, WUI committee participants toured the rural communities in and adjacent to the Huckleberry CFLR project area with Don Horton, Adams County Fire Mitigation Coordinator, along with Payette NF fire and fuels specialists, to gain an understanding of existing conditions and threats. They discussed departure from historic conditions and fire regime, fuel loads, canopy cover, access and egress routes, power lines and other infrastructure values, as well as the concerns of area residents and recreationists.

The WUI Committee defines WUI as the interface where housing structures, developments, infrastructure, and human populations meet wildland fuel. Wildland fire within these areas creates significant congestion of resources and the public and manifests in multiple hazard exposure, from burning structures and hazardous materials to community alarm. Fire suppression efforts are significantly thwarted by the need to provide for public safety.

Two wildland/urban conditions exist in the Huckleberry Project: Intermix Condition and Rural Condition.

Intermix Condition: A situation where structures are scattered throughout a wildland area. There is no clear line of demarcation; the wildland fuels are continuous outside of and within the developed area. The development intensity in the intermix condition ranges from structures very close together to one structure per 40 acres.



Rural Condition: A situation where the scattered small clusters of structures (ranches, farms, resorts, or summer cabins) are exposed to wildland fuels. There may be miles between these clusters, and they tend to have poor ingress/egress routes.



Flame lengths as well as fire type are two excellent measures of whether fire risk has been reduced. Greater flame lengths equate to greater heat output, and greater heat output limits suppression capability. See the “Hauling Chart” below (from the Incident Response Pocket Guide). This chart provides a guide for making decisions in wildland fire suppression. Significantly more resources are needed when attacking a fire with greater flame lengths. As flame lengths increase, the number of resources needed to suppress a fire significantly increases.

Fire Behavior Hauling Chart

Flame Length	Tactical Interpretations from Flame Length
Less than 4 feet	Fires can generally be attacked at the head or flanks by firefighters using hand tools. Handline should hold fire.
4 to 8 feet	Fires are too intense for direct attack on the head with hand tools. Handline cannot be relied on to hold the fire. Dozers, tractor-plovers, engines and retardant drops can be effective.
8 to 11 feet	Fire may present serious control problems: torching, crowning, and spotting. Control efforts at the head will probably be ineffective.
Over 11 feet	Crowning, spotting, and major fire runs are probable. Control efforts at the head of the fire are ineffective.

Fire in the crowns of trees, whether isolated torching, passive crowning, or an independent crown fire, can significantly increase fire spread (i.e., embers lofted through the air can travel well beyond the main fire front). Additionally, structures can be lost from burning embers landing on roofs, decks, etc. Heat pulses manifested from fire within the canopy can be too great for ground resources to control or safely work around. Ground or surface fires pose much less threat than fires in the canopy.

A Fuel Reduction Zone is a break in the fuel condition, strategically located for fighting anticipated wildfires, where the vegetation has been modified or removed so that fires burning into it can be more easily controlled. These fuel breaks may divide fire prone areas into smaller areas for easier fire control and provide access for firefighting.

Recommended Wildfire Mitigation Within WUI

Based on the assessments and background materials above, the WUI committee recommends the following actions be included in the Huckleberry CFLR Project:

- 1) Create 300-foot Fuel Reduction Zone (FRZ) on Forest Service lands around all private property post-vegetation treatments. Implement restoration vegetation treatments to private property lines as designed by PFC for each PVG. Non-commercial trees in FRZ's will be thinned according to the understory tree spacing as shown in Post-Treatment Forested Conditions Table 1 below. All trees in the FRZ will be limbed up a minimum of 4 feet with a chainsaw. Concentrations of dead and down slash material will be hand or machine piled (where feasible) and burned, or separated for firewood or biomass utilization as economically feasible. Once these FRZ's are completed they will need to be maintained with periodic treatments, including the use of prescribed fire. Forest management activities may include commercial thinning/harvest, pre-commercial thinning, limbing, piling (mechanized and hand) for firewood retrieval and/or biomass utilization when feasible, pile burning, and/or prescribed burning.

Additional treatments which include ecological restoration treatments are recommended beyond the 300' FRZ, up to one mile, as determined by the changes in fuel loading, fuel types, slope, aspect, and proximity to private property, roads, and values at risk.

Table 1: Post-treatment Forested Conditions Needed to Minimize Fire Potential

PVG	Canopy Closure	¹ Understory Tree Spacing Between Crowns (<10" DBH)	Coarse Woody Debris (tons/ac)				Litter (tons/acre)	Average Live Crown Ratio	Desired Tree Species
			1-hr	10-hr	100-hr	1000-hr			
1 and 2	20-40%	25-35	.08	.16	.35	1.3	1.01	40%	PP, DF, QA
5	20-45%	25-30	.07	.20	.35	2.3	.98	50%	WL, PP, DF, QA
6	30-50%	20-30	.06	.28	.56	2.3	.80	50%	WL, PP, DF, QA
7	35-55%	20-30	.05	.23	.52	3.5	.67	70%	QA, DF, WL, PP
11	35-55%	20-30	.03	.14	.56	4.8	.77	70%	WB, ES, QA

¹ All understory trees within the crown of trees greater than 10" DBH have been felled
Note: this table represents fuel profiles that mitigate fire risk concerns; other resource objectives (wildlife, vegetation or other) may require less fuel loadings and tree densities.

DF = Douglas-fir

ES = Engelmann spruce

PP = ponderosa pine

QA = quaking aspen

WB = whitebark pine

WL = western larch

- 2) Within the project boundaries, create 250' Road Right-of-Way Fuel Reduction Zone, to provide multiple escape routes for anyone who may need to escape the area in the event of wildfire, and improve conditions for fire suppression and prescribed fire.

Escape Route #1 is Council Cuprum Road FS002, traveling from Cuprum, up Huntley Gulch, continuing to Bear or Council.

Escape Route #2 is Landore Road FS105 from Cuprum, up towards the Landore Site, then to Four Corners, and down to Bear.

Escape Route #3 is Kleinschmidt Grade Road FS072, from Cuprum down drainage along Indian Creek on FS002, then FS072, then proceeding on FS050 (Kleinschmidt Grade) to Hells Canyon Park. This is not a desirable escape route because of the multiple hairpin curves, minimal turnouts, with a several thousand-foot drop-off, but should still be managed for an escape route opportunity.

The 250' Fuel Reduction Zone treatments along these escape routes on both sides of the road may include the ecological restoration goals that include commercial harvest, non-commercial thinning, limbing, piling for firewood or biomass utilization when feasible, pile burning and/or prescribed fire. Maintaining this buffer along these roads will support safer fire fighter access, as well as significantly reducing fire intensity along egress routes. Additionally, lowered fuel conditions within this buffer

would improve the ability to manage wildfire and prescribed fire from these roadways. We recommend the FS thin to targets listed in Table 1 and remove dead trees and hazard trees within one tree length (approximately 150') of the roads, to minimize the risk of falling trees blocking escape route in the event of wildfire. All of these primary egress roads are maintained by Adams County. Public safety is paramount, and maintaining these escape routes takes precedence over other restoration activities.

- 3) Where Fuel Reduction Zone's overlap Riparian Conservation Areas, the following treatments are recommended:
 - A. Conduct all ecological vegetative treatments and non-commercial thinning to private property lines and roadways. Strive to meet the Canopy Closure and Understory Tree Spacing as outlined in Table 1, to within 25' of intermittent and perennial streams.
 - B. Hand pile and burn concentrations of slash created by forest management activities, and dead and downed material (not currently providing stream shade, fish habitat, bank stabilization, and large woody debris) within 60' of intermittent streams, and 120' of perennial streams.
 - C. Prescribed fire ignition shall not occur within 25' of the stream channel.
 - D. No tracked or wheeled equipment is allowed to operate within 120' of intermittent streams, and 240' of perennial streams.
- 4) Cooperate with Adams County in creating fire-adapted communities. This includes many steps, including working with the multiple landowners within the project area to mitigate wildfire risk by providing information on how to mitigate risk as well as opportunities to fund these actions and understanding the risk to the community. For example, it is recommended that the community of Cuprum identifies, creates, and maintains safety zone(s) within the community. It cannot be assumed that ingress and egress routes will be available in the event of a wildfire, regardless of whether escape routes preparations are in place. The intent of the safety zone is to provide emergency responders as well as the public a safe alternative location to stage while a fire moves through or around the community.
- 5) Recommend FS continue to complete activities associated with the Cuprum Fuels Reduction Project, which includes prescribed fire on the north, east and south sides of the community of Cuprum.
- 6) Prioritize vegetation treatments within WUI areas to meet ecological conditions consistent with the Vegetation Committee recommendations for the Huckleberry project.
- 7) Construct a foot trail around the community of Cuprum that can aid in the protection of the community. This approximately 2-mile trail (18-24 inches wide) would provide firefighters with an efficient and safe opportunity to defend the community of Cuprum. The majority of the trail would be on NFS lands and would encircle the entire community.
- 8) Recommend continued and timely coordination between the Cuprum Benevolent Preservation Society (CBPS) and the Forest Service on their historic ditch maintenance plan. This plan is key to the town of Cuprum's water supply which includes irrigation, (keeping lawns and trees fire resilient), and for firefighting, it offers an excellent and continuous drafting site for pump and hose lay operations. Additionally, it is second line of defense for burnout operations if the foot trail above does not hold.

- 9) Fire engine access points for drafting/refilling need to be identified and improved as needed. Ensure that draft sites near communities are accessible to engines (Type 6 - Type 4) and pump operations (supporting hose lays) are located and provide for safe operations for emergency responders and the public. This includes reducing potential fire risk at these sites and ensuring that other vehicles (emergency responder and the public) can get around vehicles drafting from these sites. Firefighting equipment need unencumbered access to draft sites for efficient and effective fire response, particularly near houses and other structures. Roads may need to be constructed, reconstructed, extended or altered to facilitate efficient and safe drafting and filling access points. Any improved roads that are not designated as open to the public should be gated and signed for fire access only, no camping or parking allowed.
- 10) For the life of the scope of this project, recommend that following wildfires or other significant natural disasters (wind, snow, flooding, tornados, etc.) in areas in and adjacent to WUI, the Forest Service complete a timely assessment of stand mortality and the benefits and feasibility of salvage logging, as well as opening areas to private and commercial fuel wood gathering.
- 11) Plan to re-apply Fuel Reduction Zone treatments as needed (estimated 5-20 years) to maintain the desired condition of low fuel loading. These applications are low-moderate intensity (intensity meaning fire behavior, not fire effects). Fuel loadings that need to be managed include needle litter, down logs and branches, as well as regenerating trees and shrubs. The lowering of the live crown also needs to be managed with fire. Prescribed fire can do all these things quickly and efficiently while mechanical means of maintaining fuel conditions (when in maintenance phase) is relatively costly and sometimes not the best option because the primary carrier of fire are finer fuels.

Appendix A

Vegetation Treatment Type Descriptions

Commercial Thin / Free Thin (CT/FT) – This prescription is a mechanical thinning and will be applied to medium and large tree size class stands that generally have a desirable species composition with an objective of reducing tree densities, promoting and/or retaining a large tree character and promoting and/or retaining early seral species. These treatments are expected to provide a positive economic return. In general, the prescription will thin from below combined with crown thinning to retain desired species and vigorous, healthy trees.

Commercial Thin / Patch Cut (CT/PC) – This prescription is a mechanical treatment and will be applied to medium and large tree size class stands that have a component of desirable species but are losing or have lost the desired species in portions of the stand. The objective is to regenerate early seral species in up to 25% of the total stand area. These areas (patch cuts) would range from 3-10 acres in size and would have 5-12 reserve trees per acre retained in the patches. In the remainder of the stand Free Thinning (as described above) will be applied to areas with desirable species composition or deferred from treatment if the desired species are not present.

Commercial Thin / Mature Plantation (CT/MP) – This prescription is a mechanical treatment that will be applied to small and medium tree size class plantations that are generally greater than 35 years of age. Although some commodities (small logs and woody biomass) would be removed, the value of the timber would not generally be expected to pay for the entire treatment.

Pre-Commercial Thin (PCT) – This prescription will be applied to sapling and small tree sized plantations where no commodity would be removed. The objective would be to promote growth of early seral species into the larger size class while promoting the desired species composition. This treatment is a restoration investment.

Targeted Prescribed burning (Rx Fire) – This prescription will be recommended in areas receiving the CT/FT and CT/MP as well as other medium and large tree size class stands that are currently in their desired canopy closure class (i.e. Low and Moderate Canopy Closure Classes). The objective of burning is to reduce fuel loads, restore ecological function and increase the resiliency of the landscape.

Modified Shelterwood–Modified Selection (MSh/MSe) -This prescription is a modified regeneration harvest system designed to retain low density(T/A) large and medium sized trees for structure and composition either through the use of groups with ¼ to 2 acre openings or relatively uniformly spaced trees, emphasizing early seral species of comparable longevity. These leave tree designated single or weakly clumped large to medium sized trees provide both the regeneration seed source as well as the site protection to regenerating seedlings and saplings. These trees also provide the legacy trees. Low stocking levels of regeneration is maintained by prescribed fire and early thinning.

Variable Retention Patch Cuts (VRPC) -This prescription is used to adjust patch size as recommended in Treatment Priority 6. The irregularly shaped regeneration harvest cut leaves older single or small clumped trees scattered irregularly throughout as well as patches of healthy, seral species seedling to pole size regeneration. The areas are irregular in size and shape, spaced similarly to the fire patterns of

a rapidly moving variable intensity, low heat fire. Leave trees and reproduction patches are retained to create at least two age classes and structures. This situation applies in mixed and lethal fire regimes.

Targeted Thin/Fuelbreaks (TT/FB) This prescription is recommended in areas primarily associated with the PVGs 6 thru 10 that are associated with topography and the vegetation situation where there is a need to aid wildfire control or provide escaped fire protection adjacent to the wildland urban interface (WUI), private lands or other areas with special protection needs. The treatments are designed to enhance fuel breaks or other fire control strategies. They also would allow effective fire control or management capability allowing human control or intervention. When possible the composition and structure of leave trees or groups will enhance long-term risk reduction maintenance costs. Utilizing the most fire capable trees and understory density will assure control capability. Maintenance of fire control effectiveness will probably require maintenance treatments to control flame heights requiring transportation access.

- Consider biomass removal in plantations over 35 years of age if a lop and scatter treatment would create an unacceptable fuel load.
- The consensus recommendation regarding Inventoried Roadless Area the following: no mechanized harvest in this Management Prescription Category.