WESTERN KLAMATH RESTORATION PARTNERSHIP

The Slater Fire, September 8, 2020, encroaches on the town of Happy Camp, CA. Nearly 200 homes were lost as the fire burned over 90,000 acres on this day alone. Photo: Will Harling.

Post-Fire Management Recommendations

April 2021

Executive Summary

In response to the locally devastating 2020 wildfire season in California, the Western Klamath Restoration Partnership (WKRP) is providing post-fire management recommendations to managers and our communities based on indigenous and western science-based knowledge systems. WKRP is a diverse group of partners including tribal, federal, non-governmental organizations and community members. The WKRP's planning area is cross-jurisdictional, and includes the Six Rivers and Klamath National Forests, State Responsibility Areas, and spans the Karuk Tribe's Aboriginal Territory, totaling approximately 1.2 million acres. More than a century of fire exclusion and suppression of indigenous burning has left a fire debt on the landscape. WKRP partners know that our restoration projects cannot address the scale of this fire debt on a timeline that compares to the pace and scale of wildland fires and climate change. WKRP puts forward these recommendations to address how we can collaboratively respond to wildland fire as the dominant management force in our planning area and to identify where there are research needs.

In 2020, the Slater Fire burned over 157,000 acres around the town of Happy Camp – including the entire Indian Creek watershed, which had not seen recent wildfire. Nearly 200 homes were lost. With much of the forest burned at high intensity, there is increased need to envision and memorialize what WKRP partners want to see on the landscape moving forward.

The Karuk name for Indian Creek means "hazel creek" and Happy Camp is athithúfvuunupma -- literally, hazel-creek flowing-down-to. In the face of tragedies like the Slater Fire, there is a thin silver lining that creates opportunities for restoration that can foster resilient ecosystems, communities and economies. This would logically include restoration of cultural vegetation characteristics such as those that produce high quality and abundant hazel for cultural and subsistence use. Access to hazel has been severely impacted by the long absence of fire on the landscape. WKRP offers these initial considerations as an opportunity to collaboratively restore fire resilience at the landscape level upon the post-fire landscape.

These recommendations are for post-fire planning in and/or near recent (0-12 years) fire footprints. The document is not a substitute for collaboration. WKRP has an all-lands, multi-jurisdictional focus and prioritization in cross-boundary burning, private lands and Tribal lands treatments. Recommendations are intended to assist in the collaborative identification of desired future conditions through the use of climate adaptation plans and assessment of the best available scientific information. Current and/or potential vegetation type, slope, aspect, species of interest, 1944 aerial photos, Weislander (circa 1930) and/or General Land Office survey maps for historic vegetation, Potential Operational Delineations (PODs)/REBURN, and information brought forward through the knowledge, practice and belief systems of the people indigenous to place are valuable contributions to this effort. These recommendations do not address all potential circumstances that may arise in a post-fire environment, instead they may guide appropriate project collaborations on a case-by-case basis.

After the 2017 Wallow Fire, a WKRP partner came upon a falling crew cutting large diameter trees within a fire footprint in a wilderness area. The trees were barely burned and were not a hazard. The crew appeared to be using the tree falling as a non-essential training exercise. While this document focuses on post-fire management, WKRP partners recognize that actions taken during the wildfire event impact the group's ability to effectively collaborate after the fire. WKRP partners will continue to work with wildland fire managers to address actions during wildfire events that impact the need for post-fire management activities. When crews remove trees outside of a need for hazard tree removal, trust is diminished. While not addressed in this document, actions during wildfire events impact our ability to progress our collaborative work.

The WKRP planning area has been managed as an ignition-limited system and not a fuels-limited system for over a century, and the impacts of this fire management strategy become clearer every summer. These recommendations are focused on how we can restore fire process on the landscape, and return to a fuel-limited fire system together.

Collaboratively Developed Best Management Practices

In the spring of 2015, WKRP partners hosted a three-day workshop to collaboratively develop Best Management Practices (BMPs) for restoration – including post-fire restoration – within the 1.2 million acre WKRP planning area. This workshop was prompted by the 2014 wildfire season that burned nearly 300,000 acres in the WKRP scope. These wildfires averaged over 30% high severity, nearly double the average from recent wildfires (1987-2013). The BMPs were edited in 2019 and in 2020, culminating in this document. These recommendations include science support and research engagement in addition to monitoring, and are intended to inform cross-boundary, pre- and post-fire management across all land management designations as applicable in the Western Klamath Mountains.

Our history of extraction-based principles in determining sustainability must shift to a new paradigm that moves from socio-economic resilience first to achieving socio-ecologic resilience first and foremost. We must complement functional ecological processes, not work against them. The fire regimes of the past may not be the regimes that will work in a future climate, but centering them as a cultural norm founded in the principles of our local indigenous knowledge, practice and belief systems will not only help us to establish and build upon the principles behind practice, but also teach us to align our human behaviors with the greater trajectory of how our environment responds to disturbance.

General Recommendations

- Work collaboratively with WKRP partners to make incident and site-specific recommendations, including prescriptions and priorities.
- Collaboratively develop treatment descriptions for a range of post-fire scenarios – including a range of severities, vegetation and soil types.
- The overall recommendation is to increase the pace and scale of beneficial fire processes on the WKRP landscape.
- Use these descriptions to formulate prescriptions that address the contextual situation at hand.
- Use Traditional Ecological Knowledge as a form of best available science.
- Work to revitalize indigenous knowledge, practice and belief systems through more in-depth formulation of WKRP intergenerational learning strategies.
- Ensure tribal consultation occurs early and often.

- Prioritize re-introduction of fire process into recent fire footprints. Design NEPA to facilitate the re-application of fire in recent fire footprints as well as to use recent fire footprints as a fuel-limited area for adjacent prescribed fires, cultural burns, and managed wildfires.
- Complete NEPA and write prescribed burn plans that allow for utilization of recent wildfire footprints to expedite safe restoration of historic fire regimes, including indigenous fire use practices.
- Work collaboratively to identify funding for post-fire management treatments. Demonstrate effective economic stacking models that achieve long-term sustainability, such as the Endowment for Eco-Cultural Revitalization.
- Integrate post-fire management activities into the WKRP annual workplan. When multiple fire footprints need to be addressed: 1) prioritize high severity landscapes, 2) prioritize fire in fire footprints that have conditions such as a limited fuelbed, that allow for a lower complexity reentry of fire (typically 0-12 years), 3) recognize the importance of maintaining low and moderate severity fire footprints.
- Promote natural and cultural disturbance regimes.
- Integrate post-fire treatments with existing fire planning documents, including local Community Wildfire Protection Plans (CWPPs), and the WKRP overlay assessments for manual, mechanical and prescribed burning treatments.

Post-Fire Treatment Recommendations

Post-Fire Tree Felling

Post-fire logging is a highly controversial issue. WKRP partners are using this as an opportunity to share areas of agreement. One of these areas is to create implementable burn units to restore fire processes in and adjacent to recent fire footprints in strategic areas. Another is around homes and along critical access routes and infrastructure when appropriate. These recommendations are not an opportunity to recover costs, or meet budget justification targets through “salvage logging.”

- Use the WKRP “mechanical thinning overlay assessment” to identify areas where ridgetops are a high priority (i.e. red color in the assessment) and areas where these tree and/or snag felling/removal treatments are necessary for implementation of prescribed burning treatments (including the safety of fire personnel) and creation/maintenance of shaded fuelbreaks.
- Include prescribed burning in all NEPA documents analyzing post-fire tree removal.
- Analyze the tradeoff between negative impacts of tree felling/removal, and subsequent loss of snags, for example, and any restoration benefit of the tree felling/removal (e.g. erosion control, fish habitat, wet meadow restoration, fire control feature). Limit the geographic scope of tree felling/removal to minimize negative impacts. Identify areas of habitat connectivity that are most valuable for wildlife.
- Prioritize retention of large snags on the landscape for wildlife values. Consider the impacts of activity fuels after post-fire tree felling for all treatment types.
- Use post-fire tree removal as a tool for restoration in habitats impacted by conifer encroachment (e.g. oak woodlands, meadows). Restoration actions may be achieved without tree removal. In some situations trees may be left on site and/or used for instream projects. Remove hazard trees in strategic roadside areas.
- Prioritize removal of hazard trees that are in areas of high use; on access routes that cannot be closed; areas of high values and/or unique resources; areas adjacent to permanent structures; areas that are strategic for future fuels/restoration treatments; and on strategic control features.

- Remove hazard trees in strategic roadside areas. Prioritize based on road maintenance level (Level 5 - highest priority, Level 1 - considered if they serve larger function (reference travel management plans and CWPPs).
- Remove hazard trees in administrative areas (e.g. campgrounds), near houses and other areas with infrastructure.
- Retain desired trees – whether green or snags; preference to older, larger, fire-resistant conifers and hardwoods.
- Conduct research to better understand tree survivability in hardwoods including best practices for identifying mortality versus dormancy post-fire.
- Use a high (greater than 0.7) probability of mortality (PM) threshold for small to medium diameter trees. Do not use the PM threshold for large (DBH depends on the species of tree) trees. These trees should be maintained for seed production if possible. Default to retaining largest trees. Reassess PM of large trees over time. Do not rely on the initial assessment.
- Do not construct new roads.
- Do not remove trees in riparian areas or in severely erosive soils and sensitive soil (e.g. decomposed granite, deep soils with potential for debris flows). Retain large snags and/or downed logs in swales or drainage features, especially in sensitive soils.
- Do not log during wet weather conditions.
- Focus treatments along strategic roads, former hardwood/pine dominated early seral species patches, and strategic fuelbreaks and control features to protect fisheries in the short- and long-term by enabling reintroduction of fire to safeguard areas in the Wildland Urban Interface (WUI).
- Immediately post-fire, engage local fisheries biologists to plan for and implement strategic directional felling (or pulling over in a way to keep the root wad intact) opportunities to maximize soil retention in high severity burn areas. Ideally these treatments would occur before the first major winter rains. If needed, use helicopters to place large woody debris in streams.

Fuels and Fire Restoration

Wildfires offer unique opportunities for restoring fire processes both within and adjacent to their footprints. Reduced fuels in burned areas lower the risk of prescribed burn escapes, can lower the cost of manual thinning treatments through “pre-treatment” of fuels, and often leave behind functional fuelbreaks that can be used for managing future wildfires or prescribed burns. How each fire footprint fits into the mosaic of previous fires and areas where fire has been long absent can guide planning for larger post-fire restoration actions that incorporate managed wildfire and prescribed and cultural fire with minimal risk. Collaboratively developed planning documents, including CWPPs and the WKRP overlay assessments, are valuable tools in prioritizing treatments post-wildfire.

- Focus treatments in the WUI, including ingress/egress routes. Prioritize reduction of hazard to power poles and distribution lines. Create a power distribution fuels hazard recommendation document for the WKRP planning area based on the Karuk Tribe’s PG&E report.
- Consult WKRP overlay assessments for areas to prioritize for manual thinning.
- Update the WKRP firelines geodatabase annually with input from cultural specialists, botanists, and fire behavior analysts to provide guidance for appropriate management of firelines.
- Survey all newly constructed firelines every spring for at least two subsequent years to identify and manage invasive species, and document fireline conditions for future use.

- Identify, enhance, and maintain strategic control features for future use -- both in wildfire management and prescribed fire (reference and update: Happy Camp CWPP, Orleans-Somes Bar CWPP, Salmon River CWPP).
- Don't plant control lines with conifers, instead promote natural regeneration. Minimize the use of heavy slash to reduce erosion. Pile and burn slash associated with fireline construction.
- Identify a re-burn schedule for recent fire footprints and ensure that NEPA will allow for this.
- Maintain recent fire footprints with appropriate fire intervals (typically 5- to 10-year intervals, but dependent on the vegetation type) to restore historic fire regimes and reduce threats to communities.
- Use recent fire footprints as a fuel-limited area adjacent to prescribed fire units.
- Maintain sufficient coarse woody debris, good-quality snags on post-fire landscapes while considering future community protection and pre-fire management needs (short and long-term).

Erosion and Sediment Control

Post-fire erosion and sediment control techniques vary widely between regions and even within local national forests. There is more work to be done reviewing recent innovations in post-fire erosion management from around the country, and agreeing to what practices are the most applicable to the WKRP landscape. While post-fire erosion control at the scale wildfires are occurring is a daunting task, directional felling immediately post fire – guided by fisheries biologists and restoration partners – at larger scales shows promise for retaining soil in the upper watersheds where it is needed to sustain riparian recovery. This topic deserves further research by WKRP and partnering scientists.

Planting

Planting can be controversial – especially when continual replanting of the upper third of south-facing slopes has contributed to the lack of fire resilience on national forest system lands. If planting, plant fire / drought / disease-resistant species suitable to future climate conditions (site specific). Pre-suppression era vegetation patterns within burn area should be reconstructed to guide replanting to favor pre-suppression era vegetation by location. A wide range of genetic traits, not just for timber production, should be considered. When needed, disease resistance genetic stock should be used. While natural revegetation is the best option, consider planting in riparian areas, if needed, to promote soil stability and stream shading. Natural revegetation favors shrubs over hardwoods in the short term. Planting could be used immediately to increase the percentage of hardwoods and conifers in denuded riparian areas. The Master Stewardship Agreement template says that anything planted is the property of the USFS. This can be problematic in relation to tribal sovereignty.

- Perform fire suppression repair as soon as possible and before significant rains fall.
- Increase timeline for BAER and BAR funding until follow up burning or NEPA coverage is complete.
- Engage affected residents to collaboratively plan BAER response actions on private and tribal lands.
- Map areas with greatest potential for stream contamination from burned infrastructure, and develop plans for containing this effluent.
- Utilize straw wattles, catchment basins, and minor alterations to site drainage on toxic areas to minimize impacts to streams. Use weed free materials (straw, straw wattles, seed mix). Use local materials when possible. If reseeding is necessary, use native seed sourced as local as possible. Consult botanists to ensure weed free and native materials are used.
- Prioritize toxic runoff from fires in WUI areas (e.g. burned homes) and pre-existing superfund sites (e.g. mines).

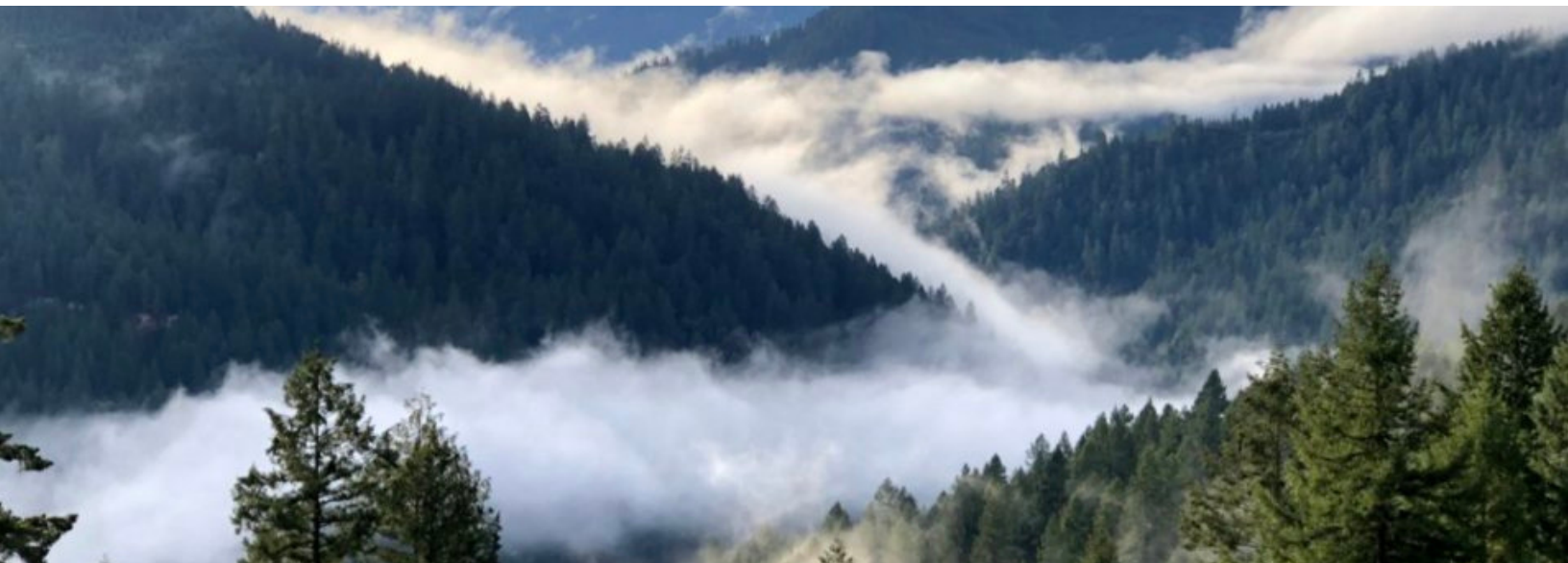
Erosion and Sediment Control cont'd

- Prioritize areas with highest erosion potential based on soil type and percent slope.
- Use woody biomass, especially large trees with root wads, for wood loading in streams.
- Work with fisheries biologists to understand habitat benefits from directional falling for erosion control in hard-to-access reaches. Design sediment catchment ponds above culvert road crossings to not pond and heat stream water during summer months.
- Consider installing water bars manually or limiting their construction to only when necessary.
- When installing water bars (e.g. on firelines), use minimal soil reconfiguration and tailor to slope steepness.
- Minimize erosion on strategic firelines without using vegetative materials that reduce potential for future fireline utilization.
- Consider erosion potential at each site to guide pile/windrow construction and/or lop & scattering.

Forest Heterogeneity

Wildfires are an opportunity to restore fire resiliency in burned forests. First, natural regeneration and invasive species management are a top priority. Planting can complement a climate-smart approach when slope, aspect and solar radiation are factored into planting decisions (see box on pg. 5). The goal of post-fire treatments needs to be diverse, fire-resilient forests. Wildfires can be an opportunity to increase heterogeneity in plantations.

- Protect and retain older, larger, fire-resistance conifers and hardwoods – especially species (living or dead) such as rare endemic conifers, sugar pine, yews, and broken top/wildlife trees.
- Retain hardwoods with potential for bole sprouting even if < 8 in. in diameter, especially dogwood.
- Count natural hardwood regeneration in stocking requirements.
- Do not plant within low and moderate severity areas or high severity patches less than ½ mile long/wide (with the exception of selective planting of disease/pathogen resistant trees, rare endemic conifers, sugar pine, yews, and reintroduction of hardwoods).
- Non-native invasive plants can spread quickly following fire. The disturbance as well as increased light and nutrients increase growth and seed germination of many invasive plants present within the Western Klamath Region. It is critical to manage existing invasive plant populations post fire.
- BAER policy relating to invasive species should be extended from one year to three years. The ability to find invasive plants that are introduced from suppression is next to impossible in the first year. And treatment for three consecutive years following a burn allows time for other plants to recover from the disturbance minimizing the spread of weeds.



- Emergency response monitoring: get water quality grab samples from creeks after first rains to understand aquatic and human impacts from post-fire runoff.
- Collaboratively develop a water quality and soils monitoring plan at the site-specific level.
- Promote citizen monitoring for areas of concern.
- Build out research partnerships and intergenerational learning through the Karuk Department of Natural Resources Pikyav Field Institute.
- Use research and monitoring data to inform place-based adaptations and plan updates as needed.
- Revitalize place based indigenous knowledge practice and belief systems.
- Review regional and national post-fire erosion control techniques to understand the best techniques for the WKRP landscape. Develop monitoring protocols to determine whether current post-fire management actions are resulting in the intended effects.

Summary

The pace and scale of wildfires appears to be increasing as a century of fire exclusion and the cessation of indigenous burning collide with climate change. Wildfires have, and will continue to be, the largest form of fuels treatment on our landscape. How we prepare for, react to, and work with these wildfires will greatly affect both human and natural communities. We are returning to a fuel limited landscape with every new large wildfire, and there are significant opportunities to maintain these burned areas as fuel limited, fire resilient landscapes into the future. In order to do this, we must transition from fire suppression as our primary method of fire management, to a model that relies much more on managing wildfires for resource objectives and larger scale seasonal prescribed burning. Post-fire treatments are a critical step in preparing for this management shift.