

August Complex

Vegetation and Resource Rapid Assessment



Mendocino, Six Rivers and Shasta-Trinity National Forests
December 2020

I) Introduction

The purpose of the August Complex Post-Fire Rapid Assessment (Assessment) is to (1) evaluate short-term post-fire restoration opportunities as well as identify public safety, cultural, and natural resource concerns, and (2) integrate a short-term strategy with medium- to long-term strategic management of the post-fire landscape across forest boundaries. Establishing and strengthening relationships with stakeholders and partners is both a short- and long-term goal of this Assessment. Seeking public involvement in the plans and priorities for restoration efforts on the Mendocino, Six Rivers and Shasta-Trinity National Forests is an integral piece of the restoration process.

A total of 1,032,648 acres burned in the August Complex, with approximately 612,634 acres on the Mendocino National Forest (MNF), 162,201 acres on the Six Rivers National Forest (SRF), and 139,760 acres on the Shasta-Trinity National Forest (SHF). Each of these forests have experienced substantial wildfire on the landscape in the past five years. In that time, the MNF has burned over 903,000 acres, the SRF over 308,701 acres, while the SHF has had wildfire affect more than 413,000 acres. Restoration efforts on the August fire footprint are even more critical given the recent fire history on these forests.

The Rapid Assessment team was formed by the Forest Supervisors of the Mendocino, Six Rivers and Shasta-Trinity National Forests, with employees from across the three forests. This course level “first look” at the restoration needs within the August Fire footprint will be a starting point. Additional resource considerations and public input will be included during the next steps to help refine and target areas for restoration work.

This assessment is aimed at the long-term ecological restoration needs and vegetation related public safety concerns. It will not address emergency actions such as suppression repair and burned area emergency response (BAER) activities. Suppression repair is on-going across all three Forests.

Copies of maps associated with this assessment as well copies of the August, North, and South BAER reports can be found at <https://www.fs.usda.gov/detail/mendocino/home/?cid=FSEPRD860382>

II) Evaluation Criteria for Resources

Each resource has described either the criteria that they used to narrow down treatment opportunities or key issues that will be important to consider when moving from an opportunity to a proposed action. A general evaluation was conducted for the following resources:

- Forestry
- Fuels
- Wildlife
- Botany
- Hydrology
- Geology
- Heritage
- Fisheries

A brief explanation of the general considerations used for this assessment can be found in Appendix 1.

III) Focus Areas

Seventeen Focus Areas that may support area projects are identified below, with a summary of natural and cultural resource considerations. All resources shown are ranked low, moderate, or high. For Timber/Silviculture, Fuels, Hydrology and Partnerships the ranking indicates a priority for treatment. For

Wildlife, Fisheries, Geology the ranking generally indicates a level of complexity. For more information on these rankings please see the individual focus area general assessments found in Appendix 2.

Focus Area treatment rating by resource.

Focus Area	Timber	Fuels	Heritage	Wildlife	Fish	Hydro	Geology	Partner
1 - Forest Glen	High	High	High	Low	Mod	High	Mod	High
2 - Red Mountain	Mod	High	Mod	Low	Low	High	Low	Low
3 - E. Fork/Texas Spider	High	High	Mod	Mod	Mod	High	Low	Mod
4 - Trough/Buck Ridge	Low	Mod	Mod	High	High	High	Mod	Low
5 - Tomhead	Mod	High	Low	Low	Low	Low	Low	Low
6 - Anthony Peak	Mod	High	Mod	High	Low	Mod	Mod	High
7 - Summit Springs	High	High	Mod	Mod	Low	Low	High	High
8 - Smokey/Hardin	High	High	High	Mod	High	High	High	Low
9 - Yuki/Black Butte	Mod	Mod	High	High	High	High	High	Low
10 - Bald Mountain	Mod	High	Mod	Low	High	High	Low	Low
11 - Brushy Mountain	Low	Mod	Mod	Low	High	High	Mod	Low
12 - Rnd Mtn/Kettenpom	Mod	High	Mod	High	Mod	High	Low	Mod
13 - Ruth/Packwood Flat	Mod	High	Mod	High	Mod	High	Low	High
14 - Boundary	High	Mod	Low	Mod	Mod	Mod	Mod	High
15 - Van Horn	High	High	Mod	Mod	Mod	Mod	High	High
16 - Roads	High	High	High	Mod	Mod	Mod	Mod	High
17 - Infrastructure	High	High	High	Low	Low	Low	Low	High

IV) Areas of Special Concern

Areas of Special Concern (ASCs) were identified as natural, cultural or administrative resources with high value, within the August Fire Footprint. These areas of special concern are identified as potential opportunities for additional long-term restoration of the burned area. Each of the resources considered these additional opportunities. A brief description of these opportunities as well as the initial analysis can be found in Appendix 3.

Areas of Special Concern treatment ratings by resource

Area of Special Concern	Timber	Fuels	Heritage	Wildlife	Fish	Hydro	Geology	Partner
A - Strategic Fuel Breaks & Rx Fire	High	High	Mod	High	Mod	High	High	High
B - Oak Woodlands	Low	High	Mod	High	Low	Low	High	Mod
C - Slope Stability	High	Mod	Mod	Mod	High	High	High	Mod
D - Watershed Restoration	Mod	Mod	Mod	Mod	High	High	High	High
E - NSO Critical Habitat	Mod	Mod	Mod	High	Low	Low	Low	Low
F - Reforestation	High	Mod	Low	High	High	High	High	High

V) Partnerships

The Forest Service (FS) has a multitude of organizations that desire to partner with the FS in maintaining the health and well-being of the National Forests. In order to incorporate their concerns and priorities into the assessment we endeavored to meet with as many of them as possible. However, despite our best efforts we were not able to meet with all of them. The partners we met with provided us with valuable information about the areas of concern for the impacted communities. In brief, the assessment team

contacted collaboratives, Resource Conservation Districts, Office of Emergency Services, private timber interests, energy interests, wildlife interests, Native American groups, etc.

By and large the organizations that were contacted expressed interest in working with the Forests on projects that are developed by the FS. Some specific areas of concern were identified, but many concerns were expressed in a general manner. These general comments supported salvage opportunities followed by reforestation, as well as addressing hazard trees adjacent to roads. A few organizations expressed interest in working on the planning and implementation aspects of projects, but the majority are waiting for the Forests to lead in project identification and development.

Many partners expressed interest in seeing salvage work done so that affected areas can be reforested. Multiple organizations want to continue to reduce the fuels on the areas of the forests that burned low intensity or not at all. Additionally, they would like to see better fuels management in the future. South Fork Mountain and Tatum ridges were specifically identified as important strategic fuel break opportunities. Adjacent landowners expressed a desire for Forest Service to treat fuels near property lines that if left untreated will pose a threat to their reforestation investments or personal safety.

The habitat of many birds and animals were either decimated or severely impacted and require habitat restoration work. Many of the wildlife organizations are interested in partnering to assess the impacts and design projects to rehabilitate these habitats. There was a lot of interest in having native vegetation returned to various areas. Restoration of traditional oak woodlands and grasslands was highlighted.

Several partners expressed downstream concerns regarding the impacts of sediment and/or debris moving from the fire area into municipal water systems or damaging important infrastructure downstream. This included concerns in the Ruth Lake watershed, Thomas Creek headwaters, Grindstone Creek watershed, Elk Creek watershed, Williams Creek headwaters and the Eel River watershed. Multiple organizations also expressed concern to fish habitats in the Thomas Creek, Williams Creek, and Eel River Watersheds.

Several of the Tribes that were contacted responded and provided confidential cultural information for the team to take into account. Many of them also provided information regarding the types and locations of restoration activities they would like to see.

Many Forest Service roads have been identified as being severely impacted and in need of road repair, culvert repair, and hazard tree removal. The local communities are concerned with roads as they are the primary means of accessing the public lands and the timber interests (i.e. Crane Mills and Sierra Pacific Industries) are concerned with keeping the roads open for salvage and reforestation efforts. Many trail heads, trails, and campgrounds were impacted by the fire. Affected areas need repair and it was suggested that it may be an opportune time to identify trails that can be redirected to better locate them with regards to future fires.

Several partners expressed interest in contributing to post-fire efforts either through funding or staffing resources. The Forests will be following up with these organizations as well as pursuing other internal and external funding opportunities for both planning and implementation.

Many organizations would like to be provided with the results of this assessment. Several of them would like to continue to be involved in project planning and implementation. Outreach will be an ongoing effort as not all partners have been contacted. It will be a priority to continue to incorporate their concerns in the restoration efforts.

VI) Public Participation

Public participation in National Forest management is critical to meeting the mission of the Forest Service. The restoration of the August Fire is a prime example of the importance of public involvement. The August Fire affects the public in Trinity, Glenn, and Tehama counties. These communities have a rich history close ties to their National Forests. The Forests have also provided much needed outdoor recreation opportunities for record numbers of outdoor enthusiasts during the recent national health crisis. The National Forests are an integral part of these communities.

The August Complex Restoration Communication Plan is intended to provide a framework for communication, contribution, and participation among all parties involved, or desiring involvement during the planning and implementing phases for August Complex restoration. Engaging with our internal and external audiences early and often is imperative. The Communication Plan outlines the methods and tools that are available to use to reach out to the widest audience possible. It is a living document that is anticipated to evolve based on input and feedback from all parties throughout the planning and implementing process.

The Goals of the Communication Plan are to:

- Establish and maintain open communication channels, internally and externally
- Increase awareness and promote a common understanding of the restoration process
- Keep all concerned parties informed throughout the planning and implementing process
- Provide opportunities to exchange data and information
- Build and maintain effective working relationships

VII) Environmental Compliance

Any restoration activities moving forward will need to go through the environmental compliance process to ensure applicable laws are being met. The staffing strategy and NEPA strategy will be critical factors moving forward. They will influence the size and type of restoration project(s) that are developed.

Staffing Strategies:

Option 1: Establish one Interdisciplinary Team (IDT), assigning the highest skills available from the three Forests, to complete all NEPA proposed (Environmental Assessment (EA)/Categorical Exclusions (CE)). The IDT would be sequestered to lead and manage all procedural requirements in fiscal year 21, working down the line officer priority list. The line officers would need to agree on common timelines, sideboards for risk and agreement on public involvement. The sub-option is this team could focus on producing templates with pre-set boilerplate management direction, purpose and need, mitigations and for EAs, the introduction and current conditions for chapter 3.

Pros. It provides a focused, stable team environment allowing for efficiencies to expedite NEPA. The IDT could develop the proposed actions for all NEPA concurrently across the three Forests. The EA(s) could have a single decision document with co-signatures from line officers.

Cons. The Forests have different capacities, some forests and their program of work may be more heavily impacted.

Option 2. Establish multiple independent Forest IDTs, utilizing agreements and enterprise team, etc. to fill voids in skills need to complete NEPA procedures.

Pros. Acquiring additional services from partners could increase the footprint of proposals to achieve more post fire restoration work.

Cons. Requires substantial additional project management time to modify agreements, secure funding and coordinate logistics. Line officers would want to assign a project manager so the NEPA team can focus on planning work. Partner capacity is limited and will be in high demand from North Zone Forests.

Option 3. Request funding and contract out the preparation of an EA and all related services required. Forest staff could target multiple CEs, or an additional EA either as 1 or multiple IDTs.

Pros. Increases capacity substantially to accomplish larger project footprints. Shares the workload for over-programmed limited resources on the Forests.

Cons. Requires project manager to process contracts and specialists time to orient and review products for quality control.

NEPA Options:

Batch or not to Batch

Ultimately, if a multiple CE approach is selected, the NEPA strategy should be informed by the scope and extent of effects to natural and cultural resources and whether the activities can occur independent of one another. A preliminary review of potential effects relative to extraordinary circumstances and significance would best inform next planning steps.

Option 1. Batch all commercial area vegetation recovery/restoration and other restoration projects in one EA and use alternate arrangement and ESD authorities. The RAT identified over 200,000 acres as suitable for commercial vegetation treatments in delineated Focus Areas and other strategic defensible space (ridgeline, roads, etc.) within and outside Wildland Urban Interface (WUI). Out of these acres, 80,377 lie within Late Successional Reserves (LSRs) and roughly 24,000 acres of RR.

Pros. Streamlines NEPA documentation and consultation by focusing IDT on single products (one BA, one SHPO consultation, etc.), while achieving legal sufficiency.

Cons. “No effect” restoration activities that could be processed under a CE category could be delayed due to notice and comment procedures required under an EA. If litigated, all restoration could be put on hold.

Option 2. Multiple CEs. Target CEs using the appropriate categories to maximize achievable acreage listed in Table 20.

Pros. Narrows the focus and simplifies the NEPA analysis and consultation. Easier for new IDT members and typically supported by partners. CE acres are limited, except for TSI/Wildlife CE category. If the event existing NEPA is in place (SRNF Roads Maintenance CE), batch recovery/restoration actions to streamline consultation (preparation of tier forms) can streamline procedures.

Cons. The analysis time and documentation is similar for a CE and EA. Multiple reports and multiple consultations take more time.

Multiple CE’s can appear as a disjointed, segmented approach, which tends to confuse the public. However, this can be addressed through collaborative outreach and during scoping as a method to demonstrate a cohesive approach.

Next Steps

It is important to emphasize that, though this rapid vegetation assessment is complete, there is much work yet to be done. Implementing restoration work within the August Fire footprint will be a long-term commitment. The next steps will be to look at prioritizing work to jump start the restoration process. Given the scale of the recovery effort, it will be crucial to engage our partners and the public as much as possible during the recovery and restoration process.

The Mendocino, Six Rivers and Shasta-Trinity National Forests will continue to work together to develop a planning and implementation strategy.

Appendix 1

Resource Considerations

Timber/Silviculture –

Special concerns for timber and silviculture are driven by the need to abate hazards to the public caused by fire-killed/injured trees and salvage areas to reduce heavy fuels in order to prepare the site for reforestation. There is a need to reestablish forest cover in deforested stands. Stands experiencing extensive mortality have lost seed sources (i.e. live trees) to naturally establish the next generation in a timely manner. In addition, when fuel loads were not completely consumed (which sometimes occurred in young plantations that burned hot), these areas retain excessive fuel loads especially in mature stands.

Heavy fuel loads reduce the chances of long-term success (i.e. mature stand) for reforestation efforts if salvage or other site preparation is not implemented prior to planting. There is a need to prioritize these treatments for short-term (likelihood a salvage opportunity will be implemented) and long-term success (future mature planted and resilient stand).

Consistency with Forest Plan Land Allocations

- No treatments proposed in Wilderness, Research Natural Areas, non-National Forest System lands
- No area salvage proposed in Inventoried Roadless Areas and National Monuments, however Hazard Tree Removal and reforestation are permitted and encouraged.
- High priority for restoration treatments in high severity areas including salvage and subsequent planting in:
 - Late Successional Reserve to restore forest cover in high value wildlife habitat
 - Matrix and Adaptive Management Areas to accelerate the return of forest structure and reduce likelihood of type conversion from forest to shrublands.

Fire-killed/injured hazard tree removal including:

- Removal of fire killed or injured trees impacting state/county highways and/or high use National Forest System roads open to the public.
- Bounding: 1.5x tree length above the road; 1 tree length below road
- Threats to transmission and powerlines as assessed by special uses permittees
- Developed recreation investments such as campgrounds, trailheads and recreation rentals
- Recreation residences located on lands managed by the National Forest System
- Other structures including guard stations, fire stations, lookouts, bridges on National Forest System Lands as well as structures on private lands.
- Undecked or decked trees felled during emergency fire suppression efforts.

Area salvage opportunities include the following criteria:

- High vegetation burn severity (RAVG¹ Basal Area Mortality - moderate to high)
- Land allocations – no area treatments were planned in Wilderness, RNA, IRA, private

¹ Rapid Assessment of Vegetative Condition after Wildfire (RAVG) uses geospatial technology to assist in post-fire vegetation management planning. Products include the 4-class basal area loss (mortality) model utilized in this assessment. Field verification on all three Forests indicate high degree of accuracy with the possible exception of underestimating mortality in young/plantation stands adjacent to high severity patches.

- Species composition (Douglas-fir and true firs have the highest likelihood for success)
- Stand structure – mature trees averaging greater than 14-inches, dense canopy and basal area
 - Sufficient volume/acre is needed for marketability
 - Plantation trees <50 years old were removed from consideration
- Accessibility – distance to road, slope (tractor vs. cable)
- Timber industry market – greater opportunities on SHF and SRF due to proximity to mill(s) and less flooding of market from salvage logs than MNF.

Reforestation of deforested stands:

- Reforestation is critical to establishing future forest cover in areas where existing seed sources have burned, with benefits all resource and public interests. The following areas are recommended for reforestation:
 - All stands proposed for area salvage (recommended, NFMA)
 - All existing plantations lost to fire (recommended)
 - Region 5's Post-Fire Condition modeling recommends evaluation of remaining deforested areas outside of Congressionally Withdrawn lands (approximately 227,000 total acres)

Fuels –

Special concerns for fuels and fire management are driven by the need to manage hazard fuels and restore the role of fire in our ecosystems. There is a need to establish a resilient fire regime that limits the extent of high-severity fire in the vegetative communities that aren't adapted to stand-replacement. There are a variety of short, medium, and long-term solutions for establishing a more resilient landscape and they range from the immediate removal of large fuels from the landscape to establishing a regular cycle of beneficial fire on the landscape. There is a need to prioritize treatments where they are adjacent to values at risk and where they provide strategic value to future fire management operations. The concept of adjacency should be based on a scale that will provide a high probability of successful protection and resilience for identified values at risk. Treatments should be large enough to slow, stop, or manage the effects of future wildfires.

Landscape-scale Treatment Areas

- The assessment maps prioritize landscape-scale areas for treatment. Areas for treatment would involve a range of treatment methods and are prioritized by
 - Proximity to human communities (wildland-urban interface)
 - Proximity to infrastructure (administrative, recreation, energy) and private property (including industrial timberlands)
 - Strategic value for fire management (including areas adjacent to wilderness)
 - Anticipated current and future fuels/fire hazard
- Areas outside, but adjacent to, the fire footprint should be considered for prescribed fire. Additional fuels treatments may be necessary prior to a successful prescribed fire and should also be considered.
- Treatments should include, or prepare for, landscape-scale prescribed fire.

Linear Treatments

- The assessment maps identify treatment buffers along strategic features, roads (ML2+, county, and state), and transmission lines.

- Strategic linear treatment buffers will incorporate the ridges, roads, and natural features that consistently provide opportunities for fire managers to control planned and unplanned fires. The Potential Operational Delineations are an important reference for identifying these features (see maps). Risk Management Assistance tools, such as the Region 5 Potential Control Locations dataset, can also be useful.
- Roadside buffer treatments will reduce access and egress hazards for local communities, the recreating public, agency personnel, and emergency responders.
- Linear treatments should be prioritized by where they fit in the area prioritization, how they intersect with WUI, and where roads and strategic features align.
- Places where roads overlay strategic ridges should be prioritized for treatment.

Other Considerations

- Areas of all burn severity classes should be considered, including “green islands” that burned at low/mod severity and may be a priority to treat around and within.
- Treatments along and adjacent to property and jurisdictional lines demonstrate a shared commitment to hazard reduction through continuous treatment across boundaries.
- We need to continue to build partnerships that promote and enable prescribed fire across ownership lines.
- Buffers around infrastructure will reduce hazards adjacent to USFS facilities, recreational sites, and energy corridors.
- Treatments should target dead fuels of all size classes. Live surface fuels (including shrubs and small trees) and ladder fuels should also be considered for treatment, particularly in areas that burned at low to moderate severity.
- A wide variety of treatment methods (e.g. thinning, hand and machine piling, chipping, mastication, pile burning, broadcast burning) should be considered, including novel treatments (e.g. air curtain burners, re-use of chipped material for restoration, etc.).
- Treatments should be planned beyond short-term removal of biomass and consider treatment maintenance.

Biological Sciences –

Wildlife

The August Fire had over 260 historic northern spotted owl (NSO) territories that experienced some level of reduction in suitable habitat.

A main emphasis of ESA consultation for the federally listed NSO is to ensure reproductive success of the species during the nesting season, from February 1 through September 15. The central location of nesting activity for NSO is called an Activity Center (AC). During the nesting season, NSO habitat use is concentrated within a Core Area of 0.5 miles radius of an AC. At larger scales, spotted owls may use habitat up to and sometimes beyond 1.3 miles from an AC, in an area called the Home Range.

In general, with these assumptions of habitat use, vegetation treatments outside of Core Areas (≥ 0.5 miles) are considered to pose less risk for NSO reproduction, resulting in shorter consultation timelines and more flexible treatment options. Proposing treatments within Core Areas may result in longer consultation timelines and still conclude with very limited or no treatment options in Core Areas.

The August Complex adds additional complexity to these general assumptions. Where fire has removed substantial amounts of habitat in a Core Area, the AC may no longer be viable for successful NSO reproduction.

- Activity Centers with high levels of habitat removal in Core Areas (Moderate to High burn severity) may be considered for NSO abandonment in future ESA consultations.
- Recommendations for Focus Areas will tend towards treating outside viable Core Areas, or where Moderate to High severity fire effects have removed habitat altogether, whether within or outside of Core Areas.
- Activity Centers with Low to Very Low burn severity may still support NSO reproduction and will likely have a Limited Operating Period (Feb 1 – Sept 15) that may affect implementation timelines for future activities.
 - The NSO survey protocol requires 2 years of surveys – ESA consultation without full protocol surveys may be challenging in areas that have high amounts of post-fire suitable habitat (RAVG classes 1-2), in or outside of Core Areas.

In areas of Moderate to High burn severity (low expectation of NSO occupancy), treatment options may include:

- Strategic fuel breaks - should be a high priority to help protect adjacent suitable habitat, and to reduce the risk of future wildfire spreading to adjacent watersheds with suitable habitat
- Reducing fuel loading in Moderate to High severity burned areas may reduce the threat posed by future fire events to adjacent suitable habitat and designated Critical Habitat

Wildlife considerations for both short- and longer-term proposed activities:

- Emergency consultation on the August Complex and the other 2020 fires in the North Zone will need to be completed prior to consulting on future projects
- The following guidelines would likely decrease project-level ESA consultation timelines:
 - Prescriptions that maintain habitat (i.e. no downgrading or removal)
 - Avoiding vegetation treatments in viable Core Areas (high levels of RAVG classes 1-2)
 - Limiting commercial treatments to RAVG classes 3 and 4 only (unsuitable NSO habitat)
 - Conversely, proposals to treat post-fire suitable habitat in RAVG classes 1 and 2 may increase ESA consultation timeline.
- Other considerations for ESA consultation:
 - Past surveys may be inadequate due to post-fire displacement of NSO to adjacent suitable habitat
 - Depending on seasonal staffing capability, surveys for NSO may not be feasible in multiple Focus Areas in the same season
 - Salvage, other logging operations or vegetation management activities in State and/or Private lands may contribute to cumulative effects in areas proposed for federal vegetation management activities in the August Complex, in focus areas or in Areas of Special Concern
 - Treatments that may be considered within Core Areas
 - Removing ladder fuels within suitable nesting/roosting, foraging and dispersal habitat
 - Fuels treatments that create safety corridors along roadsides
 - Removing excess and/or fuel in remaining suitable habitat would keep future fire activity from reaching the canopy. Removing understory fuels would also allow opening up the lower canopy for easier flight. Some piles could also be created for prey species.

- Other wildlife concerns: Oak woodland treatments in areas where pre-fire conifer encroachment was occurring, replanting oaks, and to restore native grasses and replanting oaks where fir encroachment has occurred

Botany

Considerations for August Complex Special Status Plant Species:

- Plant surveys:
 - Survey and Manage (S&M) species have a pre-decisional survey requirement
 - S&M species have habitat in all elevations in Focus Areas
 - Forest Sensitive (17 species) plant surveys are not required before a decision but are required before implementation
 - Forest Sensitive and S&M surveys can be conducted at the same time (more efficient)
 - If avoidance measures are not feasible, consider dropping known sites from inclusion into project areas
- Serpentine and Rattlesnake Terrain - flag and avoid is the best option
 - These soils are not suitable for conifers, but they are highly compactable and cannot be restored after the fact
 - Re-routing temp roads or reusing old logging roads are also suitable avoidance measures
- For known Forest Sensitive plant sites in Focus Areas, a LOP from Feb-July 15th could be utilized to allow seed set if avoidance measures cannot be employed (e.g. avoidance flagging too problematic due to large scattered populations).
- There are 2 Pechman exemptions that can be applied to botany
 - No Survey and Manage surveys are required in the case of plantations less than 80 years old with under burning as the treatment.
 - Emergency declaration (immediate entry post-fire) preferred when solely looking at cryptogamic crust and soil productivity. The damage to soils 1-year post-fire is more adverse to sensitive plants than immediate entry.
- For additional resource protection measures, refer to the North Coastal Range Conservation Strategy that identifies 53 subpopulations of rare, endemic plants
- Targets for restoration:
 - In riparian areas that experienced severe mortality, replanting with nitrogen-fixing or long-lived plants, like alders (*Alnus* spp.) would reduce and/or prevent erosion and provide food for aquatic species
 - Seeds from cones collected in January could be used for direct seeding in riparian areas and add value to habitat for anadromous fish.

Fisheries

The primary concern for fisheries resources within in the August Fire footprint is for the preservation and/or restoration of watersheds which provide habitat for aquatic organisms, namely those listed as threatened by the Endangered Species Act (ESA). A total of 403 kilometers of ESA designated critical habitat occur within the fire footprint. Watersheds of high priority are the Black Butte and Upper South Fork Trinity (HUC 10). Aspects of salvage and restoration projects that are most beneficial to fisheries are:

- Developing prescriptions that exclude riparian reserves from salvage logging or hazard tree abatement operations.
- Stabilizing inner gorges and reforestation in high priority watersheds to prevent increased sedimentation
- Protection of or reestablishing riparian habitats
- Fuels reduction in priority watersheds to prevent future fires with high burn severity

- Assessing large woody debris (LWD) in streams and mechanically adding if necessary

Physical Sciences –

Hydrology

- Forest Plan direction for each of the 3 forests states that Key Watersheds are the highest priority for restoration.
- The streams in the jurisdiction of the North Coast Region Water Quality Control Board are impaired for sediment and temperature.
- Most likely, any post-fire vegetation management project(s) will be determined to be Category B by the North Coast Region Water Quality Control Board. Several important things about Category B projects include the following:
 - Legacy sediment sites will have to be identified and treated.
 - If a Category B project is within a sub-watershed that contains an active Watershed Restoration Action Plan that is treating legacy sediment sites, the Category B project is exempt from treating additional legacy sediment sites
 - Some Category B projects may be too large or contain project specific conditions that make it infeasible or unnecessary to treat all legacy sediment sites. In such cases, alternative legacy sediment site treatment plans that inventory and propose to treat some portion of the largest sediment producing sites within the project area may be submitted to Executive Officer for approval.
- Roads are the most common source of sediment caused by human activities according to the sediment TMDLs that have been developed for the Eel River, the Mad River, and the South Fork Trinity River. To decrease sediment delivery to ensure adequate water quality, desired conditions include the following:
 - Less than one percent of the stream crossings should have diversion potential (construct critical dips).
 - Less than one percent of the stream crossings should have significant crossing failure potential (design culverts and crossings to pass a 100year flood, including associated debris and sediment).
 - Hydrologic connectivity should be reduced to the extent feasible (construct rolling dips).
- The source of stream temperature impairments caused by human activities is most often lack of stream shading. Replanting site appropriate riparian vegetation (including alders and/or willows) should be a priority.
- Direction for restoring aquatic and riparian-dependent resources according to the Watershed Condition Framework includes the following:
 - Focus on a few priority watersheds, rather than on stream segments that are scattered over multiple watersheds.
 - Integrate a wide range of treatments on a watershed scale rather than a narrow range of treatment focusing on individual sites.
- Forest Plan direction states that watersheds that are over the threshold of concern will not be further impacted unless they can be improved with appropriate mitigation measures.

Geology

- Reforestation of landslides is not proposed; only reforestation stable slopes that burned at Moderate and Severe. Do not plant trees in glades or wet areas.
- Under the NWFP, active landslides and inner gorges are riparian reserves. Inner gorges are stream-side slopes $\geq 65\%$. Mechanical equipment is excluded from unstable areas and commercial timber operations are generally prohibited. Non-mechanical treatments, such as underburns for fuels or hand piling and pile burning, are compatible with these areas. Unstable areas must be mapped and assessed during project planning and protected from ground disturbance to not induce management-related landslides.
- If type-conversion from forested to shrubs is likely, it is highly recommended to have widespread reforestation on currently stable slopes to meet these objectives:
 - increase long-term slope stability through evapotranspiration (groundwater reduction).
 - increase root support
 - increase canopy cover for rain interception, and
 - provide long-term seed sources for adjacent steep and unstable areas that cannot be manually reforested
- Landslides or steep $>35\%$ slopes at reforested plantation densities may not be effective. Dense trees on steep slopes or unstable areas may increase instability in the long term due to weight of trees. Effective and economical site preparation for reforestation usually involves mechanical equipment, which are prohibited in unstable areas and most steep slopes. Reforestation in fast moving or steep unstable areas is likely to not be successful. It is therefore likely not practical to reforest unstable areas and steep slopes.
- Reforested areas on stable ground and gentler $<35\%$ slopes have a much higher chance of success and may serve as long-term seed sources for adjacent unstable areas and steeper slopes.
- Reforestation of stable areas should reduce groundwater levels on lower steeper slopes, helping to reduce landslide risk in the long-term.
- Reducing the risk of widespread mass wasting due to deforestation in the August Complex is critical to also reduce long-term sediment loads into stream systems.
- Reforestation also provides long-term large and coarse woody debris to stream systems, which is essential for long-term overall stream health and reducing the impacts of debris flows.
- Landslides tend to be most concentrated in drainages and along roads, though some earthflows may extend far upslope. Large acres of landslides in Focus Areas tend to be due to large earthflows or particularly large rotational slides along steep streamside inner gorges (such as along the anadromous and Wild and Scenic Black Butte River on the Mendocino NF).

Heritage –

- Precontact Native American archaeological sites in addition to historic sites, trails, and buildings constitute historic properties that were impacted by both wildfire and fire suppression efforts. Tree mortality, soil erosion, looting, and increased pace of data loss through natural deterioration are continued threats to historic properties that can be mitigated through project design.

- Many of the designated campgrounds are historic in age with unique CCC era features. They also often coincide with the location of pre-contact village sites. The recommended post-fire rehabilitation at these recreation areas will be intensive and has the potential to negatively impact site integrity.
- Combustible artifacts, features, and buildings, in addition to data rich archaeological sites that were not burned within the fire perimeter should be considered for prioritization of preservation efforts.
- The majority of the assessment area has not been intensively surveyed by an archaeologist. Proposed undertakings will likely require new intensive survey; however, to provide for surveyor safety and account for the rugged terrain, a less than intensive survey strategy has been drafted as part of this assessment. Pursuant to the USFS Region 5 Programmatic Agreement with the State Historic Preservation Office (SHPO) the strategy will require informal SHPO consultation to be utilized for individual undertakings.
- Historic properties that may have been adversely impacted by suppression efforts are required to be assessed under the National Historic Preservation Act of 1966 (NHPA). To determine which cultural resources, constitute historic properties, formal National Register of Historic Preservation (NRHP) evaluations must be conducted. Utilization of the incident P-code for this work is authorized. The Heritage Program Managers recommend contracting this extensive work.

Appendix 2 Focus Areas Initial Analysis

Focus Area 1: Forest Glen

Focus Area #1 is one of the more complex areas, incorporating, a WUI community (Forest Glen), Designated Wild and Scenic River (South Fork of the Trinity) within a key watershed, powerlines, State Highway 36, campgrounds, recreation rental and recreation residences, critical habitat for Coho salmon and northern spotted owl, and has a rich history of heritage values and cultural use. The western boundary, South Fork Mountain is the longest and one of the most prominent ridgelines in northern California.

Focus Area 1- Forest Glen data summary in acres

RAVG Burn Area Index Basal Area Mortality (4 Class)		Very Low	Low	Moderate	Severe	Total	Grand Total
Land Allocation (acres)	LSR	5517	1394	827	1998	9736	16565
	Matrix/AMA	2810	1468	585	1154	6017	
	Private	239	106	57	300	702	
	Other	54	56	29	33	172	
Roads (miles)	ML 3-5	5.2	2.4	1.8	2.2	11.6	72.6
	ML 2	17.6	5.9	2.4	9.2	35.1	
	ML 1	14.0	4.5	1.8	5.6	25.9	
WUI (acres)		7886	2775	1352	3022	15035	998.3
Infrastructure/ Developed Recreation (Each)	Campgrounds	1		2		3	
	Trailheads	0		0		0	
	Structures	17		5		22	
	Bridges	2		1		3	
NSO	Activity Centers	7		1		8	
Critical Habitat	NSO (area)	7585	2547	1243	3036	14413	
	Salmonids(km)	15.93	1.72	1.02	1.80	20.47	
Active Landslides (acres)	Riparian reserves	312.8	57.8	6.3	3.9	380.8	
Inner Gorge (acres)	Riparian reserves	367.3	97.1	55.5	97.5	617.5	

Timber/Silviculture - HIGH

- High priority for roadside hazard removal due to proximity to Forest Glen and high recreational use. High use roads include: State Hwy 36, 1S04, 1S10, 1S23, 1S25, 1S26, 29N58
- Three campgrounds and a swimming hole, Recreation Residences (10) and powerlines (PG&E Transmission and TPUD) were highly impacted and will require hazard tree treatment and removal. Powerline hazard tree abatement is in progress under Special Uses Permit; NEPA for these are likely to be addressed separately.
- High priority for area salvage and reforestation due to high recreational use and private inholdings as well as meeting LSR objectives.
- Potential area salvage opportunities: **800 acres**, 80% tractor-based logging systems

- Rough estimates indicate this area has **moderate** potential for economical restoration opportunities.
- Accessibility: very good due to proximity to state highway
- Reforestation recommended within areas salvaged plus burned plantations.
 - Existing plantations: approximately 3000 acres
 - Plantations experiencing high severity: **1000 acres** - recommend for reforestation

Fuels – HIGH

- Extensive WUI and private property (including industrial timberlands)
- Extensive infrastructure including Highway 36, transmission lines, distribution lines, gas lines, campgrounds, trails, and recreation residences
- High strategic value for fire management
- The ridgetop along South Fork Mountain is a high priority for treatment.

Biological Sciences

- **Wildlife – LOW**
 - One NSO AC may be designated as abandoned during the ESA consultation process
 - Treatments proposed, if any, within viable Core Areas (RAVG 1-2) could have LOPs and treatment restrictions
 - Fuels treatments, salvage, and reforestation would be beneficial in habitat that was removed by fire (RAVG 3-4), where the likelihood of NSO occupancy is low
 - These treatments may still have LOPs if within disturbance buffers for NSO
 - Treating adjacent to suitable habitat may reduce the risk of loss in a future fire
- **Fisheries – MODERATE**
 - Majority of critical habitat in low burn severity
 - Watershed is lacking LWD and would benefit from mechanical additions

Physical Sciences

- **Hydrology - HIGH**
 - This area is in the Upper South Fork Trinity River Key Watershed. Key Watersheds are the highest priority for restoration.
 - This area is in the jurisdiction of the North Coast Region Water Quality Control Board.
 - The streams are sediment impaired. Legacy sediment sites are not yet identified and may require treatment.
 - The streams are temperature impaired. Treatment options should include replanting vegetation in the Riparian Reserves in order to reduce stream temperatures by increasing stream shading.
- **Geology - MODERATE**
 - Shasta-Trinity road 1S26 intersects a burned over talus slide that may need stabilization and so should be at least be monitored and reviewed for potential engineered fixes.
 - Area has widespread unstable areas, but most were not in high severity areas

Heritage - HIGH

- This focus area was identified as sensitive areas of concern by the Nor-Rel-Muk Wintu Nation and Hayfork Wintu. They would like post-fire work focused here, but in a manner conscientious to tribal and cultural resources.
- The highest concentration of known cultural resources in this focus area lie along the river corridor and on South Fork Mountain.
- Historic buildings and campgrounds would benefit from hazard tree removal.
- Work in campgrounds will be complicated due to the possible presence of archaeological sites.
- Forest Glen, Scott Flat, and Hell Gate Campgrounds are historic and must be recorded and managed as cultural resources.
- Historic campgrounds have significant “Klamath” stoves that require repair due to impacts caused by emergency hazard tree felling activities.

Focus Area 2: Red Mountain

While Focus Area #2 is located in the Upper South Fork Trinity River Key Watershed, this area has a lower stream density than most other areas in the watershed, contributing to the low complexity for implementation. Red Mountain contains large concentrations of high vegetation burn severity and decent road access.

Focus Area 2- Red Mountain data summary in acres

RAVG Burn Area Index Basal Area Mortality (4 Class)		Very Low	Low	Moderate	Severe	Total	Grand Total
Land Allocation (acres)	LSR	0	0	0	0	0	4880
	Matrix/AMA	527	982	694	2663	4866	
	Private	0	0	0	0	0	
	Other	9	3	0	0	12	
Roads (miles)	ML 3-5	1.0	2.4	0.9	3.9	8.2	28.3
	ML 2	1.3	2.7	2.4	4.8	11.2	
	ML 1	0.5	1.4	1.3	5.7	8.9	
WUI (acres)		135	186	103	435	859	
Infrastructure/ Developed Recreation (Each)	Campgrounds	0		0		0	
	Trailheads	0		0		0	
	Structures	1		2		3	
	Bridges	0		0		0	
Critical Habitat	NSO (area)	0	0	0	0	0	
	Salmonids (km)	0	0	0	0	0	
NSO	Activity Centers	1		1		2	
Active Landslides (acres)	Riparian reserves	0.5	0.7	0.3	3.8	5.3	26.5
	Inner Gorge (acres)	Riparian reserves	0.1	2.2	1.7	17.2	

Timber/Silviculture - MODERATE

- Moderate priority for roadside hazard removal however, high use roads include: NFSR 30N29 (Bramlet Rd), 29N32, 29N76 and 29N49.

- Potential area salvage opportunities: **700 acres**, all tractor-based logging systems
- Rough estimates indicate this area has **moderate** potential for economical restoration opportunities.
- Accessibility: very good due to proximity to state highway; note that road system also accesses Focus Area 3
- Reforestation recommended within areas salvaged plus burned plantations.
 - Existing plantations: approximately 250 acres
 - Plantations experiencing high severity: **210 acres** – recommend for reforestation

Fuels – HIGH

- High strategic value for fire management because it's a portion of an extensive prominent ridgeline (29N73 / Rattlesnake Ridge)
- 29 Rd (Bramlet) is key WUI and access/egress route
- Treatment here would be a key anchor point to tie into other treatment areas.
- Roads and strategic features could support future landscape-scale prescribed fire.
- Adjacent to the Dubakella Plantations project area and Pine Root TS, which would provide some continuity of treatment

Biological Sciences

- **Wildlife - LOW**
 - One NSO AC may be designated as abandoned during the ESA consultation process
 - Treatments proposed, if any, within viable Core Areas (RAVG 1-2) could have LOPs and treatment restrictions
 - Fuels treatments, salvage, and reforestation would be beneficial in habitat that was removed by fire (RAVG 3-4), where the likelihood of NSO occupancy is low
 - These treatments may still have LOPs if within disturbance buffers for NSO
 - Treating adjacent to suitable habitat may reduce the risk of loss in a future fire
- **Fisheries - LOW**
 - No major concerns as the area has minimal aquatic habitat

Physical Sciences

- **Hydrology - HIGH**
 - This area is in the Upper South Fork Trinity River Key Watershed. Key Watersheds are the highest priority for restoration.
 - This area is in the jurisdiction of the North Coast Region Water Quality Control Board.
 - The streams are sediment impaired. Legacy sediment sites are not yet identified and may require treatment.
 - The streams are temperature impaired. Treatment options should include replanting vegetation in the Riparian Reserves in order to reduce stream temperatures by increasing stream shading.
- **Geology - LOW**
 - No key issues as the area lacks widespread mapped landslides

Heritage - MODERATE

- Very little previous survey occurred in this focus area. As such, few cultural resources are known.
- The potential density of pre-contact cultural resources is lower than other focus areas due to sparse water sources. However, there is also scant previous survey to provide much data.

Focus Area 3: East Fork/Texas Spider

Focus Area #3 is mostly located in the Upper South Fork Trinity River Key Watershed, with the rest in the Beegum watershed. Wild and Scenic River (South Fork of the Trinity River) forms the southwest boundary of this area and is one of the many rivers contributing to critical habitat for Coho salmon. The extensive road network in this Focus Area creates a nexus for important ingress/egress routes into the southern portion of the Shasta-Trinity. As the collector roads were designed for prior forest management, this area is ideal for salvage opportunities, and one of the few areas where cable logging systems may be recommended to complement mechanical harvesting.

Focus Area 3 - East Fork/Texas Spider data summary in acres

RAVG Burn Area Index		Very Low	Low	Moderate	Severe	Total	Grand Total
Basal Area Mortality (4 Class)							
Land Allocation (acres)	LSR	742	525	270	251	1788	19912
	Matrix/AMA	5738	4643	2337	4797	17515	
	Private	2	0	1	0	3	
	Other	284	177	75	71	607	
Roads (miles)	ML 3-5	13.2	12.5	3.9	8.0	37.6	114.6
	ML 2	17.7	13.9	5.8	9.7	47.1	
	ML 1	8.2	7.1	3.8	10.8	29.9	
WUI (acres)		2360	1893	858	1278	6389	
Infrastructure/ Developed Recreation (Each)	Campgrounds	0		0		0	
	Trailheads	0		0		0	
	Structures	7		1		8	
	Bridges	1		0		1	
Critical Habitat	NSO (area)	4048	2493	1105	2030	9678	
	Salmonids (km)	7.01	0.12	0.07	0.35	7.55	
NSO	Activity Centers	9		1		10	
Active Landslides (acres)	Riparian reserves	197.8	83.9	25.8	39	346.5	1164
Inner Gorge (acres)	Riparian reserves	438.4	155.1	75.8	148.2	817.5	

Timber/Silviculture - HIGH

- High priority for roadside hazard removal due to the nexus of high use NFS roads in this focus area, serving as the only ingress and egress to many areas of the Forest: 29N30 (Wild-Mad), 28N35 (Rat Trap Gap), 28N10 (Stewart Gap), 28N64 (Round Mtn), 30N29 (Bramlet), and 29N28 (String Bean), all ML 3+
- Focus Area contains South Fork Trinity River and Pine Root Picnic Areas, Round Mountain Lookout, three USFS outbuildings (Pine Root), and gets high use for dispersed camping.

- High priority for area salvage and reforestation due to accessibility, high recreational use, past management practices and relatively recent NEPA (East Fork II) that may reduce survey workload.
- Potential area salvage opportunities: **1800 acres**, 75% tractor-based logging systems
- Rough estimates indicate this area has **high** potential for economical restoration opportunities.
- Accessibility: very good due to the number of maintenance level 3 and 4 roads that intersect in this focus area as well as recent harvests that have improved the road system. Road system is in place for cable salvage opportunities. Note road system also accesses Focus Area 4.
- Reforestation recommended within areas salvaged plus burned plantations.
 - Existing plantations: approximately 2400 acres
 - Plantations experiencing high severity: **1000 acres** – recommend for reforestation

Fuels - HIGH

- High strategic value for fire management; 35 Rd is best feature for keeping fires out of east/west aligned drainages leading toward Central Valley
- Multiple important WUI corridors and access/egress routes
- Roads and strategic features will support future landscape-scale prescribed fire.

Biological Sciences

- **Wildlife - MODERATE**
 - One NSO AC may be designated as abandoned during the ESA consultation process
 - Treatments proposed, if any, within viable Core Areas (RAVG 1-2) could have LOPs and treatment restrictions
 - Fuels treatments, salvage, and reforestation would be beneficial in habitat that was removed by fire (RAVG 3-4), where the likelihood of NSO occupancy is low
 - These treatments may still have LOPs if within disturbance buffers for NSO
 - Treating adjacent to suitable habitat may reduce the risk of loss in a future fire
- **Fisheries - MODERATE**
 - Upper South Fork Trinity watershed is an area of special concern for fisheries, and has potential to introduce large sediment loads to critical habitat if left untreated

Physical Sciences

- **Hydrology - HIGH**
 - Part of this area (East Fork South Fork Trinity River) is in the Upper South Fork Trinity River Key Watershed. Key Watersheds are the highest priority for restoration.
 - East Fork South Fork Trinity River is in the jurisdiction of the North Coast Region Water Quality Control Board.
 - The streams are sediment impaired. Legacy sediment sites are not yet identified and may require treatment
 - The streams are temperature impaired. Treatment options should include replanting vegetation in the Riparian Reserves in order to reduce stream temperatures by increasing stream shading.

- Part of this area (Beegum) is in the jurisdiction of the Central Valley Region Water Quality Control Board.
 - Erosion sites will be required to be identified and treated.
 - The streams are not water quality impaired.
 - Beegum has been identified as a priority watershed for Restoration.
 - A Watershed Restoration Action Plan is available. NEPA has not yet been completed.
- **Geology - LOW**
 - No key issues as most landslide areas burned in low severity.

Heritage - MODERATE

- This focus area is rich with cultural resources, known and unknown. The local environment is ideal for pre-contact archaeological sites.
- The historic Pine Root Guard Station would greatly benefit from hazard tree removal for resource protection. Significant effort was made during the incident to protect its buildings from burning.

Focus Area 4: Trough Ridge/Buck Ridge

Focus Area #4 is located in the Upper South Fork of the Trinity River Key Watershed and incorporates the South Fork of the Trinity Wild and Scenic River through the middle of the Focus Area. In addition, the Shell Mountain Creek sub-watershed is recommended as a restoration priority. Impacted by the Trough Fire (2008), this portion of the watershed burned at high severity during the August Complex, due in part to the excessive untreated fuel loading. Focus area includes has a rich cultural history around the river corridor and Historic Humboldt Trail, however much of the area has severe topography, resulting in challenging opportunities for salvaging and other restoration activities.

Focus Area 4 - Trough Ridge/Buck Ridge data summary in acres

RAVG Burn Area Index		Very Low	Low	Moderate	Severe	Total	Grand Total
Basal Area Mortality (4 Class)							
Land Allocation (acres)	LSR	1338	988	1054	3691	7071	15602
	Matrix/AMA	983	1060	1230	5010	8283	
	Private	14	35	31	59	139	
	Other	28	34	24	21	109	
Roads (miles)	ML 3-5	0.3	1.3	1.9	8.9	12.4	64.1
	ML 2	6.3	5.3	4.0	12.4	28.0	
	ML 1	5.0	2.2	2.9	13.6	23.7	
WUI (acres)		60	172	273	1214	1720	
Infrastructure/ Developed Recreation (Each)	Campgrounds	0		0		0	
	Trailheads	0		0		0	
	Structures	1		0		1	
	Bridges	0		0		0	
Critical Habitat	NSO (area)	1404	1033	1073	4287	7799	
	Salmonids (km)	7.13	0.94	0.18	0.15	8.4	
NSO	Activity Centers	6		5		11	

Active Landslides (acres)	Riparian reserves	14.6	19.3	21.1	86.8	141.8	1302.5
Inner Gorge (acres)	Riparian reserves	160.8	203.2	204	592.7	1160.7	

Timber/Silviculture - LOW

- Moderate priority for roadside hazard removal due to the distance from state highways, however high-use roads which are critical for access include: 29N30 (Wild-Mad), 28N10 (Stewart Gap), and 27N02 (Jones Ridge)
- While haul is farther than other focus areas on the Shasta-Trinity, much of this focus area was impacted by the Trough Fire in 2008 (~200 acres of salvage harvest, 2009) resulting in already excessive existing fuels.
- Moderate priority for area salvage and reforestation due to high value for NSO and Coho (critical habitat) and LSR objectives in addition to past management.
- Potential area salvage opportunities: **2500 acres**, 20% tractor-based logging systems
- Rough estimates indicate this area has **high** potential for economical restoration opportunities.
- Accessibility: sufficient for area salvage opportunities, however haul is longer than other areas. The high cable to tractor ratio is the primary driver in the ultimate low priority determination as that is a major contributor to likelihood of success.
- Reforestation recommended within areas salvaged plus burned plantations.
 - Existing plantations: approximately 2300 acres
 - Plantations experiencing high severity: **1800 acres** – recommend for reforestation

Fuels - MODERATE

- Contains several key strategic features (Buck Ridge, SF Trinity River, Horsehead Ridge)
- Proximity to private property, including industrial timber lands
- Adjacent to wilderness
- Contains a portion of the 30 Rd WUI corridor

Biological Sciences

- **Wildlife - HIGH**
 - Some NSO ACs may be designated as abandoned during the ESA consultation process
 - Treatments proposed, if any, within viable Core Areas (RAVG 1-2) could have LOPs and treatment restrictions
 - Fuels treatments, salvage, and reforestation would be beneficial in habitat that was removed by fire (RAVG 3-4), where the likelihood of NSO occupancy is low
 - These treatments may still have LOPs if within disturbance buffers for NSO
 - Treating adjacent to suitable habitat may reduce the risk of loss in a future fire
- **Fisheries - HIGH**
 - Upper South Fork Trinity watershed is an area of special concern for fisheries, and has potential to introduce large sediment loads to critical habitat if left untreated

Physical Sciences

- **Hydrology - HIGH**

- This area is in the Upper South Fork Trinity River Key Watershed. Key Watersheds are the highest priority for restoration.
- This area is in the Shell Mountain Creek sub-watershed. The Watershed Condition Framework states that it is the responsibility of the Forest Supervisor to identify priority watersheds for restoration. It is recommended that this sub-watershed be selected as a priority watershed for restoration. A draft Watershed Restoration Action Plan is available.
- This area is in the jurisdiction of the North Coast Region Water Quality Control Board.
 - The streams are sediment impaired. All legacy sediment sites are already identified and may require treatment. Some NEPA has already been completed. Some funding has been attained, but not enough to design all the stream crossings for a 100-year flood.
 - The streams are temperature impaired. Treatment options should include replanting vegetation in the Riparian Reserves in order to reduce stream temperatures by increasing stream shading. Beaver dam analogs should also be considered.

- **Geology - MODERATE**

- Widespread unstable areas burned in Moderate and Severe classes
- Reforestation of stable slopes is recommended for long term stability, CWD, and LWD.
- Glades should be maintained or improved by removing encroaching surviving firs. Do not plant conifers in glades. Avoid use of heavy machinery on glades as they tend to be dormant or active earthflow-type landslides.

Heritage - MODERATE

- The river corridor, in addition to localized water sources have a high probability for cultural resources. Access to these areas is difficult due to steep terrain.
- The historic Humboldt Trail crosses the focus area and would benefit from improved recordation, route clearing, and project associated resource protection.

Focus Area 5: Tomhead

Focus Area #5 is located in the far southeastern corner of the Shasta-Trinity National Forest’s portion of the August Complex. While not a complex area for resource concerns, restoration opportunities are limited due to topography and less commercial forest structure. Area includes campgrounds and trailheads in addition to the actively staffed Tomhead Lookout and is a fuels priority due to adjacency to both Wilderness and WUI.

Focus Area 5 - Tomhead data summary in acres

RAVG Burn Area Index		Very Low	Low	Moderate	Severe	Total	Grand Total
Basal Area Mortality (4 Class)							
Land Allocation (acres)	LSR	0	0	0	0	0	3085
	Matrix/AMA	752	874	533	783	2942	
	Private	5	3	4	2	14	
	Other	10	21	16	82	129	

Roads (miles)	ML 3-5	0.4	0.7	0.3	0.2	1.6	18.1
	ML 2	3.2	5.7	2.3	2.9	14.1	
	ML 1	0.6	0.9	0.4	0.5	2.4	
WUI (acres)		747	847	511	749	2855	
Infrastructure/ Developed Recreation (Each)	Campgrounds	0		5		5	
	Trailheads	0		0		0	
	Structures	1		0		1	
	Bridges	0		0		0	
Critical Habitat	NSO (area)	636	544	310	534	2026	
	Salmonids (km)	0	0	0	0	0	
NSO	Activity Centers	1		0		1	
Active Landslides (acres)	Riparian reserves	2.7	9.2	6.5	5.4	23.8	204.8
Inner Gorge (acres)	Riparian reserves	101.7	49.7	18.5	11.1	181	

Timber/Silviculture - MODERATE

- High priority for roadside hazard removal due to proximity to residential use and access to the active Tomhead Lookout. High use roads include: 28N35 (Rat Trap Gap), 27N06 (Tomhead Mtn) as well as critical access to Lookout (27N06D).
- Focus area is split by private land in the middle, which experienced high severity, resulting in high levels of hazards near several structures, especially on the east side of the private/Focus Area).
- Tomhead Saddle and Corral, Tomhead Lookout and a TH into the Wilderness were impacted and will need hazards removed.
- Moderate priority for area salvage and reforestation due to high recreational use, high value for NSO and Coho (critical habitat) and LSR objectives.
- Potential area salvage opportunities: **200 acres**, 80% tractor-based logging systems
- Rough estimates indicate this area has potential for economical restoration opportunities.
- Accessibility: very good due to proximity to state highway
- Reforestation recommended within areas salvaged plus burned plantations.
 - Existing plantations: approximately 320 acres,
 - Plantations experiencing high severity: **150 acres** - recommend for reforestation

Fuels – HIGH

- WUI and private property with numerous seasonal cabins
- Strategic value on the edge of wilderness and jurisdictional boundary
- Tomhead Lookout and recreational infrastructure
- The 28N35 is strategically valuable.

Biological Sciences

- **Wildlife - LOW**
 - Treatments proposed, if any, within viable Core Areas (RAVG 1-2) could have LOPs and treatment restrictions
 - Fuels treatments, salvage, and reforestation would be beneficial in habitat that was removed by fire (RAVG 3-4), where the likelihood of NSO occupancy is low

- These treatments may still have LOPs if within disturbance buffers for NSO
- Treating adjacent to suitable habitat may reduce the risk of loss in a future fire
- **Fisheries - LOW**
 - No major concerns as the area has very little aquatic habitat

Physical Sciences

- **Hydrology - LOW**
 - This area is not in a Key Watershed.
 - This area is in the jurisdiction of the Central Valley Region Water Quality Control Board.
 - This area is not water quality impaired.
 - Erosion sites will need to be identified.
- **Geology - LOW**
 - No issues as area has few mapped landslides and inner gorges.

Heritage - LOW

- This focus area has only general heritage concerns.

Focus Area 6: Anthony Peak

This Focus Area includes the headwaters of Grindstone Creek and has an abundance of mapped northern spotted owl activity centers. Roadside treatments are a high priority due to the extensive WUI and recreation infrastructure incorporated within the Focus Area.

Focus Area 6 - Anthony Peak data summary in acres

RAVG Burn Area Index		Very Low	Low	Moderate	Severe	Total	Grand Total
Basal Area Mortality (4 Class)							
Land Allocation (acres)	LSR	4210	5790	3304	6710	20014	22006
	Matrix/AMA	271	170	94	153	688	
	Private	515	556	120	71	1262	
	Other	21	14	4	3	42	
Roads (miles)	ML 3-5	1.5	7.2	3.3	5.5	17.5	103.9
	ML 2	11.4	19.4	9.0	20.9	60.7	
	ML 1	3.6	9.2	3.3	9.6	25.7	
WUI (acres)		3448	5103	3123	6622	18295	
Infrastructure/ Developed Recreation (Each)	Campgrounds	2		0		2	
	Trailheads	0		0		0	
	Structures	79		86		165	
	Bridges	0		0		0	
Critical Habitat	NSO (area)	4510	6022	3247	6908	20689	
	Salmonids (km)	0	0	0	0	0	
NSO	Activity Centers	20		0		20	

Active Landslides (acres)	Riparian reserves	64.7	49.4	11.1	10.2	135.4	961.1
Inner Gorge (acres)	Riparian reserves	307.4	288.4	107.2	122.7	825.7	

Timber/Silviculture - MODERATE

- Moderate priority for area treatments, with high priority for roadside hazard removal due to the following high use roads: M2 and M4, 22N11, as well as access roads to Anthony Peak Lookout and recreation sites (Sugar Spring, Wells Cabin, Brower Oak Campgrounds and Grindstone TH)
- Potential area salvage opportunities: **500** acres, all tractor-based logging systems
- Rough estimates indicate this area has **moderate** potential for economical restoration opportunities.
- Reforestation
 - Existing plantations: 2100 acres
 - Plantations experiencing high severity: **1100 acres** – recommended for reforestation

Fuels – HIGH

- Extensive WUI
- Proximity to industrial timber land
- Strategic features and travel corridors (M1, M2, M4)
- Anthony Peak Lookout and recreational infrastructure (campgrounds and trailheads)
- Areas of future high fuels/fire hazard

Biological Sciences

- **Wildlife - HIGH**
 - This Focus Area may have a high level of effort for ESA consultation due to the presence 20 viable NSO Core Area.
 - Focus area is within critical habitat subunit ICC3 which is completely consumed in the fire footprint. Replanting in those high burn areas is recommended
 - Treatments proposed, if any, within viable Core Areas (RAVG 1-2) could have LOPs and treatment restrictions
 - Fuels treatments, salvage, and reforestation would be beneficial in habitat that was removed by fire (RAVG 3-4), where the likelihood of NSO occupancy is low
 - These treatments may still have LOPs if within disturbance buffers for NSO
 - Treating adjacent to suitable habitat may reduce the risk of loss in a future fire
- **Fisheries - LOW**
 - No major concerns as this area has very little aquatic habitat

Physical Sciences

- **Hydrology - MODERATE**
 - This area is not in a Key Watershed.
 - This area is in the jurisdiction of the Central Valley Region Water Quality Control Board.

- It is not water quality impaired.
 - Erosion sites will need to be identified.
 - Part of this area (Headwaters Grindstone Creek) has been identified as a priority watershed for restoration. A Watershed Restoration Action Plan is available.
- **Geology - MODERATE**
 - Headwaters Grindstone burned Moderate to Severe and its instabilities are not well mapped. The expectation is there would be far more landslides than mapped.
 - Reforestation of stable slopes is recommended to help restore long-term stability

Heritage - MODERATE

- Heritage resources around Government Camp and Wells Cabin Campgrounds were subjected to high heat (RAVG Class 4) and are now subject to illegal artifact collection. These resources need to be remapped so they can be better protected.
- The Nome Cult Trail (M4/FH-7) crosses through the focus area.
 - This trail follows the historic route utilized to forcibly move Native tribes from Chico to Covelo in 1863 and is walked annually by local tribes.
 - The route should be preserved, and the interpretive sign replaced at Government Camp.

The National Register-eligible Anthony Peak Lookout survived the fire but may need some restoration work to preserve its integrity as a historic lookout.

Focus Area 7: Summit Springs

Focus Area #7 is located near the community of Elk Creek, contributing to its priority status for hazard removal and restoration treatments. Much of this area burned at high severity and includes substantial WUI, plus access to private inholdings, Valley View Conservation Camp and multiple NFS recreational facilities.

Focus Area 7 - Summit Springs data summary in acres

RAVG Burn Area Index		Very Low	Low	Moderate	Severe	Total	Grand Total	
Basal Area Mortality (4 Class)								
Land Allocation (acres)	LSR	199	119	124	93	535	36937	
	Matrix/AMA	3316	5292	4357	18199	31164		
	Private	239	272	277	662	1240		
	Other	639	937	706	1506	3788		
Roads (miles)	ML 3-5	6.4	8.8	3.2	5.5	23.9	164.8	
	ML 2	9.8	14.2	10.1	37.1	71.2		
	ML 1	14.5	17.5	8.3	29.4	69.7		
WUI (acres)		4354	6554	5433	20417	36578		
Infrastructure/ Developed Recreation (Each)	Campgrounds	0		0		0		
	Trailheads	0		0		0		
	Structures	49		4		53		
	Bridges	0		0		0		
Critical Habitat	NSO (acres)	1051	1274	608	1059	3993		
	Salmonids (km)	0	0	0	0	0		
NSO	Activity Centers	9		0		9		
Active Landslides (acres)	Riparian reserves	105.8	233.8	207.2	464.1	1010.9		2007.4

Inner Gorge (acres)	Riparian reserves	198.5	260.4	215.8	321.8	996.5	
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Timber/Silviculture – HIGH

- Moderate priority for area treatments, with high priority for roadside hazard removal including the following high use roads: County Road 309, M3, M6, 21N01, 20N89, as well as NFS roads providing access to private land inholdings, Valley View Conservation Camp, Rattlesnake Firefighter Memorial, Alder Springs CG, and Rattlesnake TH and Overlook.
- There are several areas of proposed fuels and commercial treatment under the Salt EA analysis that have completed survey work that would contribute towards future restoration efforts in this area
- Potential area salvage opportunities: **400** acres, all tractor-based logging systems
- Rough estimates indicate this area has **moderate** potential for economical restoration opportunities.
- Reforestation
 - Existing plantations: 1050 acres
 - Plantations experiencing high severity: **450 acres** – recommended for reforestation

Fuels – HIGH

- Extensive WUI and some private property
- USFS infrastructure and Valley View Conservation Camp
- Multiple strategic linear features, including travel corridors
- Adjacent to jurisdictional boundary
- Areas of future high fuels/fire hazard

Biological Sciences

- **Wildlife - MODERATE**
 - Treatments proposed, if any, within viable Core Areas (RAVG 1-2) could have LOPs and treatment restrictions
 - Fuels treatments, salvage, and reforestation would be beneficial in habitat that was removed by fire (RAVG 3-4), where the likelihood of NSO occupancy is low
 - These treatments may still have LOPs if within disturbance buffers for NSO
 - Treating adjacent to suitable habitat may reduce the risk of loss in a future fire
- **Fisheries - LOW**
 - Reforestation will protect downstream aquatic habitats from increased sedimentation

Physical Sciences

- **Hydrology - LOW**
 - This area is not in a Key Watershed.
 - This area is in the jurisdiction of the Central Valley Region Water Quality Control Board.
 - It is not water quality impaired.
 - Erosion sites will need to be identified.

- **Geology - HIGH**

- Some drainages empty into Elk Creek which goes through the community of Elk Creek
- Includes widespread unstable areas that burned at Moderate and Severe
- Recommend reforestation of stable ground for long-term slope stability, long-term development of CWD and LWD to help slow future debris flows and reduce any related sediment.
- Glades should be maintained or improved by removing encroaching surviving firs. Do not plant conifers in glades. Avoid use of heavy machinery on glades as they tend to be dormant or active earthflow-type landslides.

Heritage - MODERATE

- Rattlesnake and Sanhedrin ridges burned moderate to severe likely exposing more heritage resources.
 - Recorded sites should be remapped before vegetation grows back.
 - 2018 and 2019 surveys for the Salt Vegetation project should be documented and reassessed in light of the changed conditions.

Focus Area 8: Smokey/Hardin

Focus Area #8 is located in the Middle Fork Eel Key Watershed and contains multiple active landslide/unstable areas that burned at moderate to high severity. This area serves as an important intersection of several strategic ridgelines in the Black Butte / Snow Basin vicinity, and has a high recreation value, including several campgrounds and substantial WUI. In addition to roadside hazard reduction, this area has less severe topography, and a history of recent management contributing to a higher likelihood of success for area salvage and other restoration opportunities.

Focus Area 8 - Smokey/Hardin data summary in acres

RAVG Burn Area Index		Very Low	Low	Moderate	Severe	Total	Grand Total
Basal Area Mortality (4 Class)							
Land Allocation (acres)	LSR	4286	2288	1138	3063	10775	27771
	Matrix/AMA	893	1714	2337	8303	13247	
	Private	267	436	449	1274	2426	
	Other	157	291	276	599	1323	
Roads (miles)	ML 3-5	5.8	4.2	2.2	5.9	18.1	118.8
	ML 2	18.4	14.9	12.3	40.1	85.7	
	ML 1	3.1	2.0	2.1	7.8	15.0	
WUI (acres)		961	1552	1880	5707	10101	
Infrastructure/ Developed Recreation (Each)	Campgrounds	2		1		3	
	Trailheads	1		0		1	
	Structures	60		76		136	
	Bridges	0		0		0	
Critical Habitat	NSO (area)	4345	2460	1623	5953	14382	
	Salmonids (km)	0.1	0	0	0	0.1	

NSO	Activity Centers	9		3		12	
Active Landslides (acres)	Riparian reserves	305.3	247.9	259.8	632.3	1445.3	1996.4
Inner Gorge (acres)	Riparian reserves	191.8	166.2	79.2	113.9	551.1	

Timber/Silviculture - HIGH

- High priority for area treatments, with high priority for roadside hazard removal on high use roads such as FH7, M4, 22N11 and 22N21 as well as other NFS roads providing access to Atchison, Telephone Camp, Masterson, and Plaskett Meadows Campgrounds.
- There are several areas of past fuels and commercial treatment under Hardin and Smokey Project analysis areas that have completed survey work that would contribute towards future restoration efforts in this area.
- Much of the area is inaccessible at this time due to weather (little field verification)
- Potential area salvage opportunities: **1,000** acres, all tractor-based logging systems
- Rough estimates indicate this area has **moderate** potential for economical restoration opportunities.
- Reforestation
 - Existing plantations: 1300 acres
 - Plantations experiencing high severity: **800 acres** – recommended for reforestation

Fuels – HIGH

- WUI and private property
- Multiple campgrounds
- Important intersection of several strategic ridgelines (Plaskett, Harvey Spring, 22N27, Hardin, FH7) in the Black Butte / Snow Basin vicinity
- Many opportunities for treatment areas between strategic ridgelines and roads
- Roads along strategic ridges

Biological Sciences

- **Wildlife - MODERATE**
 - Some NSO ACs may be designated as abandoned during the ESA consultation process
 - Treatments proposed, if any, within viable Core Areas (RAVG 1-2) could have LOPs and treatment restrictions
 - Fuels treatments, salvage, and reforestation would be beneficial in habitat that was removed by fire (RAVG 3-4), where the likelihood of NSO occupancy is low
 - These treatments may still have LOPs if within disturbance buffers for NSO
 - Treating adjacent to suitable habitat may reduce the risk of loss in a future fire
- **Fisheries - HIGH**
 - Area of Special Concern for fisheries
 - Located in Black Butte watershed with 47 km of critical habitat for Steelhead trout

Physical Sciences

- **Hydrology - HIGH**
 - Part of this area is in the Middle Fork Eel Key Watershed. Key Watersheds are highest priority for restoration.
 - It is in the jurisdiction of the North Coast Region Water Quality Control Board.
 - The streams are sediment impaired. Legacy sediment sites may require treatment.
 - The streams are temperature impaired. Treatment options should include replanting vegetation in the Riparian Reserves in order to reduce stream temperatures by increasing stream shading.
 - The area outside the Key Watershed is in the jurisdiction of the Central Valley Region Water Quality Control Board.
 - Erosion sites will need to be identified.
 - The streams are not water quality impaired.
 - Part of this area (Headwaters Grindstone Creek) has been identified as a priority watershed for restoration.
 - It is in the jurisdiction of the Central Valley Region Water Quality Control Board.
 - A Watershed Restoration Action Plan is available.
- **Geology - HIGH**
 - Includes widespread active landslides that burned at Moderate and Severe
 - Key recreation area where reforestation would help slope stability, increase long-term CWD and LWD, and improve the recreation experience of the impressive geologic area at Black Butte
 - Glades should be maintained or improved by removing encroaching surviving firs. Do not plant conifers in glades. Avoid use of heavy machinery on glades as they tend to be dormant or active earthflow-type landslides.

Heritage - HIGH

- Reassess National Register eligibility of Keller Place in light of the cabin burning down.
 - Thin hazard trees so heritage can safely map and reassess site significance and integrity
 - Re-record site and submit to SHPO for NRHP eligibility assessment.
- Develop and install heritage interpretive signs at Plaskett Meadows Campground and recreational area as mitigation for fire suppression damage to heritage sites.

Focus Area 9: Yuki/Black Butte

Focus Area #9 is located east of the Yuki Wilderness and west of the Black Butte Wild and Scenic River in the Middle Fork of the Eel River Key Watershed. Widespread large landslides burned at moderate to severe intensity further contributing to slope instability. Along with strategic ridgelines, this area includes Grizzly Flat Campground and substantial high severity. However, the road system may be challenging for haul. This area has a rich history of cultural use, especially within the Black Butte WSR corridor.

Focus Area 9 - Yuki/Black Butte data summary in acres

RAVG Burn Area Index Basal Area Mortality (4 Class)		Very Low	Low	Moderate	Severe	Total	Grand Total
Land Allocation (acres)	LSR	365	271	667	8842	10145	11035
	Matrix/AMA	16	18	9	21	64	
	Private	6	25	56	418	505	
	Other	7	13	24	277	321	
Roads (miles)	ML 3-5	0.5	0.3	0.1	0.1	1.0	42.2
	ML 2	1.6	1.3	1.4	29.7	34.0	
	ML 1	0.1	0.2	0.3	6.6	7.2	
WUI (acres)		12	21	25	389	446	
Infrastructure/ Developed Recreation (Each)	Campgrounds	0		0		0	
	Trailheads	0		0		0	
	Structures	5		4		9	
	Bridges	0		0		0	
Critical Habitat	NSO (area)	352	198	520	8269	9340	
	Salmonids (km)	1.11	0.04	0	0	1.15	
NSO	Activity Centers	3		3		6	
Active Landslides (acres)	Riparian reserves	13.4	12.1	33.8	175.8	235.1	834.8
Inner Gorge (acres)	Riparian reserves	17.4	26.5	71.4	484.4	599.7	

Timber/Silviculture – MODERATE

- Moderate priority for area treatments, with high priority for roadside hazard removal on high use roads such as M1 and 22N11 (Black Butte) as well as other NFS roads providing access to private land inholdings and Grizzley Flat CG.
- Transportation on M1 could be costly, road is slated for BAER improvements
- Good area for salvage and restoration but past projects have been challenged due to LSR and haul route concerns.
- Project design can be challenging in this area due to private land inholdings, inconsistent stands, and topography
- Potential area salvage opportunities: **1,000** acres, all tractor-based logging systems
- Rough estimates indicate this area has **high** potential for economical restoration opportunities.
- Reforestation
 - Existing plantations: 625 acres
 - Plantations experiencing high severity: **600 acres** – recommended for reforestation

Fuels – MODERATE

- Adjacent to wilderness (to SW) and WUI (to NW)
- Private property
- Contains strategic ridgelines (Doan and Discovery Trail)

Biological Sciences

- **Wildlife - HIGH**

- Some NSO ACs may be designated as abandoned during the ESA consultation process
- Treatments proposed, if any, within viable Core Areas (RAVG 1-2) could have LOPs and treatment restrictions
- Fuels treatments, salvage, and reforestation would be beneficial in habitat that was removed by fire (RAVG 3-4), where the likelihood of NSO occupancy is low
 - These treatments may still have LOPs if within disturbance buffers for NSO
 - Treating adjacent to suitable habitat may reduce the risk of loss in a future fire
-
- **Fisheries - HIGH**
 - Area of Special Concern for fisheries
 - Located in Black Butte watershed which provides 47 km of critical habitat for Steelhead trout

Physical Sciences

- **Hydrology - HIGH**
 - This area is in the Middle Fork Eel Key Watershed. Key Watersheds are the highest priority for restoration.
 - This area is in the jurisdiction of the North Coast Region Water Quality Control Board.
 - The streams are sediment impaired. Legacy sediment sites may require treatment.
 - The streams are temperature impaired. Treatment options should include replanting vegetation in the Riparian Reserves in order to reduce stream temperatures by increasing stream shading.
- **Geology - HIGH**
 - Widespread large active landslides burned at Moderate and Severe
 - Wild and Scenic designation for the Black Butte River, for its anadromy and partly for geologic values
 - Reforestation of stable slopes is recommended for long-term stability, CWD, and LWD and possibly prevent type-conversion to shrubs
 - Glades should be maintained or improved by removing encroaching surviving firs. Do not plant conifers in glades. Avoid use of heavy machinery on glades as they tend to be dormant or active earthflow-type landslides.

Heritage - HIGH

- Road M1 on Etsel Ridge passes through a high density of important heritage resources and ground disturbance should be limited.
- An important heritage site at Post Camp burned very hot and public access should be restricted until vegetation grows back.
 - Heritage should re-record site in light of increased visibility.
 - Temporary closure of the access road into the site would be beneficial until the vegetation cover can get re-established.
- The Black Butte River lies directly adjacent to the focus area to the east which is a Wild and Scenic River (WSR) corridor rich with important heritage resources.

- Treatments to help stabilize the slopes on the rivers southwest side would help protect important Yuki village sites on lower terraces of the river.
- It would be recommended that the entire WSR corridor be surveyed while visibility is good after the fire.
- Sites in this WSR corridor would be a great candidate for designation as a National Register District.
- Opportunities to work with local tribes to develop interpretive displays to help educate the public about the importance and sensitive nature of cultural resources.

Focus Area 10: Bald Mountain

Focus Area #10 is located in the Middle Fork of the Eel River Key Watershed, approximately half in the Berryessa National Monument. This area has a high value for fisheries due to the extensive steelhead trout critical habitat located within the vicinity. While adjacent to the Yuki Wilderness at the strategic Horse Ridge ridgeline, substantial private inholdings contribute to the WUI designation. Project planning had begun for Cherry Hill prior to the fire, resulting in some preliminary survey information.

Focus Area 10 - Bald Mountain data summary in acres

RAVG Burn Area Index		Very Low	Low	Moderate	Severe	Total	Grand Total
Basal Area Mortality (4 Class)							
Land Allocation (acres)	LSR	3195	3635	2264	4217	13311	25957
	Matrix/AMA	2111	2919	1723	3563	10316	
	Private	148	163	70	72	453	
	Other	666	495	263	453	1877	
Roads (miles)	ML 3-5	2.6	6.2	1.7	1.4	11.9	115.7
	ML 2	19.2	27.9	12.4	19.8	79.3	
	ML 1	6.0	8.3	3.4	6.8	24.5	
WUI (acres)		4107	4151	2316	4752	15325	
Infrastructure/ Developed Recreation (Each)	Campgrounds	0		0		0	
	Trailheads	0		0		0	
	Structures	40		60		100	
	Bridges	0		0		0	
Critical Habitat	NSO (area)	1785	2744	1824	3480	9835	
	Salmonids (km)	0	0	0	0	0	
NSO	Activity Centers	12		1		13	
Active Landslides (acres)	Riparian reserves	289.9	219.3	93.4	172.4	775	2319.7
Inner Gorge (acres)	Riparian reserves	620.3	386.6	181.9	355.9	1544.7	

Timber/Silviculture – HIGH

- Moderate priority for area treatments, especially outside of and adjacent to National Recreation Area, however much of what burned hot is not commercial or feasible for implementation.
- High priority for roadside hazard removal on high use roads such as M1, M6 and M61, as well as other NFS roads providing access to private land inholdings and recreational opportunities

- The Cherry Hill project area had been established prior to the fire
- Some survey work had been completed and available for future restoration planning efforts
 - Prior to the fire, unstable areas and Riparian Reserves have been surveyed and mapped by Forest Geologist
- Potential area salvage opportunities: **300** acres, all tractor-based logging systems
- Rough estimates indicate this area has potential for economical restoration opportunities.
- Reforestation
 - Existing plantations: 3800 acres
 - Plantations experiencing high severity: **2100 acres** – recommended for reforestation

Fuels – HIGH

- Area had previously been identified by the forest as a high priority for treatment
- Extensive WUI and some private property
- Adjacent to wilderness
- Bounded by highly strategic features (Horse Ridge, M1, M6) and bisected by M61

Biological Sciences

- **Wildlife - LOW**
 - One NSO AC may be designated as abandoned during the ESA consultation process
 - Treatments proposed, if any, within viable Core Areas (RAVG 1-2) could have LOPs and treatment restrictions
 - Fuels treatments, salvage, and reforestation would be beneficial in habitat that was removed by fire (RAVG 3-4), where the likelihood of NSO occupancy is low
 - These treatments may still have LOPs if within disturbance buffers for NSO
 - Treating adjacent to suitable habitat may reduce the risk of loss in a future fire
- **Fisheries - HIGH**
 - Area of Special Concern for fisheries
 - Located in Black Butte watershed with 47 km of critical habitat for Steelhead trout

Physical Sciences

- **Hydrology - HIGH**
 - Part of this area is in the Middle Fork Eel Key Watershed. Key Watersheds are highest priority for restoration.
 - This area is in the jurisdiction of the North Coast Region Water Quality Control Board.
 - The streams are sediment impaired. Legacy sediment sites may require treatment.
 - The streams are temperature impaired. Treatment options should include replanting vegetation in the Riparian Reserves in order to reduce stream temperatures by increasing stream shading.
- **Geology - LOW**
 - Most landslides burned at Very Low and Low severities, but reforestation of stable slopes in Severe areas could improve long-term slope stability, CWD, and LWD.

- Glades should be maintained or improved by removing encroaching surviving firs. Do not plant conifers in glades. Avoid use of heavy machinery on glades as they tend to be dormant or active earthflow-type landslides.

Heritage - MODERATE

- The access road/trail (20N14) to Long Doe Ridge accesses important heritage resources important to local tribes and should be closed to vehicular access.
 - Would be a good opportunity to put in a locked gate but provide for limited vehicular tribal access for important traditional uses.
- There is a high density of heritage resources in the vicinity of Spruce Grove and ground disturbing activities should be limited.
- The Cherry Hill area burned moderately to hot and is likely to have numerous heritage resources.
 - The Cherry Hill area and south to the Eel River have no systematic archaeological survey and should be inventoried.

Focus Area 11: Brushy Mtn

Focus Area #11 is located in the Middle Fork of the Eel Key Watershed and has high value for fisheries as there is extensive critical habitat for steelhead trout in the vicinity. Several strategic ridgelines and recreational sites are within the Focal Area. In addition, past fires including Hunter Fire, Kingsley Complex (2006), and Spanish Fire (2003) impacted August Fire impacts and existing opportunities.

Focus Area 11 - Brushy Mountain data summary in acres

RAVG Burn Area Index Basal Area Mortality (4 Class)		Very Low	Low	Moderate	Severe	Total	Grand Total
Land Allocation (acres)	LSR	135	55	79	189	458	18947
	Matrix/AMA	1990	3198	3003	7832	16023	
	Private	137	99	47	152	436	
	Other	408	495	434	693	2030	
Roads (miles)	ML 3-5	0	0	0	0	0	119.6
	ML 2	8.3	15.6	11.8	22.2	57.9	
	ML 1	5.8	12.0	11.7	32.2	61.7	
WUI (acres)		0	0	0	0	0	724.5
Infrastructure/ Developed Recreation (Each)	Campgrounds	0		0		0	
	Trailheads	0		0		0	
	Structures	7		6		13	
	Bridges	0		0		0	
Critical Habitat	NSO (area)	571	656	715	2080	4023	
	Salmonids (km)	0	0	0	0	0	
NSO	Activity Centers	11		0		11	
Active Landslides (acres) Inner Gorge (acres)	Riparian reserves	18.4	28.9	22.7	18.1	88.1	
	Riparian reserves	163.4	158.2	111.8	203	636.4	

Timber/Silviculture – LOW

- Low priority for area treatments, with high priority for roadside hazard removal on high use roads such as County Road 312, FH7, and other NFS roads providing access to private land inholdings and dispersed recreation sites.
- High recreational use for hunting and disperse camp sites
- Several past fires have burned through this area: Hunter Fire, Kingsley Complex 2006, and Spanish Fire 2003.
- Opportunities for small salvage sales
- Potential area salvage opportunities: **600** acres, all tractor-based logging systems
- Rough estimates indicate this area has **moderate** potential for economical restoration opportunities.
- Reforestation
 - Existing plantations: 1400 acres
 - Plantations experiencing high severity: **900 acres** – recommended for reforestation

Fuels - MODERATE

- Private property; 1 FS campground
- Several strategic features, including ridges overlaid with roads

Biological Sciences

- **Wildlife - LOW**
 - Treatments proposed, if any, within viable Core Areas (RAVG 1-2) could have LOPs and treatment restrictions
 - Fuels treatments, salvage, and reforestation would be beneficial in habitat that was removed by fire (RAVG 3-4), where the likelihood of NSO occupancy is low
 - These treatments may still have LOPs if within disturbance buffers for NSO
 - Treating adjacent to suitable habitat may reduce the risk of loss in a future fire
- **Fisheries - HIGH**
 - Area of Special Concern for fisheries
 - Located in Black Butte watershed with 47 km of critical habitat for Steelhead trout

Physical Sciences

- **Hydrology - HIGH**
 - Part of this area is in the Middle Fork Eel Key Watershed. Key Watersheds are highest priority for restoration.
 - This area is in the jurisdiction of the North Coast Region Water Quality Control Board.
 - The streams are sediment impaired. Legacy sediment sites may require treatment.
 - The streams are temperature impaired. Treatment options should include replanting vegetation in the Riparian Reserves in order to reduce stream temperatures by increasing stream shading.
 - The part of the area that is outside the Key Watershed is in the jurisdiction of the Central Valley Region Water Quality Control Board.
 - Erosion sites will have to be identified.

- The streams are not water quality impaired.
- **Geology - MODERATE**
 - Widespread unstable areas in Cold Creek are not mapped and not represented in the table
 - Reforestation is recommended to improve long-term slope stability, CWD, and LWD along Cold Creek

Heritage - MODERATE

- The Cottonwood Creek area burned moderately and has not been surveyed (formerly Commander Tract lands).
 - It is recommended that this area be surveyed as it is a sensitive heritage area.
- The middle and upper reaches of Rocky Basin Ridge burned moderately to hot and should be surveyed as it is known to be sensitive archaeologically.

Focus Area 12: Round Mtn./Kettenpom

Focus Area #12 is located in the North Fork of the Eel River Key Watershed, with portions already over watershed Thresholds of Concern. This focus area is split into several smaller subunits generally along the County Road 502 road network and includes other high use roads utilized to access to private inholdings, campgrounds/campsites as well as interior forestlands. The Akrewoods project (signed in May 2020) is currently under contract and impacts are being assessed.

Focus Area 12 - Round Mtn./Kettenpom data summary in acres

RAVG Burn Area Index		Very Low	Low	Moderate	Severe	Total	Grand Total
Basal Area Mortality (4 Class)							
Land Allocation (acres)	LSR	1765	1035	651	1002	4454	
	Matrix/AMA						
	Private						
	Other						
Roads (miles)	ML 3-5	2.1	0.9	0.6	0.4	4.0	35.5
	ML 2	6.4	4.1	3.1	11.0	24.6	
	ML 1	4.0	1.7	0.9	0.3	6.9	
WUI (acres)		889	450	289	334	1962	
Infrastructure/ Developed Recreation (Each)	Campgrounds	1		2		3	
	Trailheads	0		0		0	
	Structures	1		1		2	
	Bridges	0		0		0	
Critical Habitat	NSO (area)	2053	1280	971	2045	6351	
	Salmonids (km)	1.49	0.66	0.17	0.19	2.51	
NSO	Activity Centers	9		2		11	
Active Landslides (acres)	Riparian reserves	6.7	2.9	0.9	1.9	12.4	492.4
	Inner Gorge (acres)	Riparian reserves	189.7	118.4	76.1	95.8	

Timber/Silviculture - MODERATE

- Moderate priority for area treatments, with high priority for roadside hazard removal (i.e. County Roads 502, 503, 520, NFSR 2S08) due to proximity to county road system and high recreational use on USFS system roads, including Watts Lake Campground
- Includes a portion of the Akrewoods Fuels Reduction Project area, DN 05/11/2020. Approximately 800 acres of the of fuels and commercial treatment have been compromised and will need to be reevaluated.
- Potential area salvage opportunities: **1,000** acres, all tractor-based logging systems
- Rough estimates indicate this area has **high** potential for economical restoration opportunities.
- Watts Lake campground and several high use disperse camp sites were highly impacted and will require hazard tree treatment and removal prior to opening
- Reforestation recommended within areas salvaged plus burned plantations.
 - Existing plantations: **166 acres**
 - Plantations experiencing high severity: **156 acres** - recommend reforestation

Fuels - HIGH

- High rating driven largely by areas along Co Rd 502 where there is potential for high future hazard in a WUI corridor
- Other areas are adjacent to private property and jurisdictional boundaries
- Moderate overlap with strategic features

Biological Sciences

- **Wildlife - HIGH**
 - Survey coverage from previous years:
 - Three years of surveys for the Akrewoods project.
 - Robbers Roost was planned for year-1 surveys in 2021
 - Two NSO ACs may be designated as abandoned during the ESA consultation process
 - Treatments proposed, if any, within viable Core Areas (RAVG 1-2) could have LOPs and treatment restrictions
 - Fuels treatments, salvage, and reforestation would be beneficial in habitat that was removed by fire (RAVG 3-4), where the likelihood of NSO occupancy is low
 - These treatments may still have LOPs if within disturbance buffers for NSO
 - Treating adjacent to suitable habitat may reduce the risk of loss in a future fire
- **Fisheries - MODERATE**
 - Critical habitat in focus area is within low to moderate burn severities
 - Reforestation will help reduce long term sedimentation

Physical Sciences

- **Hydrology - HIGH**
 - Part of this area is in the North Fork Eel Key Watershed. Key Watersheds are the highest priority for restoration.
 - This area is in the jurisdiction of the North Coast Region Water Quality Control Board.
 - The streams are sediment impaired. Legacy sediment sites may require treatment.

- The streams are temperature impaired. Treatment options should include replanting vegetation in the Riparian Reserves in order to reduce stream temperatures by increasing stream shading.
 - Part of this area (Salt Creek) is over the threshold of concern. Headwaters North Fork Eel River is probably over the threshold of concern. Kettenpom Creek may be over the threshold of concern.
 - **Geology - LOW**
 - Has few mapped landslides and most burned at Very Low and Low severities.
 - Glades should be maintained or improved by removing encroaching surviving firs. Do not plant conifers in glades. Avoid use of heavy machinery on glades as they tend to be dormant or active earthflow-type landslides.

Heritage – MODERATE

- There is a large concentration of heritage resources off road and access will need to be limited.
- Portions of Round Mountain will require survey prior to implementation.

Focus Area 13: Ruth Packwood Flat

Focus Area #13 is located in the North Fork of the Eel River Key Watershed, with portions already over watershed Thresholds of Concern. This focus area is split into several smaller subunits generally along the Mad River Ridge (02S05) road network, near the community of Ruth. This WUI area includes other high use roads utilized to access to private inholdings, campgrounds/campsites as well as interior forestlands. Recent projects within this area include Beaverslide and 1st 48, and impacts are being assessed.

Focus Area 13 - Ruth/Packwood Flat data summary in acres

RAVG Burn Area Index		Very Low	Low	Moderate	Severe	Total	Grand Total
Basal Area Mortality (4 Class)							
Land Allocation (acres)	LSR	0	1	6	39	47	
	Matrix/AMA						
	Private						
	Other						
Roads (miles)	ML 3-5	0.5	0.9	1.4	5.1	7.9	32.2
	ML 2	0.7	2.7	4.8	14.8	23.0	
	ML 1	0	0.1	0.2	1.0	1.3	
WUI (acres)		132	419	716	1638	2905	
Infrastructure/ Developed Recreation (Each)	Campgrounds	0		0		0	
	Trailheads	0		0		0	
	Structures	0		8		8	
	Bridges	0		0		0	
Critical Habitat	NSO (area)	160	515	906	2759	4342	
	Salmonids (km)	0	0	0	0	0	
NSO	Activity Centers	17		0		17	
Active Landslides (acres)	Riparian reserves	0.1	0.7	0.5	2.1	3.4	496.7
Inner Gorge (acres)	Riparian reserves	15.4	63.3	118.6	296	493.3	

Timber/Silviculture - MODERATE

- Moderate priority for area salvage/restoration treatments with high priority for hazard removal due to the extent of high mortality around private lands. High priority roads include county road system, NFSR 3S02, 3S05, 3S12, as well as access to private lands and recreational use (NFSR provides access to Packwood Flat TH and North Fork Wilderness).
- Recommend hazard tree removal and fuel reduction around private property to create fuel breaks adjacent to property lines.
- Potential area salvage opportunities: **1,000** acres, all tractor-based logging systems
- Rough estimates indicate this area has **high** potential for economical restoration opportunities.
- Packwood Flat Trailhead will require hazard tree treatment and removal prior to opening
- Reforestation recommended within areas salvaged plus burned plantations.
 - Existing plantations: 475 acres
 - Plantations experiencing high severity: **446 acres** – recommend for reforestation

Fuels – HIGH

- Several areas in the Ruth WUI
- Highly adjacent to private property
- Moderate overlap with strategic features

Biological Sciences

- **Wildlife - HIGH**
 - For ESA consultation:
 - With 17 viable ACs, this Focus Area may require more effort for ESA
 - Cumulative effects from THPs in the analysis area for ACs could be very high
 - Focus area has past survey coverage
 - Many sites were active before the 2020 fires and birds will be displaced. Protection of remaining habitat will need to be a priority.
 - One AC is within the 1st 48 timber sale – 4 years of surveys
 - Treatments proposed, if any, within viable Core Areas (RAVG 1-2) could have LOPs and treatment restrictions
 - Fuels treatments, salvage, and reforestation would be beneficial in habitat that was removed by fire (RAVG 3-4), where the likelihood of NSO occupancy is low
 - These treatments may still have LOPs if within disturbance buffers for NSO
 - Treating adjacent to suitable habitat may reduce the risk of loss in a future fire
- **Fisheries - MODERATE**
 - Focus area in critical habitat drainages
 - Reforestation recommended to decrease sedimentation in critical habitat

Physical Sciences

- **Hydrology - HIGH**

- Part of this area is in the North Fork Eel Key Watershed. Key Watersheds are the highest priority for restoration.
- This area is in the jurisdiction of the North Coast Region Water Quality Control Board.
 - The streams are sediment impaired. Legacy sediment sites may require treatment.
 - The streams are temperature impaired. Treatment options should include replanting vegetation in the Riparian Reserves in order to reduce stream temperatures by increasing stream shading.
- Part of this area (Upper North Fork Eel River) is over the threshold of concern. Ruth Lake – Mad River and Headwaters North Fork Eel are probably over the threshold of concern.
- **Geology - LOW**
 - Has low density of landslides; while it has inner gorges, there is no recommendation for treatment
 - Glades should be maintained or improved by removing encroaching surviving firs. Do not plant conifers in glades. Avoid use of heavy machinery on glades as they tend to be dormant or active earthflow-type landslides.

Heritage - MODERATE

- Historic homestead should be re-recorded, and eligibility determined.
- Historic trail runs through focus area and should be re-recorded, and eligibility determined.

Focus Area 14: Boundary

Focus Area #14 is generally located in the Mad River drainage at the convergence of all three Forests and experienced some of the greatest concentrations of high fire severity across the August Fire footprint. Lost Creek – Mad River watershed has been identified as a priority watershed for restoration, as it contributes directly into the Humboldt Bay Municipal Water District water supply. Adjacent to Wilderness, this Focus Area receives high recreational use of campgrounds and trailheads. The primary fuels objective is to treat strategic ridgelines and roads, particularly along Mad River Road (27N02). Focus area includes the footprint for Little Gulch and Lost Creek project areas and is adjacent to Shasta-Trinity's Focus Area #4.

Focus Area 14 - Boundary data summary in acres

RAVG Burn Area Index Basal Area Mortality (4 Class)		Very Low	Low	Moderate	Severe	Total	Grand Total
Land Allocation (acres)	LSR	119	149	122	679	1069	
	Matrix/AMA						
	Private						
	Other						
Roads (miles)	ML 3-5	0.4	2.5	1.3	7.7	11.9	77.2
	ML 2	0.2	3.4	4.7	55.3	63.6	
	ML 1	0	0	0	1.7	1.7	
WUI (acres)		10	34	71	1244	1358	
Infrastructure/	Campgrounds	0		3		3	

Developed Recreation (Each)	Trailheads	0		2		2	
	Structures	0		1		1	
	Bridges	1		0		1	
Critical Habitat	NSO (area)	388	1090	1534	10232	13245	
	Salmonids (km)	0	0	0	0	0	
NSO	Activity Centers	3		1		4	1322.3
Active Landslides (acres)	Riparian reserves	3.7	6.2	12.1	48.8	70.8	
Inner Gorge (acres)	Riparian reserves	41.1	129.4	219.7	861.3	1251.5	

Timber/Silviculture - HIGH

- High priority for roadside hazard removal due to proximity of roads accessing areas of high recreational use for camping and trailhead access (FSR 27: Blue Jay Mine, Red Mtn, Boundary, Lost Creek, and Waterspout providing access to trails within the Upper Mad River and Yolla Bolla Middle Eel Wilderness).
- High priority for area salvage and restoration due to the extent of high severity fire resulting in high mortality within the Upper Tributaries Upper Mad River Watershed which contributes directly into the Humboldt Bay Municipal Water District water supply.
- Recent NEPA (Little Gulch and Lost Creek) have completed surveys which may expedite analysis.
- Potential area salvage opportunities: **2,600 acres**, all tractor-based logging systems
- Rough estimates indicate this area has **high** potential for economical restoration opportunities.
- One established campground and two identified disperse camp site and several trailheads were impacted and will require hazard tree treatment and removal prior to opening
- Reforestation
 - Existing plantations: **1020 acres**, all of which burned at high severity and are recommended for planting.

Fuels – MODERATE

- Strong alignment with strategic features, including ridges with roads
- Strategic features are a high priority for treatment, particularly the 27N02.
- Some WUI and private property
- Multiple trailheads and one campground
- Adjacent to wilderness

Biological Sciences

- **Wildlife - MODERATE**
 - No recent NSO survey coverage – fore ESA consultation:
 - One AC may be declared abandoned during consultation
 - The 4 known ACs also occur within the Kelsey project.
 - If treating in remaining suitable habitat, cumulative effects from THPs in the analysis area could be an issue depending on prescription.
 - Fuels treatments to reduce reburn in those sites would be recommended.
 - Treatments proposed, if any, within viable Core Areas (RAVG 1-2) could have LOPs and treatment restrictions

- Fuels treatments, salvage, and reforestation would be beneficial in habitat that was removed by fire (RAVG 3-4), where the likelihood of NSO occupancy is low
 - These treatments may still have LOPs if within disturbance buffers for NSO
 - Treating adjacent to suitable habitat may reduce the risk of loss in a future fire
- **Fisheries - MODERATE**
 - Focus Area in Mad River drainage
 - Reforestation is recommended to decrease downstream sedimentation

Physical Sciences

- **Hydrology - MODERATE**
 - This area is not in a Key Watershed.
 - This area is in the jurisdiction of the North Coast Region Water Quality Control Board.
 - The streams are sediment impaired. Legacy sediment sites may require treatment.
 - The streams are temperature impaired. Treatment options should include replanting vegetation in the Riparian Reserves in order to reduce stream temperatures by increasing stream shading.
 - Lost Creek – Mad River has been identified as a priority watershed for restoration. A Watershed Restoration Action Plan is available.
 - Lost Creek – Mad River is over the threshold of concern.
- **Geology - MODERATE**
 - Has dissected topography with relatively widespread unstable areas that burned at Moderate and Severe severity
 - Reforestation is recommended for long-term slope stability, CWD and LWD.

Heritage – LOW

- This focus area has only general heritage concerns.
- Ridges throughout the focus area need to be surveyed.

Focus Area 15: Van Horn

Focus Area #15 is generally located in the Mad River drainage and experienced some of the greatest concentrations of high fire severity across the August Fire footprint. Lost Creek – Mad River watershed has been identified as a priority watershed for restoration, as it contributes directly into the Humboldt Bay Municipal Water District water supply. This area contains substantial WUI along with developed recreation, and is in alignment with strategic ridges and roads, including South Fork Mountain. Focus area includes the footprint for Kelsey Peak project area and is adjacent to Shasta-Trinity's Focus Area #4.

Focus Area 15 - Van Horn data summary in acres

RAVG Burn Area Index		Very Low	Low	Moderate	Severe	Total	Grand Total
Basal Area Mortality (4 Class)							
Land Allocation (acres)	LSR	0	0	7	393	400	
	Matrix/AMA						
	Private						

	Other						
Roads (miles)	ML 3-5	1.6	2.1	1.9	15.6	21.2	80.2
	ML 2	2.6	4.5	6.1	42.2	55.4	
	ML 1	1.5	0.6	0.2	1.4	3.7	
WUI (acres)		461	694	1015	5056	7225	1562.2
Infrastructure/ Developed Recreation (Each)	Campgrounds	2		1		3	
	Trailheads	0		0		0	
	Structures	1		1		2	
	Bridges	0		1		1	
Critical Habitat	NSO (acres)	1068	1356	1903	12362	16693	
	Salmonids (km)	0	0	0	0	0	
NSO	Activity Centers	15		3		18	
Active Landslides (acres)	Riparian reserves	1.7	4.3	7	37.9	50.9	
Inner Gorge (acres)	Riparian reserves	138.9	156.3	229.9	986.2	1511.3	

Timber/Silviculture - HIGH

- High priority for roadside hazard removal due to proximity to County road 501 and NFS roads used for private land access and recreational use (disperse camp sites, Picket Peak Lookout)
- High priority for area salvage and restoration due to the extent of high severity fire resulting in high mortality within the Upper and Lower Tributaries Upper Mad River Watersheds which contributes directly into the Humboldt Bay Municipal Water District water supply.
- Recent NEPA (Kelsey Peak EIS) has completed surveys which may expedite analysis.
- Potential area salvage opportunities: **2,500** acres, all tractor-based logging systems
- Rough estimates indicate this area has **high** potential for economical restoration opportunities.
- Several disperse camp sites and Picket Peak Lookout were impacted and will require hazard tree treatment and removal prior to opening
- Reforestation
 - Existing plantations: 700 acres
 - Plantations experiencing high severity: **670 acres** – recommended for reforestation

Fuels – HIGH

- Considerable WUI
- Adjacent to private property and forest boundary
- One campground
- Strong alignment with strategic features, including ridges with roads and a portion of South Fork Mountain

Biological Sciences

- **Wildlife - MODERATE**
 - For ESA consultation:
 - Some ACs may be designated abandoned during the consultation process
 - All of these ACs overlap within Beaverslide, Kelsey and 1st 48 timber sales

- These projects all have at least 2 years of protocol surveys - most of these sites were active and had breeding pairs the last few years. Where birds are displaced due to loss of habitat suitable NR habitat will be critical to protect as we move forward
 - If treating in remaining suitable habitat, cumulative effects from THPs in the analysis area could be an issue depending on prescription.
 - Treatments proposed, if any, within viable Core Areas (RAVG 1-2) could have LOPs and treatment restrictions
 - Fuels treatments, salvage, and reforestation would be beneficial in habitat that was removed by fire (RAVG 3-4), where the likelihood of NSO occupancy is low
 - These treatments may still have LOPs if within disturbance buffers for NSO
 - Treating adjacent to suitable habitat may reduce the risk of loss in a future fire
- **Fisheries - MODERATE**
 - Focus Area in Mad River drainage
 - Reforestation is recommended to decrease downstream sedimentation

Physical Sciences

- **Hydrology - MODERATE**
 - This area is not in a Key Watershed.
 - This area is in the jurisdiction of the North Coast Region Water Quality Control Board.
 - The streams are sediment impaired. Legacy sediment sites may require treatment.
 - The streams are temperature impaired. Treatment options should include replanting vegetation in the Riparian Reserves in order to reduce stream temperatures by increasing stream shading.
 - Lost Creek – Mad River and Barry Creek – Mad River have been identified as priority watersheds for restoration. Watershed Restoration Action Plans are available.
 - Lost Creek – Mad River and Barry Creek – Mad River are over the threshold of concern.
- **Geology - HIGH**
 - Topography is very dissected and has widespread unstable areas that burned at Moderate and Severe.
 - Reforestation recommended for long-term improvements to slope stability, CWD, and LWD.
 - Glades should be maintained or improved by removing encroaching surviving firs. Do not plant conifers in glades. Avoid use of heavy machinery on glades as they tend to be dormant or active earthflow-type landslides.

Heritage – MODERATE

- Extensive heritage resources in the area of a gulch need to be revisited and re-recorded.

Focus Area 16: Roads

Focus Area #16 includes all open NFS roads, as well as county, state and roads under special use permits that access high-value energy infrastructure corridors within the August Fire footprint. The existing environment consists of a mosaic of fire-killed and defective trees along these roads, which has increased the risk to human life due to diminished structural integrity of the existing forest structure. Road segments experiencing moderate to high vegetation burn severity pose the greatest risk, especially when correlated with larger trees.

Focus Area 16 - Roadside Hazard data summary in miles

Road Type	RAVG	Mendocino	Shasta-Trinity	Six Rivers	Fire Total
ML-5	Mod-High	0.4	0	0	0.4
	Low	1.1	0	0	1.1
ML-4	Mod-High	0	6.6	9.9	16.5
	Low	0.1	10.2	3.2	13.5
ML-3	Mod-High	28.3	25.4	24.0	77.7
	Low	42.2	29.4	8.3	79.9
ML-2	Mod-High	226.8	55.9	142.0	424.7
	Low	161.9	79.5	24.4	265.8
Fire Total	Mod-High	255.5	87.9	175.9	519.3
	Low	205.3	119.1	35.9	360.3

Timber/Silviculture - HIGH

- Hazard tree abatement of large trees should move forward as quickly as possible in order to promote safe use of NFS roads and allow for the potential for removal through utilization.
- Failure to remove large trees off-site creates different safety issues and is much more costly to address in the long term.
- Hazards along roads with steep slopes can often be endlined to roads
- Identification of hazards should follow the R5 Hazard Tree Guidelines.
- Account for landings along roads or be prepared to close roads during implementation.
- Recommend 1.5x length of tree on the uphill side of road; 1 tree length on downhill side of road.
- Priority for treatment should be given to high use (ML 3 and 4), roads accessing private inholdings, powerlines, lookouts, recreational sites, county and state roads, critical access routes for emergency personnel and cost-share roads.

Fuels - HIGH

- Fuel treatments are critical for reducing the loading associated with hazard tree mitigation.
- Roadside buffer treatments will reduce access and egress hazards for local communities, the recreating public, agency personnel, and emergency responders.
- Buffer treatments of generally up to 300' on each side of the road and perhaps farther when local conditions dictate the need.

Biological Sciences

- **Wildlife – MODERATE**
 - In general, linear projects are do not present a high risk to NSO

- **Fisheries - MODERATE**
 - In general, riparian reserves should be excluded from hazard tree abatements

Physical Sciences

- **Hydrology - MODERATE**
 - Roads are generally the most common source of sediment caused by human activities. In the North Coast Region, legacy sediment sites will likely require identification and treatment. In the Central Valley Region, erosion sites will have to be identified.
 - It is generally more beneficial to treat areas on a watershed scale, rather than linear features that cross multiple watersheds.
- **Geology - MODERATE**
 - No key issues but keep heavy machinery out of unstable areas

Heritage - HIGH

- Limit falling hazard trees on heritage sites.
- Hazard trees will not be skidded, decked, or piled within heritage sites.
- Removal of hazard trees from heritage sites where possible under the direction of a heritage specialist.
- Chipping and mastication of hazard trees within sites may be necessary to create a visual screen to decrease looting. However, it must not create a fuels buildup that would cause high burn intensity.

Focus Area 17: Infrastructure

Focus Area #17 includes all the recreation, road and facility infrastructure impacted by the August Fire. Hazard tree abatement and removal is critical prior to reopening campgrounds and facilities to the public to ensure safe use. As fire killed and injured trees continue to lose their structural integrity, critical infrastructure such as bridges and increase risk of failure with time. Once hazards are abated, follow-up fuels treatments are recommended to reduce future wildfire risk and improve safety.

Focus Area 17 - Infrastructure data summary

	Mendocino	Shasta-Trinity	Six Rivers
<i>Mod-High RAVG</i>			
Campgrounds	3	3	10
Trailheads	8	0	4
Bridges	2	1	1
Lookouts	0	1	1
Other	361	23	24
<i>Low-Very Low RAVG</i>			
Campgrounds	12	1	10
Trailheads	2	1	1
Bridges	3	4	2
Lookouts	1	0	0
Other	459	82	22

Timber/Silviculture - HIGH

- Hazard tree abatement and removal is critical prior to reopening campgrounds and facilities to the public.
- Much of the recreation infrastructure that experienced high burn severity includes larger/older conifer trees, as large trees enhance the recreational experience. These trees may be of sufficient size for commercial removal even if areas are small.
- It is notable that campground trees inherently are challenging for commercial removal due to decades of human impacts (such as nails, wire, etc.) that may be hidden under the surface.
- Reforestation is a high priority for any developed site in order to return forest cover in a reasonable time frame.

Fuels - HIGH

- Fuel reduction is critical for public safety and infrastructure protection from future wildfires.
- Consider defensible space around structures and fuel treatment buffers around infrastructure. Width of buffer will depend on type of infrastructure and location.

Biological Sciences

- **Wildlife - LOW**
 - No wildlife concerns for infrastructure
- **Fisheries - LOW**
 - Bridge and other stream crossing repairs should be designed to minimize stream disturbance and sedimentation

Physical Sciences

- **Hydrology - LOW**
 - Bridges are generally not legacy sediment sites, although it is possible that rolling dips could be constructed to hydrologically disconnect the road from the stream.
 - Campgrounds are often located adjacent to waterbodies and can be minor sources of sediment. Legacy sediment sites in the jurisdiction of the North Coast Region may need to be identified and treated.
 - Streams in the jurisdiction of the North Coast Region are temperature impaired, so care should be taken to prevent a reduction in stream shading.
- **Geology - LOW**
 - Dennis Veich is Point of Contact for this Focus Area
 - Shasta-Trinity Road 1S26 goes through a fire-destabilized talus slope area and should at least be monitored.
 - A major engineering effort may be required to stabilize it.
 - Shasta-Trinity Road 28N35 was reopened for fire-suppression efforts and a dozer went through an active landslide.
 - It should be monitored and possibly rehabilitated if not already done.

Heritage - HIGH

- Much of the infrastructure identified in this section are also cultural resources. Repair and restoration should be made in collaboration with Heritage staff.
- Rehabilitation of historic infrastructure should be conducted in a manner that preserves historic integrity.

- Infrastructure has not necessarily been recorded by archaeologists. Specialized assistance from a historic architect may be necessary to properly record these resources.

Appendix 3

Areas of Special Concern

A – Strategic Fuel Breaks & Landscape-Scale Prescribed Fire

A network of strategic fuel breaks offers control lines for landscape-scale prescribed fire, as well as potential control locations for future wildfires. Frequent low-to-moderate intensity fire on a large scale will be the most fruitful path to large-scale restoration. Breaking the cycle of extensive high-severity fire will require immediate efforts to reduce the loading of heavy fuels, especially before standing dead trees become too dangerous to manage. The immediate future offers an opportunity to conduct prescribed burning in high hazard areas outside the August Complex footprint, as the recently burned area will be a barrier to extensive fire spread. It will be critical to reintroduce fire into the August footprint within 10 years to manage live and dead surface fuels (or all size classes), as well as ladder fuels, in order to reduce the severity and extent of future wildfires. The planning for this reintroduction of fire needs to begin now and preparing the strategic control lines is one of the first steps.

The assessment maps prioritize areas for treatment based on proximity to WUI, infrastructure and strategic locations for future fire management operations. Future fuels and fire hazard were also used to determine priority. Linear treatments should be prioritized by where they fit in the area prioritization, how they intersect with WUI, and where roads and strategic features align. Places where roads overlay strategic ridges should be prioritized for treatment.

Treatments should target dead fuels of all size classes. Live surface fuels (including shrubs and small trees) and ladder fuels should also be considered for treatment, particularly in areas that burned at low to moderate severity.

Timber/Silviculture - HIGH

- High priority in order to reduce levels of high severity fire impacting vegetation in the future
- Depending on existing forest structure, there may be commercial removal opportunities

Fuels - HIGH

Biological Sciences

- **Wildlife - HIGH**
 - Strategic fuel breaks have been used to protect designated critical habitat and suitable habitat for listed and non-listed species
 - Prescribed fire has many benefits for wildlife such as increase foraging, increase native grasses, lowering fuel loads to protect habitat in heavy timber, keeping brush to a minimum so wildlife can still get through stands.
 - Fuel breaks are effective for treating and maintaining habitat. Prescriptions usually are based on canopy closure and spacing which benefits the NSO
- **Fisheries - MODERATE**
 - Fuel breaks and prescribed fire will benefit fisheries by preventing high severity fires in sensitive watersheds
 - Fuel breaks should be designed to leave riparian reserves intact

Physical Sciences

- **Hydrology - HIGH**
 - Fuel breaks should be located outside Riparian Reserves to the extent practicable.
 - Landscape-scale prescribed fire is an essential component of watershed restoration.
- **Geology - HIGH**
 - Reducing the risk of high intensity wildfire is key to reduce long-term deforested conditions that can result in new or reactivated landslides and debris flows.

Heritage - MODERATE

- Tribes generally support the intent of fuels projects.
- Fuel breaks along ridgelines have the potential to impact cultural resources and should be designed in a manner to respect historic trails and avoid adverse impacts to historic properties.
- Fuels projects should be designed to cause low fire intensity through pre-contact sites and avoid combustible artifacts and features. This may require pre-ignition site prep.

B – Oak Woodland Restoration

Past fire exclusion has allowed vegetation such as Douglas-Fir to encroach into oak woodlands. Treatments would include removal of competing conifers to allow hardwoods to respond to increased sunlight. This would also require prescribed burning every 5 to 10 years to exclude species that are not fire resilient. The project would restore grassy areas by the application of prescribed fire to rejuvenate grass and other grassland species and remove encroaching vegetation.

- Benefits of Oak Restoration:
 - Provides wildlife forage for many species: deer, bear, etc.
 - Enhancing native tree and plant diversity
 - Removing invasive Douglas-fir trees
 - Reintroducing fire back on the landscape.

Timber/Silviculture - LOW

- Species diversity is key to a healthy landscape
- Potential for commercial opportunity related to conifer removal
- While hardwoods generally sprout from the base, areas with high soil burn severity may have impacted root/cambial viability which would require planting to maintain these valuable and unique ecotypes.

Fuels - HIGH

- Prescribed fire is an essential tool for oak woodland restoration
- Prescribed burning for restoration also aligns with many cultural burning practices
- Regular prescribed fire maintains low fuel loading and lowers resistance to control during future wildfires

Biological Sciences

- **Wildlife - HIGH**
 - Oak woodlands provide crucial forage for wildlife
 - Oaks often provide cavities for nesting opportunities for various species
 - Oak woodlands are often not considered habitat for NSO

- Funding for implementation can be from partners including but not limited to the California Deer Association, Mule Deer Foundation, National Wild Turkey Foundation, and Rocky Mountain Elk Foundation
- **Fisheries – LOW**
 - No major concerns

Physical Sciences

- **Hydrology - LOW**
 - No issues.
- **Geology - HIGH**
 - Oaks often have extremely deep root systems, are long lived, are climate adapted, can increase ecological diversity, and can survive fire. Oak woodlands are very important for slope stability.

Heritage - MODERATE

- Tribes generally support the intent of oak woodland restoration projects.

C – Slope Stability

Reforestation of stable slopes should occur as soon as possible in previously forested areas. Reforestation of stable slopes in these areas of special concern should reduce groundwater on lower steeper unstable and potentially unstable slopes, helping to reduce long-term landslide risk (starting at 20-30 years, after successful planting, peak root strength will occur). Reducing the risk of widespread mass wasting due to deforestation in the August Complex is critical to also reduce long-term sediment loads into stream systems. Reforestation also provides long-term large and coarse woody debris to stream systems, which is essential for long-term stream health and reducing the impacts of debris flows. Reforestation should occur as soon as possible as roots of dead trees will decay in 3-5 years and evapotranspiration is currently much reduced in RAVG class 4 and 5 areas. Some areas of special concern are subdivided with different priorities. The GIS data for areas of special concern is located here:

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These areas were identified by first an ocular review of unstable area density, selecting areas with relative high densities of unstable areas, and then intersecting those areas with RAVG classes 3 and 4 and forested areas (Douglas-fir, True Fir, and Pine). Most geology areas of special concern are within Focus Areas. They all have the same recommended treatment of reforestation and reasons for being special areas of concern. Chaparral areas were excluded from the analysis as they tend to rapidly recover post-fire by crown sprouting. In addition, shrub dominated areas are not properly represented by the forest calibrated RAVG. These areas of concern can be lumped or split if it makes sense for planning purposes. Any reforestation is better than nothing, though any glades should not be planted with trees.

Timber/Silviculture - HIGH

- Reforestation is recommended following salvage harvest or site preparation to promote long-term success (future mature stand). See Special Area F for more information on Reforestation.

Fuels - MODERATE

- Reforestation efforts should be preceded with adequate site preparation to reduce fuels beneath and around planted trees; lack of site prep can lead to loss of investment when future wildfires burn untreated fuels and result in high tree mortality
- Broadcast prescribed fires are the most cost-effective tool for site preparation burning; pile burning is effective but can be costly, labor intensive, and can take a long time to accomplish on large areas.

Biological Sciences

- **Wildlife - MODERATE**
 - Reforestation to create mature stands in the future would have many benefits to wildlife
 - Stabilizing slopes would protect habitat in the future from large landslides
- **Fisheries - HIGH**
 - Stabilizing slopes benefits fisheries by reducing sedimentation in streams, and by allowing LWD input through reforestation

Physical Sciences

- **Hydrology - HIGH**
 - Stabilizing slopes reduces the risk of landslides and benefits water quality by reducing sedimentation in streams.
 - Reforestation provides long-term recruitment of CWD and LWD. CWD can trap sediment, preventing it from reaching streams. LWD in streams is beneficial to help reduce sediment and temperature.
- **Geology - HIGH**
 - Mechanical equipment/heavy machinery is prohibited from unstable areas, though non-mechanical treatments such as underburns or hand piling and pile burning may be appropriate.
 - These areas are deemed as high priority for reforestation due to widespread instability and the need for long-term stabilization of the landscape
 - Reforestation, if effective, also provides long-term CWD and LWD, which is critical for stream function and reducing impacts of debris flows.

Heritage - MODERATE

- Project activities on steep slopes are generally lower concern. Project activities in close proximity to water on low slopes and terraces are sensitive and require more intensive heritage survey.
- Cultural resources will benefit from stabilized slopes through decreased erosion.
- Tribes generally support the intent of slope stability projects.

D – Watershed Restoration

Watershed restoration (fisheries)

The Black Butte and Upper South Fork Trinity are steep sloped watersheds that contain critical habitat for Northern Coastal Steelhead trout and Southern Oregon/Northern California Coho Salmon respectively. Each watershed burned at high intensity and is an area of special concern in order to protect its aquatic habitat as well as downstream habitat.

Timber/Silviculture - MODERATE

- Reforestation may help improve slope stability and improve habitat in the long-term.
- In special circumstances, deliberate placement of large fire-killed trees (including roots) in the river may help improve habitat

Fuels - MODERATE

- Reintroduction of frequent low-to-moderate intensity and severity fire can be an effective tool for the long-term restoration and maintenance of watersheds.

Biological Sciences

- **Wildlife - MODERATE**
 - Watersheds provide habitat for many wildlife species.
- **Fisheries - HIGH**
 - Watershed restoration reduces sedimentation, protects riparian habitat, and improves stream function

Physical Sciences

- **Hydrology - HIGH**
 - Restoring aquatic and riparian-dependent resources is more effectively managed by focusing on a few priority sub-watersheds rather than focusing on treatments on stream segments that are scattered over multiple watersheds.
 - A wide range of treatments that are integrated at the watershed scale should be encouraged rather than a narrow range of treatments that focuses on a few sites.
 - The Watershed Condition Framework identifies the Forest Supervisor as the responsible official for identifying priority sub-watersheds for restoration.
 - There is presently no priority sub-watershed identified for restoration in the Upper South Fork Trinity River Key Watershed. Shell Mountain Creek is recommended for selection.
 - There is presently no priority sub-watershed identified for restoration in the Black Butte River Key Watershed. There are four sub-watersheds in the Black Butte River Key Watershed to choose from; including Blue Slide Creek-Black Butte River, Cold Creek, Baldy Creek-Black Butte River, and Spanish Creek-Black Butte River.
- **Geology - HIGH**
 - Watershed restoration goes hand-in-hand with slope stability

Heritage – MODERATE

- Project activities on steep slopes are generally lower concern. Project activities in close proximity to water on low slopes and terraces are sensitive and require more intensive heritage survey.
- Tribes generally support the intent of watershed restoration projects.

E – NSO Critical Habitat throughout the August Complex

The August Complex Fire burned in Northern spotted owl (NSO) critical habitat within the Interior California Coast unit, subunits 1,2,3,4, and 5. The table below summarizes the effects to critical habitat by subunit. Restoration within the high severity burn RAVG class 3 and 4 would help maintain and protect the remaining habitat. Treatments in these burn classes are proposed low risk to the NSO as habitat is no longer suitable and occupancy will most likely not occur.

Table 1: Area of Special Concern 2- Summary of effects to Northern Spotted Owl Critical Habitat

Critical Habitat Subunit	Total Acres in the August Fire	Percent of Subunit Effected
ICC1	73,120	22%
ICC2	115,385	57%
ICC3	99,224	95%
ICC4	90,297	75%
ICC5	1,156	3%

Timber/Silviculture - MODERATE

- Critical habitat loss has a direct correlation to deforested lands. The most effective way to accelerate the return of forest cover in extensive areas where mature trees were lost to fire is to remove the majority of the heavy fuels through a salvage and follow up with reforestation with a comparable species composition.
- Salvage activities in CH should be designed to retain sufficient large snags, that will also contribute to large woody debris as trees lose structural stability as it will be several decades before new large snags will be created in those stands.

Fuels – MODERATE

- Treatment of high fuel loading in high severity burn areas can protect adjacent areas of intact functional habitat that burned at lower severity.
- Treatments should also occur in habitat that burned at low/moderate severity to bolster these stands’ resilience to future wildfires. The Shasta-Trinity and USFWS have developed acceptable parameters for prescribed fire in NSO habitat (See Dubakella Insect & Disease Project).

Biological Sciences

- **Wildlife - HIGH**
 - Treatments within high severity burns, should maintain legacy snags that could provide habitat and nesting opportunities for various species.
 - Habitat lost by high severity should be a focus for reforestation
- **Fisheries – LOW**
 - No concerns

Physical Sciences

- **Hydrology - LOW**
 - No issues.
- **Geology - LOW**

Heritage – MODERATE

- Project activities on steep slopes are generally lower concern. Project activities in close proximity to water on low slopes and terraces are sensitive and require more intensive heritage survey.

F – Reforestation throughout the August Complex

The August Complex Fire burned over 700,000 acres of forested National Forest System lands across the Mendocino, Shasta-Trinity and Six Rivers National Forests. Of the total area burned, approximately 227,000 acres have been deforested *outside* areas congressionally withdrawn from treatment. These deforested areas have not only lost their former habitat function, but also lost value for slope stability,

stream temperature regulation, providing for botanical and fungal microsites as well as contributing to recreational value. In addition, high fuel loading associated with the dead trees is not a recipe for long-term ecological stability.

Reforestation is the driver for all areas salvage harvested. Salvage removes the heavy fuels, setting the stand up for success following planting by reducing the risk of high severity fire the next time the area burns. Salvage and reforestation are a huge component of restoration. Reforestation, specifically following salvage/site preparation, is the key to setting an area back on the trajectory for providing high quality forest habitat into the future.

In addition to salvage, site preparation and planting in existing plantations is recommended. This is because:

- Treatment of fuels in stands of smaller trees (i.e. young plantations) is more cost effective than in natural stands which generally contain larger trees.
- Areas are already disturbed and have often been surveyed.
- Site prep for planting can be done in smaller “bites” across a longer time frame as funding becomes available. When associated with reforestation, it is historically an activity that is competitive for partnership and grant funding.
- As 227,000 acres of planting is not a reasonable activity to take on, the 49,700 acres associated with plantations, and especially the 27,000 acres that burned hot is a more reasonable amount to take on. Of the plantations that burned:
 - Mendocino: 31,300 acres of plantations (total); 17,500 ac burned at high severity
 - Shasta-Trinity: 13,000 ac of plantations (total); 5,300 ac burned at high severity
 - Six Rivers: 5,400 acres of plantations (total); 4,100 ac burned at high severity
- The remaining deforested areas should be evaluated, per national/regional direction, however it is notable that much will be dismissed due to access, size (small areas will naturally seed in), soil productivity, climate change predictions, etc.

Species composition is recommended to be comparable to adjacent stands, based on soil type, not necessarily planting an identical mix (or lack thereof) to the original plantation.

Area of Special Concern F - Reforestation R5 summary of reforestation needs for the August Complex for the Mendocino, Shasta-Trinity and Six Rivers.

Veg Type	Treatments NOT Permitted (Wilderness)		Treatments Permitted		Treatments Permitted		Total
	Deforested NFS Lands	Lands that Remain Forested	Deforested NFS Lands	Lands that Remain Forested	Deforested NFS Lands	Lands that Remain Forested	
	STEEP GROUND >30%				FLAT GROUND <30%		
alpine	393	702	599	1,743	696	1,737	5,870
fir types	18,156	36,970	10,815	12,953	11,646	10,833	101,373
pine types	2,727	8,554	2,701	4,314	3,348	3,800	25,444
Douglas-fir	16,371	39,614	63,194	83,270	33,289	40,919	276,657
mixed conifer types	10,202	26,518	36,021	65,690	24,258	38,262	200,951
closed cone conifers	1,305	691	9,491	2,814	3,878	1,038	19,218
pj	4	2	8	5	29	29	78
hardwood	9,337	17,435	19,708	23,275	7,567	7,038	84,360
Total	58,496	130,487	142,536	194,064	84,710	103,657	713,950

Timber/Silviculture HIGH

- Accelerates the establishment of forest cover and sets a stand on a trajectory to provide for high quality habitat into the future.
- Fulfills the intent of NFMA, reducing the likelihood for a net loss of forested lands.
- Critical to pair with salvage or site preparation after the spring of 2022 planting season.
- Long-term activity – reforestation following site preparation will occur (with likely a diminished capacity) over the next 5-10 years, as funding permits.

Fuels – MODERATE

- Reforestation efforts should be preceded with adequate site preparation to reduce fuels beneath and around planted trees; lack of site prep can lead to loss of investment when future wildfires burn untreated fuels and result in high tree mortality
- Broadcast prescribed fires are the most cost-effective tool for site preparation burning; pile burning is effective but can be costly, labor intensive, and can take a long time to accomplish on large areas.

Biological Sciences

- **Wildlife - HIGH**
 - Reforestation will provide for future habitat
- **Fisheries – HIGH**
 - Reforestation will decrease sedimentation in streams and restore riparian habitat and LWD recruitment

Physical Sciences

- **Hydrology - HIGH**
 - Reforestation in Riparian Reserves should be included in order to reduce stream temperatures by increasing stream shading.
- **Geology - HIGH**

Heritage – LOW

- Reforestation in salvaged areas should be conducted in a manner consistent with the USFS Region 5 Programmatic Agreement.
- Tribes may have specific input regarding species selection.