# Technical Proposal For Ashland Forest Resiliency Stewardship Supplemental Project Agreement (SPA) No. 10-SA-11060489-077

# Tiered to Ashland Forest Resiliency Project Master Stewardship Agreement No. 10-SA-11061001-031

This Technical Proposal is attached to and incorporated into that certain Supplemental Project Agreement (SPA) No. 10-SA-11060489-077, dated as of March 15, 2010 (the "SPA"), which is being entered into by and among the United States Forest Service ("USFS"); the City of Ashland, Oregon ("COA"); Lomakatsi Restoration Project, an Oregon non-profit corporation ("LRP"); and The Nature Conservancy, a District of Columbia non-profit corporation ("TNC"), with respect to the Ashland Forest Resiliency Project (the "Project") and that certain Master Stewardship Agreement No. 10-SA-11061001-031, dated as of March 15, 2010 (the "MSA"), which was entered into by the same parties concerning the Project. The parties to the SPA are each sometimes referred to herein as a "Party", and are entering into the SPA, as supplemented by this Technical Proposal, for the following reasons. On that understanding, the following provisions are incorporated into the SPA:

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## Introduction

In order to faithfully implement the intended outcomes of the Project, the Parties wish to collaboratively plan and implement wildfire hazard reduction and ecological forest restoration, and this Technical Proposal is being set up to clarify their specific roles and responsibilities in connection with the Project, along with a general activity schedule lasting through summer of 2012.

This Technical Proposal is designed to detail approaches to unit layout, surface and ladder fuels management, density management, prescribed burning, multi-party monitoring, and community engagement as part of the Project, and both technical and public reviews are to be incorporated into the planning and implementation process alongside education and outreach actions, so that the organizational experiences and capacity of the Parties can create a uniquely qualified cooperative effort.

The SPA is tiered to the MSA, and the Parties believe that this cooperative arrangement is complementary and collaborative, and will result in an exceptional implementation of values expressed in the community's Wildfire Protection Plan of 2004, which composes the bulk of the Project's Preferred Alternative, as described in the *Ashland Forest Resiliency Final Environmental Impact Statement* (2008) (the "FEIS") which was prepared with respect to the Project, and the Record of Decision entered concerning the Project (the "ROD"). That plan represents an ecologically sensitive approach to achieving wildfire management goals while minimizing environmental impacts in this municipal watershed (the "Ashland Watershed") and restoring resilient conditions and appropriate processes on these dry forest sites. The breadth of experience in this cooperative arrangement will facilitate community engagement, multi-party ecological monitoring and local workforce training-non-traditional elements of forest management that are nonetheless equally important to the Project given the enhanced social and political attention in the Ashland Watershed. The Parties intend the Project to serve as a national example of how a community can meaningfully participate in a successful forest restoration and watershed protection project on federal lands.

## I. Project Cooperators Roles and Responsibilities

For the purposes of this SPA, the Parties will share responsibilities for all facets of the Project as a whole while deferring to organizational leads in specific areas of work based on each Party's expertise, past involvement and interest. Roles are subject to annual review. This organizational framework is designed to faithfully implement the Project as described in the FEIS and the ROD.

All of the Parties will participate in the following:

- Technical review of Project data, design and all aspects of implementation including contract design, prescriptions, tree marking guidance, tree marking and logistics
- Development and implementation of a community engagement plan (the "Community Engagement Plan") (see Appendix TP-B)
- Development and implementation of a multi-party monitoring plan including technical support and fundraising (the "Monitoring Plan") (see Appendix TP-A regarding the Monitoring Strategy which will lead to the Monitoring Plan)
- Coordination of Project communications with the public

Specific Party roles are described below.

**USFS shall:**

- Maintain overall decision making authority on National Forest System lands, including consistency review of implementation against the ROD.
- Lead Project design and development of the plans for implementing the Project (elements of the implementation plan include as a minimum: unit layout/design, prescriptions, marking guidance, unit prioritization and scheduling, mitigation measures), including needed GIS support.
- Lead unit layout and tree measurement, and certify unit prescriptions
- Provide oversight by key resource specialists (wildlife, fish, soils, botany, fire and fuels, hydrology, heritage)
- Administer stewardship agreement and other service (or timber sale) contracts as planned
- Prepare prescribed fire burn plans and provide operational oversight (i.e. burn boss)

**COA shall:**

- Lead development and implementation of the Community Engagement Plan
- Convene and lead community meetings and field trips to gather input and disseminate results of technical review and Project progress and results
- Assume technical lead for contract oversight and administration of helicopter operations, including marketing of restoration by-products
- Lead development of silvicultural prescriptions and tree marking guidance, and co-lead tree marking for density management
- Assist with preparation and implementation of USFS-prepared burn plans
- Maintain and regularly update the Project website (ashlandwatershed.org) (the "Project Website")

**TNC shall:**

- Coordinate technical review and oversight of the Project design and implementation, with input from other Parties, and conduct analysis as needed to inform the review (it being understood that TNC shall have no responsibility for carrying out or supervising on-the-ground activities under the SPA, which are to be done by or under the auspices of the other Parties)
- Oversee the development and implementation of the Monitoring Plan, including data collection protocols, coordination with stakeholders, and science delivery
- Serve as lead fiscal organization for the non-USFS Parties under the MSA and the SPA

**LRP shall:**

- Contract for and provide oversight and administration of all aspects related to on the ground implementation of surface and ladder fuel treatments, prescribed understory burning
- Assume technical lead for contract oversight and administration of ground based density management, including marketing of restoration by-products
- Lead development of prescriptions for surface and ladder fuel treatments
- Co-lead tree marking for density management
- Provide workforce training and contractor development, recruitment, and staffing
- Market fuel reduction and restoration by-products

## II. Proposed Technical Approach

The Technical Approach addresses all Project activities undertaken by the Parties. Each element is described in detail and where details are included in an external document, that document is referenced. The technical approach is intended to be a guide with flexibility to alter the approach as needed within the confines of the ROD, the FEIS, this SPA, and future agreements among the Parties, in addition to economic and political considerations.

### Operational Approach and Staging of Operations

The operational approach to implementation of the Project encompasses the organization wherein the Parties will accomplish the work as outlined as well as the chronological staging of operations to best implement ecological and social objectives in a sound economic environment.

"Operations" are defined as any aspect of the Project that the Parties are engaged in, including:

- Unit Layout and Designation
- Surface and Ladder Fuel Treatments
- Prescribed Understory Burning
- Density Management, including Silvicultural Prescriptions, Marking and Tally, Thinning, and Marketing of Fuel Reduction and Restoration By-Products
- Community Engagement including Public Review
- Monitoring and Quality Control, including Multi-party Monitoring, Technical Review and Implementation Monitoring
- Local Workforce Utilization and Training

Each operational category is governed by a plan or guidance that defines the goals, methods, and/or outcomes. Although certain Parties have been assigned as leads in operational categories, all Parties shall have the opportunity to review proposed plans and actions during the technical review process and informally during plan development. The proposed operational "flow" is shown in Figure 1 below.

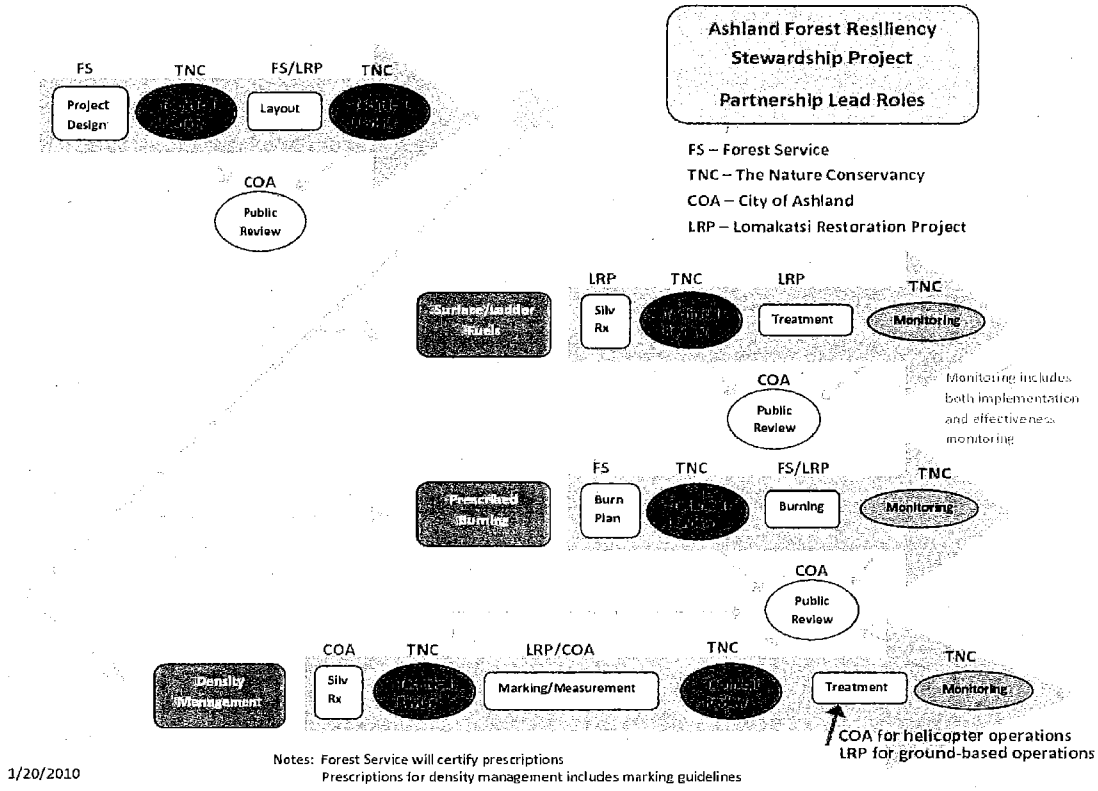



Figure 1. Cooperators Lead Roles and Operational Flow

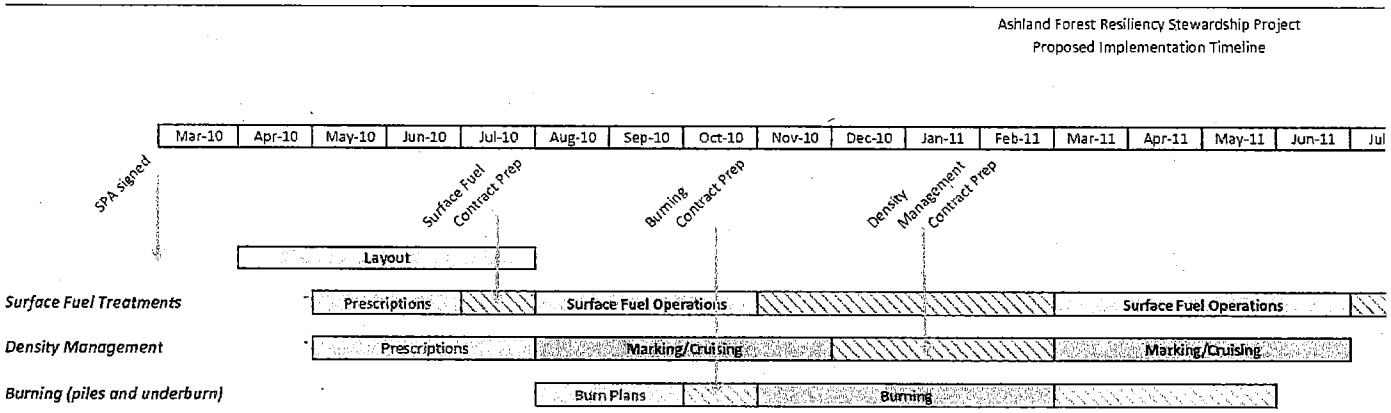
***Proposed Staging and Implementation of Operations***

Operations will follow the general timeline and order. The timeline and order of operations can change to best meet Project goals or fiscal requirements (Figure 2, following page). Operational proposals were submitted based on the most current knowledge and experience of the Parties. Verification of field conditions and unforeseen external factors will likely lead to adjustments during actual operations, which will yield the best Project outcomes within the parameters of the FEIS and ROD. It is the intention of the Parties that changes be transparent and advertised to community stakeholders. Operational stages are described below.

**Unit Layout and Designation**

Preliminary unit delineations will be based on developed project design (subject to technical review) and guidance provided by USFS. Preliminary units will incorporate adjustments for special design features such as Riparian Reserves, wildlife habitat protected areas (e.g. spotted owls, fisher), botanical protection areas, landslide hazard zones, shrub retention areas or other areas of no or modified treatment. Once formally approved and/or adjusted after technical and public review, preliminary unit delineations will be finally approved and posted/painted by USFS.

Figure 2. Operational Staging and Timeline



## Surface and Ladder Fuel Proposed Operations

LRP will be the lead contractual entity for surface and ladder fuel treatments for the SPA. Treatment activities will consist of cutting, thinning, hand piling and hand pile burning on approximately 1,039 acres, 845 acres of prescribed understory burning ("understory burning"), and 100 acres of maintenance understory burning. Each phase of proposed, ongoing, and completed work will be reviewed by the Parties and other members of the technical team and adjustments considered (Figure 1). Public review of plans, operations, and results will subsequently be reviewed in a public process coordinated by COA (see Figure 1 above).

***Prescription Development and Implementation***

Prescriptions developed for surface and ladder fuel treatments will reflect guidance from the FEIS and the ROD, combined with unit level evaluation of the site-specific conditions, with a goal to develop prescriptions that accomplish fuel reduction objectives, while maintaining understory species diversity and health. The Parties will integrate surface/ladder fuel and density management prescriptions, so that understory and overstory treatments complement each other. Plans to implement the specific treatments and operations will be designed to maximize mutual management objectives while capitalizing on opportunities to increase efficiency among operations. Integrative, collaborative management among the Parties is necessary to achieve wildfire management objectives focused on fuel reduction, while maintaining ecological integrity.

Surface and ladder fuel treatments will be guided by the prescriptions described in the FEIS and per the ROD, and guidance from unit level evaluation of the site-specific conditions by the Parties through stand level reconnaissance in each unit, and subunit subsequently determined. Surface and ladder fuel prescriptions will consider Plant Association Groups (in each case, a "PAG"), topography, slope stability, aspect and the major treatment regime categories (Fuel Discontinuity, Strategic Ridgeline, Research Natural Area, and Roadside treatment areas) outlined in the FEIS. Prescriptions will vary, but a general emphasis of the treatments will focus on the cutting, piling and burning of the younger trees and vegetation that are generally less than 8 to 10 inches in diameter (at 4.5 feet height or diameter at breast height or "dbh"), with exceptions and diameter guideline variations made for specific desired leave tree species.

*Overview of Prescription Guidelines*

1. Cutting / Thinning

With a focus on fuels reduction objectives, surface and ladder fuel treatments will cut the majority of Douglas-fir and white fir generally less than 8 to 10 inches dbh beneath Cohort #1 and #2 trees. The majority of shrubs for a given area will also be cut. Shrub patches, up to 5% of the area will be retained in areas that are to be handpiled and burned, and/or the lower portion of broadcast burn areas in areas where shrub retention would not interfere with prescribed burn operations, or compromise wildfire suppression objectives.

2. Species, Size Class, and Growth Form Retention Guidelines

Prescriptions for surface and ladder fuels will follow guidelines to retain certain desirable or currently under-represented species, size classes and growth forms.

- Ponderosa and sugar pine less than 8 inches dbh
- Black oak less than 6 inches dbh
- In Cool White Fir PAG's, Shasta red fir and incense cedar less than 8 inches in diameter
- Pacific yew and Pacific Dogwood and other under-represented native species

In uniform, even-aged stands, a variable density thinning treatment will be implemented under four different thinning treatment regimes:

- **Regular Spacing**- 30% of the area has a spacing of 15 foot by 15 foot for conifers and a 20 foot by 20 foot spacing for hardwoods.
- **Wide spacing-** 30% of the area has a spacing of 30 foot by 30 foot for conifers and hardwoods on a 40 foot by 40 foot spacing. Wide spacing would be placed on the flatter or more stable slope locations.
- **Variable Spacing-** 30% of unit
- **Reserve Area-** 10% of the area where no treatment occurs.

Criteria for hardwood spacing would be as follows: sprouting hardwood stumps with more than 3 sprouts should be cut back to three sprouts. Criteria for selecting which 3 sprouts to leave shall be prioritized as follows:

1. Largest diameters at 2 feet above ground level.
2. Best-formed, straightest, and with the best developed crowns.
3. Originates closest to ground level.

Any vigorous pine (ponderosa or sugar) or hardwoods greater than 12 inches dbh would have all vegetation within their drip lines cut and piled. Vigorous pine is defined as pine with at least a 30% live crown ratio. Vigorous hardwoods are those with a minimum of a 25% live crown ratio. All other vegetation greater than 1 inch in diameter and 1 foot above ground level, would be cut, handpiled, and burned.

3. Slope Stability and Soil Resource Protection Measures

On unstable areas mapped as Landslide Hazard Zone 1 or 2, additional ground cover will be maintained by retaining 50% of the stems less than 7 inches dbh. Oaks and madrone, which are sprouting species, will be favored for retentions. Coarse woody material (CWM), including down material of various sizes or diameters will be placed in contact with the soil and oriented to provide a barrier to surface soil movement.

4. Treatments Within Spotted Owl Activity Centers

No treatment would occur within 650 ft. of spotted owl activity centers. Beyond 650 feet to 2,640 ft. (½ mile) of the owl activity center, surface fuels less than 8 inches dbh will be handpiled and burned, or surface and ladder fuels will be treated through understory burning, and some trees, generally less than 10 inches dbh, may be thinned to reduce ladder fuels.

5. Hand Piling / Hand Pile Burning

Slash generated from surface and ladder fuel cutting and or density management thinning will be hand piled according to specifications described in the SPA. To mitigate resource damage from pile burning, hand piles will be located away from legacy nurse logs, retention patches, wildlife buffer zones, desired leave trees, other special ecological features, and avoid old stumps and rotten logs to reduce "holdover" fire potential. Hand piles will be allowed to 'summer over' at minimum and may be allowed to cure for a period of up to 2-3 years in preparation for burn operations.

Following the development and approval of a Prescribed Fire Plan ("Burn Plan") and a DEQ Smoke Management clearance by USFS, and under the guidance and direction of the Siskiyou Ranger District's Fire Management Officer, and in coordination with COA, LRP and its subcontractors will burn piles. Such operations will occur during the wet season, which is generally between the months of November thru March.

LRP and subcontract crews will provide personnel and burn bosses with the necessary qualifications according to the National Wildfire Coordinating Group and Wildland and Prescribed Fire Qualification System Guide for carrying out burn operations on National Forest lands. LRP will work closely with Parties on public communications prior to burn operations.

In unit areas where hand piles constitute a significant tonnage of biomass per acre, operations may require a multiple entry ignition approach to ameliorate heat output and to protect leave trees and other resources. Swamper burning may be utilized as a method to reduce the scorch to leave trees and retention areas and to minimize associated resource damage in sensitive areas. Two to five hand piles will generally be retained per acre as wildlife habitat.

6. Pruning

Pruning is anticipated within Strategic Ridgeline Treatment Areas. The lower limbs from larger diameter trees will be pruned to reduce ladder fuels and raise the crown base height (height from the ground to the bottom of the live crown) to 15-20 feet, providing vertical discontinuity, further reducing fire risk. Pruning will occur along with other surface and ladder fuel cutting operations, so the limbs can be hand piled at the same time for future burning.

**Prescribed Understory Burning**

***Objectives and Benefits***

Prescribed understory burning ("underburning") is the knowledgeable and controlled application of fire to forest fuels on a specific area under selected weather conditions to accomplish predetermined, well-defined management objectives.

Understory burning is used to maintain or restore fire dependent ecosystems, while reducing accumulated surface and ladder fuels to decrease future fire intensity or severity, and increasing overall forest health and resiliency.

Use of underburning is tentatively planned for fifteen units on approximately 945 acres on the Project. Understory burning will be planned and initiated following surface and ladder fuel treatments and density management operations. The combination of density management, surface and ladder fuel treatments, followed by prescribed understory burning will reduce canopy, ladder, and surface fuels, thereby optimally reducing the potential for severe fires in the future.

The purpose of underburning used in this manner is to reduce the hazard represented by both dead and down woody material; to reduce the amount of fine fuels, duff, shrubs and other live surface fuels present; to maintain the low fuel hazard created with initial fuels treatments; reduce the fuel hazard of activity fuels created during harvest operations; increase availability of soil nutrients, encourage natural species diversity and the natural regeneration of conifers, especially pine, with an overarching goal for creating a more fire resilient forest.

The mosaic burn pattern typically resulting from understory burning helps create and maintain desirable understory structural heterogeneity within and among units. Fire will usually skip over portions of the unit where other areas will burn more intensely regulating the existing fuel profile and creating more of a mosaic of fuel loadings.

***Workforce & Legal Requirements for Underburning***

LRP will serve as the lead contractual entity to implement understory burns for the Project. LRP will provide a workforce and forestry subcontractors with the capacity and experience in underburns. Hired subcontract crews will provide personnel that meet the qualifications under the National Wildfire Coordinating Group and Wildland and Prescribed Fire Qualification System Guide, for carrying out burn operations on National Forest lands. LRP will involve COA and TNC in the selection process and evaluation for hiring contractual organizations for implementing understory burns.

Prior to any underburning, a Burn Plan will be developed by a Forest Service fuels specialist to address burning objectives and operational concerns and will be approved by Forest Service fire mangers. The Burn Plan will guide the implementation based on site-specific conditions (including fuel moisture and weather conditions) at the time of planned ignition, and provide for pre- and post-burn evaluation to monitor the burn and its effectiveness at meeting resource objectives.

Burn Plans include design features to diminish potential of fire to escape control lines, and such design features must be in place before burning is permitted or initiated. Design features include: prescribed weather and fuel moisture conditions to produce fire behavior which can be readily controlled by direct attack; specified numbers of people and equipment required for holding forces; and escape contingency requirements such as the availability of backup forces, both locally and regionally.

In addition to the legal contractual obligations and operational protocols, the Parties will work closely during the development and planning phases for each understory burn, putting Burn Plans through technical review for input and possible modification.

Underburning would be managed consistent with the requirements of the Oregon Department of Forestry (ODF) Smoke Management Plan and the Department of Environmental Quality's (DEQ) Air Quality and Visibility Protection Program. Smoke would be managed to preclude intrusion into air quality maintenance areas when air stagnation conditions exist. These conditions are usually described as "yellow" or "red" wood stove advisory days. Additional measures to reduce the potential level of smoke emissions would include: mop-up as soon as practical after the fire, burning with lower fuel moisture in the smaller fuels to facilitate their quick and complete combustion, burning with higher fuel moisture in the larger fuels to minimize consumption and burn out time, and stopping ignition in early afternoon to minimize smoke carried by evening down-canyon winds to populated areas.

Community Engagement work (see Technical Proposal Appendix TP-B, Community Engagement Plan) will educate members of the public as to the necessity for both pile burning and prescribed burning as well as when burns are taking place.

LRP will follow the direction of the Forest Service Burn Boss for the timing and execution of prescribed under burning operations. LRP will provide a burn boss to oversee and manage prescribed burning operations during the various phases of implementation.

***Implementation Strategies and Approaches***

LRP and associated subcontract crews will implement site-specific understory burns by using hand held drip torches. Directed by a USFS Burn Boss, units will be ignited depending on weather, the lay of the land, and the intensity of the fire needed to meet the goal of the burn.

Underburning will be guided by an approved Burn Plan, the FEIS, and ROD. Understory burns will be conducted at any time throughout the year when fuel and weather conditions permit the successful achievement of resource and safety objectives. Understory burns will take advantage of fuel and duff moisture conditions to reduce the potential for detrimentally burned soils and to maintain effective ground cover. Typically, understory burning is conducted from fall through late spring. Summer or early fall burning is less common, but can be feasible and would be used when needed to meet resource objectives and when the objectives of an approved Burn Plan can be met.

To most effectively utilize understory burning, the boundaries are usually tied to ridgelines or roads, or other areas where control lines can be anchored. The boundaries of understory burns do not always match with areas that have been previously treated (i.e. density management areas). It is likely that areas larger than the initial treatment will be included in the areas prescribed for maintenance understory burning to include both treated and untreated areas and to utilize natural barriers to fire spread.

***Mop-Up Operations and Post Burn Evaluation***

Under the direction of the USFS Burn Boss, LRP and subcontract crews will perform diligent patrol and mop-up within burned areas to prevent re-burn or escaped fires. Once an underburn is deemed out, the results will be evaluated against the FEIS and ROD.

***Prescribed Underburning Resource Protection and Mitigation Measures***

*Soils*

The highly erosive nature of soils in the Ashland Watershed and overwhelming need for the re-introduction of fire to reduce fuel loading create a potential for loss of effective ground cover in a sensitive municipal watershed. Among many measures that will be employed to mitigate or prevent site specific impacts to soils, the most important is retention of effective ground cover, as described in FEIS Table II-7 describing minimum standards for effective ground cover for given slope gradients and years since burn. Particular challenges to ground cover retention will take place in areas of heavier fuel loading and during fall burning. To best stay within the standards for effective ground cover during understory burning, an adaptive management approach can be used. This will be accomplished by monitoring fuel moisture levels (mainly 1 and 10 hour fuels) for several days and then immediately prior to each burn to create a log of changing conditions leading up to the burn, which can then be matched with a semi-qualitative survey of effective ground cover retention and larger diameter fuel consumption post-burn to best achieve Project goals.

Site specific impacts can be mitigated to minimize negative soil effects. Specific soil mitigations on each site will also be implemented. Understory burn control lines ("fire lines") would be constructed where necessary by crews with hand tools to serve as additional anchor points. Fire line construction will be minimized by utilizing change in aspect or use of wet lines to the extent feasible. Fire lines will be constructed as close to the date as possible when understory burning would occur to minimize weathering and erosion. Litter and or duff will be raked back into the fire line after an understory burn is declared out. Erosion control measures (native grass seeding, lop and scatter wood, etc.) resulting from prescribed fire, may be needed and applied to areas of detrimentally burned soil (FEIS II-81) greater than 100 square feet and 5 feet width.

*Legacy and Overstory Trees*

To prevent potential damage to overstory trees, burning would typically occur during the fall to early spring when conditions allow the least active fire behavior. Special efforts will be made to protect legacy trees from mortality resulting from understory burning. Duff should be raked back several feet (ideally a year in advance of burning) to prevent unwanted heat impacts to fine feeder roots or the cambium at the base of trees. Such treatments are especially important beneath large pines, which often accumulate thick mounds of debris. Ignition patterns can be modified during the burn to minimize damage to legacy trees.

*Spotted Owl and Fisher Leave Blocks*

Understory burning will not be conducted within 0.25 miles of Northern Spotted Owl activity centers between March 1 and June 30 (or until two weeks after the fledging period) unless drifting smoke will substantially avoid the nest stand. Fisher 'leave blocks' will be protected from unwanted fire during understory burns by using careful low intensity ignition patterns.

*Riparian Reserves*
Understory burning within Riparian Reserves to achieve fuel reduction and wildlife habitat objectives will preclude direct ignition within 50' of a stream; however, understory burning initiated outside of the 50' buffer will be allowed to back into this buffer as long as the understory burn is of low intensity and the midlevel and upper canopies are not at risk.

The Burn Plan for treatments adjacent to perennial streams will include the objectives of retaining an unburned strip of duff next to the stream averaging between 25-50 feet wide, as well as to retain coarse woody material within 50 feet. These objectives will be met through means such as igniting well outside 50 feet, watering down or removing fuels around at-risk coarse woody material, use of control lines, etc.

**Density Management Proposed Operations**

Density management is the fourth of the primary operational activities and will be implemented for the purposes of this SPA on approximately 702 acres. Density management describes the set of decisions and operations, above and beyond surface and ladder fuel treatments, that are associated with altering stand densities to achieve pre-designated objectives as outlined for the Project (ROD Pages 6-12; FEIS Appendix D). For this SPA, density management includes three job functions: 1) developing silvicultural prescriptions to achieve desired outcomes and help guide stand density reductions, 2) designating or "marking" trees to show which will be cut or left, while keeping tally of those trees, and 3) thinning operations, which includes felling, cutting of limbs and tops, bucking into appropriate lengths, and removal ("yarding") to pre-designated landings, utilizing helicopters or ground-based removal systems. Felled trees may also be retained on-site to function as downed woody debris as needed to meet Project guidelines. Density management will be advanced with technical and public review between each of these three job functions (see Figure 1 above).

***Silvicultural prescriptions***

Silvicultural prescriptions, or plans for treating forest stands, are ideally developed after obtaining accurate biophysical data for individually delineated stands or operational units. Effective prescriptions include:

1. An adequate description of present stand conditions.
2. Management goals or desired conditions to be obtained through implementation of active management strategies.
3. Specified silvicultural treatments and timing of activities designed to meet the management goals or desired conditions, while including interdisciplinary input to maximize attainment of multiple resource values.
4. Monitoring treatment effectiveness to inform future plans for treatments in the spirit of adaptive management.

COA is responsible for conducting an initial walkthrough of proposed units in order to evaluate present conditions relative to desired conditions for the Project, while considering distinctions between PAG, treatment setting, aspect, slope position, basal area, relative density, canopy closure, wildlife habitat, soil conditions, and other factors.

The walkthrough will be used in part to determine the degree to which surface and ladder fuel treatments alone will meet the pre-designated desired conditions. If it is determined that surface and ladder fuel treatment alone will produce desired stand conditions, further development of the prescription will be undertaken by LRP, in coordination with COA personnel. A more detailed silvicultural prescription will be developed by COA on units that require both surface and ladder fuel treatment, and density management to achieve desired fire management and forest health conditions.

These prescriptions will be informed by both qualitative assessments of site and stand conditions, as well as quantitative stand exam data collected during the walkthrough and subsequent traverses to refine the prescriptions.

As presently outlined in the SPA, the preliminary units identified contain variation that likely will require subdivision of the units into subunits in many cases. Subunit delineation may be based on variation in stand and site conditions, previous management history, and/or varied desired future conditions influenced by the configuration of unit boundaries, surrounding units or features and desired functions. In general, prescriptions will focus on thinning-from-below, reducing stand densities to Project targets (e.g. relative density, basal area, canopy closure, etc) and adjusted to the specific conditions in each unit/subunit. Subsequent stand and forest conditions should result in an improved vigor and long-term resiliency of the retained overstory cohorts and associated vegetation, facilitate the potential use of prescribed fire for maintenance of desired forest conditions while reducing the likelihood, severity and duration of future unplanned fire.

Marking guidelines will be developed from the silvicultural prescriptions to provide direction for ultimate determination and marking of trees to be removed/retained to achieve desired stand or unit level conditions. Marking guidelines will help translate silvicultural prescriptions to the on-the-ground realities of thinning trees and their removal during helicopter and/or ground-based operations. Following the development of these silvicultural prescriptions and associated marking guidelines, both technical and public review will provide assessment and input from the Parties and other designated and/or interested stakeholders.

***Marking and Tally***

With marking guidelines as a template, COA and LRP will provide technical oversight and training for a small crew of select individuals hired by LRP. The COA and LRP will work to build a core group of knowledgeable and experienced "markers". Key elements and overarching concerns of the silvicultural prescription and associated marking guidelines for each unit/subunit will be conveyed to crew members. Given that unit/stand conditions vary considerably (both between and within units/stands), and that a host of possibilities for tree removal/retention will usually exist at any one site in a unit, tree selection and marking will be closely supervised to ensure that overall objectives for the given unit/stand are being met.

COA and LRP will tally trees to be retained/removed by species and diameter class. The summarized tally will help provide a unit-by-unit description of trees removed/retained to the Parties, and other stakeholders to inform both technical and public review. This information may will help inform potential contractors.

*Thinning Operations*

Actual cutting and removal of trees pre-designated through silvicultural prescriptions and marking will be offered as a contract to prospective bidders under a "Best Value" format in which individual offers are independently assessed for the greatest likelihood of achieving desired outcomes. Bid proposals will be requested from reputable and qualified companies with a track record of performing commendably in ecologically-sensitive environments. Contract provisions will include desired ecological outcomes and derived performance standards that will be made the responsibility of the contractor. COA or LRP will provide careful oversight and administration of contracts to translate the thoughtfully derived prescriptions and tree marking into "on-the-ground" realities and intended outcomes. Under this SPA, roughly 702 acres of density reduction will be conducted utilizing helicopters as the method of removal, with COA being the lead Party administering this portion of the thinning operations. A small amount of ground-based removal is also possible (with LRP as lead), however none has been identified in the SPA at this time.

Ongoing administration by the Parties, coupled with implementation monitoring following thinning treatments, will help determine if operations are successful in being implemented as planned. Resulting outcomes "on-the-ground" will be used in adaptive management to improve on the next application of density management.

**Proposed Community Engagement Activities**

The residents of Ashland, who began using Ashland Creek as a water supply in 1852, have a long history of active engagement in the Ashland Watershed. They successfully petitioned the President of the United States to create the Ashland Forest Reserve in 1892, 13 years before the establishment of the USFS and designation of the reserve as a "National Forest". COA and USFS negotiated a formal Memorandum of Understanding in 1929 which granted COA standing in watershed management. COA also owns forestland in the Ashland Watershed and has actively managed its lands under the guidance of a citizen staffed Forest Lands Commission since 1994. Citizens formed the Ashland Watershed Stewardship Alliance in 1997 in response to proposed fuel break construction on National Forest lands in 1997, which lead to the adoption of many of the community's proposals as the Ashland Watershed Protection Project in 2000. In 2004, the community completed its Community Wildfire Protection Plan (the "CWPP") outlining the "community alternative" to USFS's proposed Ashland Forest Resiliency Project, and which was molded into the final Preferred Alternative under the FEIS and officially selected in the ROD in fall 2009. Proactive community engagement including participation in volunteer and educational opportunities offered formally through the Project will increase understanding by the interested public.

An offshoot of the multi-party monitoring effort led by TNC and COA during 2009, a community engagement committee is dedicated to involving the community in the Project in several ways ("Community Engagement"). COA will continue to coordinate those efforts and following the Community Engagement plan which is outlined in Technical Proposal Appendix TP-B. Interested stakeholders are working on projects including educational opportunities for local students in grades 6-12, increased involvement of Southern Oregon University staff and students, public communication, tours, interpretive signage, and fund raising.

LRP brings elements of their established program to complement the Community Engagement efforts already underway.

Specific Community Engagement action items will manifest in excellent opportunities for Ashland Middle School and High School students to participate in ecological monitoring. Class trips have already been planned for Spring of 2010 and a sub-committee will be formally establishing relationships and programmatic changes in curriculum to create watershed-based learning opportunities. Southern Oregon University ("SOU"), with the involvement of the Parties, is pursuing similar goals of increased involvement and community service related to the Ashland Watershed and the Project. When results of current efforts with SOU take hold, there will be class and lab sections devoted specifically to the Project and the Ashland Watershed in varying disciplines. Community Engagement will be served through ample opportunities to tour Project work sites, creation of interpretive signage in high traffic areas of the Ashland Watershed, and use of the Project Website to share news and events while allowing access to monitoring data and snapshots of AFR work and plans. Included in Community Engagement are opportunities to provide public review at steps during implementation. At each critical stage of the Project, COA will schedule and advertise public review and comment. See Figure 1 for references to Public Review. The Project Website is already in place and will be continually updated with Project information, engagement opportunities and monitoring results.

**Proposed Marketing of Fuel and Restoration By-Products**

A large amount of the fuel to be removed in the Project may also have value in the marketplace. The Parties intend to maximize, wherever possible, value return to the Project, and subsequent ability to treat more acres, through aggressive marketing of the by-products associated with the fuel reduction and restoration practices prioritized in the Project. These by-products will primarily be logs due to high extraction costs, but can include biomass, posts and poles, firewood and perhaps others. Logs generated in the Project, and in excess of coarse wood requirements, will be offered for purchase to all reputable purchasers, and subsequently sold to the highest bidder. Logs will be removed from the forest to assigned landings where they will be processed and loaded onto trucks for transport to the successful purchaser. Getting these by-products from the forest to the purchaser will be done under separate contract(s) with a reputable contractor(s) with an excellent record of operating with considerable ecological sensitivity. Most of the work under this portion of the Project will be done by helicopter logging systems in order to protect the sensitive soils and watershed processes inherent in this municipal watershed. COA will act as the lead Party in overseeing this portion of the Project. A small portion of the area on the gentlest, least erosive slopes will be treated utilizing ground-based logging systems, with LRP acting as the lead Party for those efforts. All Parties are committed to exploring the possibilities of value-added, niche markets and other opportunities in order to maximize utilization economically, while not sacrificing any of the ecological goals and foundations upon which the Project rests.

## Proposed Multi-Party Monitoring and Quality Control

Community members and other stakeholders collaborated to draft a monitoring strategy for the Project (the "Monitoring Strategy"). The Monitoring Strategy considered other ongoing or already planned monitoring and highlighted desired supplemental monitoring. Great emphasis was placed on implementation monitoring for which the Monitoring Strategy proposed a technical and public review process to improve conformity with Project guidelines and to enhance quality control. The Monitoring Strategy also identified stakeholder values and priorities for the desired baseline and longer term effectiveness monitoring. The Parties anticipate that the Monitoring Strategy as it is revised from time to time will help the Parties and stakeholders to advance their values and their commitments to inform adaptive management in implementing the Project

### *Monitoring Coordination*

In keeping with the identified roles for the Project, TNC will coordinate the technical aspects of multiparty monitoring endeavors for the Project under the SPA, such that:

- Parties collaborate with stakeholders to revise the Monitoring Strategy as a Monitoring Plan (the "Monitoring Plan"), with a budget, and a schedule that is integrated with the Project plans, SPA funds, and potential grant funding proposed or secured from time to time.
- Parties coordinate in collaborating with community members and stakeholders to help ensure that the Monitoring Plan functions as a multiparty monitoring plan.
- Parties and stakeholders adopt consistent or complementary data collection protocols
- Monitoring data are managed, stored, and summarized for science delivery to the Parties and through input to the COA, to other stakeholders.

### *Multiparty Monitoring and Quality Control*

The Monitoring Plan will identify key technical stakeholders to be invited to a technical monitoring team with the Parties' resource specialists. The focus of the technical monitoring team (the "Technical Monitoring Team") will be to provide ongoing technical review of designs, unit layout, prescriptions, tree marking, surface and ladder fuel operations, and density management as outlined in the work flow diagram (see Figure 1) and as defined within the financial plan for the SPA. Review at plan stage, during operations, and afterward, will be the primary basis for monitoring how implementation conforms to Project standards and guidelines. Both quantitative and qualitative observations will be used adaptively, along with other planned operational approaches and safeguards, and observations by USFS contracting officers or their representative (COR), to help ensure quality control.

TNC will coordinate the Technical Monitoring Team efforts, and will assemble implementation monitoring observations and data from the team, including the USFS COR, and will provide summaries to the technical team to inform ongoing review.

TNC will provide, as budgeted in the SPA, a seasonal field technician and administrative support to aid in data gathering and assembly for the Parties. TNC will also contract a data manager/biometrician to complete necessary databasing and analysis, in consultation with the TNC staff biometrician, according to the Monitoring Plan.

TNC will coordinate and schedule technical review sessions which may take the form of meetings, field visits, conference calls, email dialogue, or a combination, at each step along the workflow path (see Figure 1) to generate review and input. Additional review will be provided as TNC and the Technical Monitoring Team together deem necessary. A record of the technical input, both summarized data or observations, and meeting notes will be provided to COA to make available on the Project Website and made available for other interested stakeholders.

***Public engagement in monitoring and review***

The Technical Monitoring Team will also participate in an ongoing series of public review opportunities where other interested stakeholders are invited to comment on designs or plans, view and discuss them in a meeting, or visit the Project in the field. COA will lead public review and the record of input will be taken, summarized, and maintained for the Technical Monitoring Team and made available on the Project Website.

***Effectiveness Monitoring***

The Monitoring Strategy for the Project identified a variety of funded and unfunded monitoring indicators to measure success in meeting stated Project goals. TNC will lead the Parties and other stakeholders in effort to integrate additional desired effectiveness monitoring with the funded effectiveness monitoring in the Monitoring Plan. TNC will work with the USFS to obtain regular reports on the ongoing funded monitoring managed by the USFS, including surveys for the Northern Spotted Owl, baseline monitoring of the Pacific fisher, and botanical survey. TNC will also coordinate with the USFS to make data available for summary and analysis from the ongoing baseline forest inventory plots that provide information on stand composition, structure, age, growth rates, fuels, and understory composition across a wide range of forest conditions in and around the Project. TNC and COA will provide staff time on plot inspections to assist USFS in maintaining quality control for the baseline inventory data. The baseline forest inventory data will be summarized and entered into the Project database annually after the data is proofed by the USFS. TNC will manage the work of a database manager and biometrician to produce annual summaries of the data, including analysis of derived indicators as set out in the Monitoring Plan. The database and summaries will be delivered to the COA to make available on the Project Website.

Due to insufficient funding the Monitoring Plan will also incorporate additional prioritized effectiveness monitoring to be identified as unfunded needs that may become a focus for the future fund-raising efforts of the Parties and/or other stakeholders. These needs include, at minimum, repeat measures of the baseline data taken on a post treatment schedule to be identified in the Monitoring Plan. Efforts may also focus on funding for water quality monitoring, riparian area function, continued bird monitoring, herbaceous layer recovery, fire history, and others as funding may be available.

## Organizational Capability and Experience

### *City of Ashland*

COA brings a substantial history and well-established institutional capabilities at successfully conducting sound forest, resource, and watershed management within the Ashland Watershed and adjacent wildland/urban interface lands. Under the auspices of COA's Fire Department, led by former Fire Chiefs Keith Woodley and current Fire Chief John Karns, and with consistent technical guidance by Marty Main of Small Woodland Services, Inc., and a very effective and professional volunteer Forest Lands Commission, COA has displayed a unique ability to represent a diversity of strongly-felt perspectives while still conducting the "business" of owning and managing forestlands and simultaneously guiding citizens to more active engagement in the care of their own lands.

Since 1992, COA has formally managed nearly 650 acres of municipal forestlands for the benefits of fire threat abatement, watershed protection, and ecological sustainability. Management is directed by a volunteer Forest Lands Commission, stemming from the 1992 *Ashland Forest Plan.* With assistance from consulting and contracting forester Marty Main and his cohorts at Small Woodland Services, Inc., active management on COA lands has included development of numerous silvicultural prescriptions and other professional survey work; more than 300 acres of surface and ladder fuel thinning and slash treatment, as well as over 100 acres of additional maintenance of that work; initiation of several prescribed underburns; execution of 4 commercial restoration thinning projects, including a helicopter thinning of 180+ acres of the lower Ashland Watershed in 2004. Active programs of native grass establishment, noxious non-native weed abatement, trail maintenance and restoration and legacy tree protection; and a monitoring and inventory plan, including 205 permanent plots installed in 2000, and recently remeasured. COA has also sponsored an aggressive fuels reduction grant program using National Fire Plan funds to leverage over 2000 acres of thinning on over 250 private ownerships across the city's urban interface zone and abutting federal lands and the Project area. Led by Forest Resource Specialist Chris Chambers, this work has helped integrate Project goals across multiple scales and ownerships.

Woodley, Karns, Chambers and Main were also instrumental in the development of the CWPP, with an associated Community Alternative that largely formed the basis for the Preferred Alternative selected for implementation as the Project. It is believed that the use of a Community Alternative as the preferred alternative in a USFS-sponsored project is a first in the country. Karns, Chambers and Main are actively involved in the emerging cooperation in implementation of the Project by the Parties.

### *The Nature Conservancy*

TNCs mission is to preserve the plants, animals and natural communities that represent the diversity of life on Earth by protecting the lands and waters they need to survive. TNC has more than 50 years of conservation experience and is well-known for a collaborative and effective approach to land and water conservation.

For over 30 years, TNC has used controlled burns and other restoration tools to help restore habitats and native species on lands managed in southwest Oregon. TNC's ongoing adaptive management calls on varied and detailed implementation and effectiveness monitoring and at times research. Through its Global Fire Initiative, TNC is also assisting agencies, organizations and communities to find lasting solutions to the challenges posed by altered fire regimes. In 2003, TNC launched the Northwest Fire Learning Network, establishing cooperative arrangements at four landscape projects to fill data gaps and bring together collaborative efforts to enable development of stand-specific maps showing prioritized restoration actions.

TNC responded during the scoping process for the Project, and began collaboration with others in the Ashland Watershed in 2004 at the request of the Ashland Forest Lands Commission. TNC staff assisted with writing the Community Wildfire Protection Plan and the Community Alternative forwarded to USFS. TNC subsequently has participated in the ongoing collaboration among the parties and the community, helping to foster agreement and understanding in the complex social and environmental setting. TNC sponsored a National Forest Foundation ("NFF") grant from October 2008 through September 2009 (the "NFF Grant") to support Community Engagement in writing the Monitoring Strategy, a draft Community Engagement Plan, creation of the Project Website, and participated in leading tours for stakeholders, and other communications.

TNC's principal staff on the Project includes Darren Borgias, Mark Stern, Nathan Rudd, and Keith Perchemlides. Darren Borgias holds a Master of Science degree in biology with an emphasis in plant ecology and has worked in the endeavors cited above for 23 years. Darren has planned and implemented prescribed fire, and other restoration actions, including fuels reduction and tree thinning, and addressed ongoing monitoring and research needs on the dozen existing preserves in southwest Oregon and projects on federal and state lands. Mark Stern is TNC's Klamath Program Director, has a Master of Science degree in wildlife ecology and has over 25 years experience in conservation action, including supervising TNC's multimillion dollar restoration and endangered species recovery projects at Sycan Marsh and Williamson River Delta, and helping support major research projects such as the Birds and Burns Project carried out in conjunction with the USFS at multiple sites in the West. The monitoring efforts coordinated by TNC will be supported in part by Nathan Rudd, Biometrician, who holds a Master of Science degree in ecology with a minor in statistics. Nathan supports statistical data summary and analysis for TNC monitoring and research projects in Oregon. Keith Perchemlides holds a Master of Science degree in botany/plant ecology and provides field ecology expertise to all TNC projects in southwest Oregon. Keith gained applied forest mensuration and monitoring experience working for researchers at the USFS Pacific Southwest Sierra Nevada Research Center contributing to research on the Quincy Library Group forest management projects in northern California, and has published research on fuel reduction thinning treatments and vegetation response in shrub and oak systems in the Applegate River Watershed of southwestern Oregon.

***Lomakatsi Restoration Project***

LRP is a non-profit organization formed in 1995 to develop and implement pro-active community-based ecological restoration projects and programs throughout the Klamath-Cascade-Siskiyou ecoregions of southwestern Oregon and northwestern California. Lomakatsi achieves its goals through education, vocational training, specialized workforce development, and the utilization of restoration by-products, encouraging the recovery of ecosystems and the sustainability of communities, cultures and economies.

Over the past 15-years, LRP has performed over 9,500 acres of fuels reduction, prescribed fire, and ecological forestry treatments within the WUI, matrix lands, scenic corridors, and LSR's , working for federal agencies, private landowners, city and park municipalities and land conservancies.LRP implements a wide spectrum of forest and watershed projects by partnering with federal and state land management agencies through cooperative agreements and contracts.

LRP has worked extensively throughout the widely diverse forests and watersheds of the Klamath Siskiyou ecoregion and is well versed in the vegetation, the behavior of the varying degrees of forest fuels, seasonal weather conditions, and terrain. Accordingly, -its silvicultural prescriptions and work practices focus on restoring the varying forest types and woodlands found throughout south western Oregon and north western California. LRP's project planners and work crews are accustomed to developing and implementing site specific treatments throughout this diverse landscape, in an effort to begin the process of restoring these complex forest communities, while simultaneously reducing the threat of severe uncharacteristic wildfire's and providing small diameter and biomass materials from thinning operations.

*National Fire Plan Projects*
Since 2001, LRP has maintained a cooperative agreement with the regional BLM office in Portland through the National Fire Plan. LRP has designed and obtained funding for fourteen National Fire Plan projects in Jackson and Josephine Counties, treating 1,200 acres for hazardous fuels reduction

*Habitat Restoration Projects*
Fish habitat, stream improvement, riparian restoration and oak woodland enhancement projects have been accomplished by LRP on private lands, through a long standing cooperative agreement with the Klamath Falls USFWS office, with funding from federal wildlife conservation programs. LRP is funded through ODFW Restoration and Enhancement program for the operation of four community native plant nurseries used for riparian enhancement projects.

*Federal Land Stewardship Contracting*
Since 2004, LRP has been one of the leading contractual entities for the implementation of long-term federal land stewardship contracts and agreements, on BLM and USFS lands in southern Oregon, currently providing 45 full time jobs. Under the stewardship authorities, LRP has completed surface and ladder fuel, density management and prescribed fire treatments on 2,000 acres. Workforce training, community outreach, education and collaboration, have also been key program components for these projects. Small diameter poles, saw logs and biomass have been provided to local mills and processing facilities through LRP's stewardship projects.

*Ashland WUI Fuels Reduction Projects*
For the past eight years, LRP has been awarded contracts with the COA, Ashland Parks Department and private landowners where over 300 acres of fuels reduction treatments have been implemented in the Ashland WUI.

*Forest Health Projects*
Forest health treatments, forest stewardship management plans and timber stand improvement treatments have been accomplished by LRP on private lands, through ODF, CDF and NRCS cost share programs.LRP has provided additional ecological stewardship services to hundreds of landowners, on an additional several thousand acres, throughout the region.

*LRP Staff and Workforce*
For the past fifteen years, LRP has been creating jobs, developing workforce, and furthering contractor capacity throughout southern Oregon for the emerging ecological restoration and stewardship forestry industry. LRP's training programs in the region have provided it with a skilled local workforce and project management professionals. The LRP crew is a 'best value' ecologically conscious workforce. LRP's leading saw-crews comprise a specialized technical thinning team that is accustomed to carrying out detailed ecological prescriptions. LRP's crew managers are knowledgeable in the diversity and complexity of local fire- adapted ecosystems. Crews are regularly trained in fire ecology, soils, wildlife habitat, plant associations, watershed function and health along with all the necessary skills to perform on the ground work. LRP's executive leadership is shared by two co-directors, Marko Bey and Justin Cullumbine, who collectively provide the variety of necessary skills necessary for operating, and managing all aspects of the organization. LRP provides its staff with frequent educational opportunities by organizing workshops, and training programs for expanding and upgrading the skills of its personnel.

Marko Bey, Co- Director and LRP's co-founder, oversees all aspects of planning, development, and operations for the organizations projects and programs. Over the past 22 years, Marko has worked within a variety of diverse landscapes and ecosystems where he has developed a wide range of on the ground technical expertise in the practices of ecological forestry and watershed restoration. For eight years he was a lead laborer, inspector, agency liaison, and crew boss for mobile forestry service contractors, working on federal lands throughout six western states. Since LRP's inception in 1995, Marko's responsibilities have included grant writing, technical planning, supervision of workforce operations, and co-management of contracts, and cooperative agreements with federal and state land management agencies, city municipalities, and private landowners. He designed LRP's *Ecological Restoration Workforce Training Program,* which provides training for forest workers in holistic ecosystem management and stewardship forestry. In addition to many years of field and program management experience, Marko has supplemented his education through self study, training seminars, internships and certification programs, learning from a variety of recognized forest and watershed resource professionals.

Justin Cullumbine, Co-Director and co-founder of LRP serves as the organization Contract Administrator and Chief Financial Management Officer. Prior to Justin's involvement with LRP, he worked as a laborer and crew boss on federal and private land contracts. He was a member of the mobile workforce for four years, planting and thinning trees, climbing trees for seed collection and working as a timber faller and bucker on logging crews. Justin has been working in ecosystem management and ecological restoration for the past 16 years. He is a key member of LRP's planning and program development team, working closely with other staff members to design community based forest and watershed restoration projects and programs. Justin also has been instrumental in working with local landowners and in collaboration with land management agencies, coordinating the crafting of regional project proposals for the National Fire Plan, RAC, OWEB, U.S. Fish and Wildlife Service, etc.

**Contractor and Workforce Training**

Since 1999, LRP has pioneered on-project training to develop workforce capacity and inspire community business infrastructure that will support a long-term restoration based economy for rural communities throughout southern Oregon. LRP's *Ecological Workforce Training Program* is designed to demonstrate, collaboratively develop, implement and evaluate restoration forestry in extremely dense fuel-loaded forests. LRP has promoted replication of a multi-stakeholder, consensus-building forest restoration model across southern Oregon. LRP has provided both in-class and on-the-job-training for over 330 participants during federal and private lands restoration contracts and projects.

Through LRP's training programs, local intern-workers receive training and retraining in a diversity of skills for holistic ecosystem management, including selective logging of small diameter trees. Treatments focus on the utilization of biomass materials for a variety of value added restoration by-products. Training sessions also build community-wide capacity and demonstrate a workable model while implementing projects that serve to reduce extreme fire hazards, improve riparian and stream habitat for salmon on intermingled private and federal land, and help restore oak woodland, meadow and conifer forest habitats located in Late-Successional Reserve (or "LSR") areas.

Developed in conjunction with active projects and contracts that LRP is implementing on federal and private lands, training programs are separately funded through matching federal and private grant dollars to subsidize the added costs for training workers. Over the past decade, LRP has emphasized training and development of a new workforce of otherwise unemployed, underemployed residents and displaced timber industry workers. Work in rural communities throughout southern Oregon has served to break down diverse interest and position-based polarization between industry stakeholders, landowners, environmentalists and federal agencies. Multiple contractors, equipment operators, and other locals have recently contacted LRP to find out how to get involved.

LRP also promotes and mentors planning, monitoring and business development opportunities, including native plant nursery development, round wood marketing, and contract licensing that promotes sustainability. LRP staff co-convene community collaborative stewardship meetings, project workshops and workforce meetings throughout the year.

LRP's training programs have been funded through the following federal, state and private programs including: *ARRA, National Forest Foundation-Matching Awards Program, Jobs In the Woods, National Fire Plan, Resource Advisory Committee Title III and Title III, Rural Business Enterprise Grants, Community-Based Organizing Grants (Alliance of Forest Workers and Harvesters), Tides Foundation.*

## III. Financial Operating Proposal

TNC's role as lead fiscal entity for the other non-USFS Parties under the MSA and the SPA shall be as follows:

- TNC will develop separate sub-award agreements with COA and LRP that detail each Party's portion of the funds made available by USFS for the Project, invoicing, reporting, document retention and other necessary provisions.
- Pursuant to those subawards, TNC will disburse funds under such subawards to COA and LRP, based on invoices submitted to TNC.
- TNC will invoice USFS under the SPA based on work completed by TNC and the other non-USFS Parties on a quarterly basis and receive payment from USFS. TNC's invoices will be based on a per unit cost of treatments completed; however, TNC will also be allowed to bill non-treatment costs on a prorated basis divided equally between all treatment costs. TNC will set up a separate grant accounting center to track the funds received from USFS and their disbursement.
- TNC will prepare and submit quarterly reports (financial and programmatic) as required by ARRA.
- TNC will maintain source documentation to substantiate its expenditures per the MSA and SPA, but shall be entitled to rely on COA and LRP to maintain the appropriate source documentation to substantiate the expenditures each Party makes and has invoiced TNC
- TNC will not be acting as either COA's nor LRP's fiscal agent, in that TNC will not be managing either Party's financial systems, payroll, etc.

## Technical Proposal Appendices

| Appendix | Description |
|---|---|
| TP-A | Monitoring Strategy |
| TP-B | Community Engagement Plan |
| TP-C | Notes from Public Engagement Workshop |

## Appendix TP-A: Monitoring Strategy

**This version of the strategy is based on the October 2009 draft prepared by the Parties and other stakeholders and has been updated to reflect changes in the Project circumstances including the signed ROD.**

**Executive Summary:** The collaborative effort to plan and implement monitoring around the proposed Project has resulted in the Monitoring Strategy which is described in this Appendix and its attachments. The Monitoring Strategy considers stakeholder values and priorities and proposes to gain leverage by integrating priorities with other ongoing or planned monitoring. Monitoring considerations are introduced below, followed by a proposed process for collaborative project implementation that incorporates multiparty review and monitoring. A wide range of proposed effectiveness monitoring is captured in the Monitoring Strategy. The Parties anticipate using the Monitoring Strategy to help the Parties and other stakeholders to collaborate further to develop a cooperative plan for monitoring with roles, responsibilities, a budget, and a timeline that reflects commitments of the Parties and other stakeholders in the Project.

### I. Introduction

Monitoring is an essential component of adaptive management. By tracking and informing ongoing project implementation, monitoring helps ensure plans are followed, and measures success in meeting goals and objectives. The term "monitoring", as it is used here, includes both making observations (e.g. data collection), and evaluation of data. Implementation monitoring tracks project activity before, during, and after to ensure that design features, standard practices, and mitigation measures are implemented as specified within thresholds set by laws, regulations, applicable standards, or critical objectives so that the activity or the project may be modified as necessary. Effectiveness monitoring evaluates whether or how well planned activities achieved desired project outcomes. Validation monitoring evaluates if key assumptions hold true. Feedback from each type of monitoring provides the basis for learning which can inform ongoing implementation of the Project and future Project plans.

Significant public interest in collaborative monitoring for the Project was expressed during the environmental planning process. COA, in its CWPP, recommended that COA participate in implementation and monitoring of the Project[1]. COA also participated in securing funds to support multi-party monitoring for the Project through its commitments to the NFF Grant. TNC helped develop the CWPP and originated the proposal for the NFF Grant, and provided matching funds. In light of the significant interest expressed in such an approach, and consistent with the Healthy Forests Restoration Act ("HFRA"), under which the Project was developed, USFS was instructed to establish a collaborative multi-party monitoring, evaluation, and accountability process[2]. Three of the Parties, not including LRP, worked together with interested stakeholders toward that end.

[1] City of Ashland, 2005. Community Wildfire Protection Plan, pg 26.
[2] HFRA Section 102(g)(5)

## A. Monitoring Cooperation

A considerable collaborative effort by the Parties and other stakeholders has developed the Monitoring Strategy to inform monitoring that is robust enough to serve the Project, providing for ongoing assessment of change. Since 2004 the USFS, TNC, and COA have worked together with interested stakeholders to develop the Monitoring Strategy with strong support and wide buy-in that could inform the commitments to collaborative monitoring effort.

The Monitoring Strategy addresses key priorities suggested by stakeholders for special attention. Clarifying expectations and coordinating efforts is necessary to avoid duplication of effort and to build a stronger monitoring program. Implementing the Monitoring Strategy is subject to available funding among all of the Parties and other interested stakeholders.

## B. Monitoring Oversight Committee

An Oversight Committee (the "OC") was formed to advance multi-party monitoring. The OC was comprised of representatives of USFS, TNC, and COA, each contributing matching, or cash, funding for multi-party monitoring under the NFF Grant. The OC coordinated collaborative planning for ecological and social monitoring consistent with the 2004 Healthy Forests Restoration Act ("HFRA"), as well as requests by COA and stakeholders. The practice of the OC was to engage the community to increase understanding and transparency and to support adaptive management through effective monitoring, and to provide opportunities for community involvement, including citizens, local students, and interest groups.

To that end, the OC invited interested technical stakeholders to a workshop in June 2009 to help identify and prioritize important monitoring. The group emphasized several monitoring practices, strategies, and indicators for special attention. The most important **strategy** was to develop a Monitoring Plan and a design that is comprehensive, long-term, and fundable. The group also placed emphasis on developing an approach and tools for science delivery. Emphasis was placed on implementation monitoring to ensure actions meet desired goals. Groups of community leaders and public outreach, education, and engagement experts convened in August 2009 provided additional insight.

The Monitoring Strategy represents the OC's effort to date to respond to the stakeholder interest in developing a comprehensive, long-term, and fundable Monitoring Plan and design for the Project.

The stakeholder group placed highest emphasis on two **indicators**: *water quality, quantity and aquatic habitat*, followed by *large tree retention and survival*. A second tier of important monitoring indicators included *late successional habitat, birds as ecosystem indicators, herbaceous cover and recovery, and fire history research.* These are addressed in the following sections.

The Monitoring Strategy describes a collaborative approach to monitoring, and it includes monitoring that represents broad interests, including effort that will be required of USFS through commitments made in the ROD. The Monitoring Strategy describes the elements of its design,

then describes proposed implementation monitoring, followed by effectiveness monitoring. Finally, the Monitoring Strategy sets out a process for coordinating the monitoring efforts and communication among the Parties, interested stakeholders through the life of the Project.

### C. Science Delivery—a Project Database and Website

To address the science delivery interest of the stakeholders, the OC approved contracting for assistance from Portland-based Mason, Bruce, & Girard to input existing data and prepare for future data in a publicly accessible Project database. The OC has also contracted with Ashland-based Project A to build the Project Website to allow access to the data and data summary products. The Project Website will be maintained by COA to facilitate communication among collaborators as well as with interested members of the public.

## II. Monitoring Considerations

Fundamental drivers guide the Monitoring Strategy. The first addresses accountability for implementing the Project according to plan, or "implementation monitoring". The drivers for "effectiveness monitoring" are the purpose and need that guided design for the Project treatments. At a minimum, effectiveness monitoring must assess how effectively potential fire behavior, hazard and risk to COA, the Ashland Watershed, and significant late-successional wildlife habitat are reduced by Project treatments. Monitoring must also assess how effectively activities increased ecological resiliency, as defined in the Project plans.

### A. Monitoring Scale and Schedule

The Monitoring Strategy considers multiple spatial and temporal scales, ranging from an individual tree to the entire landscape in the Upper Bear Creek Assessment Area[3] that contains the Ashland Watershed and surrounding slopes. For example, a stakeholder may want to track the fate of a single, special large tree that has meaning, while an ecologist may want to know how well the forested landscape reflects the natural range of variation and provides a range of wildlife habitat. Other important scales of focus include a stand of trees, a particular landscape setting (e.g. an upper southwest facing slope), a management unit, a PAG or forest type, a seral state, the extent of differing treatment types, or combinations of these. The decisions on what to monitor is driven by the relevant facet of nature or management that is valued, or about which there is concern.

Temporal scale is also critical. Some measures need to be taken and evaluated during Project implementation to help avoid misapplication of the Project, before and during an "activity" (e.g. cutting and piling brush and sapling trees), or following an activity or between multiple activities that are part of the complete "treatment" in a unit (e.g. between burning piles and thinning trees). Subsequent maintenance through later cutting and piling, or broadcast burning would be considered a separate treatment. Other measures must be taken prior to any treatment and then

[3] The Bear Creek Watershed (a 5th field watershed) totals approximately 361 square miles (231,087 acres). While FRCC generally examined at the 5th field scale, the Upper Bear Assessment includes all lands within the Ashland Creek Watershed, and portions of the Neil Creek, Hamilton Creek, and Wagner Creek 6th field sub-watersheds.

assessed for change after treatment is completed, for example, 1, 5, 10, or more years post-treatment. It is not possible to measure everything from every perspective or at every time step. Instead the Monitoring Strategy proposes the most appropriate time and scale for a given indicator.

### B. Monitoring Observations, Sampling, and Statistics

Monitoring can be informed by many types of observation. As important as choosing the appropriate scale, discussed above, is accounting for variation in nature and among observations. The science underpinning forest and fire management and ecological restoration leads some observers toward formal sampling and statistics to provide quantified results, and these are a part of the Monitoring Strategy. Qualitative assessments are also valuable, and may be more efficient and meaningful in some situations and if provided by trained, experienced observers, whether professional resource managers or conservation practitioners. Qualitative assessment is especially important for ongoing implementation monitoring.

Pilot data is useful to understand how much variation occurs in the forest for a given measure, and can help set realistic expectations around sampling size, statistical power, precision and confidence in the data. A classification of sampling area, or "stratification" of the sampling effort, can also be helpful for reducing variation encountered in data and increasing the ability to detect differences in analysis.

The Monitoring Strategy draws on both professional observation and sampled measures, includes design informed by pilot data, and draws on the power of thoughtful stratification in the sampling design. A schedule for monitoring each indicator is proposed. Parameters are defined for each indicator to the extent possible, while some still need to be developed, and annual review and refinement will need to occur. Indicators are classified as relatively certain, having a defined range but needing further definition, or yet to be established, anticipating that monitoring will inform that definition. Finally, some measures are taken to provide perspective for management decisions and have no established thresholds.

## III. Implementation Strategy

The Monitoring Strategy proposes a collaborative review and monitoring process involving stakeholders in each stage of the Project implementation. Stakeholders would participate in the Project, informing it, and making adjustments in a "shoulder to shoulder" approach with one another and the Parties.

### A. Implementing Project Design

Because Project-specific treatment units and prescriptions have not yet been defined, "implementation" of the Project, as viewed by stakeholders, includes further design work, layout, and site specific prescriptions, which the Parties and stakeholders are interested in reviewing and monitoring in a collaborative approach.

## 1. Multiparty Monitoring Leadership and Coordination

Stakeholders interests would be represented by the Parties, including COA, through its Fire and Rescue staff and COA's forestry contractor, and TNC, which has delivered ecological and programmatic input through its staff involvement and fund-raising for the Project. Additional new members of the leadership group working on the Monitoring Strategy are anticipated. Leadership requires a willingness to invest in the collaborative process, in on-the-ground monitoring, and/or in analysis or interpretation of data. Participation in the leadership core requires a considerable time investment to stay current with the Project and avoid scheduling delays. Stakeholders invited to a public engagement workshop in August strongly urged that Southern Oregon University provide a leadership role in the Monitoring Strategy. Other stakeholders may be invited to participate in the monitoring or other informational events, or to track progress and results on the Project Website, or to step into a leadership role where monitoring is concerned.

## 2. Tracking Implementation

In order to track implementation of the Project, a record of the current status of treatment activities, including the anticipated schedule for implementation as well as the status of completed treatment activities, will be maintained on the Project Website.

## 3. Implementation Review

The Monitoring Strategy proposes offering opportunities for technical review and a more-general public review at important steps. While such review requires time and investment of effort above and beyond past or standard practices for each of the Parties, it is important for making the Project transparent, to provide opportunities for meaningful collaboration, incorporate evaluation of monitoring data, or feedback, and shared learning. It is anticipated that review will naturally gain efficiencies over time as new findings, expectations, and adjustments become common fare, and adjustments are made to produce planned results.

The leadership team for the Parties will take the lead role in managing timely review, by coordinating schedules and helping to share information and updates on the Project Website, in meetings, or field outings. Review would occur after a proposed design is developed, after each unit is laid out, after a unit specific prescription is written, and after each activity (e.g. marking trees, slashing and piling, burning, cutting trees), and completed treatment. Review would occur in two stages; a technical review and a public review when requested.

A technical review stage would be led by the Parties, but would invite participation by other technically inclined stakeholders. The technical team would review and discuss with USFS the preliminary implementation plans for all or a part of the Project in light of the overall Project plans, monitoring data and observations. The review could take the form of comments on a plan document, a meeting to discuss a document or observations or data summary, or a field outing to evaluate and discuss a layout or tree marking. Review may entail all three.

Public review would be coordinated after the Parties have considered technical input, and considered possible adjustments to implementation. The Parties would offer a public review on both the Project Website via hyperlinked documents, photos, or interpretations, and via a field outing when interest is expressed.

## IV. Implementation Monitoring

Implementation monitoring assesses whether treatments were implemented according to design, including appropriate mitigation measures and management constraints. Stakeholders elevated the importance of securing baseline data to inform the Project design and, if gathered in the future, to document changes resulting from the treatment for future reference and how these changes compare to planned changes. The following questions form the basis for the implementation monitoring basic to the Project:

1. Were treatments implemented according to design criteria, including appropriate mitigation measures and management constraints, outlined in the plans for the Project and the subsequent decision?
2. Were fire hazard reduction treatments implemented according to the schedule outlined in the decision document?
3. Did the treatments meet or exceed key land use plan *standards and guidelines* for direct effects?
4. Did the resultant vegetation and fuels conform to conditions intended in the plans for the Project?

### A. Implementing Treatments and Monitoring

Elements of implementation monitoring are captured in brief on Attachment A to this Appendix, and in greater detail in Attachment B to this Appendix.

Implementation monitoring for USFS is typically carried out by a combination of a contracting officer, or their representative, or by technical specialists, such as a botanist, geologist, soil scientist, wildlife biologist, or hydrologist, to make certain observations. Most of this monitoring is informed by qualitative professional judgment, on a unit by unit basis. Professional judgment is improved over time by reference to new scientific information, perspective, and summary and interpretation of quantitative data at various scales. Qualitative monitoring is useful for determining general trends, spot checking that basic assumptions appear to be correct, or to aid in determining treatments which may need quantitative monitoring due to unexpected outcomes. The anticipated minimum standard for qualitative monitoring is a walk-through and narrative text describing conditions relevant to the design criteria, prescriptions, constraints, and mitigation in the treatment area. Simple and quick measures of different conditions and photographs may be taken and included in the narrative. It is important that such walk-through monitoring be conducted both before treatment activities have begun and after they are complete. Funding for this basic implementation monitoring is anticipated to be allocated from Project funds.

## B. Supplemental Implementation Monitoring

Stakeholders suggested the importance of implementation monitoring during the June workshop to help ensure that the Project's concept, design constraints, and mitigation measures were effectively implemented. Key stakeholder concerns during implementation are the retention of larger trees, protection for late-successional habitat, the protection of soils, and recovery of herbaceous cover.

### 1. Large Tree Retention and Survival

The Monitoring Strategy proposes that technical and public review will include special consideration for large tree retention in the Project, and that large trees are provided treatment to reduce mortality rates. While other proposed monitoring in the Monitoring Strategy is designed to capture how well the Project performs in this measure in total, by forest type, or by treatment, the emphasis here is on a tree by tree tracking in each unit. While the emphasis for thinning in the Project is thinning "from below", or starting with the smallest trees, while retaining "cohort 1" trees (also described as legacy and heritage trees), the Project provides flexibility needed by managers in what size tree to thin in order to address fire threat and forest health issues. Cohort 1 trees, defined in the community alternative, generally predate the fire-exclusion era, and are typically larger than 25" DBH (diameter at breast [4.5'] height). They may dominate stands in terms of both canopy stature and biomass, or comprise a secondary or even minor part of the biomass of the forest where dense infill of younger trees has occurred or where the cohort 1 trees where sparse. Their retention and treatment is a primary consideration for the various functions large trees serve while living, as snags, or down logs.

The technical review will consider cohort 1 trees including both those prescribed or marked for thinning and those not. A representative sample of observations and photos of the cohort 1 trees marked for thinning and or treatments to enhance survival will be uploaded on the Project Website for transparency. A general public review will be coordinated if requested. Implementation monitoring will include follow-up verification that un-marked trees were not cut. If the technical review discovers unmarked cohort 1 trees are cut, the causes will be considered and proposed changes in operations discussed.

### 2. Late Successional Habitat

Stakeholders placed a high priority on sustaining late successional habitat for dependant species, for which the watershed was included in an LSR under the Northwest Forest Plan, and especially the Northern Spotted Owl, for which the watershed was designated Critical Habitat by the US Fish and Wildlife Service. Technical and public review during the design, prescription writing, and implementation will be important. A variety of existing data and proposed data will help inform the group about this habitat and where it occurs relative to implementation

### 3. Riparian Protection

The Project provides setback buffers around riparian habitat to leave it untreated, and proposes treatment not to exceed 50% of the upland forests nearby within the Riparian Reserves as established by the Northwest Forest Plan. Treatment intensity would also diminish toward the setbacks. Implementation monitoring by USFS for these Project design features is anticipated, and the implementation strategy would provide technical and public review.

### 4. Effective Ground Cover for Soil Protection Abating Sediment Delivery

While other monitoring is designed to capture evidence of altered sediment in the branches of Ashland Creek, unit by unit consideration of sediment sources, erosion mitigation, and effective ground cover is a required focus of USFS implementation monitoring, and will be made a focus for supplemental monitoring by stakeholders. This proposed effort will provide a double check on the adequacy of unit design, prescription parameters, operational methods, including planned mitigation. Follow-up on site monitoring of operations and effectiveness of mitigation will also be made.

### 5. Herbaceous Layer Recovery

Response to the treatment in the herbaceous layer, especially concerns about invasive non-native species, sensitive species, and other native species recovery was emphasized as important by stakeholders. Non-native invasive species and sensitive species will be tracked in unit by unit survey and mapping by USFS. Supplemental implementation monitoring will provide technical review of previous USFS efforts, and provide a general public review if requested.

### C. Tracking Implementation Monitoring

Monitoring observations will be maintained in a database, currently proposed to be FEAT/FIREMON Integrated (FFI)[4], a federal inter-agency developed, publicly available designed to hold both quantitative and qualitative monitoring observations. Data entry for unit-based qualitative implementation observations has not yet been tested.

## V. EFFECTIVENESS MONITORING

Effectiveness monitoring, to be relevant to manager and stakeholder concerns should answer questions about performance on Project goals, in this case, functions of ecological or social resources or risks associated with them. It is important that monitoring methods are on point, technically feasible, minimize measurement error, and are efficient in accounting for natural and social variability over time and space.

The effectiveness monitoring which is proposed for the Project answers questions concerning whether the implementation of proposed treatments are effective in achieving USFS's purposes

[4]http://frames.nbii.gov/portal/server.pt?open=512&objID=483&&PageID=2216&mode=2&in_hi_userid=2&cached=true

and need for the Project, as well as goals and objectives of USFS land management allocations over the Project area which will guide the Project. Stakeholders have many of these same questions and additional questions.

While some questions may be answered immediately after treatment when re-measured, other answers require passage of time to develop and may require five or ten years, or longer. Modeled results based on change in selected measurements may provide answers for some questions (e.g. probable fire severity based on mapped fuel models), while others are more direct (e.g. tree protection during design and operations). The proposed effectiveness monitoring is outlined below.

**A. Developing an Effectiveness Monitoring Proposal**

Effectiveness monitoring questions were identified by Project stakeholders assembled for the Ashland Forest Resiliency Community Alternative Technical Team in 2005-2006. These questions were largely incorporated in the FEIS as proposed for effectiveness monitoring, along with a recommended monitoring methodology[5]. The OC translated the questions into measurable indicators when possible. Appropriate scales in space and time were considered for each, along with methods for measurement. Stratification of the Project area into forest types defined by plant association group, by seral state, and basic structural classes was discussed, along with the desire to have a minimum of five sample plots allocated in each type and in treated and untreated (control) areas.

**B. Integrating Existing or Previously Planned Sources of Baseline Monitoring**

At least seven ongoing or proposed projects will provide useful data in the Ashland Watershed. Four of these are described here, followed by the remainder of the list.

**1. Forest Insect and Disease Plots**

Forest Insect and Disease Plots stand exam plots were established by USFS Forest Health Protection staff of the Southwest Oregon Forest Insect and Disease Service Center in the Ashland Research Natural Area in 2004-2005. These 40 permanent, fixed and variable radius plots, arrayed on a grid with a random start, provide a valuable source of baseline data that may serve the Project. The plots provide basic data on the tree, shrub, and herbaceous layer, down wood, fuels, and the location, distribution, and severity of dwarf mistletoes and root diseases and the causes of tree mortality for that portion of watershed.

**2. Vegetation Data to Train LiDAR Imagery for Forest Mapping**

An ongoing USFS program to map vegetation on the Siskiyou Mountains District using light detecting and ranging ("LiDAR") technology will provide a dense array of on-the-ground stand exam plots in and around the Project area. The OC collaborated with the USFS staff working on the LiDAR project on ways that forest sampling could also serve baseline monitoring for forest

[5] Ashland Forest Resiliency FEIS, II-92-94.

conditions in the watershed. Some 700 permanent plots will be read starting fall 2009. The plots layout was stratified by modeled PAG and seral/structural state, and actual plot locations are randomized. TNC and COA have proposed to provide technical staff assistance to provide accuracy checks for the planned data. Plots will be taken in locations planned to represent the range of proposed treatment types as well as probable untreated control areas, and spanning the range of forest conditions. The locations of a proportion of those plots were coordinated with existing USFS ecology, insect and disease, and Forest Inventory and Analysis ("FIA") and or Current Vegetation Survey ("CVS") plots.

Variable and fixed radius permanent inventory plots will be installed using the National standards and protocols of the Common Stand Exam ("CSE")[6]. The following tree data will be collected: species, diameter, height, crown ratio (proportion of the tree with live crown), radial growth, dwarf-mistletoe infection rating, stand position (dominant, co-dominant, intermediate, suppressed), live or snag (and decay class), height to crown base, and coarse woody material by size class.

In addition to the tree data, the following forest conditions will also be collected: crown closure, shrub cover by species, total herbaceous and grass cover, and cover by individual plant association indicator species and species considered sensitive by USFS, percentage effective soil cover/bare soil, fuels (Brown's transects), and Fuel Model (Scott and Burgan).

Photos will be taken from plot centers in four cardinal directions, and will include a marker or signboard that indicates, at minimum, the date the photo was taken and its location[7]. Plot centers will be monumented with a rebar stake, a GPS reading will be obtained at each. Trees greater than 5" DBH that intersect the variable radius plot will be tagged. These efforts were supported by the OC to enable accurate re-reading of the plot data in the future, and to reduce potential variance due to sampling two locations selected for pre- and post-treatment measurements.

The Monitoring Strategy proposes that plot data will be summarized by forest type and made available on the Project Website. This data can be used to assess a range of indicators and to model conditions across the Ashland Watershed. The Monitoring Strategy proposes repeat monitoring of some or all of the measure in the suite or subset of the plots post treatment at year 2, 5, and/or 10 years, depending on the indicator. Funding for future monitoring has not been identified

[6] CSE documentation available at : http://fsweb.ftcol.wo.fs.fed.us/fsveg/documentation/

[7] Several photopoint guides are stored in the Ecoshare Library under Fire Ecology Implementation (http://199.134.225.86/ecoshare/news-issues/index-issues.asp) .

### 3. Forest Conditions in Mapped Home Ranges of the Northern Spotted Owl

The Rogue-Siskiyou National Forest is having additional forest stand exam plots installed within and around previously mapped home ranges of the Northern Spotted Owls in the Ashland Watershed. to characterize the forest habitat used. These home ranges were mapped by Oregon State University ("OSU") using telemetry. USFS and OSU continue to collaborate on securing funding to continue the research.

### 4. Ecological Effect of the Project: Bird Abundance, Community Composition, and Demographics

Birds provide an excellent monitoring tool because they respond relatively quickly to habitat change and individual species respond differently. By studying changes in species abundance, bird community composition, and demographic parameters such as productivity and survivorship, bird monitoring can quantify whether or not land management achieves desired conditions. The USFS and Klamath Bird Observatory (KBO) established bird monitoring as an important and cost effective component of the effectiveness monitoring in advance of the Project.

KBO has collected pre-treatment data in the watershed annually since 2004, and summarized results from 2005 through 2007 breeding season surveys, a 2007 fall dispersal/migration survey, and constant effort mist netting (Stephens and Alexander 2008). KBO detected 13 species that are listed as either or both Oregon and Washington Partners in Flight (PIF) focal species for coniferous forests and PIF species of continental importance, confirming that a variety of conditions that are considered important for the conservation of coniferous forest birds occur in the Project area. These results were discussed in the FEIS. PIF bird conservation plans and information about bird community response to wildfire in the adjacent Little Applegate Watershed were used to predict the near and mid-term response of a select group of species to the Project.

KBO has continued to operate the constant effort mist netting site annually from May through October. Bird monitoring in the Ashland Watershed is being coordinated with ongoing efforts to monitor bird community response to wildfire in the adjacent Little Applegate Watershed as well as other efforts to use bird monitoring to evaluate the ecological effects of fuel management in the region.

### 5. Other Ongoing or Previously Planned or Completed Monitoring

- Sediment delivery to Reeder Reservoir via DEQ Required TMDL monitoring
- Forest Health Protection Program Aerial Tree Mortality Detection Survey
- Ecology Plots monitored by the USFS Area Ecology Program
- FIA and CVS plots
- COA forest monitoring- 203 permanent plots, including data on trees, snags and coarse wood, fuels, vegetation, and soils.

## C. Supplemental Effectiveness Monitoring

Technical stakeholders at the June workshop considered these ongoing or planned projects and the data that would be available, and then nominated and prioritized supplemental effectiveness monitoring to help ensure that the Project and future projects are optimally informed. Priority values for the stakeholders included water quality and quantity, aquatic and riparian habitat, large tree survival, late-successional habitat amount and function, herbaceous layer recovery.

### 1. Water Quality, Quantity, and Aquatic Habitat

Members of a joint USFS and COA group met independent of the other Parties to consider monitoring for Ashland Creek focused on monitoring for sediment in stream consistent with the EPA standards for Total Maximum Daily Load ("TMDL")[8]. At this time, their proposal calls for measuring change in accumulated sediment in the catch basins built on both the east and west forks of Ashland Creek immediately above Reeder Reservoir. A monitoring protocol and schedule has not been worked out. Responsibility for the work has not been determined. Components of other ongoing and proposed monitoring are included in the attachments to this Appendix.

### 2. Riparian Function

The Monitoring Strategy proposes assessing riparian function in terms of the overall landscape reduction in probable exposure to severe fire (assessed by mapped fuel model), and landscape level fire regime condition class. Abating the threat of uncharacteristic stand conditions at the landscape scale reduces the threat of uncharacteristic pulses of coarse wood and sediment delivery to streams due to large scale, severe fire.

### 3. Large Tree Vigor

Large tree vigor calls for different monitoring than that discussed above under implementation. In this case the concern is whether the Project, after implementation, results in improved survival and regained vigor for the large trees. Such data is gathered in the forest stand exam plots, and will be available from already planned work. Repeating those observations on growth rates at 5 years and 10 years post treatment is proposed to determine the extent to which the Project was successful.

### 4. Late Successional Habitat

As described in the implementation monitoring section, late successional habitat is an important focus for stakeholders in the Project and in the Ashland Watershed. The FEIS disclosed an amount of such habitat that would be impacted by the Project and tracking that amount is anticipated to be a component of USFS implementation monitoring. Several different indicators are proposed to assess the condition and function of the habitat. Fire Regime Condition Class

[8] http://www.epa.gov/OWOW/tmdl/

("FRCC:")[9] analyzed at the scale of the entire Upper Bear Analysis Area compares the amounts of stand seral stages and structures (open or closed) across a landscape with estimated historical averages for those seral stages. The forest mapping on which FRCC is based can be informed by the data from the planned USFS forest inventory plots, and may eventually use the LiDAR data trained by those plots. Other indicators proposed include functional measures, such as habitat use by Northern Spotted Owls, and fire resistance, or the potential for large trees to survive in a fire event, by considering the proportion of relatively large trees, or the fuel models and anticipated fire effects.

**5. Herbaceous Layer Recovery**

Response to the treatment in herbaceous layer, especially concerns about invasive non-native species, needs to be tracked in unit by unit survey and mapping effort. The effects of the Project on the ratio of native to non-native species may be evaluated at 5 years post treatment, but 10 years provides anticipated spiked fluctuation to settle out.

**6. Using Birds as Indicators of Conditions at Landscape Scale**

Stakeholders expressed interest in furthering bird monitoring initiated by the KBO to use birds to indicate landscape conditions. To monitor the Project in the context of regional bird populations, KBO proposes to 1) continue to operate the constant effort mist netting site annually (Attachment A and B), 2) complete 5 years of post-treatment bird surveys during the spring breeding season and fall dispersal/migration season, and 3) complete associated analyses, reports, and an outreach product (i.e. Decision Support Tool) to disseminate findings. Results from these monitoring efforts will document changes in bird abundance and demographics related to changes in ecosystem characteristics, post-fire bird communities (i.e., the Quartz Fire), and PIF conservation objectives. This information can be used to evaluate the success of the Project to reach the desired ecological conditions, whether bird communities post-fuels reduction are similar to post-wildfire, and substantially improve the best available science to inform future regional fuels reduction prescriptions in order to meet both the needs of healthy forests and bird communities.

**7. Fire History**

Stakeholders expressed interest in obtaining more accurate temporal and spatial fire history information. This information would substantially improve the available science regarding fire periodicity in various locations in the watershed, influence desired outcomes in native and non-native herbaceous recovery, help influence and inform future fuels reduction prescriptions, be useful in helping determine return intervals for maintenance burning in the project and in general help establish reference conditions that can guide treatment to improve long-term resiliency of

[9] FRCC is an indicator developed as part of LANDFIRE, a national interagency mapping effort designed to provide fuels and vegetation layers and analytical approaches for broad scale use (see http://www.landfire.gov). Refer to the website for definitions and methods to determine FRCC.

the forest ecosystems of the Project area. Effectiveness monitoring would measure the degree to which post-treatment conditions allow a return to historical fire frequencies and severities.

### 8. Other priorities, and Developing a Budget

The range of ongoing, proposed and possible monitoring follows in Attachment A to this Appendix, and in more detail in Attachment B to this Appendix. Where costs for past work or probable costs for future work are known those are shown. Funds for follow up, post treatment effectiveness monitoring have not been identified, but could be built into a combination of allocations from all Project dollars, and additional funds raised by the Parties and other stakeholders.

## D. Pilot Data from the Ashland Research Natural Area

As described earlier, under the Forest Insects and Disease data set, a set of existing data from 40 forest inventory plots in the Ashland Research Natural Area serve as pilot data to help inform assessment of natural variation in the Ashland Watershed and inform sampling intensity considerations and statistical power. The OC worked with that data set and the Parties are making the data available to interested stakeholders and summaries on the Project Website. Initial power assessments for several indicators were run for plots sorted by PAG, and later by strata (see Attachment C to this Appendix)

The Monitoring Strategy proposes "stratification" for observations, sorting data points into forest-type bins to prevent jumbling together various forest types, so that "apples and oranges" are measured separately. The tentative bins proposed to include a set for each PAG, each of the three dominant seral states that occur in the watershed, and three fundamental treatment regimes (see Table 1 below).

**Table 1. Stratification factors that could be considered for sampling design or analysis of data from the monitoring of the Project. Dominant conditions in bold. Note, other stratification approaches may also be appropriate.**

| Plant Association Group | Seral-Structural States | Treatment Regimen |
|---|---|---|
| **Ponderosa Pine** | early (shrub) | **Fuel Discontinuity** |
| **Dry Douglas Fir** | **mid-seral closed** | **Strategic Ridgeline** |
| **Moist Douglas Fir** | mid-seral open | **Control** |
| **Dry White Fir** | mid-seral closed w/legacies | RNA |
| **Moist White Fir** | late-seral open | Urban Interface |
| | **late seral closed** | |

The combinations of possible plant association group by dominant seral states by treatment regimen (not including a distinct type for the RNA) yields 30 combinations or strata. Considering post treatment conditions and keeping the RNA treatment and urban interface regimens separate would result in 150 different possible combinations. Robust sampling is necessary at either end of that spectrum. Preliminary estimates of sampling size for a forest type suggest that as many as 17 plots may be necessary to provide relatively narrow confidence

intervals around estimated means for indicators where the data is less variable. Stratification that parses some of the variation out amongst strata can reduce the standard deviation around measure and may lead to a reduced sampling size to reach desired confidence intervals.

## E. Tracking Effectiveness Monitoring and Science Delivery

TNC worked with the OC and contracted Mason Bruce and Girard Inc. ("MBG") to develop a monitoring database that will hold effectiveness monitoring data and other observations, as discussed under implementation monitoring. Existing and future data will be entered into a FEAT/FIREMON Integrated (FFI) database. FFI provides software for: data entry, data storage, Geographic Information System, summary reports, analysis tools and Personal Digital Assistant use. FFI supports scalable (project to landscape scale) monitoring at the field and research level, and encourages cooperative, interagency data management and information sharing.

## F. Developing Measurable Indicators

Attachments A and B to this Appendix include monitoring elements representing the initial interests of the Parties, which is committed to work with the stakeholders to find resources to provide for the highest priorities identified. These monitoring elements are subject to available funding among the Parties. Several possibilities exist for funding these aspects: Project dollars, PNW research, OSU research, and other private and public stakeholders.

**ATTACHMENT A. SUMMARY OF PROPOSED INDICATORS**

Scale of measurement, source of existing baseline date, proposed lead for project, reporting, scheduled monitoring, and costs

| Indicator/Condition | Scale | | | Baseline Data source | Proposed Lead | | Delivery | Scheduled Monitoring (Year post-treatment) | | | | | | Estimated data cost per monitoring event | Data analysis/summary each time period |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | unit | strata | project | | FS | multi-party | | annual | 1 | 2 | 5 | 10 | Other | | |
| **PROJECT IMPLEMENTATION AND ACCOMPLISHMENT** | | | | | | | | | | | | | | | |
| layout, operations, mitigation, constraints, and limits, LHEs, soils, etc. | x | x | x | Implementation | x | | maps, meetings, notes | | | | | | | unknown | |
| Units treated mapped | x | | | Implementation | x | | 5 year summary | x | | | | | | none | |
| Multiparty technical review of design, unit, prescriptions, treatment | x | x | x | Implementation | | x | field, mtg. notes, report | | | | | | | $150,000 over 5 yrs, uncertain | |
| Multiparty public review of design, unit, prescriptions, treatment | x | x | x | Implementation | | x | field, mtg. notes, report | | | | | | | $150,000 over 5 yrs, uncertain | |
| **FUEL REDUCTION** | | | | | | | | | | | | | | | |
| Percent unit with Fuel Model TU3-5 | x | | | Implementation | x | | 5 year summary | | | | x | | | | |
| Percent reduction moderate and high severity fuel models (TU3-5) | | x | | FS Stand Inv. | x | | 5 year summary | | | | x | | | $35,000 each FS inventory ** | $15,000 *** |
| Percent reduction in potential for active crown fire (analysis) | | | x | FS Stand Inv. | x | | 5 year summary | | | | x | | | | $1,000 GIS and NEXUS |
| Low, mixed, and high burn-severity fuel model by strata (mapping) | | x | | FS Stand Inv. | x | | 5 year summary | | | | x | | | $2,000 | |
| Develop local surface fuel, fuel model photo series | | | x | Implementation | | x | field guide | | | | | | once | | $5,000 |
| Brush response to reduced canopy closure (analysis) | | x | | FS Stand Inv. | | x | summary | | | | | | once | | $3,000 |
| Proportion of fire resistant to less fire resistant trees by species | | x | x | FS Stand Inv. | | x | 10 year summary | | | | | x | | ** | *** |
| **TERRESTRIAL HABITAT AND RESILIENCY** | | | | | | | | | | | | | | | |
| Protection of cohort 1 (legacy, or heritage) trees | x | | | Implementation | x | x | Census, reports | | | | | | | see multiparty tech. review | none |
| Proportion of trees in larger tree size classes | | x | | FS Stand Inv. | x | | 10 year summary | | | | | x | | ** | *** |
| Average stand diameter | x | x | | FS Stand Inv. | x | | 10 year summary | | | | | x | | ** | *** |
| Down wood assessment | x | x | | FS Stand Inv. | x | | 10 year summary | | | | | x | | ** | *** |
| Bird monitoring: Point count and area search surveys post treatment | | x | x | Klam. Bird Obs. | | KBO | 5 year Report post | x | | | | | 5 yrs | $135,000 over 5 years post | $28,000 at 5th year post |
| Bird monitoring: Mist-netting and banding continuous | | | x | Klam. Bird Obs. | | KBO | 5 years continuous | x | | | | | 5 yrs | $85,000 over 5 years | Included in report below |
| Bird monitoring: Mist-netting and banding post treatment | | | x | Klam. Bird Obs. | | KBO | 5 year Report post | x | | | | | 5 yrs | $85,000 over 5 years post | $18,500 at 5th year post |
| Abundance and habitat use of Pacific fisher | | | x | not available | x | | 5 year Report | | | x | | | | $250,000 for 1 pre, 1 post year | included |
| Northern Spotted Owl habitat quality mapped/modeled | x | x | x | FS Stand Inv. | x | | mapped | | | x | | | | $5,000 | $18,000 |
| Northern Spotted owl habitat use | x | x | x | OSU/FS Inv. | x | | 5 year summary | | | | x | | | $300K telemetry work and analysis 2 years post treatment | included |
| Northern Spotted Owl survival and fecundity | | | x | OSU/FS Inv. | x | | 5 year summary | | | | x | | | | included |
| Barred owl use, census | | | x | not available | x | | 5 year summary | | | | x | | | | included |
| Stand-level Late-Seral Habitat attributes met | | x | | Implementation | x | x | summary | | | | | | n/a | unknown | |
| Snag/Snag condition Inventory | x | x | | FS Stand Inv. | x | | summary | | | | | x | | ** | *** |
| Stand Vigor - radial growth | | x | | FS Stand Inv. | x | | summary | | | | x | x | | ** | *** |
| Stand vigor - basal area | | x | | FS Stand Inv. | x | | summary | | | | | x | | ** | *** |
| Stand Vigor - crown ratio | | x | | FS Stand Inv. | x | | summary | | | | x | x | | ** | *** |
| Stand dwarf mistletoe incidence and infection severity | x | x | | FS Stand Inv. | x | | summary | | | | x | x | | ** | *** |
| Canopy cover/coarse wood/duff within 50 feet of stream | x | x | | FS Stand Inv. | x | | summary | | | | | x | | ** | *** |
| Establish additional riparian plots | x | | x | not available | | x | summary | | | | | x | | $5000 (50 plots) | 5000 |
| Riparian area treatment target not exceeded | | x | x | FS Stand Inv. | x | | mapped | | | | | | n/a | no cost | |
| FRCC - Structural seral states relative to historic range | | | x | FS Stand Inv. | x | | mapped | | | | | x | | ** | 2500 |
| Bark Beetle-caused mortality (landscape) | | | x | FS FHPP | x | | mapped, report | x | | | | | | Forest Health Protection Prgm | included |
| Bark beetle-caused mortality (treatment-based) | | x | | FS Stand Inv. | x | | mapped, report | | | x | | x | | ** | *** |
| Basal area targets met | x | x | | FS Stand Inv. | x | | summary | | | | | x | | ** | *** |
| Number and percent of trees 17 to 24 inches DBH | | x | | FS Stand Inv. | x | | summary | | | | | x | | ** | *** |
| Number and percent of trees greater than 24 inches DH | x | x | | FS Stand Inv. | x | | summary | | | | | x | | ** | *** |
| Percent of treatment area disturbed | x | | x | Implementation | x | | summary | | | | x | | | unknown | |
| Percent of treated area with effective ground cover (FEIS II-81) | | | x | Implementation | x | | summary | | x | | | | | unknown | |
| Percent of treated area with effective ground cover by unit | x | | | Implementation | x | | summary | | | | x | | | unknown | |

| Indicator/Condition | Scale | | | Baseline Data source | Proposed Lead | | Delivery | Scheduled Monitoring (Year post-treatment) | | | | | | Estimated data cost per monitoring event | Data analysis/summary each time period |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | unit | strata | project | | FS | multi-party | | annual | 1 | 2 | 5 | 10 | Other | | |
| Non-native invasive species unit survey (FEIS II-27) | x | | | implementation | x | | GIS map | | x | | x | | | unknown | |
| Estimated herbaceous cover | | x | | FS Stand Inv. | | x | summary | | | | x | | | ** | *** |
| Ratio of native to non-native species cover | | x | | not available | | x | summary | | | | x | x | | $15,000 | *** |
| Number of native species present | | x | | not available | | x | summary | | | | x | x | | see ratio of native to nonnative | *** |
| Number and extent of sensitive species present | x | | | implementation | x | | summary | | | | x | x | | unknown | |
| AQUATIC | | | | | | | | | | | | | | | |
| Estimate sediment in East and west Fork catchment ponds | | | x | COA Public Wrx | | COA | summary | x | | | | | | $1,000 | |
| Annual rate of sediment deposition in Reeder Reservoir (bathymetry) | | | x | COA Public Wrx | | COA | summary | | | | x | | | $10,000 | |
| Excavate and estimate sediment 10 yrs after major storm event | | | x | COA Public Wrx | | COA | summary | | | | | x | | unknown | |
| Inspect Reeder Reservoir road for erosion after major storm events | | | | COA Public Wrx | | COA | summary | x | | | | | | unknown | |
| Monitor reservoir slopes for erosion after major storm event | | | | COA Public Wrx | | COA | summary | x | | | | | | unknown | |
| Percent fines in E. and W. Fork after major storm, and 5 yr interval | | | x | not available | | COA | summary | | | | x | | | $2,000 | |
| Summer low flow stream temperature | | | x | not available | | COA | summary | x | | | | | | $1,000 | |
| Streamside canopy | | | | not available | | | summary | | | | | | | unknown | |
| Macroinvertebrate indicator species post storm event and 5 yrs | | | x | not available | | | Census | | | | x | | | $5,000 | |
| Summer residual pool depth in fish bearing reaches | | | x | not available | | | summary | | | | x | | | $15,000 | |
| Establish RAWS to record major storm events | | | x | not available | | | weblink | | | | | | hourly | unknown | |
| Water flow | | | x | USGS | | x | weblink | | | | | | hourly | no cost | |
| SOCIAL | | | | | | | | | | | | | | | |
| Stakeholders and general public surveys and interviews | | | x | SOU | | x | summary | | | | x | | | $5,000 | included |
| Participation in project activities | | | x | SOU | | x | summary | x | | | | | | unknown | |

## Appendix TP-A – Attachment B
## Monitoring Indicators and Methods

The Parties and other stakeholders have prepared this listing of monitoring indicators and methods, organized by topic, including a range of both biophysical and social facets.

### I. Biophysical Monitoring

#### a. Fire Behavior

**1) Stand level fuels (surface, ladder, crown) in treatment unit**
Goal: Achieve a fuel model with lower fire severity (TL1, TL2, TL3, TU1, TU2, SH2)[10] in the higher severity[11] fuel model (e.g. TU5, SH7) within treatment units.

*Indicator: Percent reduction in mapped area of moderate and high severity fuel models within units.*

i) Map Fuel Model (see FEIS III-13, table III-4) pre-treatment, post-treatment, five-years post treatment
Initially derived from USFS terrestrial data.
Post-treatment, five-year post treatment or other out-year mapping to be determined.
ii) Develop "local" photo series using plot photos and data for cross reference to Scott and Burgan fuel models.
Analysis to be determined.

*Indicator: Reduced potential for active crown fire.*

iii) Map calculated canopy bulk density and subsequent crown fire potential pre-treatment, post-treatment, five-years post treatment
Initial calculations using USFS terrestrial data.
Incorporate into landscape analysis via FLAMMAP[12]
Calculation and analysis to be determined.

*Indicator: Shrub layer cover relative to canopy closure by plant association group (PAG) ("brush response").*

iv) Proportion of unit with TU3-5 fuel model trajectory at five-years post-treatment judged in year two after final treatment.
Initial derivation from USFS terrestrial data.
Post-treatment and two-year post treatment data collection to be determined.
v) Brush and understory response to treatment
Initial derivation from USFS terrestrial data.
Post-treatment and out-year data collection to be determined.

[10] Scott and Burgan 2005, General Technical Report No. RMRS GTR-153
[11] High severity fire results in greater than 75% overstory mortality in patches greater than 1 acre.
[12] www.firemodels.org

**2) Landscape level fuel pattern**

Goal: Achieve a proportion of low, intermediate, and high burn severity fuel models across the National Forest System Land in the study area (ca. 22,000 acres) that is consistent with historic range of variation[13].

*Indicator: Change in percent distribution of stands with low, mixed, and high burn severity fuel models.*

i) Map Fuel Model post-treatment, five-years post treatment

Post-treatment, five-year post treatment or other out-year mapping to be determined.
Analyze using FLAMMAP or similar software, using random ignitions to measure change in severity (flame length, rate of spread, crown fire class).
FLAMMAP modeling to be determined.

**b. Forest Resiliency**

**1) Stand level tree[14] resistance to disturbance (insects, pathogens, fire)**

Goal: Achieve stands with a higher proportion of disturbance resistant trees in treated units.

*Indicator: Increased proportion of fire resistant species to less-fire resistant tree species[15].*

i) Abundance by tree species from USFS terrestrial data.

Post-treatment or out-year data collection to be determined.

*Indicator: Increased proportion of trees in the more fire resistant larger tree size classes.*

ii) Percentage of trees in the 17-24" and > 24" size classes.

Pre-treatment size-class distribution from USFS terrestrial data.
No commitment to post-treatment or out-year data

*Indicator: Increase in stand vigor as measured by increased radial growth and crown ratios.*

iii) Radial growth by species and size class five- and ten-years post- treatment from sample trees.

Pre-treatment growth information from USFS terrestrial data.
Post-treatment, five-years post-treatment and ten-years post- treatment data collection to be determined

iv) Proportion of trees with adequate[16] crown ratios by species, size class from USFS terrestrial data.

Pre-treatment crown ratio information from USFS terrestrial data.
Five-years post-treatment and ten-years post- treatment data collection to be determined

[13] Low - 40%, mixed - 40%, and high - 20%, AFR FEIS Page III – 47.
[14] Tree for these indicators is considered 5" DBH and greater
[15] Diameter survival thresholds by species in "moderate severity burned plots" (D. Goheen unpublished data 2009), based on 1800 trees 5 years post fire in three 2002 SW OR fires: Pipo>12, Psme>14, Cade>10, Pila>16, Abco>24, Arme>30, Quke>12, Quga>14
[16] Adequate crown ratios to be defined for each species by oversight committee.

*Condition: Dwarf mistletoe* (Arceuthobium *spp.*) *incidence (trees/acre) and infection severity (Hawksworth[17] or modified Hawksworth (Tinnan[18]) Rating by diameter classes appropriate for meeting resource objectives.*

v) Mapped extent of high level dwarf mistletoe infestation derived from USFS terrestrial data.
Calculated percent of infected trees by species.
Calculated percent of infected trees where severity is high (Hawksworth /Tinnan Severity Code = 5 or 6).
Post-treatment, five-years post-treatment and ten-years post- treatment data collection to be determined

Goal: Achieve a basal area in pine dominated stands or around individual legacy conifers that are within recommended guidance to reduce risk of pine bark beetles (*Dendroctonus* spp.)

*Indicator: Basal area thresholds for pine dominated stands or for individual pines by PAG (pine and dry Douglas fir (60 to120 sq. ft./acre), moist PAGs (80 to 150 sq. ft./acre.)*

i) Basal area calculations from USFS terrestrial data.
Post-treatment, ten-years post-treatment data to be determined.

**2) Landscape level forest resiliency to disturbance**

Goal: Achieve a proportion of structural states[19] across the National Forest System Land in the study area (ca. 22,000 acres) that is more consistent with historic range of variation.

*Indicator: Proportional distribution of LANDFIRE structural states relative to historic range (Fire Regime Condition Class - FRCC).*

i) Mapped structural seral states via Forest Vegetation Simulator (FVS).
Derived from USFS terrestrial data.
Post treatment, ten-years post-treatment data to be determined.

Goal: Achieve a mortality rate from insects and disease that is within the natural range of variation (0.5% of the pine trees year[20]) across the National Forest System Land in the Upper Bear Assessment Area (ca. 22,000 acres).

*Indicator: Bark beetle mortality rate in treated stands relative to control areas.*

i) Mapped estimates of mortality in trees killed by year in the Upper Bear Assessment Area by species by PAG from annual aerial tree mortality surveys
Forest Health Protection data available on web.[21].

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[17] Hawksworth, F.G. 1977. The six-class dwarf mistletoe rating system. U.S. For. Serv. Rocky Mtn. For. Range Exp. Stn. Gen. Tech. Rep. No. RM-48.
[18] Tinnin, R.O. 1998. An alternative to the 6-class dwarf mistletoe rating system. West. J. Appl. For. 13:64–65.
[19] LANDFIRE's five structural states: early seral, mid-closed, mid-open, late closed, late open. The same basic states were used in the 2005 Upper Bear Analysis.
[20] Upper Bear Assessment
[21] http://www.fs.fed.us/r6/nr/fid/as/index.shtml

ii) Compare bark beetle-caused mortality (trees/acre) by treatment unit and project area with controls based on five-years post-treatment and ten-years post-treatment data.
Post-treatment and out-year data collection to be determined

iii) Basal area calculations within target range (see above for stand level BA's)
Percent of stands in the Project area that achieved these BA's
Post-treatment and out-year data collection to be determined

**c. Large Tree Retention**

Goal: Retain the largest and healthiest cohort 1 and 2 trees (FEIS).

*Indicator: Number and percent of trees 17 to 24 inches DBH and greater than 24 inches DBH removed by treatment unit.*

i) Trees per acre/treatment unit- setting 17-24 inches and greater than 24 inches DBH removed.
Derived from USFS terrestrial data.
Post-treatment, five-years post-treatment, and ten-years post- treatment data (survival of large trees) collection to be determined

*Indicator: Cohort 1, "legacy", or "heritage" trees in treated units protected during marking phase, harvest, and post harvest*

ii) Cohort 1, legacy, "heritage" trees marked for harvest reviewed by technical team and public.

**d. Soils**

**1) Soil Disturbance and compaction**

Goal: Operations to be kept within Project specific, Forest/Regional Standards and Guidelines for detrimental soil disturbance or compaction in treatment units.

*Indicator: Percent of treatment area detrimentally disturbed or compacted.*

i) *Implementation monitoring*: Use protocol from soil disturbance field guide[22], and or the USFS soil disturbance monitoring guide on a unit by unit (USFS terrestrial data). USFS will provide pre-assessment based on walk-through examination by USFS soil scientist. Records maintained by USFS and shared with the other Parties for uploading on the Project Website as soon as practicable.

[22] A soil disturbance field guide is being developed by the Forest Service San Dimas Technology Development Center to assist in qualitative assessments of soil impacts from both equipment and fire. A two volume Forest Soil Disturbance Monitoring Protocol is also in the works with an anticipated publication date of June 2009 by the Rocky Mountain Research Station. Volume 1 will be a quick field reference and volume 2 will cover soil monitoring in detail.

**2) Effective Ground Cover**[23]

Goal: Operation to be managed or mitigated to maintain required effective ground cover percent by slope class year 1 and 2 post treatment (FEIS Page II- 82, Table II-7).

| *Indicator: Percent of treated area with effective ground cover.* |
|---|

i) *Implementation monitoring*: Use protocol from Soil Disturbance Field Guide, and or USFS Soil Disturbance Monitoring Guide (both in development. Supplemental monitoring may call for conducting qualitative assessment during and after each activity

Year-two post treatment data collection and out-year data collection to be determined

**e. Slope Stability**

Goal: Operations and mitigation are implemented as designed to maintain slope stability.

| *Indicator: Extent to which layout, operations, and treatment follow limitations on* Landslide Hazard Zone (LHZ) 1 and 2. |
|---|

i) *Implementation monitoring*: Document review to determine extent to which a geologist was consulted and recommendations followed

Records maintained by USFS, and shared with the other parties to be uploaded on the Project Website as soon as practicable

**f. Herbaceous Layer**

Goal: Improve the understory composition of species by PAG and Structural State.

| *Indicator: Herbaceous cover* |
|---|

i) Estimated cover of indicator herbaceous species in USFS terrestrial data.

Pre-treatment data for indicator species provided via USFS terrestrial data.

Post-treatment and out-year data collection needs to be determined.

| *Indicator: Ratio of native to non-native species cover.* |
|---|

ii) Estimated cover based on all species and designation of native vs. non-native

Not currently covered by USFS terrestrial data; will require supplemental monitoring pre-traetment, post-treatment and out-year.

[23] Any material (i.e. rock, litter, vegetation) which is attached to or lying on the soil surface (AFR FEIS Page II-81) is considered to be effective ground cover.

*Indicator: Number of native species.*

iii) Number of native species surveyed in units
Pretreatment data for designated species from USFS terrestrial data.
Additional data collection needs to be determined.
Post-treatment and out-year data collection to be determined.

Goal: Maintain all sensitive species (vascular plants, bryophytes, fungi, lichens).

*Indicator*: Survey of sensitive species by unit

i) Sensitive species surveys (USFS terrestrial data).
USFS will provide pre-treatment data on list of targeted plants.
Supplemental surveys to be determined.
Post-treatment and out-years post- treatment data collection to be determined.

*Indicator: Document review to determine extent to which a botanist was consulted and recommendations followed.*

ii) *Implementation monitoring*: Records maintained by USFS and shared with the other Parties to upload on the Project Website

Goal: Reduce targeted non-native invasive species in Project relevant areas.

*Indicator: Location and extent of target non-native invasive species.*

i) Target weed species surveyed
USFS will provide pre-treatment for targeted plants.
Supplemental surveys to be determined.
Propose using TNC GPS Weed Information Management System or other platform
ii) *Implementation monitoring*: Document review to determine if target species were mapped and botanist was consulted and recommendations followed (supplemental monitoring).
Records maintained by USFS and shared with the other Parties to be uploaded on the Project Website

**g. Hydrologic Function**

**1) Water Quality**

Goal: Maintain Total Maximum Daily Load (TMDL) of sediment delivery to Reeder Reservoir[24].

*Indicator: Annual rate of sediment deposition in Reeder Reservoir.*

i) Baseline data supplied by COA.
ii) Conduct bathometric survey of Reeder Reservoir within 5 years of treatment and at regular intervals thereafter.
iii) Excavate sediment and estimate amount of sediment removed from the reservoir.
iv)Evaluate sediment in the East and West Fork sediment catchment ponds
v) Inspect and monitor the Reeder Reservoir access road.
vi) Monitor reservoir slopes for signs of increased erosion.
COA Public Works

*Indicator: Percent fines in stream[25].*

vii) Wolman pebble counts at existing Rosgen monitoring sites on East and West Forks Ashland Creek
USFS has established reference points.
Data processed through "Pebble-count Analyzer" software.
Done at five-year intervals post-treatment or after major events.
Data collection to be determined.

Goal: Maintain existing stream temperatures.

*Indicator: Summer low flow stream temperature[26].*

i) Existing USFS Stream Survey monitoring points on both branches of Ashland Creek.
Use remote temperature probes that need to de calibrated, deployed and data download
Data collection to be determined.

Goal: Mitigate Project sediment sources

*Indicators: Effectiveness of mitigation of displaced soil and loss of effective ground cover*

i) *Implementation monitoring*: Evaluate soil displacement on a per unit basis during and after treatment
USFS walk through by soil scientist or hydrologist
Records maintained by USFS and shared with the others on the Project Website.

[24] Oregon DEQ established background level at 3.62 yds$^3$/day based on WEPP modeling completed by the Forest Service.
[25] Su Maiyo (RR-S Forest Fish Biologist) considers the sediment percent more applicable than the embeddedness for sediment monitoring
[26] Summer low flow stream temperature not currently limiting, and DEQ has not set a TMDL.

ii) Evaluate ground cover changes
Pretreatment USFS terrestrial data
Additional data collection to be determined.

Goal: Understand hydrologic impacts of major storm events

*Indicators: Establish baseline*

i) Install remote automatic weather station in the Watershed for more detailed information
Installation to be determined.
ii) Establish a link on the Project Website to USGS gauging station on Ashland Creek that measures flow
Oversight Committee.

**2) Aquatic Habitat**[27]

Goal: Maintain current assemblage of macroinvertebrates.

*Indicator: Macroinvertebrate indicator species.*

i) Macroinvertebrate survey
Reference sites at high elevation and low elevation currently exist.
Mid elevation baseline site would require establishment.
Remeasurement interval of five years and after major events.
Data collection to be determined.

Goal: Maintain current fish habitat.

*Indicator: Summer residual pool depth in fish bearing reaches in the Project area.*

i) USFS Stream Survey Protocol (20% sample of pools or V Star) would be used in selected reaches.
Remeasurement interval of five years and after major events
Data collection to be determined.

[27] Recent assessments (Tioga 1997, Siskiyou Research Group 2001). SRG evaluated overall stream function as healthy.

**h. Special Habitats**

**1) Riparian Habitat[28] and Wetlands**

Goal: Maintain riparian habitat or wetlands for both aquatic and terrestrial function.

| *Indicator: Extent to which layout, operations, and treatment follow limitations on Landslide Zone Hazard 1 and 2.* |
|---|

i) *Implementation monitoring*: Document review to determine extent to which a biologist was consulted and recommendations followed.
Records maintained by USFS
ii) Determine monitoring plots within 50 feet of stream (USFS terrestrial data)
iii) Establish additional plots (if necessary) to characterize riparian conditions including canopy cover mid and high level, and retention of duff and coarse wood within 50' of stream.
Pretreatment data (potentially) derived from USFS terrestrial data.
Post-treatment and out-year data collection to be determined

| *Indicator: Area of riparian habitat in close proximity to proposed burn units.* |
|---|

iv) Mapped riparian area relative to treatment unit boundaries
v) Evaluate post-burn conditions.
Field evaluation to be determined.

**2) Riparian Reserve (NWFP) Function**

Goal: Riparian Reserves are better protected from impact of severe fire.

| *Indicator: See monitoring for landscape level fuel and structural state patterns.* |
|---|

Goal: Riparian Reserves are mapped in vicinity of treatment areas.

| *Indicator: Document review to determine extent to which geological and hydrological specialists were consulted and recommendations followed.* |
|---|

i) Implementation monitoring: GIS map informed by on site review
Records maintained by USFS, shared on the Project Website.

Goal: No more than 50% of Riparian Reserve (outside of riparian habitat) treated.

| *Indicator: Percent of area treated.* |
|---|

i) Mapped treatment area.
ii) Map informed by on site review.
Post-treatment field evaluation to be determined..

[28] Terrestrial vegetation influenced by aquatic habitat.

### 3) Late-Successional Wildlife Habitat

Goal: Develop landscape-level late successional habitat within Historic Range of Variation of structural states (Landfire/Upper Bear Assessment).

*Indicator: See monitoring for Forest Resiliency, 2) Landscape resiliency.*

Goal: Maintain stand level late-successional habitat attributes.

*Indicators: Stand level attributes within desired ranges by PAG (Upper Bear Assessment/Landfire)*

i) Large woody material per acre averages (by size and decay class).
Pretreatment data from USFS terrestrial data.
ii) Average stand diameter.
Pretreatment data from USFS terrestrial data.
iii) Diameter range (structure) (Size Class Distribution).
Pretreatment data from USFS terrestrial data
iv) Snags per acre by size and decay classes.
Pretreatment data from USFS terrestrial data.
v) Post-treatment and out-year treatment data to be determined.

Goal: Research response of northern spotted owl to fuel reduction treatments.

*Indicator: Change in habitat quality*

i) Baseline habitat described (FEIS) and quantified.
Pretreatment data from USFS terrestrial data.
ii) Post-treatment evaluation and analysis by ROR-SIS Wildlife Biologist.
Analysis costs not yet committed.

*Indicator*: Habitat use

i) Two-years pre-treatment home ranges and habitat use data available.
Post-treatment and out-year telemetry data (USFS/OSU) acquisition to be determined.

*Indicator*: Survival and fecundity

ii) Two-years pre-treatment home ranges and habitat use data available.
Post-treatment and out-year telemetry data (USFS/OSU) acquisition to be determined.

*Indicator: Percent of northern spotted owl use/time in standard nesting, roosting, foraging habitat versus abiotically modeled habitat.*

iii) Two-years pre-treatment home ranges and habitat use data available.
Modeled habitat data available
Post-treatment and out-year telemetry data (USFS/OSU) acquisition to be determined.
Analysis needs to be determined.

*Indicator: Distribution and success of Barred owls.*

iv) Assessment of number of breeding pairs.
Analysis for interactions with treatments and Northern Spotted Owl
Data acquisition and analysis to be determined.

Goal: Maintain other late-successional dependent species.

*Indicator: Abundance and habitat use of Pacific fisher.*

i) Post treatment camera detection to compare to pretreatment.
ii) Pull Hair for DNA analysis
iii) Radio collar captured individuals
iv) Test habitat use, treatment/mitigation avoidance/effectiveness
v) Mark recapture for DNA from hair for density. Confirm use compared to estimated 9-11 individuals modeled in the FEIS for carrying capacity.
vi) Determine habitat islands were retained.
Funding and data collection to be determined

*Indicator: Abundance of "sentinel snag" bat maternity roosts*[29].

vii) Derived from USFS terrestrial data on snags by distribution and size class.
Post-treatment and out-year data collection to be determined.

*Indicator: Nesting cavities; see snags under late-successional habitat.*

viii) Derived from USFS terrestrial data on snags by distribution and size class.
Post-treatment and out-year data collection to be determined.

[29] Pallid bat, long-eared bat, fringe-tailed bat

*Indicator: Bird abundance, community composition, and demographics* [30].

ix) Pre-treatment data has been collected in the watershed annually since 2004, using standardized bird (point counts, area search, mist-netting and banding) and vegetation survey methodologies (Stephens and Alexander 2008).
x) Additional pre-treatment data needed, including continued operation of the constant effort mist netting site annually from May through October. Additional point count and area search surveys might be needed depending on Project design changes since 2004. If units have been redefined, one year of surveys across the landscape of the Project area would be beneficial.
xi) Collect post-treatment data using standardized bird (point counts, area search, mist-netting and banding) and vegetation survey methodologies and complete an analysis to compare with pre-treatment data.

Funding not identified

## II. Social Monitoring

**a. Level of Support for the Project**

Goal: Increased community knowledge of the need for and benefits of the Project and Project collaborators.

*Indicator: Percent of positive responses to an annual survey/interview on key facets of the Project*

i) Initial survey/interview addressing ecologically sensitive timber harvest, late successional reserve management (protection/restoration), municipal water supply, prescribed burning, smoke management, recreation, solitude and wildness, etc by SOU
ii) Continue to address this issue with the community as treatments occur and monitoring results are available.

Future funding/support to be determined

Goal: Increased sense of stewardship.

*Indicator: Percent of positive responses to an annual survey/interview on sense of stewardship.*

i) Survey/interview.

Future funding/support to be determined

*Indicator: Participation in Project activities (number of individuals, hours of involvement in monitoring, tours, website contact, programs, and presentations)*[31].

ii) Document report and review participation.

Records kept by the Parties

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[30] Report on file: Monitoring the Ecological Effect of Fuels Reduction in the Ashland Watershed: A Summary of Pre-treatment Bird Community Composition. Jaime L. Stephens and John D. Alexander. June 30, 2008. Klamath Bird Observatory. PO Box 758 Ashland, Oregon, 97520

[31] At least 20 volunteers in the field, 100 interested persons participating in discussion at a minimum of six meetings and tours, outreach to at least four outside groups (including Southern Oregon University and Rotary), at least 1,000 website visits, 200 downloads of project material, and 200 comments (NFF grant).

**b. Capacity for Collaboration**

Goal: Increased community capacity for collaboration on the Project and related forest projects.[32]

*Indicator: Percent positive responses to an annual and initial retrospective survey/interview among participants in the Project, pre NFF, and post NFF.*

i) Survey/interview questions about collaborator credibility, transparency, communication timeliness, balance of assertion/accommodation, collaborative problem solving ability, shared decision making.

Future funding/support to be determined.

*Indicator: Percent positive responses to an annual survey/interview of general public not directly involved in the Project about Project collaborators.*

ii) Survey/interview questions about collaborator credibility, transparency.

Future funding/support to be determined.

*Indicator: Diversity of representation in collaborative effort to plan and implement the Project.*

iii) Observed and documented number of individuals and groups (agency, municipal, environmental, industry, community organizations, etc) invested in the Project.

Records kept by the Parties on the Project Website

**c. Quality of Life**

Goal: Perception of quality of life is improved and sustainable.

*Indicator: Proportion of forest interface effectively treated to promote fire safe community.*

i) Mapped acreage treated.

Tracked annually by COA

*Indicator: Net balance (favorable/negative) for an array of ecosystem services- municipal water, recreation opportunities for, solitude and wildness, late-successional reserve values, active forest management, harvest, smoke, prescribed burning, and social process around the Project.*

ii) Survey/interview.

Future funding/support to be determined

[32] Past quality of collaboration was assessed by Fleeger in 2008

*Indicator*: Economic activity generated by the Project.

Document/review:
iii) Number of local workers involved in Project.
iv) Dollars from the Project in the Rogue Valley.
v) Percent of contracts to small and large local contractors.
vi) Number and diversity of woods products processed locally.

To be determined

**d. Landscape Scenic Character**

Goal: Maintain a natural appearing landscape based on visual quality objectives.

*Indicator*: Percent change from existing for openings in foreground viewed from COA.

To be determined

*Indicator*: Straight high contrast lines on the slopes and ridges.

Landscape architect photo points and professional judgment of line, form and texture, openings, contrast from key viewpoints

To be determined

## Appendix TP-A – Attachment C

## Pilot Power Analysis for a Selection of Proposed Indicators for the Ashland Forest Resiliency Project using Pilot Data from the Ashland Research Natural Area

**Nathan Rudd, Biometrician, The Nature Conservancy. September 2009**

This summary provides preliminary results of a power analysis based on pilot data (n = 40 plots) from the Ashland Research Natural for the proposed Ashland Forest Resiliency project for the following indicators: % crown closure, % total shrub cover, % mortality from bark beetles (calculated both from trees/acre and basal area), and % of fire resistant and large trees (also as TPA and BA).

### Methods

I used PROC POWER in SAS (9.2) to calculate required samples size for estimating indicator values with 90% confidence at varying levels of precision (defined as the half-width of the confidence interval) and for a range of standard deviations (SD) that more or less reflect the range of observed values. I used summary statistics calculated by Plant Association Group (PAG) to develop inputs for power analyses (i.e., precision levels and range of variability for each attribute). The 'tolerance probability,' or probability of meeting the desired precision level, was set at 0.8. An estimate of the probability of an interval (CI) both encompassing the true mean value *and* being no greater than the desired half-width is 0.9*0.8 = 0.72.

The major caveats for this analysis are:

1. the small size of the pilot sample relative to the proposed full sample (~750 plots), which brings into question the validity of SD estimates;
2. statistics and sample size estimates are calculated for PAG over all canopy/seral stages. The full sample will likely be stratified by these PAGs, several canopy/seral stages and several treatment regimens. It's possible that variation within PAG/canopy/seral strata will be smaller than what is indicated from the pilot sample. On the other hand, the full sample will cover additional area, and so observed variance may be larger for some indicators.
3. this analysis assumes normally distributed data, which is especially unlikely for attributes like % mortality from bark beetle, where observed mortality rates in pilot data are very low (i.e., the distribution is highly skewed). Power estimates can be relatively robust to this assumption at larger sample sizes, but pilot sample sizes are quite small.

Only 3 plots fell in the PIPO PAG and only one of these was forested; the non-forested plots were omitted from this analysis and the forested plot was grouped with other DDF plots.

### Crown Closure and Total Shrub Cover

Results are grouped for these two indicators because the range of variability is similar for both, as is the possible range of data values, i.e., 0-100% (though total shrub cover could conceivably be > 100%?). Summary statistics are given in Tables 1 and 2. I calculated the required sample size for CI half-widths (CIHW) of 5, 10, and 15, and for SD of 10 to 30 by 5 (Table 3). A graph of total sample size vs. CIHW is in Figure 1.

Median and mean values are very similar for crown closure, suggesting the distributions are not highly skewed. Total shrub cover is more variable (higher CVs) and appears to have a more skewed distribution. Provided sample size by strata is somewhere close to 17, crown closure estimates should be within ± 5-10% cover for most PAGs except DDF (Table 3). This is also true for shrub cover, but with lower mean values one would want CIHW to be no more than 5% cover (or even less) to be meaningful. This is unlikely to be possible unless stratification leads to SD of 10 or lower.

Table 1. Summary statistics for % Crown Closure

| PAG | N | Median | Mean | ±90% CI | SD | CV |
|---|---|---|---|---|---|---|
| DDF | 9 | 88 | 77.7 | 15.80 | 25.490 | 32.82 |
| MDF | 8 | 87 | 87.9 | 5.86 | 8.741 | 9.95 |
| MWF | 11 | 88 | 84.7 | 7.43 | 13.595 | 16.05 |
| DWF | 10 | 77 | 76.1 | 10.13 | 17.477 | 22.97 |
| All | 38 | 87 | 81.4 | 4.76 | 17.393 | 21.36 |

Table 2. Summary statistics for % Total Shrub Cover.

| PAG | N | Median | Mean | ±90% CI | SD | CV |
|---|---|---|---|---|---|---|
| DDF | 9 | 2.9 | 8.8 | 6.26 | 10.098 | 114.68 |
| MDF | 8 | 8.4 | 13.1 | 9.33 | 13.936 | 106.75 |
| MWF | 11 | 22.3 | 35.7 | 14.42 | 26.392 | 74.02 |
| DWF | 10 | 15.9 | 19.1 | 10.40 | 17.947 | 93.82 |
| All | 38 | 13.6 | 20.2 | 5.74 | 20.960 | 103.82 |

Table 3. Summary of power analysis.

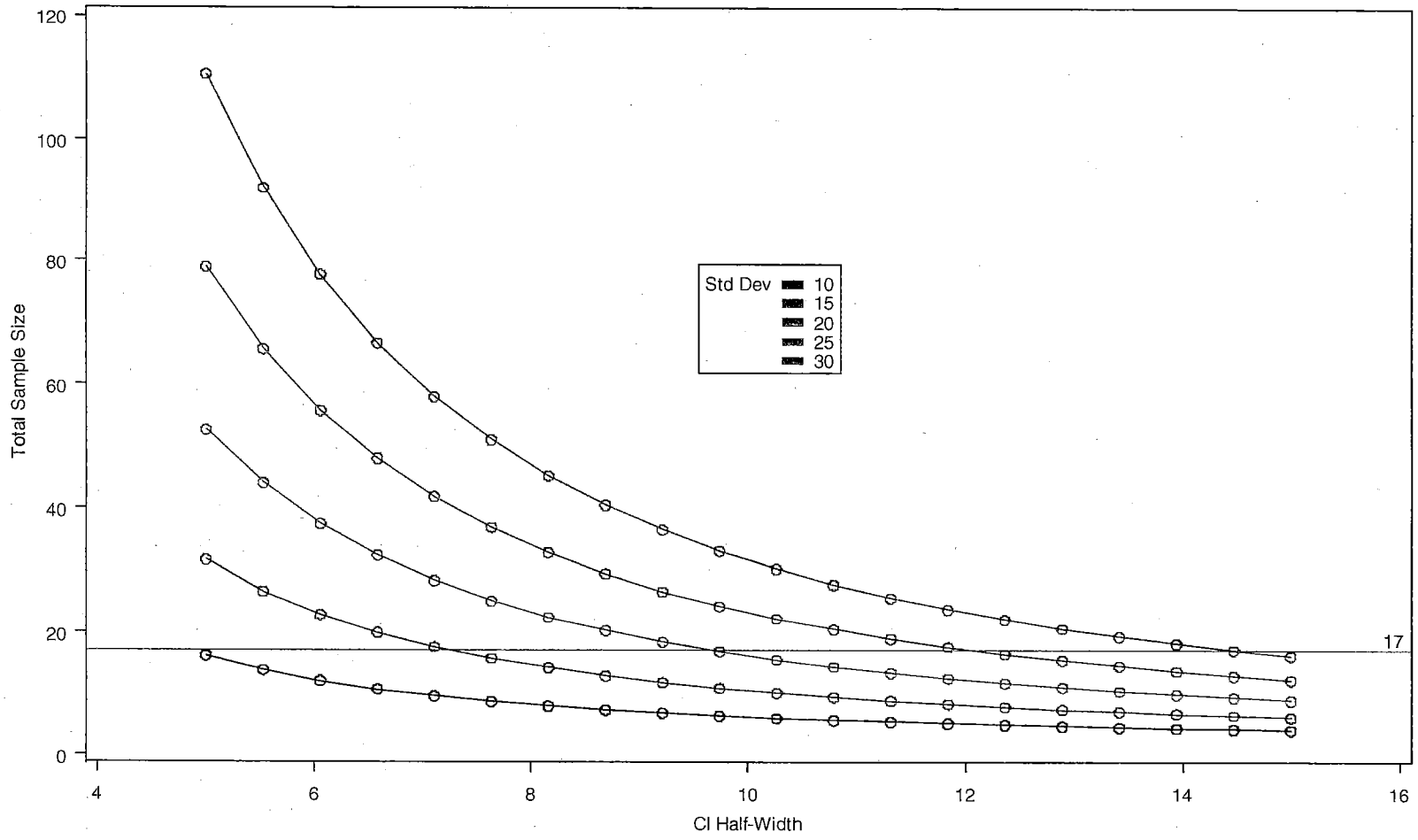
Required N for estimating Crown Closure or Total Shrub Cover with 90% confidence and at least an 80% chance of the estimate being within 5, 10 or 15 cover points of the mean.

| | | Half- Width | | |
|---|---|---|---|---|
| | | 5 | 10 | 15 |
| Alpha-- | Std Dev-- | -- | -- | -- |
| 0.1 | 10 | 17 | 7 | 5 |
| | 15 | 32 | 11 | 7 |
| | 20 | 53 | 17 | 9 |
| | 25 | 79 | 24 | 13 |
| | 30 | 111 | 32 | 17 |

Figure 1.

# Crown Closure/Shrub Cover; N vs. 90% CI Half-width for Varying SD

**Assume at least 80% chance of achieving CI Half-Width**



## % Mortality from Bark Beetle

Summary statistics in Table 4 indicate that mortality from bark beetle is quite low. Estimates based on TPA are lower than those based on basal area, probably because the range of TPA is much greater than basal area for a given plot. With mortality estimates this low, it may be difficult to achieve estimates with CIHW that are less than the mean value (Table 5, Figure 2).

Table 4. Summary statistics for % mortality from bark beetle, calculated by TPA and BA.

| | | % Mortality from Bark Beetle | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Trees / Acre | | | | | Basal Area | | | | |
| PAG | N | Median | Mean | ±90% CI | SD | CV | Median | Mean | ±90% CI | SD | CV |
| DDF | 9 | 0.0 | 0.7 | 1.18 | 1.90 | 255.64 | 0.0 | 2.2 | 2.86 | 4.61 | 205.54 |
| DWF | 10 | 0.0 | 2.6 | 3.35 | 5.78 | 223.21 | 0.0 | 5.0 | 5.54 | 9.55 | 191.07 |
| MDF | 8 | 0.2 | 1.4 | 1.96 | 2.93 | 210.33 | 3.3 | 6.1 | 6.22 | 9.28 | 151.69 |
| MWF | 11 | 0.0 | 4.8 | 6.41 | 11.72 | 242.33 | 0.0 | 8.9 | 7.16 | 13.11 | 148.05 |
| All | 38 | 0.0 | 2.6 | 1.94 | 7.09 | 278.09 | 0.0 | 5.7 | 2.68 | 9.78 | 171.56 |

Table 5. Power analysis for % mortality from bark beetle.

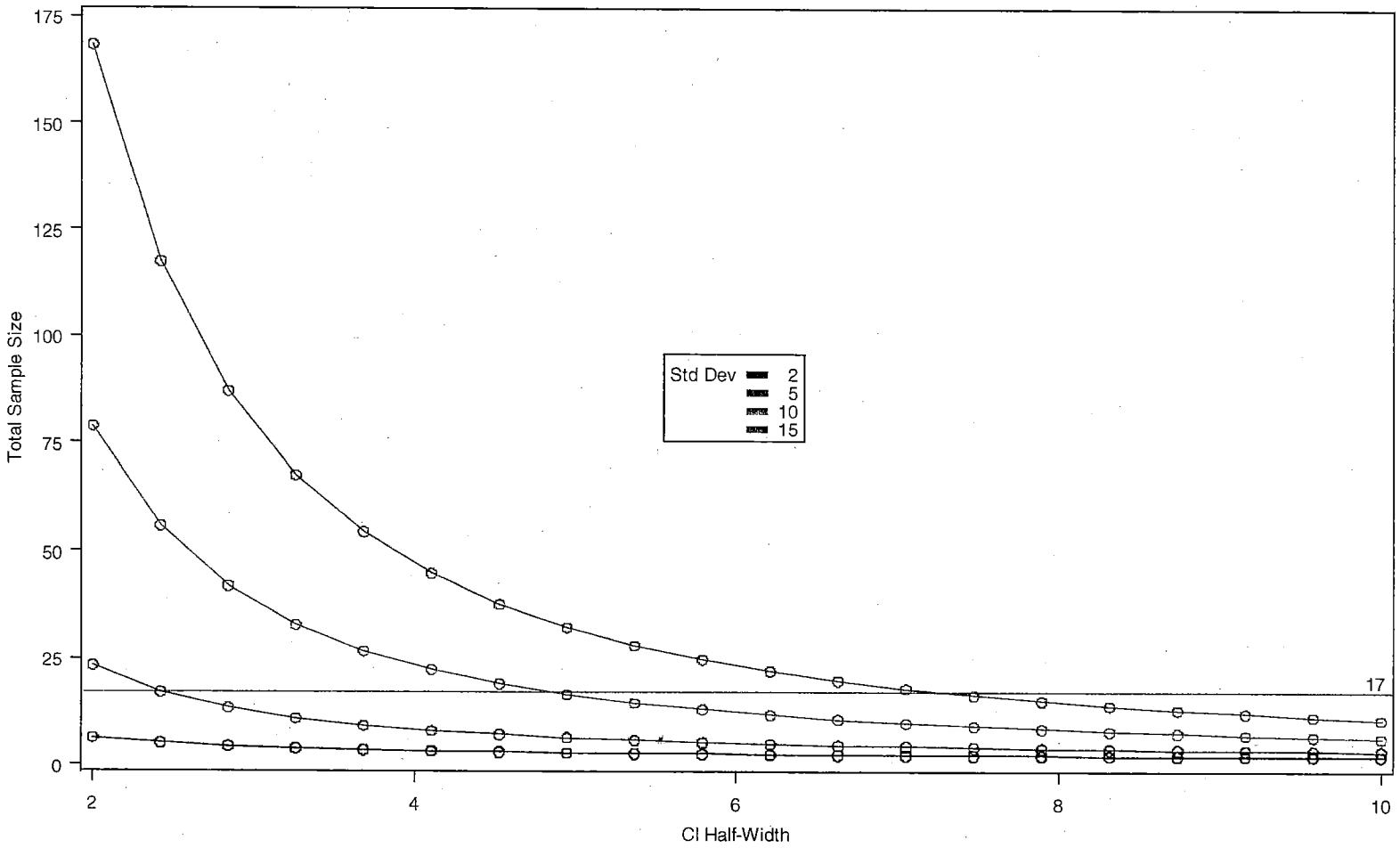
Required N for estimating bark beetle mortlaity with 90% confidence and at least an 80% chance of the estimate being within 2, 5 or 10 mortality points of the mean.

| | | Half- Width | | |
|---|---|---|---|---|
| | | 2 | 5 | 10 |
| Alpha -- | Std Dev -- | -- | -- | -- |
| 0.1 | 2 | 7 | 3 | 3 |
| | 5 | 24 | 7 | 4 |
| | 10 | 79 | 17 | 7 |
| | 15 | 169 | 32 | 11 |

Figure 2

# Bark Beetle Mortality, N vs. 90% CI Half-width for Varying SD

**Assume at least 80% chance of achieving CI Half-Width**




Summary based on trees >= 24" dbh.

| | | | % Mortality from Bark Beetle | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Trees / Acre | | | | | Basal Area | | | | |
| Obs | PAG | N | Median | Mean | ±90% CI | SD | CV | Median | Mean | ±90% CI | SD | CV |
| 1 | | 34 | 0.0 | 12.3 | 6.68 | 23.00 | 187.7 | 0.0 | 13.3 | 6.33 | 21.80 | 164.1 |
| 2 | DDF | 8 | 0.0 | 4.9 | 6.28 | 9.38 | 193.2 | 0.0 | 5.6 | 7.03 | 10.50 | 186.7 |
| 3 | DWF | 8 | 0.0 | 12.7 | 16.41 | 24.50 | 192.5 | 0.0 | 10.4 | 13.26 | 19.80 | 190.0 |
| 4 | MDF | 7 | 9.4 | 21.6 | 26.56 | 36.16 | 167.0 | 16.7 | 23.8 | 26.07 | 35.50 | 149.1 |
| 5 | MWF | 11 | 0.0 | 11.3 | 10.56 | 19.32 | 170.7 | 0.0 | 14.2 | 9.91 | 18.14 | 127.4 |

The means for both TPA and BA are larger (and much more similar), but the distributions are still obviously skewed, and SDs are a lot bigger. Of course, some plots dropped out because they had 0 total TPA/BA of trees > 24". You can compare the SDs to graphs in the current summary that span the range of 10-30 or 40 to get an idea of what this means for required N (Figures 1 and 3).

**Notes on Stratifying sample by Seral/Canopy or Legacy status**

Data were stratified by seral/crown closure and legacy plot status to verify that stratified sampling will result in lower variability (and therefore higher precision at proposed sample sizes). For seral/canopy, only the MWF PAG has enough samples for analysis (i.e. > 4 in each strata). All plots in this PAG are legacy plots. For summary tables by legacy status, Y = legacy plots.

I included 10 plots in the Dry Doug-Fir PAG for this summary (rather than the 9 that were counted for the original power analysis), i.e., both Plots 17 and 28 were included in this group (per "RNA plot allocation proposed with legacy.xls").

Crown Closure

Stratification substantially lowers the SD of the MWF LCL (late seral stage, closed canopy) plots (Tables 1-2, from 13.6 for unstratified to 9.8 for this class). Variation among MCL (mid-seral, closed canopy) plots is higher, as might be expected (SD = 16.9). At proposed sample sizes (average of 17 / strata), estimates may be within ± 5 cover points for LCL, but will probably be closer to 10 for MCL.

Stratifying by legacy status greatly reduces SD for DDF in legacy plots (Table 3). The same is true to a lesser degree for DWF legacy plots. Stratifying for legacy increases SD in the MDF legacy plots.

Table 1. Summary statistics for % Crown Closure

| PAG | N | Median | Mean | ±90% CI | SD | CV |
|---|---|---|---|---|---|---|
| DDF | 10 | 87.5 | 69.9 | 19.92 | 34.362 | 49.16 |
| MDF | 8 | 87 | 87.9 | 5.86 | 8.741 | 9.95 |
| MWF | 11 | 88 | 84.7 | 7.43 | 13.595 | 16.05 |
| DWF | 10 | 77 | 76.1 | 10.13 | 17.477 | 22.97 |
| All | 39 | 87 | 79.4 | 5.82 | 21.556 | 27.16 |

Table 2. Crown closure by seral/crown strata.

| PAG | Seral Strata | N | Median | Mean | ±90% CI | SD | CV |
|---|---|---|---|---|---|---|---|
| DDF | 1407LO | 2 | 83 | 83 | 28.4 | 6.36 | 7.71 |
| DDF | 1407MC | 3 | 88 | 82 | 19.5 | 11.59 | 14.08 |
| DDF | 1407MCL | 3 | 90 | 91 | 7.0 | 4.16 | 4.56 |
| DDF | 1407MO | 2 | 7 | 7 | 41.0 | 9.19 | 141.42 |
| MDF | 1408LCL | 3 | 96 | 97 | 2.9 | 1.73 | 1.79 |
| MDF | 1408MC | 2 | 77 | 77 | 12.6 | 2.83 | 3.67 |
| MDF | 1408MCL | 3 | 84 | 86 | 5.8 | 3.46 | 4.03 |
| MWF | 2003LCL | 5 | 87 | 87 | 9.3 | 9.78 | 11.27 |
| MWF | 2003MCL | 6 | 89 | 83 | 13.9 | 16.89 | 20.35 |
| DWF | 2004LCL | 4 | 71 | 70 | 17.0 | 14.45 | 20.64 |
| DWF | 2004MC | 3 | 96 | 82 | 45.3 | 26.89 | 32.79 |
| DWF | 2004MCL | 3 | 75 | 78 | 24.1 | 14.29 | 18.25 |

Table 3. Crown closure by legacy status.

| PAG | legacy | N | Median | Mean | ±90% CI | SD | CV |
|---|---|---|---|---|---|---|---|
| DDF | N | 5 | 69 | 52 | 40.6 | 42.59 | 81.89 |
| DDF | Y | 5 | 88 | 88 | 6.2 | 6.50 | 7.40 |
| MDF | N | 2 | 77 | 77 | 12.6 | 2.83 | 3.67 |
| MDF | Y | 6 | 93 | 92 | 5.4 | 6.50 | 7.11 |
| MWF | Y | 11 | 88 | 85 | 7.4 | 13.59 | 16.05 |
| DWF | N | 3 | 96 | 82 | 45.3 | 26.89 | 32.79 |
| DWF | Y | 7 | 75 | 74 | 10.2 | 13.87 | 18.85 |

Shrub cover

Later seral stages have lower or comparable SD (no doubt related to consistently lower shrub cover). Legacy plots have lower SD except for MDF.

Table 4. Summary statistics for % Total Shrub Cover.

| PAG | N | Median | Mean | ±90% CI | SD | CV |
|---|---|---|---|---|---|---|
| DDF | 10 | 6.9 | 10.5 | 6.32 | 10.908 | 104.00 |
| MDF | 8 | 8.4 | 13.1 | 9.33 | 13.936 | 106.75 |
| MWF | 11 | 22.3 | 35.7 | 14.42 | 26.392 | 74.02 |
| DWF | 10 | 15.9 | 19.1 | 10.40 | 17.947 | 93.82 |
| All | 39 | 13.6 | 20.3 | 5.59 | 20.700 | 101.83 |

Table 5. Shrub cover by seral/crown strata.

| PAG | Seral Strata | N | Median | Mean | ±90% CI | SD | CV |
|---|---|---|---|---|---|---|---|
| DDF | 1407LO | 2 | 13 | 13 | 63.4 | 14.21 | 109.46 |
| DDF | 1407MC | 3 | 0 | 4 | 12.9 | 7.65 | 171.48 |
| DDF | 1407MCL | 3 | 2 | 5 | 9.2 | 5.46 | 117.33 |
| DDF | 1407MO | 2 | 26 | 26 | 1.0 | 0.22 | 0.85 |
| MDF | 1408LCL | 3 | 4 | 9 | 15.3 | 9.07 | 103.19 |
| MDF | 1408MC | 2 | 11 | 11 | 57.8 | 12.95 | 114.25 |
| MDF | 1408MCL | 3 | 13 | 18 | 35.3 | 20.96 | 113.47 |
| MWF | 2003LCL | 5 | 40 | 44 | 29.7 | 31.19 | 70.62 |
| MWF | 2003MCL | 6 | 21 | 29 | 18.1 | 21.96 | 76.88 |
| DWF | 2004LCL | 4 | 19 | 17 | 13.7 | 11.62 | 69.93 |
| DWF | 2004MC | 3 | 14 | 23 | 46.0 | 27.29 | 118.00 |
| DWF | 2004MCL | 3 | 10 | 18 | 36.4 | 21.56 | 116.63 |

Table 6. Shrub cover by legacy status.

| PAG | legacy | N | Median | Mean | ±90% CI | SD | CV |
|---|---|---|---|---|---|---|---|
| DDF | N | 5 | 13 | 13 | 12.3 | 12.88 | 99.11 |
| DDF | Y | 5 | 3 | 8 | 8.8 | 9.28 | 116.27 |
| MDF | N | 2 | 11 | 11 | 57.8 | 12.95 | 114.25 |
| MDF | Y | 6 | 8 | 14 | 12.7 | 15.39 | 112.90 |
| MWF | Y | 11 | 22 | 36 | 14.4 | 26.39 | 74.02 |
| DWF | N | 3 | 14 | 23 | 46.0 | 27.29 | 118.00 |
| DWF | Y | 7 | 18 | 17 | 11.0 | 14.95 | 85.84 |

## % Mortality from Bark Beetles

Stratification does not appreciably lower variance for bark beetle mortality. i.e., in strata with a higher incidence of mortality, SD is similar or larger than when estimated by PAG. This is because overall bark beetle mortality is relatively low (distributions are still usually skewed).

Table 7. Summary statistics for % mortality from bark beetle, calculated by TPA and BA.

| | | % Mortality from Bark Beetle | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Trees / Acre | | | | | Basal Area | | | | |
| PAG | N | Median | Mean | ±90% CI | SD | CV | Median | Mean | ±90% CI | SD | CV |
| DDF | 9 | 0.0 | 0.7 | 1.18 | 1.90 | 255.64 | 0.0 | 2.2 | 2.86 | 4.61 | 205.54 |
| DWF | 10 | 0.0 | 2.6 | 3.35 | 5.78 | 223.21 | 0.0 | 5.0 | 5.54 | 9.55 | 191.07 |
| MDF | 8 | 0.2 | 1.4 | 1.96 | 2.93 | 210.33 | 3.3 | 6.1 | 6.22 | 9.28 | 151.69 |
| MWF | 11 | 0.0 | 4.8 | 6.41 | 11.72 | 242.33 | 0.0 | 8.9 | 7.16 | 13.11 | 148.05 |
| All | 38 | 0.0 | 2.6 | 1.94 | 7.09 | 278.09 | 0.0 | 5.7 | 2.68 | 9.78 | 171.56 |

Table 8. Summary statistics for % mortality from bark beetle by seral/crown strata, calculated by TPA and BA.

| | | | % Mortality from Bark Beetle | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Trees / Acre | | | | | Basal Area | | | | |
| PAG | Seral Strata | N | Median | Mean | ±90% CI | SD | CV | Median | Mean | ±90% CI | SD | CV |
| DDF | 1407LO | 2 | 2.9 | 2.9 | 18.10 | 4.05 | 141.4 | 6.3 | 6.3 | 39.46 | 8.84 | 141.4 |
| DDF | 1407MC | 3 | 0.0 | 0.3 | 0.92 | 0.55 | 173.2 | 0.0 | 2.6 | 7.49 | 4.44 | 173.2 |
| DDF | 1407MC | 3 | 0.0 | 0.0 | . | 0.00 | . | 0.0 | 0.0 | . | 0.00 | . |
| DDF | 1407MO | 2 | 50.0 | 50.0 | 315.69 | 70.71 | 141.4 | 50.0 | 50.0 | 315.69 | 70.71 | 141.4 |
| DWF | 2004LCL | 4 | 0.4 | 2.1 | 4.26 | 3.62 | 175.6 | 3.6 | 8.9 | 15.91 | 13.52 | 151.4 |
| DWF | 2004MC | 3 | 0.0 | 5.9 | 17.18 | 10.19 | 173.2 | 0.0 | 4.8 | 13.91 | 8.25 | 173.2 |
| DWF | 2004MC | 3 | 0.0 | 0.0 | . | 0.00 | . | 0.0 | 0.0 | . | 0.00 | . |
| MDF | 1408LCL | 3 | 0.0 | 0.1 | 0.40 | 0.24 | 173.2 | 0.0 | 2.2 | 6.49 | 3.85 | 173.2 |
| MDF | 1408MC | 2 | 4.3 | 4.3 | 26.94 | 6.03 | 141.4 | 13.6 | 13.6 | 86.10 | 19.28 | 141.4 |
| MDF | 1408MC | 3 | 0.9 | 0.7 | 1.09 | 0.65 | 88.9 | 6.7 | 5.0 | 7.43 | 4.41 | 88.2 |
| MWF | 2003LCL | 5 | 0.0 | 2.5 | 5.15 | 5.40 | 216.4 | 0.0 | 7.9 | 13.79 | 14.46 | 182.7 |
| MWF | 2003MC | 6 | 0.3 | 6.8 | 12.78 | 15.54 | 228.9 | 4.5 | 9.6 | 10.87 | 13.22 | 137.2 |

Table 9. Summary statistics for % mortality from bark beetle by legacy status, calculated by TPA and BA.

| | | | % Mortality from Bark Beetle | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Trees / Acre | | | | | Basal Area | | | | |
| PAG | legacy | N | Median | Mean | ±90% CI | SD | CV | Median | Mean | ±90% CI | SD | CV |
| DDF | N | 5 | 0.0 | 20.2 | 42.54 | 44.62 | 221.0 | 0.0 | 21.5 | 41.94 | 43.99 | 204.2 |
| DDF | Y | 5 | 0.0 | 1.1 | 2.44 | 2.56 | 223.6 | 0.0 | 2.5 | 5.33 | 5.59 | 223.6 |
| DWF | N | 3 | 0.0 | 5.9 | 17.18 | 10.19 | 173.2 | 0.0 | 4.8 | 13.90 | 8.25 | 173.2 |
| DWF | Y | 7 | 0.0 | 1.2 | 2.05 | 2.79 | 236.5 | 0.0 | 5.1 | 7.85 | 10.69 | 209.4 |
| MDF | N | 2 | 4.3 | 4.3 | 26.94 | 6.03 | 141.4 | 13.6 | 13.6 | 86.10 | 19.28 | 141.4 |
| MDF | Y | 6 | 0.2 | 0.4 | 0.45 | 0.54 | 125.5 | 3.3 | 3.6 | 3.29 | 4.00 | 110.8 |
| MWF | Y | 11 | 0.0 | 4.8 | 6.41 | 11.72 | 242.3 | 0.0 | 8.9 | 7.16 | 13.11 | 148.1 |

## % Fire Resistant Trees

Stratification by seral/crown classes may reduce variability in the percentage of fire resistant trees calculated as trees/acre (but not as basal area) for the LCL strata for MWF, but not for MCL strata for MWF. 90% confidence interval half-widths may be close to 5 (rather than 10-15) for this PAG/Seral class. There is no evidence that variability will be lower for legacy plots.

Table 10. Summary statistics for % of fire resistant trees, calculated by TPA and BA.

| | | % Fire Resistant Trees | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Trees / Acre | | | | | Basal Area | | | | |
| PAG | N | Median | Mean | ±90% CI | SD | CV | Median | Mean | ±90% CI | SD | CV |
| DDF | 9 | 36 | 38 | 22.7 | 36.57 | 95.4 | 73 | 52 | 24.3 | 39.22 | 75.2 |
| DWF | 10 | 15 | 22 | 14.7 | 25.36 | 113.1 | 50 | 50 | 13.9 | 23.98 | 48.2 |
| MDF | 8 | 12 | 22 | 17.4 | 25.98 | 116.7 | 44 | 47 | 19.2 | 28.66 | 60.5 |
| MWF | 11 | 13 | 19 | 9.9 | 18.08 | 94.6 | 46 | 52 | 8.9 | 16.38 | 31.5 |
| All | 38 | 15 | 25 | 7.3 | 26.81 | 106.4 | 50 | 50 | 7.3 | 26.53 | 52.6 |

Table 11. Summary statistics for % of fire resistant trees by seral/crown strata, calculated for TPA and BA.

| | | | % Fire Resistant Trees | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Trees / Acre | | | | | Basal Area | | | | |
| PAG | Seral Strata | N | Median | Mean | ±90% CI | SD | CV | Median | Mean | ±90% CI | SD | CV |
| DDF | 1407LO | 2 | 80.6 | 80.6 | 122.53 | 27.45 | 34.1 | 88.9 | 88.9 | 70.15 | 15.71 | 17.7 |
| DDF | 1407MC | 3 | 14.1 | 29.6 | 66.77 | 39.60 | 134.0 | 31.3 | 39.6 | 74.75 | 44.34 | 112.0 |
| DDF | 1407MCL | 3 | 3.6 | 13.0 | 33.01 | 19.58 | 150.2 | 20.0 | 30.9 | 63.34 | 37.57 | 121.6 |
| DDF | 1407MO | 1 | 56.2 | 56.2 | . | . | . | 80.0 | 80.0 | . | . | . |
| DWF | 2004LCL | 4 | 8.0 | 12.5 | 15.35 | 13.05 | 104.0 | 45.0 | 48.8 | 27.33 | 23.23 | 47.6 |
| DWF | 2004MC | 3 | 18.8 | 19.0 | 12.90 | 7.65 | 40.3 | 50.1 | 48.0 | 12.07 | 7.16 | 14.9 |
| DWF | 2004MCL | 3 | 25.4 | 39.1 | 74.50 | 44.19 | 113.2 | 60.0 | 52.8 | 69.64 | 41.31 | 78.3 |
| MDF | 1408LCL | 3 | 9.2 | 6.2 | 9.03 | 5.35 | 86.6 | 38.5 | 29.5 | 44.14 | 26.18 | 88.8 |
| MDF | 1408MC | 2 | 29.3 | 29.3 | 87.49 | 19.60 | 66.8 | 57.6 | 57.6 | 127.15 | 28.48 | 49.4 |
| MDF | 1408MCL | 3 | 22.4 | 33.6 | 65.51 | 38.86 | 115.6 | 71.4 | 58.5 | 53.67 | 31.84 | 54.4 |
| MWF | 2003LCL | 5 | 8.9 | 11.3 | 6.18 | 6.48 | 57.4 | 46.2 | 50.6 | 18.74 | 19.65 | 38.8 |
| MWF | 2003MCL | 6 | 20.3 | 25.6 | 18.54 | 22.54 | 87.9 | 51.9 | 53.2 | 12.31 | 14.96 | 28.1 |

Table 12. Summary statistics for % of fire resistant trees by legacy status, calculated for TPA and BA.

| | | | % Fire Resistant Trees | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Trees / Acre | | | | | Basal Area | | | | |
| PAG | legacy | N | Median | Mean | ±90% CI | SD | CV | Median | Mean | ±90% CI | SD | CV |
| DDF | N | 4 | 35.1 | 36.2 | 41.15 | 34.97 | 96.6 | 55.6 | 49.7 | 48.79 | 41.46 | 83.4 |
| DDF | Y | 5 | 35.6 | 40.1 | 39.87 | 41.82 | 104.4 | 72.7 | 54.1 | 40.18 | 42.14 | 77.9 |
| DWF | N | 3 | 18.8 | 19.0 | 12.90 | 7.65 | 40.3 | 50.1 | 48.0 | 12.07 | 7.16 | 14.9 |
| DWF | Y | 7 | 9.4 | 23.9 | 22.48 | 30.61 | 128.0 | 50.0 | 50.5 | 21.33 | 29.04 | 57.5 |
| MDF | N | 2 | 29.3 | 29.3 | 87.49 | 19.60 | 66.8 | 57.6 | 57.6 | 127.15 | 28.48 | 49.4 |
| MDF | Y | 6 | 9.3 | 19.9 | 23.86 | 29.01 | 145.8 | 44.2 | 44.0 | 25.11 | 30.53 | 69.4 |
| MWF | Y | 11 | 12.5 | 19.1 | 9.88 | 18.08 | 94.6 | 46.2 | 52.0 | 8.95 | 16.38 | 31.5 |

## % Large Trees

For the LCL strata in MWF, stratification by seral/crown classes appears to reduce variability for the percentage of large trees expressed as either trees/acre or basal area, but the effect is more pronounced for TPA. Provided this trend holds for the full sample, CIHW may be 5-10, instead of 10-15. Variability may also be lower for DWF legacy plots (expressed as % of basal area only). However, for the LCL strata in MWF, stratification appears to increase variability in either TPA or BA).

Table 13. Summary statistics for % large trees (> 17" dbh), calculated by TPA and BA.

| | | % Large Trees | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Trees / Acre | | | | | Basal Area | | | | |
| PAG | N | Median | Mean | ±90% CI | SD | CV | Median | Mean | ±90% CI | SD | CV |
| DDF | 9 | 20 | 21 | 12.0 | 19.29 | 90.4 | 55 | 41 | 17.0 | 27.45 | 66.6 |
| DWF | 10 | 21 | 29 | 14.0 | 24.10 | 83.3 | 61 | 59 | 12.7 | 21.89 | 37.0 |
| MDF | 8 | 5 | 10 | 8.2 | 12.21 | 118.2 | 28 | 32 | 15.5 | 23.10 | 71.4 |
| MWF | 11 | 18 | 25 | 14.6 | 26.65 | 108.7 | 63 | 63 | 11.6 | 21.28 | 33.8 |
| All | 38 | 15 | 22 | 6.0 | 22.05 | 100.5 | 55 | 50 | 7.0 | 25.70 | 51.1 |

Table 14. Summary statistics for % large trees (> 17" dbh) by seral/crown strata, calculated by TPA and BA.

| | | | % Large Trees | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Trees / Acre | | | | | Basal Area | | | | |
| PAG | Seral Strata | N | Median | Mean | ±90% CI | SD | CV | Median | Mean | ±90% CI | SD | CV |
| DDF | 1407LO | 2 | 40.5 | 40.5 | 74.26 | 16.63 | 41.1 | 69.0 | 69.0 | 15.03 | 3.37 | 4.9 |
| DDF | 1407MC | 3 | 11.7 | 19.0 | 36.96 | 21.92 | 115.7 | 31.3 | 35.0 | 43.65 | 25.89 | 74.1 |
| DDF | 1407MCL | 3 | 1.2 | 7.2 | 19.25 | 11.42 | 158.5 | 13.3 | 22.6 | 47.94 | 28.44 | 125.7 |
| DDF | 1407MO | 1 | 32.6 | 32.6 | . | . | . | 60.0 | 60.0 | . | . | . |
| DWF | 2004LCL | 4 | 22.2 | 23.9 | 20.50 | 17.42 | 72.9 | 68.8 | 64.4 | 20.99 | 17.84 | 27.7 |
| DWF | 2004MC | 3 | 13.5 | 11.7 | 10.57 | 6.27 | 53.4 | 38.5 | 36.2 | 25.57 | 15.17 | 41.9 |
| DWF | 2004MCL | 3 | 52.1 | 52.8 | 46.84 | 27.78 | 52.6 | 75.0 | 75.0 | 25.29 | 15.00 | 20.0 |
| MDF | 1408LCL | 3 | 2.2 | 2.7 | 5.11 | 3.03 | 111.7 | 23.1 | 21.6 | 35.19 | 20.87 | 96.7 |
| MDF | 1408MC | 2 | 8.0 | 8.0 | 25.42 | 5.69 | 71.2 | 22.9 | 22.9 | 65.77 | 14.73 | 64.3 |
| MDF | 1408MCL | 3 | 22.4 | 19.5 | 28.10 | 16.67 | 85.4 | 54.5 | 49.4 | 42.15 | 25.00 | 50.6 |
| MWF | 2003LCL | 5 | 20.4 | 19.2 | 4.79 | 5.02 | 26.2 | 69.2 | 70.9 | 12.95 | 13.59 | 19.2 |
| MWF | 2003MCL | 6 | 10.3 | 29.0 | 30.21 | 36.72 | 126.8 | 53.5 | 56.2 | 20.80 | 25.29 | 45.0 |

Table 15. Summary statistics for % large trees (> 17" dbh) by legacy status, calculated by TPA and BA.

| | | | % Large Trees | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Trees / Acre | | | | | Basal Area | | | | |
| PAG | legacy | N | Median | Mean | ±90% CI | SD | CV | Median | Mean | ±90% CI | SD | CV |
| DDF | N | 4 | 22.1 | 22.4 | 22.55 | 19.16 | 85.7 | 45.6 | 41.2 | 28.91 | 24.57 | 59.6 |
| DDF | Y | 5 | 20.4 | 20.5 | 20.60 | 21.61 | 105.3 | 54.5 | 41.2 | 30.95 | 32.46 | 78.8 |
| DWF | N | 3 | 13.5 | 11.7 | 10.57 | 6.27 | 53.4 | 38.5 | 36.2 | 25.57 | 15.17 | 41.9 |
| DWF | Y | 7 | 31.6 | 36.3 | 18.69 | 25.45 | 70.1 | 75.0 | 68.9 | 11.99 | 16.32 | 23.7 |
| MDF | N | 2 | 8.0 | 8.0 | 25.42 | 5.69 | 71.2 | 22.9 | 22.9 | 65.77 | 14.73 | 64.3 |
| MDF | Y | 6 | 4.1 | 11.1 | 11.62 | 14.12 | 127.1 | 32.4 | 35.5 | 21.08 | 25.62 | 72.2 |
| MWF | Y | 11 | 18.2 | 24.5 | 14.56 | 26.65 | 108.7 | 62.5 | 62.9 | 11.63 | 21.28 | 33.8 |

**Appendix TP-B**

# A Community Engagement Plan for the Ashland Forest Resiliency Project

**February 18th, 2010**

**Executive Summary:** The collaborative effort to plan and implement monitoring and community involvement in the proposed Ashland Forest Resiliency project has resulted in this Community Engagement plan. The plan outlines the importance of the watershed to the city, the need for managing the watershed, the need for community engagement, and specific goals and action items that will engage citizens in their watershed over the expected 10 year timeframe of the AFR project and perhaps beyond. The actions are prioritized for focused efforts given scarce funding and time.

## Introduction- The Ashland Creek Watershed: A Brief History

In 1892, the Ashland Board of Trade (now Chamber of Commerce) petitioned then President Cleveland to preserve the Ashland Watershed for the purpose of securing the City's water supply. The request was honored in September of 1893, one of only two granted throughout the country with the other being the Bull Run watershed near Portland, Oregon.[33] Upon creation of the US Forest Service in 1905 the issue of the Ashland Watershed's protection continued, resulting in a 1929 Memorandum of Understanding (MOU) giving the City of Ashland standing as a partner in all aspects of watershed management. As a result there are relatively few roads and few acres where commercial logging has taken place compared to many landscapes across the country. The City of Ashland is a minor land owner in the watershed as well, with 645 acres of municipal forestlands that have been managed since 1994 under the Ashland Forest Plan and the management direction of the Ashland Forest Lands Commission. Work has taken place in the watershed over the years including limited logging, construction of fuel breaks, weed management, fire suppression, trail construction, and fuels reduction. True community engagement in management planning has historically been lacking, but has more recently amped up during the Forest Service's planning process involving the Ashland Watershed Stewardship Alliance in the late 1990's (leading to the Ashland Watershed Protection Project (AWPP)) and most recently the Ashland Forest Resiliency Community Alternative in 2004, which lead to the present day AFR project. Although the AWPP project addressed the wildfire hazard and forest health dilemma, it only encompassed 10 percent of the watershed area. The AFR project was initiated under the Healthy Forest Restoration Act (2003), requiring community stakeholder collaboration and multi-party monitoring on roughly one-half the watershed area. The complex

[33] Borgias, Darren- The Nature Conservancy. 2009. *Historical Conservation by the Ashland Chamber of Commerce-Draft.*

political, social, and ecological situation demands both careful restoration practices and respectful interaction among citizens and organizations.

## What is the proposed Ashland Forest Resiliency Project?

Since 2004, the people who live and work in Ashland and depend on a healthy forest for clean water have been working together to design a future for the Ashland watershed.

Citizens, community leaders and the U.S. Forest Service all agree on the key objectives: to reduce the risk of large-scale wildfire thus protecting residents, properties, organizations in and around the City; to help large, old trees survive fire, insects and disease; to restore a healthy forest ecosystem; and to uphold the critical values of our watershed -clean drinking water, recreation and wildlife habitat.

The mark of a healthy, resilient forest is its ability to recover from disturbance such as fire or drought. Our local forests were once adapted to frequent, low intensity underburns among other disturbances. Larger conifers such as pines, Douglas-fir and incense cedar with their thick bark are scarred, but historically survived frequent low intensity fires. More recently, these dry, open forests of large trees have grown dense with young Douglas-fir, Pacific madrone, white fir and shrubs as a result of fire suppression. If a fire burns now, the large, older "legacy trees" are prone to succumb as unnaturally severe wildfires boil up through the dense undergrowth into the canopy. They also must compete for water and nutrients with the dense young growth, weakening the older trees and increasing their vulnerability to insects and disease.

The City of Ashland, local citizens and forest conservation groups collaborated to develop a Community Wildfire Protection Plan in 2004 that included a forest restoration plan. In 2008, the Forest Service used the community plan to develop a preferred alternative for managing national forest lands comprising the bulk of our watershed. This is the forest resiliency plan, and it guides where and how to thin trees and brush on 7,600 acres in order to restore a resilient and sustainable forest. The plan will save the largest trees and preserve habitat for wildlife dependent on older forests. It will also ensure water quality by preserving stream-side habitat, and protecting unstable slopes and erodible soils. And the plan will keep our communities safer from the threat of wildfire. Forest workers will thin smaller trees, reduce flammable fuels and conduct controlled burns to replicate the natural process. Citizens can participate through multi-party monitoring and community education.

The people of Ashland are interested in how their plan for forest resiliency and safety is implemented on the ground. To meet that need, local stakeholders propose working closely with the Forest Service to monitor results and conditions each step of the way. The multi-party monitoring effort will help ensure that plans are followed and that measurable results are used to adjust management actions along the way. Community engagement will be key to developing awareness of project activities, goals, and opportunities as well as awareness of the watershed's importance. A 2008-2009 grant from the National Forest Foundation helped to develop the monitoring project and kick off the most recent efforts to engage Ashland in its watershed.

# I. Community Engagement Strategy

Community collaboration and multi-party monitoring are required elements of a Healthy Forest Restoration Act project. Legislation aside, community involvement in the management of such an important resource makes good sense and will be increasing as this important project draws more attention. The community engagement effort

Interest in community involvement and education was expressed at two meetings and during outings to see conditions and discuss development of ecological monitoring, public engagement and social capital around the AFR project. Goals were proposed and prioritized by citizens and project partners whose work provides insight into effective ways to improve understanding of the AFR project, to involve citizens and students in project monitoring and to create associated educational opportunities. In addition, it addresses means to gather quality data and input during the project implementation and monitoring process that will help guide "adaptive management" and shape future actions. Following is a list of the proposed goals, as prioritized, along with action steps developed to varying degrees. Common threads run through each item; when integrated and taken together, these threads offer exceptional potential for accomplishing the goals. A concluding section draws together connections to consolidate work and relationship building from the outset. Multiple opportunities for stakeholder involvement and leadership are suggested, as well as potential project organization strategies (e.g. sub-committees) to marshal this engagement.

## Goal#1: Create and Update Community Engagement Plan

*Background*: The culmination of the two workshops on public involvement is a plan to implement the finding and priorities (this document). Further input is needed to complete this plan and move forward on specific goals and actions.

**Goal #1/Action #1: Create Plan and Update Regularly**

| | |
|---|---|
| **Desired Outcome:** | The strategic outreach and education plan guides actions and establishes the need and compelling case for funding of identified activities. The plan establishes timelines and responsibilities to goals. A funding committee is established that identifies sources of funding and facilitates applications to these sources. The CE group periodically updates and revises the plan to stay current with progress and needs. |
| **Timeline:** | Complete CE plan with stakeholder input by March 2010. Update the plan every 6 months or as needed. |
| **Strategies:** | Take stakeholder input on the draft plan and finalize. Assemble a vital group of interested people and divide work into small groups or sub-committees. Small groups will give input on the progress and updates for each goal. Larger group will approve updates as needed. |

| | |
|---|---|
| **Lead:** | City of Ashland (including Forest Lands Commission). |
| **Progress:** | Feb. 2010--Plan has been drafted and edited by the group. Final version expected in March 2010. |

## Goal #2: Fund and Hire a Community Engagement Coordinator

*Background*: An employee is needed to work full-time on implementing the Community Engagement Plan among other public communication tasks. A non-federal employee is preferred.

### Goal #2/Action #1: Fund and hire a Coordinator

| | |
|---|---|
| **Desired Outcome:** | One full-time employee is hire to implement actions identified in this plan and assist with fundraising and budgeting. |
| **Timeline:** | Have someone working as soon as possible. |
| **Strategies:** | City of Ashland will be advocating for position money as a project partner. Create a position description for the coordinator. |
| **Lead:** | City of Ashland (including Forest Lands Commission) and Community Engagement committee working with the fund development committee and other key stakeholders and partners |
| **Progress:** | Feb. 2010 – City is dedicating staff half-time with likely funding from AFR project and City funds. |

## Goal #3: Bring the Watershed to the People Using Traditional and Emerging Modes of Communication

*Background*: This goal is about reaching out to the public and keeping them informed through reliable and recognized (although not necessarily traditional) modes of communication.

### Goal #3/Action #1: AFR Community Information Campaign

| | |
|---|---|
| **Desired Outcome:** | The public is well informed about the AFR project goals, strategy and timeline, and the results and opportunities involved in monitoring. Information will be available in a variety of formats and a diverse range of outlets to capture different citizen groups. |
| **Timeline:** | A website (www.ashlandwatershed.org) went public in October 2009. Further communication strategies need to be developed by a committee in preparation for timely occurrence/release depending on events taking place. |
| **Strategies:** | Bulletin boards, community meetings, YouTube, Facebook (and other social media), local radio and television, website, a news column, neighborhoods, simulations, a play, a festival, and speakers to deliver the AFR message and information. Establish a communication committee to develop these ideas into a communication plan, guide action and find funding and related support. |
| **Lead:** | City of Ashland (with involvement from the Forest Lands Commission) will be the lead. |
| **Progress:** | Website is up being updated. City is considering use of social networking sites for public information. |

## Goal #3/Action #2: Interpretive Signs

| | |
|---|---|
| **Desired Outcome:** | Installation of durable, informative interpretive signs that supplement other outreach and discussions and that address various types of users. |
| **Timeline:** | Signs designed and installed prior to action on the ground, or as action in certain areas is implemented. Certain locations may be less time sensitive as would be certain topics. |
| **Strategies:** | Make some signs accessible to auto traffic via turnouts and others for those exploring the forests, e.g. at natural resting locations for hikers and bikers and at entrances to trails. Ideas offered included an interpretive station at the White Rabbit Trail, upper Granite St (swimming reservoir?), and trail junctions at roads, and also in the plaza/Lithia Park area.<br><br>Hold a fun design competition inviting design artists, students, others to compete for the most compelling and clear sign presentations.<br>Invite sign maker business/es to provide discounts for manufacturing the signs, and potentially receive a tax deduction.<br>Seek local sponsors for the signs – an "Adopt a Sign" program where the business or individual can have the name noted on the sign. |
| **Lead:** | City of Ashland with the Ashland Chamber of Commerce: Coordinate city, business and Forest Service effort, by recruiting a public-private leadership committee, to include an adult educator and a design specialist |
| **Supporting roles:** | Southern Oregon University: provide social assessment to inform optimal messaging and delivery<br>North Mountain Park (Ashland Parks): input on design and production of signs |

| | |
|---|---|
| | Local graphic artist—develop a unified presentation |
| **Progress:** | North Mountain Park shared their experience creating signs. Budget for signs is being submitted as part of City request for AFR funding. |

## Goal #4: Create and Offer Opportunities for Community Participation

*Background*: Informative tours were ranked as the highest priority element by those assembled for the Public Engagement Workshop, Participants specified informative tours as well as eco-recreation trips, post-activity tours, Parks Department sponsored trips, and interpretive exhibits.

### Goal #4, Action #1: Hold Informative Tours

| | |
|---|---|
| **Desired Outcome:** | Get the "people to the woods" by offering opportunities for community members and leaders to see first hand and understand forest conditions, understand the AFR plan and the resulting restoration work, and discover what forest monitoring is and how multi-party monitoring works. |
| **Timeline:** | Hikes are recommended to be an ongoing activity, as needed to show project outcomes or as requested by stakeholders. Future hikes will be scheduled as weather allows in the Fall of 2009 and begin again in Spring 2010. |
| **Strategies:** | Hikes/outings for key community leaders and City government leaders are important and need to be scheduled, especially around key decision points such as the signing of the Forest Service record of decision, and between distinct activities, i.e. sample tree marking, unit layout, understory thinning, controlled burning.<br>Outings need to be tailored to involve specific user groups (bikers, hikers, non-recreational residents, merchants, real estate professionals, etc...) or other community groups in focused trips on topic areas of greatest interest to them. Enlist the support of knowledgeable community members to establish a strategy. |
| **Lead:** | City of Ashland including Forest Lands Commission: schedule and publicize public outings and outreach with input from stakeholders and public. |
| **Progress:** | Hikes were held for the public on August 20th, 22nd, and September 12th of 2009. |

## Goal #5: Create volunteer work and monitoring program through Southern Oregon University

*Background*: Harkening back to the existence of the REAL Corps (part of the federal Americorps program) at SOU in past years, SOU can play a prominent role in AFR project monitoring and student involvement through direct work experience and/or the environmental sciences curriculum.

### Goal #5/Action #1: SOU involvement

| | |
|---|---|
| **Desired Outcome:** | SOU takes a formal role as a project partner for education, engagement of students, and research. It integrates opportunities for students to participate in project social and ecological monitoring and hopefully implementation. A program similar to REALcorps comes into existence and brings in volunteers who work on the project in various capacities. |
| **Timeline:** | SOU formalizes their involvement with help of partners and students are involved in monitoring by spring 2010. Volunteer program depends on funding and available work. |
| **Strategies:** | Work with SOU to Come up with a well defined role. Make contact with SOU to establish a formal working relationship and agreement. |
| **Lead:** | SOU –Mark Shibley |
| **Progress:** | SOU students worked on strategies for AFR involvement in Fall of 2009 and will present their findings to SOU administration and AFR partners in February 2010. |

## Goal #6: Establish AFR monitoring partnership between the Ashland School District, Southern Oregon University, and the Forest Service.

*Background*: This goal brings in the Ashland School District to provide opportunities for local youth to become involved in the watershed through field trips, data collection, and monitoring. The link is made to SOU to give college students meaningful community-based learning opportunities and to help and mentor younger kids in field work and classroom work. The Forest Service fosters these activities and encourages staff to participate when possible.

### Goal #6/Action #1: Monitoring partnership including Ashland Schools

| | |
|---|---|
| **Desired Outcome:** | Local students (primarily Middle School and High School) develop a sense of place by learning about the watershed and experiencing it first hand. SOU students gain credit and experience by mentoring or teaching younger people about the watershed. |
| **Timeline:** | Contacts with ASD and SOU are made in 2009 and details are worked out through the end of the 2010 school year. Full involvement begins in Fall of 2010. |

| | |
|---|---|
| **Strategies:** | City and TNC project partners facilitate meetings to lay out the possibilities of and educational partnership centered on the watershed. Create a coordinator/liaison who works with both ASD and SOU to develop these opportunities, possibly an Americorp volunteer. The Forest Lands Commission has been discussing a similar approach and should be consulted as this moves forward. Tap into existing efforts like fourth grade watershed education curriculum, sixth grade water studies, North Mt Park Nature Center programs, and forestry education. High School Environmental Studies and biology classes are a good target as well. |
| **Lead:** | Rich Whitley with City/Ashland Forest Lands Commission to provide input and/or assistance. |
| **Progress:** | SOU students worked on strategies for AFR involvement in Fall of 2009 and will present their findings to SOU administration and AFR partners in February 2010. Rich Whitley has been talking with the ASD about creating an education program involving local forests. |

## Goal #7: AFR Partnership articulates a clear vision for AFR project and launches implementation with demonstration areas.

*Background*: The need for a transparent process is key to building trust between the community and the Forest Service as this project moves into implementation. Community members want demonstration areas where they can see exactly how the process will work and the results on the ground as the project ramps up. A reliable and recognizable USFS presence in the community is desired. The AFR partnership (City, TNC, Lomakatsi Restoration Project) will play a large role.

### Goal #7/Action #1: Forest Service vision and transparency

| | |
|---|---|
| **Desired Outcome:** | The "roadmap" for AFR is clearly laid out and communicated to partners and community. Demonstration sites are completed and reviewed as implementation gains speed. |
| **Timeline:** | The project Record of Decision was signed in October. Ideally, the roadmap would be laid out before any activities begin, depending on the funding deadlines. |
| **Strategies:** | Maintain communication between City and USFS to stay up to date on project timelines and development of a roadmap.<br>Seek membership on the Ashland Coalition for U.S. Forest Service local District Ranger<br>Through a variety of means, keep the community updated on how the project is progressing (see Goal #6, Action #1) |
| **Lead:** | Project partners to communicate updates on timelines with Forest Service (Don Boucher) as lead. City of Ashland and Chamber of Commerce can assist with distribution of information. |

| | |
|---|---|
| **Progress:** | An implementation timeline and plan are being developed by the Forest Service and project partners. A new District Ranger will be here in March 2010. |

## Goal #8: Create volunteer involvement opportunities

*Background*: Volunteer opportunities are an exceptional and essential way to get the community involved in the AFR project. Volunteer opportunities have been discussed but yet need clear definition along with the formation of a volunteer support structure for recruiting, training, supervising and recognizing volunteers. Volunteers can function in a variety of roles depending on their expertise and capability.

### Goal #8/Action #1: AFR Volunteer Program

| | |
|---|---|
| **Desired Outcome:** | Ample opportunities are put forth for citizen and student volunteers to be engaged in aspects of the AFR project -- tied with project goals and actions listed above. Volunteers are given the necessary preparation and support, and they feel like their efforts are important and make a difference in the project. |
| **Timeline:** | Create a volunteer opportunity marketing piece describing what volunteers can do and when, to be completed by January 2010. Have the volunteer recruitment and training in place by end of Spring 2010. |
| **Strategies:** | Broad based appeal for volunteers through various outlets and organizations. Connect this program with SOU students as mentors and/or volunteers. Recruit retired resource professionals from the community to help guide and train other volunteers. Solicit volunteers from local service clubs. Use media outreach outline in Goal #6 to reach people |
| **Lead:** | City of Ashland (with involvement from the Forest Lands Commission) will be the lead for now. |
| **Supporting roles:** | US Forest Service provides ideas for volunteer jobs, possibly contributes supplies for use by volunteers, and plans and delivers the volunteer support program. SOU can support this effort even if not taking a lead role |
| **Progress:** | Lomakatsi Restoration Project will be involved as a project partner and brings an active volunteer program to the table. |

## Goal #9: Secure Funding for Community Engagement Work

*Background*: Undoubtedly there will be more work than can be funded from agency coffers. Outside funding sources will be key to accomplishing Goals and Actions identified in the plan.

### Goal #9/Action#1 Establish Funding Committee and Create a Budget

| | |
|---|---|
| **Desired Outcome:** | A funding committee is established and identifies sources of funding and facilitates applications to these sources based on projected costs laid out in a project budget. |
| **Timeline:** | Establish funding committee by March of 2010. Finish budget by May 2010 and begin applying to funding sources appropriate to activities. |
| **Strategies:** | Talk with Chamber of Commerce representatives and local service organizations to recruit members of funding committee. |
| **Lead:** | City of Ashland (including Forest Lands Commission) and Community Engagement committee working with the fund development committee and other key stakeholders and partners |
| **Progress:** | The AFR budget currently includes money for CE action items. A coordinator and other staff have been proposed for funding. |

## II. Coordinating Efforts into a Cohesive Program

There are many points of intersection among the goals and actions identified in this plan. In addition, other entities (City Forest Lands Commission, local schools) have been pursuing similar goals and programs. Coordination amongst all potential partners would create a unified and more effective campaign, maximize project effectiveness, and save time and effort. Coordination focuses on the education component involving local schools and volunteers.

*Bringing Together Education Partners*

Foster school district involvement with the Forest Lands Commission's fledgling efforts to get watershed education into local schools. Explore coordination with the Environmental Education program at SOU. SOU students could design forest related curriculum and/or create programs for local schools to be taught by future students. This may also be a way to offer meaningful volunteer opportunities for high school and college students and/or community members.

*Bringing in Volunteers*

Volunteers can play an essential and mutually beneficial role in getting others engaged in the process and becoming educated themselves. Depending on the amount of involvement from SOU and the potential re-creation of an Americorps program (or at least individual Americorps volunteers), the extent of a potential volunteer program varies. Integrating volunteers is a possibility through options for teaching in schools, collecting forest field data, and working behind the scenes coordinating programs. In any situation, volunteer monitoring and management are crucial to their success. The Nature

Conservancy has extensive volunteer coordination experience and is a valuable resource in helping the Forest Service design the AFR volunteer program. It will be essential to create a staff position to lead the volunteer program and provide timely and appropriate opportunities for volunteers.

*Oversight: Creating a Project Structure and Establishing Committees*
Several potential committees are identified in the plan. Leaders need to outline a proposed AFR organization for further review and input from key stakeholders and partners. Duplicating efforts or becoming too decentralized or defused could lead to a loss of volunteers and a lack of success. Further fleshing out of this plan might involve a chart of critical functions and how minimal oversight could lead to maximum results using but not overusing people on as few committees as possible.

## III. Prioritizing Goals and Actions

In recognition that there this effort has to begin with limited time and funding, there has to be a prioritized approach. Some actions are ongoing, and already had momentum when this plan was conceived. Others need significant input and to varying degrees are time sensitive. This table lays out priorities set forth by the Community Engagement committee for time sensitive and ongoing issues. Highest priorities are at the top of the table.

| Time Sensitive | Ongoing |
|---|---|
| 1. Create and Update Plan (Goal #4) | 1.Tours of Watershed (Goal #1) |
| 2. Convene Funding Committee (Goal #8) | 2. SOU Involvement (Goal #2 and #3) |
| 3. Fund and Hire Coordinator (Goal #9) | 3. Monitoring Partnership (Goal #3) |
| 4. Community Information /Interpretive Signs (Goal #6) | 4. Clear vision with demonstration areas (Goal #5) |
| 5. Create Volunteer Opportunities (Goal #7) | |

## *AFR Sub-Committee Leads and Members February, 2010*

### Goal#1: Create and Update Community Engagement Plan

Lead: City of Ashland - Chris Chambers

Group: All attendees will help edit, finalize, and update

### Goal #2: Fund and Hire a Community Engagement Coordinator

Lead: City of Ashland - Chris Chambers

No group since the City will be lead partner on Community Engagement in AFR. Chris Chambers has been assigned to Community Engagement work.

### Goal #3/Action #1: Bring the Watershed to the People Using Traditional and Emerging Modes of Communication

Lead: Chris Chambers

Group: Niki Del Pizzo, Dana Fortmiller, John Williams, Craig Gorson, Gary Pool, Kari Geis

### Goal #3/Action #2: Interpretive Signs

Lead: None listed

Group: The Nature Conservancy, Tim Chesley, Chris Chambers, Karin Onkka, Ashland Parks Dept

### Goal #4: Create and Offer Opportunities for Community Participation: Tours

Lead: City of Ashland - Chris Chambers

Group: Parks Dept, Chamber of Commerce -Dana Fortmiller, Marty Main, Lomakatsi RP- Niki Del Pizzo

### Goal #5: Create volunteer work and monitoring program through Southern Oregon University

Lead: SOU- Mark Shibley

Group: Chris Chambers, Rich Whitley, George McKinley, Marty Main, Vicky Sturtevant,

Lomakatsi RP

### Goal #6: Establish AFR monitoring partnership between the Ashland School District, Southern Oregon University, and the Forest Service.

Lead: Rich Whitley

Group: Mark Shibley, Tim Chesley, Craig Gorson, Niki DelPizzo, Vicky Sturtevant

## Goal #7: AFR Partnership articulates a clear vision for AFR project and launches implementation with demonstration areas.

Lead: Forest Service- Don Boucher

Group: City of Ashland- Marty Main, The Nature Conservancy, Lomakatsi Restoration Project

## Goal #8: Create volunteer involvement opportunities

Lead: City of Ashland – Chris Chambers/Marty Main

Group: Dana Fortmiller, Paul Galloway (USFS), Niki Del Pizzo, Craig Gorson, Jeff McFarland (Parks Forester)

## Goal #9: Secure Funding for Community Engagement Work

Lead: None listed

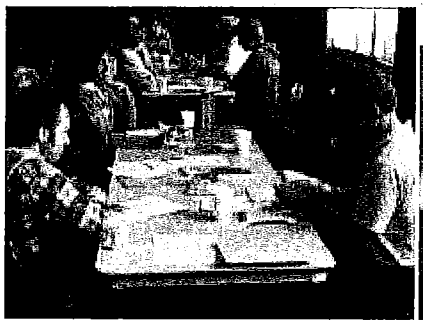
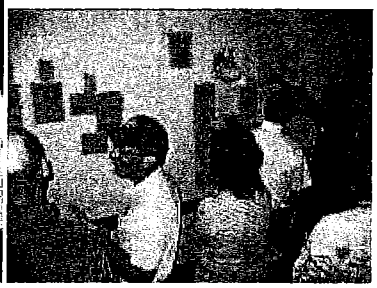
Group: Dana Fortmiller, Craig Gorson, Chris Chambers, Paul Galloway, Darren Borgias

## Appendix TP-C: Notes from Public Engagement Workshop

### Ashland Forest Resiliency Multiparty Monitoring *Public Engagement Workshop*
### August 7, 2009, Ashland Community Center, 10 am – 2 pm

**Participants**: Mark Shibley, Darren Borgias, Vicky Sturtevant, John Karns, Molly Sullivan, Chris Chambers, Marty Main, Rachel Werling, Melody Noraas, Kari Geis, Sam Whitridge, Rich Whitley, Paul Galloway, Neil Benson, John Stromberg, Carol Voisin, George McKinley, Joseph Vaile, Richard Best

- Welcome comments were offered by Mayor John Stromberg, and Fire Chief John Karns
- Darren Borgias reviewed the agenda and hand outs
- Marty Main gave a history of City involvement in the watershed and development of the community alternative for the Project
- Darren Borgias provided background on USFS monitoring and supplemental monitoring prioritized by a stakeholder group of technically inclined community members on June 12
- Vicky Sturtevant reviewed the results of the social capital workshop held on July 23.
- Darren described the small group process to brainstorm and then prioritize strategies and resources to support public engagement in monitoring to optimize social and ecological results of the Project.

- Individuals brainstormed, prioritized, shared in small group, and then shared with the large group. All ideas were included on the wall on sticky notes. Large group discussed organization and differentiation of ideas. Individuals voted for top three priority ideas using sticky dots, and one additional item for urgent implementation.

Results of the brainstorming, organization, and prioritization follow.

| Multi-party monitoring public engagement strategy, specific nominations with votes, and summary of nominated ideas with no votes. | Priority 1st 3 pts | 2nd 2 pts | 3rd 1 pt | total votes | total pts | Urgent (red) |
|---|---|---|---|---|---|---|
| **Hold informative tours, including stakeholder led walks** | **2** | **1** | **3** | **6** | **15** | **0** |
| ***Informative tours in the watershed woods*** | 3 | | 3 | 6 | 12 | |
| ***Stakeholder led informative walking tours*** | | 1 | 1 | 2 | 3 | |
| Eco-recreation trips, harvest trips, Parks trip, Parks exhibit | | | | 0 | 0 | |
| **SOU volunteer program for work and long-term monitoring** | **3** | **1** | **3** | **7** | **14** | **2** |
| ***SOU manage volunteer program (e.g. Americorps)*** | 2 | 1 | 1 | 4 | 9 | 1 |
| ***Establish Long-term monitoring program*** | 1 | | 2 | 3 | 5 | 1 |
| **Establish Ashland Schools-SOU-FS monitoring partnership** | **1** | **5** | **0** | **6** | **13** | **5** |
| ***Establish Partnership Ashland Schools/SOU/FS and monitoring agreement*** | 1 | 5 | | 6 | 13 | 5 |
| Place-based ed. (fire ecol., climate change), adopt-a-plot, watershed study book, branded restoration byproducts used locally | | | | 0 | 0 | |
| **Create education-outreach plan, establish funding committee** | **2** | **2** | **2** | **6** | **12** | **4** |
| ***Create education/outreach plan and funding*** | 2 | 2 | 1 | 5 | 11 | 3 |
| ***Establish fund-raising committee*** | | | 1 | 1 | 1 | 1 |
| **FS to hold vision, implement, starting with demonstration scale** | **2** | **2** | **2** | **6** | **12** | **0** |
| ***Demonstration sites with signs explaining treatment*** | 1 | 2 | 2 | 5 | 9 | |
| ***Vision (accomplishment and progress)*** | 1 | | 0 | 1 | 3 | |
| Ranger visible in community, aggressive implementation | | | | 0 | 0 | |
| **Communicate using bulletin boards, discussions, material w/logo** | **0** | **2** | **5** | **7** | **9** | **1** |
| ***Watershed bulletin boards (to inform watershed visitors)*** | | 2 | | 2 | 4 | |
| ***Embrace discussion with those with opposing viewpoints*** | | | 3 | 3 | 3 | 1 |
| ***Create logo*** | | | 2 | 2 | 2 | |
| YouTube, RVTV, Facebook, animation on website, news column, FAQs, Neighborhoods, simulations, meeting place, forum, stage a play, AFR festival, speakers bureau. | | | | 0 | 0 | |
| **Volunteer workdays and monitoring for adults and students** | **2** | **0** | **0** | **2** | **6** | **1** |
| ***Adult / student volunteers for work days (brushing/burning) and monitoring*** | 2 | | | 2 | 6 | 1 |
| Citizen vols. from NGO's, retirees, CERT. Establish vol./outreach coordinator, neighborhoods | | | | 0 | 0 | |
| **Identify coordinating body, committee** | **1** | **0** | **1** | **2** | **4** | **1** |

Providing watershed forest tours for community members ranked highest, however several more urgent strategies followed closely in priority. These included establishing a new cooperative arrangement among SOU, USFS, and Ashland Schools to provide monitoring program and place-based education opportunity tied to the Project. A similar priority and urgency was place on developing a plan for education and outreach, and funding. Developing communication materials with a logo, such as bulletin boards in the Ashland Watershed, and holding discussions with those opposed to the Project was a lower priority. Volunteer workdays were elevated among the list of strategies but lower than the more institutional educational involvement in monitoring. USFS was recognized for its role of vision keeper and implementer, and encouraged to start with demonstration treatments.

Subsequent roundtable discussion emphasized need for a strategic education and outreach plan incorporating the identified strategies and priorities and including contacts and stakeholders, and effective "marketing" or outreach using a variety of tools, including a logo/name to increase recognition. This plan should be drafted for review by a larger group. Attendees also stressed finding funding for an outreach effort and forming an

education/outreach committee to perpetuate this effort. Chris Chambers, Rich Whitley, and Paul Galloway were listed as conveners of the committee.

The group discussed importance of volunteerism as an aspect of community involvement, and the need for organization and coordination of volunteer efforts. Establishing an Americorps volunteer position was considered favorably by the group, in order to help build the relationships among participants. A local person with understanding of the issues and people could provide advantages. Subsequent discussion considered who would host/supervise an Americorp volunteer—both TNC and North Mountain Park have Americorps positions right now and other possibilities include SOU, COA (Public Works?), but not USFS as explained by Paul Galloway. Another possible avenue for staff/funding is through a Jackson County Title III grant.

In order to advance key strategies, clearly defined roles for the Parties and key contacts with responsibility for coordinating need to be identified in a Community Engagement Plan. Chris Chambers was nominated and he accepted appointment to draft the plan.