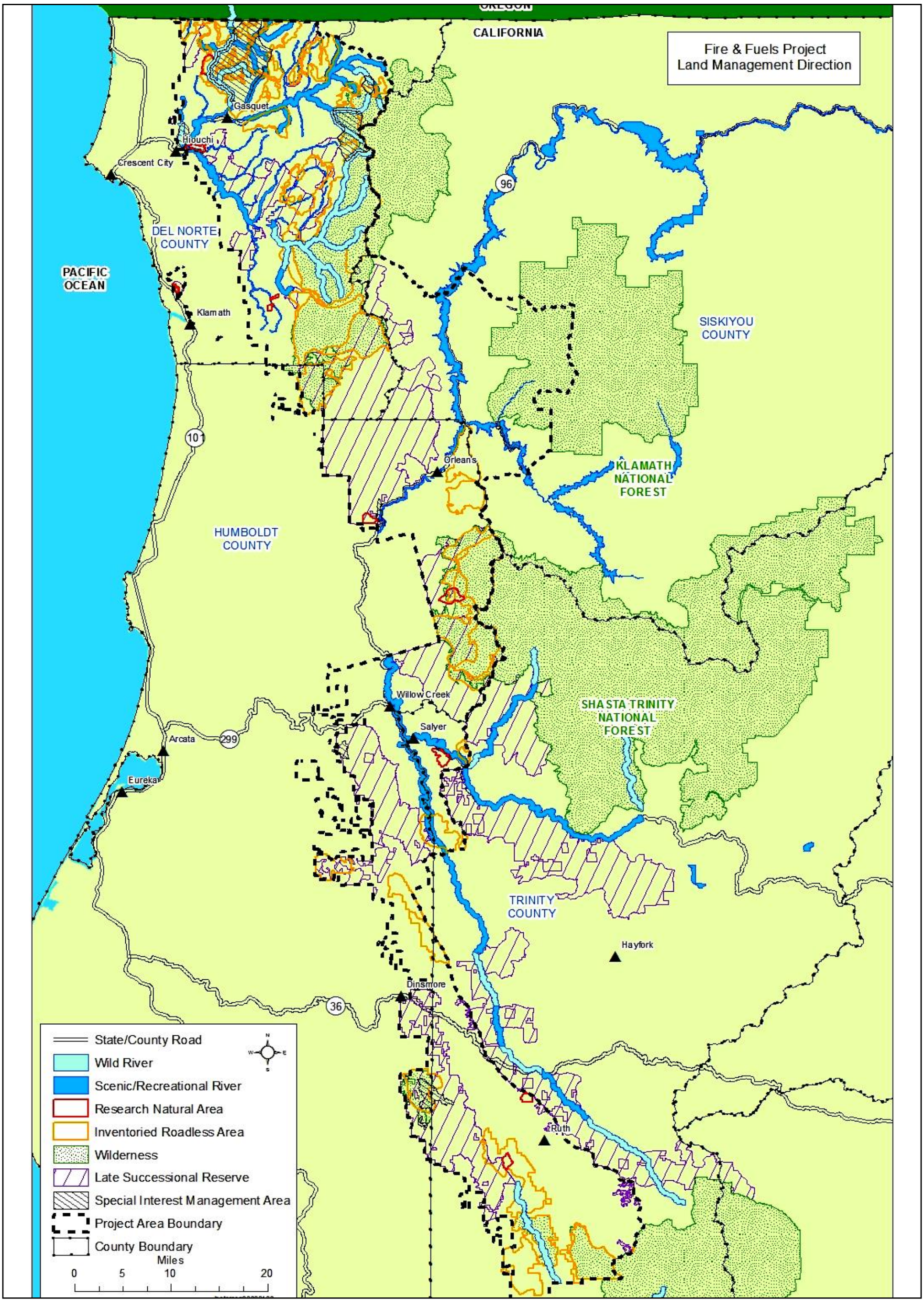
Fire & Fuels Project
Land Management Direction
OREGON
CALIFORNIA
PACIFIC OCEAN
DEL NORTE COUNTY
HUMBOLDT COUNTY
SISKIYOU COUNTY
TRINITY COUNTY
KLAMATH NATIONAL FOREST
SHASTA TRINITY NATIONAL FOREST
Gasquet
Hiouchi
Crescent City
Klamath
Orleans
Willow Creek
Salyer
Arcata
Eureka
Hayfork
Dinsmore
Ruth
96
101
299
36
State/County Road
Wild River
Scenic/Recreational River
Research Natural Area
Inventoried Roadless Area
Wilderness
Late Successional Reserve
Special Interest Management Area
Project Area Boundary
County Boundary
Miles
0
5
10
20

CLOSE TO HOME: Values and objectives guide our course

Reference values and objectives represent an expression of the human desire for a healthy environment now and into the future. In context of the *Fire & Fuels Project*, the condition-based management process begins by sharing our values — incorporating western and indigenous ecological knowledge in geographic and cultural context. This informs the design and analysis stages, identifying desired outcomes and priority areas to consciously use fire as a management tool. The design stage describes eco-cultural landscapes, linking culture to the physical environments in which people live. Values translated as objectives act to inform preferences for management methods, socially acceptable threshold limits for unavoidable risk, and our monitoring priorities.

A preliminary list of values and objectives gleaned from government studies, comments shared during prior forums and those documented in local plans are displayed below (sources listed on next page). This list is not comprehensive, nor does it reflect ranked Forest Service priorities; rather, it is provided to stimulate thought and discussion.

Value 1: Conserve productive soils supporting diverse habitats benefiting native life forms and their ability to function, reproduce, and prosper.

The Six Rivers National Forest administers 1.7 million acres of forest lands, supporting a substantial proportion of the area's biological diversity, threatened and endangered species of conservation concern, and culturally important animal and plant species. Biological diversity enables nature to respond to external influences such as insect infestations and disease, to recover after fires occur, and to maintain essential ecological processes like carbon uptake. Human activities designed to eliminate or suppress natural fire processes can adversely impact biological diversity. Examples of unintended outcomes from lack of fire include interrupting nutrient cycling, rampant forest understory growth, loss of cultural plants, and shrinking meadows and pine, hazel, and oak woodlands.

Objective: Maintain sufficient habitat size, adequate connectivity, necessary structural diversity and appropriate protection for native species.

Objective: Decrease the number of invasive, exotic forest-associated species.

Objective: Promote diverse species composition healthy oak woodlands and pine forest by encouraging sprouting of serotinous cones.

Objective: Restore fire regimes to which the ecosystems are adapted.

Objective: Treat fuels and alter forest structure to enable prescribed fire to do its ecological work frequently, at relatively self-limiting small scales, in historic topographic positions, and when seasonally appropriate.

Objective: Reinstate the use of traditional fire integrated with emergent restorative fire practices at the landscape scale.

Objective: Reestablish frequent fire cycles, behavior and patterns stimulating resilient, spatially heterogeneous forest and riparian habitats and self-sustaining populations of focal species.

Objective: Consider proactive fuels reduction of plantations during their period of greatest vulnerability to fire.

Objective: Manage fuel buildups caused by debris after fires, windfalls, insect and disease outbreaks, and other events.

Objective: Manage vegetation around forests demonstrating unique or valued characteristics, to better protect them from stand-replacing fires and rapid release of greenhouse gases.

Objective: Accelerate development of late-successional habitat characteristics in plantations and restore ecological conditions for terrestrial and aquatic species.

Objective: Protect intact late-successional habitat.

Value 2: Conserve and maintain healthy river systems and water resources.

Forest management influences the quantity, quality and timing of surface-water and groundwater flows. This includes changes to forest structure and species composition through planned activities including timber harvesting and planting of forests on previously non-forest land, and unplanned activities such as wildfire and fire suppression. Changes to water quality and flow can have a severe impact on aquatic resources. as well as human wellbeing. In addition, the Six Rivers National Forest boasts some of the most biologically diverse and productive aquatic and riparian forest habitats in the country.

The quality and quantity of water flowing from forested areas, including annual and longer-term patterns, are commonly regarded as key indicators of the quality of forest management. Water quality and quantity integrate many potential impacts on forest sustainability and overall ecosystem health.

Objective: Minimize sedimentation in lakes and rivers, and protect against flooding, mudslides and erosion.

Objective: Maintain local areas of concern such as watersheds that provide municipal water sources.

Value 3: Maintain and enhance long-term social benefits to cultural uses, amenities for visitors and the needs of our communities.

Forests provide food, fuel, shelter, clean water and air, medicine, recreation, livelihoods, income and spiritual refuge for the public. Communities that rely on forests for subsistence and indirect revenue may be vulnerable to the effects of policy changes in the forest sector and outcomes of wildfires.

Objective: Promote cultural and community vitality

Objective: Restore access to abundant and quality hunting, fishing, and gathering areas, as well as traditional, ceremonial, or religious fire use. Natural resources including nutritious foods, medicines, and raw materials for making tools, clothing, cordage and structures have become scarcer and of lower quality since the onset of fire suppression.

Objective: Provide for tribal and local community subsistence needs and access to high quality, abundant food and fiber resources in support of traditional economies and food security. Communities are defined as food secure when all members have access to nutritious, safe, and culturally acceptable foods through local sources at all times.

Objective: Restore and maintain forest heterogeneity using fire to recreate patch size as if fire was never suppressed, applying anthropogenic fire to establish functioning resilient forests at multiple scales and benefit cultural uses, native flora, wildlife habitats and successional complexity.

Objective: Reduce vegetative fuel hazards around private properties and protect critical ingress/egress routes to safeguard life, health and property, as well as improve the ability for safe and effective fire management, including planned and unplanned ignitions.

Objective: Promote shared values; encourage widespread personal ownership and local technical skills leading to healthy communities and economies capable of coordinated land stewardship regardless of ownership or administrative boundaries.

Objective: Promote fire adapted communities.

Objective: Create defensible space around structures and critical infrastructure through manual and prescribed burning fuels reduction treatments. Consider mechanical treatments to create 500-foot buffers.

Objective: Create safe and reliable access and egress routes. Consider 300 foot buffers along critical routes.

Objective: Create defensible space along borders of private property inholdings within national forest boundary.

Values and objectives guide our course continued

Value 3: Maintain and enhance multiple long-term social benefits to cultural uses, amenities for visitors and the needs of our communities.

Objective: Create fuelbreaks along existing firelines, ridges and trails. Consider firesheds, defined as areas where fire (both controlled and wildfires) can be contained and stopped.

Objective: Establish and maintain priority fuel breaks along linear landscape features including priority roads and ridges to facilitate safe evacuation, firefighter access, and landscape fire management.

Objective: Provide rural communities and residents with travel zones that allow for safer evacuation during wildfires; allow greater, faster wildland firefighter response and suppression; and reduce the risk of roadside fire starts burning into high-value landscape-level forest resources.

Objective: Reduce hazardous fuel loading in strategically located high-risk areas to enhance the defensibility around private inholdings.

Objective: Maintain existing fuels treatments to increase fuelbreak effectiveness. Consider 0-3 years since treatments, 3-10 and 11+ years since last treatment.

Objective: Link the Six Rivers and Shasta-Trinity National Forests' Road Management Plans to ensure that roads critical for access in case of fire are maintained. Encourage cooperation among all jurisdictions (CalTrans, counties, adjacent National Forests, etc.) to manage and reduce roadside fuels.

Objective: Identify and publicize safety zones for each community in case of catastrophic fire.

Objective: Minimize threats to natural resources highly valued by residents for their contribution to the local quality of life, and as an asset that attracts tourism-related economic activity.

Objective: Maintain air quality for public health.

Objective: Limit duration of smoke generated by wildfire to minimize visible and invisible emissions that contain particulate matter (soot, tar, water vapor, and minerals), gases (carbon monoxide, carbon dioxide, nitrogen oxides) and toxics (formaldehyde, benzene).

Sources: Values and objectives were compiled from the following Six Rivers National Forest NEPA decisions and collaborative documents:

With Smith River Collaborative: North K Project (2020); Knopki South project (2019); Smith River National Recreation Area Restoration and Motorized Travel Management Project (2017); Little Jones Creek Pilot Project (2017); Gordon Hill Vegetation and Fuels Management Project (2015).

With Trinity County Collaborative: Akrewoods Roadside Fuels Reduction Project (2020); 1st 48 Roadside Fuelbreak Collaborative Project (2018); From Fire-kill to Fuelbreaks Project (2017).

With Western Klamath Restoration Partnership: Leary Creek Project (2019);Karuk Climate Adaptation Plan (Norgaard and Tripp 2019); Somes Bar Integrated Fire Management Project (2018); Roots and Shoots Project (2015); A Plan for Restoring Fire Adapted Landscape (WKRP 2014).

Value mapping

Maps displaying administrative, ecological, and infrastructure information enable us to spatially evaluate whether values and objectives are feasible and sustainable. The following listing are spatial map layers available in the Forest Service geographic information systems database to inform this evaluation.

Fire Management	Fire history to 2018 Water Source Wildland-Urban Interface Air Hazards Communication Sites Lookouts Military Training Routes Powerlines (2003) Utility Corridors Weather Stations Estimated number of "missed" fires since 1900, relative to historical fire return intervals (Percent Fire Return Interval Departure PFRID) Plant community categories? Existing and Decommissioned Forest Service Roads US, state, and county roads	Hydrography	Watersheds Flowlines Watercourses Sources Waterbodies
		Water	Streams Reservoirs
		Wildlife	Critical habitat areas Predicted Northern Spotted Owl habitat classes Seral Stages Tree Age Classes Forest Canopy Closure
Lands	Forest admin boundaries Ownership Ranger Districts Section Township Wilderness Inventoried Roadless Areas Wild and Scenic Rivers Research Natural Areas	Recreation	Trails Recreation sites Recreation Opportunity Spectrum Visual Quality Objectives
		Special Areas	Late successional reserves Special Interest Management Areas Traditional Cultural Properties
		Invasive Species	Invasive Plants Other Invasive Species

Indicators to track our progress

Identifying indicators—things we can measure to gauge our progress—is a critical part of the *Fire & Fuels Project* planning process. Indicators provide a common framework for community members to describe what constitutes conservation, and how "good fire" use fits in. Taken together, indicators reflect a holistic approach to forests as ecosystems, addressing the full range of forest values. No single indicator represents a forest's health or resilience. Rather, individual indicators should be considered in the context of other indicators.

As you review the preliminary indicators below, consider what others you would like added, and where, when and what treatment type(s) available in our toolbox from Beyond the Spark pamphlet (pg. 3) you consider appropriate to promote the values and objectives expressed. Preliminary indicators are compiled from the sources listed on the previous page, and the Montréal Process Criteria and Indicators for the Conservation and Sustainable Management of Temperate and Boreal Forests; Fifth Edition, September 2015

Value 1: Conservation of productive soils supporting diverse habitats for all native life forms and their ability to function, reproduce, and prosper.

1.1 Biological diversity

Maintenance of the variety and quality of forest ecosystems is necessary for the conservation of species. Without sufficient habitat size, connectivity, structural diversity, and appropriate protection and management measures, species may decline and become vulnerable to extinction. These indicators provide information on the area and extent of ecosystem types, forest area under formal protection and the effects of fragmentation.

1.1.a Area and percent of forest by forest ecosystem type, successional stage, age class, and forest ownership or tenure

Rationale: Indicates the sustainability and stability of forest ecosystems may depend on their size and diversity. If these are not maintained, forests may become vulnerable to habitat degradation and loss. Tenures or ownership types may be associated with different management regimes and different impacts on biological diversity.

1.1.b Area and percent of forest in protected areas by forest ecosystem type, and by successional stage

Rationale: Indicates protective measures to safeguard biological diversity and representative examples of forest ecosystem types, and helps identify forest types of conservation value that are in need of protection.

1.1.c Fragmentation of forests

Rationale: Indicates the extent to which forests are divided into pieces by human activities and natural processes. Fragmentation may lead to the isolation and loss of species and gene pools, degraded habitat quality, and a reduction in the forest's ability to sustain the natural processes necessary to maintain ecosystem vitality.

1.2 Species diversity

The greatest and most readily recognizable aspect of biological diversity is the variety of species and their population levels. A key objective for the conservation of biological diversity is slowing down the rate of population decline and species depletion and extinction due to human factors. Changes in species population levels and distribution may also provide an early warning of changes in ecosystem stability and resilience, as will increases in the number of invasive, exotic forest-associated species.

1.2.a Number of native forest associated species

Rationale: Indicates the health of locally adapted forest ecosystems. Highlights the importance of certain forest types in meeting conservation objectives and helps understand the relationships species have within ecosystems. The loss or addition of species in an ecosystem can provide valuable insights into its health.

1.2.b Number and status of native forest associated species at risk, as determined by legislation or scientific assessment

Rationale: Indicates species that may require specific action or intervention to ensure their survival. The number of species at risk and their status is a measure of the health of forest ecosystems and their ability to support species diversity.

1.2.c Status of on-site and off-site efforts focused on conservation of species diversity

Rationale: Indicates which species and habitats may have declined to such an extent that intervention is required, and whether it is working.

1.3 Soil Resources

Forest soils support forest productivity and other ecological functions through their ability to cycle, hold and supply nutrients, store organic matter and provide habitats for plant roots and for a wide range of soil organisms. These soil related functions mainly occur on or near to the forest floor. A reduction or loss of the soil resource, or the inappropriate disturbance of the forest floor, may result in a decline and degradation in forest health and in the provision and regulation of other ecosystem services.

1.3.a Proportion of forest management activities that meet best management practices or other relevant legislation to protect soil resources .

Rationale: Indicates the extent to which soil resource protection, legislation and best management practices have been identified and integrated into forest management activities. Inappropriate activity may result in loss, compaction, contamination or degradation of soils, which in turn causes the loss of soil nutrients, forest productivity and other ecosystem services that soils provide.

1.3.b Area and percent of forest land with significant soil degradation

Rationale: Indicates the extent of significant soil degradation in forests likely to affect productivity, ecosystem processes or social and cultural benefits. This indicator is primarily concerned with degradation caused directly or indirectly by human activity.

Value 2: Conservation and maintenance of healthy river systems and water resources.

Forest cover and tree root systems act to minimize sedimentation in lakes and rivers, and protect against flooding, mudslides and erosion. These indicators provide information on levels and quality of forest employment, community resilience to change, and the use of forests for subsistence purposes..

2.1 Proportion of forest management activities that meet best management practices, or other relevant legislation, to protect water related resources .

Rationale: Indicates the extent to which water resources have been identified and safeguarded during forest management. This indicator is primarily concerned with activities that may affect riparian zones, water quality, quantity and flow rather than the designation of land for water-related conservation. The protection of the water resources and associated forest and aquatic ecosystems is vital for the human populations dependent on them.

2.1.a Area and percent of water bodies, or stream length, with significant change in physical, chemical or biological properties from reference conditions.

Rationale: Indicates water quality in forests. Significant changes in the physical, chemical or biological properties of water in forest lakes, rivers and streams may reveal the extent to which management activities or natural events are affecting water quality. Maintaining water quality is important for human use and consumption and to support healthy forest and aquatic ecosystems. Where water quality is being adversely affected by human activity, forest management practices may be adapted to protect water values.

Indicators to track our progress (continued)

Value 3: Maintenance and enhancement of long-term multiple social benefits to meet the needs of societies

3.1 Resilience of forest-dependent communities

Communities dependent on forests for their wellbeing, livelihoods, subsistence, quality of life or cultural identity need to be able to respond and adapt to social and economic change.

3.1.a Area and percent of forests used for subsistence purposes

Rationale: Indicates the extent to which indigenous and other communities rely on forests as a source of basic commodities, such as food, fuel, shelter and medicinal plants. The practice of forest-based subsistence reflects the dependence of rural communities and individuals on forests for essential resources and may be closely linked to cultural identity and quality of life.

3.2 Recreation and tourism

Forests have long been used as a place for recreation and other leisure activities. The location and accessibility of forests and the availability of recreation facilities are important to forest-based recreation and tourism. Levels of use are an indication of the extent to which forests are valued by society for these uses.

3.2.a Number, type, and geographic distribution of visits attributed to recreation and tourism and related to facilities available

Rationale: Indicates the level and type of recreation and tourism use in forests and the extent to which people participate in forest-based leisure activities and the importance of forests for recreation and tourism.

3.3 Cultural, social and spiritual needs and values

People and communities, in both rural and urban areas, have a variety of cultural, social, and spiritual connections to forests based on traditions, experiences, beliefs, and other factors. These values may be deeply held and influence people's attitudes and perspectives towards forests and how they are managed. These indicators provide information on the extent to which cultural, social, and spiritual needs and values exist and are recognized by society.

3.3.a Area and percent of forests managed primarily to protect the range of cultural, social and spiritual needs and values

Rationale: Indicates the extent to which forests' values to indigenous communities and others with strong ties to forests are recognized by society.

3.3.b The importance of forests to people

Rationale: Indicates the range of values that communities and individuals hold for forests. These values shape the way people view forests, including their behaviors and attitudes to all aspects of forest management.

3.4 Legal, institutional and economic framework for forest conservation and sustainable management

These indicators relate to the overall legal, institutional, and policy environment pertinent to the Six Rivers administrative authority. Legislation, institutional capacity, and policy measures at the national forest level establish the framework guiding sustainable management of forests. Reporting on these indicators contributes to raising public and political awareness of issues affecting forests and builds support for their sustainable management.

3.4.a Legislation and polices supporting the sustainable management of forests

Rationale: Indicates the legal scope of forest management and operations, including regulations and programs, and policymakers' priorities for conservation.

3.4.b Cross-sectoral policy and program coordination

Rationale: Indicates the extent to which organizations are working together to support the sustainable management of forests. Non-forest sector land use and development decisions may have a significant impact on forests and their use. Cross-sector coordination of forest and non-forest related policies and programs can help minimize adverse impacts and by strengthening the ability of communities to respond to local issues.

3.5 Clarity of land ownerships and jurisdictions

Rationale: Indicates ownership and jurisdictions to inform access and use conflicts.

3.6 Existing monitoring, assessment and reporting on progress towards sustainable management of forests

Rationale: Indicates the capacity to monitor, assess and report on forests. An open and transparent monitoring and reporting system that provides up-to-date and reliable forest-related information is essential for informed decision making, in generating public and political awareness of issues affecting forests, and in developing policies to underpin the sustainable management of forests.