
Management and Monitoring of Forests, Habitats and Habitat Elements within Red River Forests and Shasta Forests



PREPARED FOR:

Red River Forests LLC

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1.0 INTRODUCTION

The overall goal guiding the forest management of Red River Forests LLC (Red River Forests) is to provide for sustainable commercial timber production while maintaining healthy forest ecosystems. Healthy forest ecosystems are capable of maintaining soil productivity and providing non-timber attributes such as clean water, wildlife habitat, livestock forage, and recreational opportunities (Thomas 1979). Providing sustainable commercial timber production and the amenities of a healthy forest ecosystem also meets the landowner's intent to support employment and long term regional economic vitality.

1.1 RED RIVER FORESTS LLC

Red River Forests shares an ownership history in northeastern California forestland acquired in the late 1800's and early 1900's by Thomas B. (T.B.) Walker and John E. Andrus. In particular, T.B. Walker owned The Red River Lumber Company and a 50 percent interest in the Waland Lumber Company that was administered by The Red River Lumber Company based in Westwood, California. Over the following several decades, differences in ownership objectives led to a partitioning of the ownership and the eventual formation of the Red River Forests Partnership in 1994. The lands owned by Red River Forests Partnership amounting to approximately 132,254 acres now comprise Red River Forests. Red River Forests LLC, is divided into six subsidiary California limited liability companies, RRF Jimmerson LLC, RRF Lassen-Plumas LLC, RRF Pondsosa LLC, RRF Shasta LLC, RRF Westwood LLC, and Slate Mountain Renewables LLC. Red River Forests LLC is certified under the Forest Stewardship Council's (FSC) Pacific Coast Standards (Standards) as a well-managed forest. W.M. Beaty & Associates, Inc. (WBA), as consulting managers for Red River Forests, has developed the forest management guidelines described in this report to meet all applicable federal and state laws, regulations and codes, and also achieve the Standards of the FSC.

2.0 FOREST MANAGEMENT

To meet the goal to maintain healthy forests and suitable wildlife habitat over time, the expertise of professional forestry and wildlife personnel is used. Information needed to inform management and monitoring activities to meet forest and wildlife objectives, is provided by incorporating forest and habitat types and special habitat elements into resource inventories and land-based data management. Also, forest management plans for particular Threatened and Endangered (T&E) species are developed in cooperation with California Department of Fish & Game (DFG) and United States Fish & Wildlife Service (USFWS) to ensure against direct or indirect harm to protected wildlife and to promote the long term maintenance of diverse habitats.

The long-term maintenance of healthy watersheds, including soils, water quality, riparian habitat, livestock forage, aesthetics and recreation, is an important objective for the landowners. Appropriate forest management and erosion control practices are used to sustain the long term productivity of the soils as well as maintain and enhance the objectives.

It is well described that management and monitoring needs to be designed around multiple ecological scales (Layton et al, 2003), yet recognize the temporal changes that occur at multiple ecological scales from both natural and manmade disturbances (White and Walker 1997). Accordingly, forest, biological and watershed resource management and monitoring of Red River Forests is also designed around the recognition of the various scales that occur within the forested landscape: (1) Natural disturbance regimes, (2) Ecological scales, and (3) Temporal scales.

2.1 HISTORICAL FOREST CONDITIONS

Accounts or scientific data that describe vegetation condition in the 1800's is scattered and not comprehensive (McKelvey and Johnston 1992). Early written accounts of vegetation condition in the 1800's were made by explorers and naturalists. Most notably, John Muir described "...the forested belt of the Sierra where wildfires seldom or never sweep over the trees as they do in the dense Rocky Mountains or the Cascade Mountains of Oregon and Washington. Forester S. B. Shaw described forests in the Southern Cascades as "... so uneven-aged and broken and have such a varied cover type that continuous crown fires are practically impossible...".

Between 1890 and 1910 several surveys of the vegetation in the Southern Cascades and Sierra Nevada were commissioned. The United States Geological Service initiated the first surveys in Sequoia National Forests and Yosemite National Park in 1890, Eldorado and Stanislaus National Forests in 1900, and Tahoe, Plumas and Sierra National Forests in 1902. The surveys or inventories were designed systematically and represent the best data on vegetation condition at the turn of the century. These early inventories found mixed-conifer types included all conifer species found presently today. Also, trees over 24" diameter were common in the overstory. Larger diameter trees from 3 to 5 feet in diameter and 150 to 180 feet tall were present in these forests (Sudworth 1900a). Where sheep had been removed from the forests, regeneration was common (Leiberg 1902). Tree species composition today in the Stanislaus and Tahoe National Forest appear similar to composition observed at the turn of the century (Sudworth 1900b). However, current tree species composition around the Plumas National Forest have more true-fir, incense cedar and less pine than the early 1900's (Moore 1913). When averaged across the Sierra Nevada, tree density as measured by basal area and canopy closure significantly higher today than observed in the early 1900's (McKelvey and Johnston 1992). This in addition to fire suppression policies have led to a significant increase in fuel loading throughout the Sierra Nevada and Southern Cascades. Most recently these fuel loads combined with prolonged drought have brought about some of the worst fire seasons in recent history.

Red River Forests is currently managed to contain a natural diversity of vegetation types. Tree species currently found are similar to those species found by early explorers, naturalists and later by foresters (Sustained Yield Plan (SYP) Timber Assessment). As compared to early forest inventories, these forests currently contain greater tree density, basal area and canopy closure than historical forest conditions (SYP Fish and Wildlife Table FW-7, Current (2010) and future CWHR Habitat Types by Acres on Red River Forests). These forests also currently contain relatively large overstory trees in excess of 24" in diameter (SYP Timber Assessment), similar to

the tree sizes commonly found in early forest inventories. However, these forests, like many in the Southern Cascades and Northern Sierra Nevada currently do not contain numerous examples of overstory trees, snags and large woody debris in excess of 3 to 5 feet in diameter. Current existing forest management plans and management guidelines that are summarized in this document are designed to improve the maintenance and recruitment of these larger diameter trees, snags and large woody debris (SYP Fish and Wildlife Assessment, Section FW.IV Wildlife Habitat Analysis, Table FW-7, Current (2010) and future CHWR Habitat Types by Acres on Red River Forests , also see below Section 4.4 and 4.5). Also, detailed existing forest inventory information and forest growth modeling (SYP Timber Assessment) indicates that individual tree size classes in excess of 3 and 4 feet will be increasing over the next 100 years of forest growth and management (SYP Fish and Wildlife Assessment, Section FW.IV, Wildlife Habitat Analysis, Table FW.7, Current (2010) and future CWHR Habitat Types by Acres on Red River Forests).

2.2 DISTURBANCE REGIME

Natural disturbance regimes are one part of creating the natural mosaic of vegetation patterns of an ecosystem. The natural disturbance regime can be best described by disturbance type, frequency and severity. Natural disturbances can include, but not limited to, wildfire, windthrow, both chronic and episodic disease and insect events typically initiated by drought conditions and potential climate changes. However, anthropogenic disturbances including, but not limited to, wildfire, timber harvesting, transportation right-of-ways, railroads, roads and highways, grazing, construction of communities and most notably fire suppression have all influenced the forests we see today.

Prior to written records, in the Southern Cascades and Northern Sierra Nevada, both frequent low-intensity wildfires and more episodic mixed-severity fires were common (North et al. 2009, Swetnam et al. 1999). Natural or anthropogenic caused disturbances, like wildfire, have influenced vegetation patterns in the Southern Cascades and Northern Sierra Nevada for thousands of years (Scholl and Taylor 2010, North et al. 2009). Native Americans on both the west slopes (School and Taylor 2010) and east slopes (North et al. 2009) of the Sierra Nevada used wildfire to improve habitat for their exploitation of wildlife and other resources (Vankat 1970, Lewis 1973). Due to the long-term existence of both natural and anthropogenic disturbances and the difficulty to separate or measure the effects of the natural disturbances versus anthropogenic disturbances, herein after, we refer to all disturbances in terms of a "natural disturbance regime".

Tree ring based climate reconstruction data (Fritts and Gordon 1980) has confirmed that disturbances in the Southern Cascades and Northern Sierra Nevada included natural and anthropogenic wildfires, and several extended periods of drought conditions. Most notably the periods of 1750 to 1820 and again 1860 to 1880 were periods of extended drought conditions (Fritts and Gordon 1980). By the late 1800's, observed vegetation communities were typically large, scattered, older trees with little understory vegetation.

By the early 1900's, natural disturbance regimes estimated from comparison between early inventories and current scientific information verified that both natural and anthropogenic

disturbances were typically of low intensity and frequent. Prior to 1900, in the Central Sierra Nevada wildfires were common with a mean fire return interval of 12 years (School and Taylor 2010). Mean fire interval using tree rings dating back prior to the 1800's found fire return intervals in the eastern Sierra Nevada ranged from 4.8 years to 16.9 years at lower elevations (mean = 10.9 years) and from 13.4 years to 45.7 years at higher elevations (North et al 2009). Research has found, in general, as annual moisture increases and ambient temperatures decreases, with increases in elevation and longitude, the subsequent potential drought conditions decrease resulting in larger disturbance return intervals (Martin et al. 1979, Miller and Urban 1999). In other words, latitudes that are more northern and higher elevations have larger disturbance return intervals than more southern latitudes and lower elevation areas.

Forest management planning and silviculture currently used on Red River Forests attempts to mimic these natural disturbance regimes by:

- (1) Management plans include harvest return intervals of 10 to 20 years.
- (2) At the stand scale, attempts are made to create fine-scale canopy gaps (North and Keeton 2008) through use of selection and group-selection silviculture.
- (3) When existing stand conditions indicate more intensive stand management is necessary to improve forest health, variable retention silviculture is used to retain disperse or aggregate retention of trees similar to historical disturbance regimes (Kohn and Franklin 1997, North and Keeton 2008).
- (4) When economic conditions permit their use, commercial thinning and biomass thinning of over stocked forests has been applied extensively to further mimic more open forest historical conditions and to reduce the potential threat of catastrophic wildfire.
- (5) When stand replacing wildfire has impacted the ownership quick action is taken to salvage and restore stands to a forested condition while also looking for opportunities to restore biological and watershed function across the impacted landscape.

In summary, these silvicultural prescriptions not only mimic natural disturbance regimes but help maintain or enhance retention of biological legacies in our forests which help maintain or enhance our contribution towards biological diversity and overall ecosystem sustainability. We also believe, the management plans and silvicultural prescriptions also meet the intent and specific requirements of FSC-US Forest Management Standard (v1.0) C6.4 and Indicators 6.4.a and 6.4.b.

2.2 ECOLOGICAL SCALE

There is no single forestland classification scheme that is better than another at management and monitoring of forest diversity or for species and maintenance of biological diversity (Pregitzer and Goebel 2000). Many have supported a hierarchical approach to management and monitoring that mimics the biological organization of nature or scales (Pregitzer and Goebel 2000). The biological scales of nature follow a series of nested levels, each of the lower scales are dependent on physical conditions in the larger scale for the development of ecological conditions. For the purposes of the forest, biological and watershed resources, resources will be described, measured and monitored at the sub region scale (i.e. landscape)

and then at various forest management scales (i.e. stand and species). A goal of the management and monitoring is to validate contributions of managed forests at the various monitoring scales: Landscape, Stand and Species (see SYP Fish and Wildlife Assessment and Appendix O, Monitoring of Forest and Biological Resources).

2.3 TEMPORAL SCALE

Management and monitoring should be also be done over a long enough time period to incorporate the range of environmental conditions allowing for valid estimates of management actions (White and Walker 1997). The appropriate time period maybe as short as one year, as an example, when estimating response of a rare species to specific auditory disturbances during the breeding season. However, multiple years of management and monitoring may be needed to identify responses, if any, to changes in habitat types by species (SYP Fish and Wildlife Assessment, Appendix O).

3.0 LANDSCAPE LEVEL MANAGEMENT - FOREST TYPES

As previously stated, the overall objective guiding the management of Red River Forests is to provide for sustainable commercial timber production while maintaining healthy forest ecosystems. In order to accomplish these long-term objectives, management and monitoring activities will be implemented to achieve a regulated forest structure over time. Accordingly, timber harvesting and other management activities are designed to create a sustainable distribution of size and age classes for each vegetation type. An additional landowner objective is to maintain existing suitable forest cover on a landscape scale while maintaining stand conditions that mimic natural processes. These objectives have led to the extensive use of unevenaged silvicultural methods (i.e. selection harvest). The use of evenaged silvicultural methods (i.e. clearcut harvest) occurs when understocked stands or stands without adequate regeneration warrant use of these techniques to improve overall stand conditions. The use of salvage treatments occurs when natural events like wildfire, windthrow or insect epidemics damage forest types. These management objectives also maintain suitable wildlife habitat over time for a diversity of native wildlife species.

Information needed for management and monitoring activities will be provided by incorporating habitat types and special habitat elements into resource inventories and GIS based databases. The measurement and monitoring of the vegetation and habitat types are best described in the Red River Forests SYP. Current and future forest vegetation is described in the Timber Assessment and current and future wildlife habitat is described in the SYP Fish and Wildlife Assessment, Section FW.III, Non-Listed Species, and Section FW.IV., Wildlife Habitat Analysis, and specifically in Table FW-7, Current (2010) and future CWHR Habitat Types by Acres on Red River Forests.

In addition, the objectives for long-term forest management and wildlife habitat maintenance include planning to maintain a distribution of vegetation types and seral stages within each planning watershed by the end of each 10-year period across the 100-year planning horizon. By maintaining a distribution of these stages within pre-defined ranges, a variety of forested habitats will be present over time. The seral stages and target proportions of each stage within

any planning watershed are given in SYP Fish and Wildlife Assessment, Table FW-3, Stand Structural Stages on Red River Forests by Planning Watershed. By maintaining this distribution within the natural range of variability across planning watersheds, a “shifting mosaic” (Kohm and Franklin 1997) of habitats will exist at appropriate ecological scale and temporal scales.

3.1 GAP ANALYSIS - WITHIN THE FOREST MANAGEMENT UNIT

During the preparation and development of the Red River Forests SYP, an assessment of the distribution of forest stand types and seral stages was completed (see SYP Timber Assessment). Also, a wildlife habitat assessment was completed to identify: (1) Unique habitats not common in portions of the forests (SYP Fish and Wildlife Assessment, Section III, Non-Listed Species), (2) Habitats by type and seral class and identify any significant changes over time (SYP Fish and Wildlife Assessment, Section FW.IV.C, Current CWHR Types), (3) Guilds of species by habitat type and seral class to better understand any potential impacts of species, and (4) Monitoring and adaptive management (SYP Fish and Wildlife Assessment, Section FW.V, Monitoring). These assessments identified the following key forest stand and wildlife habitat types that need additional consideration when forest management activities are planned:

- (1) Late Successional or Mature Stands: The current number of forested stands and acreage meeting late-successional definitions (size class 5M, 5D and 6) are currently less than 1% for Red River Forests. Based on management guidelines in place (Old and Large Tree guidelines, Old and Large Tree - Rehabilitation guidelines, Snag and Green cull guidelines) and forest growth projections, for Red River Forests over 4% of the ownership will meet late-successional definitions in 80 years.
- (2) Snags and Large Woody Debris: An important habitat element in all forest stand types and seral stages. Specific guidelines have been developed for maintenance of existing elements and enhanced recruitment for future elements (see SYP Fish and Wildlife Assessment, Section FW.III.A.5, Snags and Large Woody Debris, and Section 4.5, Forest Structural Elements, of this document)
- (3) Hardwood Trees and Aspen Stands: Hardwood trees as habitat elements in our conifer forests and aspen stands are important habitat types within our landscapes. Specific management guidelines are described in the SYP for hardwoods (SYP Fish and Wildlife Assessment, Section FW.III.A.6, Hardwoods) and for aspen (SYP Fish and Wildlife Assessment, Section FW.III.A.7, Aspen) and in Section 4.5, Forest Structural Elements, of this document.

Specific to certification under the FSC-US Forest Management Standard (v1.0), a GAP analysis is to be completed to identify any potentially under represented vegetation or wildlife habitat types in the forest management unit. In general, GAP analysis is based on our known associations between vegetation types and wildlife species and overall biodiversity patterns (Thomas 1979). Since it is usually impractical to survey and map all the plants and wildlife species found within a forest management unit, mapping of vegetation types and seral stages is completed, and groups of species or guilds, based on known habitat use associations, are assessed. The GAP analysis then identifies any vegetation types, vegetation seral stages, specific guilds of species or individual sensitive species where amounts of habitat that may be

relatively low or poorly distributed (WDFW 2011). The analysis then identifies specific guidelines or measures, at the appropriate ecological and temporal scales, to improve forest management unit conditions.

The Timber Assessment and Fish and Wildlife Assessment completed during the development of the SYP; mapped and described all habitat types and seral stages including unique habitats, identified any significant changes over times, linked guilds of species to habitat types and seral stages and identified potential "gaps" or area needing specific management guidelines. We believe, the SYP Timber Assessments and SYP Fish and Wildlife Assessments and subsequent management guidelines also meet the intent and specific requirements of FSC-US Forest Management Standard (v1.0) C6.4 and Indicators 6.4.a and 6.4.b for within the forest management unit

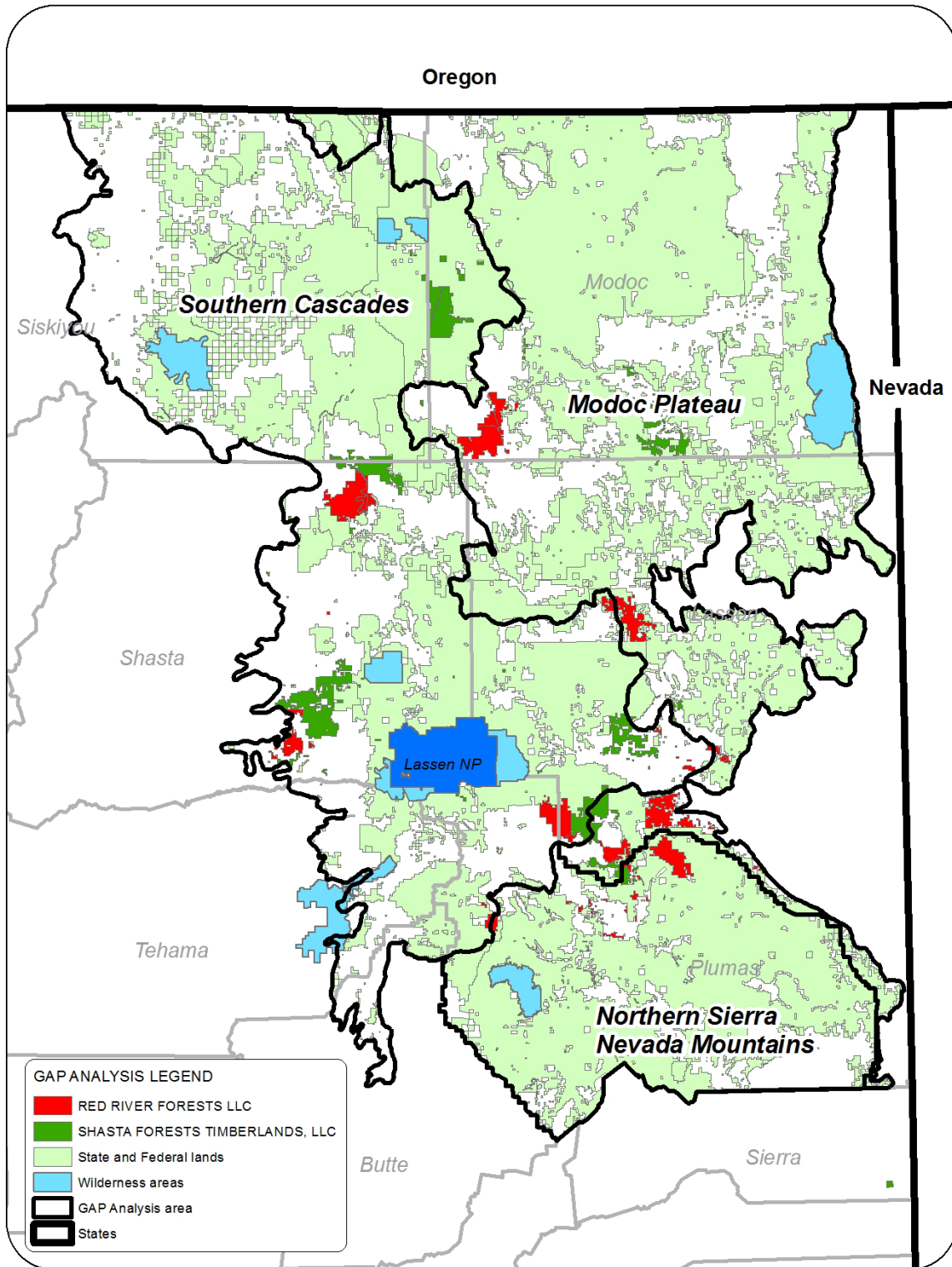
3.1 GAP ANALYSIS - OUTSIDE THE FOREST MANAGEMENT UNIT

Specific to certification under the FSC-US Forest Management Standard (v1.0), a GAP analysis was completed to identify any potentially under represented vegetation or wildlife habitat types outside the forest management unit. Specifically, the GAP analysis was guided by the intent and specific requirements of FSC-US Forest Management Standard (v1.0) C6.4 and Indicators 6.4.a and 6.4.b.

3.1.1 GAP ANALYSIS - GEOGRAPHICAL AREA

The GAP analysis for areas outside of the forest management unit were geographically bounded by the ecological units (USDA 1997) within the State of California (Figure 1). Recent scientific studies have verified that biophysical factors like climate, elevation, slope, aspects, landscape position, disturbance history and frequency and geologic history influence the vegetation and biological diversity found in land types (Hansen *et al*, 2002). Ecological regions are described based on associations of those environmental factors that directly or indirectly regulate structure and function of ecosystems and are mapped in the Ecological Subregions of California (USDA 1997). The ecological regions also include sub-regions that were described in terms of geomorphology, lithology, soil taxa, vegetation, fauna, climate, surface water, disturbance regimes, land use and cultural ecology. This GAP analysis focused on all three ecological regions that the forest management unit lies within: Southern Cascades, Modoc Plateau and the Northern Sierra Nevada Mountains. To make the GAP analysis more relevant to the forest management unit, only the Southern Cascades and Modoc Plateau in California was considered and only the Northern Sierra Nevada Mountains in Plumas and Lassen counties was considered (Figure 1).

Figure 1 GAP Analysis - Outside the Forest Management Area



The presence of specific forest types, stand seral stages and subsequent wildlife habitats that occur within the GAP analysis area are dependent on both the physical factors described above, but also on additional environmental factors. These additional environmental factors may include disease, competition and various stochastic processes like drought, fire, and extreme weather events. These factors may increase or reduce a tree, vegetation or wildlife species presence or distribution either above or below expected levels for various habitat conditions (O'Neil and Carey 1986; Airola 1988). Accordingly, during the GAP analysis both physical and environmental influences within the GAP analysis area were considered.

3.1.2 GAP ANALYSIS - LAND OWNERSHIP AND MANAGEMENT

The GAP analysis area is approximately 9.3 million acres, generally consisting of forest, range, pasture and agricultural land. A portion of the area contains small towns, urban areas and state and county roads. Approximately 3.5 million, 4.2 million and 1.6 million acres occur in the Modoc Plateau, Southern Cascades and Northern Sierra ecological regions, respectively. State and federal agencies own and manage 5.6 million acres or 60% of the area and 40% is own and managed by private landowners (Figure 1, 2).

Figure 2 GAP Analysis - Outside the Forest Management Unit (acres)

| State or Federal Landowner | Acres (Thousands) |
|---|----------------------|
| Bureau of Land Management | 843 |
| Bureau of Reclamation | 1 |
| U.S. Forest Service and Wilderness | 4,477 |
| U.S. Fish and Wildlife Service | 98 |
| National Park Service | 154 |
| California Department of Fish and Game | 50 |
| California Department of Park and Recreation | 12 |
| California Department of Forestry and Fire Protection | 9 |
| Total | 5,644 |

There are approximately 327,000 acres or 3.5% of the GAP analysis area within state and federal parks and monument areas, wilderness areas and special management areas within the GAP analysis area. The larger parks and wilderness areas include Lassen National Park and Caribou wilderness (122,000 acres), South Warner wilderness (70,000 acres) and Mt. Shasta wilderness (37,000 acres) and Ishi wilderness (42,000 acres). The U.S. Forest Service also manages approximately 4.5 million acres which includes portions of the Klamath, Shasta-Trinity, Modoc, Lassen and Plumas National Forests.

3.1.3 GAP ANALYSIS - FOREST TYPES AND WILDLIFE HABITATS

Similar to the GAP Analysis conducted within the Forest Management Unit (see Section 3.1), the analysis for areas outside the Forest Management Unit focused the distribution of, and existing management plans for, forest stand types, seral stages and wildlife habitats. Key issues identified during the analysis were:

(1) Late Successional or Mature Stands: The GAP analysis area contains approximately 327,000 acres or 3.5% within state and federal parks and monument areas. Wilderness areas that have specific management plans to ensure late-successional or mature stands are present within these areas. These areas are some of the most intact, best examples of Representative Sample Areas (RSA) in western North America. In addition, portions of the Klamath, Modoc, and Shasta-Trinity National Forests are managed under programs of the Northwest Forest Plan (USDA 1993). The Northwest Forest Plan is designed to maintain a viable forest ecosystem for the maintenance or enhancement of all wildlife species present, including those dependent on late-successional or mature stands, within the ecological provinces. In addition, the U. S. Fish and Wildlife Service (USFWS 2011) has recently proposed in a Revised Recovery Plan for the Northern spotted owl that many of these same late-successional stands as critical habitat. This designation would ensure continued existence of late-successional stands throughout the Klamath, Modoc and Shasta-Trinity National Forests for the foreseeable future.

The Plumas and Lassen National forests in the Modoc Plateau, Southern Cascades and Northern Sierra Nevada Mountains ecological regions are managed under programs of the Sierra Nevada Forest Plan (2001). The Plan includes, but is not limited to, protecting all trees greater than 20" in diameter, protection of all existing old-growth habitats and plans to promote growth of mature stands into old-growth stands. It also includes protection of late-successional California spotted owl habitats, protection of critical aquatic habitats and conservation of late-successional fisher habitat. In summary, based on; (1) The significant amount of federal land ownership (48%) in the GAP analysis area, (2) Existing federal management plans and conservation efforts to protect and enhance late-successional forests, (3) Amount of existing state and federal parks and monument areas, wilderness areas and special management areas (3.5%) within the GAP analysis area, late-successional or mature forest as well represented, distributed and protected throughout the GAP analysis area.

(2) Risk of Catastrophic Wildfire: The Southern Cascades, Modoc Plateau and Northern Sierra Nevada Mountains are at high risk of catastrophic wildfire. While both low-intensity and more episodic catastrophic wildfire have been common in the historic past (North et al. 2009, Swetnam et al. 1999), risk of catastrophic wildfire has been increased by management plans designed to protect late-seral forest and wildlife habitats (USFWS 2011). These same management plans have proposed forest management activities which would lessen the risk of catastrophic wildfire, including thinning of spotted owl habitats and returning fire reoccurrence intervals to those observed in the historic past (North and Keeton 2008, USFWS 2011)

Accordingly, we found no "gaps" relating to the protection or enhancement of forest types, seral stages or wildlife habitats outside of the forest management unit. However, improved

management of fuel loads that may contribute to catastrophic wildfires, which could impact present and distribution of forest types, seral stage, wildlife habitats and species like the Northern and California spotted owls and fisher, should be a focus of management plans both within and outside the forest management unit. We believe this analysis meets the intent and specific requirements of FSC-US Forest Management Standard (v1.0) C6.4 and Indicators 6.4.a and 6.4.b for outside the forest management unit.

4.0 STAND LEVEL MANAGEMENT

Several key vegetation types or habitat types and elements have intrinsic value for overall plant and wildlife biological diversity. Wildlife species or species guilds are associated with particular habitat types or elements. Assessment of these species and guilds was completed during SYP development. Some of the species in the guilding assessment are rare, threatened or endangered species, while others are important as game species or some fill ecological niches critical to ecosystem function. During previous assessments in 2000 and 2010 and a recent 2015 5-year review (SYP Fish and Wildlife Assessment), key vegetation types, habitat types or habitat elements were identified for additional consideration. Development of specific management guidelines were included for: (1) Riparian Habitats, (2) Wet and Dry Meadows, (3) Rock, Talus Slopes and Cliffs, (4) Late Successional and Mature Forests, (5) Snags, (6) Large Woody Debris, (7) Hardwoods, (8) Aspen, (9) Wildlife Trees and (10) Firewood Harvesting.

4.1 RIPARIAN HABITATS

Riparian habitats can support a unique diversity of plant and wildlife species. Many aquatic and terrestrial wildlife species (vertebrates and invertebrates) are known to use riparian areas disproportionate to availability. Riparian areas provide food and water resources, thermal and escape cover, and important travel corridors for terrestrial wildlife. Riparian zones also contribute to the ecological integrity of freshwater habitats and influence the primary factors affecting aquatic organisms. Some of these factors include: water flow, temperature, organic input, bank stability, sediment transport, and nutrient cycling.

Areas that function as riparian zones adjacent to watercourses and lakes are generally protected through the Watercourse and Lake Protection Zones (WLPZ). Extra protection is often provided by establishing Equipment Limitations Zones (ELZ) that are not required by the FPRs around springs, seeps, and Class III watercourses beyond the requirements of the Forest Practice Rules (FPR). The predominant hardwood tree species (i.e. alder, aspen, vine maple, willow) that occupy these sites are not commercially harvested. In general, only sanitation/salvage treatments are used in riparian areas and thereby retain more habitat than is required by the FPR. To continue to maintain or enhance riparian habitats within our forests, we have developed the following guidelines. The guidelines described below may be modified as new information becomes available and information is incorporated into management plans through an adaptive management process.

- (1) No evenaged regeneration harvest within 2 times the standard WLPZ buffer zone width (SYP Fish and Wildlife and Watershed Assessment).

- (2) Retention of all existing unmerchantable snags and large woody debris (LWD).
- (3) Retention of any tree leaning across a watercourse that cannot be removed without impairing watercourse channel conditions.
- (4) Use of silvicultural prescriptions and WLPZs designed to increase growth rates of large diameter conifers and recruit habitat structure and elements
- (5) For watersheds that support listed aquatic species, salvage operations in WLPZs shall employ methods necessary to prevent long term adverse impacts to watershed and aquatic resources. As such, all non-merchantable trees and LWD within WLPZs shall be retained and only sanitation/salvage or selection marking criteria shall be applied. Any healthy trees shall be retained during salvage operations.

Also, if necessary, measurements or estimates of the physical properties associated within WLPZs subject to salvage operations under exemption and/or emergency notices shall be made. These measurements may include: identifying trees and LWD that shall be or were retained both before and following salvage operations necessary in WLPZs. Canopy closure in WLPZs may be measured or estimated before salvage operations are conducted and monitored for a period of 1 to 3 years after harvesting operations are complete. Sediment bedload, waterflow, pool volume, and channel bank stability may be measured or estimated as needed to verify that increased sedimentation is not adversely affecting water quality or aquatic resources. All erosion control facilities will be constructed, maintained, and monitored to ensure they are properly functioning.

In general, most watercourse channels have experienced very little significant change over the past 10 years (SYP Watershed Assessment). Notable exceptions are areas where crossings have been upgraded, restorative work on roads within WLPZs has occurred, and in areas impacted by catastrophic wildfire.

4.2 WET AND DRY MEADOWS

Wet and dry meadows can support unique vegetative communities. Species of aquatic, terrestrial wildlife and some native plants are closely associated with seasonal or permanent wet meadows. The geographic location and porous volcanic substrates limit the amount of wet meadow habitat within the assessment area. Because of their seasonal nature, most of the wet areas do not meet the definition of "Wet meadows and other wet areas" found in the FPRs. They also do not meet the California Wildlife Habitat Relationships (CWHR) definition for this habitat type because they are not permanently wet. Nonetheless, the seasonally wet areas that occur in this region may function as wet meadow habitat for part of the year and are protected accordingly.

Typically, an ELZ is established around the boundary of habitat so that disturbance to wildlife and habitat is avoided. It should be noted that ELZ protection measures minimize soil compaction, disturbance to plants, and disperse drainage patterns. Detailed and comprehensive assessments and site specific measures used to maintain wet and dry meadow habitats and the species that use these habitats are described in the SYP Fish and Wildlife Assessment and in specific timber harvesting plans (THPs).

4.3 ROCK, TALUS SLOPES AND CLIFFS

Rock, talus slopes and cliffs can support unique vegetative communities and support several species of birds, bats and other wildlife which use rocky areas and cliffs for nesting, cover, or other life functions. There are some areas of Red River Forests that provide canyon habitat, usually along watercourses. In addition, lava reefs provide some topographic relief but no known nest sites for cliff dwelling raptors or other special status wildlife are known to occur in these habitats. If cliffs or rocky areas are thought to be providing wildlife habitat that could be adversely affected by timber operations, site specific mitigation measures will be developed between the forester, wildlife biologist, and any other appropriate regulatory agency biologist(s). Detailed and comprehensive assessments and site specific measures used to maintain rock, talus slopes and cliff habitats and the species that use these habitats is described in the SYP Fish and Wildlife Assessment and specific THPs.

4.4 LATE SUCCESSIONAL AND MATURE FORESTS

Late successional and mature forests can support unique vegetative communities that provide habitat for many species of wildlife. Since 2000, there has been a formal management for late successional and mature forests. As defined in FPR, a "Late Succession Forest Stand" meets the CWHR classification of 5M, 5D, or 6 with an open, moderate or dense canopy closure, may have multiple canopy layers, contains decadent elements such as large snags and down logs, and is at least 20 acres in size. The FORSEE growth and yield modeling software is used to simulate growth of stands 20 years of age and older (SYP Timber Assessment). The FORSEE CWHR calculations are based on the program developed by Greenwood and Eng 1993 and are applied to the forest inventory data. Based on existing data, no stands currently occurring on Red River Forests meet all of the criteria of a late-successional forest stand.

4.4.1 *Type 1 and 2 Old Growth Stands*

It should be stressed that the reason that no stands currently meet the definition of "late succession forest stand" is probably more related to the CWHR classification system as it applies to unevenaged timber stands, than to the lack of late-seral and mature forest attributes. There are few previously unmanaged timber stands on Red River Forests. Although the inventory shows a component of large diameter trees in most stands, the average diameter is lowered by the high number of small diameter trees present. These small trees are necessary in unevenaged stands to sustain stand structure over time, but when used in the calculation of CWHR types, lowers the quadratic mean diameter(QMD) below the minimums needed for late-successional designation. In addition, managed forests do not typically contain the decadent conditions found in old growth forests. Decadence in the form of very large, old trees, mistletoe infestations, and other features is also limited because of periodic harvest and sanitation/salvage operations designed to improve stand vigor and capture the economic value of dead and dying trees. While truly decadent "old growth" stands are not present, large snags, culls, and large woody debris are identified and retained where they exist to provide habitat for wildlife species that use these late seral elements (SYP Fish and Wildlife Assessment). Large trees (≥ 30 " diameter at breast height (DBH)), snags, and woody debris are recruited into stands by applying selection silvicultural prescription harvests without regard to diameter.

Modeling performed as part of the SYP Timber Assessments for Red River Forests indicate that stands of CWHR size class 5M, 5D, or 6 will increase over time (SYP Timber Assessment). For timber stands in the future that meet the criteria of CWHR habitat type 5M, 5D, or 6 and are at least 20 acres in size, an analysis will be conducted to determine if they possess late successional characteristics (i.e. large snags, large woody debris, decadence, etc.). Stands will be examined on the ground to determine if late successional elements are present and to what degree they are exhibited in the stand (i.e. number of snags and pieces of large woody debris per acre).

The difference between late successional and mature stands is tenuous. Elements that make mature stands function as late successional stands and are important to the biotic function within these stands include: large diameter overstory trees, younger trees that make up one or more understory canopies, and a certain amount of decadence. Decadence can be in the form of large, old culls and snags, deformed or damaged trees, large woody debris, and background levels of disease, pests, and pathogens. However, tree densities within natural old growth forests are also influenced by abiotic factors such as precipitation, soil productivity and disturbance regime. So, in some forests, it is unlikely that many eastside pine forests ever maintained canopy closure values that approached 60% canopy closure (Kaufmann et al. 2007) and stands of uniformly large trees did not occur in patches approaching 20 acres in size (Youngblood et al. 2004).

To continue to maintain or enhance older forests, we have developed the following guidelines. The guidelines described below may be modified as new information becomes available and information is incorporated into management plans through an adaptive management process.

- (1) Old and Large Tree retention guidelines
- (2) Old and Large Tree retention - rehabilitation guidelines
- (3) Snag and Green Culls guidelines
- (4) Riparian Habitats and High Conservation Value Forests guidelines

We believe this review and the specific management guidelines described meet specific guidance for certification under the FSC-US Forest Management Standard (v1.0), Type 1 old growth stands (minimum 20 acres containing old growth trees or structures) and Type 2 old growth stands (minimum 3 acres of undisturbed old growth trees or structures).

4.4.2 *Old and Large Tree Retention*

Specific to FSC certification, in 2000, and further refined in 2015, a site-specific approach was developed to identify and manage old and large tree retention. Initial entries of timber management removed most of the old growth timber that was present. Since initial removal of older forests, management has been primarily limited to selection silvicultural prescriptions designed to increase the health and vigor of the forest and promote the growth of individual trees into large diameters. However, these stands have not had the time to develop high densities of trees as large as the old growth. It should be noted that the size of old growth trees varies by site. On dry sites, precipitation and soil qualities serve to limit tree size regardless of age. To continue to maintain or enhance older forests and forest elements, we

have developed the following guidelines. The guidelines described below may be modified as new information becomes available and information is incorporated into management plans through an adaptive management process.

- (1) Green Cull trees over 30" DBH will not be harvested or felled unless they pose a safety hazard.
- (2) Foresters will designate for wildlife and legacy retention, on average, and if present, approximately one large, live tree per 160 acres. The designated tree should exhibit "old growth" characteristics including declining growth, flat tops or large diameter. These trees will be identified and designated during the course of pre-harvest activities and should be retained in abiotically favored locations to achieve maximum use by wildlife species (Clark 2002, Irwin 2000, Underwood et al. 2010). These trees will be identified and designated during the course of pre-harvest activities.
- (3) Unevenage Silviculture: A primary landowner management objective is to grow larger trees. This objective is attained by using unevenage treatments, by thinning poorer performers, and favoring the retention of healthy, vigorous trees in post-harvest stands.
- (4) Evenage Silviculture: Application of variable retention harvest strategies will provide future large, old legacy trees within the Habitat Retention Areas (HRAs) in young forests..
- (5) Snag and Green Cull guidelines: Adherence to these guidelines will also help maintain or enhance recruitment of older and large trees in the forests.
- (6) Designated Wildlife Tree guidelines: Adherence to these guidelines will also help maintain or enhance recruitment of older and large trees in the forests.
- (7) Firewood Harvesting guidelines: Adherence to these guidelines will also help maintain or enhance recruitment of older and large trees in the forests.
- (8) Hardwoods. In addition to management of hardwoods described in Section 4.5.3, hardwoods that exhibit tree form and structure described under Section 4.4.2, Item (2) above, may be designated as legacy trees.

4.4.3 *Old and Large Legacy Tree Retention - Within Rehabilitation Treatments*

Specific to FSC certification, in 2000, a site-specific approach was developed to identify and retain habitat structure in areas receiving rehabilitation treatments. During this site-specific assessment, the habitat elements available for retention are identified and prioritized. A general description of the kind of elements to be retained is included in the THP or site preparation agreements. In some areas the designation of additional specific individual trees (or other elements) is completed jointly by the forester, wildlife biologist and reforestation forester. Contractors hired to complete various timber harvesting and rehabilitation activities are closely supervised to ensure compliance with the retention guidelines in the agreement, THP, SYP, and this habitat retention policy. To continue to maintain or enhance older forests and forest elements within rehabilitation treatments, we have developed the following guidelines. The guidelines described below may be modified as new information becomes

available and information is incorporated into management plans through an adaptive management process.

- (1) Focus on retention of large diameter trees with low economic value. These trees are valuable to wildlife because they possess various levels of decay or defect that provide habitat structure.
- (2) Prior to salvage harvest, the forester, wildlife biologist, and reforestation forester will work jointly to retaining suitable snags, LWD, large trees, and other legacy elements during harvest operations and subsequent site preparation activities. Site preparation agreements include specifications for the retention of snags and other habitat elements as stated above.
- (3) Rehabilitation treatments will establish trees on understocked areas thereby increasing the number of large diameter trees over the long term. Because of the variability of initial conditions prior to rehabilitation (e.g. tree stocking, site preparation method needed, brush species and density, and recent burn or old brush field) a site-specific approach will be used.

4.5 FOREST STRUCTURAL ELEMENTS

Management and monitoring of forest structural elements is conducted following a series of guidelines developed during previous and current SYPs, THPs, various permits acquired during management of the forests and most importantly to achieve the landowners' objectives. These guidelines for retention of forest structural elements apply to unevenage and evenage silvicultural treatments as well as in intermediate and rehabilitation treatments. The following management guidelines assess: (1) Snags and Green Culls, (2) Large Woody Debris, (3) Hardwoods, (4) Aspen, (5) Wildlife trees, (6) Variable Retention Silviculture and (7) Firewood Harvesting.

The management guidelines described are also guidelines described in previous and current SYPs, where annual training sessions are conducted by forestry and wildlife staff to familiarize field personnel with the benefits of, and procedures for identifying and retaining structural elements for wildlife. Further, all contractors are closely supervised to ensure that stated objectives are properly implemented.

4.5.1 *Snags and Green Culls*

Snags, green culls and large woody debris (LWD; fallen logs, stumps, root wads, etc.) serve a variety of ecosystem functions. Functions include nutrient cycling, providing substrate to support beneficial fungal (mycorrhiza) populations, and use as breeding and foraging habitat for over 100 species of vertebrate wildlife (and many more invertebrates which constitute a major food source for wildlife). Many snag-dependent bird species are highly insectivorous and have been shown to control pest populations. Carpenter ants, which inhabit snags, green culls and down woody debris, have also been shown to limit insect populations by feeding on the larvae of forest pest species (e.g. spruce bud worms). Some of these snags and green culls are among the largest diameter stems in the stands where they exist and typically represent "old growth" remnants.

Snag size and abundance needed to support various primary cavity nesters have been estimated at different levels of a maximum population potential (Thomas et al. 1979). It should be noted that guidelines did not rely on the model developed by Thomas et al. (1979) to set snag retention values, but simply used the model as one validation point indicating that our snag and green cull retention values are adequate to avoid significant adverse impacts to the environment. This approach greatly exceeds the 60-70% values for the maximum populations of these species (Thomas 1979). This level of snag and green cull retention is exemplary for private lands managed primarily for timber production and secondarily for wildlife and other resource values.

To continue to maintain or enhance snags and green culls within Red River Forests, in 2000 we formalized guidelines. The current guidelines described below may be modified as new information becomes available and information is incorporated into management plans through an adaptive management process.

- (1) In order to evaluate the abundance and distribution of snags, data concerning snags was initially collected during the 1996 inventory cruise. Since that time data regarding snags has been collected on an ongoing basis as part of the WBA inventory procedure (SYP Appendix J, Cruise Manual).
- (2) Based on recommendations by California Department of Fish and Wildlife in 1999, the SYP Fish and Wildlife Assessment established an interim goal of 3.0 snags $\geq 16''$ DBH per acre of mature forest (CWHR size class 3 and above). Of these 3.0 snags per acre, 0.5 should be $\geq 20''$ DBH, 0.25 should be $\geq 24''$ DBH and 0.1 should be $\geq 30''$ DBH.
- (3) For the tracts that do not meet these goals, efforts to retain and recruit snags of the deficient size class will include a voluntary reduction in the intensity of sanitation/salvage operations and the physical identification of appropriate sized trees that are likely to become snags within the next 10 years.
- (4) All snags and green cull trees that do not contain at least 25% sound wood volume and do not pose a safety hazard or a potential hindrance to future access for initial attack of wildfire shall be retained.
- (5) Unevenaged silviculture: Unmerchantable large snags and green cull trees are retained to provide wildlife habitat. Areas that do not currently meet the snag retention objectives stated in the SYP Fish and Wildlife Assessment are identified and efforts are made to retain and recruit additional snags of the appropriate size class and species. These efforts take the form of discussions between the forester and wildlife biologist preparing the plan. The on-the-ground application relies on the supervision of field personnel. These on-the-ground efforts focus on applying conservative selection criteria with respect to marking. In other words, timber marking crews are instructed to bypass some merchantable trees exhibiting high quality habitat attributes because they may have a higher likelihood of becoming snags than vigorous and full-crowned trees. This practice will contribute to attainment of the goals detailed in the SYP Fish and Wildlife Assessments.

- (6) Evenaged silviculture: Unmerchantable large snags and green cull trees are retained to provide wildlife habitat by retaining snags and green culls within both the harvest area and with specific Habitat Retention Areas (HRAs) at the rate of at least 0.2/acre, where they exist and do not hinder operations. Often, many more than 0.2 snags per acre are retained because there are no benefits to falling snags that do not hinder operations. The forester, wildlife biologist and reforestation forester will work jointly to identify snag and green cull retention options during the preparation and implementation of evenage treatments.
- (7) Rehabilitation treatments are areas that are understocked due to insect attack and usually have numerous snags to select for retention. However, rehabilitation treatments in areas damaged by wildfire pose a special problem because sometimes snags are totally consumed by intense wildfires prior to any treatment. The long term availability of large trees for snag and green cull development is greatly improved by reforesting stands that have been left understocked due to wildfire or insect attack.
- (9) Prior to salvage harvesting, the forester, wildlife biologist, and reforestation forester jointly discuss retention of structural components like suitable snags, LWD, and large tree during harvest operations and subsequent site preparation activities. Site preparation contracts typically include specifications for the retention of snags and other habitat elements. To achieve these guidelines the following steps will be followed:
 - (a) To meet the forester objectives identify at the landscape scale all non-operational salvage areas including, but not limited to, economically and logistically limited areas. Also, identify all environmental and biological areas where salvage operations may be limited or not occur at all (e.g. WLPZs, seeps, springs, wildlife sites, archaeological sites).
 - (b) To meet the reforestation forester objectives identify at the landscape scale all non-operational and non-reforestation areas. Also, identify all areas where reforestation activities (e.g. biomass, fuel reduction or sub-soil ripping) may occur within salvage non-operational areas where retained stands or trees have been identified under item (a) above.
 - (c) To meet SYP and FSC requirements, identify at the landscape scale,
 - i. Pre-wildfire existing snag and large woody debris density.
 - ii. Green tree retention for wildlife use and to accelerate seral stage development.
 - ii. FSC standards and audit observations regarding salvage operations and wildlife considerations.
 - (d) Based on information identified under (a) through (c) above and consideration of structural components being retained at the landscape scale, if necessary, develop with the forester and reforestation forester stand level structural retention specifications and include these specifications in the appropriate contracts.

- (10) Watercourse and Lake Protection Zone: Large snags are not harvested or felled, hence recruited into WLPZs which also serve as wildlife habitat retention areas.

4.5.2 Large woody debris

In 1997, a forest management landowner objective was established to maintain or enhance wildlife habitat, including the retention of LWD as stated in the Red River Forests SYP. Data concerning size and abundance of LWD has been collected during cruises since 1997. This information has been gathered following harvest or thinning operations and is updated approximately every 10 years. Minimum thresholds for size are 10 inches diameter at the large end and 10 feet total length. All pieces meeting this minimum size requirement are estimated to the nearest diameter in inches and length in feet. Any piece that falls within the plot (1/50 acre or 16'-7" radius circle) is counted. It is anticipated that as snag numbers increase over time, LWD numbers will also increase as snags naturally fall. In addition, snag sizes will increase through retention efforts and subsequent LWD size should increase as well.

In general, management guidelines ensure forest management does not remove LWD during operations and, if possible, leaves LWD intact during all operations. To continue to maintain or enhance large woody debris within Red River Forests, in 2000 we further refined management guidelines. The current guidelines described below may be modified as new information becomes available and information is incorporated into management plans through an adaptive management process.

- (1) Retain 1 to 2 pieces per acre at least 10" in diameter and 10 feet long per acre. This retain should be focused in mature CWHR types (i.e. size class 3 or above) and efforts will be made to retain adequate levels in all CWHR types. A 5-year SYP update completed in 2010 indicates that these objectives were being met, especially in the larger (>24" diameter) size and advanced decay classes.
- (2) Avoiding LWD where it exists during operations involving tractors. Any LWD that does not contain sound sawlog or chip volume is currently left in place unless it needs to be removed for safety reasons.
- (3) Leaving LWD in place when piling material during rehabilitation or reforestation operations. As areas are reforested following regeneration harvest, LWD is and will be left intact where feasible. If LWD is professionally judged to be lacking in cleared areas, piled logs may be left unburned as allowed by the FPRs to provide habitat.
- (4) Where LWD is identified as deficient through inventory data, operators may be required to redistribute cull portions of logs that were skidded into landings during timber harvests.
- (5) During biomass operations, equipment limitations restrict the harvest of downed material to pieces <24"-26" and standing dead material <20"-22" in diameter.

4.5.3 Hardwoods

Native hardwoods typically occur as a component within some of the lower and middle elevations of Red River Forests. Hardwood primary species include: black oak, canyon live oak,

dogwood, vine maple, big leaf maple, various willows, quaking aspen, alder, and cottonwood. The only hardwood species that is considered for commercial value is black oak, and commercial sawlog harvests of black oak have occurred rarely in the past. While commercial oak harvests have taken place on limited occasions in the past 20-30 years, none have occurred within the past 10 years and none are anticipated in the future.

All hardwoods are measured in the forest inventory design and data collection. The tree diameter and height is collected during cruises. Hardwoods in general and black oak in particular, can be very valuable for wildlife habitat. Black oaks can possess features such as dead limbs, broken tops, or other forms of decadence that provide structures, cavities, and hollow portions used by wildlife in addition to providing mast (acorns) valuable as wildlife forage. In some areas dead portions of otherwise sound black oaks can provide habitat for cavity dwelling wildlife in excess of what is provided by conifer snags within the same stand (Garrison et al. 1998). This is a crucial distinction and the proportion of defect in black oaks has been recorded since 2002 under the existing forest inventory design.

To continue to maintain or enhance hardwoods within Red River Forests, in 2000 we originally developed guidelines. The current guidelines described below may be modified as new information becomes available and information is incorporated into management plans through an adaptive management process.

- (1) The management of hardwoods during timber harvesting is primarily a default retention of nearly all stems. Hardwoods may be felled if they pose a safety hazard during operations.
- (2) There is some very limited removal of hardwoods by commercial and non-commercial firewood cutters under permits. The hardwood volume removed under woodcutting permits is insignificant and primarily occurs near roads and on gentle topography where removal of firewood is feasible without machinery.
- (3) Efforts to limit the unauthorized removal of hardwoods include the employment of a patrolman, and regular inspection of all tracts. Illegal firewood cutting is actively discouraged through the posting of signs and the reporting of incidents to local law enforcement agencies.
- (4) Unevenage silviculture: The management of hardwoods is focused on the retention of all hardwood trees greater than 16" DBH, where feasible.
- (5) Evenage silviculture: In areas that are harvested using evenaged regeneration methods, mature oaks are specifically retained for wildlife habitat. If hardwoods occur in densities high enough to hinder operations, a representative 10% sample are individually marked for retention or retention specifications are stated in the THP. Where immature oaks are removed incidental to logging operations, rapid stump sprouting will ensure that oaks are recruited into stands. In areas treated with rehabilitation prescriptions, approximately 10% of the existing oaks or 1 to 2 oaks per acre are specified for retention as wildlife habitat in all site preparation and brush control agreements.

- (6) Biomass: There may be incidental removal of hardwoods during biomass operations but hardwoods are not targeted for removal. Harvest criteria in these types of operations include leaving hardwoods $\geq 20''$ DBH and retention of a substantial component of smaller hardwood stems for future recruitment of large stems. Also, because approximately 10% of all biomassed areas are left unthinned (SYP Fish and Wildlife Assessment), the percent hardwood composition within these unthinned areas will remain essentially the same as the pre-harvest levels.
- (7) Rehabilitation: Approximately 5 to 10% of the area may be left untreated due to operational constraints and therefore, existing oaks are retained. Additionally, 1 to 2 oaks per acre are specified for retention as wildlife habitat in site preparation and release agreements.

4.5.3.1 Aspen

Native aspen (*Populus tremuloides*) can occur as its own unique habitat type or within several types of forest and non-forest habitats. Aspen can be an important habitat for many wildlife species. Several factors have contributed to an apparent decline in aspen stands including fire suppression, conifer encroachment, and browsing by domestic livestock and wild ungulates. Restoration of previously existing aspen stands can be achieved by removing conifers near existing aspen trees which reduces the competitive interactions for the light, water, and nutrients. Also, restoration can be enhanced by excluding domestic livestock and wild ungulates for a period of time following initial restoration to allow aspen stems to grow above browse height. When opportunities for aspen enhancement are consistent with overall goals and objectives the forester and wildlife biologist will propose restoration of aspen stands and seek the support of the California Department of Forestry and Fire Protection (CAL FIRE), DFG, and water quality agencies.

4.5.4 Designated Wildlife Trees

Since 1993 WBA has been specifically identifying trees with special value to wildlife by either painting with a large "W" or attaching a metal "Designated Wildlife Tree" sign. Data concerning these trees had not been previously collected. Formal guidelines regarding data collection and mapping of Designated Wildlife Trees were established in 2001. When a tree is designated as a "wildlife tree" field personnel will collect information about the tree and the data will be entered into a database. This data will be tracked over time to determine how many wildlife trees are being specifically designated and what characteristics these trees possess. Criteria used for selecting wildlife trees and data collection and handling procedures are discussed during annual field training sessions conducted by and with foresters and wildlife biologists. Trees retained for wildlife are those that exhibit beneficial habitat characteristics such as existing nest structures, cavities, large horizontal branches, large diameter boles, or indications of heart rot or other defect. While most trees possessing these characteristics are unmerchantable, some live green trees containing sound sawlog volume are retained. These otherwise sound trees may exhibit "old growth" characteristics such as declining vigor, flat tops, or diameters



significantly larger than the surrounding stand average. When designating wildlife trees, tree species should be considered along with structural characteristics and spatial relationships. The emphasis should be on retaining pine trees where large pines or pine snags are currently scarce. Wildlife trees should be designated at rates necessary to achieve the snag recruitment guidelines specified in the SYPs, while taking into consideration the contribution of all the other management guidelines that promote snags.

4.5.5 *Variable Retention Silviculture*

Since 2000, as described in Red River Forests SYP, habitat retention areas are established when even-aged silviculture (clearcut) is proposed within a THP. Since the majority of unevenaged silviculture proposed on Red River Forests is either selection or group selection, habitat retention area establishment is designed to primarily contribute towards increasing forest habitat complexity. Secondly, habitat retention areas are also effective at retaining forest habitat elements, like wildlife trees, snags, large down logs and unique understory species including rare plants, that otherwise can be difficult to retain in the managed forest landscape.

While habitat retention areas are not the primary means how functional wildlife habitat will be retained in forest habitats, use of variable retention silviculture and intentional retention of complex forest structures have been shown to increase wildlife use in managed forests. Numerous observational studies have correlated relationships between complex forest structures and wildlife use in managed forests. Yet Rochelle (2005) highlighted that few studies have demonstrated the cause-and-effect relationships of retaining complex forest structures in managed forests. However, where cause-and-effect studies have been attempted, results have been positive. In early seral forests, biological monitoring of habitat retention stands has found that retention of pole, seedling, understory vegetation, and down woody debris is a key component in measured wildlife use (Stofel 1993, Kelsey 1994). Also, biological monitoring of new forestry stands have confirmed that small mammals (Sullivan and Sullivan 2001, Sullivan et al. 2001, Stofel 1993) and resident and neotropical song birds (Stofel 1993) benefit from the retention of these understory structures. In addition, regionally, Farber and Hewitt (2004) and Roloff and Liden (2009) found increased use of early seral habitats by neotropical and resident songbirds when habitat retention areas were retained within even-aged clearcut silviculture. Based on these results, habitat retention areas can enhance existing functional wildlife habitat. To continue to maintain or enhance habitat elements within Red River Forests we have developed the following guidelines. The guidelines described below may be modified as new information becomes available and information is incorporated into management plans through an adaptive management process.

- (1) Within even-aged clearcut silviculture prescriptions larger than 6 acres, 10 to 30% of the pre-harvest basal area shall be retained.

- (2) Habitat retention areas will be between 0.1 and 1.2 acres in size, although the targeted size of HRAs may vary depending on surrounding stand conditions such as the proportion of the tract scheduled for evenaged management over the planning horizon, the size of the evenaged regeneration unit, existing features within harvest units, and other wildlife considerations.
- (3) Habitat retention areas will be centered on existing habitat elements such as large snags, large green culls, poorly formed or defective trees, hardwoods, and LWD.
- (4) Native hardwood and understory vegetation will be retained, as available in pre-harvest conditions, to maintain or restore a diversity of species and forest structure.
- (5) Within habitat retention areas, trees of all sizes will be retained, although some removal of merchantable trees is allowed during the initial harvest.
- (6) Within habitat retention areas, following the initial harvest, some salvage of commercial trees may occur, as long as target levels for snag and other habitat element abundance is being approached.
- (7) Modifications may be proposed during the development of subsequent THPs based on site specific conditions. Modifications may include higher rates of retention, alternate spatial arrangement of retained elements, and other site specific adjustments.
- (8) Habitat retention harvest strategies are employed to assure that habitat structure is maintained in areas treated with evenage regeneration silvicultural prescriptions. In other words, plantations will be intermingled with unevenaged stands and distributed through space and time to ensure that a mosaic of various age and structure classes is present within planning watersheds.

4.5.6 *Firewood Harvesting*

Many homes in the rural mountain communities of northeastern California rely on firewood as their primary source of heat during the winter months. In recognition of this fact, the removal of firewood has been permitted on all tracts under its management. It is estimated that 500 - 600 cords of firewood are cut annually. For accounting purposes, firewood permits are sold according to ownership and location or tract.

A mutual benefit is achieved through the sale of personal use and small-scale commercial firewood permits. The general public benefits by having a relatively inexpensive source of fuel wood located on private properties that are often closer to their homes than public lands. The resulting fuels treatment, particularly along roadsides, from public firewood gathering benefits the landowners, recreationists, and wildland fire suppression forces. The vast majority of personal use firewood cutters do not have the equipment or expertise needed to harvest large diameter snags (> 20" DBH) and prefer instead 12" – 20" DBH diameter firewood.

At times it is necessary and desirable to remove snags for safety and fire purposes. Snags found along roadways may fall onto the roadway blocking or slowing access for forest management,

recreation, and fire suppression activities. Roadside snags are problematic for fire suppression because they may project firebrands into the air promoting spot fires and facilitating the spread of fire across roads. Additionally, snags may pose a safety hazard to logging crews when they are located adjacent to log landings or interfere with safe timber falling.

To guide maintenance and retention of wildlife habitat elements like snags and green cull trees, data is collected on snag size and density during the inventory process according to ownership and location or tract. As such, the harvesting of firewood can be controlled by tract according to needs indicated by the inventory. Additional measures may be necessary when inventory data indicates that a particular tract is deficient in snag or large woody debris (LWD) abundance. To balance the needs of local communities versus maintenance of wildlife habitat elements like snags, a Firewood Harvesting Policy was developed in 2001 to balance possible conflicts and protect forested watersheds via seasonal firewood cutting closures during periods of wet weather and severe fire danger.

4.5.6.1 *Firewood Harvesting Policy*

Currently, due to the potential to accidentally ignite a wildfire during firewood harvesting and the potential significant civil or criminal liabilities currently associated with the accidental ignition of a wildfire, no firewood harvesting is currently permitted on Red River Forests. However, if current liabilities associated with accidental ignition of wildfires changes, or site specific circumstances lessen potential liabilities, the following Firewood Harvesting Policy shall be followed.

- (1) Firewood Harvesting Policy for Active Timber Sales: Within logging areas, all snags shall be retained to provide wildlife habitat except those that pose a hazard to a roadway, present a safety hazard to the logging crews, or as otherwise stated in the FPR (CCR §939.1). Those snags that are felled for hazard reduction purposes may, at the discretion of the District Forester or supervised designee, on a limited basis may be removed for firewood.
- (2) Green cull trees are generally left standing. However, some portions of otherwise sound trees are non-merchantable because of high levels of defect. When these cull portions (logs) are inadvertently skidded into landings but not removed as sawlogs or chiplogs it may be beneficial to redistribute them back into the adjacent timber stands. The decision to redistribute this material or retain it at the landing should be based on the current abundance of LWD in the area and an evaluation of the benefits to forest and soil biota that might be gained from this action. This redistribution of LWD should occur where necessary to achieve the management objectives stated in the SYP. If adjacent timber stands have sufficient LWD as indicated by the inventory data this cull material may be removed from landings as firewood.
- (3) Policy for Personal Use Firewood Cutting Permits: Due to potential public safety and wildfire liability and personal use firewood permits are not sold to the general public for the removal of firewood.

- (4) No snag, tree or green cull bearing a WBA “Designated Wildlife Tree” sign or a painted “W” may be felled.
- (5) Tracts shown by the inventory to be deficient in large diameter snags including those not meeting interim SYP goals, may, at the discretion of the forester in consultation with a wildlife biologist, require additional restrictions on personal use firewood permits. These restrictions include but are not limited to:
 - (a) No additional restriction on personal use firewood permits. The elimination of snag removal during logging operations will, over time, sufficiently increase snag densities to meet the interim goals.
 - (b) Special treatment areas within tracts designated as “off limits” to firewood removal because of special status species presence or other ecological considerations. Tract closures may be seasonal to correspond with nesting activity or utilize a combination of the restrictions listed above.
 - (c) Tract closure to personal use firewood cutting. An extreme measure for use when all previous efforts have failed to move snag and LWD densities toward desired goals as indicated by inventory data.
- (6) To prevent undue damage to roads and to reduce the risk of wildfire, permits shall be seasonal. At the direction of the District Forester, tracts shall be closed to firewood cutting activities during the wet weather season and during periods of severe fire danger.
- (7) Policy for Commercial Firewood Harvesting Permits: Commercial firewood permits may be issued for specific areas where firewood removal will promote attainment of project and management goals. Commercial permits are primarily used for down material or small diameter (<12” DBH) standing dead trees. No falling of large diameter (>20” DBH) snags will occur under a commercial firewood permit without prior consultation with a forester and wildlife biologist.

As part of preparing a Timber Harvesting Plan, the forester and wildlife biologist shall review the snag and LWD inventory data. Post-harvest inventory data will also be examined to determine if these policies are being implemented effectively and progress is being made toward ownership goals.

Also, we believe, this firewood harvesting policy also meets the intent and specific requirements of FSC-US Forest Management Standard (v1.0) Indicator 5.3.a, Indicator 5.3.b and Indicator 6.3.f.

4.6 MANAGEMENT SPECIFIC TO HIGH CONSERVATION VALUE

High Conservation Value Forests (HCVF) are defined by FSC to be forests that contain environmental and social values of outstanding significance or critical importance at either a local or national level (ProForest 2003). Previously, a formal Special Management Area (SMA) policy was developed in 2001 and updated to a High Conservation Value Area (HCVA) in 2005. Current FSC Standards require that forests be assessed to see if they contain any HCVFs

(Indicator 9.1.a), collaborate with stakeholders or experts knowledgeable on HCVFs (Indicator 9.1.b), then develop management plans (Indicator 9.1.c), and monitor efforts to maintain or enhance the condition of HCVFs (Indicator 9.4.a).

4.6.1 HCVF Large Scale Ecosystem Assessment

Ecological regions are described and mapped based on associations of those environmental factors that directly or indirectly regulate structure and function of ecosystems (ECOMAP 1993, USDA 1997). Environmental factors include climate, physiography, water, geology, soils and hydrology that form potential natural communities. The United States Department of Agriculture (USDA) used these basic environmental factors in a hierarchical framework and mapped the Ecological Subregions of California (USDA 1997). The ecological regions were described in terms of geomorphology, lithology, soil taxa, vegetation, fauna, climate, surface water, disturbance regimes, land use and cultural ecology. Red River Forests lie within the Sierran Steppe-Mixed Forest-Coniferous Forest-Alpine Meadow province of North America (ECOMAP 1993).

The World Wildlife Fund Global 2000 ecoregions have been designated by specific ecological based criteria. The criteria includes species richness, endemism, taxonomic uniqueness, extraordinary ecological phenomena and global rarity of major habitat types. Red River Forests lie within the World Wildlife Fund(WWF) Global 2000 ecogregions: Eastern Cascades (NA0512) and Sierra Nevada (NA0527).

Conservation International (CI) has designated Biodiversity Hotspots. Portions of Red River Forests lie within the California Floristic Province hotspot. The California Floristic Province is a sub-region of Mediterranean-type climate and has the high levels of plant endemism. The province includes unique species like giant sequoia, coastal redwood, and numerous listed species. Conservation International lists potential threats to the region as commercial farming, expansion of urban areas, pollution, and road construction. Red River Forests are managed, in part, by following native plant and invasive plant guidelines, which should minimize any potential impacts for native plant species identified by CI.

The International Union for Conservation of Nature (IUCN) and Smithsonian Institution have designated a Red List of ecosystems. To our knowledge, Red River Forests do not lie within any IUCN/Smithsonian Red List ecosystems. However, the ownerships do lie within the California Floristic Province (NA16g) also designated by Conservation International.

Greenpeace has identified Intact Forest Landscapes (IFL) as unbroken expanse of natural ecosystems within the zone of current forest extent, showing no signs of significant human activity, and large enough that all native biodiversity, including viable populations of wide-ranging species. Red River Forests lie within the forest zone outside of the IFL.

Based on these assessments of large-scale ecosystems and the native species that may occur within those ecosystems, the management of vegetation communities on Red River Forests does not appear likely to pose risk to those ecosystems. However, as described above, these forests lie within the California Floristic Province designated by Conservation International as a biodiversity hotspot. Red River Forests has management and monitoring plans in place to

maintain or enhance native plant species. These plans are included in both SYPs and THPs and are described in this document in Section 4.7 Native Plants, Section 4.7.1, Invasive and Noxious Plants and Appendix D.

4.6.2 *HCVF assessment (Indicator 9.1.a)*

The assessment and identification process for HCVFs (formerly referred to as Special Management Areas - SMAs) has been in place since the preparation of the SYP began in 1998. This process was designed to evaluate the relative costs and benefits to the landowners of designating a particular area as a HCVF or employing a particular HCVF practice. Costs include foregone revenues from curtailing or delaying harvest in HCVF areas, retaining and recruiting HCVF elements and costs associated with management of these timbered and non-timbered areas. Benefits include increasing habitat and aesthetic values, maintenance of biological diversity, and safeguarding water quality. In 2000, the process of selecting HCVFs began and will continue until the normal 10 to 20-year timber harvesting entry cycle has been completed. In 2001, WBA began developing a list of candidate HCVFs to recommend for designation by the owners. Final approval of the more obvious HCVFs designations by the landowners has occurred and additional recommended areas can be approved at any time.

4.6.2.1 *Information Sources*

The identification of HCVFs was completed using numerous information sources, including but not limited to, information documented in THPs, SYPs, state and federal wildlife databases, WBA forest inventory and the WBA GIS databases. Existing inventory information is used to classify forest stands using the CWHR (Mayer and Laudenslayer 1988). Stands are described by primary species, tree size and tree density. Non-forested areas such as montane riparian (MRI), wet meadows (WTM), annual grass (AGS), sagebrush (SGB), chaparral (MCH and MCP), juniper (JUN), blue oak/pine (BOP), and barren areas (BA) are also classified. If necessary, information from the WBA forest inventory including forest stand elements like snags, culls, large woody debris, and hardwood trees may be reviewed.

Additional sources of information include, but not limited to, observations of Special Status Species or unique vegetative communities. As noted in the SYP, several other sources of information are incorporated into the WBA database including current data from the California Natural Diversity Database (CNDDDB), local U.S. Forest Service data, and frequent contacts with adjacent landowners. These sources of information may also provide location of unique habitat types including, but not limited to, aspen stands, seeps, springs, and talus rock outcroppings, which may be suitable as HCVFs.

Watercourse and Lake Protection Zones are established to ensure riparian function is maintained and water quality is not adversely affected. Watercourses are mapped and classified in the SYP and updated during the preparation of individual THPs. All watercourse crossings use a Best Management Practices (BMP) approach developed in conjunction with the DFG in a Master Streambed Alteration Agreement (#R1-05-0497). In addition, Watershed Analysis is conducted as part of the SYP and will be repeated during SYP updates every 5 years. Also, aquatic surveys and water quality assessments and monitoring that are conducted as part

of THP preparation and in specific locations known or suspected to support Special Status Species. Based on the existing information, either WLPZs or location of aquatic Special Status Species, may be suitable as HCVFs.

Significant historical and archeological sites have been and will continue to be documented in conjunction with a professional archeologist as part of THP development as required by the California Forest Practice Rules (FPR). These sites are mapped and stored in the GIS; they are also reported to the CDF for inclusion in the California Historical Resources Information System (CHRIS). Archeological or historic sites that are reported in THPs and SYPs and documented and maintained in GIS and database, may be suitable as HCVFs.

4.6.2.2 HCVF Criteria

The assessment of our forests, non-forested areas and sites of historical or cultural importance (archeological sites) were reviewed following the HCVF guidelines appropriate to the scale and intensity of forest management conducted on our forests. Consistent with the intent of HCVF, HCVFs were identified using the following criteria:

- (1) Stand or type met one or more of the values described as HCVF1 through 6 under Principle 9.
- (2) Stand or type met one or more data sources described under Indicator 9.1.a
- (3) Stand or types inhabited by Special Status Species. Examples of such areas include forest stands that have late seral characteristics or riparian areas that are occupied by special stands.
- (4) Forested areas, not primarily identified for their ecological characteristics, but identified regulatory, administrative and/or operational constraints that can be addressed by managing in a non-standard manner. Regulatory constraints include things such as WLPZs or protection of historic or archeological sites. Operational constraints include difficult terrain, limited road access, or geologically unstable areas. Administrative (voluntary) constraints consider aesthetic and/or recreational values as well as ecological considerations (i.e., stands currently containing relatively abundant late seral attributes, supporting listed species, or unique vegetative communities).
- (5) Forested areas that have or could develop late seral characteristics relatively quickly (within 25 to 50 years), have been and will continue to be designated so as to comprise approximately 1 to 3% of the timbered portion of Red River Forests. These forested areas and timber stands have and will be specifically designated as High Conservation Value Forests (HCVF) distributed among the WBA Northern and Southern Districts. The management objectives for these HCVF will be to maintain and promote late seral forest habitats and values. Timber management may be conducted in some designated HCVFs, however, the harvesting guidelines will be tailored to meet the goals of the specific area.

For Red River Forests, there are a total of 3,533 HCVF acres identified in the WBA GIS. These acres represent 2.7% of Red River Forests and is within the goal of 1 to 3%.

4.6.3 HCVF Assessment Collaboration (Indicator 9.1.b)

In identifying HCVFs, a consultative process was used. The process included use of Registered Professional Foresters licensed by the State of California to provide objective and professional land management advice. These foresters have detailed knowledge of the forests from routine timber harvest field work, tree marking and timber cruising. District Foresters should encourage their respective staffs to bring potential candidate HCVFs to their attention.

Each District Forester will consult with a wildlife biologist to present potential areas for consideration by the SYP and Certification Team as candidate HCVFs. Currently, a wildlife biologist permitted by the State of California (#SC-7097) to handle wildlife species, permitted by U.S. Fish and Wildlife Service to handle endangered species (TE-834385-10, TE-20178A-0) and designated a Spotted Owl Expert (14 CCR 895) by the State of California, was consulted during the current review of HCVFs. The consultative process also included use of DFW, Natural Diversity Database (CNDDDB) and Biogeographic Information and Observation System (BIOS) database. Proper identification of HCVFs is improved through consultation with DFG and other state or federal agencies for listed species and sensitive habitats during the THP public comment period and review process. Areas identified for meadow restoration, restorative fencing, and aspen release projects are also subject to public review because they are normally conducted as part of a THP or in conjunction with state or federal agencies. Additionally, as new scientific information or assessments are available, management, maintenance or monitoring of HCVF areas may be adapted to the new information.

In addition, all personnel are encouraged to bring areas that meet HCVF criteria and objectives to the attention of the appropriate District Forester or a wildlife biologist. The District Foresters and wildlife biologist should consult with other WBA managers and staff such as the Inventory Forester, Lands Department Manager, and Projects Forester, in gathering sufficient information regarding a candidate HCVF for the SYP and Certification Team's review. The HCVFs have been and will continue to be entered into the WBA GIS database. The SYP and Certification Team will be responsible for prioritizing and selecting candidate HCVAs for submittal to the landowners for approval as designated HCVFs. Once a sufficient number of candidates are identified, the landowners may approve designation of HCVFs based on the cost/benefit analyses and prioritization schedule developed by the WBA SYP and Certification Team. If a candidate HCVF is either not approved by the owners or removed from consideration by WBA after further evaluation, it will be removed from the list of candidates and managed using standard forest management practices. During this candidacy period, nominated HCVFs have been and will continue to be treated as if they were approved.

4.6.4 HCVF Management Plans (Indicator 9.1.c)

FSC Principle 9.3 states a management plan shall include and implement specific measures that ensure the maintenance or enhancement of the applicable conservation attributes consistent with the precautionary approach. These measures shall be specifically included in the publicly available management plan summary.

The established *High Conservation Value Practices* employed are specifically described in the publicly available Red River Forests SYP. Newly applied practices developed in conjunction with

all stakeholders will likewise be described during 10-year SYP renewals. Additionally, THPs are subject to public review and are required to disclose and mitigate any potentially significant adverse impacts to the environment. These include operations scheduled to occur in Late Successional Forest Stands, notification of downstream water users, notification of tribal representatives, presence of special status species, impacts to functional wildlife habitat, and cumulative impacts analyses that considers recreation, aesthetics, and watershed processes.

Sites inhabited by Special Status Species are monitored over time to determine occupancy, reproductive success, and habitat suitability. Management activities are designed to avoid adverse impacts to Special Status Species and maintain the habitat characteristics associated with these sites. All observational data pertaining to Special Status Species are annually provided to state and federal agencies for inclusion in their databases and also to adjacent private landowners if activities on neighboring lands could impact the site.

Management activities that may impact archeological or historically significant sites are developed in conjunction with CAL FIRE as part of the THP review process. During THP preparation, native tribal representatives are notified and input is solicited. Any concerns from tribal representatives are discussed and resolved prior to THP implementation.

4.6.4.1 *HCV1 Management Guidelines - Non-timbered areas*

These de facto HCVFs represent portions of Red River Forests that are maintained in a native condition and subject to natural succession. These areas will follow successional trajectories over time except that fire suppression may alter truly natural conditions (i.e., fire return intervals across the western U.S. are typically longer than those that occurred prior to European settlement). The commitment of Red River Forests to maintain these non-revenue producing portions of the ownership should be noted. Regulatory and Certification compliance costs exert pressure on landowners to dispose of such holdings; often with the unintended consequence of increased disturbance or environmental degradation associated with development or other more intensive land uses. Where necessary and feasible, desired seral stages and habitat conditions (i.e., natural vegetative communities and structure) may be maintained or restored using a variety of techniques including prescribed fire, managed grazing, and control of exotic or invasive species.

4.6.4.2 *HCV3 Management Guidelines*

For stands that meet the HCVF criteria for HCV3 or are candidates (SMA), management guidelines will be focused to maintain or enhance features associated with functional late seral habitats. Late seral habitats are naturally variable across the landscape encompassed by Red River Forests. Generally, late successional forests on the slopes of the Cascade and Sierra ranges are more densely stocked with timber, contain more snags and LWD, and achieve higher canopy closure than similarly aged forests found on the Modoc Plateau and east of the Sierra or Cascade crests. As such, the HCVF criteria may be adjusted based on geographic limitations (natural range of variability), site class, safety concerns in high use areas, or research that indicates alternative standards may be more appropriate.

Specific management criteria for these areas are outlined in “Timbered HCVF Management Guidelines” below. In summary, timber harvesting would only be conducted in the <20” DBH classes until the designated area grows into a specified condition. The guidelines would then allow for harvesting all size classes provided the post-harvest stand meets the minimum conditions detailed in the guidelines.

The designation of HCVFs and the management practices used in them are determined at the sole discretion of the landowner. They will be implemented to meet the overall long-term management goals of the ownership and are not considered “mitigation” to any regulatory permit, including the SYP or individual THPs.

For specific stands that have been identified as candidate (SMA) and designated timbered HCVFs will be managed using the following guidelines:

- Unit size variable up to 400 acres based on surrounding landscapes, connectivity, and unique characteristics of a particular HCV3.
- A variable range of 5 to 10 live trees per acre ≥ 24 ” DBH with between 2 and 6 live trees per acre ≥ 32 ” DBH and overstory canopy closure of between 40 and 85%.
- A variable number (0.5 to 2.0 per acre) of snags ≥ 24 ” DBH and at least 0.25 snags per acre that are >30” DBH.
- Entries no closer together than 15 years with targets of 20 to 30 years including salvage operations (catastrophic events would necessitate salvage in some cases).
- May use selection or sanitation/salvage silviculture so long as all minimum criteria listed above are met post harvest. Harvests should focus on removing smaller trees and retaining larger trees regardless of declining vigor.
- Maintain all LWD >18” diameter (large end) and >20’ long.
- In order to more quickly attain objectives, may thin from below appropriate trees that are <20” DBH prior to meeting criteria to promote growth into larger size classes and reduce the risk of catastrophic wildfire.

4.6.5 HCVF Monitoring Plans (Indicator 9.1.d)

The goal of the HCVF monitoring is to assess the implementation of the HCVF policy and effectiveness of plans to maintain or enhance HCVF objectives. Designated HCVFs have and will continue to be entered into a geographic information system and forest inventory. Designated HCVFs are and will be mapped as polygons that may include all or portions of one or more previously delineated timber stands or non-timber areas. Data concerning the resources within a HCVF will be analyzed by reviewing inventory data or data collected specifically for analysis as a HCVF. A general inventory of conditions within a HCVF may need to be conducted separately from standard cruising methods. This inventory would quantify existing conditions relative to tree diameter distribution, snags, indications of wildlife use such as cavities or existing nest structures, culls, LWD, species composition including conifers, shrub layers, and hardwoods, roads and road problems, any other relevant information (i.e., riparian zones or instream conditions if watercourses are present). A photo record may be used to depict these baseline

conditions. High Conservation Value Forests may be re-inventoried on a regular basis (every 5 to 20 years) to quantify changes. Inventory intensity/rate will be dependent on level of management activities within a given HCVF and also on the number and size of areas to inventory and time needed to complete this work. A subset of HCVFs may be evaluated in any year. All inventory information for each HCVF will be recorded in a database with standardized fields. As monitoring and measurement of HCVFs and SMAs occur over time, based on these field measurements, changes in management objectives, uncertainty in interpretation of the FSC standards, and possible FSC standard changes or clarifications, HCVFs areas may be reevaluated and downgraded into SMAs (or no designation) and SMAs and other areas may be upgraded to HCVFs.

If necessary, monitoring will focus on inventory specifically focusing on snags, LWD, large trees, and degree of decadence. Monitoring will also focus on use of habitat elements by conducting point counts for birds, establishing camera monitoring stations, and conducting species specific surveys. Monitoring may include cooperative research to ensure objectives are being met and to assess wildlife use, biodiversity indicators, and habitat conditions within HCVFs or SMAs.

4.7 NATIVE PLANTS

Due to unique habitats and topographic and climatic conditions, a diverse native plant community is found within Red River Forests. In addition, many native plant species occur along seeps, springs, wet meadows and streams. In some cases, rare, threatened or endangered native plants may be found and are an important part of the natural biological diversity of Red River Forests. Since 2000, to ensure that proposed timber harvest plans and harvesting operations do not potentially cause significant adverse impacts to botanical resources, a comprehensive and detailed assessment and management plan is developed for each plan. A portion of the assessment includes collaboration with stakeholders including DFW, Calflora and the California Native Plant Society (CNPS). In general, the management plan intends to avoid or minimize significant adverse impacts to botanical resources by assessing the intensity of the proposed operations, the response of specific native plant species to disturbance, the continued maintenance of naturally vegetated habitat types, and the rarity of the potential native plant species present within the timber harvest plan area. A comprehensive and detailed description of our native plant management plan is described in the SYP Fish and Wildlife Assessment, Section FW.II.D, Native Plants. Key features of the native plant management plan are highlighted below.

- (1) Timber harvest plan area is evaluated for known native plant occurrences or specific habitat types known to support various special status native plant species.
- (2) Potential habitat changes or disturbances occurring from the THP, if any, are reviewed relative to potentially occurring special status native plant species.
- (3) Where a THP may pose a risk of significant adverse impact to a particular special status native plant species, both extensive and focused intuitive searches for that species are conducted prior to timber management operations.

- (4) If special status species are detected, a site specific mitigation plan is developed with state agencies.
- (5) Based on a site specific mitigation plan, monitoring of a native plant species may occur.
- (6) A summary of native plant searches conducted is submitted to state agencies in a 5-year report.

4.7.1 Invasive and Noxious Plants

The overall goal of the invasive and noxious plant programs is to reduce the risk of introduction, establishment, and spread of invasive and noxious weeds. To achieve these goals, the objectives of the program include: (1) Education and training of forest management personnel in specific species identification and recognition for early detection, (2) Assessments of specific species locations, (3) Physical, biological, or chemical control of specific species, (4) Monitoring effectiveness in achieving desired objectives.

To achieve these goals and objectives, the invasive and noxious plant program is designed to support existing county programs that coordinate county-wide control under the California Food and Agricultural Code (7272(b)) as well as an internal integrated pest management program. Management is conducted in cooperation with the Modoc County Weed Management Area, Shasta County Weed Management Area, Siskiyou County Weed Management Area, and Plumas-Sierra Noxious Weed Management Group which coordinates county-wide control for Plumas and Sierra counties. In addition, the invasive species policy incorporates an integrated pest management program, which guides the control of specific species. The integrated program may use silvicultural, chemical, manual, mechanical, prescribed fire, and biological tools to control or eradicate invasive and noxious plants. A comprehensive and detailed Invasive and Noxious Plant Management Plan is described in Appendix D.

5.0 MONITORING

Monitoring of forest, biological and watershed resources is guided by the SYP Fish and Wildlife Assessment, Section FW.V, Monitoring, of the Red River Forests SYP and the "Monitoring of Forest and Biological Resources prior to and during the implementation of the Red River Forests " in Appendix F. The various monitoring programs described in Appendix F, provide information to help evaluate the effectiveness of maintaining or enhancing forest, biological and watershed resources on Red River Forests. The monitoring programs also provide information to evaluate the forest management plans and operations.

Monitoring for wildlife values is conducted using a variety of methods and at a variety of ecological scales. The monitoring and subsequent adaptive occurs at three primary scales: (1) Landscape scale, (2) Stand scale and (3) Species scale. Due to the large number of individual species and habitats it is not economically feasible to monitor all the species or habitats. The various monitoring efforts or scientific studies which have been completed or are currently on-going are not intended to completely study each species or specific habitat type. The goal is to validate the existing information in a hierarchical format. The validation will begin with reviews

of regional literature. If necessary, monitoring will provide better information than previously known regarding the presence, distribution and habitat requisites of species, or the cause-and-effect relationship between forest management activities and selected species or their habitats: The hierarchical format is as follows (Excerpt from SYP Appendix F):

| Hierarchical Scale of Monitoring Types | | |
|---|----------------------|--|
| (1) | Regional Literature: | Monitoring which describes the regional information and scientific underpinnings of the forest, biological or watershed resource. |
| (2) | Presence or Absence: | Monitoring to determine the presence of a resource or species. |
| (3) | Implementation: | Monitoring which measures implemented management plans, as an example, measuring THP mitigation measures or best management practices. |
| (4) | Effectiveness: | Monitoring of whether a particular mitigation measure or best management practices is effective in achieving designed goal or objective. |
| (5) | Correlational: | A form of validation monitoring, used to validate whether previous Regional information or scientific underpinnings of species presence or habitat use is correct. |
| (6) | Cause-and-effect: | A form of validation monitoring, to explicitly test correlational information, typically in a before-after-control-treatment (BACI) study design. |

Significant efforts will be made to conduct many of these monitoring efforts and studies with various regulatory agencies, in the belief that participation by stakeholders builds mutual understanding in the study design, the data collected and the analysis of the data. Results can then help evaluate the effectiveness of any mitigation measures and uses the results in an adaptive management context to develop future SYPs and THPs.

5.1 STATISTICAL AND BIOLOGICAL RELEVANCE

Typically, due to relatively small sample sizes and lack of controls for both dependent and independent variables, statistically rigorous testing of forest and biological resource management assumptions is difficult. However, working with resource agencies and refining specific resource management questions can improve scientific study designs so that spurious results are limited. Both statistical and biological relevance of the scientific question should always be reviewed and the resulting acceptable level of scientific uncertainty should be described in study proposals.

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APPENDIX A RED RIVER FORESTS – HCVF (2021)

| HCVF Code | HCVF Type¹ | HCVF (acres) |
|------------------|---|---------------------|
| HCV1 | Forests or areas containing globally, regionally or nationally significant concentrations of biodiversity values (e.g. endemism, endangered species, refugia). | 0 |
| HCV2 | Forests or areas containing globally, regionally or nationally significant large landscape level forests, contained within, or containing the management unit, where viable populations of most if not all naturally occurring species exist in natural patterns of distribution and abundance. | 0 |
| HCV3 | Forests or areas that are in or contain rare, threatened or endangered ecosystems. | 1,304 |
| HCV4 | Forests or areas that provide basic services of nature in critical situations (e.g. watershed protection, erosion control). | 1,875 |
| HCV5 | Forests or areas fundamental to meeting basic needs of local communities (e.g. subsistence, health). | 0 |
| HCV6 | Forests or areas critical to local communities' traditional cultural identity (areas of cultural, ecological, economic or religious significance identified in cooperation with such local communities). | 354 |
| | Total Area Classified (Acres) | 3,533 |

^[1] High Conservation Values should be classified following the numbering system given in the ProForest High Conservation Value Forest Toolkit (2003) available at www.ProForest.net or at www.wwf.org

APPENDIX B Invasive and Noxious Plant Management Plan



INVASIVE SPECIES POLICY
for
Lassen Forest & Red River Forests



July 2022

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1.0 Introduction

The W. M. Beaty & Associates, Inc. Invasive Species Policy is a program to assess the risk of invasive species, prioritize, and, as warranted, develop and implement a strategy to prevent or control invasive species. This is accomplished through assessment, management practices, control, and monitoring. Known populations of invasive species are present on the forest.

This policy has been developed and implemented in compliance with the FSC Standard for Principle 6, Environmental Impact, and Principle 7, Management Plan. Additionally, the policy relies on and is supported by the associated Sustained Yield Plan (SYP).

The intent of this policy is to reduce the risk of introduction, establishment, and spread of invasive plant species. The goal of this risk reduction is to minimize the damages associated with invasive species to native ecosystems and to conserve the biological diversity found on the forest. By maximizing positive environmental impacts and minimizing adverse environmental impacts resulting from forest management operations, the damages to water resources, soils, landscapes, and unique and fragile ecosystems from invasive species can be minimized.

A noxious weed is any species of plant that the California State Department of Food and Agriculture has determined to be "troublesome, aggressive, intrusive, detrimental, or destructive to agriculture, silviculture, or important native species, and difficult to control or eradicate" (CDFA section 5004 Oct. 2015).

(http://ca.regstoday.com/law/fac/ca.regstoday.com/laws/fac/calaw-fac_DIVISION4_PART1_CHAPTER1.aspx)

All noxious weeds are invasive and non-native; however, not all invasive or non-native weeds are noxious.

2.0 Assessment

A combination of methods is used to determine the extent of invasive species populations on the forest. W. M. Beaty & Associates, Inc. strives to provide education to foresters regarding detection of invasive species. Forestry personnel are expected to document field observations of invasive species and report these findings to the W. M. Beaty & Associates, Inc. Reforestation Department.

2.1 Education

Foresters will be trained in the identification of invasive species that are likely to occur on the forest. Reference information is contained in the W. M. Beaty & Associates, Inc. files and are made available to foresters. Additionally, foresters are encouraged to participate in training courses related to invasive species. The following sources are used to aid in the identification and recognition of invasive species known or likely to occur within the forest.

- All Weed XID CD (purchase from Cal-IPC website)

- CA-California Invasive Plant Council. <http://www.cal-ipc.org/>
- CA-California Weed Management Areas. <https://www.cdfa.ca.gov/plant/index.html>
- CA-CalPhotos. <http://calphotos.berkeley.edu/>
- CA-CalWeed Database
- CA-Encycloweed (CDFA). <https://www.cdfa.ca.gov/plant/index.html>
- California Department of Food and Agriculture, Integrated Pest Control, Weeds Alphabetical by Scientific Name: http://www.cdfa.ca.gov/phpps/ipc/weedinfo/winfo_list-synonyms.htm
- California Invasive Plant Council (Cal-IPC). <http://www.cal-ipc.org/>
- California Invasive Plant Council: California Invasive Plant Inventory Database: <http://www.cal-ipc.org/ip/inventory/weedlist.php>
- CA-Practical Guidebook for Invasive Aquatic Identification & Control. <http://www.sfei.org/nis/NISguidebooklowres.pdf>
- CA-UC Davis Integrated Pest Management. <http://www.ipm.ucdavis.edu/>
- CA-UC Davis Weed Research and Information Center. <http://wric.ucdavis.edu/>
- CA-UC IPM Online Weed Photo Gallery. http://ipm.ucanr.edu/PMG/weeds_intro.html
- Invasive Plants Field and Reference Guide: An Ecological Perspective of Plant Invaders of forests and Woodlands: <http://www.na.fs.fed.us/pubs/detail.cfm?id=9822>.
<http://www.fs.fed.us/ne/morgantown/4557/cindy/InvasiveSpeciesFieldGuide.pdf>
- Joseph M. DiTomaso and Evelyn A. Healy. 2007. Weeds of California and Other Western States.
- Noxious Weeds...A Serious Threat to Shasta County's Resources, Shasta County Weed Management Area.
- Selected Noxious Weeds of Northeastern California, A Field Identification Guide.
- The Nature Conservancy: Wildland Invasive Species Program
- Tom D. Whitson, Parker, Dewey, Burrill. 2000. Weeds of the West.
- U.S. Department of Agriculture, Invasive and Noxious Weeds: <http://plants.usda.gov/java/noxious?rptType=State&statefips=06>

- U.S. Department of the Interior Bureau of Land Management, Noxious Weeds of the Alturas Field Office. <http://www.blm.gov/ca/st/en/fo/alturas/altweed.html>.
<http://www.blm.gov/ca/st/en/fo/surprise/altweed.html>
- University of California, Agriculture and Natural Resources, UC IPM Online, Statewide Integrated Pest Management Program: How to Manage Pests, Exotic and Invasive Pests: <http://www.ipm.ucdavis.edu/EXOTIC/exoticpestsmenu.html>
- University of California, Growers Weed Identification Handbook.
- Weed Research and Information Center, UC Davis, <http://www.wric.ucdavis.edu/ca>.
<http://wric.ucdavis.edu/>

2.2 Detection

All forestry personnel should be vigilant in their observation of invasive species during field activities including: informal observations, tract inspection, screening sites during harvest planning and THP preparation, botanical searches/surveys, archaeological searches/surveys, monitoring activities, forest inventory cruising, timber marking, etc. Contract botanists may also be used for searches, field surveys, and identification when necessary. Foresters should communicate with adjacent landowners regarding known or potential invasive species occurrences. State listings of invasive species locations should be utilized as sources of information.

Known invasive species on the forest that were targeted with control methods or assessed in the previous 10 years include, but are not limited to:

| Common Name | Scientific Name | CDFA Weed Rating | Cal-IPC Weed Rating | County | Tract |
|--------------------------------------|---------------------------------|------------------|---------------------|--------|---------------------------------------|
| Dyer's woad | <i>Isatis tinctoria</i> | B | Mod | Modoc | Adin/Canby, Egg Lake, Glass Mountain |
| Hounds tongue | <i>Cynoglossum officinale</i> | B | Mod | Shasta | Pondosa, Jimmerson |
| Klamath weed | <i>Hypericum perforatum</i> | C | Mod | Shasta | Shasta |
| Musk thistle | <i>Carduus nutans</i> | A | Mod | Shasta | Pondosa |
| Purple loosestrife | <i>Lythrum salicaria</i> | B | High | Shasta | Pondosa |
| Scotch broom | <i>Cytisus scoparius</i> | C | High | Shasta | Shasta |
| Scotch thistle | <i>Onogordum acanthium ssp.</i> | A | High | Modoc | Adin Canby, Glass Mountain, Jimmerson |
| Spotted knapweed | <i>Centaurea maculosa</i> | A | High | Modoc | Adin/Canby, Glass Mountain, Jimmerson |
| Squarrose knapweed | <i>Centaurea squarrosa</i> | A | Mod | Modoc | Jimmerson, Pondosa |
| Tall whitetop (Perennial pepperweed) | <i>Lepidium latifolium</i> | A | High | Lassen | Harvey |
| Yellow star thistle | <i>Centaurea solstitialis</i> | C | High | Shasta | Pondosa, Shasta |

2.3 Reporting

Foresters should report observations of invasive species to the Project Forester. Observations should include species name, descriptive location, legal description, mapped location, geographic positioning system (GPS) coordinates, extent, and photograph (if available). Known occurrences of invasive species will be added to the invasive species database as they are discovered. An invasive species layer has been developed and is maintained in the W. M. Beaty & Associates, Inc. geographic information system (GIS).

2.4 Weed Ratings

Methods to determine the degree of threat to native species and ecosystems include two widely recognized and accepted weed area rating systems.

California Department of Food and Agriculture (CDFA)

http://www.cdffa.ca.gov/phpps/ipc/weedinfo/wininfo_list-synonyms.htm

The CDFA weed rating system includes five classes (A, B, C, D, or Q). The ratings are policy guidelines that indicate the most appropriate action to take against a pest under general circumstances. Local conditions may dictate more stringent actions at the discretion of the county agricultural commissioners, and the rating may change as circumstances change. The following are the definitions of the weed ratings:

- “**A**” A pest of known economic or environmental detriment and is either not known to be established in California or it is present in a limited distribution that allows for the possibility of eradication or successful containment. A-rated pests are prohibited from entering the state because, by virtue of their rating, they have been placed on the of Plant Health and Pest Prevention Services Director’s list of organisms “detrimental to agriculture” in accordance with the FAC Sections 5261 and 6461. The only exception is for organisms accompanied by an approved CDFA or USDA live organism permit for contained exhibit or research purposes. If found entering or established in the state,

A-rated pests are subject to state (or commissioner when acting as a state agent) enforced action involving eradication, quarantine regulation, containment, rejection, or other holding action.

- "B" A pest of known economic or environmental detriment and, if present in California, it is of limited distribution. B-rated pests are eligible to enter the state if the receiving county has agreed to accept them. If found in the state, they are subject to state endorsed holding action and eradication only to provide for containment, as when found in a nursery. At the discretion of the individual county agricultural commissioner they are subject to eradication, containment, suppression, control, or other holding action.
- "C" A pest of known economic or environmental detriment and, if present in California, it is usually widespread. C-rated organisms are eligible to enter the state as long as the commodities with which they are associated conform to pest cleanliness standards when found in nursery stock shipments. If found in the state, they are subject to regulations designed to retard spread or to suppress at the discretion of the individual county agricultural commissioner. There is no state enforced action other than providing for pest cleanliness.
- "D" An organism known to be of little or no economic or environmental detriment, to have an extremely low likelihood of weediness, or is known to be a parasite or predator. There is no state enforced action.
- "Q" An organism or disorder suspected to be of economic or environmental detriment, but whose status is uncertain because of incomplete identification or inadequate information.

California Invasive Plant Council (Cal-IPC)

<http://www.cal-ipc.org/ip/inventory/weedlist.php>

The Cal-IPC weed rating includes three categories (High, Moderate, or Limited). The following are the definitions of the weed ratings:

- **High** – These species have severe ecological impacts on physical processes, plant and animal communities, and vegetation structure. Their reproductive biology and other attributes are conducive to moderate to high rates of dispersal and establishment. Most are widely distributed ecologically.
- **Moderate** – These species have substantial and apparent—but generally not severe—ecological impacts on physical processes, plant and animal communities, and vegetation structure. Their reproductive biology and other attributes are conducive to moderate to high rates of dispersal, though establishment is generally dependent upon ecological disturbance. Ecological amplitude and distribution may range from limited to widespread.
- **Limited** – These species are invasive but their ecological impacts are minor on a statewide level or there was not enough information to justify a higher score. Their reproductive biology and other attributes result in low to moderate rates of invasiveness. Ecological amplitude and distribution are generally limited, but these species may be locally persistent and problematic.

Natural Resources Conservation Service (NRCS)

<http://plants.usda.gov/java/noxious?rptType=State&statefips=06>

The NRCS weed rating system relies on the CDFA rating system and includes additional qualifiers.

3.0 Management

Vectors to invasive species distribution include humans, animals, mulch, equipment, wind, vehicles, tools, etc. Numerous management practices are used to minimize the risk of invasive species establishment, growth, and spread. Practices to be considered and implemented by W. M. Beaty & Associates, Inc. include:

- Wash or clean equipment, vehicles, tools, and clothing of weed seeds prior to moving to or from sites with invasive species
 - Avoid seed mixes that contain potential invasive species
 - Use native logging slash
 - Use certified weed free seed
 - Use certified weed-free mulch (*more costly than native logging slash, not always 100% weed free, does not hold up as well as slash, supply is variable, and requires hauling in*)
 - Seed landings and other disturbed areas with native species
 - Alter silvicultural treatments
 - Effective forest monitoring and early detection
 - Invasive species identification training
-

4.0 Control

In prioritizing control of invasive species populations, W. M. Beaty & Associates, Inc. will consider the relative risk of invasive species infestations relative to other threats to the forest (e.g., fire, insects, disease, etc.). Control measures should match the scale of the infestation and the potential risks and/or actual impacts to native species and ecosystems. Where eradication is not feasible, efforts shall focus on control of existing populations to prevent further spread. Efforts should focus on controlling the seed bank (minimize new seed production and deplete existing seed). Where invasive species are extremely aggressive, mitigation, repair, and restoration of native species is often difficult, more costly, and sometimes impossible. Resources shall be allocated both to eradication and control of established invasive species populations when feasible and the prevention of new species occurrences.

W. M. Beaty & Associates, Inc. will use in-house foresters, outside contractors, and local government resources to control populations as appropriate. W. M. Beaty & Associates, Inc. has been a cooperator in the Lassen, Modoc, Plumas-Sierra, Shasta, and Siskiyou County weed management area (WMA) groups. These WMAs are cooperators in county-wide weed control under the California Food and Agricultural Code §7272(b). W. M. Beaty & Associates, Inc. maintains annual cooperative agreements (Weed Eradication Agreement Memorandum of Understanding) with Shasta and Modoc Counties to treat noxious weeds. The primary purpose of the WMAs is to cooperate on projects in order to seek and obtain funding. Unfortunately, funding for the WMA Program has been eliminated from the CDFA budget as of June 30, 2011. The Terrestrial Noxious Weed Program and Weed Biological Control Programs at CDFA will also be eliminated on June 30, 2011.

Control methods to be considered include physical/cultural (mechanical and manual), chemical, thermal (prescribed fire), and biological (natural enemy). Non chemical control will be used where it can be effective.

Mechanical control will be used where feasible and may include mastication, hand pulling, and removal of seed heads along with bagging and disposal of collected material.

Chemical control will be used in compliance with the W. M. Beaty & Associates, Inc. Vegetation Management Policy and Pesticide Use Guidelines and Section WA.I.E.6, Chemical Contamination of the associated SYP. A pest control advisor (PCA) will prepare a pest control recommendation for all pesticide use. Herbicides that have been effectively used include: Accord XRT II (glyphosate), Milestone

(a.i. aminopyralid), Transline (a.i. clopyrard), Garlon 4 (a.i. triclopyr), Weedone LV6 EC (2,4-D), etc. These herbicides are generally tank mixed with adjuvants and may include a water carrier. Herbicides are generally applied by hand crews equipped with backpack sprayers to control small populations.

5.0 Monitoring

Monitoring of control measures and management practices will be used to assess their effectiveness in preventing or controlling invasive species. The following types of monitoring will be used:

- Implementation monitoring will be conducted during and immediately after treatment to ensure the treatment was in compliance with the prescription.
- Effectiveness monitoring will be conducted the year following herbicide application to determine if the control measures produced satisfactory results.
- Trend monitoring will be used to determine if known populations of invasive species are expanding or new populations are occurring.

Monitoring may be conducted in conjunction with other monitoring activities described in Section WA.I.F, Monitoring Plan of the SYP. The metric of success is if existing populations are not increasing and new populations are controlled.

6.0 Invasive Species Photographs

The following invasive species occur or have the potential to occur on WBA managed lands.



Wavyleaf Thistle



Plumless Thistle



Canada Thistle



Scotch Thistle



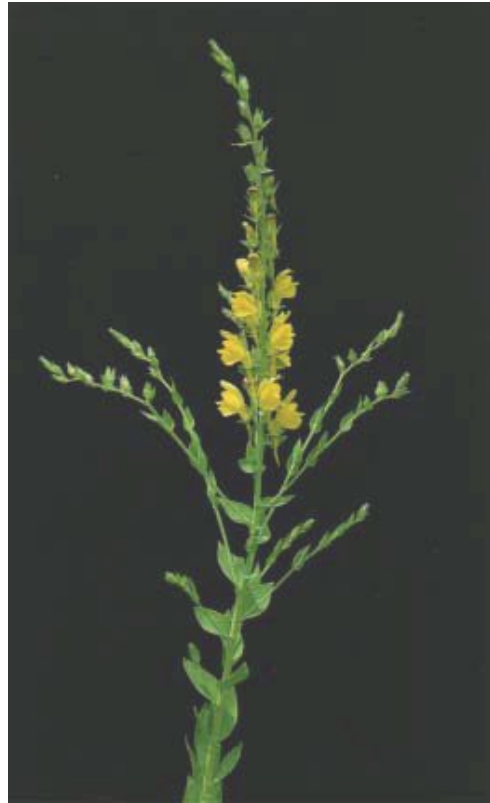
Yellowspine Thistle



Musk Thistle



Yellow Starthistle



Dalmatian Toadflax



Dyer's Woad



Dyer's Woad



Halogeton



Klamath Weed (St. Johnswort)



Hoary Cress



Leafy Spurge



Mediterranean Sage



Medusahead



Purple Loostripe



Tall Whitetop (Perennial Pepperweed)



Diffuse Knapweed



Squarrose Knapweed



Spotted Knapweed



Russian Knapweed



Houndstongue



Scotch Broom



Common Crupina

APPENDIX C GRAZING MANAGEMENT PLAN

W.M. BEATY & ASSOCIATES, INC.
GRAZING MANAGEMENT POLICY
RED RIVER FORESTS

Background

Livestock grazing on Red River Forests (RRF) predates the acquisition of these properties by The Red River Lumber Company (TRRLC) and as such has been part of the custom, culture, and economic base in the northeastern region of California for well over 100 years. The timberlands and mountain meadows of this region serve as summer pasture and livestock operators were among the earliest settlers in the area.

In the early 1900's after private timberland holdings were established and the National Forests and Bureau of Land Management were created, a system of permitting livestock use was developed to manage grazing activities on what was and for the most part still is open range. A network of grazing allotments was formed around logical management units that evolved over time; these allotments often cover both private and federally managed lands. Grazing on federal land was, and still is authorized under long-term Grazing Permits while TRRLC permitted grazing under annual permits to the individual operators in each allotment. Permittees on RRF and SF still operate under an annual permitting process. Where grazing allotments include federally managed lands the appropriate agency has taken a custodial role over the allotment. As such, these agencies prepare annual operating plans that include turnout dates, stocking rates, animal use months (AUM's) and other applicable information for the entire allotment.

Monitoring

W.M. Beaty & Associates, Inc. (WBA) has been and will continue to work with the custodial agencies to monitor annual forage utilization using consistent methods to measure long-term trends on rangeland allotments. On most allotments key areas are being identified as appropriate locations for utilization transects to be established. Key areas are representative of the general range conditions and are capable of, and likely to show, a response to management actions. Grazing exclosures (4' X 4') are being constructed on key areas to aid in gauging annual forage production. Exclosures may periodically be relocated or mowed to reflect the grazed condition on allotments. Exclosures will serve as photo monitoring points at the end of each grazing season. Utilization data will be collected on key area transects by the permittee using the landscape appearance method. The WBA staff will use this same method to verify utilization on an annual basis. Permittees will provide WBA with utilization data collected on adjacent federally managed lands so that overall range trend and condition can be monitored. Where RRF comprise a minor percentage of an allotment and no key areas have been identified WBA will rely on adjacent transects. Utilization data, herd movement and range improvement forms will be provided to each permittee prior to each grazing season. These forms will be completed by the permittee and returned to WBA no later than November 30th of that years grazing. Data collected will be entered into a database by allotment.

Standards and Guidelines

In general the following standards will be used on rangeland allotments. These standards may be adjusted to achieve desired range conditions and/or to protect threatened and endangered species. Utilization standards will be applied to key areas on uplands, dry meadows, and moist meadows. Compliance with allowable use standards may require that cattle are moved or removed from key areas or entire units before standards are exceeded. Livestock will be removed from the allotments before the expiration of the grazing period if deemed necessary.

It is the permittee's responsibility to understand and comply with the allowable use standards. The permittee is required to move or remove livestock from areas before standards are exceeded.

Upland Areas

Allowable utilization of perennial herbaceous vegetation in the uplands is 50% of perennial rangeland vegetation that is in at least fair condition with stable trend and not associated with riparian zones. Decrease utilization to 0-49 percent on perennial vegetation where rangeland condition is less than fair condition or has a downward trend. Utilization is based on data collected using the landscape appearance method. Allowable utilization of current annual growth on browse species is 20%. Total utilization is the amount eaten or trampled by both wildlife and livestock.

Riparian Areas

Where necessary site potential and desired future condition will be defined for specific areas. Standards will be developed to achieve these conditions. Until site specific standards are in place, the following will be used to maintain or improve riparian condition. It is essential that the standards and guidelines are not exceeded.

Allow no salting or livestock supplements within ¼ mile of water developments, streams, or other riparian areas.

Bank Stability: At key use riparian benchmarks, cattle disturbance to streambanks and lakeshores will not exceed 20% of the measured reach. Disturbance includes bank sloughing, chiseling, trampling, and other means of exposing bare soil or cutting plant roots. Apply management strategies to achieve at least 80 percent of naturally occurring streambank stability. Stability will be measured in linear feet by stream reach.

Stubble Height: Retain 4 to 6 inches stubble height on streamside vegetative biomass at end of the grazing season where capable. This standard may be modified depending upon stream condition and grazing system.

Utilization: Do not exceed 40 percent use of streamside herbaceous vegetation with no reduction in ground cover for streamside zones in good condition (utilization may exceed 40 percent when intensive systems are used to restore streamside zones to good condition or to maintain riparian zones already in good condition). For streamside zones in poor condition, utilization may be 0-25 percent until restored to fair condition. Riparian browse species (aspen and willow) will receive no more than 20% use on the current year's annual growth.

Irrigated Pastures

A few allotments are comprised of irrigated pasture. Permittees graze these pastures judiciously in the spring then move the majority of stock to rangeland allotments during the summer months. Livestock are brought back on to irrigated pasture after rangeland forage is utilized. Livestock are rotated off a pasture when an average stubble height of 4–6 inches is achieved. The most extensive irrigated pastures are located on the Home Ranch. In 2004 the Natural Resource Conservation Service developed a grazing management plan for the ranch. In addition to maintaining a 4-6 inch stubble height a rest and rotation schedule for the pastures was developed. Key areas of these pastures will be monitored by the permittee using either stubble height transects or photographic monitoring.

Threatened and Endangered Species

WBA is working with the United States Department of Agriculture (USDA) Forest Service to identify allotments where threatened or endangered (T&E) plant species may be present and potentially impacted by grazing activities. The WBA wildlife database and the California Department of Fish and Game (California Natural Diversity Database) are also checked for species that may be impacted by grazing. Where T&E species are known or are likely to occur within an allotment, site specific surveys of suitable habitat will be conducted by WBA to determine if that species present. If a T&E species is found to be present, WBA will work with the permittee to develop appropriate mitigations to avoid impacts to that species. These mitigations may include modifying the time of use, duration of use or exclusionary fencing.

Annual Meetings

Cooperative Meeting/Adjacent Landowner Coordination. Topics addressed include herb movement, range maintenance responsibilities, turn out restrictions, etc.

Related Documents

- Annual Grazing Plan
- Utilization Study Data (Landscape Appearance Method & form)