



Cragin Watershed Protection Project

Proposed Action for Public Scoping

Public Scoping February 24, 2016



Forest Service

Coconino National Forest Mogollon Rim Ranger District

INTRODUCTION

Project Proposal

The Mogollon Rim Ranger District of the Coconino National Forest is preparing an Environmental Assessment (EA) under the Healthy Forest Restoration Act (HFRA) authority to document the environmental effects of the Cragin Watershed Protection Project (CWPP). The analysis will evaluate and disclose the effects of vegetation treatments using mechanical and hand thinning and prescribed burning on the National Forest to reduce the risk of uncharacteristic wildfire¹ to the wildland urban interface² (WUI), critical developments, infrastructure and drinking water watersheds in and adjacent to the project area. Mechanical and hand vegetation treatments are proposed over about 39,000 acres and prescribed burning treatments are proposed over about 64,000 acres within the project area. A recent example of an uncharacteristic wildfire on the Coconino National Forest includes the Schultz Fire in 2010, which encompassed thousands of acres and burned at high severity³ over 39% of the fire area. This fire caused large stands of trees to be killed and resulted in soils becoming hydrophobic (a condition where soils repel water). The conditions resulted in post-fire erosion and flooding in sub-watersheds within and downstream of the burned area.

The HFRA of 2003 as amended, provides improved statutory processes to reduce delays and the complexity of administrative processes for hazardous fuel reduction projects on National Forest System Lands. The delays not only put communities and infrastructure at risk to uncharacteristic fire, they allow the conditions of key watersheds to continue to degrade. While the focus of the CWPP is fuels reduction, the proposed treatments benefit ecological processes that promote healthy resilient ecosystems and healthy human communities. The CWPP qualifies under the HFRA authority (USDA, USDI 2004) in the following ways:

- The entire project area is covered by the Blue Ridge Area, Mogollon Rim Ranger District Community Wildfire Protection Plan (Gatewood 2009).
- 26% of the project area consists of WUI values at risk and surrounding buffers consisting of private lands, critical communications sites, high voltage transmission lines, water pipelines, campgrounds, weather stations, fire towers, historical cabins and Forest Service administrative sites that if destroyed by fire would result in hardship to communities.

¹ Uncharacteristic wildfire means fire severity outside the historic fire regime, which was a low severity/high frequency fire regime.

² The WUI definition used in this project comes from Southwestern Region (R3) Supplement No. 5100-2010-2, September 7, 2010, FSM 5100, Fire Management, Chapter 5140, section 5140.5. The WUI includes those areas of resident populations at imminent risk from wildfire and human developments having special significance. These areas in CWPP include critical communications sites, municipal watersheds, high voltage transmission lines, water pipelines, campgrounds, weather stations, fire towers, historical cabins and Forest Service administrative sites that if destroyed by fire would result in hardship to communities. These areas encompass not only the sites themselves, but also the continuous slopes and fuels that lead directly to the sites regardless of the distance involved. Generally all private property, developments and infrastructure was buffered by a half mile in all directions to denote the WUI boundary surrounding the values at risk. In the Blue Ridge, Mogollon Rim Ranger District Community Wildfire Protection Plan (Gatewood 2009) all private lands are buffered by a half mile in all directions and up to 4 miles on the upwind side of predominant winds. This does not necessarily mean that WUI areas will be treated any differently than other areas in the project area but is a way to prioritize treatments.

³ Severity (Keeley 2009) is used to describe the effects of wildfire on soil (sometimes called “burn severity”) or on fuels and vegetation (sometimes called “fire severity”). Fire severity descriptors may include characterization of fuel consumption (what is burned), vegetation mortality and measures such as bark char and foliage scorch. These are indicators of how the fire behaved and are often related to mortality. Intensity is reserved for fire-line intensity and the important physical characteristics of fire such as residence time, rate of spread, depth and duration of soil heating which all help to explain the severity and secondary ecosystem effects of the fire.

- 71% of the project area is within watersheds that drain into the C. C. Cragin Reservoir which is a municipal water supply to the Town of Payson and other northern Gila County communities. The municipal watersheds and water supply are a WUI value at risk.
- An uncharacteristic wildland fire's effects including erosion would have an adverse effect on water quality of the C. C. Cragin Reservoir and maintenance of the municipal water supply.
- ~100 % of the project area is in Vegetation Condition Class 2 and 3 where the vegetation is highly to moderately departed from historical reference conditions.
- Threatened and endangered (T&E) species and habitat is present. The project's purpose is to provide enhanced protection from uncharacteristic wildfire for T&E species and habitat and the proposed action complies with applicable guidelines in the Coconino National Forest Plan 1987 as amended and the revised Mexican Spotted Owl Recovery Plan 2012 (U.S. Fish and Wildlife Service 2012).
- Old growth vegetation and large trees are present within the project area and the proposed vegetation treatments satisfy the old growth and large tree retention requirements in the Coconino National Forest Plan 1987 as amended. The project incorporates an Old Tree Implementation Plan and a Large Tree Implementation Plan.
- Collaboration with stakeholders and interested publics occurred during project proposal development and was key to the development of this Proposed Action.

Location

The CWPP area encompasses about 64,433 acres and is located about 55 miles south of Flagstaff on the Mogollon Rim Ranger District of the Coconino National Forest in Coconino County Arizona (Figures 1 and 2). The project legal location is listed on Figure 1. The CWPP area mainly includes the three sub-watersheds that drain into the C. C. Cragin Reservoir (formerly Blue Ridge Reservoir): East Clear Creek-Blue Ridge Reservoir, Bear Canyon and Miller Canyon. Together these sub-watersheds comprise about 45,485 acres or 71 percent of the project area. Additional areas (18,948 acres) surrounding the three sub-watersheds are included in the project area because the forest has a high crown fire hazard and includes various WUI sites and values at risk (Figure 3) such as private lands, Forest Service administrative sites, recreation sites and other critical infrastructure.

Local Community and Values at Risk

The project area serves as a source area for a large municipal water supply and includes many WUI sites and values at risk (Figure 3). The Cragin sub-watersheds comprise a municipal water supply source area for the Town of Payson, several Northern Gila County communities and the Tonto Apache Indian Reservation, which are situated below the Mogollon Rim surrounded by the Tonto National Forest. The sub-watersheds are also a water supply source area for the Salt River Project's shareholders and customers. Water deliveries provided from the C.C. Cragin reservoir are delivered by a pipeline to the East Verde River, which is a tributary to the Verde River. The Lower Verde River and its reservoirs provide municipal water deliveries in the Phoenix Metropolitan area. The project area includes various C. C. Cragin Project facilities owned by the U.S. Bureau of Reclamation and operated by the Salt River Project: the dam, pumping facility, water pipeline, electric power line, priming reservoir and surge tank. There are 557 acres (45 parcels) of developed and undeveloped private lands in small blocks consisting of Goddard, Dick Hart, Little Springs and the Reservoir. Numerous Forest Service administrative sites,

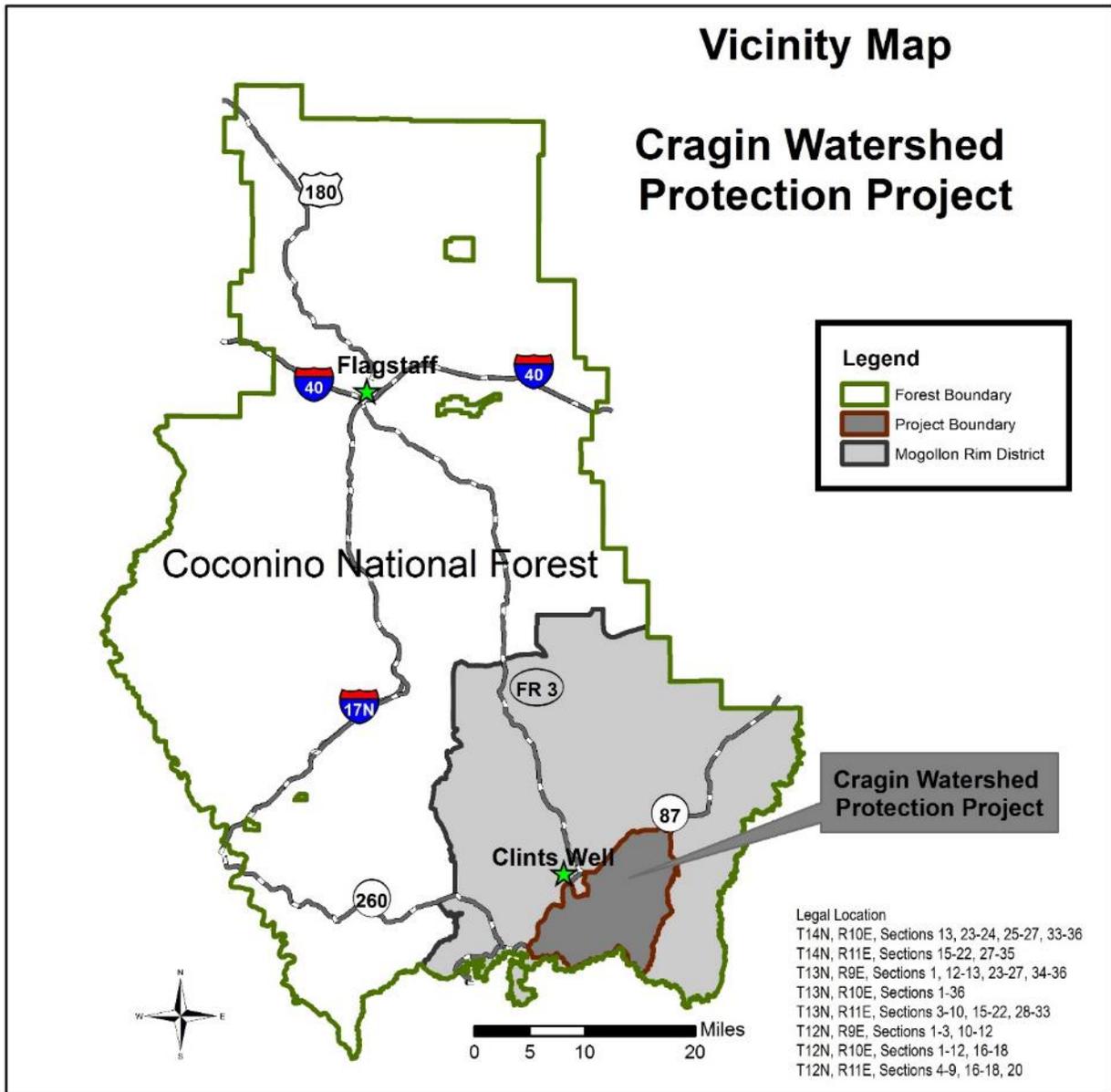


Figure 1. Vicinity Map for the CWPP.

facilities and infrastructure are located within the project area including the Blue Ridge Ranger Station, Moqui and Baker Butte lookout towers, Long Valley, Moqui, Kehl, and Blue Ridge Campgrounds. Several historical cabins are in the project area: Pinchot Cabin; Baker Butte Cabin and Barn; General Springs Cabin and various cabins and structures at Long Valley Campground. Three permitted recreational residences at Forty Four Springs are WUI sites. There are numerous facilities under special use authorizations including electric power lines, telephone and fiber optic cable lines, radio repeaters, communication towers and weather stations. The State Highway Route 87 right-of-way is in the project area and is another value at risk. The designated WUI area for private lands, facilities and infrastructure comprises about 17,000 acres (26% of the project area).

The Blue Ridge Community Wildfire Protection Plan (Gatewood 2009) includes all of the project area as well as the entire Mogollon Rim Ranger District. Community Wildfire Protection Plans were authorized by the Healthy Forests Restoration Act of 2003. The Blue Ridge Community Wildfire Protection Plan evaluated the local conditions and risks from fire, and designed a plan to address all aspects of community protection and wildfire mitigation that can be implemented by the community and forest.

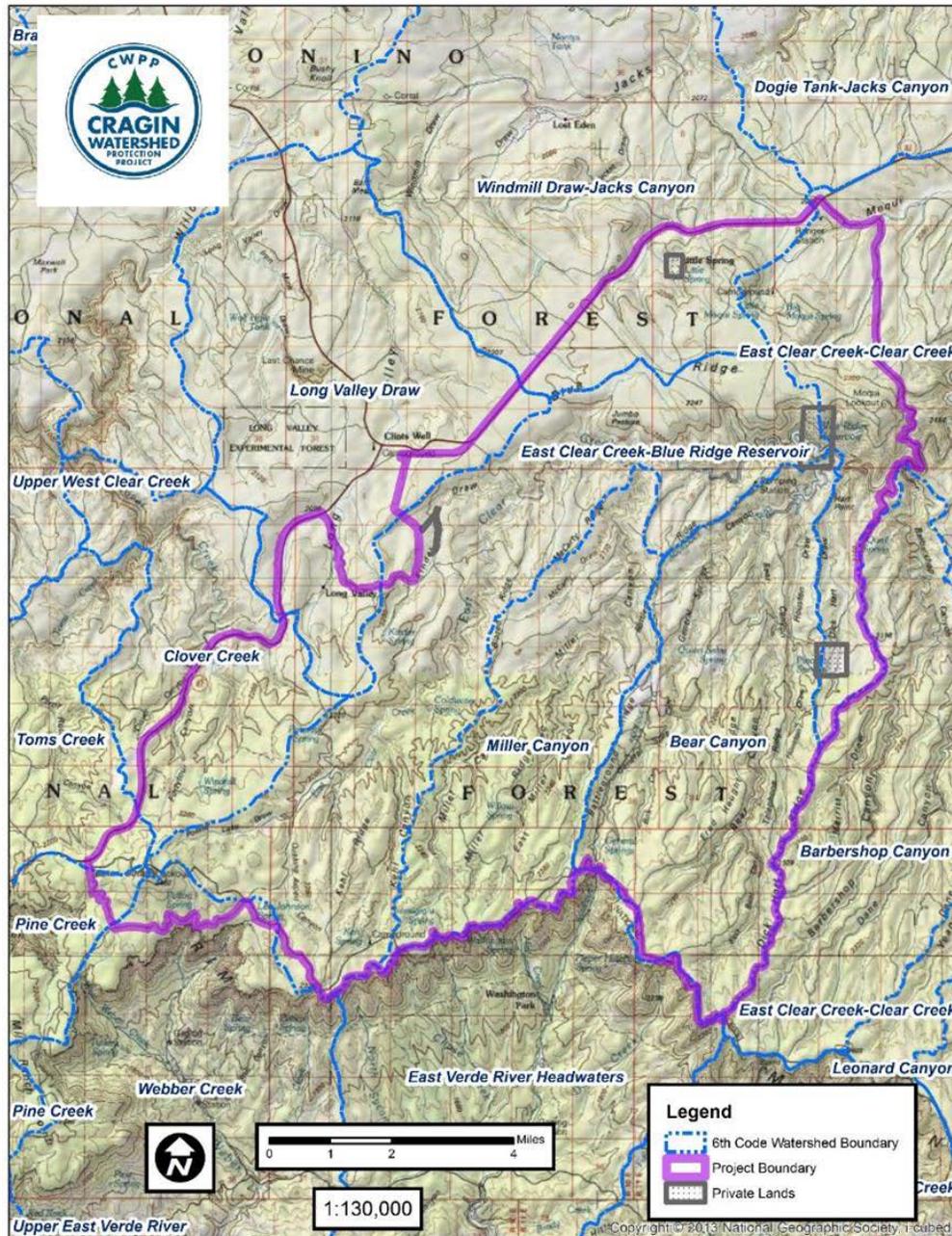


Figure 2. Location and Boundary Map for the CWPP.

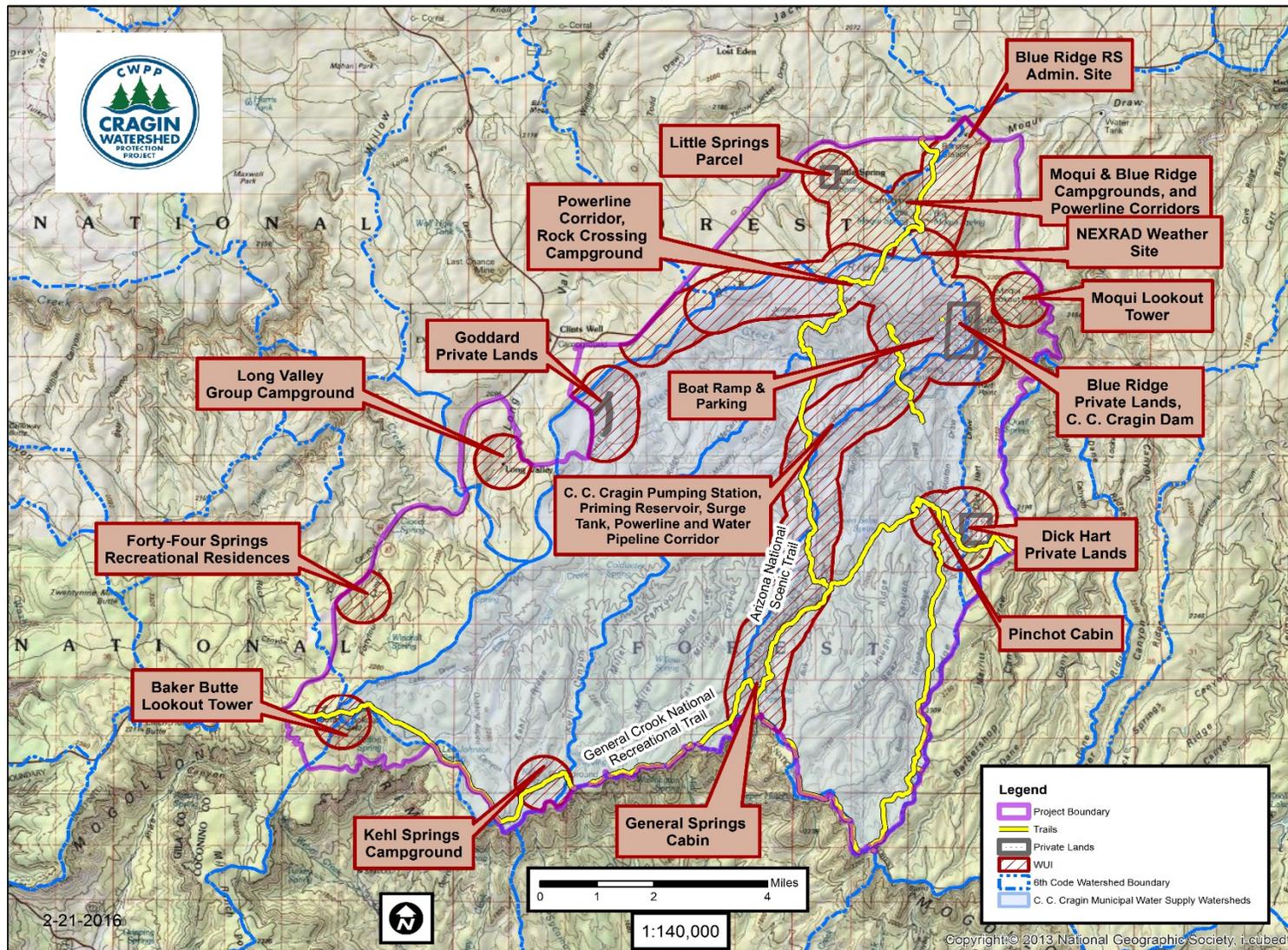


Figure 3. Municipal Watershed, WUI Sites and Boundaries, Critical Infrastructure and Values at Risk

The CWPP area contains parts of two National Trails, the Arizona National Scenic Trail (11.6 miles) and the General Crook National Recreational Trail (14.1 miles). In addition, the project area contains parts of several system trails including the Barbershop, Rock Crossing, Houston Brothers, Fred Haught and U Bar trails (18.0 miles) (Figure 3). The national and system trails feature outstanding recreational, natural resource, cultural, historical and scenic values and are considered a value at risk from uncharacteristic wildfire.

The CWPP area contains habitat for several important protected and sensitive wildlife species. The project area provides critical habitat for the threatened Mexican spotted owl (MSO). All or parts of 26 Mexican spotted owl Protected Activity Centers (PACs) are found in the project area and comprise about 24% of the project area (15,732 acres). About 26 miles of streams provide critical habitat for the threatened Little Colorado spinedace, candidate species roundtail chub and candidate conservation agreement species bluehead sucker and Little Colorado River sucker spp. Three northern goshawk Post Fledging Areas (NOGO PFAs) occur in the project area and comprise about 3% of the project area (1,922 acres). The northern goshawk is a Southwest Region Forest Service Sensitive species. The project area also contains habitat for northern (sensitive) and Chiricahua (listed as threatened) leopard frogs, another sensitive species. The steep canyons in the project area provide the bulk of the habitat for nesting and breeding for these terrestrial and aquatic wildlife species. An uncharacteristic wildfire in the project area would modify forested habitat important to the birds and could result in post-fire hill slope erosion that would supply unnatural amounts of sediment ash into streams that would degrade water quality for aquatic species.

The Salt River Project (SRP) manages a series of dams and reservoirs on the Salt River, the Verde River, and East Clear Creek, having a total functional capacity of 2.3 million acre-feet of water. These central Arizona reservoirs are a key water supply to the Phoenix Metropolitan Area. The C.C. Cragin reservoir is one of seven reservoirs within SRP's reservoir system. SRP and municipal water providers in the Phoenix Metropolitan area have realized impacts to water supplies following wildfires in the Salt and Verde River systems. Monsoonal rain events following fires such as the Rodeo-Chediski Fire, Cave Creek Complex Fire, Willow, Sunflower and Wallow Fire have washed sediment, debris and ash into rivers and reservoirs with detrimental impacts to water quality and reservoir capacity. Runoff from wildfires contains heightened levels of nitrates, phosphates, heavy metals, total organics, and turbidity. Inflows into reservoirs following uncharacteristic wildfire reduce storage capacity through sedimentation and increase water treatment costs due to increases in chemical constituents.

Why Here – Why Now?

The purpose of the Cragin Watershed Protection Project (CWPP) is to reduce the risk of uncharacteristic wildfire and subsequent flooding and sedimentation within and adjacent to the three sub-watersheds that drain to C.C. Cragin reservoir through a combination of mechanical thinning and prescribed fire. Under the 2004 Arizona Water Settlements Act (Act) (Public Law 108-451, 43 USC 1501), title to the Blue Ridge dam, reservoir, and associated water diversion infrastructure was transferred from the Salt River Project Agricultural Improvement and Power District (Salt River Project or SRP) to the U.S. Department of Interior, Bureau of Reclamation, for the exclusive use and benefit of the Salt River Federal Reclamation Project. In addition, the reservoir and dam were re-named the C.C. Cragin Project and SRP and the Salt River Valley Water Users' Association were assigned responsibility for the care, operation, and maintenance of the reservoir, dam, and associated water diversion infrastructure. The Act allows use of up to 3,500 acre-feet/year of water for municipal and domestic uses in Northern Gila County, Arizona. Currently, the Town of Payson relies exclusively on groundwater to meet its demand for potable water. In 2011, the Land Withdrawal and Reservation for the Cragin Project was enacted which clarified the jurisdiction of the Secretary of Interior with respect to the C.C. Cragin Dam and Reservoir and

administrative jurisdiction of the Secretary of Agriculture over various land management activities on the covered land (Public Law 112-45). Through collaborative efforts that include the Forest Service, Salt River Project (SRP), Bureau of Reclamation (BOR) and the Town of Payson, a pipeline and water treatment facility are being constructed by the Town of Payson that will allow Payson to use water from the reservoir. The Town will have access up to 3,000 acre feet – approximately 1 billion gallons – of water for its drinking water supply per year, beginning in 2018. When the pipeline is fully operational, surface water from C.C. Cragin reservoir will become the primary source of potable water for the Town Payson allowing this municipality to meet its projected build-out demand for water resources. Water from the reservoir is used by SRP and is actively being used for water rights resolution agreements between SRP and various communities in Northern Gila County and as a potential source of supply for the Tonto Apache Indian Community. The build out of the Payson C. C. Cragin project includes modernization of C. C. Cragin Reservoir pumping and transmission facilities and construction by the Town of Payson of new raw water and finished water pipelines, a hydroelectric facility and a water treatment plant. Total cost of the Payson C. C. Cragin Project is estimated to be in the amount of 50 million dollars. More information on the Town of Payson, C. C. Cragin Project and the pipeline and water treatment facility can be found at this website: <http://www.paysonaz.gov/Departments/water/Cragin.html>

The potential threat of wildfire to the use of C.C. Cragin Reservoir as a domestic and municipal water supply is exemplified by the 2003 Hayman Fire in Colorado. This wildfire burned over 137,000 acres impacting watersheds that provide domestic and municipal water to several cities along Colorado's Rocky Mountain Front Range including the City of Denver. Over a two year period following the fire, water providers spent \$25 million removing sediment from a reservoir that serves as a source of potable water with additional costs due to slope re-stabilization efforts. This web site, (<https://www.planning.org/research/postdisaster/casestudies/haymanfire.htm>) provides information on the post-fire impacts of the Hayman Fire. The Hayman post-fire erosion response is typical of high-severity fire-impacted watersheds with reports of increases in sediment yield of over 1,400 times greater than pre-fire conditions. In addition to increased erosion and its impact on suspended sediment concentrations in surface waters, high-severity wildfires can result in an increase in nutrient loading (i.e., nitrogen and phosphorus) to water bodies resulting in an increase in algal growth and reduction in dissolved oxygen leading to fish kill (Rinalli, 2004). The Cragin project facilities, which include the extensive infrastructure required to divert water from the reservoir, 11 miles of pipeline and power lines, water pumps, priming tank and the hydropower generating unit, are all susceptible to direct fire damage. Fire damage could leave the communities which depend on C.C. Cragin water supplies without water.

Partnerships and the Cragin Watershed Protection Project

The three watersheds that feed C. C. Cragin Reservoir were identified as priority watersheds in the Western Watershed Enhancement Partnership between the U.S. Department of Agriculture and the Department of Interior. The partnership between the two agencies seeks to accomplish common goals and interests in water supply, quality, conservation and watershed function. The Cragin Watershed Protection Project is one of six pilot projects in the nation. These pilot projects are designed to improve watershed functions and reduce the risk of uncharacteristically severe wildfire across jurisdictional boundaries.

The Coconino National Forest, the Salt River Project, Bureau of Reclamation, National Forest Foundation and the Town of Payson signed a Memorandum of Understanding (MOU) intended to establish a joint program to proactively improve the health of the three watersheds and reservoir in July of 2014. A proclamation was signed in September, 2014 between the partners and local and state officials codifying the efforts to reduce wildfire hazard in the watersheds under the Western Watershed Enhancement Partnership.

This project is one of the many projects within the Four Forest Restoration Initiative (4FRI) footprint, and the Rim Country Environmental Impact Statement (EIS) (second 4FRI EIS) project area which initiated the proposal development phase of planning in 2015. The goal of 4FRI is to increase the pace and scale of restoration efforts in the forests of northern Arizona. The goal of the CWPP is to expeditiously reduce hazardous fuels in the project area to protect the water supply of the Town of Payson and other water users. The Coconino NF and partners are working toward this goal by accelerating the CWPP planning efforts. To meet this timeline, the CWPP does not include restoration projects. The anticipated completion of the Rim Country EIS is estimated to be in 2019 or later. The CWPP EA is scheduled for completion in 2017. The rapid completion of CWPP planning efforts will enable the Forest Service to begin implementation as soon as possible which is important to protect the C. C. Cragin reservoir and water supply from the damaging effects of a future uncharacteristic wildfire.

Ongoing and Future Foreseeable Projects

The CWPP partially overlaps with the East Clear Creek (ECC) Watershed Health Project NEPA Decisions (2006); the overlap comprises about 30,446 acres (47% of the CWPP project area). Past thinning over 1,520 acres (thin from below treatments⁴) and prescribed burning over about 4,200 acres as part of the ECC project have been completed within and adjacent to the CWPP project area. About 4,295 acres of forest (2,753 acres within the CWPP boundary) are targeted for commercial mechanized logging as part of the East Clear Creek 4FRI task order which was issued in 2014. This task order area is not shown in Figure 8 but is within areas of No Vegetation Treatment of the CWPP project. Watershed restoration opportunities that would improve conditions in the CWPP project area have been identified in the East Clear Creek Watershed Health Project decision and include but are not limited to thinning of conifers in meadows, stabilization of incised stream channels, and protection of riparian areas by fencing out access by elk and deer. One treatment block (89 acres) of the Long-Term Ecological Assessment and Restoration Network (LEARN) research project to study dry mixed conifer treatments on the Mogollon Rim is within the CWPP area. Research treatments in dry mixed conifer stands were analyzed in the East Clear Creek Watershed Health Improvement Project EA and approved in the Decision Notice (2006). Mechanical thinning and prescribed burning treatments in the LEARN blocks are presently undergoing Chapter 18 NEPA review and may be implemented in 2017. A detailed listing of past, ongoing and future foreseeable actions such as vegetation treatments, wildfires, prescribed burning and watershed restoration treatments will be included in the EA as part of the cumulative effects analysis.

The entire project area of the CWPP is included in the Rim Country Environmental Impact Statement (EIS) analysis area. 4FRI has a much broader purpose of forest restoration than the more focused purpose of CWPP which is to reduce fuels in such a way as to decrease the chance of an uncharacteristic wildfire affecting critical infrastructure and values at risk within the project area. Possible project activities that the Rim Country EIS may consider in the CWPP area include wildlife habitat improvement, stream channel restoration, aspen regeneration and restoration of meadows and springs. Thinning and prescribed burning activities completed through CWPP will not be intensified or further analyzed for treatment under 4FRI; rather 4FRI activities will complement CWPP by focusing on other restoration objectives.

⁴ Thin from below is a treatment description where the smallest diameter or shortest trees are removed until the desired stocking level is reached.

Forest Management Direction

This project follows National and Regional direction for vegetation and fuels management as well as direction found in the Coconino Forest Plan.

Forest Service Manual Direction guides forests to implement forest restoration in consideration of current and desired conditions and with consideration of potential future changes and in collaboration across ownerships and jurisdictions.

“All resource management programs have a responsibility for ecological restoration including, but not limited to, management of vegetation, water, wildland fire, wildlife, and recreation. Management activities may range from monitoring resource conditions to manipulation of terrestrial and aquatic ecosystems to regulation of human uses.” FSM 2020.3 (1), 10/15/2015”.

“Ecological restoration activities should be planned, implemented, monitored, and evaluated in consideration of current and desired conditions and the potential for future changes in environmental conditions, including climate change. FSM 2020.3(3), 10/15/2015”.

“Collaborate across ownerships and jurisdictions to achieve landscape restoration objectives. FSM 2020.3(5), 10/15/2015”.

The Southwestern Region (R3) provides the following direction:

The restoration of the ecological functionality of Southwestern forests and grasslands, with primary emphasis on fire adapted systems, was identified as the central priority for this Region (R3 Strategic Action Plan 2004).

The National Strategy: the Final Phase of the Development of the National Cohesive Wildland Fire Management Strategy has as its second priority “vegetation and fuels management” and provides guidance for designing and prioritizing fuel treatments, strategically placing fuel treatments, increasing the use of wildland fire to meet resource objectives and continuing and expanding the use of all methods (prescribed fire, managed wildland fire, and mechanical treatments) to improve the resiliency of our forests (USDI, USDA April 2014).

The Coconino Forest Land and Management Plan as amended (1987) contains the following goals for the resource elements of timber and protection:

Timber

Manage the timber resource to provide a sustained-yield of forest products through integrated stand management. On forested lands identified as suitable for commercial timber production, design timber management activities to integrate considerations for economics, water quality, soils, wildlife habitat, recreation opportunities, visual quality, and other values. Develop and implement a sustained-yield program for firewood and other miscellaneous forest products including posts, poles, Christmas trees, and wildings. Emphasize uneven-aged management for timber cutting areas. (Replacement page 23)

Protection

Use fire as a resource management tool where it can effectively accomplish resource management objectives. Use fire prevention and control to protect life, property, and resources. (Replacement page 25)

Purpose and Need for Action

The purpose of the Cragin Watershed Protection Project is to:

- Reduce the risk of uncharacteristic wildfire to the WUI and drinking water watersheds in and adjacent to the project area.
- Reduce the risk of post-fire erosion and/or flooding that could impact reservoir operations and storage which could affect the water supply for the Town of Payson, the community of Mesa del Caballo, the Salt River Project, Native American Indian tribes and other northern Gila County water users.
- Begin to initiate the re-establishment of a fire-adapted, resilient, diverse and sustainable forest ecosystem

The following needs would be met as part of achieving the purpose of the project:

- There is a need to reduce active and passive crown fire in the drinking water watersheds and in the WUI and to increase the ability of fire suppression crews to control a wildfire within the project area.
- There is a need to reduce the crown fire potential in and adjacent to Mexican spotted owl PACs.
- There is a need reduce the buildup of natural fuels to reduce the threat of uncharacteristically severe stand-replacing fire and post-fire sedimentation and flooding and which would move the forest towards a fire adapted ecosystem.
- There is a need to shift the vegetation condition class from high and moderate departure to dominantly low and moderate departure from historical conditions.
- There is a need to remove trees that obscure the landscape from Baker Butte Lookout Tower that optimally has a 360 degree view of the watersheds on the Coconino and Tonto National Forests. There is a need to reduce the crown fire potential and fuels buildup around the tower that comprises a safety risk to safe escape from the tower by the fire lookout employee.
- There is a need to reduce fuels and dense thickets of small young trees adjacent to State Highway 87 to reduce crown fire potential and to maintain safe travel ways.
- There is a need to reduce fuels, remove hazard trees⁵ and dense thickets of small young trees along forest roads to reduce crown fire potential, maintain safe travel ways and improve sight distances along roads.
- There is a need to treat ladder fuels on steep slopes next to selected private lands and around two campgrounds to prepare the area for prescribed burning.
- There is a need to amend the Forest Plan to: allow cutting of a limited amount of old and large trees to create and maintain an adequate viewshed for fire-start detection over the long term at Baker Butte Tower; to better align treatments in CWPP Mexican spotted owl habitats with the revised Mexican Spotted Owl Recovery Plan (U.S. Fish and Wildlife Service 2012) and to bring the project into alignment with the best available science (Tuten 2015; Reynolds et al. 2013) that provides desired conditions for restoring fire-adapted ponderosa pine in the Southwest.

⁵ A hazard tree refers to any potential tree failure due to a structural defect that may result in property damage or personal injury. USDA Forest Service. 1981. Tree Hazards: Recognition and Reduction in Recreation Sites. Forest Pest Management. Denver, CO. Accessed online at: <http://na.fs.fed.us/spfo/pubs/hazardtrees/treehazards/thazards.pdf> (5/24/11)

Fire Regime and Forest Vegetation

The following sections on fire regime and forest vegetation describe the historic conditions, existing conditions and desired conditions for the project to be able to implement management actions that address the needs for change.

Historic Conditions

Historically, fire was an integral component of the ecosystem that served to maintain forests. Prior to human-influenced changes to the characteristic fire regime, the composition, structure, and spatial pattern in frequent-fire forests were maintained by frequent, low-severity fire through a functional relationship between pattern and process; that is, frequent low-severity fires resulted in forest structures that facilitated continued low-severity fire (Fitzgerald 2005; Graham and others 2004; Hiers and others 2009; Mitchell and others 2009; Thaxton and Platt 2006).

Recent research from a small group of scientists has concluded that historic data demonstrates the region surrounding the project area experienced mixed severity fire, and that high-fire severity was not an uncommon phenomena (Odion et al. 2014, Williams and Baker 2012). While there may have been many areas in the southwest region that historically supported naturally dense stands of trees, which may have supported mixed severity fire or even high-severity fire, the overwhelming majority of research from a great number of studies which have occurred near the project area, supports the reduction of tree densities to meet restoration objectives (Sanchez-Meador et al. 2010, Ffolliott 1967, Fulé 1997). Recent research on the Mogollon Rim found that historical high-severity fires were very unlikely, and “the historical fire regime on this landscape was one of high-frequency, low-severity fires.” (Huffman et al. 2015).

Much research has been done in the past several decades to determine reference conditions (pre-European settlement \approx 1870) for ponderosa pine in Arizona. Tree stocking levels, stand density and tree age and diameter have been studied. Data collected around Camp Navajo near Flagstaff determined that approximately 60 trees per acre were present in 1883 (Fulé, et al. 1997). Also, on the Coconino National Forest near Flagstaff, research studies found evidence that trees per acre historically ranged from 20 – 87 (Moore et al. 2004). An inventory of the Long Valley Experimental Forest, which is located near the project area, was completed around the time of its establishment in 1936. Data from that inventory shows that the average tree diameter for ponderosa pine was around 20”, stands ranged from 73 – 181 trees per acre (average = 100) and stands had basal areas ranging from 61 to 102 ft² per acre (average = 90 ft²). These stocking levels indicate a relatively open forest with less than full site occupancy, and low competition among trees.

Dry mixed conifer forests are similar to ponderosa pine forests in general stand structure, but Douglas fir, white fir, white pine, and, occasionally, blue spruce are also important components of these forests (Reynolds et al. 2013). They intergrade with the cool/moist ponderosa pine types on warmer/drier sites at the lower end of the mixed-conifer zone and with wet mixed-conifer forests on the cooler/moister sites at the upper end of the zone. Dry mixed-conifer forests intergrade with or are adjacent to pure ponderosa pine forest and experience similar site conditions and ecological disturbances.

Due to its frequent fire regime, historical fine-scale structure and spatial pattern of dry mixed-conifer forests were similar to ponderosa pine in having a more open structure and similar aggregated arrangement of trees in some stands. Historical species composition was dominated by fire-resistant, shade-intolerant conifers such as ponderosa pine, southwestern white pine, and Douglas fir. Consequently, species composition in dry mixed-conifer forests was historically regulated by the balance between climate and disturbance agents, such as fire. Shade tolerant, less fire-resistant species were historically minor components on drier sites, such as ridge tops and southwest-facing slopes, and likely

more frequent on cooler and/or more mesic sites in frequent-fire forests, such as drainages and north-facing slopes. Empirical evidence also indicates that historically, dry mixed-conifer forests had lower tree densities and a more open structure comprised of a higher proportion of old and large trees, were more spatially heterogeneous (having groups and patches of trees) and were more uneven-aged compared to current conditions. Mean tree densities and basal areas were similar to those in ponderosa pine stands but with slight increases at the fine scale.

Existing Conditions

Vegetation Types and Tree Stocking

The vegetation in the CWPP area is generally ponderosa pine/pine-oak (92%), with inclusions of dry mixed conifer, aspen, juniper, and oak woodlands. Current average tree stocking ranges from about 200 to 500 trees per acre over a majority of the project area (Figure 4). Tree stocking exceeds 1,000 trees per acre on over 3,300 acres. The majority of the basal area ranges between 100 and 200 ft² per acre, with an overall average of approximately 130 ft². The current stocking level indicates competition among trees, resulting in competition-induced mortality and growth stagnation. The century-long exclusion of frequent, low-intensity fires has led to striking and rapid changes in ecosystems that evolved under frequent disturbance: increased tree stocking, increased tree biomass, both live and dead, resulting in increased susceptibility to insect and disease epidemics, and supporting a shift from frequent, low-intensity surface fires to increasingly larger crown fires (Cooper 1960; Swetnam 1990; Covington and Moore 1994*a, b*; Kolb et al. 1994; Swetnam and Baisan 1996).

Vegetation Condition Class

Vegetation Condition Class (VCC) uses vegetation departure from historic conditions. This data gives a coarse assessment of vegetation conditions as it relates to ecosystem processes and functions. Both the current project's LANDFIRE assessment and the Blue Ridge, Mogollon Rim Ranger District Community Wildfire Protection Plan shows that almost 100% of the CWPP area has a condition class rating of two or three meaning that vegetation components are moderate to highly departed from historic conditions (Table 1 and Figure 5, Vegetation Condition Class). Previously, LANDFIRE Fire Regime Condition Class (FRCC) deliverables included both classed and continuous metrics of departure for vegetation and were called FRCC. These products will now be referred to as VCC. According to the FRCC Guidebook, FRCC is a combination of vegetation departure and fire frequency and severity departure. The layers previously referred to as Fire Regime Condition Class (FRCC) were measures of vegetation departure, hence the name change. For more information on VCC please visit the web site at <http://www.landfire.gov/>.

Table 1. Summary of Vegetation Condition Class Acres

Vegetation Condition Class within the CWPP		
Condition Class 1- low vegetation departure	Condition Class Level 2- moderate vegetation departure	Condition Class Level 3- high vegetation departure
179 ac. <1%	26,987 ac. 42%	37,267 ac. 58%

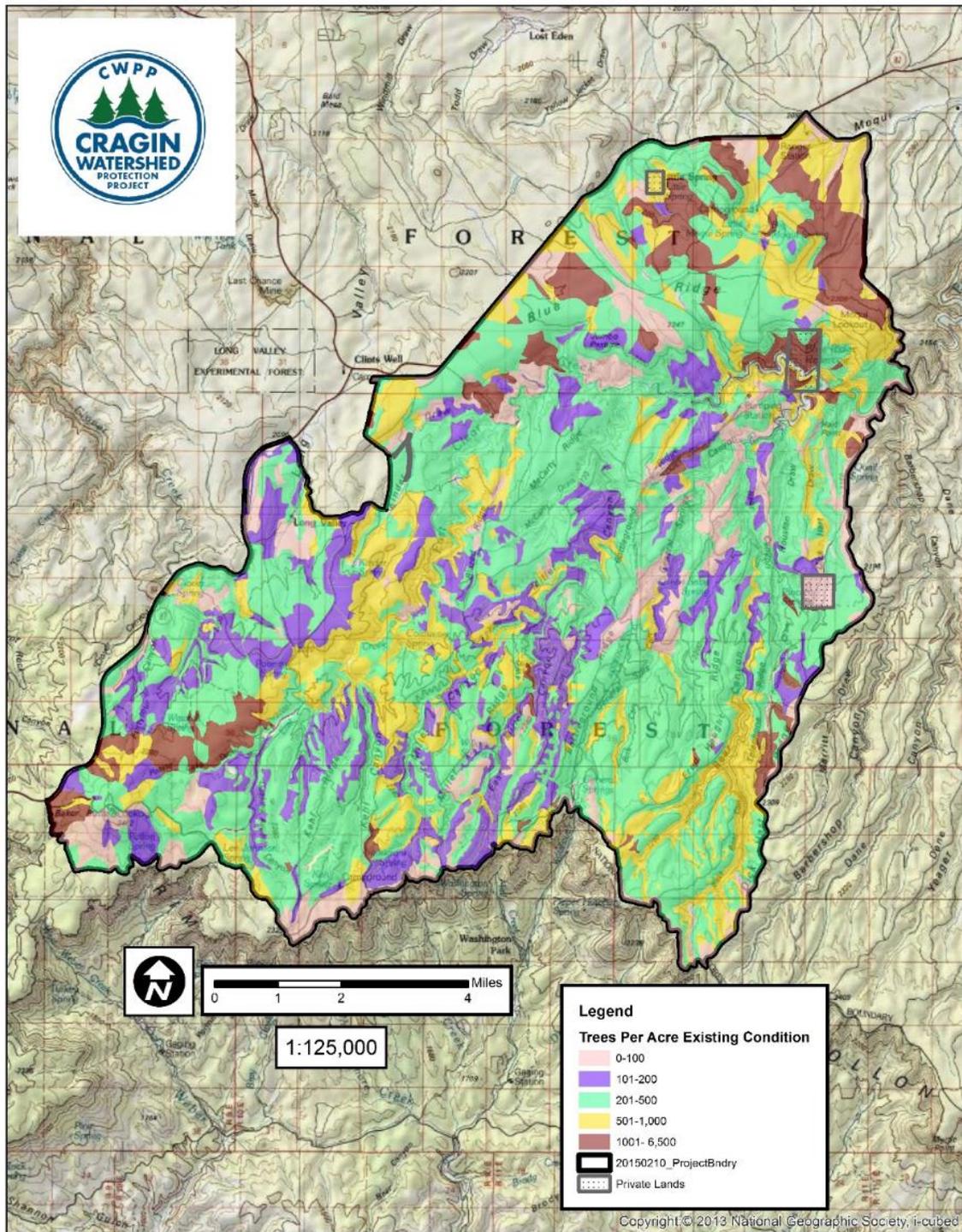


Figure 4. Trees per Acre, CWPP area.

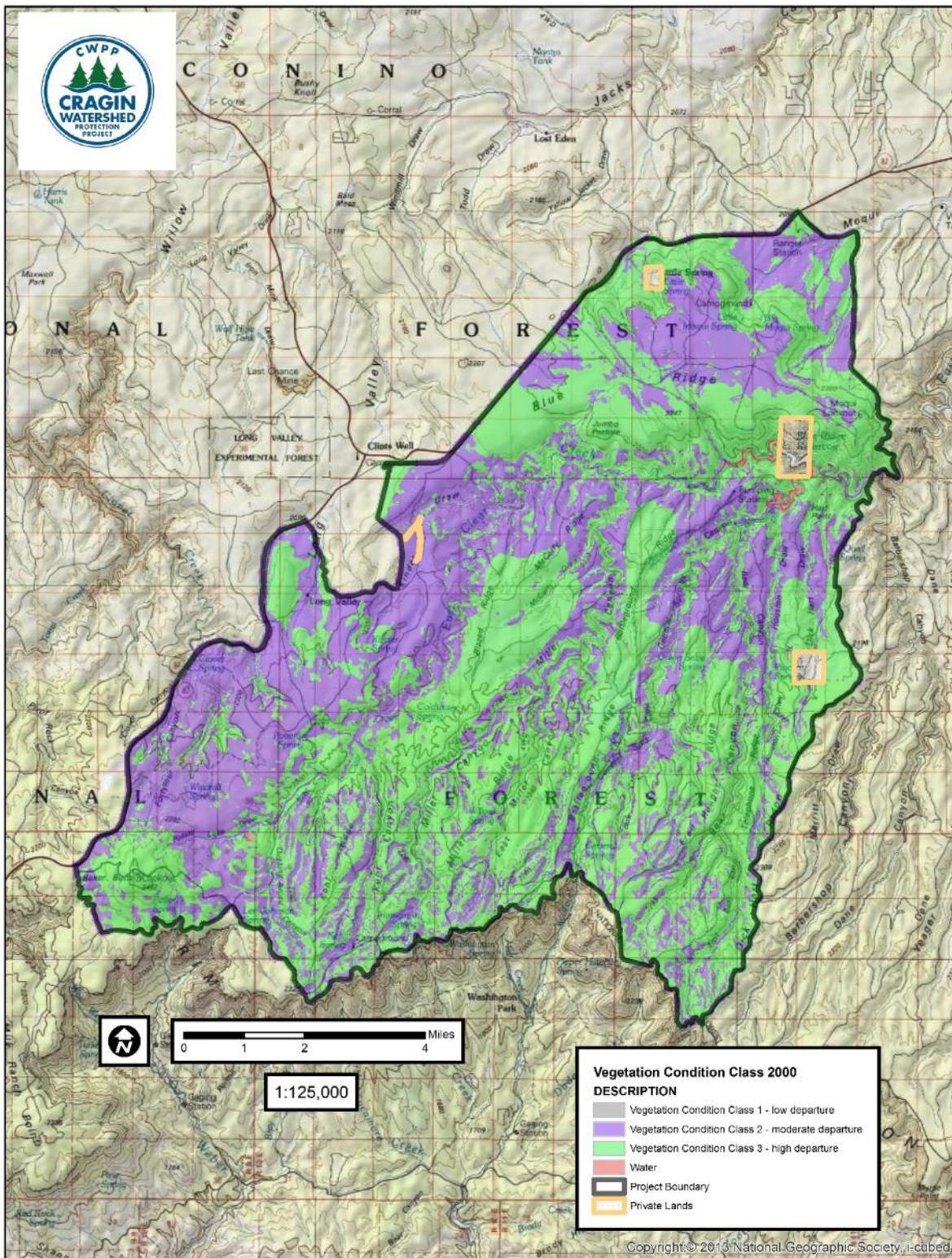


Figure 5. Vegetation Condition Class for the CWPP area.

Fire Type

As part of the fire modeling for the CWPP project area, weather conditions for nine large wildfires (>100 acres) on the Mogollon Rim District were compared to look for common factors of large fire growth. Parameters from the Clover (2000) and Pot (1996) fire were used for crown fire potential modeling and output validation. The existing conditions of the project area show that a large proportion of the area is currently susceptible to forms of crown fire (Figure 6, Fire Type). Over 90% over the project area would demonstrate some form of crown fire under 97th percentile weather. About 76% of the forested area has the potential for **active crown fire** where the entire tree canopy is lost to fire. About 18% of the area has the potential for **passive crown fire** in which individual or small groups of trees torch out, but solid flaming in the canopy is not likely to be maintained except for short periods. The remaining 6% of the forested area has the potential for a **surface fire** only. The FLAMMAP modeling run chosen to represent existing crown fire potential may show slightly higher values than reality, primarily due to the inability of LANDFIRE data to account for recent vegetation treatments and wildfire that has occurred in the recent past. There is no consistent or feasible way to account for all vegetation and fuel changes to date. The modeling run chosen (97th percentile weather conditions, along with live fuel moistures and high wind conditions of the Clover Fire) represents a high fire danger or “worst case” scenario.

Table 2. Summary of Fire Type within the CWPP

Fire Type within the CWPP		
Surface Fire	Passive Crown Fire	Active Crown Fire
3,866 ac. 6%	11,598 ac. 18%	48,969 ac. 76%

Current forest conditions in the area also limit the effectiveness of fire-fighting infrastructure within the project area such as the Baker Butte Lookout Tower. Currently, a variety of trees have grown up and around the tower obscuring the view from the lookout, which is decreasing efficiency in spotting fires has created a dangerous situation as the early detection of wildfires in the project area and surrounding areas is being compromised.

Desired Conditions

Vegetation Condition Class and Fire Type

The desired condition for the project area is to be able to support low severity, frequent surface fires that approach the historical fire regime for the vegetation types in the project area. The desired condition would be to shift the project area from mostly Condition Class 3 (highly departed) to mostly Condition Class 1 (low departure) with a minor part of the area in Condition Class 2 (moderate departure).

The desired condition for the project area is to have sub-watersheds where fire can be safely returned to the landscape to perform its natural “maintenance” function and the risk of uncharacteristic fire is reduced. Fire type in the project area would shift from dominantly active and passive crown fire to mostly surface fire. Other desired conditions include reducing the trees per acre and canopy bulk density (mass per unit volume of available canopy fuels) so that the forest is attains a more open horizontal and vertical structure more similar to historical conditions and would better support surface fire. Reducing ladder fuels and canopy base height (height at which tree branches can be ignited by surface fire) would also contribute to reducing crown fire potential. Woody debris consisting of surface litter, dead and down logs, and small trees that comprise the fuel load on the forest floor would be maintained at 5-7 tons per acre in ponderosa pine, pine-oak and 10-15 tons per acre in mixed conifer in the project area. Within WUI sites, fuel treatments would be focused and coarse woody debris may be spatially distributed so that it does not

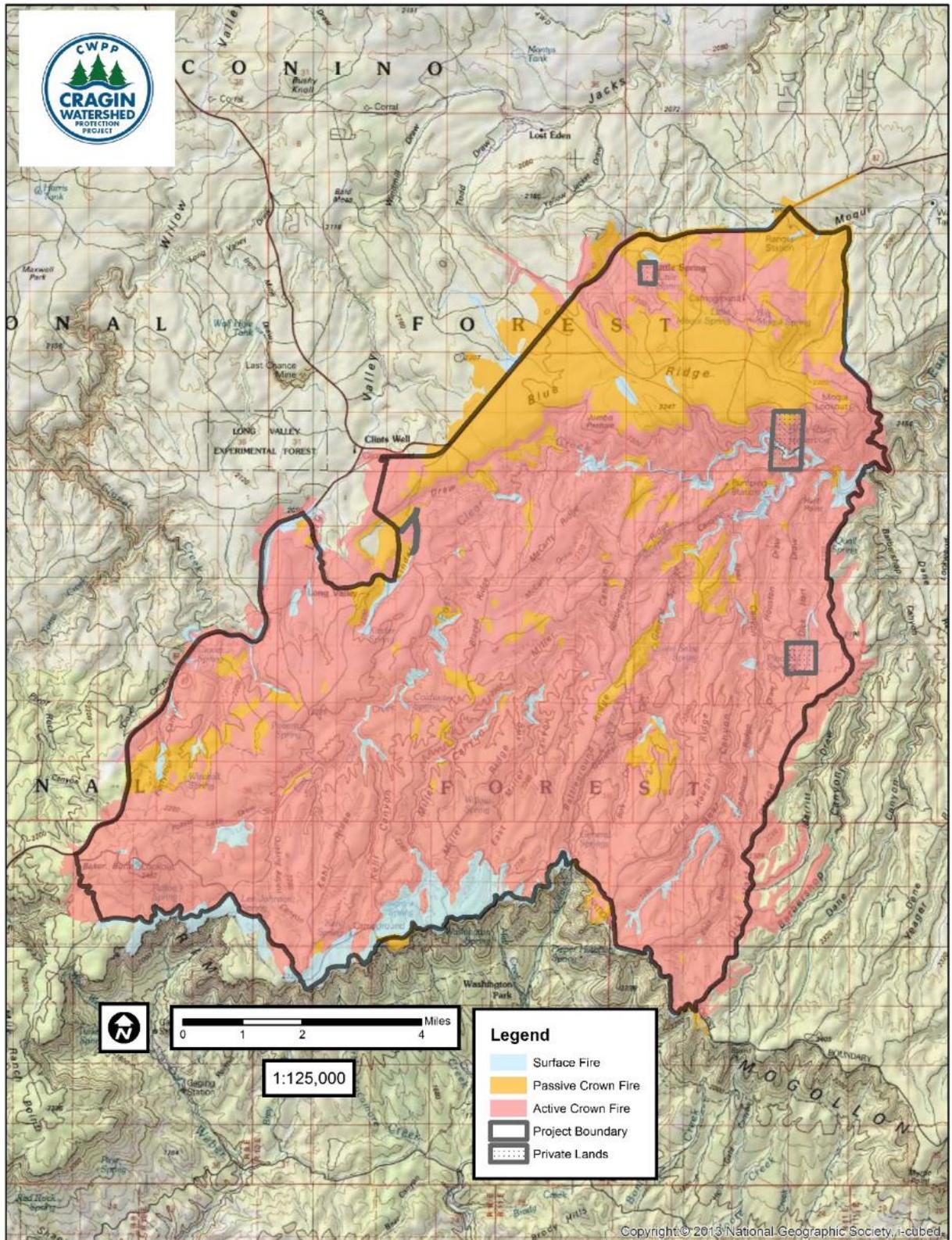


Figure 6. Fire Type Map for the CWPP, Existing Conditions.

pose a threat to infrastructure or firefighters. Shifting to a predominantly surface fire regime would reduce overall burn severity resulting in less impacts to soils and more natural levels of post-fire erosion and sedimentation.

The following scales of desired conditions (USDA Forest Service 2010) are consistent with the Coconino Land and Resource Management Plan as amended (1987), (Forest Plan) and have been used as a guide in developing the proposed action.

Table 3. Existing and Desired Conditions for Vegetation Condition Class and Fuels

Measure	Existing	Desired
Canopy Base Height	Ranges from 0-60 feet, average = 12 feet	Averaging 18 + feet in ponderosa pine ⁶
Canopy Bulk Density	Ranges from 0 - 0.35, average = 0.10 kg/m ³	Averaging 0.05 kg/m ³ in ponderosa pine ⁷
Woody Debris	0.1-50 tons per acre	3-7 tons/acre in ponderosa pine, pine-oak; 10-15 tons/acre in mixed conifer. (Forest Plan new page 65-10). Spatially distribute coarse woody debris in WUI to lessen threat to infrastructure and firefighters.
Trees per acre	10-6000 trees per acre	< 200

General Desired Conditions for the Ponderosa Pine Vegetation Community

The ponderosa pine forest vegetation community includes two sub-types: Ponderosa pine and ponderosa pine Gambel oak.

At the landscape scale, (>10,000 acres) the desired condition of the ponderosa pine forest vegetation community is to exhibit structural stages ranging from young to old. Forest appearance is variable but generally uneven-aged and open; occasional areas of even-aged structure are present. The forest arrangement is in individual trees, small clumps, and groups of trees interspersed within variably-sized openings of grass/forbs/shrubs vegetation associations similar to historic patterns. Openings typically range from 10 percent in more productive sites to 70 percent in the less productive sites. Size, shape, number of trees per group, and number of groups per area are variable across the landscape. In the Gambel oak sub-type, all sizes and ages of oak trees are present. Denser tree conditions exist in some locations such as north facing slopes and canyon bottoms.

Old growth occurs throughout the landscape, generally in small areas as individual old growth components, or as clumps of old growth. Old growth components include old trees, dead trees (snags), downed wood (coarse woody debris) and structural diversity. The location of old growth shifts on the landscape over time as a result of succession and disturbance (tree growth and mortality).

⁶ Agee and Skinner 2005; Stratton 2009

⁷ Stratton 2009

At the mid-scale, 100-1,000 acres, the mosaic of tree groups generally comprises an uneven-aged forest with all age classes present. Infrequently patches of even-aged forest structure are present. Disturbances sustain the overall age and structural distribution. Fires burn primarily on the forest floor and do not spread between tree groups as crown fire. Forest structure in the WUI can have smaller, more widely groups of trees than in the non-WUI areas.

Table 4. Existing and Desired Forest Vegetation Conditions

Measure	Existing	Desired*
Canopy Closure	2-100%	40-70%
Stand Structure	Over most of the project area, stand structure is dominantly even-aged. Without some time of disturbance (fire, bug kill) that creates a large enough gap in the canopy, natural regeneration would be reduced and canopy closure would increase.	Structural diversity within stands leading to uneven-aged condition with a balanced age distribution and the presence of openings in the canopy.
Trees per acre	10-6,000	< 200

Project Area Stratification

The project area was broadly stratified into two vegetation types and two wildlife habitat types in order to develop the project desired conditions and to comply with the 1987 Forest Plan as amended (Figure 7).

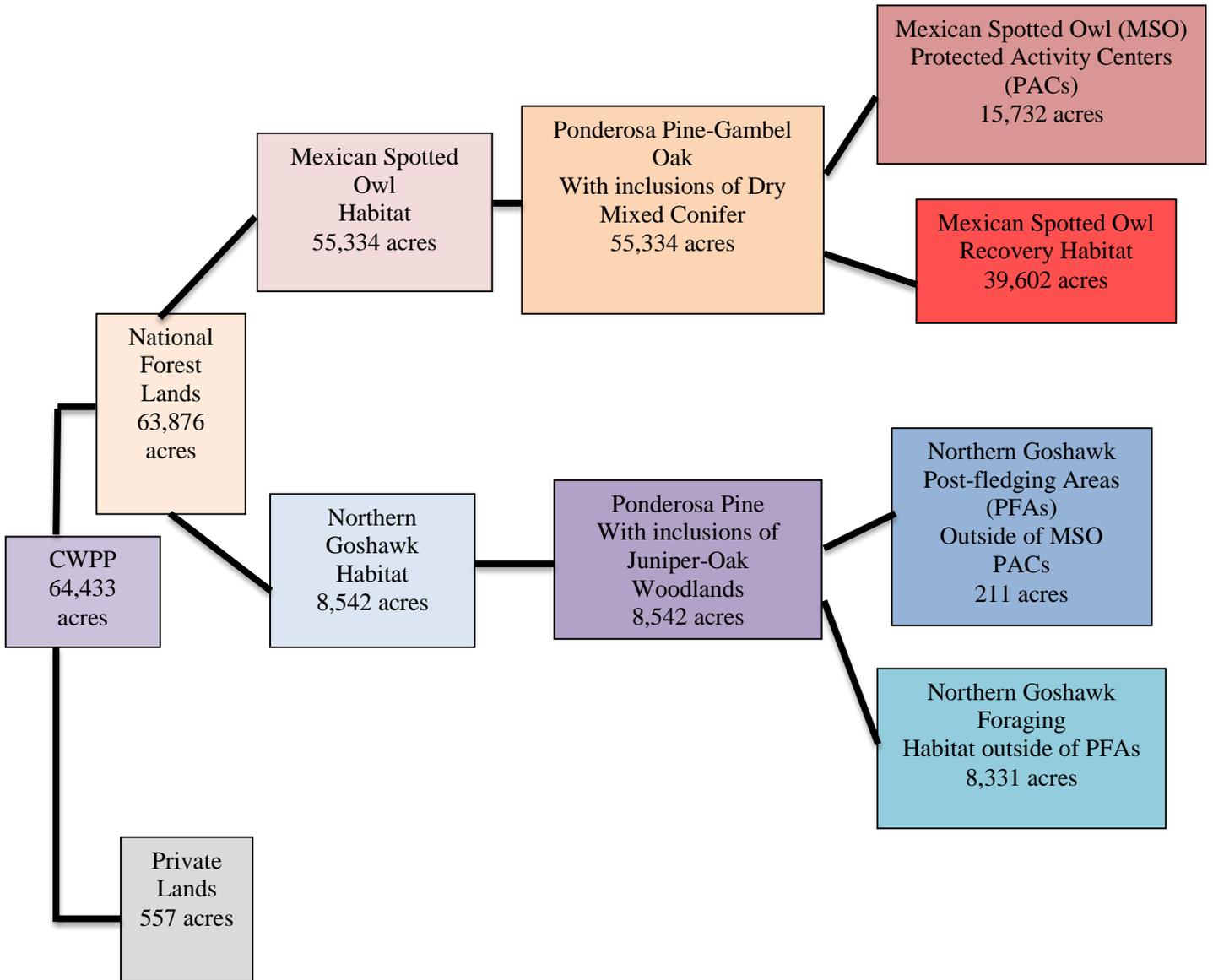


Figure 7. Vegetation and Habitat Type Stratification for the CWPP.

Desired Conditions for MSO Recovery Habitat

Recovery habitat occurs in pine-oak and mixed conifer forests that are outside of PACs. The pine-oak type includes ponderosa pine where Gambel oak inclusions are greater than 10% of the basal area of a stand. Desired conditions (guidelines) summarized below are from the revised Mexican Spotted Owl Recovery Plan (U.S. Fish and Wildlife Service 2012: 268-269).

- Within pine-oak and other forest types where hardwoods are a component of owl habitat, retain and promote the growth of additional, large hardwoods.
- Strive to retain all trees > 24" dbh (diameter at breast height) unless overriding management situations require their removal to protect human safety and or property (removal of hazard trees along roads, in campgrounds, and along power lines).
- To the extent practical, design fuel breaks to avoid the removal of large trees > 18" dbh.
- To the extent practical, design and implement prescribed burns to minimize the killing of trees > 24" dbh.
- Design and implement treatments to retain most hardwoods, large snags, large down logs and large trees.
- Achieve a balance between retaining important habitat elements for owls reducing the risk of losing existing roosting and nesting habitat from insect epidemics and stand-replacing fires.

The following desired conditions (guidelines) are from the Forest Plan (new page 65-4)

- Attempt to mimic natural disturbance patterns by incorporating natural variation, such as irregular tree spacing and various patch sizes, into management prescriptions.
- Allow natural canopy gap processes to occur, thus producing horizontal variation in stand structure.
- Emphasize uneven-aged management systems.
- Encourage prescribed and prescribed natural fire to reduce hazardous fuel accumulation. Thinning from below may be desirable or necessary before burning to reduce ladder fuels and the risk of crown fire.

Desired Conditions for MSO PACs

Desired future conditions for stands of ponderosa pine inside MSO PACs is to achieve old growth structural attributes as specified in the revised MSO Recovery Plan (U.S. Fish and Wildlife Service 2012) and to reduce hazardous fuels that have the potential for high severity wildfire from burning up the PAC. The desired conditions (guidelines) listed in the revised recovery plan call for the following conditions.

- a diversity of patch sizes with a minimum patch size of 2.5 acres, horizontal and vertical heterogeneity within patches
- maintaining or increasing species diversity
- creating openings ranging from 0.1 to 2.5 acres in size
- maintaining canopy cover of 40% in pine-oak and 60% in mixed conifer
- Maintaining 50 percent or greater basal area in trees greater than 16" dbh.
- Treatments would retain all trees greater than 17.9" dbh and would follow the project Old Tree and Large Tree implementation plan
- Retain woody debris larger than 12" in diameter, all snags and emphasize retention of all hardwood trees.

See Appendix B for proposed amendments to the Forest Plan for treatments within MSO PACs.

Desired Conditions for Northern Goshawk Foraging Habitat outside of Post-fledging Areas (PFAs)

This habitat consists of ponderosa pine where Gambel oak inclusions are less than 10% of the basal area of a stand. The proposed treatments outside of MSO recovery habitat and outside of PFAs would strive to achieve a clumpy, groupy structure to achieve desired conditions. A **clump** refers to a tight cluster of two to five trees of similar age and size originating from a common rooting zone that typically leans away from each other when mature. A clump is relatively isolated from other clumps of trees within a group of trees, but a stand-alone clump of trees can function as a tree group. A clump can be thought of as a small group by itself or a subset of a larger group that has similar characteristics. Clumps most often consist of trees that are of similar age and size that were established near the same time. A **group** is a cluster of two or more trees with interlocking crowns at maturity surrounding by an opening. The size of a group can vary depending on forest type and site conditions and can range from fractions of an acre (a two-tree group) to many acres. Trees within groups are typically non-uniformly spaced, and some of the trees may be tightly clumped. Groups may consist of multiple size and age trees. The size of tree groups typically is less than 1 acre, but averages ½ acre.

Openings between groups would range from ¼ to 4 acres in size with a maximum width of up to 200 feet. One group of reserve trees, 3-5 trees per group, would be left if the opening is greater than one acre in size (Forest Plan, New page 65-10). Approximately 10% of openings created across the project area would be managed to retain and promote growth and development of a new forest age class. Most of these openings are expected to regenerate with ponderosa pine. The target distribution of vegetation structural stages (VSS) for ponderosa pine (Forest Plan, new page 65-9) is:

10% grass/forb/shrub	(openings)	VSS1
10% seedling sapling	(1-5" dbh)	VSS2
20% young forest	(5-12" dbh)	VSS3
20% mid-age forest	(12-18" dbh)	VSS4
20% mature forest	(18-24" dbh)	VSS5
20% old forest	(24"+ dbh)	VSS6

Note that the target VSS distribution would not likely be achieved in one entry, and due to the even-aged structure of many stands it may take a century or more. The percentages are a guide and may vary up to 3%.

Within ponderosa pine forests outside of PFAs, canopy cover for mid-aged forest (VSS 4-6) should average 40% or greater. For mixed conifer, canopy cover for VSS 4 should average 1/3 at 60+% and 2/3 at 40+%; canopy cover for mature (VSS 5) forest should average 50% or greater and old forest (VSS 6) should be 60% or greater.

The following desired conditions (guidelines) are from the Forest Plan (New page 65-7, 8, 9, 10, 11).

- Manage for uneven-age stand conditions.
- Manage for old age trees such that as much old forest structure as possible is sustained over time across the landscape.
- Sustain a mosaic of vegetation densities (overstory and understory), age classes and species composition across the landscape.

- Low intensity ground fires are allowed at any time in all forested cover types, but high intensity crown fires are not acceptable in the post-fledging family area or nest areas.

Desired Conditions for Northern Goshawk PFAs

Forest conditions in goshawk PFAs outside of MSO PACs are similar to general forest conditions except these forests contain 10 to 20 percent higher basal area in mid-aged to old tree groups than in goshawk foraging areas and the general forest. Goshawk nest areas have forest conditions that are multi-aged but are dominated by large trees with relatively denser canopies than other areas in the ponderosa pine type. Other differences from goshawk foraging habitat include higher canopy cover and smaller opening sizes. VSS distribution and structural conditions are the same as for foraging habitat as described above.

Canopy cover in ponderosa pine for mid-aged forest (VSS4) should average 1/3 at 60% or greater and 2/3 at 50% or greater. Mature and old forest (VSS5 and VSS6) should average 50% or greater. Canopy cover for mixed conifer for mid-aged (VSS 4) to old forest (VSS 6) should average 60+% or greater.

PROPOSED ACTION

General Treatment Strategies

General treatment strategies, locations, objectives, and desired conditions post treatment are described below.

Thinning as described in the treatments means reducing a stand's tree density across all age classes to move toward desired conditions. Based on existing conditions, this means focusing on the removal of 5 to < 16" diameter at breast height (dbh) trees that comprise the majority of trees. Group selection would be utilized to create openings and interspaces⁸ in the forest canopy to encourage natural regeneration of ponderosa pine or to maintain grass/forb/shrub vegetation. Not all openings would be managed for regeneration; approximately 10-20% would be maintained as interspace openings to maintain the grass/forb/shrub components. Mechanical thinning treatments would occur on less than 40% slope gradients. Hand thinning may occur in treatment units where slopes exceed 40% gradient (for example in the Hand thinning, Burn Preparation Treatment).

Prescribed burning or thinning may be the initial treatment during implementation depending on the current conditions and desired objectives. Where very dense forest conditions exist with an abundance of ladder fuels, thinning would need to occur prior to prescribed burning treatments. Tree harvest methods may include traditional methods of felling trees within the unit or using mechanical harvester equipment.

Existing oak trees would be retained because oak would not be prescribed for cutting (except for the Baker Butte Treatment). The growth of additional large oaks would be promoted by thinning of ponderosa pine and prescribed burning (Forest Plan, new page 65-4). Oak and other species may also be removed for temporary roads and landings; however every attempt would be made to avoid cutting Gambel oak that is particularly large, such as oak greater than 10" diameter at root collar (drc).

⁸ Interspace: the space between groups and clumps of trees (VSS 1-6) that are intended to be dominated by grass/forb/shrub vegetation and may include scattered individual trees.

Conservation of Old Trees and Large Trees

The issue of conserving large and old trees has been identified by stakeholders and has been similarly identified and addressed in every single large-scale fire risk reduction or restoration project on the Coconino National Forest in recent years. In response to this issue, two implementation plans will be developed and integrated into the decision to conserve old trees and large trees. The principles of this strategy have already been integrated into the proposed action. These plans are also included to meet management direction in the Healthy Forest Restoration Act to protect old growth stands and retain large trees. The plans identify ecological conditions where old pre-settlement and large, post-settlement trees may be removed to move toward or meet desired conditions.

Old Tree Implementation Plan

Old trees (approximately over 150 years old) would be retained, with few exceptions, regardless of their diameter and condition, within the project area. Removal of old trees would be rare. Exceptions would be made for threats to human health and safety and to provide for community protection goals (such as in the Baker Butte Treatment), and those rare circumstances where the removal of an old tree is necessary in order to prevent additional habitat degradation. Old trees will not be cut for forest health issues or to balance age or size class distributions. A proposed exception to this is the Baker Butte treatment where a number (35) of old and large trees will be cut to enable the lookout staff at the tower to see wildfires.

The guidance for identifying old trees is specific to Ponderosa pine. Since the majority of the project area is made up of Ponderosa pine and Ponderosa pine is a major component of dry mixed conifer forests, old trees will be determined by the following characteristics described by Thomson (1940) as 3 (intermediate-mature) and 4 (mature to over-mature). For ponderosa pine, pre-settlement, (old), trees would be determined by the following characteristics described by Thomson (1940) as age class 3 (intermediate to mature) and age class 4 (mature to over-mature):

- **Age** – approximately 150 years and older.
- **Bark** – ranging from reddish brown, shading to black in the top with moderately large plates between the fissures to reddish brown to yellow, with very wide, long and smooth plates.
- **Branching** – ranging from upturned in upper third of the crown, horizontal in the middle third and drooping in the lower third of the crown to mostly large, drooping, gnarled or crooked. Branch whorls range from incomplete and indistinct except at the top to completely indistinct and incomplete.

For other species of trees which occur in dry mixed conifer, the assumed age of trees will be based on their size and thus the information in the Large Tree Implementation Plan will be more relevant. The EA will provide old tree descriptions and illustrations for ponderosa pine and other tree species that occur in dry mixed conifer.

One example of a situation where the removal of an old tree might be necessary in order to prevent additional habitat degradation is in the rare case of an old tree growing on the side of an existing curve in a road. Logging equipment may require a wider turning radius. The options are to relocate the road or cut the old tree and widen the curve to accommodate the larger turning radius. Relocating the road would result in a larger area of the forest being permanently disturbed, versus cutting the large tree and widening the curve radius. This is an example where cutting the old tree would result in less habitat degradation than relocating a road.

Large Tree Implementation Plan

The large tree implementation plan is designed to reflect the Healthy Forest Restoration Act requirements regarding large tree retention by clarifying the intent to focus fuels reduction treatments on small-diameter tree thinning, to retain large trees whenever possible, and to more specifically design treatments so that large trees will be retained unless they must be cut to meet the desired conditions listed in the categories below. It incorporates the old tree implementation plan by reference.

For the CWPP, large post-settlement trees, are those that are 16" dbh or larger. The 16" dbh also has some degree of social and political consensus as being considered the minimum diameter of large tree for ponderosa pine ecosystems in the Southwest. Trees greater than or equal to 18" dbh represent VSS 5 and 6. VSS 5 and 6 represent the largest and (sometimes) oldest trees. These size classes best correspond with the successional age classification system that was developed to address the forest dynamics of southwestern ponderosa pine.

Exceptions to the large tree implementation plan include ecological conditions where large, post settlement trees may (or should) be removed to move toward or meet desired conditions. Exceptions include the following for the CWPP:

- As necessary to meet community protection, public and operational safety goals.
- To remove large trees that obstruct the viewsheds from the Baker Butte Lookout Tower.
- Where best available science identifies sites where ecological restoration and biodiversity objectives cannot otherwise be met. This specifically applies to several exception categories including within stand openings and heavily stocked stands with high basal area generated by a preponderance of large, young trees. The following are descriptions of these types of categories:
 - To provide for the ability to create structural modification to reduce crown fire potential and restore understory vegetation that supports surface fire in the preponderance of large young trees category.
 - To provide the ability to create regeneration openings using a group selection treatment method to move towards uneven-aged management within the large, young tree stands and the within-stand openings category.
 - To remove a limited number of 9"-17.9" dbh trees within heavily stocked stands in MSO PACs to move the stands toward more uneven-aged conditions where it is needed to reduce risk of active crown fire in the PAC and/or other project areas.

The large tree implementation plan may not include every instance where large post-settlement trees may be cut. There may be additional areas and/or circumstances where large post-settlement trees need to be removed in order to achieve fuels reduction objectives. During implementation (prescription development), if a condition exists that does not meet the desired conditions included in this strategy, no large trees will be cut until the NEPA decision is reviewed by the Forest Service implementation team. The team will decide whether the action is consistent with the analysis and the decision made. This information will be made part of the annual implementation plan checklist/compliance review that would be recommended by the team and approved by the forest supervisor or district ranger.

The EA will describe the conditions where large trees may need to be removed in the various exception categories.

Vegetation Treatments

The Proposed Action consists of a variety of vegetation treatments, fuels reduction, and prescribed burning actions over the next 20 years. Mechanical and hand vegetation treatments are proposed over about 39,000 acres and prescribed burning actions are proposed over about 64,000 acres within the project area (Tables 5 and 6). The proposed action would begin to change surface fuels, stand density, tree basal area and fire type to move towards desired conditions. The desired forest structure may not be fully met by the initial silvicultural treatment. Due to the structure of many stands, it may take more than one entry and more than 100 years to fully achieve the desired forest structure. The locations of vegetation treatments and prescribed burning treatments are shown in Figures 8 and 9. The acres of treatments are estimates used for analysis and will be refined based on additional fieldwork. Treatment units may vary after unit layout and after project design features have been applied.

Table 5. Proposed Cragin Watershed Protection Project Vegetation Treatments

Vegetation Treatment	Estimated Treatment Acres
Baker Butte Treatment	27
Hand Thinning, Burn Preparation Treatment	77
Highway 87 Right-of-Way Treatment	200
Mexican Spotted Owl Protected Activity Center Thinning	2,986
Mexican Spotted Owl Recovery Habitat, Uneven-aged Management	19,644
Mexican Spotted Owl Recovery Habitat, Uneven-aged Management – Roadside Treatment	7,093
Northern Goshawk Habitat Outside of Post-Fledging Areas – Uneven-aged Management	6,137
Northern Goshawk Post-Fledging Area Maintenance	211
Northern Goshawk Habitat Outside of Post-Fledging Areas – Thin from Below	2,081
Mexican Spotted Owl Recovery Habitat – Thin from Below	394
Total All Vegetation Treatments	38,850 (60%)
Total No Vegetation Treatment (no thinning)	25,583 (40%)
Total Project Acres	64,433

Table 6. Proposed Cragin Watershed Protection Project Prescribed Burning Treatments

Prescribed Burning Treatment	Estimated Acres
Hand Pile Burn, Maintenance Burn	157 (<1%)
Activity Fuels Treatment, Broadcast Burn, Maintenance Burn	38,692 (60%)
Broadcast Burn, Maintenance Burn,	24,938 (39%)
Total Prescribed Burning Treatments	63,787 (99%)
No Treatment (Private Lands, LEARN Study)	646 (1%)
Total	64,433

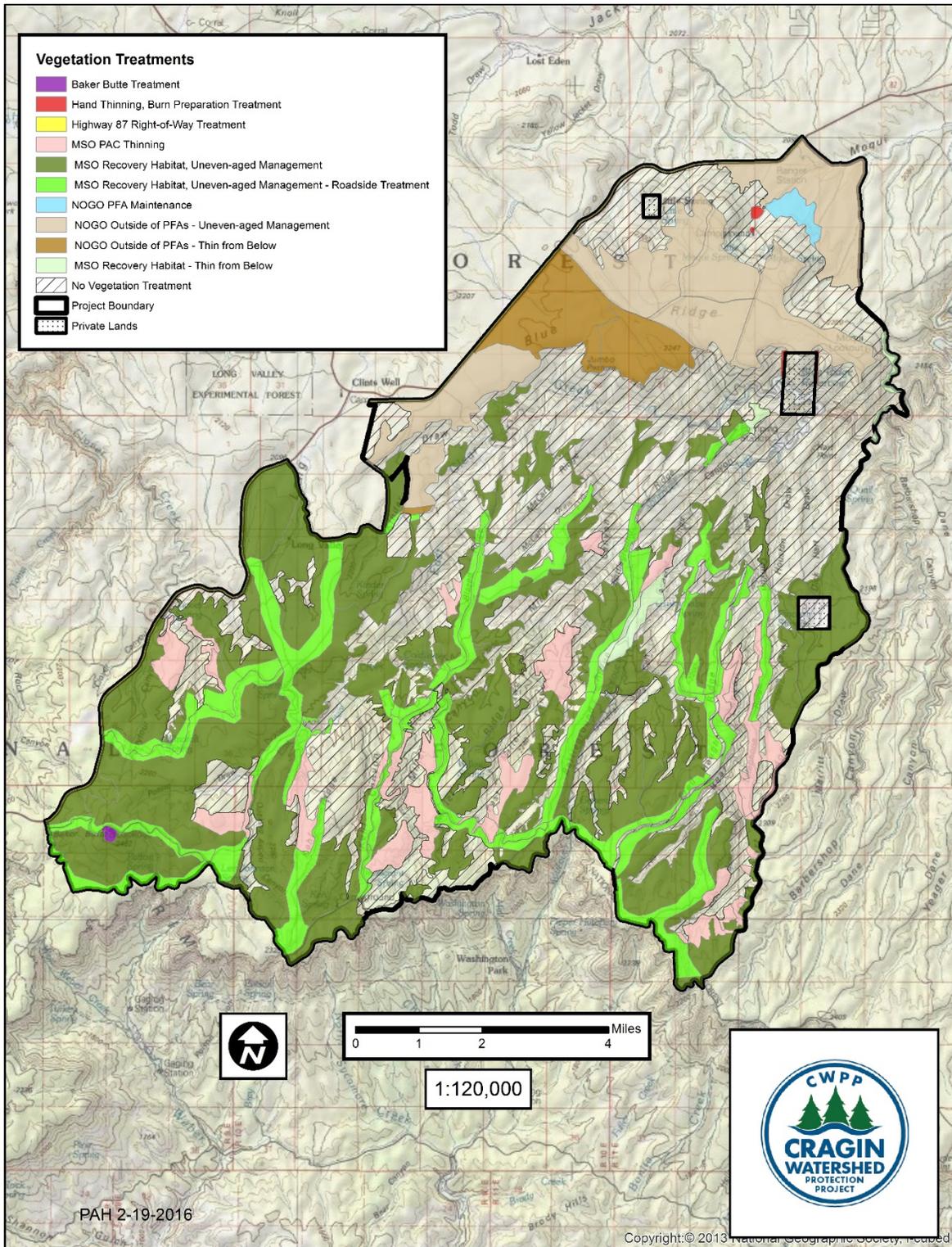


Figure 8. Proposed Vegetation Treatments for the CWPP.

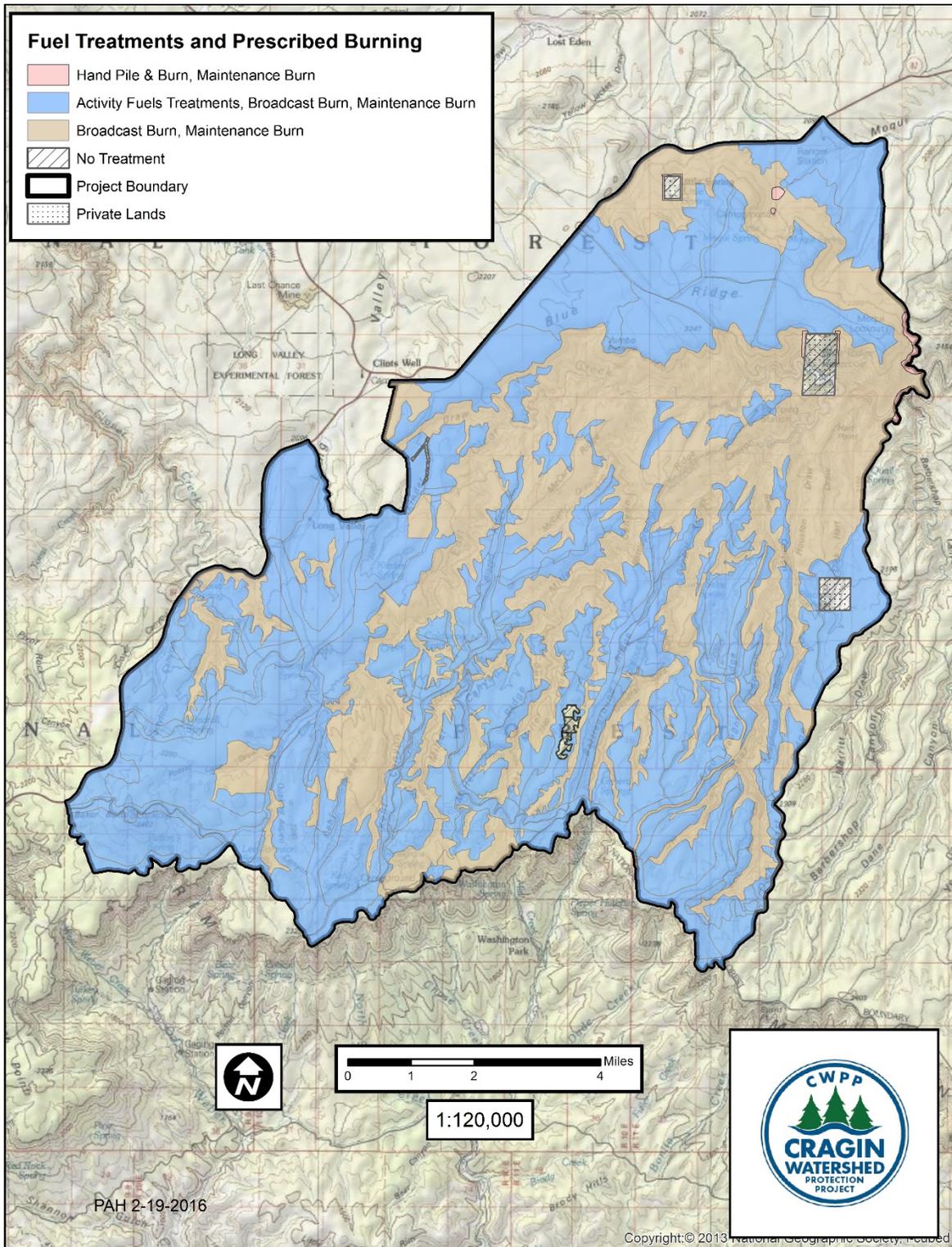


Figure 9. Proposed Fuel Treatments and Prescribed Burning for the CWPP.

Table 7. Vegetation Treatments Summary Table

Treatment	Purpose	Vegetation Type	Habitat Type	Existing BA and Trees per Acre (TPA)	Target Basal Area
Baker Butte Treatment	Fuel reduction and removing trees that block the view of the landscape from the tower, reducing the ability of personnel to detect new fires	Mixed Conifer	MSO Recovery	BA/acre: 192 ft ² TPA:347	80-100 ft ² /acre
Hand Thinning, Burn Preparation Treatment	Reduce ladder fuels and areas of dense trees on steep slopes next to private lands and Moqui and Blue Ridge Campgrounds.	Ponderosa Pine and Ponderosa Pine-Oak	Northern Goshawk foraging, MSO PAC	BA/acre: 143 ft ² TPA: 685	No Target BA
Highway 87 Treatment	Remove trees and vegetation within the recovery zone that are hazards to vehicles and fuels reduction in the rest of the ROW to the fence line.	Ponderosa Pine and Ponderosa Pine-Oak, and Mixed Conifer	Northern Goshawk foraging, MSO Recovery	BA/acre: 77 ft ² TPA: 525	No Target BA
Mexican Spotted Owl Protected Activity Center Thinning	Reduce crown fire hazard and maintain habitat conditions.	Ponderosa Pine-Oak with inclusions of dry Mixed Conifer	MSO PACs	BA/acre: 143 ft ² ; TPA: 350	110 ft ² /acre in Ponderosa pine and 120 ft ² /acre in mixed conifer
Mexican Spotted Owl Recovery Habitat, Uneven-aged Management	Reduce crown fire hazard while developing uneven-aged conditions and retaining key MSO habitat elements.	Ponderosa Pine-Oak with inclusions of dry Mixed Conifer	MSO Recovery	BA/acre: 137 ft ² , TPA: 345	80-120 ft ² /acre
Mexican Spotted Owl Recovery Habitat, Uneven-aged Management - Roadside	Provide strategic fuel breaks and a defensible fuel profile zone along roads. Reduce the number of small trees or thickets of trees adjacent to roads.	Ponderosa Pine-Oak with inclusions of dry Mixed Conifer	MSO Recovery	BA/acre: 133 ft ² , TPA: 337	80-120 ft ² /acre
Northern Goshawk Habitat Outside of Post-fledging Areas - Uneven-aged Management	Reduce the threat of an uncharacteristic wildfire, while developing uneven-aged stand characteristics and maintaining goshawk habitat.	Ponderosa Pine with inclusions of juniper, oak and, other hardwoods	Northern Goshawk foraging	BA/acre: 95 ft ² TPA: 852	60-90 ft ² /acre
Northern Goshawk Post-fledging Area Maintenance	Protect the PFA from uncharacteristic wildfire, while retaining goshawk PFA habitat characteristics.	Ponderosa Pine with inclusions of other hardwoods	Northern Goshawk PFA	BA/acre: 117 ft ² TPA: 354	100-120 ft ² /acre

Treatment	Purpose	Vegetation Type	Habitat Type	Existing BA and Trees per Acre (TPA)	Target Basal Area
Northern Goshawk Habitat Outside of Post-fledging Areas - Thin from Below	Reduce the threat of uncharacteristic wildfire	Ponderosa Pine with inclusions of oak	Northern Goshawk foraging	BA/acre: 74 ft ² TPA: 509	40-60 ft ²
Mexican Spotted Owl Recovery Habitat - Thin from Below	Reduce the threat of uncharacteristic wildfire	Ponderosa Pine	MSO Recovery	BA/acre: 79 ft ² TPA: 114	60-80 ft ² /acre

Baker Butte Treatment

The Baker Butte Lookout Tower is one of two fire lookout towers located within the project area. The focus of the treatment in this area would be to remove trees that block the view of the landscape from tower, preventing the lookout staff from seeing fire starts in the project area and surrounding areas.

The mixed conifer forest on the slopes around the lookout tower is multistoried and densely stocked. Vegetation consists of ponderosa pine, Douglas fir, Gambel oak, and New Mexican locust. The basal area is 192 ft² per acre, with approximately 347 trees per acre. Treatment within this 27 acre unit would consist of thinning through the diameter classes with the goal of raising the average crown base height and reducing the number of taller trees that affect the view from the tower. The residual basal area would be about 80 to 100 ft² per acre. This treatment would also remove up to 35 conifer trees over 24.0" dbh that directly obscure the view from the tower. Gambel oaks and locust that block the view may be topped or cut. Locust stands in the area exhibit characteristics of being in the oldest age classes for that species and would be retained for wildlife and scenery values. This treatment includes periodic maintenance focused on removal of trees that grow and obstruct the view over time. A Chapter 18 NEPA review would be conducted at any time in the future prior to the maintenance treatment.

Hand Thinning, Burn Preparation Treatment

This treatment was developed to reduce ladder fuels and areas of dense trees on steep slopes next to selected private lands within the project area and within and around Moqui and Blue Ridge Campgrounds. The purpose of this treatment is to prepare the area for safe implementation of prescribed burning activities. The treatment would extend approximately 100 feet from the private land boundary. For the campgrounds, treatment would occur within the two campgrounds and 100 feet from the campground boundary. Treatments on these 77 acres would be similar to those described in the Thin from Below treatment. The proposed treatment consists of hand thinning, piling and burning conifers generally less than 9" dbh that act as ladder fuels underneath the canopy of larger trees. The trees would be thinned at a varied spacing to provide species diversity and horizontal structure. This treatment does not set a basal area target or range. The treatment would mimic natural disturbance patterns (to the extent possible) by incorporating natural variation, such as irregular tree spacing into the prescription.

Highway 87 Right-of Way Treatment

The vegetation in the Highway 87 right-of-way (ROW) consists of Ponderosa pine, pine-oak and dry mixed conifer. The habitat types include northern goshawk foraging and MSO Recovery habitats. This treatment consists of removal of trees and vegetation within the recovery zone and fuels reduction in the remainder of the ROW to the fence line. The objectives of this treatment are to reduce the crown fire hazard along the highway where human-caused fires are more common, improve visibility in the ROW and to increase highway safety. The ROW width is variable but is about 100 feet from the fence line to the white lane stripe. The recovery zone is the area 30 feet from the edge of the white lane stripe where trees and other vegetation could pose hazards to vehicles that leave the roadway. Clearing the recovery zone allows drivers increased time to stop or recover their vehicles before hitting a hazardous obstacle. Both mechanical and hand thinning would be used to remove vegetation. The old and large tree implementation plan would apply to this treatment.

Mexican Spotted Owl Protected Activity Center Thinning

All or portions of 26 Protected Activity Centers (PACs) occur within the project boundaries. Of these, fourteen have been identified and recommended for mechanical treatment by the District fuels specialist, wildlife biologist and silviculturist to reduce fire hazard while maintaining habitat conditions preferred by MSO. The PACs selected for treatment were chosen because of their location, accessibility, and potential to change the effects of uncharacteristic wildfire. The PACs selected for treatment have active crown fire potential on 95% of the acres proposed for treatment. No mechanical treatments are proposed within the 100 acre nest cores. Retention of key habitat species such as Gambel oak, and habitat components such as snags and large down logs would be a high priority (Forest Plan, New page 65-2). The desired condition is to mimic natural disturbance patterns (to the extent possible) by incorporating natural variation, such as irregular tree spacing and various patch sizes, into management prescriptions. Treatments would use combinations of mechanical treatment and prescribed fire to abate fire risk. The minimum basal area per acre retained would be 120 ft² in mixed conifer and 110 ft² in pine/pine-oak forest. The actual basal area for individual units would be based on maintaining a minimum of 40 percent canopy cover in pine-oak and 60 percent in mixed conifer per the revised Mexican Spotted Owl Recovery Plan (U.S. Fish and Wildlife Service 2012: 276-277). Natural disturbance patterns would be mimicked by incorporating irregular tree spacing and various patch (opening) sizes into the treatment design. Canopy gaps or openings ranging from 0.1 – 2.5 acres in size would be implemented across 10 to 30 percent of the treatment area. Post-treatment, trees greater than 16" dbh would contribute at least 50 percent of the stand basal area following the revised Mexican Spotted Owl Recovery Plan ((U.S. Fish and Wildlife Service 2012: 276-277) desired conditions. Where necessary, trees up to 17.9" dbh may be removed for example in heavily stocked stands having a high basal area, or for operational or safety considerations. The large tree removal would be consistent with the project's Large Tree Implementation Plan. Mechanical treatments would be followed by fuels treatment, which would include prescribed burning.

Mexican Spotted Owl Recovery Habitat, Uneven-aged Management

The forest type in these areas is ponderosa pine/pine-oak, with inclusions of dry mixed conifer (Douglas fir, ponderosa pine, white fir, and southwestern white pine) in the drainages and steeper areas. The basal area ranges from 100 to 270 ft² per acre, with canopy closure ranging from approximately 30% to over 80%. The average tree diameter ranges from 6.0" to 20.0" dbh. Trees per acre range from approximately 100 to over 1,000, with an overall mean of 345 trees per acre.

Treatment in these areas would be designed to meet guidelines outlined the Revised Mexican Spotted Owl Recovery Plan (U.S. Fish and Wildlife Service 2012).

for Forested Recovery Foraging/Non-Breeding Habitat. Objectives include retaining key owl habitat elements such as large trees, snags, logs and hardwoods. Treatment would be designed to develop uneven-aged structure, with a mosaic of openings and tree groups of varying sizes, while maintaining those key habitat elements. Canopy gaps or openings ranging from 0.1 – 2.5 acres in size would be implemented across 10 to 30 percent of the treatment area. The remainder of the area would be thinned to a basal area of 80-120 ft² per acre. Trees greater than 24.0” dbh would be retained unless they need to be cut for operational or safety considerations. Large conifers up to 24” dbh within this treatment area may be removed as part of the Large Tree Implementation Plan including young-age trees on the edges of grassland meadow openings.

Mexican Spotted Owl Recovery Habitat, Uneven-aged Management - Roadside Treatment

This treatment was developed to reduce fire risk along those roads in the project area most traveled by the public. Treatment objectives would be to reduce the number of small trees or thickets of trees adjacent to or near roads. These thickets of small trees increase the risk of fires moving into the canopy resulting in crown fires and overall higher fire burn severity. They can also make it difficult to fight fires safely because roads are often used strategically to limit the spread and severity of fires. The objectives of this treatment are to reduce the crown fire hazard and create a defensible fuel profile zone along roads where human-caused fires are more common. Visibility and sight distance along forest roads would also be improved, increasing roadway safety. The forest vegetation types are the same as that listed under MSO Uneven-Aged Management above. The average basal area is 133 ft² and ranges from 100 to 270 ft² per acre, with canopy closure ranging from approximately 30% to over 80%. The average tree diameter ranges from 6.0” to 20.0”. Trees per acre range from approximately 100 to over 1,000, with an overall mean of 337 trees.

Mechanical treatment prescriptions would be designed to develop uneven-aged structure and a mosaic of openings and tree groups of varying sizes. Canopy gaps or openings ranging from 0.1 – 2.5 acres in size would be implemented across 10 to 30 percent of the treatment area. Tree groups would vary in shape, size, density, and number: generally from 0.05 – 0.7 acres in size with residual group basal areas of 20-80 ft² per acre and 2-40 trees per group.

Treatment in these areas would also meet guidelines outlined the Revised Mexican Spotted Owl Recovery Plan (U.S. Fish and Wildlife Service 2012) for Forested Recovery Foraging/Non-Breeding Habitat as described in Mexican Spotted Owl, Recovery Habitat - Uneven-aged Management described above. While the treatment would be designed to move towards uneven-aged structure, the focus would be on removing small trees adjacent to roads or underneath the canopy of larger trees. The area would be thinned to a residual basal area of 80 to 120 ft².

Northern Goshawk Habitat Outside of Post-Fledging Areas- Uneven-aged Management

The forest type in these areas is ponderosa pine, with inclusions of juniper and oak woodlands. The basal area ranges from 50 to over 200 ft² per acre, with canopy closure ranging from approximately 20% to over 70%. The average diameter ranges from 3.0” to 11.0” dbh. Trees per acre range from approximately 200 to over 1,000, with an overall mean of over 852 trees per acre.

Under this treatment, these areas would be managed to eventually achieve/maintain a balanced uneven-aged structure in terms of VSS distribution and openings. A mosaic of vegetation densities, age classes and species composition would be sustained across the landscape.

Northern Goshawk Post-Fledging Area Post-Fledging Area Maintenance

Two northern goshawk post-fledging areas (PFAs) have been identified for treatment. Treatments in the PFAs would manage for uneven-age stand conditions of live trees and retain desired snags, downed logs, and woody debris. The objectives of the Old Tree and Large Tree Implementation Plan would be implemented to provide as much old forest structure as possible. Higher canopy cover and smaller opening sizes (less than 2 acres) would be managed for within PFAs. One group of reserve trees (3-5 trees per group) would be left if an opening is greater than one acre in size (Forest Plan, New page 65-10). Target residual basal area/acre range: 100 to 120 ft².

Northern Goshawk Habitat Outside of Post-Fledging Areas - Thin from Below

The forest type for most of these treatment areas is either ponderosa pine (with a mix of oak) or oak woodland. The majority of these stands have an average diameter of less than 9.0”.

The proposed treatment would consist of thinning conifers generally less than 9” dbh to a varied spacing to provide species diversity and horizontal structure. Natural disturbance patterns would be mimicked by including irregular tree spacing into the prescription. These stands are dominated by trees <9” dbh and thinning these smaller trees would reduce ladder fuels in the understory and would lower crown fire hazard. The target basal area range is 40-60 ft² based upon 114-170 trees per acre, assuming that the average residual tree diameter is 9” dbh.

Mexican Spotted Owl Recovery Habitat – Thin from Below

These treatments are located within the Mexican Spotted Owl Recovery Habitat area. The forest type for this treatment is pine-oak and constitutes recovery habitat for MSO. The average diameter of the trees ranges from 6.0” to 16.0”, with canopy closure ranging from 40% to 80%. Trees per acre ranges from 300 to 500.

The proposed treatment consists of thinning conifers generally less than 9” dbh. These stands are dominated by trees <9” dbh and thinning these smaller trees would reduce ladder fuels in the understory and would lower crown fire hazard. The trees would be thinned at a varied spacing to provide species diversity and horizontal structure. Natural disturbance patterns would be mimicked by incorporating an irregular tree spacing into the prescription. The target basal area range is 60-80 ft² based upon 170-220 trees per acre, assuming that the average residual tree diameter is 8.0” dbh.

Prescribed Burning Treatments

The proposed treatment consists of using prescribed fire to treat natural fuels and fuels generated from timber sales or thinning activities across the entire project area (Figure 7). Prescribed burning would consist of three different stages or types of burning that depends on the location within the project area. In some locations, all three stages may occur in the same area over a number of years. Generally an “initial entry” burn would take place first in a given area to consume naturally accumulated fuels and old logging debris. The next treatment may be a “pile” burn which would consume slash from thinning activities. The next burn would be a “maintenance” burn which would reoccur in previously burned areas to keep fuel accumulations at a level that reduces the threat of an uncharacteristic wildfire. Maintenance burns would be implemented to mimic natural return intervals every 2-10 years depending on fuel accumulations. Both initial entry and maintenance burns would consist of low to moderate intensity fire that would result in the consumption of surface litter, logs and mortality of smaller diameter trees. Pile burning would burn slash generated from logging and would generally be confined to activity fuels such

as limbs, tops of trees and needles (activity fuels). All stages of burning could occur at any time of the year as long as conditions are favorable to meet objectives safely and are within constraints defined by resource specialists. The EA will develop a treatment implementation plan that will include priorities, locations and time frames for prescribed burning.

Activity Fuels Treatments

The preferred yarding and activity fuels treatment method for this project would be for whole tree yarding and removal of all biomass from treatment units. Activity fuels is the debris generated from logging and includes the limbs cut from the bole of the tree, tops of the tree and needles. The second preferred method would be piling and burning of slash including logs, limbs, or tops of trees. Piling may occur either by machine or hand to create slash piles that would be burned at a later time. For this proposal, hand piling and burning is only proposed in treatment units adjacent to private lands, within and outside of campgrounds and along roads where slopes are too steep for mechanized logging or machine piling (157 acres).

Road Management, Maintenance and Use

Existing roads would be used to the extent possible for hauling harvested trees and biomass. Forest Roads (FR) 123, 141, 141H, 147, 218, 300, 308, 612, 751 and State Highway 87 would be used as the main haul routes. Minor road maintenance activities on several of these roads would be necessary prior to implementation, including, but not limited to reconditioning and resurfacing.

Based on an analysis of potential treatment areas, it is estimated that 121 miles of existing roads that are closed to the public and managed for administrative use would need to be used. Twenty (20) miles of decommissioned roads would need to be re-opened and used as existing temporary roads, and an estimated 12 miles of newly constructed temporary roads would be necessary to transport harvested material. This proposed action includes a best estimate of the proposed location of temporary roads. The precise placement of newly constructed temporary roads may be slightly different than planned because the on-the-ground site work for road construction is not done until a contract for treatment is secured and the type of equipment to be used is determined. No new temporary roads would be located within Mexican Spotted owl nest cores or Protected Activity Centers. All temporary roads, landings, and skid trails to be used will be pre-approved by the Forest Service Timber Sale Administrator prior to harvesting and will be constructed and located in compliance with project design features. Existing roads would be used to the extent possible for hauling harvested trees and biomass.

All of the decommissioned roads that are re-opened to be used as existing temporary roads would be returned to the condition they were before they were reopened and used. For all new temporary roads, after the new temporary road has served its purpose, the road will be rehabilitated which may include lopping and scattering of slash, ripping and seeding, installing adequate drainage structures and effectively blocking the road to normal vehicular traffic where feasible pursuant to the standard timber contract provision BT6.63 (temporary roads). Applicable Coconino National Forest Management Plan direction, Best Management Practices, Forest Service Manual and Handbook direction, as well as standard mitigation measures would be implemented for roads used in project implementation.

Rock Pit Use

Existing rock pits within or closely adjacent to the project area that have current NEPA decisions would be used for pit run or crushed aggregate material for spot rocking and other road maintenance needs during project implementation.

There are three existing rock sources outside of the project area that would be used if needed: Lockwood Pit (T13N, R11E, Section 11) on FR 96; and Cinch Hook Pit (T12N, R9E, Section 6) at the junction of State Route 87 and State Route 260 and Park Knoll Pit, (T14N, R10E, Sec. 27) off of FR 698. Rock material would be extracted by following an approved development and operating plan. During and after use, rock pit working areas would be water-barred and shaped for proper drainage.

Project Design Features and Resource Protection Measures

Design features are part of the proposed action and would be incorporated into the project to protect soil, water, scenery values, wildlife and aquatic species and habitat, facilities, infrastructure and rare plants. Mitigation measures and best management practices would be implemented during the project to minimize watershed impacts, prevent the introduction and spread of invasive plants, to reduce impacts to wildlife, to protect heritage and cave and karst resources and to protect public health and safety. A listing of design features and resource protection measures is found in Appendix A.

Forest Plan Compliance and Amendments

The Coconino National Forest is currently operating under the 1987 Coconino Land Management Plan, as amended; the Forest is in the process of revising the Forest Plan, with the Record of Decision (ROD) for the revised plan anticipated for release in 2017. The following two project specific Forest Plan amendments are required if this decision is signed prior to implementation of the revised Forest Plan. This project is proposing to amend the Forest Plan under the 2012 Planning Rule (36 CFR 219.13); the two amendments below are not significant per (36 CFR 219.13(b)(3)). The proposed amendments are described in Appendix B.

The purpose of amendment 1 is to bring the alternative in alignment with the revised Mexican Spotted Owl Recovery Plan (U.S. Fish and Wildlife Service 2012) to the extent possible, while allowing site-specific activities that do not follow the Recovery Plan recommendations, and defer monitoring to the U.S. Fish and Wildlife Service biological opinion that is specific to this project. Amendment 2 clarifies existing direction related to managing canopy cover and interspace in the forest plan. The purpose of amendment 2 is to bring the project into alignment with the best available science (Tuten et al. 2015; Reynolds et al. 2013) that provides desired conditions for restoring fire-adapted ponderosa pine in the Southwest.

No amendment alters multiple use forest plan goals and objectives, adjusts management area boundaries or management prescriptions. The changes in standards and guidelines are considered to be minor because they reflect the latest, best available science (Tuten et al. 2015; Reynolds et al. 2013). The amendments bring the alternatives into alignment with the revised Mexican Spotted Owl Recovery Plan (U.S. Fish and Wildlife Service 2012) although the degree of alignment is limited since this amendment allows for specific activities to meet the purpose and need, which will not meet all of the recommendations in the Recovery Plan. Neither amendment will alter the long-term relationship between levels of multiple-use goods and services originally projected for the Coconino NF. These outputs were specific to a planning period ranging from 10 to 15 years (as identified in 1987). The amendments will not result in an important effect to the entire land management planning area. Each amendment is a specific, one-time variance for this project. The Coconino National Forest land management plan revision process, is affecting ongoing and future analyses. The plan amendments that are specific to this project do not impose direction on ongoing or future analyses.

Level of Environmental Analysis

An Environmental Analysis (EA) is being prepared for the Cragin Watershed Protection Project using the authority of the Healthy Forest Restoration Act of 2003 as amended, Title I, Hazardous Fuel Reduction on Federal Land. The purpose of the Healthy Forest Restoration Act (HFRA) is the same as the Cragin Watershed Protection Project: reducing hazardous fuels to protect the wildland urban interface, and reducing the risk of damage from uncharacteristic wildfire to nearby communities and municipal water supply watersheds.

HFRA is also an appropriate authority because the entire Cragin Watershed Protection Project is within the Blue Ridge Area and Mogollon Rim Ranger District Community Wildfire Protection Plan (Gatewood 2009) and includes a municipal water supply watersheds, private land inholdings, FS administrative facilities, and critical infrastructure within the project area that meet wildland urban interface definitions of human improvements at imminent risk to wildfire and having special significance.

HFRA also has provisions for the protection of old growth and large trees, and allows for fuel reduction treatments in threatened and endangered species habitat. The project area is home to the Mexican spotted owl, and the Little Colorado Spinedace, which are both threatened species, candidate roundtail chub and candidate conservation agreement species bluehead sucker and Little Colorado River sucker spp.

Cooperating Agencies

The CEQ regulations define “Cooperating agency” as any Federal, State or local agency and Federally recognized Indian Tribe which has jurisdiction by law or has special expertise with respect to any environmental impact involved in a proposal or major Federal action affecting the quality of the human environment (40 CFR 1508.5). The following groups are cooperating agencies for the CWPP.

The Bureau of Reclamation Phoenix Area Office (Reclamation) has jurisdiction by law for the withdrawn areas (covered lands) of the C. C. Cragin Project under Public Law 112-45 of November 7, 2011. Reclamation also has special expertise in water management and water management facilities in the Western United States, including the C. C. Cragin facilities and the federal standards that apply to Federal Reclamation projects.

The Salt River Project is responsible for the care, operation and maintenance of the C. C. Cragin Dam and Reservoir under Public Law 108-451, the Arizona Water Settlements Act of December 10, 2004. Salt River Project has special expertise in water measurement, precipitation, snow measurement and monitoring, reservoir and water system operations, watershed monitoring and management, water rights analysis, environmental permitting, fisheries biology, and power corridor and system management.

The Town of Payson has acquired rights to water from the C. C. Cragin Dam and Reservoir and water pipeline system. The Town of Payson has special expertise in the subjects of reservoir and water system operations, water quality chemistry, water sampling and analysis, water transmission operations and management, water quality management and road development and surface water drainage planning.

The U.S. Fish and Wildlife Service Arizona Ecological Services Office (FWS) has jurisdiction and special expertise as the lead wildlife agency for threatened and endangered species in the project area which includes threatened Mexican spotted owls and critical habitat, threatened Little Colorado spinedace, candidate roundtail chub and candidate conservation agreement species bluehead sucker and Little Colorado River sucker spp.

The Arizona Game and Fish Department, (AZGFD) under the authority of the Arizona Game and Fish Commission, and pursuant to Title 17 of the Arizona Revised Statutes, has jurisdiction over wildlife (and fish) in the State of Arizona. AZGFD jointly manages federally endangered and threatened wildlife species with the US Fish and Wildlife Service. The Department has special expertise in wildlife and fisheries management covering the C. C. Cragin Watersheds.

Collaboration and Public Involvement

During project proposal development and prior to public scoping, collaboration was initiated with a group of stakeholders that have expressed interest in the project. Three stakeholder meetings were held facilitated by the National Forest Foundation and their partner, Southwest Decision Resources. The first stakeholder meeting was held on September 9, 2015 at the Blue Ridge Community Church facility in Happy Jack, AZ. In October, a second stakeholder meeting was held in the field and various field trip stops were made within the project area. At that meeting, the Forest Service presented draft project vegetation and prescribed burning treatment scenarios that provided a basis for discussions by the stakeholders. On February 11, 2016 the third stakeholder meeting was held at Gila Community College in Payson, AZ. At that meeting, stakeholders provided comments to the Forest Service on a pre-scoping CWPP Draft Proposed Action document (dated February 4, 2016). Stakeholder information is contained at the following web site developed and maintained by the National Forest Foundation, <https://www.nationalforests.org/who-we-are/regional-offices/southernrockies/cragin>.

Information that came from these meetings was used to help develop the proposed action.

A public information letter dated September 3, 2015 was mailed out to 190 individuals, tribes, agencies and groups. The letter provided background information on the project location, partners, and project purpose. A project website also was developed in September 2015 to provide public information on the project, <http://www.fs.usda.gov/goto/coconino/CWPP>. The project has been listed on the Coconino National Forest Schedule of Proposed Actions since January 1, 2015, <http://www.fs.usda.gov/project/?project=46075>.

Decision to be Made

The Coconino Forest Supervisor is the Responsible Official for this project. The decision to be made is whether or not to approve the Proposed Action, another alternative, or develop an alternative design that meets the purpose and need and moves the area towards the desired condition, or to not implement a project at this time. The Responsible Official may also determine that the proposal or alternatives will result in significant effects requiring analysis through an Environmental Impact Statement.

Contact Person

Project Manager/Team Leader: Polly Haessig, Mogollon Rim Ranger District (928-477-5007) or email: phaessig@fs.fed.us

Your Involvement

At this time, our desire is to receive comments on the merits of the Proposed Action. Your comments should be within the scope of the proposal that have a direct relationship to the proposal, and that include supporting reasons for the deciding official's consideration. A detailed description of the Proposed

Action can be found on the Coconino Forest internet site at: <http://www.fs.usda.gov/goto/coconino/CWPP> and <http://www.fs.usda.gov/project/?project=46075>. Paper copies are available upon request.

Written or oral comments may be submitted via mail, fax, telephone, or in person (Monday through Friday, 7:30 a.m. to 4:00 p.m., excluding holidays) to: Polly Haessig, Project Manager, Mogollon Rim Ranger District, 8738 Ranger Road, Happy Jack, AZ 86024; TEL: 928-477-2255; FAX 928-527-8282. Comments may also be sent by e-mail to: FS-comments-southwestern-coconino-mogollon@fs.fed.us. The name and address of the person submitting electronic comments must be included. Please submit your comments by **March 25, 2016**.

If you provide comments to this Proposed Action, you will receive notification of the Preliminary Environmental Assessment (EA) which is anticipated to be completed in the fall of 2016.

Comments received in response to this scoping notice, including names and addresses of those who comment, will be considered part of the public record on this project and will be available for public inspection. Comments submitted anonymously will be accepted and considered but will not be eligible for objection per §218.5. Additionally, pursuant to 7 CFR 1.27(d), any person may request the agency to withhold a submission from the public record by showing how the Freedom of Information Act (FOIA) permits such confidentiality.

This project is subject to the objection process pursuant to 36 CFR part 218 subparts A and C (March 27, 2013), and is being authorized under the Healthy Forest Restoration Act (HFRA). As such, those who provide specific written comments during the scoping or the comment period in accordance with §218.5(a) will be eligible to participate in the objection process. Issues raised in objections must be based on previously submitted, timely, specific written comments regarding the proposed project unless new information arises after designated opportunities (36 CFR 218.7).

We appreciate your interest and continuing cooperation with our forest management programs. Should you have any questions, or need additional information about this project, please contact Polly Haessig, Cragin Watershed Protection Project Manager for at (928) 477-5007 or by e-mail at phaessig@fs.fed.us.

We welcome your comments during the scoping period. You are welcome to discuss the project with Linda Wadleigh, District Ranger, Mogollon Rim Ranger District at the Blue Ridge Ranger Station in Happy Jack, AZ or call me at me at (928)477-5001.

Multiple public meetings will be held throughout the planning process for the CWPP project. A general information sharing, discussion group and comment meeting is scheduled for March 2, from 6 pm to 8:30 pm at the Payson Unified School District Office Boardroom, 902 W. Main Street, Payson, Arizona. A second general information sharing, discussion group and comment meeting is scheduled for March 5, from 10 am to 12:30 pm at the Starlight Pines Community Center, 2740 Arapaho Drive, Happy Jack Arizona (Southeast corner of Starlight Drive and State Highway 87, milepost 305.5). Please visit the CWPP project website at <http://www.fs.usda.gov/goto/coconino/CWPP> for more information and a calendar of upcoming meeting dates

Appendix A, Project Design Features, and Monitoring

The design features listed below are the best compilation at this time of resource protection measures to mitigation impacts of implementing the project. They come from the Forest Plan or are modified from the Forest Plan guidelines or come from Forest Manual or Handbook direction as well as law and regulation. These design features may be modified, changed or new measure added in response to public comments and the environmental analysis process.

Silviculture	
Old Trees	
S1	Emphasize retaining old, pre-settlement trees where possible, particularly within MSO recovery nest/roost habitat. Old trees, as defined by Thomson (1940), would not be targeted for cutting. However, exceptions may be necessary. An example of this would be removing an old tree to address human health and safety concerns and OSHA regulations if these trees are considered to be dangerous. Another instance would be to cut an old tree in order to accommodate the turning radius of a logging truck, rather than relocating an entire road, or if they are located within a cable yarding corridor. See Old and Large Tree Implementation Plan for the project.
Mixed Conifer	
S2	Treatments in dry mixed conifer vegetation types would be site-specific in nature and vary according to the diversity of tree species compositions and locations. Treatments would be designed to enhance historic tree species composition while reducing the risk of high-severity wildfire.
Vegetation Protection during Thinning and Timber Harvest	
S3	Identify staging areas for heavy equipment to protect existing vegetation surrounding project sites from damage from logging activities
S4	Minimize creation of green slash between January and June, and monitor the green slash left on site so that if a serious bark beetle (<i>ips spp.</i>) infestation develops it can be treated.
Slash Treatment	
S5	In thin and pile areas, pile slash in openings, outside drip lines of retained trees whenever possible.

Soil and Watershed Protection

In order to avoid negative impacts to soils and water resources, best management practices (BMPs) would be implemented for prescribed fire and mechanical vegetation treatment measures. These resource protection measures are derived mainly from the Soil and Watershed Conservation Practices Handbook (USDA, 1990) and the National Best Management Practices for Water Quality Management on National Forest System Lands, Volume 1: National Core BMP Technical Guide (USDA, 2012). Resource protection measures are implemented to protect soils and minimize nonpoint source pollution as outlined in the intergovernmental agreement between the Arizona Department of Environmental Quality and the Southwest Region (Region 3) of the Forest Service (ADEQ, 2008). BMPs would be incorporated in prescribed fire burn plans and timber harvesting or stewardship contracts.

Where applicable, design features that are included for other resources are noted.

Prescribed Burning

SW1	Incorporate prescription elements into the prescribed fire plan including such factors as weather, slope, aspect, soils, fuel type and amount, and fuel moisture in order to minimize high soil burn severity.
SW2	Consider the spatial distribution and contiguous size of the planned burn area in a watershed during prescription development to reduce the effects of peak flow change on channels.
SW3	At a minimum, all perennial water bodies including but not limited to streams and springs, wetlands, and areas with riparian ecosystems would be designated as Aquatic Management Zones (AMZs), also called filter strips. Those stream channels that support seasonal flow in response to snowmelt and/or seasonal fluctuations in the water table would also be evaluated for potential designation as AMZs. AMZ widths would be adjusted based on the steepness of up gradient hillslopes.
SW4	AMZ width is the distance measured perpendicularly from the outer edges of the stream course (i.e., channel bank) or wetland. For stream courses or wetlands with up gradient hillslopes of 35% or less, the AMZ width shall be 25' plus the width of the stream course (i.e., 25' from either streambank). For those with up gradient hillslopes greater than 35%, AMZ width shall be 50' plus the width of the stream course (i.e., 50' from either streambank).
SW5	Equipment/vehicle staging areas, and fuel used for ignition devices would be located outside of AMZs. Ignition of fuels would not be initiated within AMZs. Prescribed fire can occur within AMZs while meeting desired objectives for vegetation, soils, snags, down logs, etc. Hand piling and burning of slash within AMZs would be avoided to the extent practicable.
SW6, SCN	Containment lines would be sited and constructed in a manner that minimizes erosion and prevents runoff from directly entering water bodies by consideration of placement relative to the water body or bodies and lay-of-the-land and through construction and maintenance of suitable drainage features such as water bars. To the extent possible, wetlands and riparian areas would be avoided. Where applicable, natural fire breaks

	such as outcrops would be used in lieu of ground-disturbing containment lines. In general, spacing of water bars would be such that water bars are located at eye level when viewed starting at the bottom of a slope and traversing upward.
SW6, SCN	Containment lines would be rehabilitated by rolling back the soil berm formed during line construction and constructing drainage features as necessary to prevent concentration of runoff. Disguise containment lines to line of sight or first 300 feet, whichever is greater, from where they intersect trails or roads using native materials such as rocks and slash.
SW7, SCN	Staging areas would be kept as small as possible while allowing for safe and efficient operation.
Thinning and Timber Harvest	
SW8	Staging areas shall be kept as small as possible while allowing for safe and efficient operation.
SW9	At a minimum, all perennial water bodies including but not limited to springs and streams, wetlands, and areas with riparian ecosystems shall be designated as Aquatic Management Zones (AMZs. Those stream channels that support extended flow in response to snowmelt and/or seasonal fluctuations in the water table shall also be evaluated for potential designation as AMZs. AMZ widths shall be adjusted based on the steepness of up gradient hillslopes with the following general guidelines listed below.
SW10	AMZ width is the distance measured perpendicularly from the outer edges of the stream course (i.e., channel bank) or wetland. For stream courses or wetlands with up gradient hillslopes of 35% or less, the AMZ width shall be 25' plus the width of the stream course (i.e., 25' from either streambank). For those with up gradient hill slopes greater than 35%, AMZ width shall be 50' plus the width of the stream course (i.e., 50' from either streambank).
SW11	All fueling/servicing of vehicles shall be conducted in a designated staging area outside of AMZs. Temporary fuel storage tanks shall be permitted and installed in accordance with the Office of the State Fire Marshall requirements.
SW12	Prior to conducting harvesting activities, all skid trails, cable yarding corridors, temporary roads, and landings shall be designated on a map and visibly marked by means of flagging or other suitable measures for approval by the timber sale administrator. This requirement is included in contract provision BT6.422 (landings and skid trails) and BT6.63 (temporary roads).
SW13	Skid trail design shall not include long, straight downhill segments which would concentrate runoff. Skid trails shall be located out of AMZs except at approved crossings. Skidding up or down drainage courses shall not be permissible.
SW14	Insofar as safety permits, trees shall be felled to angle in the direction of skidding.
SW15	The following activities shall be prohibited in AMZs: skid trails, new temporary roads (except at designated crossings), landings, and machine piling of slash. This

	requirement is included in timber sale contract provision BT6.5 (stream course protection).
SW16	Crossing of AMZs must be at designated locations as approved by the timber sale administrator. Temporary road or skid trail crossings of stream courses shall be oriented perpendicular to the stream course.
SW17	Equipment would not be operated when ground conditions are such that excessive damage would result as visually monitored through such indicators as soil rutting. This requirement is included in timber sale contract provision B9.3 (Breach).
SW18	Machine piling of logging slash would be done in such a manner as to minimize the construction of new clearings for slash piles through use of natural openings, temporary roads, and landings.
SW19	Drainage of roads shall be controlled by a variety of methods including but not limited to insloping of the road bed toward an interior drainage ditch with periodic cross drains, outsloping of the road bed, crowning of the road bed, and construction of rolling dips and turn-outs. Drainage from landings and skid trails shall be controlled to prevent concentration of runoff.
SW20	Skid trails shall be restored after use by a combination of any or all of the following practices in order to prevent the concentration of runoff in skid trails and to protect exposed soil: reshaping the surface to promote dispersed drainage (i.e., create convex vs. concave cross-section), installation of drainage features such as water bars to shed water, and spreading slash across skid trails to protect areas where mineral soil is exposed. Where skid trails intersect existing roads or trails, native materials such as logs, slash, and/or boulders shall be placed along skid trail to line-of-sight or first 300', whichever is greater. This requirement is described in a standard contract provision BT6.6 (erosion prevention and control), BT6.67 (erosion control structure maintenance) and within the road package
SW21	Skidding shall be limited to slopes less than 40%.
SW22	Where visual observation indicates that the above methods of erosion protection are inadequate, a certified weed-free mix of native or naturalized grasses suitable for the area would be broadcast evenly over the inadequately protected surface at the rate 5 pounds per acre after surface scarification. This requirement is included in timber sale contract provision BT6.01.
SW23, RD	Unless waived in writing, following the completion of skidding and yarding operations in the project area, all landings, skid trails, and temporary roads constructed by the contractor shall be scarified by the contractor to a depth of not less than four inches and must effectively prepare the ground for seeding. If deemed necessary by district sale administration staff, the contractor shall seed areas of exposed soil on landings, skid trails, firebreaks and temporary roads where other erosion control measures will not result in satisfactory control of soil movement. This requirement is included in timber sale contract provisions (WO) CT6.601# (Erosion Control Seeding) and CT6.602 (Temporary Road and Landing Scarification).

Transportation System, Road Use and Maintenance	
RD1	Applicable Coconino National Forest Management Plan direction, Best Management Practices, Forest Service Manual and Handbook direction, as well as standard mitigation measures would be implemented.
RD2	A new temporary road is a primitive road created during vegetation treatment activities for the specific purpose of transporting woody material from the project area. The road is constructed where there is no evidence of a road prism being present and/or does not exist in the FS transportation system. During use the new temporary road shall be stabilized by use of such measures as, but not limited to, outsloping and installing drainage dips. After the new temporary road has served its purpose, the road will be rehabilitated which may include lopping and scattering of slash, ripping and seeding, installing adequate drainage structures and effectively blocking the road to normal vehicular traffic where feasible. This requirement is included in the standard timber contract provision BT6.63 (temporary roads). An existing temporary road is a road used for harvest activities that is recorded in the FS transportation system as decommissioned. After use of such road, it is the contractor's responsibility to return the road to the condition it was immediately prior to operations.
RD3	New temporary roads and landings would be restored after use by a combination of any or all of the following practices in order restore original topography, protect soils, and prevent concentrated runoff: roll berms created during temporary road and/or landing construction back across the disturbed surface to restore original surface topography to the extent practicable, install drainage features such as water bars where needed to prevent runoff from concentrating, and spread slash on areas with exposed mineral soil. Where new temporary roads intersect existing roads or trails, native materials such as logs, slash, and/or boulders would be placed along temporary road to line-of-sight or first 300', whichever is greater.
RD4	New temporary roads would be seeded with certified weed free native or naturalized grasses suitable for the area. Where feasible, slash would be spread across the road to disguise the roadbed and provide for surface roughness.
RD5, SCN	Where new permanent gates are necessary, use non-reflective materials such as self-weathering steel, dimensional timbers, etc. that are Forest Service in character.
<h2 style="margin: 0;">Heritage</h2> <p style="margin: 0;">Where applicable, design features that are included for other resources are noted.</p>	
H1	The project administrator is responsible for coordinating with the District or Forest Archaeologist in advance of project activity implementation in order to comply with the conditions of the cultural resources clearance. Enough lead time would be provided to conduct pre-implementation survey or site marking work if needed.
H2	Archaeological sites will be marked for avoidance in the field prior to implementation of activities. This requirement is included in timber sale contract provision BT6.24 (protection measures needed for plants, animals, cultural resources, and cave

	resources). Fire-sensitive sites identified by the archeologist will be lined or otherwise avoided and monitored as needed during and following prescribed burning operations.
H3	All National Register of Historic Places (NRHP) eligible or sites that have not been evaluated will be protected from ground disturbing activities.
H4	Temporary roads will be surveyed prior to their construction following the plan submitted to and approved by the State Historic Preservation Office (SHPO).
H5, REC, SCN	Historic trails, roads and trail markers in the project area will be protected during project implementation in accordance with timber sale contract provision BT6.221, and BT6.22 (protection of improvements not owned by the forest service and those owned by the forest service respectively).
H6	Previously undocumented archaeological sites if discovered during project activities will be reported to the District or Forest Archaeologist within two working days. No activities near the discoveries will take place until such time as the District or Forest Archaeologist can visit the location and determine needed site protection zones. Should sites be damaged by project activities, it must be reported immediately to the District or Forest Archaeologist and all work near the previously recorded site, if not previously recorded must cease, in accordance with timber sale contract provision BT6.24 (protection measures needed for plants, animals, cultural resources and cave resources). Work cannot continue until a damage assessment report is prepared. Damage may include ground disturbance, burning of combustible artifacts or features, heavy scorching or killing of historic tree features, or other physical impacts to the sites.
Wildlife	
Where applicable, design features that are included for other resources are noted.	
W1	Prior to the start of any treatment activities, coordinate with district biologist to minimize potential impacts to wildlife and fish species and sensitive areas including breeding and roosting locations.
Mexican Spotted Owl	
W2	Mexican spotted owl (MSO) surveys would be coordinated with the Fish and Wildlife Service the year of implementation or one year prior to determine occupancy of owls in the project area. Surveys include the project area plus ½ mile beyond the perimeter of the project boundary.
W3	The CWPP project boundary lies within the project boundary for 4FRI as well as other forest thinning and burning projects. Mogollon Rim Ranger District staff would ensure that all proposed treatments are coordinated to ensure that there are not multiple entries into sensitive habitats (such as MSO protected activity centers [PACs]) that are split between different project boundaries. In doing so, habitat and noise disturbance to these areas would be minimized.
W4	The Forest Service would monitor effects to MSO from the proposed action and report their findings to the FWS. Implementation monitoring would include information such

	as when or if the project was implemented, whether the project was implemented as analyzed in the site specific BO (including conservation measures, and best management practices), breeding season(s) over which the project occurred, relevant MSO survey information, and any other pertinent information about the project's effects on the species.
W5	Minimize thinning, prescribed burning, temporary road construction, maintenance or obliteration within occupied PACs during the breeding season (March 1 to August 31). This requirement is included in timber sale contract provision (WO)-CT6.24#. No thinning activities are proposed in nest cores. Any activities will be coordinated with the USFWS as part of consultation and monitoring.
Federally Listed & Sensitive Fish Species	
W6, SW	Minimize impacts to federally listed and sensitive fish species and aquatic habitats through implementation of watershed design features and BMPs. See also soil and watershed protection BMPs.
Other Forest Plan Guidelines for Wildlife	
W7, SW	Hiding cover would be maintained near dependable waters by not targeting drainages for interspaces and openings, and through implementation of watershed Best Management Practices (BMPs).
W8	Protect snags and logs wherever possible through site preparation, implementation planning, and ignition techniques to retain ≥ 2 snags per acre >18 inches dbh and ≥ 30 ft in height and ≥ 3 logs with > 12 inches mid-point diameter and ≥ 8 ft in length in ponderosa pine and ≥ 3 snags per acre >18 inches dbh and ≥ 30 ft in height and ≥ 5 logs with >12 inches mid-point diameter and ≥ 8 ft in length in mixed conifer and spruce-fir.
W9	Retain ≥ 2 trees per acre ≥ 18 inches dbh with dead tops, cavities, and lightning strikes wherever possible to provide for replacement snags and cavity nesting/foraging habitat
W10	Emphasize retention of snags exhibiting loose bark to provide habitat for roosting bats.
W11	Create snags in key areas (i.e. PACs, recovery nest roost habitat) where monitoring determines a deficit.
Noxious and Invasive Weeds	
The Best Management Practices as outlined in Appendix B of the "Final Environmental Impact Statement for Integrated Treatment of Noxious or Invasive Weeds" (USDA Forest Service 2005) would be followed to incorporate weed prevention and control into the project. The following design features would be incorporated into project implementation and monitoring.	
NW1	Treat weed infestations within stands before implementing project activities. Avoid known populations of noxious or invasive weed during project activities.

NW2	Survey temporary roads and landings before work begins. Avoid existing noxious or invasive weeds during soil disturbing activities.
NW3	Prevent the spread of potential and existing noxious or invasive weeds by vehicles used in management activities by incorporating weed prevention and control into project layout, design, and implementation.
NW4	Fully incorporate the equipment cleaning provisions (BT6.35 equipment cleaning) of the timber sale and/or stewardships contracts into the implementation contract(s) to prevent the introduction or spread of noxious or invasive weeds.
NW5	Clean all equipment of seeds, soil, vegetative matter, and other debris that could contain or hold seeds before entry into a project area. Clean vehicles, machinery and tools before moving from infested areas into uninfested areas.
NW6	When in areas where known noxious weeds exist, designate turnaround sites for log trucks and other large equipment that are weed free.
NW7	Manage prescribed fires as an aid to control of existing weed infestations and to prevent the spread of existing weeds through coordination with the District Weeds Coordinator.
NW8	Place slash piles on previously used locations such as old piling sites, old log deck sites, or other disturbed sites to avoid severe disturbance to additional locations where possible.
NW19	Monitor slash pile sites after burning and if found, control noxious or invasive weeds.
NW10	Avoid acquiring water from weed-infested areas to use for dust abatement.
NW11	Minimize period from end of project activities to site rehabilitation, revegetation, and contract closure.
NW12	Inspect material sources and ensure that they are weed-free before use and transport. Treat weed-infested sources for eradication and strip, stockpile and treat contaminated material before using pit materials. Inspect and document areas where materials are used annually for at least 3 years after project completion to ensure that any weeds transported to the site are promptly detected and controlled.
Mogollon Rim Botanical Area	
MRBA1	The botanical area is managed to maintain existing conditions and natural processes for public enjoyment, demonstration, and study. Natural events are not rehabilitated.
MRBA2	Off-road driving is prohibited.
MRBA3	Timber harvest and firewood cutting in the botanical area is prohibited.
MRBA4	Use prescribed fire with planned ignitions as a management tool provided its use is compatible with the management of the specific area.

MRBA5	Determine potential occurrences and habitat of Region 3 sensitive plants in potential activity areas when planning for implementation. Identify potential species and survey the area to be treated before implementation.
Sensitive Plants	
SP1	Mitigate negative effects from management actions on Region 3 sensitive plants during design and implementation.
SP2	Prohibit slash pile construction within populations of Region 3 sensitive plants.
SP3	Construct slash piles at least 10 to 20 feet away from known populations of Region 3 sensitive plants to the extent practicable.
SP4	Prohibit temporary road construction and reconstruction, log landings, tracked vehicles, and other ground disturbances within populations of Region 3 sensitive plants.
SP5	Deferrals and groups may include Region 3 sensitive plant groups where practical, using areas not occupied by the plants as interspaces.
SP6	Prior to implementation, survey springs and channels for Arizona sneezeweed and Bebb's willow.
SP7	Review watershed BMPs for project area and incorporate mitigations for Arizona sneezeweed into BMPs. Minimize impacts to Arizona sneezeweed through implementation of watershed design features and BMPs.
SP8	Manage prescribed burns to promote native species and to hinder weed species germination.
Recreation	
Where applicable, design features for scenery that apply to recreation sites are noted.	
Public Awareness	
REC1	Inform forest visitors about activities within the project area and make them aware of potential impacts when visiting this part of the forest. Provide information about implementation activities on the Forest website.
REC2	Issue news release(s) as appropriate when forest restoration activities are scheduled to occur and how it may affect forest visitation.
REC3	Consider use of a hotline or link on our web pages that would indicate closures or hazards that may be encountered. Ensure front liners are well informed about activities occurring on the districts and forests.
REC4	If it is necessary to close forest roads or areas of the forest during burning or harvesting operations, notices and signs would be posted at key locations adjacent to and within the project area to inform the public of these closures, in conjunction with issuing news

	releases as stated above. This may include major FS roads accessing the area, kiosks at trailheads, bulletin boards, electronic sign boards, etc.
REC5	Utilize dust abatement methods during haul of logs on unpaved roads near private land residences during the season
Forest System Trails	
REC6	Coordination with the District Recreation Planner, District Trails Specialist and local trail stewards will occur during prescription or burn plan development, layout, marking logging and burning where any treatment will occur on, adjacent or near National and system trails. This is to ensure that trails and trail infrastructure are considered and protected and effects to scenic qualities are minimized to the extent practicable.
REC7	Harvesting activities would avoid National and forest system trails, if possible. If it is determined necessary that a trail must be used as a skid trail crossing, then the trail would be restored to USFS standards (pre-project condition) post-treatment.
REC8, SCN	National and forest system trails will not be used as skid trails or for temporary roads, except where motorized use is already authorized (trails located on open system and administrative roads).
REC9, SCN, H	It is acceptable to make perpendicular trail crossings. Trail crossing locations, including those on the Arizona National Scenic Trail and General Crook National Recreation Trail would be designated and flagged with input from the District Trails Specialist, Recreation Planner or Archaeologist. Crossing of the National and forest system trails will be done sparingly and only if no other alternative exists. Trail crossings would be restored to pre-project condition after use.
REC10	Forest restoration treatments within close proximity (i.e. 100'-200') of National or forest system trails would consider "feathering" the treatment so the visual impacts are more transitional than abrupt and as to not significantly change the character or experience of the trail.
REC11, SCN	Minimize using National and system trails as boundaries especially for visually different treatments.
REC12, SCN, H	Large, upright trail cairns and markers used on the Arizona National Scenic Trail or General Crook National Recreation Trail and other system trails must be protected. Locate cairns ahead of time. Logging operations will not damage the cairns or markers.
REC13, SCN, H	If National or system trails are determined to be necessary to be used as fire control lines, involve the District Recreation Planner, Trails Specialist or Heritage Specialist in preparation and post treatment of those lines.
REC14	Place warning signs on all trail access points and along trails where treatment activities are occurring. It is also appropriate to place warning signs at developed recreation sites to inform visitors.

REC15	If trails are temporarily closed due to harvesting, the trail tread will be cleared of all slash prior to reopening the trail.
REC16	Character trees that have unique shape or form along the Arizona Trail should be retained where feasible within the applicable prescription.
REC17	Coordinate with the District Recreation Planner or trails specialist to ensure well marked and publicized detour routes for the Arizona Trail, General Crook Trail and system trails during operational closures within the project.
Special Use Events	
REC18	Coordinated efforts would be made with sponsors of recreational special-use events (i.e. running or mountain biking races) to minimize the impacts of such proceedings within the project area during CWPP project implementation activities. Appropriate signage will be used to inform the public of logging or prescribed burning activities.
High Use Weekends and Holidays	
REC19	Efforts would be taken to limit forest treatment activities within the project area during high-use weekends and holidays (i.e. Memorial Day, 4 th of July, Labor Day, etc.); especially in locations where recreation based activities (i.e. trails, trailheads, etc.) occur.
Developed Recreation Sites	
REC20	Any vegetation treatments or prescribed burning in developed recreation sites would generally occur in fall, winter, or spring (low use recreational periods). All treatments in recreation sites would be designed to protect and enhance existing vegetative structure, while maintaining the character of the site. Work with the District Recreation Specialist to determine boundaries or no treatment zones around constructed features that need to be protected in the campgrounds. Treatments around the perimeter of the campgrounds are encouraged.
Temporary Closures	
REC21	Implement road closures, one-way traffic, and area closure restrictions as deemed necessary by forest officials for health and safety concerns during any operation. Notices and signs will be posted at key locations adjacent to and within the project area to inform forest visitors of the restrictions.

Scenery

Where applicable, scenery measures were combined with Recreation measures and are not duplicated here. Design features that apply to recreation and heritage resources scenery are noted.

Scenery Concern Levels

SCN1	<p>Concern Level 1 is where visitors have a primary concern for scenery. Concern Level 2 is where visitors have a moderate concern for scenery.</p> <p>Concern Level 1 Travel ways include the following: FR300, AZ87, FR95, FR751, FR751A, FR147A, and FR501.</p> <p>Concern Level 1 Recreation Use areas include the following: General George Crook Trail FS130, Arizona Trail FS87A, Fred Haught Trail FS141, Houston Brothers Trail, FS 171, Rock Crossing Trail FS18B, U-Bar Trail FS28, Barbershop Trail, FS91, Baker Butte Lookout, Moqui Lookout, Moqui Group Camp and Amphitheater, Blue Ridge Campground, C. C. Cragin Reservoir, East Clear Creek, Kehl Spring Campground, Long Valley Group Camp, Rock Crossing Campground, Potato Lake, McFarland Spring, Hay Meadow Trailhead, Jumbo Trailhead, Arizona Trail Trailhead at FR138 and General Springs Trailhead.</p>
SCN2	<p>Concern Level 2 Travel ways that have been defined include the following roads: FR141, FR95, FR751B, FR751D, FR751D, FR9033H, FR218, FR139, FR9729W and FR139A.</p> <p>Concern Level 2 Recreation Use areas include group event use sites at Aspen Spring at 139,139G, Oak Grove at FR 218, 218A; Long Valley Draw.</p>

Edges of Individual Units

SCN3	<p>Shape and/or feather the edges of treatment areas to avoid abrupt changes between treated and untreated areas.</p>
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Unit Marking

SCN4	<p>Directional mark trees within 300 feet of Concern Level 1 and 2 travel ways, trails, and recreation sites. Where multiple travel ways intersect determine the priority of marking prior to unit layout.</p>
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Road, Skid Trail and Landing Construction

SCN5	<p>New temporary roads, skid trails and log landings shall be located out of view of Concern Level 1 and 2 use areas to the extent possible. Screen log landings using existing vegetation and slash piles from view to the extent possible. If impacts are unavoidable prior to unit layout, coordinate with Recreation Planner or Landscape Architect to minimize impacts to areas of high scenic integrity.</p>
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SCN6	Highest priorities for slash treatment, temporary road closures, road decommissioning and landing rehabilitation will be placed on foreground (up to 300 feet) of developed recreation sites, private home, and concern level 1 roads (paved roads and passenger car level roads) and trails, especially those designated as national scenic or recreation trails.
Stump Heights and Slash Treatments	
SCN7	Stump heights shall be cut low with a 6" height maximum in the immediate foreground (300 feet) of CL1 and CL2 travel ways and in the foreground of recreation sites, private lands and trails.
SCN8	Unless used for erosion control or maintenance of soil productivity, slash on log landings must be burned or removed within 5 years.
SCN9, SW	Skid trails, slash piles and soil exposure shall be minimized to the extent possible from the seen areas of CL 1 and CL 2 travel ways and use areas.
SCN10	Slash must be treated or removed in the seen area immediate foreground CL1 and CL2 travel ways and use areas within 5 years.
SCN11, REC, H	Locations of landings and slash piles in seen areas CL1 and CL2 travel ways and use areas will be placed to minimize scenery effects and visual contrasts. The timber sale planner will coordinate with Scenery, Recreation and Archaeology specialists on locations of landings and piles.
Fire Control Lines	
SCN12	Restore control lines to a near undisturbed condition in the foregrounds (within 300 feet) of CL1 and CL2 travel ways, private lands and developed recreation sites.
Public Health and Safety	
The following measures are designed to: minimize impacts to campers and hunters during prescribed burns that coincide with hunting seasons; provide public information and notification about prescribed fire implementation; prevent injury or damage to private citizens, agency personnel, and or private property; and to prevent electrical power outages caused by management activities.	
HS1	Temporary gates may be necessary on some roads for public safety.
HS2	Notify the public by placing signs in conspicuous locations at least one week prior to and during prescribed burning. This would include maps of the boundaries of the scheduled burns.
HS3	Notify smoke-sensitive individuals and other private landowners in the area through the media (signs, newsletters, personal communication etc.) prior to prescribed burns.
HS4	Hazard trees felled along roads may be left for coarse woody debris where feasible.

Air Quality	
AQ1	The following measures are designed to minimize impacts to the Verde Valley, local residents, the Discovery Channel Telescope, and to forest visitors caused by heavy smoke conditions from prescribed burning.
AQ2	All burning would be coordinated daily with the Arizona Department of Environmental Quality (ADEQ). Burning would not take place on any portion of the project without prior approval from ADEQ. Coordination with ADEQ would take place through the Coconino National Forest Zone Dispatch Center and the Prescribed Burning Boss.
AQ3	Control the duration of heavy smoke conditions. The following guidelines would be initiated when heavy smoke conditions are occurring.
AQ4	Minimize burning when numerous consecutive days are predicted to have poor ventilation.
AQ5	Burning would be conducted early in the day or at night to allow heavy materials time to be consumed, and give smoke most of the day to disperse.
AQ6	Smoke from prescribed burning activities of adjacent districts and Forests would be considered in scheduling prescribe burn ignitions in the analysis area.
AQ7	Minimize burning on Saturday and/or Sunday unless ventilation is predicted to be good or better.
AQ8	Minimize smoke impacts to the Verde River Airshed and the highways of FH-3 and SR87. Burn with winds that will carry smoke away from the Verde River Airshed or reduce acreage burned unless safety of urban interface or Highways are compromised.
AQ9	Take advantage of spring burning where possible to minimize impacts to local air quality.
Cave and Karst Features	
CK1	Design site-specific no mechanical treatment (logging) protection buffers around cave entrances and karst sinkhole feature footprints, based on the characteristics and importance of the cave or karst features. Generally a 300 foot buffer would be used for all significant caves or potentially significant caves and for karst/pseudokarst sinkholes that contain openings, sinking or emerging streams. 100 and 50 foot buffers are applied on small sinkhole features with small openings or karst features that have no openings and are less susceptible to erosion or sedimentation. Protection buffers should be designed or reviewed by a geologist familiar with karst systems.
CK2	Existing roads may be used for mechanical harvest and hauling within buffers but no skid trails use should occur within buffers. Utilize erosion control measures (straw wattles, silt fences, etc.) to minimize road-related sedimentation into caves or sinkholes.
CK3	Aquatic Management Zone buffer strips will be used to minimize erosion and sedimentation within stream courses that lead into or emerge from caves, sinkholes and

	karst springs. The AMZ buffer should extend 1000 feet upstream or downstream of the karst feature or to where the channel ends if less than 1000 feet. The buffer should be 100 foot wide or 50 feet from the center of the channel.
CK4	Prescribed fire can occur within cave or karst feature buffers while meeting desired objectives for vegetation, soils, snags, down logs, etc. Management ignitions and fire control lines should not occur within karst features, the feature footprint or near cave openings.
Lands and Special Uses	
SU1	Notify the appropriate permit holder and office whenever land management activities are going to be implemented in areas having authorized infrastructure, facilities or data sites. Coordinate planned activities with the permit holder.
SU2	Ensure non-federal land boundaries are known and marked in advance of any activities or treatments near those lands.
SU3	Evaluate potential haul routes that may be needed through non-federal land and ensure easements are in place or obtained prior to use.
Utility Lines and Corridors, Underground Cables	
SU4	Coordinate management activities such as prescribed burning and mechanical thinning with the local utility contact.
SU5	Place project-generated slash outside of permitted utility line and pipeline rights-of-way; do not interfere with utility corridor management.
SU6	Vegetation treatments adjacent to poser line corridors will be designed to reduce linear edges and create a more irregular natural appearance outside of the right-of-ways.
Cragin Project Pipeline and Powerline	
SU7	The C.C. Cragin pipeline is a concrete and rebar reinforced pipe that was not designed to support the weight of heavy machinery. The buried depth of the pipe at most road-crossing locations does not provide enough weight disbursement to support heavy machinery crossing the pipeline. Mitigation measures in the form of steel plate or earthen berms and mounding for weight distribution over pipeline is required for any pipeline crossing intended to be utilized by heavy equipment.
SU8	The power lines that traverse the forest provide power to the water delivery facilities and may create overhead obstruction for logging equipment. Pipeline crossing mitigation plans and evaluation of power line height for timber harvest machinery must be submitted to SRP for review and approval prior to implementation or any activities (timber harvest, prescribed burning and equipment crossings).

SNOTEL and Snow Course Protection	
SU9	Implement a 100 foot buffer zone around a snow courses, data sensors, snow pillows or other meteorological facilities. No road construction or timber harvest is to occur within the buffer.
SU10	Conduct management activities such as prescribed burning, or hazard tree removal within the buffer zone in a manner that will protect site infrastructure from damage and will not diminish the value of the site, facility or the approved access to the site.
SU11	Notify the appropriate NRCS State Snow Survey Data Collection or Water Supply Specialist Office whenever land management activities are going to be implemented in areas having authorized snow courses or data sites.
State Highway 87	
SU12	Conduct management activities such as prescribed burning, hazard tree removal and mechanical thinning in a manner that will protect site infrastructure within the right-of-way from damage.
SU13	Coordinate planned mechanical thinning and prescribed burning activities with the Northcentral District (Flagstaff) of the Arizona Department of Transportation to ensure no interference with the safe operation of the roadway including requiring an operator to acquire an encroachment permit for activities with the right-or-way or for temporary access points to Highway 87.
Range Resources	
Infrastructure	
RG1	Protect range infrastructure from prescribed fire (e.g. by lining fence stays).
RG2	Upon completion of implementation, cattle guards would be cleaned to pre-implementation condition.
Timber Harvest and Prescribed Burning Implementation	
RG3	Coordinate implementation activities with range specialists when implementation would impact an active grazing allotment.
RG4	Vehicles passing through grazing pastures would close gates upon entering and exiting the area to ensure livestock remain in the correct pasture.

Project Monitoring

Mexican Spotted Owl

The revised Mexican Spotted Owl Recovery Plan (U.S. Fish and Wildlife Service 2012) provides guidance for vegetation and prescribed burning treatments and emphasizes the need for monitoring and feedback loops to allow management to be adaptive. Well-designed monitoring would provide valuable information on the effects of these activities on the owls and their habitat. A monitoring plan that would contribute to determining the effects of thinning and burning on Mexican spotted owls and their habitat would be implemented and follow methodologies similar to those developed for other projects that involved treatments in occupied owl habitat such as the Flagstaff Watershed Protection Project. The monitoring plan would include the details for sample selection, treatment specifics, measurement protocols including timing, and planned analyses. The monitoring plan will be reviewed as part of the consultation process for treatments planned to occur within PACs.

The proposed monitoring plan would pair treated and untreated (reference) PACs within the project area and compare occupancy rates, reproduction rates, and habitat changes. Reference PACs would match the environmental conditions in PACs where treatments are proposed, as closely as possible.

Appendix B, Forest Plan Amendments

Amendment 1. Mexican Spotted Owl Habitat Management

Adoption of language from the 2012 Revised Mexican Spotted Owl Recovery Plan (U.S. Fish and Wildlife Service 2012).

For this project the Forest Plan amendment utilizes some of the more updated management direction, language and definitions in the revised recovery plan where it is different than what is currently included in the Forest Plan.

Mechanical Treatment Up to 17.9” in Select PACs (3,018 acres)

This amendment allows for treatments to cut trees up to 17.9” dbh to reduce the potential for uncharacteristic wildfire and to improve habitat structure (nesting and roosting habitat) in 14 Mexican spotted owl PACs. Field reviews, data evaluation, and vegetation simulation modeling has indicated the 14 Mexican spotted owl PACs will move toward recovery plan desired conditions from mechanically cutting trees up to 17.9” dbh. Treatments up to 9” dbh are consistent with the current forest plan. See the wildlife specialist report “Methodology” section for complete details on the habitat evaluation process.

Removal of trees > 24” dbh in Mexican spotted owl restricted habitat (27 acres)

This site-specific amendment would allow for the removal of approximately 35 Ponderosa pine trees which are greater than 24” dbh in Mexican spotted owl restricted habitat. These trees are currently blocking the view from the Baker Butte Fire Tower, and thus limit the ability to detect and respond to wildfires in the project area and surrounding areas. Timely detection allows the suppression units to reach the fire in its initial stages and reduces the suppression costs and wildfire effects considerably. The current Forest Plan states that all trees greater than 24” dbh in Mexican spotted owl restricted habitat should be saved. However, without the removal of these trees, the detection of wildfires is greatly limited, increasing the potential for large high-intensity wildfires in the project area and other areas surrounding the tower. Thus, it is within the project purpose of reducing the risk of uncharacteristic wildfires within the project area, to improve the detection and potential response time to wildfire in the area and to reduce the potential for small wildfires becoming large, high-severity wildfires.

Prescribed Fire within 26 PAC Core Areas (About 2,600 acres)

Approximately 26 Mexican spotted owl core areas would be treated with prescribed fire to meet the project purpose and need. By definition, PAC habitat and especially core areas have high fuel loading and the uncharacteristic accumulation of ground fuels puts them at further risk. Reducing fuels to reduce the risk of high-severity fire in these important habitats would contribute toward conservation of this threatened species. The amendment (allowing low intensity prescribed burning within the 100-acre core area) would eliminate the need for hand line and/or dozer line construction, allow for the maximum number of surrounding PAC acres to be treated with prescribed fire, and would potentially minimize ground disturbance to PAC habitat. Reducing fire risk in core areas is consistent with the direction in the Mexican spotted owl recovery plan, “Planned ignitions (prescribed fire) and unplanned ignitions (wildland fire) should be allowed to enter cores only if they are expected to burn

with low fire severity and intensity. Fire lines, check-lines, backfiring, and similar fire management tactics can be used to reduce fire effects and to maintain key habitat elements (e.g., hardwoods, large downed logs, snags, and large trees)” (revised Mexican Spotted Owl Recovery Plan (U.S. Fish and Wildlife Service 2012:263).

Monitoring changes in owl populations and habitat

Monitoring assesses the effectiveness of management actions and provides the adaptive framework for more successful management guidelines. Monitoring habitat allows for modeling future forest conditions to determine if there will be adequate habitat to support Mexican spotted owl populations. Occupancy, reproduction and habitat monitoring and final project design for all activities in all Mexican spotted owl habitat was developed in consultation with the U.S. Fish and Wildlife Service for recently approved projects such as the Four Forest Restoration Initiative Environmental Impact Statement, and the Flagstaff Watershed Protection Project. These monitoring plans include a new strategy absent in the 1987 Forest Plan for considering and incorporating information on recent thinning and burning treatments into future thinning and burning activities in owl habitat. To build on this monitoring and adaptive management efforts, the project will comply with the biological opinion that has been developed in consultation with the U.S. Fish and Wildlife Service for monitoring of Mexican spotted owl.

Amendment 2. Management of Canopy Cover and Ponderosa Pine with an Open Reference Condition within Goshawk Habitat

Amendment 2 clarifies existing direction related to managing canopy cover and interspace in the forest plan in areas to be managed according to the guidelines for the northern goshawk. The purpose of amendment is to bring the project into alignment with the best available science (Tuten et al. 2015; Reynolds et al. 2013) that provides desired conditions for restoring fire-adapted ponderosa pine in the Southwest and thus reduces the risk of high-intensity wildfire and post-fire watershed impacts. In the “Vegetation Management – Landscapes Outside Goshawk Post-fledging Family Areas” and “Vegetation Management –Within Post-fledging Family Areas” section of the 1987 Forest Plan, a site-specific, plan amendment will: (1) add the desired percentage of interspace within uneven-aged stands to facilitate restoration, (2) add the interspace distance between tree groups, (3) add language clarifying where canopy cover is and is not measured, (4) allow about 8,542 acres to be managed for an open reference condition which affects canopy cover guidelines for VSS 4 through VSS 6 groups and reserve trees, and (5) add a definition to the forest plan glossary for the terms interspaces, open reference condition, and stands.

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