This project was initiated in 2011, as part of the Zuni Mountain Priority Landscape set forth in the Forest Leadership Team (FLT) priorities as an extension to the Bluewater Landscape Restoration Project. The FLT, Mount Taylor Ranger District, New Mexico Game and Fish Department, the Zuni Mountains Collaborative group and Mount Taylor Landscape Team have recognized the need for landscape scale restoration and building mutually beneficial, cross jurisdictional working relationships. The purpose of this project will include vegetation treatments for wildlife habitat and watershed improvement, and water developments while protecting community, cultural and natural resources at a landscape scale. The appropriate level of documentation (EA or EIS) will be based on the initial analysis and comments received from the public.

The Puerco Landscape Restoration Project is a planning effort designed to restore forest resiliency and ecosystem function to ponderosa pine, mixed conifer and pinyon-juniper forests across the western Zuni Mountains of the Cibola National Forest (NF). In 2003, the Record of Decision for the Bluewater environmental impact statement (EIS) for the eastern portion of the Zuni Mountains of the Cibola NF was signed. The Puerco Landscape Restoration Project continues that ecosystem restoration effort on about 81,000 acres covering the western portion of the Zuni Mountains on the Mount Taylor Ranger District of the Cibola NF. The project area includes portions of Cibola and McKinley Counties.

The analysis area, which is approximately 81,000 acres in size, is located in the Zuni Mountain Unit of the Mount Taylor Ranger District on the Cibola NF&G. Management Areas included within the Puerco Project are described in Table 1.

Table 1. Management Areas.

<table>
<thead>
<tr>
<th>Management Area (MA)*</th>
<th>Management Emphasis</th>
</tr>
</thead>
<tbody>
<tr>
<td>MA 8 – Ponderosa Pine Suitable Timberlands 33,590 acres</td>
<td>The primary management emphasis is on regulated even-aged timber management. Slash from timber harvests will be made available to the public as firewood. Opportunity for dispersed and developed recreational experiences will increase through new construction and rehabilitation of existing facilities. Wildlife habitat will be enhanced through structural and nonstructural improvements and through coordination of timber management activities. Grazing use will be balanced with grazing capacity.</td>
</tr>
<tr>
<td>MA10 – Mixed Conifer Suitable Timberlands 156 acres</td>
<td>Primary emphasis is on wildlife, especially those species favoring late successional stage vegetation. Grazing use will be balanced with grazing capacity.</td>
</tr>
<tr>
<td>MA 13 - No Capacity Rangelands</td>
<td>The primary emphasis is on wildlife management activities. Wildlife habitat carrying capacity will increase through structural and nonstructural improvements. Firewood will be provided as a result of wildlife management practices.</td>
</tr>
<tr>
<td>--------------------------------</td>
<td>--------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>12,382 acres</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>MA 14 – Full Capacity Rangelands</th>
<th>Pinyon-juniper will be managed for personal use and commercial firewood. Grazing use will be balanced with capacity. Wildlife habitat will be enhanced through structural and nonstructural improvements and from integrating range and firewood management activities with wildlife habitat needs. Zuni Bluehead Sucker habitat will be protected. Maintenance and protection of sensitive soils is an important management objective.</th>
</tr>
</thead>
<tbody>
<tr>
<td>28,600 acres</td>
<td></td>
</tr>
</tbody>
</table>

*MA acres do not add up to the project area total because of acres that have been subsequently acquired by the Cibola National Forest, such as Tampico Springs Ranch.

**Purpose of and Need for Action**

The purpose and need for the Puerco Landscape Restoration Project was determined by comparing the existing conditions in the project area to the desired conditions in the land and resource management plan (forest plan) related to forest and ecosystem function and resiliency. In addition, relevant research, the best available science and information, and the landscape restoration criteria found in the Omnibus Public Land Management Act of 2009 (P.L. 111-11, Title IV Forest Landscape Restoration) were used to develop the purpose and need. These criteria for landscape-scale restoration address community, wildlife habitat, and forest protection while retaining as many large trees as possible.

The purpose of the Puerco Project is to reestablish and restore forest structure and pattern, forest health, and vegetation composition and diversity in forest ecosystems to conditions within the natural range of variability, thus moving the project area toward the desired conditions. The outcome of improving structure and function is increased ecosystem resiliency. Resiliency allows for the ability of an ecological system to absorb disturbances, such as fire, insects and disease, and climate change, while retaining the same basic structure and ways of functioning and the capacity to adapt to stress and change (FSM 2020.5). This project is needed to:

- Increase forest, shrubland and grassland resiliency, sustainability
- Reduce the risk of uncharacteristic fire effects
- Improve wildlife and aquatic species habitat
- Improve the condition and function of watersheds
- Improve the condition and function of riparian areas, wet meadows, streams, and springs
- Preserve cultural resources

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1The Cibola NF is in the midst of revising its plan, this project will apply the 1985 Cibola Forest Plan (as amended), and is expecting to have a final revised plan in 2018, but will incorporate Draft Revised Forest Plan guidance where it does not conflict with the existing Forest Plan direction.
**Forest Resiliency and Sustainability.** Resiliency increases the ability of the pinyon-juniper woodlands, ponderosa pine and mixed conifer-frequent fire forest types to survive natural disturbances and stressors such as fire, insect and disease outbreaks, and climate change (FSM 2020.5). There is a need to restore the frequent low-severity fire regimes in which the forest in the Puerco Project area evolved. The Puerco Landscape Restoration Project is expected to move over 50,000 acres toward comprehensive, landscape-scale restoration.

There is a need to move tree group pattern, interspaces, and stand density toward the natural range of variability. This is a sum of reference conditions that provides a mix of open, moderately closed, and closed canopy conditions at the fine (group) to landscape (ponderosa pine forest cover type) scales as defined by the Forest Plan. There is a need to manage forest density, structure, and composition to increase forest health and reduce adverse effects from bark beetles or dwarf mistletoe, while also providing a diversity of habitat types and features. In the oak woodland and shrubland forest types, there is a need to stimulate new growth, maintain vigor in large-diameter trees, encourage faster growth in young smaller oaks, and provide for a variety of shapes and sizes of trees across the forest cover types. Where aspen is found in the frequent fire forest cover types, there is a need to stimulate growth, reduce conifer encroachment, and increase individual tree recruitment. In grassland forest cover types, there is a need to reduce or remove tree encroachment, which has decreased the size and function of these systems that were historically grasslands and savannas.

There is a need to improve the condition of native plant communities, improving the resiliency of rare species. There is also a need to improve understory vegetation to provide food and cover for wildlife where it is absent under dense forest stands where fire has been excluded.

The Puerco Project includes extensive areas where the ponderosa pine and mixed conifer forest cover types interface with the pinyon-juniper and deciduous oak woodland types. Because of this close association, treatments may be needed in these other forest cover types to facilitate and increase the effectiveness of treatments to restore the frequent fire forest structure.

**Uncharacteristic Fire Effects.** There is a need to reduce the risk of uncharacteristic fire behavior and effects, which currently pose a threat to ecosystem function and services, and human safety, lives, and values. Restoring forest, grass and shrubland structure will decrease the risks of post-fire flooding and debris flows that cause loss of soil productivity, water quality, and watershed function. Reducing the potential for uncharacteristic fire effects and reducing excessive fuel loadings will protect wildlife and aquatic species habitat, including areas within and adjacent to Mexican spotted owl habitat. Protected activity centers (PAC) currently contain high fuel loadings due to limited disturbance or management.

**Wildlife and Aquatic Species Habitat.** There is a need to move the Puerco Project area toward desired conditions for snags, coarse woody debris, forest structural stages, and stream habitat complexity that are currently deficit. There is a need to retain as many old and large trees as possible, recognizing the ecological and socio-political importance of these trees. Where restoration activities occur in the ponderosa pine and dry mixed conifer forest types, there is a need to maintain and promote the development of old growth characteristics and components. There is a need to maintain or improve aquatic habitats to meet the needs of aquatic species, recognizing the ecological and socio-political importance of these streams and associated riparian areas.

The Zuni Bluehead Sucker is listed as an endangered species in New Mexico with 9.7 miles of critical habitat designated within the project area in Agua Remora, Rio Nutria and Tampico
Creek drainages. Habitat management objectives and aquatic/riparian species protection measures from the approved Zuni Bluehead Sucker Recovery plan will be applied to all activities.

**Streams and Springs.** There is a need to improve the condition and function of riparian areas, wet meadows, streams, and springs in the Puerco Project area in order to sustain these features and aquatic habitat. Reducing road density and improving road and stream crossings would maintain natural flow regimes, provide connectivity for aquatic species and habitats, and reduce sedimentation. Approximately 2 miles of the Agua Remora drainage within the Puerco Project area has been designated as an eligible wild and scenic river because of outstanding remarkable values related to fish populations (Zuni Bluehead Sucker). In eligible rivers with “wild” classifications, cutting of trees and other vegetation shall not be allowed except when needed in association with a primitive recreation experience, to protect users (including hazard tree removal or trail maintenance), or to protect identified outstandingly remarkable values.

**Roads.** There is a need to have adequate access for project implementation, but then decommission unauthorized routes identified during project implementation or the district Travel Management Rule review processes after use.

**Cultural Resources.** There is a need to reduce threats to cultural resources caused by overly dense vegetation and soil erosion. Though most archaeological sites can tolerate low severity fire, all are very vulnerable to the effects of high severity fire in unnaturally high fuel loads and to the soil loss that occurs in post-fire flooding. In particular, there is a need to reduce fuels accumulation around cultural resources to reduce threats to these non-renewable resources.

**Water Developments.** There is a need to improve distribution of water developments to benefit range and wildlife across the four allotments covered under this analysis. Many of these developments are not functional and are degrading the riparian ecosystems associated with them. Improved design and alternative water sources are needed to reduce impacts and move toward desired conditions.

**Watershed Improvements.** There is a need to improve watershed condition in the project area, which has been impacted by unnatural fire regimes, poor soil conditions, impaired riparian conditions, road and trail impacts, and range conditions. There is a need to implement vegetation treatments that will restore natural fire regimes, and for other projects that will address other factors contributing to impaired watershed conditions.

**Plan Amendments.** To meet the project’s purpose and need, the existing Cibola Forest Plan would need to be amended to provide for areas of grass, forbs, and shrubs interspersed with tree groups and allow for treatments to move tree group patterns, interspaces, and stand density toward the natural range of variability. Amending the forest plan would allow for treatments that improve Mexican spotted owl nesting and roosting habitat as defined in the Revised 2012 Mexican spotted owl recovery plan. Amendment(s) to the Cibola Forest Plan would provide consistency in meeting desired conditions for ponderosa pine – Gambel oak and mixed conifer forest types across the Puerco Project area.

Tables 2 and 3 display project area acreage by existing vegetation cover type and existing conditions, while Figure 1 displays the general location of the existing vegetation cover types.
Existing Conditions

Table 2 - Acres of Existing Vegetation

<table>
<thead>
<tr>
<th>Vegetation Cover Type</th>
<th>Approximate Acres</th>
</tr>
</thead>
<tbody>
<tr>
<td>Quaking Aspen</td>
<td>14</td>
</tr>
<tr>
<td>Dry Mixed Conifer (frequent fire)</td>
<td>569</td>
</tr>
<tr>
<td>Ponderosa Pine</td>
<td>25,959</td>
</tr>
<tr>
<td>Ponderosa Pine-Gambel Oak</td>
<td>14,791</td>
</tr>
<tr>
<td>Pinyon-Juniper Woodland</td>
<td>25,701</td>
</tr>
<tr>
<td>Rocky Mountain Juniper</td>
<td>3,184</td>
</tr>
<tr>
<td>Grasslands/Shrublands</td>
<td>7,407</td>
</tr>
<tr>
<td>Other (Deciduous oak woodland, Miscellaneous Hardwoods and Non-stocked Forestlands)</td>
<td>3,359</td>
</tr>
<tr>
<td></td>
<td><strong>80,984</strong></td>
</tr>
</tbody>
</table>

The forested landscapes in the Puerco project area are highly departed from their desired conditions, lacking desired multi-storied structure, spatial arrangement, and are very dense as measured by basal area, trees per acre and percent canopy cover (Table 3). Because of the existing conditions most forest and woodlands in the project area are prone to uncharacteristic disturbances such as active crown fire behavior, insects and disease, and climate change. Other cover types, such as deciduous oak woodland, would also receive treatments to move toward desired cover types, improve wildlife habitat, reduce uncharacteristic fire risk, or restore natural fire regimes.

Table 3 - Average Existing Stand Conditions

| Existing Vegetation Cover Type                  | Basal Area/Acre (ft²) | Trees per Acre | Trees per Acre (5”+) | Trees per Acre (18”+) | Average Diameter (QMD 5”+)
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Mixed Conifer</td>
<td>138</td>
<td>2,900</td>
<td>227</td>
<td>7</td>
<td>9.6</td>
</tr>
<tr>
<td>Ponderosa Pine</td>
<td>119</td>
<td>1,503</td>
<td>167</td>
<td>9</td>
<td>11.4</td>
</tr>
<tr>
<td>Ponderosa Pine-Gambel oak</td>
<td>127</td>
<td>1,513</td>
<td>167</td>
<td>10</td>
<td>10.7</td>
</tr>
<tr>
<td>Pinyon-Juniper</td>
<td>116</td>
<td>1,103</td>
<td>152</td>
<td>10</td>
<td>11.2</td>
</tr>
<tr>
<td>Rocky Mtn. Juniper</td>
<td>127</td>
<td>1,932</td>
<td>171</td>
<td>9</td>
<td>11.0</td>
</tr>
<tr>
<td>Deciduous Oak</td>
<td>121</td>
<td>2,428</td>
<td>162</td>
<td>6</td>
<td>10.0</td>
</tr>
</tbody>
</table>

²Quadratic Mean Diameter (QMD) is the diameter of the tree of average per tree basal area, which is considered more appropriate than arithmetic mean for characterizing a group of measured trees.
³Crowning Index is the open wind speed at which fully active crown fire is possible.
Figure 1 – Approximate Distribution of Existing Vegetation
Several different fire regimes are represented across the project area, ranging from frequent low-intensity fires that historically occurred in ponderosa pine and dry mixed conifer (Fire Regime I: 0-35 year frequency) to mixed severity and stand replacing fires that occurred in pinyon-juniper woodlands Fire Regime III-V: 35-100+ year frequency). Currently, across much of the project area, fuel loading and tree densities are such that mortality would be high in the event of a wildfire burning under undesirable conditions. The average crowning index across the project area is 35 miles per hour, which is fairly typical on spring day in the Zuni Mountains. In the grass and shrublands of the Puerco project, fire has been excluded and conifers have encroached into these naturally open areas, decreasing their size and function.

Quaking aspen in the Puerco project area does not occur in large pure stands, and is dying or rapidly declining due to the combined effects of conifer encroachment, browsing, insects, disease, and lack of fire disturbance. Aspen and willows provide habitat for songbirds and small mammals, as well as soil and stream bank stability, and are also declining in health, vigor, and number in the project area.

Many riparian streams in the Puerco project area are currently non-functioning or functioning-at-risk, due to a lack of adequate vegetation, landform, and woody material needed to filter sediment, dissipate stream energies, and support recharge to groundwater. Restoration is needed to restore the functionality of these streams, reestablishing former drainage patterns, restoring appropriate vegetation, woody material, and returning fire to the system (prescribed fire). Impaired intermittent and ephemeral stream channels are also in need of restoration, including reducing tree encroachment and noxious weeds, revegetating, and repairing headcuts.

At least 12 springs in the Puerco project area exhibit downward trends or static-degraded conditions. The condition and function of these springs needs to be improved to sustain these features.

Approximately 2 miles of the Agua Remora drainage has been designated as an Eligible Wild and Scenic River during the Cibola National Forest’s Plan Revision process. Wild and Scenic Rivers are managed to protect or enhance existing outstanding remarkable values and classifications until designated or released from consideration. Agua Remora is eligible for fish population(s) and outstandingly remarkable values. Agua Remora is home to the Zuni Bluehead sucker population, a Federally-endangered species for which Agua Remora is one of only 3 locations where the species can still be found in the state of New Mexico and thus represents a nationally important population of this indigenous species. Approximately 602 acres of the Puerco project are included within the eligible wild and scenic river designation. Of this, 524 acres (87%) are also included within MSO PACs or on slopes exceeding 40%.

Existing recreation infrastructure including but not limited to campgrounds, picnic areas, and lookout would be assessed to determine if their current location and design and condition facilitate movement toward desired conditions. Vegetation management that meets recreation scenery management objectives would also be analyzed within and around:

- McGaffey and Quaking Aspen Campgrounds
- McGaffey McKenzie Picnic Area and McGaffey Group Picnic Site
- McGaffey Lookout
- Strawberry Canyon Trailhead
- Hillso Trailhead

There are numerous water developments and infrastructure investments throughout the project area, including windmills, water tanks, stock troughs and corrals. Many of the existing developments are not functional and are contributing to the degradation of watersheds and the riparian ecosystems associated with them. Improved design and alternative water sources are needed to reduce impacts and move toward desired conditions.

There are approximately 200 miles of unauthorized roads that have been identified within the project area which are contributing to the degradation of watersheds, riparian ecosystems, wildlife habitat, and cultural resources. Many of these unauthorized roads provide access to areas that are currently departed from desired conditions. These roads would be assessed for decommissioning, potential reroutes to mitigate resource damage or to maintain continued motorized access.

**Desired Conditions**

Desired condition acres for each vegetation cover type were determined from Terrestrial Ecosystem Unit Inventory (TEUI) data collected from the Cibola National Forest. The terrestrial ecosystem survey maps ecosystems across landscapes based on climate, geology, soils, and late-successional vegetation. The major concept underpinning this system is that climate, geology, soils, and vegetation are interrelated and form repeating combinations across the landscape that can be classified and mapped (Abella et al, 2011). Data provided from individual TEUI map units, in conjunction the Cibola Land and Resource Management Plan (LRMP) (USDA 1996) direction were used as a guide to develop desired conditions for species composition and vegetation cover type across the project area. Figure 2 displays the general location of the desired vegetation cover types. Table 4 displays the desired distribution of desired vegetation cover types based on the TEUI.

**Table 4 - Acres of Desired Vegetation**

<table>
<thead>
<tr>
<th>Vegetation Cover Type</th>
<th>Approximate Acres</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dry Mixed Conifer (frequent fire)</td>
<td>776</td>
</tr>
<tr>
<td>Ponderosa Pine</td>
<td>24,969</td>
</tr>
<tr>
<td>Ponderosa Pine-Gambel Oak</td>
<td>15,033</td>
</tr>
<tr>
<td>Ponderosa Pine / P-J Mix</td>
<td>13,403</td>
</tr>
<tr>
<td>Pinyon-Juniper Woodland</td>
<td>18,544</td>
</tr>
<tr>
<td>Grasslands (Non-forest)</td>
<td>8,237</td>
</tr>
<tr>
<td>Riparian Meadow</td>
<td>22</td>
</tr>
<tr>
<td></td>
<td><strong>80,986</strong></td>
</tr>
</tbody>
</table>
Figure 2 – Approximate Distribution of Desired Vegetation
Overall desired vegetation conditions for the entire project area are for the composition, structure, and function of vegetative conditions to be resilient to the frequency, extent and severity of disturbances and climate variability. The mosaic of tree groups generally comprises an uneven-aged forest with all age classes present. Fires burn primarily on the forest floor and do not spread between tree groups as crown fire. Desired conditions for other resources will largely be maintained or improved by vegetation management and prescribed fire treatments designed to meet desired conditions, and these restoration activities would be implemented so that they would not increase departure of the associated natural resources.

Ponderosa Pine:
Within the ponderosa pine forest type the desired condition would be to provide goshawk habitat that is consistent with the northern goshawk guidelines (Cibola Land and Resources Management Plan (LRMP), page 71-5; Management Recommendations for the Northern Goshawk in the Southwestern United States, General Technical Report RM-217. 1992).

Tree density within forested areas generally ranges from 22 to 89 square foot basal area per acre (Reynolds et al. 2013). Size of tree groups typically is less than 1 acre, but averages 0.5 acres. Groups at the mid- to old-age stages consist of 2 to approximately 40 trees per group. Ground cover consists primarily of perennial grasses and forbs capable of carrying surface fire, with basal vegetation values ranging between about 5 and 20% depending on the TEUI unit (USDA Forest Service 1986, 2006).

Overall the desired conditions include:

- Managing for uneven-age stand conditions for live trees to include tree groups and openings
- Retaining all trees 24” diameter at breast height (DBH) and greater, regardless of health or condition.
- Retaining live reserve trees, snags (2/acre), large downed logs (3/acre), and woody debris levels (5-7 tons/acre) throughout woodland, ponderosa pine
- Managing for old age trees such that as much old forest structure as possible is sustained over time across the landscape
- Sustaining a mosaic of vegetation densities, age classes, canopy gaps and species composition across the landscape
- Maintaining a range of Vegetation Structural Stages (“VSS”, or growth stages of living trees) - treatments would strive to achieve, over time, a VSS distribution of 10% VSS 1 (grasses, forbs, and shrubs); 10% VSS 2 (seedlings and saplings; 1”-4.9” DBH); 20% VSS 3 (young forest; 5”-11.9” DBH); 20% VSS 4 (mid-aged forest; 12”-17.9” DBH); 20% VSS 5 (mature forest; 18”-23.9” DBH); and 20% VSS 6 (old forest; 24”+ DBH) across the landscape.
- Within Goshawk Post Fledgling Family areas (PFAs) and dispersal PFAs, residual basal area per acre (ft²) would contain 10 percent or greater due to habitat needs compared to foraging areas (lands outside PFAs).
- Goshawk nest areas would consist of, or be managed to attain, a minimum 30-40 TPA in a size class distribution of VSS 5 (18-23.9” DBH) and/or 6 (24”+ DBH).
- On 20% of the desired 24,969 acres of ponderosa pine acres (approximately 4,994 acres) the desired condition will be to develop and maintain old growth conditions as defined in
the LRMP Forest Wide Standards and Guidelines, page 66, Table “The Minimum Criteria for the Structural Attribute Used to Determine Old Growth” These areas would be designated during the environmental analysis process.

- Temporary openings, for regeneration purposes, up to four acres with a maximum width of 200 feet exist on approximately 10% of the area. Three to five reserve trees per acre are maintained in these openings. Two large snags and three large logs per acre exist. Five to seven tons of woody debris is retained.

Forest conditions in goshawk post-fledging family areas (PFAs) are similar to general forest conditions except these forests contain 10 to 20 percent higher basal area in mid- to old-age 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. Figure 3 displays the general arrangement of leave groups and rooting zones that would remain after treatment. Not shown are the temporary openings created for regeneration purposes.

**Figure 3: Illustration of Desired Spatial Arrangement of Leave Groups**

![Figure 3: Illustration of Desired Spatial Arrangement of Leave Groups](image.png)

**Ponderosa Pine – Gambel Oak:**
This forest type would be treated similar to ponderosa pine, but additional emphasis placed on retaining and promoting the growth of additional large hardwoods (>5” diameter at root collar
(drc)), retention of ponderosa pine greater than 18” dbh, and retention large snags (>18” dbh) and downed logs (>18” dbh). Manage for at least 10% of total stand basal area (ft²) consisting of Gambel oak 5” DRC or greater, or 20 ft² of basal area per acre of Gambel oak. On 20% of the desired 15,033 acres of ponderosa pine – Gambel oak (approximately 3,007 acres) the desired condition will be to develop and maintain old growth conditions as defined in the LRMP Forest Wide Standards and Guidelines, page 66, Table “The Minimum Criteria for the Structural Attribute Used to Determine Old Growth” These areas would be designated during the environmental analysis process. Retain all trees 18” DBH and greater, per Mexican Spotted Owl recovery Plan (2012).

On a minimum of 10% of the 15,033 acres of desired pine-oak type (approximately 1,503 acres), manage for MSO Recovery Nest-Roost minimum desired conditions of:

- 30% of basal area in trees 12-18” DBH
- 30% of basal area in trees 18”+ DBH
- 110 square feet of basal area per acre
- 12 18”+ trees per acre.

**Dry Mixed Conifer (frequent fire):**

Dry mixed-conifer forests are dominated by shade-intolerant trees such as ponderosa pine, Douglas-fir, Southwestern white pine, quaking aspen, and other hardwoods. Trees typically occur in irregularly shaped groups, trees within groups are variably spaced, and group sizes generally range from a few trees up to about an acre in size, similar to ponderosa pine forest types.

Trees within groups are of similar or variable ages and groups are composed of one or more species. Crowns of trees within the mid-aged to old groups are interlocking or nearly interlocking. Size, shape, number of trees per group, and numbers of groups per area are variable. It is desirable that stands have an uneven-aged forest structure with an approximate balance of age classes ranging from young to old. Infrequently, stands of even-aged forest structure may be present. Surface fuels and small trees facilitate this fire regime. While fires burn primarily on the forest floor, occasionally individual trees or tree groups may torch. Crown fires rarely spread from tree group to tree group. Overall the desired conditions include:

- Managing for uneven-age stand conditions for live trees to include tree groups and openings. Trees typically occur in irregularly shaped groups and are variably-spaced with some tight clumps.
- Some natural openings contain individual trees or snags. Trees within groups are of similar or variable ages and one or more species. Size of tree groups typically is less than 1 acre.
- Crowns of trees within the mid- to old-age groups are interlocking or nearly interlocking. Interspaces surrounding tree groups are variably-shaped and comprised of a grass/forb/shrub mix. Groups at the mid- to old-age stages consist of 2 to approximately 50 trees per group.
- Openness typically ranges from 10 percent in more productive sites to 50 percent in the less productive sites.
• Tree density within forested areas generally ranges from 30 to 100 square foot basal area per acre.
• Managing for old age trees such that as much old forest structure as possible is sustained over time across the landscape. Retain all trees 18” DBH and greater.

On a minimum of 25% of the 776 acres of desired mixed conifer type (approximately 194 acres), manage for Recovery Nest-Roost minimum desired conditions of:

• 30% of basal area in trees 12-18” DBH
• 30% of basal area in trees 18”+ DBH
• 120 square feet of basal area per acre
• Twelve 18”+ trees per acre.

The acres managed for Recovery Nest-Roost will meet the LRMP Forest Wide Standards and Guidelines, page 66, Table “The Minimum Criteria for the Structural Attribute Used to Determine Old Growth”.

**Ponderosa Pine & Pinyon-Juniper Mix:**
These transition zones include a variable tree component that may range from sparse to relatively dense and may include any of the pinyon and juniper species, ponderosa pine and oak. It is desired to maintain uneven-aged conditions and sustain a mosaic of vegetation densities (overstory and understory), age classes, and species composition well distributed across the landscape. Overstory vegetation in trees ranges from about 15-50%, and ground cover consists of shrubs, perennial grasses, and forbs with basal vegetation values ranging between about 5 and 20% depending on the TEUI unit (USDA Forest Service 1986). Trees occur in even-aged patches ranging from young to old, where patch size of these woodlands ranges from 10s to 100s of acres (Muldavin et al. 2003). Retention of ponderosa pine will focus on the most vigorous and healthydominant and co-dominant trees in irregularly sized-groups and stringers, while removing mid-story ladder fuels. Where pinyon-juniper dominates, focus will be on thinning from below and restoring historic openings between tree groups.

**Ponderosa Pine** - Tree density within ponderosa pine dominated areas generally ranges from 22 to 89 square foot basal area per acre (Reynolds et al. 2013). Size of tree groups typically is less than 1 acre, but averages 0.5 acres. Groups at the mid- to old-age stages consist of 2 to approximately 40 trees per group. All trees 24” DBH and greater, regardless of health or condition, will be retained.

**P-J Woodland** – In areas dominated by P-J Woodland, trees occur as individuals or in smaller groups ranging from young to old. Typically groups are even-aged in structure with all ages represented across the landscape for an overall uneven-aged grouped appearance. Patch sizes of woodlands range from individual trees and clumps that are less than one-tenth acre, to tree groups of approximately an acre, and occasionally from 1 to 10s of acres.
On 20% of the desired 13,403 acres of Ponderosa Pine / P-J Mix (approximately 2,681 acres) the desired condition will be to develop and maintain old growth conditions as defined in the LRMP Forest Wide Standards and Guidelines, page 66, Table “The Minimum Criteria for the Structural Attribute Used to Determine Old Growth” These areas would be designated during the environmental analysis process.

**Pinyon - Juniper:**
The pinyon-juniper (P-J) vegetation community in the Puerco Project is primarily composed of P-J Woodland, with a small amount of P-J Grass. These are dominated by one or more species of pinyon pine and/or juniper and can occur with a grass/forb dominated understory (P-J grassland), or a discontinuous understory of some grasses and/or shrubs (P-J Woodland). Two-needle pinyon pine and One-seed juniper are common. Rocky Mountain and alligator junipers are well-represented, with a lesser abundance of oaks. Species composition and stand structure vary by location primarily due to precipitation, elevation, temperature, and soil type.

On 20% of 18,544 P-J acres (approximately 3,709 acres) the desired condition will be to develop and maintain old growth conditions as defined in the LRMP Forest Wide Standards and Guidelines found on page 66, Table “The Minimum Criteria for the Structural Attribute Used to Determine Old Growth” These areas would be designated during the environmental analysis process.

**P-J Woodland**- trees occur as individuals or in smaller groups ranging from young to old. Typically groups are even-aged in structure with all ages represented across the landscape for an overall uneven-aged grouped appearance. The patch size of woodlands ranges from 1 to 10s of acres.

**P-J Grass (Savanna)** - is generally uneven aged and open in appearance. Trees occur as individuals, but occasionally in smaller groups, and range from young to old. Patch sizes of woodlands range from individual trees and clumps that are less than one-tenth acre, to tree groups of approximately an acre (Muldavin et al. 2003).

**Grasslands/Shrublands:**
Approximately 8,237 acres of grasslandand shrubland types, based on TEUI, would be moved toward the following desired conditions:

**Sagebrush Shrubland** – Historically dominated by big sagebrush and primarily occurs adjacent to Great Basin grassland and pinyon juniper woodlands. While big sagebrush is the dominant species, other shrubs and grasses and forbs are present. Historically, tree canopy cover exceeded 10%, with the exception of early, post-fire plant communities (USDA 2015). The historic average fire return interval was 35–200 years from mixed-severity fire. Sagebrush shrubland is highly departed for vegetation structure, species composition, and patch size (too small), ecological need for change may hinge on restoring the historic mixed-severity fire regime.
**Colorado Plateau/Great Basin Grassland** - In general, found at lower elevations with vegetation coverage consisting of mostly grasses and interspersed shrubs. May have had over 10% shrub cover historically, but had less than 10% tree cover. The historic average fire return interval was 0–35 years from stand-replacing fire; however, most recent fires have been non-lethal. Departure is moderate with moderate–high risk from vegetation structure, high risk from altered fire regime, and high risk from decreased patch size, future management should strive to restore vegetation structure to reference conditions. In turn, this may simultaneously (either passively or actively) return fire regime and patch size to reference conditions (USDA 2015).

**Montane/Subalpine Grassland** - Occurs at elevations ranging from 8,000-11,000 feet, and often harbors several plant associations with varying dominant grasses and herbaceous species. Trees may occur along the periphery of the meadows, and some shrubs may also be present. These meadows are seasonally wet, which is closely tied to snowmelt. They typically do not experience flooding events. Historically, tree and shrub canopy cover were each less than 10% and stand-replacing fires occurred every 0–35 years. The most substantial risks are from a lack of frequent stand-replacing fire and patch size (currently highly departed; too small). May be considered especially sensitive to climate change, as it occurs at the highest elevations and is therefore incapable of uphill migration as a climate change response. Future management should use stand-replacing fire to reduce tree encroachment, increase patch size, and potentially restore species composition.

**Wildlife:**
- Native ecosystems are within reference conditions, are distributed throughout their potential range, and are sustainable across the Forest and able to support a full complement of native species.
- Habitat conditions and compatible multiple uses contribute to the recovery of federally listed species and the persistence of species of conservation concern.
- Habitat configuration and availability allow wildlife populations to adjust their movements in response to major disturbances (such as climate change and uncharacteristic fire) and promote genetic flow between wildlife populations across the Forest and beyond.

**Watersheds:**
- More than 50 percent of each 12 digit sub-watershed is in a satisfactory fire condition class as described in the watershed condition framework.
- No more than 20 percent of the forested land in each 12 digit sub-watershed should be at imminent risk of high levels of mortality due to insects and disease.
- Watersheds are not at risk due to the fuels composition and uncharacteristic disturbance.
- The hydrologic regime within a watershed is not impacted by the density and distribution of roads, trails, and impervious surfaces.

**Soils:**
- Soil condition is satisfactory, soil functions are sustained and soil is functioning properly. The ability of soil to maintain resource values and sustain outputs is high.
Vegetation contributes to soil condition, nutrient cycling, and hydrologic regimes at natural levels.

- Downed woody material occurs at levels (size, decay, and amount) sufficient to support soil productivity.
- Soils do not exhibit excessive rill, sheet, or gully erosion.

**Water Resources Features and Wetland/Riparian:**
- Riparian areas are in proper functioning condition and support higher ecological values.
- Sufficient reproduction of native species appropriate to the site is occurring to ensure sustainability.
- Native riparian plants such as willow (such as Bebb, peachleaf) are reproducing with all age classes present where the potential exists.
- Bank characteristics including vegetation are stable within the natural range of variability.
- In aquatic and riparian systems that evolved with wood near the streams, large woody material is present and continues to be recruited into the system at near natural rates.
- Springs, riparian areas, and wetlands have the necessary soil, water, and vegetation attributes to be healthy and properly functioning

**Puerco Aquatic Resources:**
- **Shade:** Shading over perennial and intermittent water surfaces that is at least 80 percent of natural levels.
- **Bank Cover:** Natural bank protection of at least 80 percent of natural levels. Stream bank stability provided by woody plant roots, particularly on outside bends of stream channel meanders.
- **Streambed Sedimentation:** Composition of sand, silt, and clays within streambeds should not exceed 20 percent of natural levels.
- **Habitat:** Aquatic pools are wet for longer periods of time to provide persistent habitat for aquatic species

**Puerco Riparian Vegetation Resource (where site is capable of supporting woody plants):**
- **Species Composition:** 60 percent of woody plant composition in three or more riparian species or as appropriate for the site.
- **Plant Structure:** Three age classes of riparian woody plants with at least 10 percent of the woody plant cover in the sprout seedling and sapling stages and 10 percent in the mature and over-mature.
- **Crown Cover:** Both trees and shrubs are at least 60 percent of natural levels.
- **Ground Cover:** Ground cover and litter for site and overstory conditions.

**Recreation Management:**
- The recreation program is integrated into all forest resource management decisions and activities and is adaptable to changes in recreation use and trends.
- Forest thinning and related actions are integrated with recreation and scenery objectives to enhance scenic quality, to impede future illegal motorized cross-country travel.
Vegetation management activities along road and trail corridors are designed to reinforce travel management objectives of keeping motor vehicles on the designated routes and prohibiting motorized cross-country travel by not opening up large swaths of ground without barriers along the corridors.

Provide high quality campground and picnic grounds with adjacent trail opportunities, sufficient screening, reduced overhead hazards, and a vibrant uneven-aged forest canopy.

**Scenery Management:**

- Scenery management, scenic character, and scenery values are integrated into the design, planning, and implementation of all resource management decisions.
- High quality scenery and scenic values are protected in areas of high public use, such as scenic byways, major roads and trails, and developed recreation sites.
- Scenic resources and scenic character reflect ecosystem diversity, enhance the recreation settings, and contribute to the quality of life of local residents and communities.
- The Agua Remora eligible wild and scenic river corridors managed to protect or enhance existing outstanding remarkable values and classifications until designated or released from consideration.
- Desired conditions for Agua Remora provide for the necessary ecological conditions to contribute to the recovery and maintenance or restoration of critical habitats for threatened and endangered species and integration of habitat management objectives and species protection measures from the most recent approved recovery plan.

**Range Management:**

- Livestock grazing and associated management activities are in balance with the needs of wildlife forage, watershed ground cover, natural fire regime, and resilience to climate variability.
- Herbaceous native plant communities occur within the natural range of variability.
- Range improvements minimize impacts to soil, watershed, and wildlife resources.
- Sustainable livestock grazing contributes to the long-term socioeconomic and diversity and stability of rural communities and the cultural identity tied in with traditional uses.

**Proposed Action**

To meet the purpose and need for the Puerco Landscape Restoration Project and move toward desired conditions, the Cibola National Forest proposes a combination of mechanical thinning, prescribed fire, and other restoration activities throughout the project area that would make forests, shrub and grasslands more resilient to natural disturbances such as fire, insects and disease, and climate change. Restoration activities are needed to maintain or restore structure and pattern, the desired fire regimes, and watershed and ecosystem function in ponderosa pine, frequent fire mixed conifer, ponderosa pine-Gambel oak, pinyon-juniper woodlands, riparian, shrub and grassland cover types, moving them toward conditions within the natural range of variability. Other existing cover types, such as deciduous oak woodland, may also receive
treatments to move toward desired cover types, improve wildlife habitat, reduce uncharacteristic fire risk, or restore natural fire regimes.

The proposed treatments will move these areas toward their desired conditions and help to reestablish functioning ecosystems that are sustainable and resilient. The proposed mechanical treatments (low thinning and uneven-aged selection cutting methods) are designed to establish openings and promote multi-aged stand structure, restore historic fire regimes, mitigate adverse effects of active crown fire, climate change and maintain or improve ecosystem health and function.

Implementing mechanical treatments and prescribed fire would decrease surface and canopy fuel loading, as well as ladder fuels in the immediate vicinity of desired trees and groups of trees. This would decrease potential fire-induced mortality in large and/or old trees, as well as in established seedlings and saplings needed to promote uneven-aged structure. Use of prescribed burning, particularly when combined with mechanical thinning, would reduce the potential for damage from wildfires (Fule et al 2012, Waltz et al 2014), as well as the costs associated with fire suppression.

Grass and shrubland restoration would include reducing or eliminating undesirable tree encroachment, and applying prescribed fire to reestablish historic fire regimes and vegetation composition. Spring restoration would include reducing tree encroachment and noxious weeds, returning fire to the system (prescribed fire), and placing protective barriers and/or planting.

Stream habitats and aquatic species depend upon perennial streams or reaches and their habitat is maintained by the watershed, soil, and riparian conditions within the ecosystem. Proposed stream habitat treatments may be needed within all or some portion of streams within the project area. Restoration treatments may include channel restoration (rock dams, grade control or induced meandering) and channel structural improvements (felling or girdling trees to provide large woody debris for cover and habitat complexity). All proposed riparian treatments would also improve or maintain stream habitat by restoring watershed function or resiliency. Treatments in watersheds may also improve soil condition, soil infiltration and subsurface flows.

To stimulate growth, recruit younger age classes, and increase individual recruitment of aspen and riparian species, competing conifers would be thinned from within and around existing aspen and willows where they occur within other vegetative cover types. Protective barriers may be placed around aspen and willows to reduce browsing and other disturbances, recruit younger age classes, increase populations, and retain these diverse habitats. Where monitoring indicates that recruitment of younger age classes is not sufficient, planting of appropriate species adapted to the growing sites would be considered.

Proposed treatment types are developed based upon the combination of existing conditions, soil condition and erosion hazard determined from Terrestrial Ecosystem Unit Inventory data. Table
4 displays proposed activities based upon current soil condition and erosion hazard. Where existing vegetation conditions are not highly departed from desired conditions, less intensive treatments such as hand thinning or burn only may be prescribed.

Restoration activities proposed for the Puerco Landscape Restoration Project include:

- Commercially thin trees and/or implement prescribed fire on approximately 43,200 acres.
  - Implement prescribed fire alone on approximately 3,750 acres.
  - Hand thin and and/or implement prescribed fire on approximately 20,415 acres
  - Mechanically thin or masticate and implement prescribed fire on approximately 13,000 acres.
  - Mechanically thin and/or implement prescribed fire on up to 2,850 acres of Mexican spotted owl (MSO) protected activity centers (PACs), up to 1,600 acres of MSO recovery habitat, and approximately 1,250 acres of northern goshawk post-fledging family areas (PFA).
  - Mechanically thin trees and/or apply prescribed fire on approximately 8,200 acres of grasslands.
  - Conduct thinning and/or burning on approximately 3,400 acres of other vegetation cover types to increase resiliency, and adjust species composition and structure toward desired forest cover.

- Decommission up to 200 miles of unauthorized roads.
- Improve road drainage and crossings.
- Restore approximately 12 springs.
- Restore up to 250 acres of riparian areas including associated stream habitats for threatened, endangered, and sensitive aquatic species.
- Improve the function of streams, including gullies.
- Improve soil condition by improving ground cover and woody material.
- Construct up to 70 miles of protective barriers around springs, aspen, and willows as needed for protection.
### Table 4 - Proposed Activities by Soil Condition and Erosion Hazard

<table>
<thead>
<tr>
<th>Soil Condition</th>
<th>Erosion Hazard</th>
<th>Potential Activities</th>
<th>Acres</th>
</tr>
</thead>
<tbody>
<tr>
<td>Satisfactory</td>
<td>Slight/Moderate</td>
<td>Mechanical or Hand Thinning, Mastication, Prescribed Burning, Public or Commercial Removal of Wood Products within ¼ mile of Roads</td>
<td>136</td>
</tr>
<tr>
<td>Satisfactory</td>
<td>Severe</td>
<td>Hand Thinning or limited Mechanical and Mastication, Prescribed Burning, Commercial Removal within ¼ mile of Roads, with rehabilitation of soils.</td>
<td>670</td>
</tr>
<tr>
<td>Impaired</td>
<td>Slight/Moderate</td>
<td>Mechanical or Hand Thinning, Mastication, Prescribed Burning, Commercial Removal within ¼ mile of Roads</td>
<td>57,677</td>
</tr>
<tr>
<td>Impaired</td>
<td>Severe</td>
<td>No Impaired/Severe Soil Types exist within Project Area</td>
<td>0</td>
</tr>
<tr>
<td>Unsatisfactory</td>
<td>Slight/Moderate</td>
<td>No Impaired/Severe Soil Types exist within Project Area</td>
<td>0</td>
</tr>
<tr>
<td>Unsatisfactory</td>
<td>Severe</td>
<td>Hand Thin only, Prescribed Burning, No Removal of Wood Products</td>
<td>22,501</td>
</tr>
</tbody>
</table>
Figure 5 - General Locations of Thinning and Prescribed Fire Treatments
Table 5 displays acres proposed to be thinned and/or burned by forest cover type. Figure 3 displays general locations for the proposed vegetation thinning and prescribed fire.

**Table 5 - Acres of Proposed Mechanical Treatments and Prescribed Fire by Cover Type**

<table>
<thead>
<tr>
<th>Vegetation Cover Type</th>
<th>Mechanical Treatment with Prescribed Fire</th>
<th>Prescribed Fire Only</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aspen</td>
<td>14</td>
<td>0</td>
</tr>
<tr>
<td>Dry Mixed Conifer</td>
<td>402</td>
<td>168</td>
</tr>
<tr>
<td>Ponderosa Pine</td>
<td>25,047</td>
<td>978</td>
</tr>
<tr>
<td>Ponderosa Pine-Gambel Oak</td>
<td>14,346</td>
<td>379</td>
</tr>
<tr>
<td>Pinyon-juniper Woodland</td>
<td>24,251</td>
<td>1,450</td>
</tr>
<tr>
<td>Rocky Mountain Juniper</td>
<td>2,877</td>
<td>307</td>
</tr>
<tr>
<td>Deciduous Oak Woodland/Other</td>
<td>3,090</td>
<td>269</td>
</tr>
<tr>
<td>Grassland/Shrubland</td>
<td>7,203</td>
<td>204</td>
</tr>
<tr>
<td><strong>Totals:</strong></td>
<td><strong>77,230</strong></td>
<td><strong>3,755</strong></td>
</tr>
</tbody>
</table>

Existing infrastructure including but not limited to water developments, fences, corrals and buildings would be inventoried and assessed to determine if their current location and design facilitate movement toward desired conditions. Alternative or additional locations or designs would be recommended where appropriate. Many water developments are not functional and are degrading the riparian ecosystems associated with them. Improved design and alternative water sources are needed to move toward desired conditions that increase water availability to wildlife and allow for better distribution of livestock to reduce overall impacts across the project area. To improve availability and distribution of water to benefit both range and wildlife species across the Puerco project, the following developments and improvements are proposed:

- Clean or reconstruct approximately 15 existing dirt tanks, and construct 2 new dirt tanks.
- Reconstruct approximately 15 miles of fence, and 1 corral.
- Install approximately 3 new cattle guards.
- Re-drill 3 existing wells and establish 3 new wells
- Install or extend 2 pipelines
The following table describes proposed treatments to meet the desired condition for each Forest Type based on soil conditions, location and slope:

<table>
<thead>
<tr>
<th>Product/Non-Product Removal Area</th>
<th>Treatment Type</th>
<th>Cutting Methods</th>
<th>Tree Removal</th>
<th>Slash Treatment</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Product Removal Area</strong></td>
<td>1 – Satisfactory soils with Slight/Moderate Erosion Hazard Rating on less than 40% slope: within 0.25 mile along national forest system (NFS) roads, NFS trails, or unauthorized roads. Approx. acres = 89.</td>
<td>Mechanical mastication</td>
<td>None where mastication occurs</td>
<td>Masticated material would be spread on site to a depth of 0”-4”, other cut material lopped and scattered to a depth of 18” max. Hand piles may be created where needed and piles will not exceed 10’x10’ Broadcast burning and/or pile burning when management prescription conditions are met.</td>
</tr>
<tr>
<td><strong>Non-</strong></td>
<td>3 – Satisfactory</td>
<td>Mechanical mastication</td>
<td>None</td>
<td>Masticated material would be spread on site to a depth of 0”-4”, other cut material lopped and scattered to a depth of 18” max. Hand piles may be created where needed and piles will not exceed 10’x10’ Broadcast burning and/or pile burning when management prescription conditions are met.</td>
</tr>
</tbody>
</table>
**Product Removal Area**

and Impaired soils outside 0.25 mile along NFS roads, NFS trails, or unauthorized roads. Approx. acres 13,010.

Chainsaws – contract or Forest Service Mechanized feller and/or prescribe burned only

other cut material will be lopped and scattered to a depth of 18” max. Hand piles may be created where needed and piles will not exceed 10’x10’. Broadcast burning and/or pile burning when management prescription conditions are met.

**Non-Product Removal Area**

4 – All areas with Unsatisfactory Soil Condition and less than 40% slope. Approx. acres 20,980.

Chainsaws – contract or Forest Service and/or Prescribe burned only

None

Cut material will be lopped and scattered to a depth of 18” max. Hand piles may be created where needed and piles will not exceed 10’x10’ Broadcast burning and/or pile burning when management prescription conditions are met.

**Non-Product Removal Area**

5 – All areas with greater than 40% slope regardless of Soil Condition or Erosion Hazard Rating. Approx. acres 3,792.

None- these areas would be prescribe burned only

None

None

**Table 7: Treatment Types**

<table>
<thead>
<tr>
<th>Non-Product Removal Area</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Slash Disposal:</td>
<td></td>
</tr>
<tr>
<td>Activity fuel such as bole wood, slash, hand piles, and mastication grindings would be treated as needed to meet fuels reduction, soil and scenic quality objectives through prescribed broadcast and/or pile burning when conditions allow for safe and effective burning. All prescribed burning would comply with Cibola and McKinley County air quality regulations and will be approved through appropriate permitting processes and under approved burn plans.</td>
<td></td>
</tr>
<tr>
<td><strong>Plan Amendments</strong>: To meet the project’s purpose and need, the existing Cibola Forest Plan would need to be amended to provide for areas of grass, forbs, and shrubs interspersed with tree groups and allow for treatments to move tree group patterns, interspaces, and stand density toward the natural range of variability. Amending the forest plan would allow for treatments that improve Mexican spotted owl nesting and roosting habitat as defined in the Revised 2012 Mexican spotted owl recovery plan. Amendment(s) to the Cibola Forest Plan would provide consistency in meeting desired conditions for ponderosa pine, ponderosa pine – Gambel oak and mixed conifer forest types across the Puerco Project area.</td>
<td></td>
</tr>
<tr>
<td><strong>Additional Implementation Design Criteria</strong></td>
<td></td>
</tr>
</tbody>
</table>
Migratory Bird Recommendations:
This project would be implemented in phases so that restoration activities and wood product removal can occur while providing mitigation for the unintentional take of migratory birds. The recommended Migratory Bird timing restriction for no management activity is from April 1st-July 31st. This timing restriction would be implemented annually on 2/3 of the project area, while on 1/3 of the project area activity would occur throughout the year.

Communities adjacent to this project area are heavily dependent on forest products gathered from the Cibola NF for subsistence and livelihood. Due to the high demand for personal use fuelwood and annual operating restrictions through periods of shut down caused by weather; the Cibola NF recognizes there is a need to have areas for these communities to work in throughout the year. In these areas it is recognized that unintentional take of migratory birds could occur. To minimize and mitigate this unintentional take the Cibola NF proposes to divide each geographic area into three implementation phases. Mechanical management activities would occur annually only within one implementation phase for each geographic area during the Migratory Bird timing restriction.

Mexican Spotted Owl:
Implementation of any of the proposed activities within Mexican Spotted Owl Protected Activity Centers and Nest Core would occur from March 1st - August 31th. Where surveys have not been completed, potential habitat (mixed conifer and pine-oak) would be treated as if they were occupied and buffered by ¼ mile during the breeding season. Replacement Nest-Roost habitat will be designated prior to implementation and managed in accordance with direction from the applicable MSO Recovery Plan.

Northern Goshawk:
Implementation of any of the proposed activities within northern goshawk PFA’s and Nest Areas would occur from March 1st - September 30th.

Dispersal PFAs will be designated based on LRMP direction, page 71-7 by the District Biologist and Forest Silviculturist, using the best available inventoried or imputed stand data. No timing restriction would apply in these areas, however the desired condition for PFAs would be maintained or enhanced within all designated dispersal PFAs during project implementation.

Zuni Bluehead Sucker:
Primary threats are elevated siltation, sedimentation and decreases in run and run-pools. These threats may be exacerbated with increased development in areas affected by potential treatments proposed in the project area, which may impact groundwater and surface water flows. Implementation of any of the proposed activities within Zuni Bluehead Sucker habitat will be governed by direction from the Cibola National Forest’s proposed Forest Plan related to Eligible Wild and Scenic Rivers. Specifically, cutting of trees and other vegetation shall not be allowed except when needed in association with a primitive recreation experience, to protect users (including hazard tree removal or trail maintenance), or to protect identified outstandingly remarkable values

Heritage/Cultural Resources:
All proposed mechanical activities would avoid inventoried heritage resources and no disturbance of these resources would occur, unless appropriate mitigation measures are in place prior to treatment.
Prescribed burning activities would avoid all inventoried heritage resources with structural attributes that could be compromised through fire.
Any previously undocumented heritage or cultural resources discovered during project layout or implementation will be reported to the District Archeologist for evaluation before treatment activities occur.

Recreation/Scenery:
- All project-level decisions and implementation activities should be consistent with mapped classes and setting descriptions in the recreation opportunity spectrum to sustain recreation settings and opportunities on the Cibola National Forest.
- Healthy, large trees should comprise the majority of trees in developed and dispersed recreation sites to provide shade and screening around hardened sites in order to preserve the recreation setting; some younger and mid-aged trees are retained to serve as replacement trees and as additional screening.

Eligible Wild and Scenic River Corridors:
In eligible river corridors with “wild” classifications, cutting of trees and other vegetation shall not be allowed except when needed in association with a primitive recreation experience, to protect users (including hazard tree removal or trail maintenance), or to protect identified outstandingly remarkable values.

- Activities in eligible Wild and Scenic River corridors shall comply with interim protective measures outlined in Forest Service Handbook 1909.12, 84.3, or most current version.
- In eligible wild and scenic river corridors classified as “recreational” or “scenic,” timber harvest should be allowed to maintain or restore the values for which the eligible river was identified.
- Management activities should be consistent with the scenic integrity objective of “very high” in eligible wild and scenic river corridors classified as “wild,” “high” in eligible rivers classified as “scenic,” and “moderate to high” in eligible river corridors classified as “recreational.”
- Management activities should be consistent with the recreation opportunity spectrum class of “semi-primitive non-motorized” in eligible wild and scenic river corridors classified as “wild,” “semi-primitive non-motorized” to “semi-primitive motorized” in eligible river corridors classified as “scenic,” and “semi-primitive” to “roaded natural” in eligible river corridors classified as “recreational.”

IPS Beetle Recommendations:
To the extent possible, activity slash would only be created between July-December unless woody material greater than 3 inches in diameter can be removed within 30 days of being
created, or unless the potential for *Ips* infestation is determined to be low. Creating activity slash would be avoided in the same area multiple years. As much woody material greater than 3 inches in diameter would be removed from the site as possible. Slash would be treated promptly through lop/scatter, masticating, hand pile burning, or prescribed burning.

Chipping or masticating would be accomplished after the onset of monsoon season (after July) or during fall/early winter when beetles are not flying as actively. Concentrations of chipped/masticated material would not be allowed to accumulate over 4 inches in depth or lie immediately adjacent to live standing trees. To the extent possible, chipped/masticated material would be distributed on slopes or drier aspects where they would dry quickly.

Burning of slash would not be an effective treatment for piñon *Ips* unless accomplished before beetles emerge from the woody material. Mechanical damage to residual trees and their root systems would be avoided to the reduce risk of attracting bark beetles. Slash would be monitored during and after treatment for *Ips* beetle infestation and concerns reported to the Forest Silviculturist and Forest Health Protection Entomologist(s).

**Soil and Hydrology Mitigation Measures and Management Approaches:**

- Terrestrial Ecosystem Unit Inventory is the basis for planning project activities where soil condition may be affected, including vegetation management, grazing, and transportation projects
- Vegetation should be maintained or improved to conditions as indicated by Terrestrial Ecosystem Unit Inventory as verified on the ground to support soil functions.
- Vegetation, recreation, and range management projects are planned to support the natural variability of ecological characteristics to support satisfactory watershed condition while considering the effects of climate change.
- Ground-disturbing activities that cause compaction, bare soils, loss of litter, or erosion resulting in loss of soil function should be limited to 15 percent or less of a project area.
- Depth of masticated material should not exceed an average of 2 inches, with a maximum of 4 inches.
- Best management practices are monitored using a current protocol, such as the National Best Management Practices for Water Quality Management on National Forest Systems Lands.

**Transportation and Wood Product Hauling:**

No new roads or temporary roads would be constructed for this project. All wood products generated from this project would be removed under permit using National Forest System (NFS) roads or trails or unauthorized roads and trails. Road decommissioning would be coordinated with the implementation phase approach described in the Migratory Bird Recommendation section above.