I. INTRODUCTION

The purpose of this Wildlife Resources Report is to review the potential impacts of the Willow Project on threatened, endangered, or proposed animal species; wildlife species listed on the Intermountain Regional Forester’s list of sensitive species, species identified as Management Indicator Species (MIS) by the Manti-La Sal National Forest; and priority migratory bird species identified by the Utah Partners In Flight Conservation Strategy (UPIFCS), USFWS Birds of Conservation Concern (USFWS BCC), and the Utah Comprehensive Wildlife Conservation Strategy (UCWCS).

II. DESCRIPTION OF THE PROPOSAL

A. Summary of the Proposed Action

The Manti-La Sal National Forest proposes vegetative treatments within the Ephraim watershed. The Willow Project area encompasses 16,984 acres and is within two 6th order Hydrologic Unit Code (HUC) watersheds; Ephraim Creek and Dry Canyon. The proposed treatments include approximately 5,700 acres within this project boundary. The proposed Willow Project is located in Sanpete County, Utah approximately 2 miles east of Ephraim, Utah and 5 miles northeast of Manti, Utah, stretching across T. 16 S; R. 4 E., Section 34, T. 17 S; R. 4 E., Sections 1 – 11, 14 – 23, 26 – 35, T. 18 S., R. 4 E., Sections 4 – 7, and T. 18 S., R. 3 E., Sections 1, 2, and 12. Elevations range from approximately 9,980 ft. on Skyline Drive to 6,800 ft. at the bottom of Ephraim Canyon. Most of the project area is designated as a range management (RNG) emphasis area.

Fuels treatments (more than one treatment may occur on the same acres, i.e. timber harvest followed by prescribed burning) may include:

- Harvesting dead standing spruce using a combination of ground-based and aerial logging systems and commercial thinning of aspen/mixed conifer and mixed conifer stands to reduce fuel continuity on approximately 2,000 acres;
- Under-burn approximately 200 acres of Ponderosa pine vegetation type.
- Broadcast burning, jackpot burning, mastication, and/or hand piling on both aspen and spruce stands on approximately 3,000 acres.
- Mastication and product removal within pinyon-juniper, oak, aspen and white fir stands on approximately 2,500 acres; this includes approximately 150 acres of mechanical or hand treatment of fuels in the Big Horseshoe Inventoried Roadless Area around the New Canyon Reservoir. No product removal is proposed in this 150 acre treatment area.

The proposed action is consistent with the Healthy Forest Restoration Act Guidelines:

- Ephraim Canyon is a municipal watershed.
- Stands in the Willow Project Area are classified as Fire Regime III Condition Class 2.
- The Willow Project Area includes the Ephraim Watershed, the Great Basin Experimental
Station, and Camp Utiba which are on the Utah Communities at Risk List.

- A majority of the proposed treatment areas are within one and a half miles of a development or within the municipal watersheds.
- The Proposed Action was developed collaboratively with Sanpete County, State of Utah Division of Forestry, Fire and State lands, as well as Private landowners. A Community Wildfire Protection Plan has been approved for the adjacent private land in 2012.

**B. Project Area Description/Existing Condition**

In the last 18 years, an estimated 100,000 acres (90 percent) of Engelmann spruce on the northern portion of the Manti-La Sal has been killed by a spruce beetle epidemic. In addition, aspen abundance has decreased over the past 100 years due to fire exclusion/suppression and the absence of other types of disturbances needed to promote regeneration and structural integrity. The dead spruce are beginning to fall over from wind events and heavy snow loading creating thick deadfall on the forest floor. This impacts those wildlife species that depend on open understories including northern goshawks, mule deer, and Rocky Mountain elk. It is predicted in the next 20 years over 50 percent of the dead spruce will have fallen.

The Ephraim Canyon watershed is important for many wildlife species including Rocky Mountain elk, mule deer, and raptors; including northern goshawks, black bears, mountain lion, and a variety of migratory birds and small mammals. Northern goshawks are dependent on aspen and aspen/conifer stands for nesting and foraging activities. Approximately 70% of the goshawk nests on the north zone of the Manti-La Sal National Forest are in aspen. Aspen regeneration is vital to goshawk populations on the forest. There are two northern goshawk territories within the Willow project area.

Within the project boundary, coarse-scale Fire Regime Condition Classes (FRCC) have been defined and mapped. The stands associated with this project are in a Fire Regime III Condition Class 2 (Moderate). A Fire Regime III is a 35-100 year or greater fire frequency and mixed severity (less than 75 percent of the dominant overstory vegetation replaced). Condition Class 2 is moderate departure from this regime and is considered outside the natural (historic) range of variability. Consequently, fire suppression actions necessary to protect private lands and associated structures would be difficult given the nature of the fuels in the area.
Map 1 – Existing Vegetation

Legend
- Willow Project Boundary
- Existing Vegetation
- Spruce/Fe Forest
- Lodgepole or Bridlecone Pine Forest
- Aspen and mixed conifer
- 4477 acres (32.1%)
- Aspen or Quaking Aspen
- Mixed Aspen
- Mixed forest
- Douglas Fir Forest
- White Fir Forest
- Pinyon Juniper
- 5791 acres (40.8%)
- Pinyon Juniper Woodland
- Rocky Mountains Juniper Woodland
- Ponderosa Pine Forest
- Oakbrush
- Brush
- New Forest
- 2741 acres (20.6%)
- Forbs
- Grasses
- Lake, Pond or Reservoir
- Wetlands
- Rock
C. Purpose and Need For Action
Purpose:
Reduce the probability of a high severity wildfire that is difficult to control; and reduce the negative consequences of a fire on the soil and vegetation resources in the area.

Need: The current vegetation communities are in a condition that a fire start, on an average summer day, would be uncharacteristically hot, difficult to control, and would be a significant threat to private land and other developments in Ephraim Canyon. Based on recent experiences (e.g., Seeley Fire), the results of such a fire would likely lead to overland flow, erosion, and debris flows from storm events that would have negative impacts far downstream from the National Forest System lands. There is also a need to provide an escape route from the Skyline Villas Subdivision because there is currently only one way in or out of the subdivision.

The objectives of this project are:

- Reduce fine fuel loading (< 3 inches diameter) to less than 5 tons per acre.
- Reduce the overall size of a probable stand replacing fire.
- Increase the probability that fire suppression forces would control a wildfire before it reached private property.
- Increase the amount of aspen in the watershed as a means of lowering fuel loading.
- Restore riparian vegetation.

D. Description of the Alternatives

1. ALTERNATIVE 1 (NO ACTION)

The no action alternative will reflect actions consistent with existing conditions. The proposed project area would undergo no treatments and conditions would likely follow natural successional patterns described in the existing conditions. Aspen would continue to be lost within the mixed conifer stands and spruce would continue to fall.

2. ALTERNATIVE 2 (PROPOSED ACTION)

Specific actions associated with this proposal include:

1. Proposed Vegetation Treatments:

   Ponderosa Pine Stands:

   - Conduct an understory burn on approximately 200 acres of Ponderosa pine vegetation type.

   Aspen-Mixed Conifer Stands – Spruce Fir Stands:
• Use Broadcast burning, jackpot burning, mastication, and/or hand piling on both aspen and spruce stands on approximately 3,000 acres.

• Harvest dead standing spruce using a combination of ground-based and aerial logging systems and commercial thinning of aspen/mixed conifer and mixed conifer stands to reduce fuel continuity on approximately 2,000 acres;

Pinyon-Juniper, Oak, Aspen, and White Fir Stands:

• Use Mastication and product removal within pinyon-juniper, oak, aspen and white fir stands on approximately 2,500 acres; this includes approximately 150 acres of mechanical or hand treatment of fuels in the Big Horseshoe Inventoried Roadless Area around the New Canyon Reservoir. No product removal is proposed in this treatment area.

III. EVALUATED SPECIES INFORMATION

A. Threatened, Endangered, Proposed and Candidate Species

Refer to the 2014 Willow Project Biological Assessment/Biological Evaluation for the analysis and discussion for Threatened, Endangered, proposed or candidate species.

B. Sensitive Wildlife and Fish Species

Refer to the 2014 Willow Project Biological Assessment/Biological Evaluation for the analysis and discussion for sensitive wildlife and fish species.

C. Management Indicator Species

Table 1 lists wildlife species identified as Management Indicator Species (MIS) by the Manti-La Sal National Forest (MLNF) that could occur on the Manti Division of the MLNF.

<table>
<thead>
<tr>
<th>SPECIES</th>
<th>SPECIES OCCURRENCE</th>
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<tbody>
<tr>
<td>Golden Eagle <em>Aquila chrysaetos</em></td>
<td>The Golden eagle breeds in open and semiopen habitats from near sea level to 12,000 ft. It occurs primarily in mountainous canyon land, rim-rock terrain of open desert, and grassland areas of the western United States (Kochert et al. 2002) and in eastern Utah, valley bottoms, aspen, conifer, and pinyon/juniper habitats as expected based on availability and talus habitat less than expected (Bates and Moretti 1994). They generally nest on cliffs, but they also nest in trees. Golden eagles hunt over open country for small mammals, snakes, birds and carrion. There is suitable nesting and foraging habitat .</td>
</tr>
<tr>
<td>Macroinvertebrates</td>
<td>Macro-invertebrates (aquatic insects) are ecological indicator species in aquatic</td>
</tr>
<tr>
<td>SPECIES</td>
<td>SPECIES OCCURRENCE</td>
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<tr>
<td>Aquatic Insects</td>
<td>Habitats. Habitat requirements for aquatic macroinvertebrates vary with species; habitat requirements for any one species are very specific. Many macro-invertebrates are the larval form of flying insects such as mayflies, stoneflies, and caddisflies. There are perennial streams within the proposed project area.</td>
</tr>
<tr>
<td>Mule Deer <em>Odocoileus hemionus</em></td>
<td>Mule deer use a wide array of habitat types and exhibit seasonal movement (elevation migration) in response to snow cover. The proposed project contains suitable summer habitat for mule deer.</td>
</tr>
<tr>
<td>Northern Goshawk <em>Accipiter gentilis</em></td>
<td>In Utah, most nests can be found in mid-elevation sites occupied by quaking aspen or coniferous forest (Graham et al. 1999). There is suitable nesting and foraging habitat within the proposed project area.</td>
</tr>
<tr>
<td>Rocky Mountain Elk <em>Cervus canadensis</em></td>
<td>Elk tend to occupy the higher elevation aspen and mixed conifer habitats from spring through early fall, and move to lower elevation mixed shrub, pinyon/juniper, and sagebrush habitats for winter. The proposed project area contains summer habitat for elk.</td>
</tr>
</tbody>
</table>

**D. Migratory Birds**

The Migratory Bird Treaty Act (MBTA) and Executive Order 13186 contain direction for federal agencies in the conservation of migratory birds. The intention is for agencies such as the Forest Service to support and integrate bird conservation principles into agency activities and to avoid or minimize adverse impacts on migratory birds. Under Section 3(e)(6) of EO13186, Responsibilities of Federal Agencies to Protect Migratory Birds, it states that each agency shall “ensure that environmental analyses of Federal actions required by the NEPA or other established environmental review processes evaluate the effects of actions and agency plans on migratory birds, with emphasis on species of concern”. The following analysis meets agency obligations as defined in EO 13186. High priority migratory bird species/species of concern are identified in several reports. The Utah Partners in Flight (PIF) Avian Conservation Strategy (Parrish et al. 2002) includes a list of priority species and habitats in need of conservation. The Utah Comprehensive Wildlife Conservation Strategy (CWCS) prepared by the Utah Division of Wildlife Resources also includes migratory bird species of management concern (Sutter et al. 2005). The US Fish and Wildlife Service prepared the “Birds of Conservation Concern (BOCC) 2008” report (USDI, U.S. Fish and Wildlife Service 2008), which identified more than 100 bird species that deserve prompt conservation attention to stabilize or increase populations or to secure threatened habitats.

The high priority migratory bird species and bird species of concern that could occur on the Manti Division of the Manti-La Sal National Forest and their preferred habitat are documented in a Migratory Bird document (USDA, Forest Service 2009). The table below are species from the Avian Conservation Strategy (Parrish et al. 2002), Birds of Conservation Concern (USDI, U.S. Fish and Wildlife Service 2008), and the Utah Comprehensive Wildlife Conservation Strategy (Sutter et al. 2005). The highlighted species below are those that use oak, pinyon/juniper, aspen, ponderosa pine,
mixed conifer, and/or sub-alpine conifer as primary or secondary breeding habitat as well as species that were covered within the 2014 Willow Project BA/BE. Nine of the species listed below, bald eagle, flammulated owl, golden eagle, greater sage grouse, northern goshawk, peregrine falcon, southwestern willow flycatcher, three-toed woodpecker, and yellow-billed cuckoo are addressed in the BA/BE or the MIS section of this Wildlife Report.

Table 2 PIF priority species, BOCC and CWCS bird species that may occur on the Manti Division. The highlighted species are associated with the cliff, shrub-steppe, pinyon/juniper and aspen habitat types.

<table>
<thead>
<tr>
<th>SPECIES</th>
<th>LIST(S)</th>
<th>PRIMARY/SECONDARY HABITAT*</th>
<th>CONSIDERATION FOR ANALYSIS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bald Eagle</td>
<td>CWCS</td>
<td>Lowland riparian, agriculture</td>
<td>Addressed in the BA/BE.</td>
</tr>
<tr>
<td>Black Rosy-Finch</td>
<td>PIF, CWCS</td>
<td>Alpine, alpine</td>
<td>Not Considered. Breeds above timberline in Alpine tundra using barren, rocky or grassy areas and cliffs among glaciers or at bases of snow fields. In Utah, the largest breeding populations occur in alpine habitats in the Wasatch and Uinta Mountains. They can occur from 8,200 ft to 11,000 ft. in elevation (Parrish et al. 2002). There is no suitable habitat within the project area.</td>
</tr>
<tr>
<td>Black Swift</td>
<td>PIF, BOCC, CWCS</td>
<td>Lowland riparian, cliff</td>
<td>Not Considered. Black swifts nest in small colonies near and often behind waterfalls at elevations ranging from 6,000 ft. to 11,500 ft (Parrish et al. 2002). There are two confirmed breeding locations in Utah: the Bridal Veil Falls area and Aspen Grove area (Parrish et al. 2002). There are no habitat features within or near the project area.</td>
</tr>
<tr>
<td>Black-throated Gray Warbler</td>
<td>PIF, BOCC, CWCS</td>
<td>Pinyon-juniper, mountain shrub</td>
<td>Considered. Preferred breeding habitat includes dry oak slopes, pinyon, juniper, pinyon/juniper woodlands, open mixed woods, and dry coniferous and mixed conifer habitats with brushy understories, and in chaparral. Elevation for nesting in Utah ranges from 4,000 to approximately 7,000 ft. in elevation (Parrish et al. 2002). There is suitable habitat near the water</td>
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<tr>
<td>Species</td>
<td>Management</td>
<td>Habitat</td>
<td>Consideration</td>
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<tr>
<td>Brewer’s Sparrow</td>
<td>PIF, CWCS</td>
<td>Shrub-steppe, high desert scrub</td>
<td><strong>Not Considered.</strong> Breeding habitat is primarily shrub steppe, but may also breed in high desert scrub (greasewood) habitats. Breeding habitats are usually dominated by big sagebrush (Parrish et al. 2002). No shrub-steppe will be treated.</td>
</tr>
<tr>
<td>Broad-tailed Hummingbird</td>
<td>PIF, CWCS</td>
<td>Lowland riparian, mountain riparian</td>
<td><strong>Considered.</strong> In Utah, primary breeding habitat is lowland riparian. They have also been recorded as breeding in mountain riparian, aspen, ponderosa pine, Engelmann spruce, subalpine fir, and Douglas-fir (Parrish et al. 2002). Nesting typically occurs at elevations ranging from 6,000 to 10,600 ft. near streamside habitat (Camfield et al. 2013). There is suitable habitat within the project area.</td>
</tr>
<tr>
<td>Cassin’s Finch</td>
<td>BOCC</td>
<td>Aspen, sub-alpine conifer</td>
<td><strong>Considered.</strong> Cassin’s finch breeds from southern Alberta, Canada, to the west-central United States in montane coniferous forests. In Utah, Cassin’s finch is a year-round resident that is found statewide in high and mid-elevation forests (UDNR,Utah Conservation Data Center 2014). There is suitable habitat in the proposed project area.</td>
</tr>
<tr>
<td>Ferruginous Hawk</td>
<td>PIF, BOCC, CWCS</td>
<td>Pinyon-juniper, shrub-steppe</td>
<td><strong>Considered.</strong> Usually breeds in areas of flat and rolling terrain in grassland or shrub steppe habitat. Avoids high elevations, forests, and narrow canyons. Occurs in grasslands, agricultural lands, sagebrush/salt brush/greasewood shrublands and the periphery of pinyon/juniper habitats (Parrish et al. 2002). There is suitable habitat within or near the proposed project area.</td>
</tr>
<tr>
<td>Flammulated</td>
<td>BOCC</td>
<td>Ponderosa pine, sub-</td>
<td><strong>Addressed in the BA/BE.</strong></td>
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<tr>
<td>Species</td>
<td>Agency(s)</td>
<td>Habitat Details</td>
<td>Notes</td>
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<tr>
<td>Owl</td>
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<td>alpine conifer</td>
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<tr>
<td>Golden Eagle</td>
<td>BOCC</td>
<td>Cliff, high desert scrub</td>
<td>Addressed in the MIS Section of this report.</td>
</tr>
<tr>
<td>Grace’s Warbler</td>
<td>BOCC</td>
<td>Ponderosa pine, mixed conifer</td>
<td>Considered. This species is found in mountain pine and pine-oak forests. In most of the United States Grace’s warbler breeds in ponderosa pine (NatureServe 2014). There is suitable habitat within the proposed project area.</td>
</tr>
<tr>
<td>Gray Vireo</td>
<td>PIF, BOCC, CWCS</td>
<td>Pinyon-juniper, northern oak</td>
<td>Considered. Preferred breeding habitat is on arid slopes dominated by mature pinyon/juniper woodlands. This species commonly occurs in suitable habitats in Colorado, Nevada and Arizona at elevations ranging from 4,400 ft. to 6,400 ft. Gray vireo’s are typically found within pinyon/juniper, juniper, or oak woodlands and is considered an obligate species for this habitat type (Parrish et al. 2002). There is suitable habitat within or near the proposed water development sites.</td>
</tr>
<tr>
<td>Greater Sage-grouse</td>
<td>CWCS</td>
<td>Shrub-steppe, shrub-steppe</td>
<td>Addressed in the BA/BE.</td>
</tr>
<tr>
<td>Juniper Titmouse</td>
<td>BOCC</td>
<td>Pinyon-juniper</td>
<td>Considered. The juniper titmouse is a common and widespread bird in Utah that occurs in most parts of the western United States. As its name would suggest, it is often found in areas containing pinyon-juniper woodlands. The juniper titmouse feeds on insects, seeds, and fruits. Tree cavities, including natural cavities and woodpecker holes, are used as nesting sites (UDNR, Utah Conservation Data Center 2014). There is suitable habitat within the proposed project area.</td>
</tr>
<tr>
<td>Species</td>
<td>Jurisdiction</td>
<td>Habitat</td>
<td>Considered/Not Considered</td>
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<tr>
<td>Lewis’s Woodpecker</td>
<td>PIF, BOCC, CWCS</td>
<td>Ponderosa pine, lowland riparian</td>
<td>Considered. This species is found in open forest and woodland, often logged or burned, including oak, coniferous forest (primarily ponderosa pine, riparian woodland and orchards), less commonly in pinyon-juniper (NatureServe 2014). There is suitable habitat within or near the proposed project area.</td>
</tr>
<tr>
<td>Long-billed Curlew</td>
<td>PIF, BOCC, CWCS</td>
<td>Grassland, agriculture</td>
<td>Not Considered. The long-billed curlew is a fairly common summer resident and migrant in Utah, especially through the central and more northern valleys. It is less common in the Colorado River drainage. This species lives and breeds in higher and drier meadowlands than many other shorebird species. Long-billed curlews have four essential nesting habitat requirements in the northwestern United States: (1) short grass (less than 30 cm tall), (2) bare ground components, (3) shade, and (4) abundant vertebrate prey. Uncultivated rangelands and pastures support most of the continental long-billed curlew breeding population (Parrish et al. 2002, UDNR, Utah Conservation Data Center 2014). There is no suitable habitat within or near the proposed project area.</td>
</tr>
<tr>
<td>Northern Goshawk</td>
<td>CWCS</td>
<td>Mixed conifer, aspen</td>
<td>Addressed in the BA/BE and in the MIS section of this report.</td>
</tr>
<tr>
<td>Osprey</td>
<td>CWCS</td>
<td>Water – lentic</td>
<td>Not Considered. This bird is primarily found along rivers, lakes, reservoirs, and seacoasts (NatureServe 2014). The osprey nests in dead snags, living trees, cliffs, utility poles, wooden platforms on poles, etc.; usually near or above water. There is no suitable habitat within or near the proposed project area.</td>
</tr>
<tr>
<td>Species</td>
<td>Management Area</td>
<td>Habitat Descriptions</td>
<td>Status</td>
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<tr>
<td>Peregrine Falcon</td>
<td>CWCS</td>
<td>Cliff, lowland riparian</td>
<td>Addressed in the BA/BE.</td>
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<tr>
<td>Pinyon Jay</td>
<td>CWCS</td>
<td>Pinyon-juniper, ponderosa pine</td>
<td>Considered. The pinyon jay occurs throughout much of the western United States, and is a common bird of the pinyon-juniper forests of Utah. It occurs in pinyon pine and juniper forests ranging into sagebrush. Pinyon-juniper woodland, less frequently pine; in non-breeding season, also occurs in scrub oak and sagebrush (NatureServe 2014). Nests in shrubs or trees (e.g., pine, oak, or juniper), about 1.5-9 m above ground. There is suitable habitat within the proposed project area.</td>
</tr>
<tr>
<td>Sage Sparrow</td>
<td>PIF, BOCC, CWCS</td>
<td>Shrub-steppe, high desert scrub</td>
<td>Not Considered. Uncommon permanent resident in Utah; occurs up to 8,000 ft. elevation. Nests have been found in rabbitbrush, hopsage, saltbush, and big sage. No sage-steppe habitat is proposed to be treated.</td>
</tr>
<tr>
<td>Sage Thrasher</td>
<td>CWCS</td>
<td>Shrub-steppe, high desert scrub</td>
<td>Not Considered. Species is considered to be a shrub-steppe obligate. It requires healthy stands of mature sagebrush, including large patches and expanses of sagebrush steppe for successful breeding. Sage thrashers forage on the ground for insects and berries. It is a common resident of lowland desert in Utah. No sage-steppe habitat is proposed to be treated.</td>
</tr>
<tr>
<td>Short-eared Owl</td>
<td>CWCS</td>
<td>Wetland, grassland</td>
<td>Not Considered. The short-eared owl is a medium-sized owl that frequently flies during daylight, especially at dusk and dawn, as it forages for rodents. This owl is usually found in grasslands, shrublands, and other open habitats. It is nomadic, often choosing a new breeding site each year, depending on local rodent densities. It is an uncommon breeder in the northern half of the Utah, mostly in the northwestern</td>
</tr>
<tr>
<td>Wildlife Species</td>
<td>CCOS</td>
<td>Habitat Type</td>
<td>Status</td>
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<tr>
<td>Southwestern Willow Flycatcher</td>
<td>CWCS</td>
<td>Lowland riparian, mountain riparian</td>
<td>Not Considered. There is no suitable habitat within the proposed project area.</td>
</tr>
<tr>
<td>Three-toed Woodpecker</td>
<td>CWCS</td>
<td>Sub-alpine conifer, lodgepole pine</td>
<td>Addressed in the BA/BE.</td>
</tr>
<tr>
<td>Veery</td>
<td>BOCC</td>
<td>Lowland riparian</td>
<td>Not Considered. The veery breeds in woodland habitats in the northern United States and southern Canada. In Utah, this species is a rare summer resident, known to breed in the northernmost counties; however, suitable habitat occurs along Wasatch Plateau (UDNR, Utah Conservation Data Center 2014). There is no suitable habitat within or near the proposed project area.</td>
</tr>
<tr>
<td>Virginia’s Warbler</td>
<td>PIF, BOCC, CWCS</td>
<td>Northern oak, pinyon-juniper</td>
<td>Considered. In Utah, the primary breeding habitat is oak, and secondary breeding habitat is pinyon/juniper at elevations ranging from 4,000 to 10,000 ft. (Parrish et al. 2002). There is suitable habitat within or near the proposed project area.</td>
</tr>
<tr>
<td>Williamson’s Sapsucker</td>
<td>BOCC, CWCS</td>
<td>Sub-alpine conifer, aspen</td>
<td>Considered. Found in montane coniferous forest, especially fir and Lodgepole Pine; in migration and winter also in lowland forest. Usually nests in dead or decaying pine, fir or aspen (NatureServe 2014). There is suitable habitat within or near the proposed project area.</td>
</tr>
<tr>
<td>Willow Flycatcher</td>
<td>BOCC</td>
<td>Lowland riparian, mountain riparian</td>
<td>Not Considered. The willow flycatcher occurs throughout the northern and central United States during the breeding season, and winters in southern Mexico and Central America. It is a common summer resident in Utah. Breeding sites are in low scrub,</td>
</tr>
</tbody>
</table>
thickets, or groves of small trees, often near watercourses. Nests are often built in willow, rose, or other small riparian trees, usually in a vertical fork. The willow flycatcher feeds mainly on invertebrates, though some seeds and berries are eaten (UDNR, Utah Conservation Data Center 2014). No suitable habitat will be treated.

| Yellow-billed Cuckoo | PIF, BOCC, CWCS | Lowland riparian, agriculture | Addressed in the BA/BE. |

II. *Primary/secondary habitat types listed in Parrish et al. 2002*

IV. SPECIES DESCRIPTIONS AND ANALYSIS OF EFFECTS

This analysis of effects is based on the existing conditions within or near the proposed Willow Project. The analysis reviews the potential impacts of the proposed project on Management Indicator Species (MIS) and Migratory Bird Priority Species.

A. Management Indicator Species

Golden Eagle

Golden eagles usually nest on cliffs overlooking large open expanses of grass-shrub or shrub steppe habitat, but tree nesting occurs in portions of their breeding range, including Utah. Nesting and brooding season generally extends from mid-February to mid-July. There is extensive cliff habitat along the eastern margin of the Wasatch Plateau and in canyons incising the Plateau. There are also extensive grassland and mountain brush habitats for foraging. Golden eagles primarily prey on small mammals including ground squirrels, prairie dogs, jack rabbits and cottontails. Preferred golden eagle prey habitat includes edge along high mountain brush habitat, high/mid elevation perennial forb habitat, and high elevation perennial grassland habitat. Preferred golden eagle winter habitat includes large expanses of sagebrush.

There are no known golden eagle nests within the proposed project area. The project area could possibly be used as foraging habitat. The proposed treatments would not reduce the habitat effectiveness of the area, and would benefit golden eagles long term by creating openings. Eagles prefer to hunt in more open habitat types. No past projects would add cumulatively to impacts on golden eagles.

Population Trends: Golden eagles are widely distributed throughout the Northern Hemisphere. Golden eagle populations have been estimated from 50,000 to 100,000 individuals in North America.
A population level survey in the western U.S. conducted by (Good et al. 2004), estimated a total late summer population of 4,998 golden eagles in the region, out of an interior west population of 27,392 golden eagles. This survey gave a summary of known and estimated breeding pairs, which is illustrated in table 3. Golden eagles in Eastern Utah (Carbon and Emery Counties), show significant correlations with rabbit populations, data demonstrates that golden eagles produce more young in the same year that rabbit populations increase, but a higher proportion of territories are active the year following an increase in rabbits (Bates and Moretti 1994). The optimum number of golden eagles on the forest was estimated using the fact that a breeding pair requires a territory up to 30 square miles which provides habitat for a maximum of 69 breeding pairs. On the Manti-La Sal National Forest, the number of known golden eagle nests on the Forest has increased over the years as new nests are found. Therefore, looking at the number of known active nests each year would not give an accurate impression of changes in the golden eagle population on the Forest. A better indication of golden eagle population change on the Forest would be the percent of monitored nest sites that were active each year, shown below in graph 1.

Table 3 A summary of known and estimated breeding Golden Eagle pairs in Utah and neighboring states

<table>
<thead>
<tr>
<th>STATE</th>
<th>NUMBER OF EAGLES</th>
</tr>
</thead>
<tbody>
<tr>
<td>Utah</td>
<td>1,885 pairs</td>
</tr>
<tr>
<td>Nevada</td>
<td>1,200 pairs</td>
</tr>
<tr>
<td>Colorado</td>
<td>500 pairs</td>
</tr>
<tr>
<td>Wyoming</td>
<td>4,174 pairs</td>
</tr>
<tr>
<td>Idaho</td>
<td>400-500 pairs</td>
</tr>
</tbody>
</table>

Graph 1 monitored golden eagle nests that were active from 1998 through 2013 (USDA, Forest Service 2013).

Forest Plan Guidelines:
Golden eagles were chosen as Management Indicator Species in the Forest Plan to monitor the impacts of activities (such as mining, oil and gas development) and disturbance in nesting territories. Golden eagles may use any vegetative community found on the Forest, and are not an appropriate indicator of the impacts of management activities in specific vegetation types such as spruce/fir, aspen or ponderosa pine. Forested habitats are of limited value to foraging eagles. There would not be any direct impacts to a golden eagle nesting territory from proposed project activities.

**Impacts to Golden Eagles:**

There are no known golden eagle nests within the project area. The majority of the golden eagle territories are on the east side of the Wasatch Plateau, along the escarpment. The nearest known golden eagle nest is approximately 8 miles from the proposed project area, outside the recommended 0.5 mile buffer (USDI, U.S. Fish and Wildlife Service 2002). The proposed project includes no activities that would cause disturbance or abandonment of a nesting territory, and would have no impacts to golden eagle population trends. The project is also consistent with the Bald and Golden Eagle Protection Act.

**Macro-invertebrates**

Macroinvertebrates are benthic organisms including aquatic insects (mayflies, caddis flies, daphnia, cyclops, stoneflies and others), mollusks and worms. The 1986 Forest Plan’s monitoring and evaluation program includes aquatic macroinvertebrates as a management indicator species and calls for monitoring at baseline stations or as needed for select project activities (page IV-6). Aquatic habitat is to be monitored and evaluated under the Forest Plan. Macroinvertebrates serve as natural indicators of management activities undertaken within each watershed. The Forest Plan on page E-9, in defining macroinvertebrates states that “the composition of the [macroinvertebrate] community is an indication of the quality of the aquatic habitat and reflects the condition of the entire drainage”. Representative baseline locations were selected for sampling.

Most monitoring locations are near the Forest boundary and are designed to reflect the overall water quality and aquatic habitat quality of the stream system and watershed above the monitoring point. The sampling locations are not designed to monitor the effects of a single land use or activity. These locations are not suitable for project-level monitoring or evaluation.

Freshwater macroinvertebrate communities are highly variable. In a stream system, many physical, chemical, and biotic factors interact to affect macroinvertebrate communities in ways that are not fully understood. The effects of landslides, wildfires, floods and droughts may take several years to affect these communities. The effects may persist for several years and may outweigh the effects of human activities in the watershed. “Cause and effect are often separated in time and space, concealing linkages in a complex series of physical and biological interactions. Consequently, it is often difficult to: 1) clearly link land use or management effects to environmental impacts and 2) separate man caused impacts from those that result from natural phenomena” (Larsen, 1998).
The monitoring techniques of the 1986 Forest Plan were the Biotic Condition Index (BCI), a macroinvertebrate community index, and the Habitat Condition Index (HCI); the measurement frequency was 5 years. The BCI data indicated highly variable communities across the Forest; probably in response to droughts, floods, and landslides in addition to land management activities. There were no statistically significant trends in the data. There revealed no apparent upward trend in the number of streams that did not meet the Forest Plan standard, nor was there an apparent downward trend in the number of streams that surpassed the standard. Over the entire period of record, only 5% of the samples did not meet the Forest Plan BCI standard (USDA, Forest Service 2006). The indices currently used by the Forest to monitor Aquatic Habitat, as listed in the Land and Resource Management Plan are obsolete.

The Forest Plan was amended in 2006 to update the protocols used to collect macroinvertebrate data and to change the method used to analyze the data. The 2006 amendment did not alter the language regarding macroinvertebrate monitoring as an optional technique for selected projects. The Manti-La Sal National Forest will continue monitoring aquatic habitat using macroinvertebrate sampling, but change the type of appraisal method used. The methodology is similar to that being used by the Utah Division of Water Quality for macroinvertebrate monitoring. The State program has selected relatively unimpaired representative streams as reference sites for different stream types. Monitoring will continue at baseline stations to characterize Forest-wide conditions; data analysis will be in cooperation with the Utah Division of Water Quality.

The changes proposed under the proposed alternative would lead to favorable conditions of water flow and protection of soil and water productivity and would be maintained so that neither will be significantly or permanently impaired. Under the proposed alternative, riparian and watershed standards for the Forest Plan would be met. The closest Forest-wide monitoring sites are located in Oak Creek near Spring City (north of the site), Manti Creek (south of the site). In 2009 and 2011, samples were collected the results were analyzed by the UDWQ and the O/E percentages determined. O is the number of species predicted and E is number of taxa present. Those results were compared to the 2004 results. Both sets of data were meeting the current Forest Plan standards. Both sites are meeting Forest Plan Standards. There is no site-specific monitoring proposed to continue for this project.

36 CFR 219.14(f) states that site-specific monitoring [for management indicator species] or surveying of a proposed project or activity area is not required, but may be conducted at the discretion of the Responsible Official. The Forest Plan, as amended, is consistent with this direction.

Mule Deer

Mule deer occupy several habitat types throughout the west and are very adaptable in their ability to live in diverse habitats such as coastal rain forests, icy mountains, prairie grasslands, Yukon River valleys, and deserts (Devos et al. 2003). Mule deer prefer a mosaic of various aged vegetation that provides woody cover, meadow and shrubby openings, and free water. Vegetation cover is critical for thermal regulation in winter and summer, and to provide escape cover. Mule deer are
concentrate selectors, diets contain a much higher shrub component than compared to elk, although dietary composition of forage classes vary among locations and seasons and depend on their availability (Devos et al. 2003).

Rutting season occurs in late fall through early winter. Gestation is between 195 and 212 days, and fawns are born from early April to mid-summer, with some geographic variation. Fawning peaks generally occur from late April through mid-June. Fawning occurs in moderately dense shrub lands and forests, dense herbaceous stands, and mid to high elevation riparian and mountain shrub habitats that have available water and abundant forage.

Population Trends: Mule deer occur throughout the mountains and valleys of eastern Utah. Their populations throughout Utah have historically fluctuated, periodically affected by drought and severe winter weather. Populations in eastern Utah declined in the early to mid-1990s, but showed signs of recovery in the late 1990s. The decline was attributed to severe drought conditions from 1988 through 1992, which was followed by a severe winter in 1992-93. The current mule deer population in the state of Utah is estimated at 318,550 animals which are below the objective of 411,900 (Bernales et al. 2012). The current mule deer population on the Central Mountains Manti Management Unit is estimated at 23,600 animals, which is well below the objective of 38,000 (Bernales et al. 2012). The population has increased significantly since the 1990’s, however, the population if still well below objective and is reflective of the low fawn recruitment. There is growing concern in the state of Utah for the decline in mule deer populations. There are many factors involved in mule deer population dynamics including degraded habitat, predation, hunting permits, highway mortality, Off Highway Vehicles (OHV’s), and habitat fragmentation. The deer population on the (MLSNF), for the most part, is dependent on the number and type of tags issued by the UDWR each year, and on weather cycles and patterns. Several past, present and future habitat restoration projects have and will take place on the Manti-La Sal National Forest. Graph 2 illustrates the mule deer population estimates from 1999-2012.

For mule deer, the Forest Plan (USDA Forest Service 1986) considered a minimum viable population for the Manti-La Sal National Forest to be 19,820. The current winter population estimate for herd units dominated by Manti-La Sal National Forest lands is 45,100 deer, with 23,600 on the Manti Division (Bernales et al. 2012).
Fawn production is closely tied to the abundance of succulent, green forage during the spring and summer months, predation, and overall fitness of the does following the winter months. Fawn production was very low in the dry 2001-2002 seasons, increased until 2005, decreased until 2007, and has increased until 2010.
Rocky Mountain Elk

Elk habitat includes semi-open forest and mountain meadows in the summer. They move to foothills, plains and valleys in winter. Rocky Mountain elk use uneven-aged, mature forest stands that include old growth characteristics, herbaceous openings, and water. Dense brush under-story is used for escape and thermal cover. They are herbivorous, and feed in riparian areas, meadows, and on herbaceous and brush stages of forest habitats. They graze and browse, eating grasses, forbs, tender twigs, and leaves of shrubs and trees, fungi, some mast, and aquatic vegetation.

On the Wasatch Plateau, elk tend to occupy the higher elevation aspen and mixed conifer habitats from spring through early fall, and then move to lower elevation mixed shrub, pinyon/juniper, and sagebrush habitats for winter range. The rut occurs from late August to November. Elk generally occupy winter range from about the beginning of December through mid-April, but this varies depending on the severity of the winter. On the Plateau, parturition (calving) takes place roughly from the first part of May through early July, generally in aspen dominated habitat. Protection of winter range and calving habitat is considered a key factor in the maintenance of elk populations. It is important that higher nutritional demands during calving be met to improve the chances of calving success, cow recovery, and early calf growth. Therefore, available forage within calving habitat is especially important. Available forage within winter range is also important to increase chances of survival during this harsh season.

**Population Trends:** The elk population within the state of Utah has grown dramatically over the last 30+ years. The current elk population in the state of Utah is estimated at 79,750, which is above the objective of 68,825 (Bernales et al. 2012). The elk population on the Manti Division of the MLSNF is estimated at 12,700, which is above the objective of 12,000 (Bernales et al. 2012). The population has remained relatively stable over the last 10 years, although the elk population was intentionally reduced from 2000-2003 due to the persistent drought. The elk population on the (MLSNF), for the most part, is dependent on the number and type of tags issued by the UDWR each year, and on weather cycles and patterns. Graph 4 illustrates the elk population estimates from 2002-2012. Graph 5 illustrates pre-season calf: cow ratios from 1997 through 2012.

The Forest Plan (USDA Forest Service 1986) has a minimum viable population for elk of 2,125. The current population estimate for elk on herd units dominated by Manti-La Sal National Forest lands is 16,300 elk, with 12,700 elk on the Manti Division (Bernales et al. 2012).
Graph 4 the elk population estimates from 2002-2012 for the Manti (Bernales et al. 2012).

Forest Plan Guidelines:

Forest-wide direction for deer and elk (III-19) includes:
1. Maintain adequate hiding cover around calving areas. Small trees, shrubs and down logs provide security to newborn fawns and calves, and in the project area there are also topographic features which contribute to hiding cover. The upper elevations of the Willow Project area are important for elk calving. Elk may use the mid-elevation oak-mountain brush zones to some degree but this would be based on snow levels of any given year.

2. Optimum habitat mix for the daily normal range is 25% hiding cover, 15% thermal cover, 10% hiding or thermal cover and 50% foraging area.

Cover: Forage ratios are based on more of a landscape scale. Hiding cover is vegetation, generally between the ground and 6 feet in height, which can hide 90% of an adult deer or elk from a distance of 200 feet. Thermal cover is vegetative structure that shields the animal from the effects of weather. For deer this may include sapling trees, shrubs or trees at least 5 feet tall with 75% canopy closure. For elk, this necessitates trees 40 feet or more in height with 70% or more canopy closure. Often, forested vegetation types provide both hiding and thermal cover. Foraging areas are all areas that provide food for deer and elk, which may include patches of hiding/thermal cover but would also include openings with grass/shrub ground cover (Thomas 1979).

3. In areas of historic water shortage, develop water as appropriate.

Developing more water is outside the scope of the proposed vegetation project. Water developments are usually conducted within lower elevation winter or transition ranges.

4. Minimize disturbance in key habitats.

Most of the project area has been identified by the state as crucial spring/fall habitat for deer and crucial and substantial spring/fall habitat for elk (UDWR 2012). No key or general winter range has been identified (USDA, Forest Service 1986).

**Impacts to Big Game:**

The criteria used in this report to evaluate effects on deer and elk habitat are:

- Cover:forage ratio
- Acres of aspen regeneration

The entire north zone of the Manti-La Sal National Forest is within the Central Mountains Manti Herd Unit for both elk and deer. This comprises a total of approximately 794,000 acres. The Willow Project area is approximately 16,984 acres, and the treatment units comprise approximately 5,721 acres. The majority of the treatments are within elk and deer spring/fall habitat. The treatment acres are a small percentage of the spring/fall habitat within the herd unit. The depiction of spring/fall habitat that is proposed to be treated compared to the spring/fall habitat within the herd unit is broken down in table 4.
Elk and deer utilize early-seral forests owing to the high biomass of palatable forage produced under an open tree canopy. Treatments that encourage new herbaceous and shrub growth, including thinning and prescribed fire, are attractive to elk and deer. Currently in the forested project area, the cover:forage ratio is approximately 40:57 based on acres of existing vegetation types. This is not completely accurate based on the fact that some of the conifer stands contain dead spruce. These stands may no longer provide cover in the short term; however, the treatments would increase cover long term by increasing the spruce composition and get to the optimum mix of cover:forage. These treatments are also important to prevent large scale wildfires which would eliminate big game cover over large areas. Below are the modeling of the canopy cover and mature structure in the different vegetation types based on current and long term projections.

### Table 4 Big game habitat on the Manti Division

<table>
<thead>
<tr>
<th>HABITAT</th>
<th>HERD UNIT (Acres)</th>
<th>WILLOW PROJECT AREA (Acres-Percent)</th>
<th>WILLOW TREATMENT UNITS (Acres-Percent)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Deer Spring/Fall Habitat</td>
<td>192,762 acres</td>
<td>15,340 acres (8%)</td>
<td>5,158 acres (2.7%)</td>
</tr>
<tr>
<td>Elk Spring/Fall Habitat</td>
<td>135,403 acres</td>
<td>15,075 acres (11.1%)</td>
<td>5,404 acres (4%)</td>
</tr>
</tbody>
</table>

![Graph 6 - Spruce/fir Vegetation Type](image)
Short term: Stands of this type are deficient for desired wildlife cover.

Long term: Stands over the long term will not meet cover.

Cumulative: No effect.

Short term: Stands of this type are deficient for desired wildlife cover.

Long term: Thinning, burning and planting will meet desired cover range in approximately 90 years

Cumulative: On average an increase of 10 percent.

Short term: Without treatment stands will naturally increase in size and density which is above minimum desired limit.

Long term: TPA of >18" DBH will be above desired limits. Stand health and vigor will be better than the no-action.

Cumulative: No effect.
Cumulative Impacts to Big Game:

Rangeland/Vegetation:

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Livestock Grazing – Livestock grazing has occurred within the project area since the 1850’s. Currently there are both Cattle and Sheep (C&H) and Sheep and Goat (S&G) allotments within the project area. These allotments are on the deferred rest rotation system. Grazing could alter cover:forage ratios if permitted numbers are too high. This has not been the case when looking at overall big game population numbers. Permitted grazing numbers are adjusted with wildlife habitat in mind.

Noxious Weeds – Noxious weed infestations have the potential to greatly impact habitat and cover:forage ratios because they change species composition and diversity which leads to a reduction in forage availability. Currently there small patches of noxious weeds identified within the project area. These known sites have been treated and sites are treated as identified.

Transportation: Transportation includes Existing Forest System Roads (FSRs) as well as Existing motorized trails. These will be analyzed together.

Existing Forest System Roads (FSRs) and Motorized Trails – Direct impacts to big game from existing roads and trails would include vehicular noise from the original road construction as well as vehicle use which can directly disrupt foraging activities. These impacts lesson as wildlife becomes acclimated. Indirect impacts have occurred by removing foraging habitat and dissecting large forested stands which may decrease overall habitat quality.

Unauthorized OHV USE – Unauthorized use has been increasing over the last decade and has impacted suitable habitats for many wildlife species. Direct impacts include noise and physical disturbance which can disrupt foraging activities in areas that previously did not have any OHV use including. It also further fragments habitat into smaller blocks which lead to a decrease in habitat effectiveness and quality.

Northern Goshawk

Goshawks have been found in a variety of forest ecosystems including lodgepole pine, aspen, ponderosa pine, Douglas-fir, and mixed forests throughout much of the northern hemisphere. Goshawk nest sites are usually located in dense mature forests with relatively large trees, near water, and on benches of relatively little slope (Graham et al. 1999). Closed canopies are important for protection and thermal cover, and relatively open under-stories are important to allow maneuverability during foraging. Data (district records) collected from the Wasatch Plateau between 1989 and 2013 show that over 80% of goshawk nests are in stands with a mixture of aspen and conifer species, with the remaining nest stands comprised of mixed-conifer (primarily Engelmann spruce/sub-alpine fir) without aspen (USDA, Forest Service 2013a). Nearly 70 percent of all known nests have been in aspen trees, with proportionally fewer in Douglas-fir and spruce. Nests are often used year after year, but nest stands usually contain a number of alternate nests.
Goshawks are sensitive to human disturbance and have abandoned nests and young due to human activities that take place too close to their nest. The MLNF Land and Resources Management Plan directs that Forest Service management activities and human uses for which the forest issues permits be restricted within a 30-acre area around active goshawk nests (USDA, Forest Service 1986). Restrictions within the 30-acre buffer around active nest sites would normally extend from 1 March through 30 September. In the 1980s an evaluation of 20-acre buffers around nest sites indicated that these small areas were not adequately protecting nest areas; in 1992 more comprehensive management recommendations suggested that managing for 6,000 acre territories to protect nest sites and provide adequate foraging habitat was more appropriate (Graham et al. 1999). The U.S. Fish and Wildlife Service recommend that active goshawk nests be buffered with a 0.5-mile spatial buffer from 1 March to 15 August (USDI, U.S. Fish and Wildlife Service 2002d).

Suitable goshawk habitat is often heterogeneous, which supports a broad range of prey species; particularly those preferred by the goshawk: small mammals and birds including rabbits, squirrels, chipmunks, grouse, woodpeckers, jays and robins. Important forest components in Utah include snags, multiple canopies, and down woody debris (Graham et al. 1999).

Vegetation structural stages (VSS) are stages of forest growth and maturity and are used in defining the components of goshawk habitat. VSS 1 is classified as grass/forb with 0-1” dbh trees, VSS 2 is seedling/sapling with 1-5” dbh trees; VSS 3 is young forest with 5-12” dbh trees, VSS 4 is mid-age forest with 12-18” dbh trees, VSS 5 is mature forest with 18-24” dbh trees, and VSS 6 is old forest with 24”+ trees. There are no VSS 6 within the treatment units, which could be a result of historic logging in this area.

Aspen regeneration is an important component in the life history of northern goshawks on the Manti-La Sal National Forest. The loss of aspen is concerning as well as the acreage of beetle killed spruce. Many nests have been lost due to wind or snowload causing dead spruce to fall over onto nest trees.

**Population Trends:** The goshawk population on the Manti-La Sal National Forest has remained relatively stable, although occupancy declined between 2002 - 2004. Looking at the number of active nests over the years would give the impression that the goshawk population on the Forest has steadily increased since the late 80s. A better indication of how the goshawk population is doing on the Forest would be the percent of monitored nests that were occupied each year, which is illustrated in graph 9 below. The Manti-La Sal National Forest Plan Goshawk Amendment (USDA, Forest Service 1986) states that less than a 20% decline in occupancy over a 3-year period is an acceptable range. We are currently within that range.
Graph 8: goshawk occupancy on the Manti-La Sal National Forest

Northern Goshawk Territory Occupancy

<table>
<thead>
<tr>
<th>Year</th>
<th>% Occupied</th>
</tr>
</thead>
<tbody>
<tr>
<td>2000</td>
<td>45</td>
</tr>
<tr>
<td>2002</td>
<td>42</td>
</tr>
<tr>
<td>2004</td>
<td>40</td>
</tr>
<tr>
<td>2006</td>
<td>38</td>
</tr>
<tr>
<td>2008</td>
<td>25</td>
</tr>
<tr>
<td>2010</td>
<td>30</td>
</tr>
<tr>
<td>2012</td>
<td>40</td>
</tr>
</tbody>
</table>

Forest Plan Guidelines:

1. Management actions should promote conditions within the historic range of variation.

These treatments are within the historic range of variation

2. Treatment provides for a full range of seral stages to achieve a mosaic of habitat conditions and diversity.

The treatments provide a range of seral stages. Only a portion of the project area is within the treatment units. Aspen regeneration will occur and large trees will be left within the treatments. With no treatments, aspen will continue to be lost and fuels will continue to build up, potentially leading to a large scale wildfire.

3. Vegetation management should enhance/maintain the characteristics of mature and old structural stages.

The majority of the project area contains younger age stands and this treatment will promote VSS 4 and VSS 5 (see BA/BE).

4. Leave 200 snags/100 acres (>18” DBH minimum preferred size) in ponderosa pine and 300 snags/100 acres in mixed conifer forested cover types.

5. Downed woody debris requirements include 30 down logs/10 acres (12” diameter x 8’ length) and/or 50 tons coarse woody debris/10 acres in ponderosa pine and 50 down logs/10 acres in mixed conifer.

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6. Clumps of trees with interlocking crowns should cover 40-70% of group acreage, the clumps are 2-9 trees, VSS 4, 5 or 6 (> 12” DBH).

7. Creation of openings (a break in the forest canopy covered by grasses, forbs, shrubs or tree seedlings or less than 10% stocking) as a result of mechanical treatment in designated PFAs. For ponderosa pine and mixed conifer, maximum created opening size should be 2 acres. Prescribed fire is not covered by the guideline, and may result in larger openings. There is no restriction in the Forest Plan on opening size to regenerate aspen (pg III-27).

The snag, downed woody debris, VSS guidelines, and creation of openings are part of the design features for this project (see BA/BE).

The standards and guidelines from the goshawk amendment regarding required surveys have been met. For the known territories, nest areas and PFAs (post-fledging areas-600 acres) have been delineated (standards i,j,m,s and guidelines k,n,o). The seasonal restriction (March 1- September 30) on vegetation treatment in active nest areas (standard p) and the post-fledging area (guideline t) would be followed during project implementation.

7. Vegetation treatments within the nest areas should be designed to maintain/improve nesting habitat.

These treatments are designed to improve forest health and would improve nesting habitat over the long term.

**Impacts to Northern Goshawks:**

There are 2 known goshawk nest territories located within the project area; Maple Creek and Cottonwood Creek. The Maple Creek nest is located within a proposed mastication treatment unit. This nest was last active in 2012 (USDA, Forest Service 2014). The Cottonwood Creek nest is located within a proposed salvage/aspen regeneration treatment unit. This nest was last active in 2011 (USDA, Forest Service 2014). The post-fledging family areas (PFAs) have been delineated and mapped for these territories using forest vegetation cover types.

**Aspen/Mixed Conifer**

Under Alternative 1 (No Action), 86% of the aspen/mixed conifer stands within the proposed treatment units are within VSS 1, VSS 2, and VSS 3; while only 14% are within VSS 4 and VSS 5. There are no stands within VSS 6. In 10 years, it is projected that the VSS 4 and VSS 5 would increase slightly to 15% and in 100 years, they would remain at 15%. With no treatments to these stands, goshawk nesting habitat will remain in the younger VSS classes and is not consistent with the landscape needs for goshawk.

**Spruce/Fir**
Under Alternative 1 (No Action), 76% of the spruce/fir stands within the proposed treatment units are within VSS 1, VSS 2, and VSS 3; while only 24% are within VSS 4 and VSS 5. There are no spruce/fir stands within VSS 6. In 10 years, it is projected that the VSS 4 and VSS 5 would slightly decrease to 21%, and in 100 years would remain at 21%. With no treatments, goshawk nesting habitat is not consistent with the landscape needs for goshawk.

This no action alternative does not improve goshawk nesting or foraging habitat and the quality of nesting habitat will continue to diminish as long as aspen is lost to conifer. Of the 43 goshawk territories on the Manti-La Sal National Forest, only 12 have a nest that is in a conifer. The spruce beetle mortality has also caused a shift in species composition; the majority of new growth is sub-alpine fir. In the absence of disturbance, aspen vegetation type is at risk and is being displaced by other vegetation types (Williams, 2008). Fire exclusion and lack of any alternate regeneration treatment over the past 100 years has caused, in most areas, the decline of these stands and changed the distribution of the structural classes. There is a high risk that aspen in the aspen-mixed conifer types will continue to be lost to conifer encroachment from lack of disturbance which will continue to degrade nesting habitat for goshawks. Without disturbance to remove the conifers and stimulate the aspen suckering response in these stands, conifers are gaining dominance over the aspen (Bartos and Campbell 1998). Aspen stands that are dominated by conifers, or those that are breaking up and not naturally reproducing, are likely to need treatment to rejuvenate the aspen clone (Shepperd, 2001).

**Direct and Indirect Effects for Alternative 2 (Proposed Action):**

Under Alternative 2 (Proposed Action), no direct impacts are expected because no treatments would be allowed within the active nest areas (30 acres each) for either the Maple Creek or Cottonwood Creek Territories. Project design features would protect goshawks within the proposed project area (see design features; pages 9-10).

There would be indirect impacts to both goshawk nesting and foraging habitat because the proposed project would remove the dead overstory and thin young sub-alpine fir.

**Aspen/Mixed Conifer**

Under Alternative 2 (Proposed Action), it is projected that in 10 years, 10% of the aspen/mixed conifer stands within the proposed treatment units would be within the VSS 4 and VSS 5 which is a 5% decrease from Alternative 1 (No Action). In 100 years, 17% of the aspen/mixed conifer stands would be within the VSS 4 and VSS 5 which is an increase of 2%. Treatments will increase the VSS 4 and VSS 5 in the long-term and would best meet the landscape needs for goshawk.

**Spruce/Fir**

Under Alternative 2 (Proposed Action), it is projected that in 10 years, 10% of the spruce/fir stands within the treatment units would be within VSS 4 and VSS 5, while at 100 years, 16% would be in VSS 4 and VSS 5. This is a 5% decrease in the long-term; however only 35% of the spruce/fir within the
The proposed project would be treated. The benefits to increasing aspen and increasing the VSS 4 and VSS 5 in the aspen/mixed conifer stands meets the landscape needs for goshawk.

Fire exclusion and lack of any alternate regeneration treatment over the past 100 years has caused, in most areas, the decline of aspen stands and changed the distribution of the structural classes. There is a high risk that aspen in the aspen-mixed conifer types will continue to be lost to conifer encroachment from lack of disturbance. Without disturbance to remove the conifers and stimulate the aspen suckering response in these stands, conifers are gaining dominance over the aspen (Bartos and Campbell 1998). Aspen stands that are dominated by conifers, or those that are breaking up and not naturally reproducing, are likely to need treatment to rejuvenate the aspen clone (Shepperd, 2001).

See BA/BE for cumulative effects analysis on goshawk.

A. Migratory Birds

**Pinyon Juniper, Oakbrush Species, and Ponderosa Pine Species**

There are six species that use oak/mountain brush or pinyon juniper as either primary or secondary breeding habitat; black-throated gray warbler, grace’s warbler, ferruginous hawk, gray vireo, juniper titmouse, Lewis’s woodpecker, pinyon jay, and Virginia’s warbler.

Treatments within this vegetation type include mastication and understory burning within the Ponderosa pine-oak stands. Pinyon-juniper stands would be reduced in the areas where encroachment has taken place to reduce fuels and prevent large scale wildland fire loss. Mature-old growth pinyon-juniper is an important vegetation type for many species and is not targeted as part of this project. There would be a short term habitat loss for these pinyon-juniper species; however, these treatments may prevent wide scale habitat loss from large scale wildfires which would be a long-term benefit. Timing of these treatments would be outside of nesting for these species. Foraging activities would be displaced during project related activities. Oak would be lost within ponderosa stands where understory burning would take place. These burns are low intensity and would only impact oak dependent species short-term. Impacts to ponderosa pine species such as Grace’s warbler and Lewis woodpecker would be minimal because the burn is low intensity and little to no ponderosa pine is expected to be lost.

**Aspen and Conifer Species**

There are three priority species that inhabit the aspen/conifer vegetation types; broad-tailed hummingbird, Cassin’s finch, and Williamson’s sapsucker. The majority of the treatments are within this vegetation types. There may be direct impacts/mortality to nests or nestlings within this habitat type; although most treatments would occur outside breeding season. There will be loss of habitat with this project in the short-term but long-term benefits would be the reduction of large scale habitat
loss from wildfire and forest health. Early seral species would be increased and pockets of mid-aged and mature species would be left. Foraging could be disrupted for all these species during project related activities.

V. Wildlife Design Features

The purpose of these design features is to ensure that any impacts projected to occur as a result of this proposed project are negated if these design features are followed. These design features are based on standards and guidelines taken from the Northern Goshawk Amendment as part of the Manti-La Sal National Forest Land and Resource Management Plan (MLNF-LRMP) (USDA, Forest Service 2003).

- Provide for a full range of seral stages, by forested cover type, that achieve a mosaic of habitat conditions and diversity. Each seral stage should contain a strong representation of early seral tree species. Recruitment and sustainability of early seral tree species in the landscape is needed to maintain ecosystem resilience to perturbations.

- Surveys for the northern goshawk will be on going. If goshawks are located in the project area, the guidelines of the goshawk strategy and the forest plan amendment for the Utah Northern Goshawk Project (USDA, Forest Service 2003) would be implemented, which are the following:

- Prohibit forest vegetative manipulation (timber harvest, prescribed burning, fuel-wood, thinnings, weedings, etc.) within active nest areas (approximately 30 acres; i.e.) during the active nesting period. The active nesting period will normally occur between March 1st and September 30th.

- Identify a Post-Fledgling Area (PFA) which encompasses the active, alternate and replacement nest areas and additional habitat needed to raise fledglings. A PFA should be approximately 420 acres in size (exclusive of nest area acres) when sufficient suitable habitat exists. If sufficient amounts of suitable habitat are not present, use existing suitable habitat that is available, no treatments would occur if a nest is active, within this buffer until young have fledged the nest (September 30th).

- Leave the following minimum number and size of snags. If the minimum number of snags is unavailable, green trees should be substituted. If the minimum size is unavailable, then use largest trees available on site. It is desirable to have snags represented in all size classes above the minimum available on the site. The number of snags should be present at the stand level on average and, where they are available, distributed over each treated 100 acres. This distribution is needed to meet the needs of prey species that utilize this habitat.

<table>
<thead>
<tr>
<th>COVER TYPE</th>
<th>MINIMUM SNAGS PER 100 ACRES</th>
<th>MINIMUM PREFERRED SIZE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ponderosa Pine</td>
<td>200</td>
<td>18” – 30’ tall</td>
</tr>
<tr>
<td>Mixed Conifer and Spruce Fir</td>
<td>300</td>
<td>18” – 30’ tall</td>
</tr>
<tr>
<td>Aspen</td>
<td>200</td>
<td>8” – 15’ tall</td>
</tr>
</tbody>
</table>
• Retain the following minimum amount and size of down logs and woody debris. These habitat components should be present at the stand level on average and, where they are available, distributed over each treated 10 acres. This distribution is needed to meet the needs of prey species that utilize this habitat.

Table 6 Downed logs and woody debris guidelines

<table>
<thead>
<tr>
<th>COVER TYPE</th>
<th>MINIMUM DOWN LOGS (per 10 acres)</th>
<th>MINIMUM LOG SIZE (Diameter – Length)</th>
<th>MINIMUM COARSE WOODY DEBRIS (&gt;= 3” diameter)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ponderosa Pine</td>
<td>30</td>
<td>12” – 8’ tall</td>
<td>50</td>
</tr>
<tr>
<td>Mixed Conifer and Spruce Fir</td>
<td>50</td>
<td>12” – 8’ tall</td>
<td>100</td>
</tr>
<tr>
<td>Aspen</td>
<td>50</td>
<td>6” – 8’ tall</td>
<td>30</td>
</tr>
</tbody>
</table>

• Openings created as a result of mechanical vegetative treatments should not exceed the following by cover type:

Table 7 Minimum created opening size

<table>
<thead>
<tr>
<th>COVER TYPE</th>
<th>MAXIMUM CREATED OPENING SIZE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ponderosa Pine And Mixed Conifer</td>
<td>2 Acres</td>
</tr>
<tr>
<td>Spruce Fir</td>
<td>1 Acre</td>
</tr>
<tr>
<td>Aspen</td>
<td>Follow Current Management Direction</td>
</tr>
</tbody>
</table>

VI. MIS SUMMARY

Forest Plan Consistency – A Forest Plan checklist was evaluated for this project (USDA, Forest Service 2014). This project does comply with applicable Wildlife and Fish Resource Management, Forest-wide direction and standards and guidelines.

Consideration of Best Available Science - The analysis in the Wildlife Report considers the best available science. The analysis focuses on species present in the project area, which was determined through site visits, site-specific inventories/surveys and knowledge of the life history requirements of each species and occupancy of similar habitat types on the Forest. Habitat suitability was determined through site visits and review of life histories and habitat requirements as reported in the literature. The analysis includes a summary of the credible scientific evidence which is relevant to evaluating reasonably foreseeable impacts. When appropriate, the conclusions are based on scientific analysis that shows a thorough review of relevant scientific information, a consideration of
responsible opposing views, and the acknowledgment of incomplete or unavailable information, scientific uncertainty, and risk.

The relevant science considered for this analysis consists of several key elements. For wildlife, fisheries, and botany resources, the elements of science used are:

- Forest vegetation layers (existveg.mdb).
- Scientific literature - Refer to References section.
- The effects to wildlife, fisheries and botany resources on other similar areas have been considered in the analysis.
- MIS Capability/Suitability Analysis (USDA, Manti-La Sal National Forest 2007)

VII. LITERATURE CITED


