
Appendix P
Forest Service Draft
Management Indicator Species Report

Draft
Management Indicator Species Report

for the

Greater Sage-Grouse Conservation Effort to Amend the
Ashley, Fishlake, Manti - La Sal, Dixie,
Uinta and Wasatch - Cache National Forest Plans

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I. INTRODUCTION

The National Forest Management Act (NFMA) directs National Forests to identify Management Indicator Species (MIS). MIS are chosen as a representative of certain habitat conditions important to a variety of other species. MIS are generally presumed to be sensitive to habitat changes. By monitoring and assessing populations of MIS, managers can determine if management actions are affecting other species populations. According to the various Forest Land and Resource Management Plans in Utah, there are 20 birds, 6 fish, 5 mammals, macro-invertebrates, and 1 plant (see all LRMPs, USDA 1986a-d, 2003a-b). These MIS were reviewed to determine which are present and/or have habitat in the analysis area, and to identify those likely to be affected by the implementation of a management decision, see Table I.

The 1982 (36 CFR 219.19) regulations for viability state that the Forest Service has the responsibility to provide sufficient habitat that can support viable populations of native and desired nonnative vertebrates across the planning area at a level that populations are likely to persist on National Forest System (NFS) lands.

On December 18, 2009 the Department of Agriculture issued a final rule reinstating the National Forest System Land and Resource Management Planning rule of November 9, 2000, as amended (2000 rule) (74 FR 242 [67059-67075]). This rescinded the 1982 planning rule. The 2000 rule states: Projects implementing land management plans must comply with the transition provisions of 36 CFR §219.35, but not any other provisions of the planning rule. Projects implementing land management plans and plan amendments, as appropriate, must be developed considering the best available science in accordance with §219.35(a). Projects implementing land management plans must be consistent with the provisions of the governing plans.

In order to address the MIS species, the issues surrounding the change in planning rules, and to assure the best available science was used our approach was as follows:

1. Identify habitat and population characteristics/trends by Forest
2. Identify the role of the habitat on each Forest in the overall viability of the population
3. Analyze effects of each alternative based on relevant threats, as well as current and past management
4. Make a determination whether the effects of the alternatives will affect overall viability.

2. PROJECT HISTORY

Greater Sage-Grouse have emerged as a significant conservation concern over the last 10 years. The species is currently a candidate species for listing under the Endangered Species Act inferring that listing is “warranted, but precluded due to higher priorities” because of two primary factors: 1) the large-scale loss and fragmentation of habitats across the species range, and 2) a lack of regulatory mechanisms in place to ensure the conservation of the species. The primary threats to sage-grouse habitat are summarized in the listing decision. The two dominant threats are related to infrastructure associated with energy development in the eastern portion

of the species range, and the conversion of sagebrush communities to annual grasslands associated resulting in large uncharacteristic wildfires in the western portion of the species range (USFWS 2010).

The Bureau of Land Management (BLM) manages approximately half of the Greater Sage-Grouse habitats, whereas the Forest Service (FS) manages approximately 8 percent of species habitat, with most of that occurring on national forests in the Intermountain Region. The Forest Service manages approximately 9 million acres of sage-brush habitats, of which about 7.5 million acres occurring in the Intermountain Region. Most habitats on FS administered lands contribute to summer brood-rearing habitats, although some forests and grasslands do contribute important breeding nesting and winter habitat.

In 2011 and 2012, the United States Fish and Wildlife Service (FWS) submitted letters to the BLM and FS recommending that the agencies amend Land Use Plans to provide adequate regulatory mechanisms to conserve the species. Originally, this recommendation identified 10 National Forests viewed as “high priority” to ensure appropriate regulatory mechanisms. Following scoping and discussion the FS added an additional 10 Forest Plans that would be considered for amendment. The FS is participating in several joint Environmental Impact Statements (EISs) with the BLM to develop Records of Decision that will be used as a basis for amending Land Use Plans, including Forest Plans.

Since half of all Greater Sage-Grouse habitat occurs on BLM lands, the BLM is leading the effort to amend or revise land use plans, with the Forest Service as a cooperating agency. The purpose is to provide direction in land management plans that conserve and protect sage-grouse habitat and to provide assurances to the USFWS that adequate regulatory mechanisms are in place to ensure the conservation of the species. EISs will be completed for seven sage-grouse planning subregions: 1) eastern Montana and portions of North and South Dakota, 2) Idaho and southwest Montana, 3) Oregon, 4) Wyoming, 5) northwest Colorado, 6) Utah, and 7) Nevada and northern California. The FS is participating in six of these EISs (excluding Eastern Montana/Dakotas and some of the areas in Wyoming). The EISs will include joint agency signatures, but separate Records of Decision.” The Forest Service is involved in five of these efforts (<http://fsweb.r4.fs.fed.us/unit/nr/sagegrouse/index.shtml>, Accessed April 16, 2013)

This Management Indicator Species report is being prepared in support of the Utah EIS. All National Forests in Utah are planning to amend their respective Land and Resource Management Plan for the Greater Sage-Grouse.

Table I
Management Indicator Species (MIS) on National Forest System Lands Within the Utah Greater Sage Grouse Analysis Area

Species of MIS	Forest Units	Habitat Association	Species or habitat in analysis area?	Rationale for inclusion or dismissal regarding analysis of anticipated effects from implementation of an action alternative to MIS
Brewer's sparrow	Fishlake	Shrub-Steppe	Yes	The alternatives propose some changes to management of shrub steppe habitats, so populations could respond to proposed changes according to each of the alternatives. Therefore, this <u>species will be evaluated in more detail.</u>
Golden eagle	Ashley, Manti La Sal	Shrub-Steppe	Yes	The alternatives propose some changes to management of shrub steppe habitats, so populations could respond to proposed changes according to each of the alternatives. Therefore, this <u>species will be evaluated in more detail.</u>
Greater sage-grouse	Ashley, Manti La Sal	Shrub-Steppe	Yes	The alternatives propose some changes to management of shrub steppe habitats, so populations could respond to proposed changes according to each of the alternatives. Therefore, this <u>species will be evaluated in more detail.</u>
Hairy woodpecker	Fishlake	Mature Forest	No	Essentially no habitat in mapped priority or general habitat. <i>(For definitions of priority and general sage-grouse habitat see chapter 2 of the EIS.)</i> Implementation of the alternatives will cause no changes to populations or habitat. Therefore, this species will NOT be evaluated in more detail.
Lincoln's sparrow	Ashley, Fishlake	Riparian shrub	Yes	The alternatives propose some changes to management of shrub steppe habitats, so populations could respond to proposed changes according to each of the alternatives. Therefore, this <u>species will be evaluated in more detail.</u>
MacGillivray's warbler	Fishlake	Riparian shrub	Yes	The alternatives propose some changes to management of shrub steppe habitats, so populations could respond to proposed changes according to each of the alternatives. Therefore, this <u>species will be evaluated in more detail.</u>
Mountain bluebird	Fishlake	Shrub-Steppe	Yes	The alternatives propose some changes to management of shrub steppe habitats, so populations could respond to proposed changes according to each of the alternatives. Therefore, this <u>species will be evaluated in more detail.</u>

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Northern flicker	Dixie	Mature Forest	No	Essentially no habitat in mapped priority or general habitat. Implementation of the alternatives will cause no changes to populations or habitat. Therefore, this species will NOT be evaluated in more detail.
Northern goshawk	Ashley, Dixie, Fishlake, Manti-La Sal, Uinta-Wasatch-Cache	Mature Forest	No	Essentially no habitat in mapped priority or general habitat. Implementation of the alternatives will cause no changes to populations or habitat. Therefore, this species will NOT be evaluated in more detail.
Red-naped sapsucker	Ashley	Mature Forest	No	Essentially no habitat in mapped priority or general habitat. Implementation of the alternatives will cause no changes to populations or habitat. Therefore, this species will NOT be evaluated in more detail.
Sage thrasher	Fishlake	Shrub-Steppe	Yes	The alternatives propose some changes to management of shrub steppe habitats, so populations could respond to proposed changes according to each of the alternatives. Therefore, this <u>species will be evaluated in more detail.</u>
Song sparrow	Ashley, Fishlake	Riparian shrub	Yes	The alternatives propose some changes to management of shrub steppe habitats, so populations could respond to proposed changes according to each of the alternatives. Therefore, this <u>species will be evaluated in more detail.</u>
Three-toed woodpecker	Uinta	Mature Forest	No	Essentially no habitat in mapped priority or general habitat. Implementation of the alternatives will cause no changes to populations or habitat. Therefore, this species will NOT be evaluated in more detail.

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Species of MIS	Forest Units	Habitat Association	Species or habitat in analysis area?	Rationale for inclusion or dismissal regarding analysis of anticipated effects from implementation of an action alternative to MIS
Vesper sparrow	Fishlake	Grassland, shrub edge	Yes	The alternatives propose some changes to management of shrub steppe habitats, so populations could respond to proposed changes according to each of the alternatives. Therefore, this <u>species will be evaluated in more detail.</u>
Warbling vireo	Ashley	Mature Forest	No	Essentially no habitat in mapped priority or general habitat. Implementation of the alternatives will cause no changes to populations or habitat. Therefore, this species will NOT be evaluated in more detail.
Western bluebird	Fishlake	Shrub-Steppe	Yes	The alternatives propose some changes to management of shrub steppe habitats, so populations could respond to proposed changes according to each of the alternatives. Therefore, this <u>species will be evaluated in more detail.</u>
White-tailed ptarmigan	Ashley	Tundra	No	Essentially no habitat in mapped priority or general habitat. Implementation of the alternatives will cause no changes to populations or habitat. Therefore, this species will NOT be evaluated in more detail.
Wild turkey	Dixie	Shrub-Steppe	Yes	The alternatives propose some changes to management of shrub steppe habitats, so populations could respond to proposed changes according to each of the alternatives. Therefore, this <u>species will be evaluated in more detail.</u>
Yellow warbler	Fishlake	Riparian Wooded	Yes	This species is present in riparian systems within the analysis area and adjacent to priority or general habitat in Utah. The alternatives generally propose changes to management of upland shrub-steppe environments and propose very minimal, if any, changes to the mature wooded/structured riparian corridors preferred by this species. Therefore, these species will NOT be evaluated in more detail.
Bonneville cutthroat, cutthroat, and	Ashley, Dixie, Fishlake,	Aquatic	Yes	These species are present in aquatic systems within the analysis area and adjacent to priority or general habitat in Utah. The alternatives generally propose changes to management of upland shrub-steppe

Table I
Management Indicator Species (MIS) on National Forest System Lands Within the Utah Greater Sage Grouse Analysis Area

Species of MIS	Forest Units	Habitat Association	Species or habitat in analysis area?	Rationale for inclusion or dismissal regarding analysis of anticipated effects from implementation of an action alternative to MIS
Colorado River cutthroat, brown, and brook trout	Uinta-Wasatch-Cache			environments and other than limiting grazing management in some instances, propose minimal changes to aquatic environments. Therefore, these species will NOT be evaluated in more detail.
Southern leatherside chub	Dixie	Aquatic	Yes	This species is present in aquatic systems within the analysis area and adjacent to priority or general habitat in Utah. The alternatives generally propose changes to management of upland shrub-steppe environments and other than limiting grazing management in some instances, propose minimal changes to aquatic environments. Therefore, this species will NOT be evaluated in more detail.
Virgin spinedace	Dixie	Aquatic	No	This species is present in aquatic systems within the analysis area and adjacent to priority or general habitat in Utah. The alternatives generally propose changes to management of upland shrub-steppe environments and other than limiting grazing management in some instances, propose minimal changes to aquatic environments. Therefore, this species will NOT be evaluated in more detail.
Macro-invertebrates	Ashley, Fishlake, Manti-La Sal	Aquatic	Yes	These species are present in aquatic systems within the analysis area and adjacent to priority or general habitat in Utah. The alternatives generally propose changes to management of upland shrub-steppe environments and other than limiting grazing management in some instances, propose minimal changes to aquatic environments. Therefore, these species will NOT be evaluated in more detail.
Abert's Squirrel	Manti-La Sal	Montane Conifer	No	Essentially no habitat in mapped priority or general habitat. Implementation of the alternatives will cause no changes to populations or habitat. Therefore, this species will NOT be evaluated in more detail.

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Species of MIS	Forest Units	Habitat Association	Species or habitat in analysis area?	Rationale for inclusion or dismissal regarding analysis of anticipated effects from implementation of an action alternative to MIS
American beaver	Uinta-Wasatch-Cache	Aquatic	Yes	This species is present in aquatic systems within the analysis area and adjacent to priority or general habitat in Utah. The alternatives generally propose changes to management of upland shrub-steppe environments and other than limiting grazing management in some instances, propose minimal changes to aquatic environments. Therefore, this species will NOT be evaluated in more detail.
Mule deer	Ashley, Dixie, Fishlake, Manti-La Sal	Shrub-Steppe	Yes	The alternatives propose some changes to management of shrub steppe habitats, so populations could respond to proposed changes according to each of the alternatives. Therefore, this <u>species will be evaluated in more detail.</u>
Rocky Mountain elk	Ashley, Dixie, Fishlake, Manti-La Sal	Shrub-Steppe	Yes	The alternatives propose some changes to management of shrub steppe habitats, so populations could respond to proposed changes according to each of the alternatives. Therefore, this <u>species will be evaluated in more detail.</u>
Snowshoe hare	Wasatch-Cache	Montane Forest	No	Essentially no habitat in mapped priority or general habitat. Implementation of the alternatives will cause no changes to populations or habitat. Therefore, this species will NOT be evaluated in more detail.
Rydberg milkvetch	Fishlake	Montane Forest Service Alpine	No	Essentially no habitat in mapped priority or general habitat. Implementation of the alternatives will cause no changes to populations or habitat. Therefore, this species will NOT be evaluated in more detail.

3. PURPOSE AND NEED

The purpose of the Land and Resource Management Plan amendments for the Greater Sage-Grouse is to identify and incorporate appropriate conservation measures to conserve, enhance, and/or restore sage-grouse habitat by reducing, eliminating, or minimizing threats to their habitat. The need to create this amendment arose when the inadequacy of regulatory mechanisms was identified as a significant threat in the USFWS finding on the petition to list the Greater Sage-Grouse. The USFWS identified conservation measures within Forest Service Land and Resource Management Plans (as well as BLM Land Use Plans) as the principal regulatory mechanisms for habitat conservation. Therefore, the Land and Resource Management Plan amendments will focus on areas affected by threats to sage-grouse habitat identified by the USFWS in the March 2010 listing decision (USFWS 2010).

4. DESCRIPTION OF THE ALTERNATIVES

There are five alternatives to consider under this analysis, the no action alternative and four action alternatives: Alternative A - No action, Alternative B, Alternative C, Alternative D and Alternative E. A brief description of each of the alternatives is provided below. For a full description of the alternatives, as well as project design criteria, mitigation and monitoring requirements, please refer to chapter 2 of the EIS prepared for this project.

One of the key differences between the alternatives is the habitat level or management area a specific conservation measure applies to. Greater sage-grouse habitat is divided into two management areas – preliminary priority management areas (PPMA) and preliminary general management areas (PGMA). PPMA is defined as areas that have been identified as having the highest conservation value to maintaining sustainable Greater Sage-Grouse populations. These areas include breeding, late brood-rearing and winter concentration areas. PGMA is defined as areas of occupied seasonal or year-round habitat outside of PPMA. A third category of linkage areas is also present. Within the document, all occupied habitat refers to all PPMA and PGMA, and linkage areas.

4.1 ALTERNATIVE A

Under the no-action alternative the Forest Land and Resource Management Plans would not be amended. The existing management direction set forth in the plans for sage-grouse and sagebrush habitats would continue.

4.2 ALTERNATIVE B

All applicable and appropriate conservation measures that were developed in the NTT's 2011 report (Sage Grouse National Technical Team 2011) are considered and incorporated into this alternative. These conservation measures would apply only to Greater Sage-Grouse PPMA. There would be a 3% cap on disturbance in these areas. Additional details about this alternative include: Travel construction would be limited in PPMA, minimum standards would be applied and there would be no upgrading of roads. Recreation special use permits in PPMA would only be allowed if they are deemed to have a beneficial effect to the Greater Sage-Grouse. Rights-of-way would be excluded in PPMA. The Forests would aim to keep and acquire PPMA. Grazing direction would be adjusted to improve management for Greater Sage-Grouse. PPMA would be closed to new fluid minerals leases; existing leases would have a 4-mile no surface occupancy

buffer around leks. Wildfire/Fuels would aim to protect sagebrush habitats in PPMA. Habitat restoration would be a priority, with a focus on native species.

4.3 ALTERNATIVE C

During scoping, conservation groups had the opportunity to submit suggestions on how to define PPMA and PGMA areas and developed their own conservation measures that would be applied to those areas (proposing more stringent management). All of the reasonable conservation measures across the sage-grouse range have been consolidated into one alternative which each sub region will analyze in detail. This alternative would apply to all occupied Greater Sage-Grouse habitat, including PPMA, PGMA and linkage areas. There would be a 3% cap on disturbance in these areas. PPMA would be closed to livestock grazing. Additional details about this alternative include: Travel construction would be limited in habitat, and no new roads would be constructed within 4 miles of a lek or occupied habitat. Recreation would seasonally prohibit camping and non-motorized recreation within 4 miles of a lek. All occupied habitat would be exclusion areas for rights-of-way and special use permits. The Forests would aim to keep and acquire all occupied habitat. Wind and solar installations would not be allowed to be sited in designated habitat. All occupied habitat would be closed to new fluid minerals leases; existing leases would have a 4-mile no surface occupancy buffer around leks. Wildfire/Fuels would aim to protect and restore sagebrush habitats; areas would be closed to grazing after wildfire. All PPMA would be designated as Areas of Critical Environmental Concern (ACEC) or Zoological Areas.

4.4 ALTERNATIVE D

In this alternative, the Utah sub-regions has modified the recommendations from the NTT Report and adjusted habitat boundaries based on science, resource trade-offs, scoping comments, and internal staff expertise. This alternative is very similar to the NTT alternative. It would be applied to sagebrush ecological sites within PPMA. There would be a 3% cap on disturbance in these areas. Additional details about this alternative include: Travel construction would be limited in PPMA with a disturbance exception allowing the forests to exceed the 5% cap if Greater Sage-Grouse populations are doing well. Recreation special use permits that do not adversely affect the Greater Sage-Grouse would be allowed. Rights-of-way would be excluded in PPMA, with the exception of transmission lines. Grazing direction would be adjusted to improvement management for sage grouse in PPMA and other parts of all occupied habitat. PPMA would be designated as a no surface occupancy for new fluid minerals leases; existing leases would have seasonal conditional surface use. Wildfire/Fuels would aim to protect sagebrush habitats in all occupied habitat. Habitat restoration would be a priority, with a focus on native species.

4.5 ALTERNATIVE E

As explained in Chapter 1 of the EIS, the planning area includes all occupied GRSG habitat in the State of Utah (except GRSG habitat located on portions of the Sawtooth National Forest that fall within Utah) as well as lands administered by the Ashley National Forest located in the State of Wyoming. Because portions of two states fall within the planning area, Alternative E is divided into two alternatives, Alternative E-1 for Utah and Alternative E-2 for that portion of the planning area that falls within Wyoming.

Alternative E-1 is based on the State of Utah’s Conservation Plan for Greater Sage-Grouse in Utah, and would apply to all BLM- and FS-administered lands located in Utah. Alternative E-2 is based on the State of Wyoming’s Governor’s Executive Order 2011-5 with adjustments by the BLM IDT, which includes members of the Wyoming Governor’s Office.

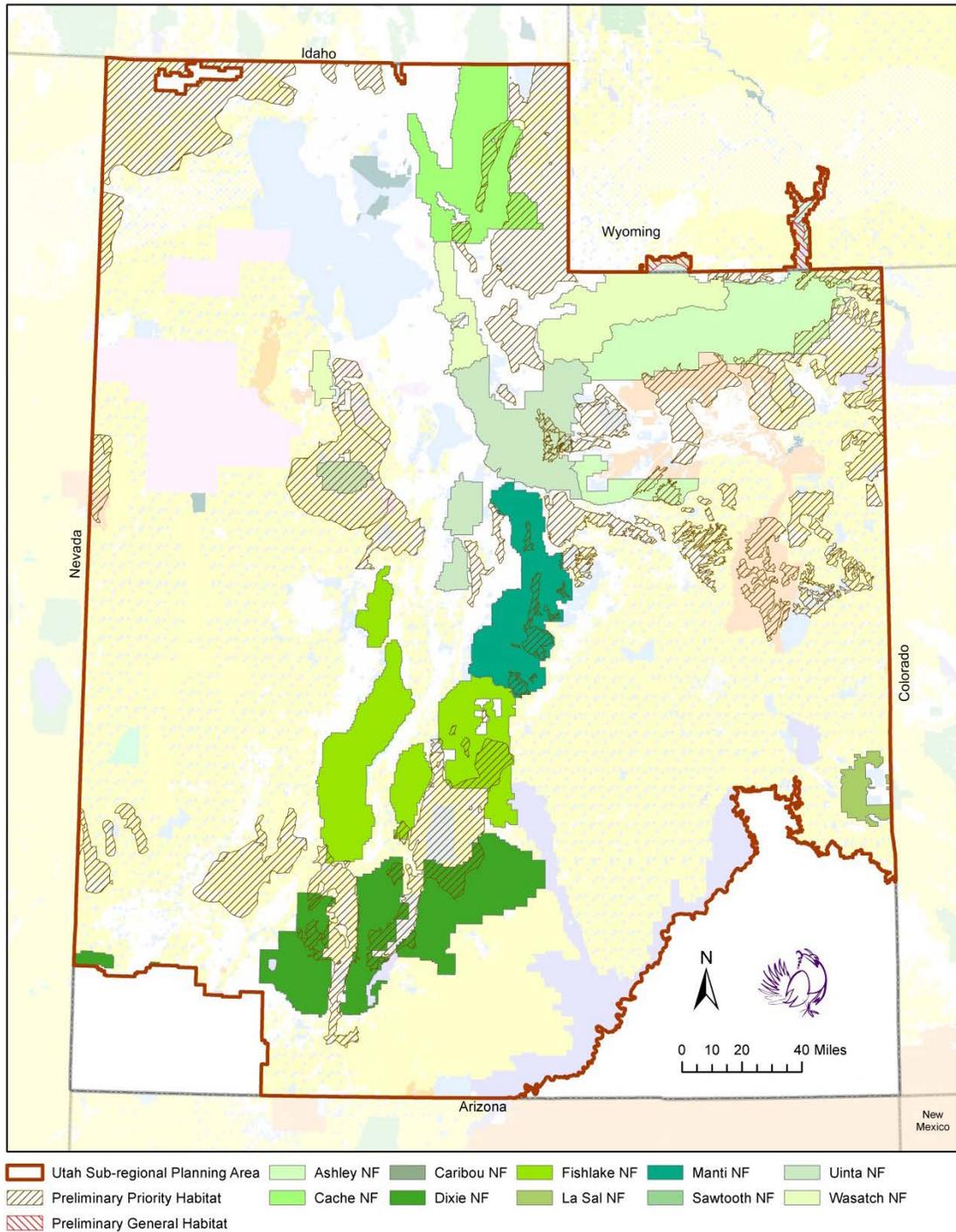
5. ANALYSIS AREA

The analysis area consists of the following National Forest system lands in Utah (and the small portion of the Ashley in Wyoming): including the Ashley, Fishlake & Manti La Sal, Dixie, and Uinta-Wasatch-Cache National Forests, that have been identified as Greater Sage-Grouse habitat (Figure 1). This consists of 845,508 total acres of identified Greater Sage-Grouse habitat, approximately 11% of the 7,663,304 acres that comprise all Forests. Of the 845,508 acres of identified habitat, 769,699 acres are preliminary priority habitat (91%), and 75,809 acres are preliminary general habitat (9%). The Dixie, Fishlake and Manti-La Sal Forests only have identified preliminary priority habitat (see Table 2).

**Table 2
Greater Sage-Grouse Habitat by Forest and Percent of Land Cover for the Utah EIS
Planning Area, From GIS Analysis**

National Forest	Preliminary Priority Habitat	Preliminary General Habitat	Total Occupied	% of Forest
Ashley	170,310	54,692	224,822	16
Dixie	183,886	0	183,886	11
Fishlake	180,452	0	180,452	11
Manti-La Sal	96,072	0	96,072	12
Uinta-Wasatch-Cache	139,159	21,117	160,276	7
TOTAL	769,699	75,809	845,508	(Ave 11.4)

Figure I
Utah Greater Sage-Grouse Planning Area with Forest Service



6. SPECIES INFORMATION AND EFFECTS ANALYSIS (DIRECT, INDIRECT, AND CUMULATIVE)

Because of the importance of Greater sage-grouse (GRSG) and their habitat in this effort, they will be singled out and discussed specifically.

6.1 GREATER SAGE-GROUSE (*CENTROCERCUS UROPHASIANUS*)

Life History– Sage-grouse depend on a variety of semiarid shrub-grassland (shrub steppe) habitats throughout their life cycle, and are considered obligate users of sagebrush (e.g., *Artemisia tridentata* ssp. *wyomingensis* (Wyoming big sagebrush), *A. t.* ssp. *vaseyana* (mountain big sagebrush), and *A. t.* *tridentata* (basin big sagebrush)) (Patterson 1952; Braun et al. 1976; Connelly et al. 2000; Connelly et al. 2004; Miller et al. 2011). Sage-grouse also use other sagebrush species (which can be locally important) such as *A. arbuscula* (low sagebrush), *A. nova* (black sagebrush), *A. frigida* (fringed sagebrush), and *A. cana* (silver sagebrush) (Schroeder et al. 1999; Connelly et al. 2004). Sage-grouse distribution is strongly correlated with the distribution of sagebrush habitats (Schroeder et al. 2004; Connelly et al. 2011b). Sage-grouse exhibit strong site fidelity (loyalty to a particular area) to seasonal habitats (i.e., breeding, nesting, brood rearing, and wintering areas) (Connelly et al. 2004; Connelly et al. 2011a). Adult sage-grouse rarely switch from these habitats once they have been selected, limiting their ability to respond to changes in their local environments (Schroeder et al. 1999). (Life history section was copied from the USFWS FINAL COT report – Feb. 2013)

Habitat conditions and population information were largely taken from the USFWS FINAL COT report – Feb. 2013 and from the BLM draft EIS chapter 3. Populations identified in the Conservation Objectives Team Report (USFWS 2013)(COT) were identified and associated with National Forests potentially supporting habitats in Utah and portions of Utah National Forests extending into Wyoming (i.e. portions of the Wasatch-Cache and Uinta). Table 3 displays the COT delineated populations along with their likelihood of persistence.

Table 3
Likelihood of Persistence of Greater Sage-Grouse Populations within Management Zones and Populations on the National Forests in Utah Based on the COT Report (USFWS 2013)

Population Area	<200 Males/500 Birds	% Chance of <50 birds/20 males in 2037	% Chance of <500 birds/200 males in 2037	% Chance of <50 birds/20 males in 2107	% Chance of <500 birds/200 males in 2107
Management Zone II: Wyoming Basin	NA	0.1	0.2	16.1	16.2
9a – Wyoming Basin	No				
9b - Rich-Morgan - Summit (WY Basin in UT)	No	0	0	9.9	10.7
9c- Uintah (WY Basin in UT)	No				
Management Zone III: Southern Great Basin	NA	0	0	6.5	7.8
10a – Strawberry Valley (NE Utah)	Y	0.8	51.8	8.8	78.6
10b – Carbon Co. (NE Utah)	Y	0.8	51.8	8.8	78.6

Table 3
Likelihood of Persistence of Greater Sage-Grouse Populations within Management Zones and Populations on the National Forests in Utah Based on the COT Report (USFWS 2013)

Population Area	<200 Males/500 Birds	% Chance of <50 birds/20 males in 2037	% Chance of <500 birds/200 males in 2037	% Chance of <50 birds/20 males in 2107	% Chance of <500 birds/200 males in 2107
11 - Sheeprock (UT, aka Tooele-Juab Counties)	Y	56.6	100	100	100
12 - Emery (UT, aka Sanpete- Emery Counties)	Y	77.2	100	99.2	100
13a – Greater Parker Mt. (Part of South Central UT)	N	0.0	3.2	1.1	21.0
13b – Panguitch (Part of South Central UT)	N	0.0	3.2	1.1	21.0

6.1.1 Habitat and Population Condition by Forest

Ashley NF

The Ashley National Forest falls within the Uintah Sage-grouse Management Area. Throughout the area (not just on the Forest) there were an estimated 452 males on leks as of 2011. Within the northern portion of this area is the Diamond Mountain and Browns Park population, a significant population center for sage grouse in Utah, Colorado, and Wyoming. Limited data are available for some of the leks throughout this area. Some show declines while a few others showed limited recovery during the past 20 years. Two of the largest leks in the area showed significant increases. Based on current management strategies and threats and known population numbers in this area, Garton et al. (2011), suggested that there was zero chance of the population dropping below 500 birds/200 males by 2037.

The central and southern portions of the management area contain fragmented habitat and populations with minimal connectivity and low potential for habitat improvement. There are a total of 170,130 acres of PPMA and 54,692 acres of PGMA on the Ashley National Forest.

Dixie NF

The Dixie National Forest contains a portion of the Greater Parker Mountain Sage-grouse Management Area and the Panguitch Management Area in south central Utah. The Parker Mountain area had an estimated 821 males on leks in 2011. Of course only a portion of the aforementioned leks, male grouse, and habitat occurs on the Forest. The Panguitch portion has more than a dozen leks that are often inter-connected, with an estimated 304 males in 2011. Only a few of these are located on FS lands. There is a large range in the number of males in attendance among these leks. Based on current management strategies and threats and known population numbers in this area, Garton et al. (2011), suggested that there was 3.2% chance of the population dropping below 500 birds/200 males by 2037.

Portions of the Parker population that are on the Forest are part of one of the most contiguous and connected sage-grouse habitats in the state. It is generally made of a single large gently sloping plateau with black sagebrush on the flats and big sagebrush in the drainages and on the uplands. It contains stringers of aspen at the higher elevations. For the Panguitch area, the population is distributed north-south in a series of linked valleys and benches, and constrained by mountains and canyons. Movement of sage-grouse from one valley or bench to another among seasons is necessary to meet their seasonal habitat requirements in the highly variable annual weather conditions of this region. This area has the highest potential for increase in Utah due to habitat treatments to remove pinyon-juniper. On the Dixie National Forest, there are a total of 183,886 acres of PPMA and zero acres of PGMA.

Fishlake NF

The Fishlake National Forest, at the southern end, also contains a portion of the Greater Parker Mountain Sage-grouse Management Area in south central Utah. The Parker Mountain area had an estimated 821 males on leks in 2011 and contains one of the most contiguous and connected habitats in the state. Only a portion of the aforementioned leks, male grouse, and habitat occurs on the Forest, generally the higher elevation sagebrush habitat. At the northernmost point of the Fishlake National Forest, there is also a small portion of the Emery Sage-grouse Management Area. This is a small isolated population with high elevation sagebrush steppe. On the Fishlake National Forest, there are a total of 180,452 acres of PPMA and zero acres of PGMA. Based on current management strategies and threats and known population numbers in this area, Garton et al. (2011), suggested that there was 3.2% chance of the population dropping below 500 birds/200 males by 2037.

Manti-LaSal NF

The Manti-La Sal National Forest contains a portion of the Carbon Sage-grouse Management Area located in the northern portion of the Colorado Plateau in central Utah. This management area (across all jurisdictions of lands) had an estimated 119 males on leks as of 2011. In addition, on the southern boundary of the Manti-La Sal NF, there is a small isolated population called the Emery Sage-grouse Management Area. In both of these areas, lek count data from 1970 to 2000 are incomplete; some leks groups show declines while others appear to be stable. Based on current management strategies and threats and known population numbers in this area, Garton et al. (2011), suggested that there was 51.8% and 100% chance respectively of both the Carbon and Emery populations dropping below 500 birds/200 males by 2037.

In the Carbon population area, it is characterized by highly broken terrain, with deep canyons and mid-elevation plateaus. Telemetry studies in the area suggest that occasionally sage-grouse migrate to and from the adjoining Strawberry Valley portion of this population. In the Emery area, it is a small, mostly isolated sage-grouse population that occupies high elevation sagebrush steppe on the eastern slope of the Wasatch Plateau. Although no direct movement between these areas has been documented, this population is relatively close to the South Central Utah population (Parker Mountain portion). On the Manti-La Sal National Forest, there are a total of 96,072 acres of PPMA and zero acres of PGMA.

Uinta-Wasatch-Cache NF

Due to the combination, over time, of what used to be three forests, the Uinta-Wasatch-Cache National Forest contains portions of multiple sage grouse management areas in the northern portion of the state. The Rich-Morgan-Summit Sage-grouse Management Area is located in Northeastern Utah, and is a part of the Wyoming Basin population, a significant population center for grouse in Utah, Idaho, Colorado, and Wyoming. This management area also includes part of what is mapped in Garton *et al.* 2011 as Summit-Morgan Counties in Management Zone III. This portion of the population is regarded as stable with potential for growth. Based on a ten-year average count of males on leks (on all land jurisdictions), the area had an estimated 1,223 males as of 2011. Based on current management strategies and threats and known population numbers in this area, Garton *et al.* (2011), suggested that there was zero chance of the population dropping below 500 birds/200 males by 2037. The habitat is comprised of mountain and big sagebrush communities with differing levels of forb and grass diversity and abundance based on past and current management regimes.

The Strawberry Valley Sage-grouse Management Area is located in central Utah, and is a significant population center for sage-grouse in Utah. This management area had an estimated 82 males on leks as of 2011. Significant restoration efforts have been conducted on this population and it is the most intensively managed in Utah. This population is regarded as stable with a high potential for growth. Based on current management strategies and threats and known population numbers in this area, Garton *et al.* (2011), suggested that there was 51.8% chance of the population dropping below 500 birds/200 males by 2037. Habitat consists of mountain big sagebrush in Strawberry Valley, with silver sagebrush in the more mesic sites and stringers of aspen at higher elevations. The migratory area to the east is drier and contains Wyoming big sagebrush with more pinyon/juniper moving off the slopes into the valleys.

The Sheeprock population in Utah is a relatively isolated population center also known as the Sheeprock Mountains Management Area. Garton *et al.* (2011) refers to this as the Toole-Juab Counties population. This population had an estimated 102 males on leks as of 2011. This population is regarded as stable with a potential for growth. However, based on current management strategies and threats and known population numbers in this area, Garton *et al.* (2011), suggested that there was 51.8% chance of the population dropping below 500 birds/200 males by 2037. Sage-grouse in this area show resiliency to known threats. Habitat is composed of Wyoming big sagebrush and less diverse understories than would be found in more mesic high elevation sites.

There are a total of 139,159 acres of PPMA and 21,117 acres of PGMA on the Uinta-Wasatch-Cache National Forest.

6.1.2 Threats by Forest

Table 4 identifies potential threats for the GRSG populations on the Utah National Forests and those portions of the Utah Forests that extend into Wyoming, as well as the contribution of management on NFS administered lands to those threats.

Table 4
Potential Threats for Greater Sage-Grouse Populations on National Forest Lands in Utah
and the Portion of Those Forests that Reach into Wyoming Based on the COT Report
(USFWS 2013)

Conservation Objectives Team Report Population Area	Isolated/ Small Size	Sagebrush Elimination	Agriculture Conversion	Fire	Conifer Encroachment	Weeds/Invasive Species	Energy	Mining	Infrastructure	Grazing	Equids	Recreation	Urbanization
9a – WY Basin	N	L	N	L	L	L	Y	L	Y	Y	L	Y	L
Ashley NF - WY	N	N	N	L	L	L	L	L	L	Y	L	Y	N
W-C NF - WY	N	N	N	L	L	L	L	L	L	Y	L	Y	N
9b – WY Basin (Rich/ Summit)	N	N	N	Y	Y	Y	Y	N	Y	N	N	Y	Y
9c – WY Basin (Uinta)	N	N	N	Y	Y	Y	L	Y	Y	N	N	Y	Y
Ashley NF - UT	N	L	N	Y	Y	Y	Y	L	Y	Y	L	Y	N
W-C NF - UT	N	L	N	Y	Y	Y	L	N	L	Y	L	Y	N
10a – Strawberry	Y	N	N	Y	Y	Y	Y	N	Y	N	N	Y	N
Uinta NF	Y	N	N	Y	Y	Y	Y	N	Y	N	N	Y	N
10b – Carbon	Y	N	N	Y	N	Y	Y	Y	Y	N	N	Y	N
Manti-LaSal NF	Y	N	N	Y	N	Y	Y	Y	Y	N	N	Y	N
11 – Sheep Rock	Y	N	N	Y	L	L	Y	Y	L	N	Y	L	N
Uinta NF – Vernon Unit	Y	N	N	Y	L	L	Y	Y	L	N	Y	L	N
12–Emery	Y	N	N	Y	Y	Y	Y	Y	Y	N	N	Y	N
13a–Parker	N	N	N	Y	Y	Y	N	N	Y	N	N	Y	N
13b–Panguitch	N	N	Y	Y	Y	Y	Y	L	Y	N	N	Y	L
Dixie-Fishlake NF	N	Y	N	Y	Y	Y	L	L	Y	Y	N	Y	L

Ashley NF

Key threats to sage-grouse on and around the Ashley NF include predation, wildfire, invasive species, noxious weeds, disease, and habitat fragmentation (naturally occurring, but not topographical, and from existing and future anthropogenic uses). Sage-grouse in the Management Area show resiliency to known threats. In concert with the remaining portions of this population, the management area is considered low risk.

Dixie NF

Key sage-grouse threats on and around the Dixie NF include: loss or degradation of habitat (primarily due to vegetation succession), conversion of habitat (sagebrush to pinyon-juniper or

cheatgrass at the lower elevations), increased risk of predation due to expansion of, or changes in, the native predator community in response to anthropogenic factors, and reduced habitat connectivity. Additionally local issues may include impacts from historical and current livestock grazing, energy development, and adjacent residential and commercial development.

Fishlake NF

Key sage-grouse threats on and around the Fishlake NF include: loss or degradation of habitat (primarily due to vegetation succession), conversion of habitat (sagebrush to pinyon-juniper or cheatgrass at the lower elevations), increased risk of predation because of expansion of, or changes in, the native predator community in response to anthropogenic factors, and habitat fragmentation from loss or degradation of habitat that results in a loss of sage-grouse habitat connectivity. Local issues include livestock grazing impacts, degraded sagebrush habitats, with sagebrush too dense in some areas and adequate in others.

Manti-LaSal NF

Key threats to sage-grouse and their habitats on and around the Manti-La Sal NF include habitat loss and fragmentation due to a variety of factors including energy development (oil and gas), checkerboard ownership, wildfire, and pinyon/juniper encroachment. In addition, invasive species, predation, and West Nile Virus have been and could continue to be a threat. In addition a few of the populations in the area are small and persist in fragmented habitats. This, along with the other threats present on and around NF lands, makes this population at-risk.

Uinta-Wasatch-Cache NF

Key threats to sage-grouse on and around the Uinta-Wasatch-Cache NF include wildfire, invasive species (cheatgrass and knapweed), pinyon/juniper encroachment, predation, habitat fragmentation (i.e. dispersed recreation), private land management and development, isolation of some small populations, a dearth of water resources at arid sites due to piping water for livestock, and some historical and current livestock operations. Because these populations are varied in their habitats, elevations, and juxtaposition with other private, state, and federal land, the risks to habitat and population persistence range from low to high.

For complete discussion and analysis of effects to GRSG from Alternatives A through E, see discussion beginning on page 26 of the Wildlife and Botany Specialist Report prepared for the UTAH EIS.

6.1.3 Summary

Effects to GRSG and their habitats due to any of the action alternatives would be generally beneficial due to reducing anthropogenic influences to sagebrush habitats known and identified as such. Overall, the highest potential for negative effects would be from Alternative A. Currently Alternative A does not provide the regulatory mechanisms or assurances to protect, conserve, or enhance GRSG habitats to the extent desired. Under the No Action Alternative (A), incremental small scale negative effects are more likely. Conversely, there would likely be beneficial impacts to GRSG as a result of implementing any of the action alternatives. Although Alternative C takes a more aggressive blanket approach to GRSG occupied habitat, especially by eliminating grazing (CI), Alternatives B and D would also provide greater protections to these habitats. Though Alternative E has protective measures for GRSG, these measures are generally less conservative in terms of acres protected than other action alternatives. Differences in

negative effects between action alternatives would be negligible and differences in positive effects would be difficult to discern at this scale. Alternative D provides a more measured approach to effects by qualifying any potential management action by ensuring it improves conditions for GRSG and their habitats.

6.2 SAGEBRUSH ASSOCIATED SPECIES (SAS) – BIRDS AND MAMMALS

Because of the importance of greater sage-grouse (GSG) and their habitat in this effort, they were singled out and discussed specifically above and in the Wildlife and Botany Specialist Report; while Brewer's sparrow, golden eagle, mountain bluebird, sage thrasher, western bluebird, wild turkey, mule deer, and elk were grouped together for this analysis due to the similar nature of the habitats they occupy in terms of association with sagebrush communities. Though each of the species may not be completely dependent upon sagebrush for every life history stage, for the sake of this analysis, and based on the potential effects, programmatic nature of the conservation measures and landscape scale which is being analyzed, we grouped them into this category and call them Sagebrush Associated Species (SAS). In addition, as the nature of the project is to amend Forest Plans to include regulatory mechanisms and conservation measures to protect sagebrush habitats for GRSG, the effects would generally be positive for these species where habitats overlap.

Brewer's Sparrow (*Spizella breweri*)

Natural History — The Brewer's sparrow commonly breeds in arid sagebrush steppes of western North America. They breed in the northern Rocky Mountains of the Yukon and British Columbia, and in the Great Basin south to southern California and New Mexico. Brewer's sparrows breed primarily in shrub steppe habitats in Utah and are considered to be shrub steppe obligates. However, Brewer's sparrows may also be found in high desert scrub (greasewood) habitats, particularly where these habitats are adjacent to shrub steppe. They may also breed in large sagebrush openings in pinyon-juniper habitat or coniferous forests. This species builds cup-shaped nests in sagebrush, with nests between 20 and 50 cm from the ground. Brewer's sparrows prefer shrubs tall enough (about 69 cm) and dense enough to provide sufficient cover. The diet of this sparrow primarily consists of insects and spiders in the summer and seeds of grasses and forbs in the winter. This species will commonly drink and bathe, but may not require free water. They are able to meet water needs by eating insects, and can subsist on dry seeds for up to 3 weeks. Direct cause of widespread decline on breeding grounds is uncertain, but possibly linked to widespread degradation of sagebrush habitats (Rodriguez 2006).

Population Status, Abundance and Trend – NatureServe shows species as “apparently secure” in Utah (S4S5B). BBS trend data from 1966-2011 show 0.0% change...stable in Utah (non-significant, N=96) (Sauer et al. 2012). Across their range in North America, a short term decline (last 20 years) of 10-30% is estimated; one exception is Utah (NatureServe 2013). Densities in Utah are high in the northern and western parts of the state and highest in Rich and Summit counties (Sauer et al. 2012). Brewer's sparrows winter in southeastern California, southern Arizona, and southern New Mexico, south into Baja and the central states of Mexico; they occur rarely in Utah during the winter, most often in the southwestern corner of the state (Parrish et al. 1999).

Golden Eagle (*Aquila chrysaetos*)

Natural History — Golden eagles breeds across western North America, from Alaska south to northern Mexico. Populations in the northern parts of the breeding range migrate south for winter, but most populations in the western United States are year-round residents of the same area. This species is also seen rarely in the eastern United States. It is quite common in Utah. Typically this eagle is found in open country, especially in mountainous regions. It feeds mainly on small mammals, especially rabbits, marmots, and ground squirrels, but it also eats insects, snakes, birds, juvenile ungulates, and carrion. Rarely, this bird attacks large, healthy mammals. At times, pairs may hunt cooperatively. Nests are constructed on cliffs or in large trees. Pairs are monogamous and often use the same nest in consecutive years, but some pairs may use alternate nests some years. Eggs are laid from late February to early March in Utah. Most often two eggs are laid, but clutches may contain one egg, three eggs, or rarely four eggs. The eggs are incubated mostly by the female and hatch after 43 to 45 days. Young can fly after 60 to 77 days and are cared for by the parents for at least 30 days after fledging. The young may remain with the parents for several months. Birds first breed at an age of 4 or 5 years (URWR 2013a).

Population Status, Abundance and Trend –NatureServe shows species “apparently secure” in Utah (S4). BBS trend data from 1966-2011 show -0.9% change...stable to slightly decreasing in Utah (significant, N=80) (Sauer etal 2012). In North America, breeding occurs from western and northern Alaska eastward through Northwest Territories to Labrador, and south to northern Mexico, Texas, western Oklahoma, and western Kansas, and in eastern North America southward to New York and northern New England (rare). Golden eagles breed also in the Palearctic. The winter range in North America extends from south-central Alaska and southern Canada southward through the breeding range, and casually farther southward. In the United States, the species is most numerous in winter in the Rocky Mountain States, Great Basin, and western edge of the Great Plains. The 2004 estimated global population size at 170,000, with approximately half of the total in the United States and Canada (NatureServe. 2013).

Mountain Bluebird (*Sialia currucoides*)

Natural History — Highly migratory, Mountain Bluebirds breed in meadows, forest edges, and rangelands at elevations generally higher than 5,000 ft. Its numbers increase when people clear forests, and its affinity for open spaces makes it easy to spot in some human-dominated landscapes. The diet of the mountain bluebird consists primarily of insects; it frequently hovers during feeding, whereas other bluebirds glean insects off of foliage. Pairs are monogamous, and the female selects the nest site, normally a tree cavity previously excavated by a woodpecker. When available, however, females will frequently select nesting boxes erected by humans. The female lines her nest cavity with grasses, and then incubates five or six eggs for approximately two weeks. The hatchlings are blind, immobile, and featherless. The mother stays with the young in the nest for six days after the young hatch. The male brings food to the hatchlings, but when the female is present in the nest, he must relinquish the food to her, as she prevents him from feeding the young directly. The hatchlings remain in the nest for about three weeks and are cared for by both parents. They will attain independence about a month after leaving the nest. If the young leave the nest early in the season, the pair may attempt to have a second brood (UDWR 2013d)(Rodriguez 2006).

Population Status, Abundance and Trend – NatureServe shows species is “apparently secure” in Utah (S4S5B,S3S4N). BBS trend data from 1966-2011 show 0.0% change...stable in Utah (non-significant, N=79) (Saur et al 2012). Range wide their status is relatively stable (NatureServe 2013). The mountain bluebird breeds in the western United States and western Canada. Individuals in the northern part of the species breeding range migrate south for the winter to the western and southwestern United States, as well as to Mexico. Populations breeding in parts of the Great Basin and the southwestern United States remain year-round, though they normally move to lower elevations. Mountain bluebirds are not currently as common in Utah as they were in previous years, but they do breed in high mountain valleys throughout the state. Flocks are commonly seen during spring and fall migrations at lower elevations. Individuals have been known to winter in southern and central Utah (UDWR 2013d).

Sage Thrasher (*Oreoscoptes montanus*)

Natural History —Sage thrashers forage on the ground for insects and berries. These birds spend the majority of their time on the ground, but males will move to an elevated perch in order to sing. Males engage in a flight courtship display to impress the females, and a monogamous pair bond is formed. Pairs build a bulky nest in a concealed location, usually in sagebrush or on the ground, using twigs and grasses. Then, both parents incubate their four eggs for about two weeks. The young are born blind and naked, and both parents feed the nestlings. The sage thrasher is a member of the mockingbird family. Thrashers and mockingbirds have complex songs that often contain elements of other birds' songs. Positively correlated with shrub cover, shrub height, bare ground, and horizontal heterogeneity (patchiness); negatively correlated with spiny hopsage, budsage, and grass cover (UDWR 2013e). Sage Thrashers are very susceptible to sagebrush community conversion and modification (Rodriguez 2006).

Population Status, Abundance and Trend – NatureServe shows species “apparently secure” in Utah (S4S5B). BBS trend data from 1966-2011 show -2.5% change ...stable to slightly decreasing in Utah (significant, N=83) (Sauer 2012) (NatureServe 2013). The sage thrasher breeds in sagebrush communities in the western United States, and winters in the southwestern United States and northern Mexico. In Utah, the species nests in greasewood and sagebrush communities in low elevation deserts throughout the state (UDWR 2013e).

Western Bluebird (*Sialia mexicana*)

Natural History —Western bluebirds rush forth from perches to capture flying insects, and they also glean snails and earthworms from the ground. When breeding, the pair selects a cavity in a dead standing tree, often an old woodpecker's nest, and lines it with fine materials. The female incubates four to six eggs for about two weeks. The young are born naked and blind, and are tended to by both parents. The chicks leave the nest after about three weeks. The female begins preparations for a second brood after the chicks leave the nest, so the male assumes responsibility for caring for the first fledglings. Because the western bluebird relies on nesting cavities in dead trees and branches, the removal and felling of dead trees negatively impacts the reproductive success of the species (Rodriguez 2006) (UDWR 2013h).

Population Status, Abundance and Trend – NatureServe shows species “imperiled” in Utah (S2S3). BBS trend data from 1966-2011 show 4.5% change...stable to slightly increasing in Utah (non-significant, N=31) (NatureServe 2013) (Sauer 2012). The western bluebird breeds in open

forests and meadows in the western United States and southern British Columbia, usually at elevations higher than 7,000 feet. The winter range of the species includes the west coast of the United States, the southwestern United States, and much of Mexico. The species is commonly found year-round in the mountains of central and southern Utah. Local declines probably have been related to loss of nesting sites, which may result from the elimination of dead trees and branches, or from competition with house sparrows, starlings, or other cavity-nesting species (NatureServe 2013) (UDWR 2013h).

Wild Turkey (*Meleagris gallopavo*)

The wild turkey was selected as an MIS to represent issues associated with general Forest Management on the Dixie NF and as a popular game bird, providing abundant watchable wildlife opportunities.

Natural History — There are 2 subspecies of the Wild Turkey found in Utah. The Rio Grande (*M. g. intermedia*) is the smaller of the two subspecies, and can be found in cottonwood river bottoms as well as pinyon-juniper, and oak-pine forests. Merriam's Wild Turkeys (*M. g. merriami*) are typically found in stands of open ponderosa pine with interspersed quaking aspen, oak forests, and pinyon-juniper forests. They can also be found in grassy meadows and open areas which are their preferred foraging habitat. Wild Turkeys are a non-migratory game species, and must rely heavily on consistently available food sources to survive through the winter. Rio Grande Turkeys feed on mast plants like juniper berries, acorns, and pine nuts. They also consume a variety of vegetable matter such as grasses and other leafy vegetation. Insects and invertebrates are extremely important in the summer diet of young poults. Merriam's Turkeys have a similar diet to the Rio Grande subspecies. Mast plants and insects are an important component of their diet. Grasses and sedges are also year-round food items (Rodriguez 2006) (UDWR 2013i).

Population Status, Abundance and Trend – In 1983, the UDWR initiated an aggressive transplant program for wild turkeys statewide, and since that time, population numbers have been on the increase statewide. Turkey populations have expanded across the state to the extent that Utah has allowed “over the counter” (very liberal) hunting opportunity since 2010 (Rodriguez 2006).

Mule Deer (*Odocoileus hemionus*)

Natural History — Mule deer occupy several types of habitat throughout Utah. Mule deer occur in coniferous forests, desert shrubs, chaparral, and grassland with shrubs. They prefer tender new growth of various shrubs, many forbs, and a few grasses. They forage from the ground surface into bushes and trees as high as they can reach. Mule deer also dig out subterranean mushrooms to eat. Food preferences vary with season, forage quality, and availability. Forbs and grasses are important in spring, they feed heavily on acorns where available, and various shrubs are critical in summer and winter, e.g. bitterbrush and sagebrush. The breeding season occurs in late fall. Fawning occurs in moderately dense shrub-lands and forests, dense herbaceous stands, and high-elevation riparian and mountain shrub habitats with available water and abundant forage. Fawning peaks from late April through mid-June. Both males and females become sexually mature at 1.5 years old. The number of natural predators of deer has been reduced in most areas. Overpopulation, with resultant winter die-offs and

destruction of habitat, occurs periodically. Mule deer are preyed upon regularly by mountain lions and coyotes, and occasionally by bobcats, black bears, and domestic dogs. Deer populations can respond rapidly to habitat management. However, populations can decline in response to fragmentation, degradation or destruction of habitat caused by urban expansion, incompatible use of land resources (e.g. timber, water, rangeland), and disturbances by humans. Mule deer compete potentially for food with domestic cattle and sheep, wild horses, wild pigs, and black bears (Rodriguez 2006) (UDWR 2008).

Population Status, Abundance and Trend – Mule deer are widespread in Utah but unlike elk, deer numbers are lower today in Utah than the middle of the last century. Most of this decline is due to habitat alteration in the way of rangeland conversion to agriculture and urban development. As a classic shrub-steppe species, mule deer are declining in Utah as they have in much of their range in the intermountain west. The Utah Division of Wildlife Resources (UDWR) statewide deer plan (mule deer only) calls for 409,900 deer across the State in over thirty herd units. Despite very minimal antlerless harvest, less than 1000 permits statewide, deer have trended down from 301,700 in 2009, to 293,700 and 286,100 in 2010 and 2011 respectively based on modeled population estimates. The trend went back up last year, with 318,550 deer estimated for post season 2012 across Utah (UDWR, Regional Advisory Council material, April 2013) (UDWR 2008).

Rocky Mtn Elk (*Cervus canadensis*)

Natural History — Elk are generally migratory and may travel large distances between summer and winter ranges. During the summer, elk are found in the mountains, usually between 6,000 and 10,000 feet in elevation. Elk migrate downslope in the fall, and congregate in valley bottoms in the winter. Important components of winter habitat include cover and available forage. Elk consume a combination of grasses, forbs, and shrubs. Elk eat mostly grasses, forbs, and sedges during summer. Though they prefer grass, elk will also feed on serviceberry, willow, bitterbrush, snowberry, mountain mahogany, winter fat, aspen shoots, juniper, and sagebrush. In winter, they consume mostly browse, including twigs, bark, pine needles, and lichens. Elk breeding season, called the rut, begins in September. Harems of cows are gathered by mature bulls, which defend their group of 10-20 females from other bulls. Coyotes, black bears, and mountain lions likely prey on elk. Human disturbance during calving season may also adversely impact calf survival. Hunting is the primary means of managing population numbers, and reducing damage to range and agricultural lands. Agricultural lands may be used more heavily after the loss of winter range due to development, logging, and other land uses that reduce habitat effectiveness. Roads in particular may decrease elk habitat effectiveness, although it is the use of roads, and not the roads themselves that disturb elk. Elk will move long distances to avoid disturbance (Rodriguez 2006) (UDWR 2010).

Population Status, Abundance and Trend – Elk are well distributed across all Forests in Utah, and primarily use the Forest during late spring through Fall; though some elk remain on Forest Service land year-round--especially during light winters. Elk have increased from as low as 18,000 around 1975 to 79,750 animals estimated by the Utah Division of Wildlife Resources (UDWR) at the close of the 2012 hunting seasons. The UDWR's statewide elk plan calls for 70,965 animals across the State and has recommended some 17,982 antlerless permits for the public draw system just in the 2013 hunting seasons to bring the herd back down to objective

(UDWR, Regional Advisory Council material, April 2013). The herd has been over objective since 2010 and antlerless harvest has been increased each year by UDWR to catch up to the surplus. Utah has rather productive elk herds with calf crops averaging near 50 calves per 100 cows on many of the elk herds using Forest Service lands (UDWR 2010).

6.3 GRASSLAND AND SHRUBLAND EDGE SPECIES (GSE) – BIRDS

Vesper sparrow were separated out from those species more dependent upon sagebrush, as they are more closely associated with shrub-steppe and grassland mix habitats. They often use grasslands interspersed with grass and/or edges of grasslands where they meet shrub-land. For the sake of this analysis, and based on the potential effects, programmatic nature of the conservation measures, and landscape scale which is being analyzed, we grouped them into this category and call them Grassland and Shrub-land edge (GSE).

Vesper Sparrow (*Pooecetes gramineus*)

Natural History — The vesper sparrow breeds in grasslands, open shrublands mixed with grasslands, and open piñon-juniper woodlands. Vesper sparrows have two broods per nesting season with 3-6 eggs/clutch. This species seeks a narrow set of habitat conditions within its nesting range (middle to high elevation sagebrush and grassland habitats) and subtle changes in these conditions (reductions in residual grass and forbs) can impact essential nesting habitat components (Rodriguez 2006). The vesper sparrow is a common summer resident in foothills (and adjacent lowlands) and mountain parks, a fairly common spring and fall migrant in western valleys, foothills, mountain parks and on eastern plains. Sparsely or patchily distributed shrubs with a good grass cover make the best habitat. It is rare in late summer and fall above timberline (UDWR 2013g).

Population Status, Abundance and Trend – NatureServe shows species “secure” in Utah (S5BS2N). BBS trend data from 1966-2011 show -1.1% change...stable to slightly decreasing in Utah (non-significant, N=79) (NatureServe 2013) (Sauer 2012). Vesper sparrows breed in Canada and the northern United States, and winter in the southern United States and most of Mexico. This species is common during summer throughout Utah and is rare during winter in the southwestern corner of the state (UDWR 2013g).

6.3.1 Alternative A

Isolation/Habitat Fragmentation

Alternative A would maintain current land management and few Forests have specific desired conditions in Land Use Plans for grassland and/or shrubland associated avian species. Under this alternative there would be no changes to the current National Forest System Roads, transportation plan, or recreation management on the Forest relative to grasslands or shrublands. This alternative has the highest potential to impact GSE due to the lack of restrictions on activities that cause these effects. Therefore all direct and indirect effects to the species and its habitat would likely allow current trends to continue. With Alternative A allowing continued impacts to sagebrush and surrounding vegetative communities, negative effects to these species would occur over time due to anthropogenic development and changes. Connectivity between seasonal habitats is decreased between isolated habitats effecting species which may be cut off from food, water, or cover at critical times of year. Isolation, in addition to

reducing the land area available to support GSE, habitat loss and fragmentation also increase opportunities for other disturbances, such as human traffic, wildfire, and spread of invasive plants, and increase the risk from such threats.

Fire

Sagebrush is killed by wildfires and recovery requires many years, especially in the case of large fires. Prior to recovery, these sites are of limited use by GSE except along the edges and in unburned islands. Being associated with slightly earlier seral vegetation following a disturbance, GSE may return to areas sooner than late seral shrub associated species like GRSG but would be displaced nonetheless. As a result of this loss of habitat, fire has been identified as a primary factor associated with GSE population threats. Cheatgrass changes historical fire patterns by providing an abundant, continuous and easily ignitable fuel source that facilitates rapid fire spread. While most sagebrush subspecies are killed by fire and slow to reestablish, cheatgrass recovers within one to two years of a fire event from seed in the soil. Forest Service management to prevent or control wildfires can also affect GSE and habitat. Increased human activity and noise associated with fire suppression and prescribed fire in areas occupied by GSE could affect reproduction, hiding, or foraging behavior. Important habitats could be altered because of the use of heavy equipment, hand tools, and noise. In addition, continued suppression may result in higher rates of pinyon-juniper encroachment in some areas. In the initial stages of encroachment, fuel loadings remain consistent with the sagebrush understory. Existing Forest Plans typically do not include specific management decisions regarding fuels treatments in sagebrush/grassland habitat. In general, both prescribed fire and non-fire fuels treatments are allowed. Additionally, fire fighter and public safety are the highest priority in a wildfire suppression scenario. GRSG habitat would be prioritized commensurate with property values and other critical habitat to be protected, with the goal to restore, enhance, and maintain areas suitable for GRSG. These policies would not avoid the use of prescribed fire in sagebrush/grassland habitat nor prioritize protection of sagebrush/grassland communities; thus, loss of habitat to wildfire and prescribed fire would continue. Alternative A would have the fewest restrictions for fuels management actions and has a high potential for vegetation disturbance. As this alternative does not prioritize fire operations beyond what has already been determined in the Fire Management Plans, potential impacts may include: removing or degrading habitat, disrupting reproduction, causing changes in species movement patterns due to areas devoid of vegetation; ultimately reducing habitat quality and quantity and negatively impacting GSE populations.

Invasive Weeds

Invasive weeds alter plant community structure and composition, productivity, nutrient cycling, and hydrology and may cause declines in native plant populations, including sagebrush/grassland habitats, through competitive exclusion and niche displacement, among other mechanisms. Invasive plants reduce and, in cases where monocultures occur, eliminate vegetation that GSE use for food and cover. Invasive plant communities do not provide suitable GSE habitat, since these species in some way depends on sagebrush and a variety of native forbs/grasses and very often the insects associated with them. Along with competitively excluding vegetation essential to GSE, invasive plants fragment existing GSE habitat or reduce habitat quality. Under current management (Alternative A), the Forest Service utilizes integrated weed management techniques, including mechanical, manual, chemical, and biological control to reduce the

likelihood of invasive weed spread and the extent of current infestations. Under Alternative A, Forest Service would continue to implement noxious weed and invasive species control using integrated weed management actions per funding and plans in cooperation with State and Federal agencies, affected counties, and adjoining private lands. Though there are no specific objectives in Forest Plans to focus these efforts on cheatgrass or sagebrush/grassland communities. These actions would benefit GSE habitat along with other vegetation types as long as funding continues, but would not specifically prioritize management of these areas.

Conifer Encroachment

Pinyon-juniper woodlands may encroach into sagebrush/grassland ecosystems, which reduce and may eventually virtually eliminate GSE occupancy in these areas. In higher elevation areas, Douglas-fir may also encroach into mountain big sagebrush communities. The Forest Service frequently manages pinyon-juniper encroachment, especially in previously treated areas, utilizing mechanical, chemical, hand-cutting, and prescribed burning, to reduce conifer encroachment of sagebrush ecosystems. Alternative A does not take any specific actions to prevent conifer encroachment, but many Forest Plans contain objectives for maintaining improving, or restoring sagebrush/rangeland plant communities often for big game winter range and/or livestock grazing. These approaches do not specifically address the threat of conifer encroachment to benefit GSE and thus would likely have limited effectiveness in controlling its spread.

Minerals/Energy Development

Energy development can result in direct habitat loss; fragmentation of important habitats by roads, pipelines, and power lines; noise; and direct human disturbance. The effects of energy development often add to the impacts from other human development and may result in GSE population declines. Nonrenewable (oil and gas) energy development impacts GSE and sagebrush/grassland habitats through direct disturbance and habitat loss from well pads, access construction, seismic surveys, roads, power lines, and pipeline corridors; indirectly from noise, gaseous emissions, changes in water availability and quality, and human presence. Renewable energy facilities, including solar and wind power, typically require many of the same features for construction and operation as do nonrenewable energy resources. Therefore, impacts from direct habitat losses, habitat fragmentation through roads and power lines, noise, and increased human presence would generally be similar to those for nonrenewable energy development. Surface and subsurface mining for mineral resources (coal, uranium, copper, phosphate, and others) results in direct loss of habitat if they occur in sagebrush/grassland habitats. Surface mining usually has a greater impact than subsurface activity. Habitat loss from mining can be exacerbated by the storage of overburden (soil removed from mine shafts) in undisturbed habitat. If infrastructure is necessary, additional direct loss of habitat could result from structures, staging areas, roads, railroad tracks, and power lines. GSE could be directly affected by trampling or vehicle collision and indirectly from an increase in human disturbance, ground shock, noise, dust, reduced air and water quality, and changes in vegetation and topography. Industrial activity associated with the development of surface mines and infrastructure could result in noise and human activity that disrupt the habitat and life-cycle of GSE. Under this alternative, a small percentage of PPMA would be closed to non-energy leasable mineral leasing, with the majority or remainder of all occupied habitats open to leasing (including expansion of new leases) with no cap on surface disturbing activities. As such, this alternative would be expected to cause the greatest amount of direct and indirect habitat loss, degradation, and

fragmentation for GSE. There would likely also be greater negative effects from noise, increased presence of roads/humans, and anthropogenic structures in an otherwise open landscape.

Infrastructure

Human disturbance is increased during infrastructure construction. In the long term, increased threats from infrastructure may cause declines in GSE. Power lines are linear and often extend for many miles. Thus, ground disturbance associated with power line construction, as well as vehicle and human presence during maintenance activities, may introduce or spread invasive weeds over large areas, thereby degrading habitat. Cellular and other communications towers have the potential to cause GSE mortality by influencing movements through avoidance of a tall structure or electromagnetic radiation, or to provide perches for corvids and raptors. Impacts from roads may include direct habitat loss from road construction and direct mortality from collisions with vehicles. Roads may also present barriers to migration corridors or seasonal habitats. Other impacts include facilitation of predator movements, spread of invasive plants, and human disturbance from noise and traffic. Closing and reclaiming unused, minimally used and/or unnecessary roads in and around sagebrush/grassland habitats during seasonal use by GSE may reduce habitat loss. In addition, fence poles create predator perch sites and potentially predator corridors along fences (particularly if a road is adjacent). Fences and their associated roads may allow for the invasion or spread of invasive weeds along the fencing corridor. Furthermore, fences may effectively cause habitat fragmentation, as GSE may avoid habitat around the fences to escape predation. Cross country motorized recreation, and other more motorized travel can be very disturbing and destructive to GSE and where available would continue under this Alternative. Also, under this alternative, there would be no changes to the current approach associated with exchange, acquisition, or disposal of lands or with permitting ROWs on Forest Service lands. All FS Lands would continue to be managed according to FS policy and regulation. Permitted ROWs would continue to allow construction, maintenance, and operation activities that may result in habitat loss, fragmentation, or degradation for GSE. Indirect effects may include new infestations of noxious or invasive weeds and an increase in edge habitat. Though most projects would be forced to mitigate or minimize impacts, this alternative would likely have the greatest impact on GSE in the future, though current population trends for vesper sparrow are favorable given current management.

Livestock Grazing and Feral Horses

Rangelands meeting Forest Plan Standards may also provide effective GSE habitat. However, grazing at inappropriate intensity, season, or location may degrade sagebrush/grassland ecosystems over the long term, including changes in plant communities and soils, leading to loss of vegetative cover and plant litter, increased erosion, decreased water quality, and reduced overall habitat quality. The reduction of grass heights from grazing could reduce the suitability of cover and habitat availability by increasing exposure to predators. Livestock may also occasionally trample GSE nests, or disturb reproduction efforts. At the planning level, Forest Service can decide whether areas would be open or closed to livestock grazing. Future impacts would be eliminated in areas closed to grazing, but past impacts would likely persist, and closing grazing may result in other harmful impacts, such as fuel buildup. At the implementation level, Forest Service can consider changes in grazing practices or systems, which could reduce grazing intensity or change the season of use, for example. Under Alternative A, Forest Service would continue to make sage-grouse habitat available for livestock grazing. Active AUMs for livestock

grazing would be 329,521 on BLM-administered lands and 265,373 on Forest Service-administered lands, though the number of AUMs on a permit may be adjusted during permit renewals, Allotment Management Plan (AMP) development, or other appropriate administrative activity. Wild horse and burro AUMs would also remain at current levels. These policies may contribute to GSE habitat degradation if current grazing practices are not meeting Forest Plan proper use parameters. Under this alternative, there would be no change in the numbers, timing, or method of livestock grazing on the Forest. Other potential effects to GSE habitat could include: overgrazing, reduction in cover, structure, and diversity of vegetation due to consumption, and degradation of meadow/wetland/spring/stream habitats.

Cumulative Effects for Seven Resource Areas in Alternative A

There could be cumulative effects in addition to impacts described above. Sagebrush/grassland habitat also occurs on private, state, and BLM land adjacent to the Forest units. Activities occurring in the seven resource areas also occur on these ownerships. There are some existing conservation measures on these other lands. Cumulatively, however, there could be additional loss, degradation, or disturbance from recreation and travel, rights-of-way granted, energy and mineral development, range management, and fire and fuels management in sagebrush/grassland habitat. See also: Cumulative Effects analysis in the Environmental Impact Statement prepared for the Utah planning area, Chapter 4.

6.3.2 Alternative B

Isolation/Habitat Fragmentation

Alternative B would encourage consolidation GRSg habitat, facilitating habitat conservation. These conservation measures would be more protective than conservation measures in Alternatives A and D, but less protective than Alternative C. This represents a concerted effort to maximize connectivity and minimize fragmentation of sagebrush habitats. Alternative B would not establish any Zoological areas for sage-grouse. These actions would protect against additional fragmentation of sage-grouse habitat, but would do little to reduce existing isolation and fragmentation. Under this alternative there would be limited opportunities for road construction in PPMA, with minimum standards applied and no upgrading of current roads. In addition, recreational use permits would only be given in PPMA if there was a neutral or beneficial impact to GRSg and no driving cross country would be permitted in PPMA. This is more restrictive than Alternative A, allowing fewer anthropogenic influence to sagebrush/grassland habitats and GSE by minimizing human use and construction or upgrading of roads. Negative impacts to GSE will be associated with displacing anthropogenic development and activities outside of PPMA/PGMA to other areas in the sagebrush/grassland ecosystem occupied by vesper sparrows.

Fire

Under Alternative B, in PPMA, fuels treatments would be designed and implemented to emphasize protection of existing sagebrush ecosystems. Fuels management programs would consider sage-grouse habitat needs, and fire suppression would prioritize protection of habitat after fire fighter and public safety, which is the highest priority, and protection of property. These policies would be likely to reduce the acres of sagebrush burned in wildfires, or lost during fuels treatment programs. As such, these policies would protect GSE where these

habitats overlap more than Alternative A. Sagebrush/grassland communities outside of sage-grouse habitat will likely not see the protection afforded to PPMA/PGMA and impacts to it will likely decrease habitat effectiveness to vesper sparrows.

Invasive Weeds

Alternative B would likely protect more acres of sagebrush/grassland habitats from invasive weeds because of the greater emphasis they place on sagebrush re-establishment than Alternative A but focusing again only on sage-grouse habitat. However, the actual change in the probability of invasive weed establishment would depend on the resources available to devote to the effort. Controlling noxious and invasive plants will benefit GSE in general.

Conifer Encroachment

Under Alternative B, invasive vegetation will be monitored and controlled in fuels treatment areas and in relation to PPMA. More emphasis on actively conserving sagebrush ecosystems than those described under Alternative A will generally benefit GSE, especially those former treatments areas maintained for livestock and big game winter range..

Minerals/Energy Development

Under Alternative B, lands within PPMA would be closed to non-energy leasable mineral leasing and to mineral material sales, including not permitting expansions of existing mines. This action would greatly reduce the acreage open to mineral leasing compared to Alternative A. These policies would reduce the acreage affected by energy development in the planning area compared to Alternative A, by limiting the impacts of energy development, including disturbance and habitat degradation. This alternative would provide protection now and into the future for the most important GRSG habitats, which would encompass many acres of GSE habitat. Though this alternative may push energy and mineral development to less desirable sagebrush or non-GRSG habitat, there may be negative effects of not protecting all GSE habitat.

Infrastructure

Under Alternative B, PPMA would be exclusion areas for new ROWs and the acreage excluded from ROW construction would be greatly increased over Alternative A. These policies would protect PPMA from ROW and road construction more than Alternative A. Under this alternative, PPMA would be managed as an exclusion area and general habitat would be managed as an avoidance area for new rights-of-way projects. This benefits GSE where habitat with GRSG overlaps but may increase negative impacts outside of GRSG habitat in other sagebrush/grassland communities suitable and/or occupied by GSE.

Livestock Grazing and Feral Horses

Alternative B would not reduce acres open to livestock or feral horse grazing, nor reduce AUMs per say, but within PPMA, Forest Service would incorporate sage-grouse habitat objectives and management considerations into grazing allotments through AMPs or permit renewals administratively. The NTT alternative would adjust grazing direction in GSG PPMA. This accounts for less than 10% of the land cover of the National Forests in Utah. The potential effects due to livestock grazing, vegetation disturbance, and range improvements is expected to be the same under Alternative B, as it would be under Alternative A, except that it would provide a few more restrictions to protect some GSE habitat. Though this would occur at a

very small scale, some effects to local populations would likely prove beneficial; however vesper sparrow prefer less dense sagebrush than GRSG and more grass.

Cumulative Effects for Seven Resource Areas in Alternative B

There could be cumulative effects in addition to impacts described above. Sagebrush/grassland habitat also occurs on private, state, and BLM land adjacent to the Forest units. Activities occurring in the seven resource areas also occur on these ownerships. There are some existing conservation measures on these other lands. Cumulatively, however, there could be additional loss, degradation, or disturbance from recreation and travel, rights-of-way granted, energy and mineral development, range management, and fire and fuels management in sagebrush/grassland habitat. See also Cumulative Effects analysis in the Environmental Impact Statement prepared for the Utah planning area, Chapter 4.

6.3.3 Alternative C

Isolation/Habitat Fragmentation

Under Alternative C, Zoological Areas are proposed on Forest Service lands in each of the fifteen GRSG population areas to function as sagebrush reserves in PPMA, totaling 318,200 acres and would conserve habitat against surface disturbance and fragmentation. These actions and the establishment of sagebrush reserves would protect against additional fragmentation of a portion of sagebrush communities generally benefiting GSE where they overlap. In addition, Alternative C would encourage consolidation of sage-grouse habitats, facilitating habitat conservation and management. This alternative would be expected to have the least negative impacts and most positive impacts to wildlife species whose ranges overlap with PGMA and PPMA, namely vesper sparrow.

Fire

Alternative C would follow the same policies as Alternative B, with the additional provision that livestock would be excluded from habitat areas post-fire to allow for recovery. As with Alternative B, these policies would prioritize sagebrush preservation more than current management under Alternative A and thus would conserve more GSE habitat. Alternative C would have the most protective measures for GSE overall.

Invasive Weeds

Alternative C would follow the same approach as Alternative A and B, using integrated vegetation management, to control/suppress and eradicate noxious and invasive plants. As under Alternative B, vegetation management would prioritize sagebrush re-establishment and noxious weed control. In addition, Alternative C would develop methods for prioritizing and restoring sagebrush steppe invaded or even once reseeded by nonnative plants. These policies would place greater emphasis on sagebrush re-establishment than Alternative A and be generally beneficial to GSE.

Conifer Encroachment

Impacts from conifer encroachment under Alternative C would be the same as those described under Alternative B, but with emphasis on a wider range of GSG habitats focusing on sagebrush communities in general and benefiting GSE more than Alternative A and more similar to Alternative D.

Minerals/Energy Development

Under Alternative C, lands within all GRSG occupied habitat would be closed to non-energy leasable mineral leasing and to mineral material sales, including not permitting expansions of existing mines. This action would greatly reduce the acreage open to mineral leasing. Under Alternative C, proposed policy changes would be the same as those described for Alternative B, but would have greater impacts because they would be applied to all occupied habitat. Lands within PPMA and PGMA would also be defined unsuitable for surface exploration of coal and would be proposed for withdrawal from locatable mineral entry. Un-leased areas would be closed to fluid mineral leasing, greatly increasing the amount of habitat protected from energy development. Existing lease areas would have conservation measures applied, including NSO stipulations. These policies would substantially reduce the available acreage for energy development, which would limit impacts such as disturbance and habitat degradation. Under this alternative, effects would be similar to those described under Alternative B, except more restrictive increasing habitat effectiveness for GSE except outside GRSG habitat where impacts are the same as Alternative A.

Infrastructure

Under Alternative C, all occupied sage-grouse habitat would be exclusion areas for new ROWs; the acreage excluded from ROW construction would be greatly increased over Alternative A. These policies would protect GSE habitat from ROW and road construction more than Alternatives A, B, D or E. Limiting infrastructure construction would reduce the risks posed by roads and transmission lines as well as fragmentation of habitat.

Livestock Grazing and Feral Horses

Alternative C1:

Under Alternative C1, grazing would be closed in sage-grouse habitat for livestock and wild horses. This change would avoid direct impacts of grazing, such as loss of herbaceous cover, erosion, and diminished water quality. However, removal of livestock and feral horse grazing may eventually lead to increased fuel loading in the way of fine flashy dry vegetation in late summer. Wild ungulates would still be using these areas and their use may also increase as available forage increases. The complete removal of livestock and feral horse grazing could improve sagebrush/grassland habitat quality initially and help to restore important wetland and adjacent riparian habitats that support GSE.

Alternative C2:

Alternative C2 would reduce acres open to livestock grazing and limit AUMs in allotments that overlap GRSG habitats. This alternative would also reduce wild horse AUMs by 25 percent. These policy changes would reduce the direct impacts of grazing from Alternative A, while also maintaining the vegetation diversity and fuel reduction promoted by livestock grazing. Not exceeding proper use grazing levels, according to Forest Plan standards, will be more easily attainable if proposed grazing reductions are followed. Wild ungulates would still be using these areas and their use may also increase as available forage increases. The reduction of livestock and feral horse grazing could improve sagebrush/grassland habitat quality and help to restore important wetland and adjacent riparian habitats that support GSE. There would be few if any negative effects on GSE due to alternative C with respect to range resources. Additionally,

under this alternative, habitat treatments would only be allowed that benefit GRSG. Therefore, Alternative C would have the least negative effects and the most positive impacts on GSE.

Cumulative Effects for Seven Resource Areas in Alternative C

There could be cumulative effects in addition to impacts described above. Sagebrush/grassland habitat also occurs on private, state, and BLM land adjacent to the Forest units. Activities occurring in the seven resource areas also occur on these ownerships. There are some existing conservation measures on these other lands. Cumulatively, however, there could be additional loss, degradation, or disturbance from recreation and travel, rights-of-way granted, energy and mineral development, range management, and fire and fuels management in sagebrush/grassland habitat. See also Cumulative Effects analysis in the Environmental Impact Statement prepared for the Utah planning area, Chapter 4.

6.3.4 Alternative D

Isolation/Habitat Fragmentation

Under this alternative, the effects of most suggested management actions would be similar to Alternative B, with the exception that more flexibility or discretion would be given to the land management agency for site specific analysis to allow for example, route construction in PPMA, road improvements, and issuance of Special Use Permits if it is determined that these actions would not adversely affect GRSG. Under Alternative D, PPMA would be managed as an avoidance area, however, new ROW projects would be allowed in designated corridors. ROWs would also be allowed in PPMA if the project would not adversely affect sage-grouse populations. Under this alternative if populations and habitats are healthy or improving, it could permit disturbance above the 5% cap of disturbance for the UT management zone. Effects of this alternative include continued disturbance of some GSE habitat that does not overlap GRSG along with some disruption of normal life history behaviors if disturbance was permitted in PPMA/PGMA.

Fire

Under Alternative D, impacts would be similar to Alternative B. In addition, fuel breaks would be constructed to protect large blocks of sagebrush habitat. Fuels management programs would consider sage-grouse habitat needs, and grazing management would be considered as a tool to reduce fuel loading. These policies would be likely to reduce the acres of sagebrush/grassland burned in wildfires or lost during fuels treatment programs. As such, they would protect sage-grouse habitat from fire more than Alternative A. This alternative would be more protective than Alternative A, but less protective than Alternatives B and C for GSE.

Invasive Weeds

Alternative D would follow the same approach as Alternative B, using integrated vegetation management and prioritizing sagebrush re-establishment and noxious/invasive weed control. In addition, as under Alternative C, Alternative D would develop methods for prioritizing and restoring sagebrush steppe invaded by nonnative plants. These policies would place greater emphasis on sagebrush re-establishment than Alternative A and generally increase habitat effectiveness for GSE.

Conifer Encroachment

Under Alternative D, vegetation management programs would include treatment of PPMA's facing conifer encroachment in order to meet sage-grouse habitat objectives to reduce conifer encroachment within PPMA. Because this alternative has a specific goal of reducing conifer encroachment to protect sage-grouse habitat, it would likely be more effective in lowering pinyon-juniper spread than Alternative A and will likely generally benefit GSE.

Minerals/Energy Development

Under Alternative D, lands within PPMA would be closed to non-energy leasable mineral new leasing and mineral material sales, including not permitting expansions of existing mines. This action would greatly reduce the acreage open to mineral leasing compared to Alternative A. Un-leased areas in PPMA and PGMA would be open to fluid mineral leasing, but all acres would require NSO or CSU stipulations, where under Alternative A over 1 million acres had no stipulations. Existing lease areas would have conservation measures applied, including NSO stipulations. However, Alternative D is more similar to Alternative B regarding energy development using stipulations to protect GRSG compared to Alternative A; as a result, impacts on sage-grouse from energy development as described under Alternative A would be reduced. Under this alternative, PPMA would be closed to new fluid mineral leases and existing leases would have a 4 mile no surface occupancy buffer around leks similar to Alternative B. However with some mineral development, this alternative would allow up to 5% disturbance in any Utah Management Zone. Effects would be similar to those associated with Alternative B. There may be a few more impacts if the disturbance allowance is increased from 3% to 5%. However the potential for this difference to have negative impacts on GSE is minimal. Therefore effects would be most similar to those described under Alternative B including displacing energy/minerals development to GSE habitats not overlapping GRSG.

Infrastructure

Limiting infrastructure construction would reduce the risks posed by roads and transmission lines, such as increased predation and habitat fragmentation. Under Alternative D, PPMA within four miles of an occupied lek would be exclusion areas for most types of new ROWs. These proposed policies would protect PPMA from ROW and road construction more than Alternative A, by limiting road and ROW construction in habitat areas. Although Alternative D would provide less protection to PPMA from ROW construction, it would restrict development more than Alternative A, while allowing for increased management flexibility to improve the effectiveness of protection measures. Alternative D is generally the same as Alternative B except that the potential for direct habitat loss and indirect impacts would be greater under this alternative compared with Alternatives B and C due largely to the five percent disturbance cap and allowance for development to occur in PPMA (open for development). As such, this alternative would be expected to provide fewer protective measures to GSE where range and/or habitats are coincident with priority sage-grouse areas than Alternatives B and C, but more than Alternative A.

Livestock Grazing and Feral Horses

Alternative D would not reduce acres open to livestock or feral horse grazing, nor reduce AUMs. Impacts would be similar to Alternative B, but under Alternative D Forest Service would incorporate sage-grouse habitat objectives and management considerations into grazing

allotments within PPMA. Other actions are similar to Alternative B, and as GRSG objectives are added to grazing permit renewals habitat quality will improve over the long-term. Alternative D would be similar to Alternative B, but would be slightly more restrictive as GRSG habitat objectives within grazing allotments would be applied to occupied habitat not just PPMA. This alternative would have much fewer negative impacts than Alternative A, but slightly greater negative impacts than Alternative C to GSE. Generally speaking, if GRSG habitat is taken into consideration before applying the management action, then GSE would likely benefit from that protection or management action though some additional GSE habitat is still at risk as it is outside of GRSG habitat.

Cumulative Effects for Seven Resource Areas in Alternative D

There could be cumulative effects in addition to impacts described above. Sagebrush/grassland habitat also occurs on private, state, and BLM land adjacent to the Forest units. Activities occurring in the seven resource areas also occur on these ownerships. There are some existing conservation measures on these other lands. Cumulatively, however, there could be additional loss, degradation, or disturbance from recreation and travel, rights-of-way granted, energy and mineral development, range management, and fire and fuels management in sagebrush/grassland habitat. See also Cumulative Effects analysis in Chapter 4 of the Environmental Impact Statement prepared for the Utah planning area.

6.3.5 Alternative E

Alternative E2 – Wyoming Governor’s EO...where noted, E2 applies to those Ashley National Forest lands in Wyoming and will be discussed in seven resource areas below. Also, in Wyoming, under alternative E2, habitat is designated core and non-core areas.

Isolation/Habitat Fragmentation

Under Alternative E, the Forest Service would not establish any Zoological areas, would not strive to retain federal lands in sage-grouse habitat under public ownership, and would not seek to acquire state and private lands to conserve, enhance or restore sage-grouse habitat. Water developments, along with seeps, springs, and wetlands are not evaluated and modified and/or enhanced except in priority habitat. Impacts to GSE, will likely continue as in Alternative A regarding water and wetlands relative to sagebrush/grassland ecosystems.

Fire

Under Alternative E, a statewide fire agency agreement would be created to reduce jurisdictional boundaries and allow for immediate response to natural fire in priority habitat. It would allow the use of fire-retardant vegetation to buffer areas of high quality GRSG habitat from catastrophic fire. Prescribed burns would be used with caution in sagebrush habitat. These policies would be more likely to reduce the acres of sagebrush/grassland burned in wildfires or lost during fuels treatment programs compared to Alternative A and generally benefit GSE.

Invasive Weeds

Under Alternative E, interagency focus groups-- likely by GRSG population area--would respond to new infestations to control invasive species. Additionally, containment of known infestations in or near sagebrush habitats would be a high priority for all land management agencies. These actions would focus invasive species control on sage-grouse habitat more than Alternative A, and effects will be generally positive for GSE.

Conifer Encroachment

Under Alternative E, vegetation management programs would include aggressive treatment to remove encroaching conifers and other plant species to expand sage-grouse habitat or increase the carrying capacity and effectiveness of habitat areas. Because this alternative has a specific goal of reducing conifer encroachment to protect sage-grouse habitat, it would likely be more effective in lowering the probability of pinyon-juniper spread than Alternative A and generally be beneficial to GSE.

Minerals/Energy Development

Alternative E would not close any lands to mineral material sales or non-energy mineral leasing, but would limit impacts from mineral leasing and development through the use of conservation measures, such as seasonal timing restrictions, and best management practices to minimize disturbance of sage-grouse. In general habitat no specific management actions would be taken. Coal leases in priority habitat would be allowed, provided special conditions, conservation measures, and pre-project mitigation requirements were met. Similarly, areas not presently petitioned for withdrawal from locatable mineral entry would remain open, but conservation measures would be applied to claimants. Existing lease areas would remain under current management. These policies would reduce the acreage open to energy development without stipulations compared to Alternative A. However, the changes compared to existing policy are minor; thus, Alternative E would provide some protection to GSE where coincident with GRSG but impacts will be similar to Alternative A overall.

Infrastructure

Limiting infrastructure construction would reduce the risks posed by roads and transmission lines such as predation, collision and fragmentation of habitat. Under Alternative E, priority habitat would be avoidance areas for new ROWs. No specific management actions are provided for general habitat. These proposed policies provide limited measures to protect priority habitat from ROW and road construction and would reduce impacts compared to Alternative A for GSE only where coincident with GRSG priority habitat.

Livestock Grazing and Feral Horses

Alternative E would not reduce acres open to livestock or feral horse grazing, nor reduce AUMs. Existing grazing operations would utilize rangeland best management practices to increase the necessary vegetation to improve nesting success and population recruitment for GRSG. To limit impacts to nesting and lekking areas, the intensity and timing of grazing in sagebrush habitats would be controlled. Alternative E may improve GSE habitat quality on grazing lands over the long-term through use of best management practices but doesn't go as far to protect and enhance habitat for GSE like other action alternatives, i.e. Alternative C.

Cumulative Effects for Seven Resource Areas in Alternative E

There could be cumulative effects in addition to impacts described above. Sagebrush/grassland habitat also occurs on private, state, and BLM land adjacent to the Forest units. Activities occurring in the seven resource areas also occur on these ownerships. There are some existing conservation measures on these other lands. Cumulatively, however, there could be additional loss, degradation, or disturbance from recreation and travel, rights-of-way granted, energy and mineral development, range management, and fire and fuels management in sagebrush/grassland

habitat. See also: Cumulative Effects analysis in Chapter 4 of the Environmental Impact Statement prepared for the Utah planning area.

6.3.6 Summary

Direct, indirect, and cumulative effects to grassland/shrubland edge species and their habitat will be similar to those described for the Sagebrush Associated Species (SAS) in the Wildlife and Botany Specialist Report. Overall, the highest potential for any negative effects would be from Alternative A. Though populations of these species (vesper sparrow) appear to be stable or slightly increasing, effects from management actions that might change the structural makeup of the vegetation, not already considered in the Land and Resource Management Plans, could have detrimental effects. All action alternatives protect and conserve GRSG habitat to some degree and increase habitat effectiveness generally for these species. Alternatives B and D have similar generally positive effects to conserve GRSG habitats more than Alternative E (most liberal protection), but somewhat less than Alternative C (most conservative protection). These species mentioned above, have affinities for sagebrush communities and though will benefit from protections offered to GRSG by the action alternatives, may be negatively impacted by the displacement of anthropogenic disturbances from GRSG habitats into other areas of sagebrush communities. Differences in negative effects between action alternatives would be negligible and likewise, differences in positive effects are difficult to discern at this scale.

6.4 RIPARIAN SHRUB SPECIES (RSS) – BIRDS

MacGillivray's warbler, Lincoln's sparrow and song sparrow were grouped together for this analysis due to the similar nature of the habitats they occupy in terms of association with sagebrush communities. Neither of these species are completely dependent upon sagebrush, but instead are closely associated with shrub-steppe and prefer to nest in riparian corridors often in shrub-steppe communities. For the sake of this analysis, and based on the potential effects, programmatic nature of the conservation measures, and landscape scale which is being analyzed, we grouped them into this category and call them Riparian Shrub Species (RSS).

MacGillivray's Warbler (*Oporornis tolmiei*)

Natural History — Breeds in streamside habitats and forest edges along the Rocky Mountains, in most of the western United States, in British Columbia, in southeastern Alaska, and in localized areas of Mexico. Most individuals migrate south, generally along the Rocky Mountains, to Mexico and Central America for winter. MacGillivray's warbler is a common species throughout Utah during the summer, where it can be found nesting at middle elevations. MacGillivray's warbler forages on or near the ground; its diet consists mainly of insects. Mating pairs form shortly after birds reach the breeding grounds. The pair builds a cup nest using a variety of dry woody and leafy materials, and then lines the nest with fine fibers. Approximately four eggs are incubated by the female for about twelve days. Hatchlings are born with closed eyes and some downy feathers. The hatchlings leave the nest after about nine days, but both parents will continue to care for the young until they are independent (Rodriguez 2006) (UDWR 2013c).

Population Status, Abundance and Trend –Natureserve shows species “apparently secure to vulnerable” in Utah (S4,S5B). BBS trend data from 1966-2011 show 3.5% change...stable to slightly increasing in Utah (significant, N=40) (Sauer etal 2012). Range wide their status is

relatively stable to decline of 30% (Natureserve 2013). In Utah, the species was less abundant in campgrounds and picnic sites developed in riparian areas where shrub/sapling density was half that of non-campground riparian sites. Activities such as intensive grazing, water developments, recreation or urban development, and intensive agriculture that remove or degrade brush and seedling/sapling vegetation in riparian habitats, ecotones, bogs, wet-meadows, and forests or woodlands may be detrimental to local populations. Widespread loss and degradation of western riparian habitats probably affects the species but is unstudied. Intensive grazing that reduces or eliminates willows and other brush and sapling vegetation along streamsides, in bogs, wet meadows, and moist woodlands is detrimental. Nests may also be vulnerable to trampling by livestock. The species may be declining in southern Alberta due to grazing and agriculture; it has disappeared in some areas, but is still common in protected provincial parks (UDWR 2013c).

Lincoln's Sparrow (*Melospiza lincolni*)

Natural History —Habitats utilized by Lincoln's sparrow during the breeding season include wet meadows, bogs, and riparian thickets, especially where these habitats include willows and where shrub cover is dense; during migration and in winter, this species uses a much broader array of habitats, ranging from weedy pastures to tropical forests. This species feeds mainly on terrestrial invertebrates (arthropods) and small seeds. The nest is typically on the ground, rarely elevated in a shrub. Clutch size is usually three to five eggs, most commonly four. The eggs are incubated by the female alone for ten to thirteen days. The nestlings are fed by both parents and fledge after an additional ten to eleven days (Rodriguez 2006).

Population Status, Abundance and Trend —Natureserve shows species “apparently secure to vulnerable” in Utah (S4B, S3N). BBS data trend from 1966-2011 shows 7.1% change...stable to slightly increasing in Utah (significant, N=22) (Sauer et al 2012). Breeds in Alaska and across northern Canada south through the Rocky Mountains and the Pacific coastal ranges to southern California, Arizona, and New Mexico. During winter, it is found in the south-central and southwestern United States south to Honduras. In Utah, it is common as a breeding species during summer in the high mountains and plateaus, especially in the north-central and northeastern parts of the state, as well as in areas of high-elevation the southwestern part of Utah. It is a common migrant throughout Utah at lower elevations, and in winter it is rare to uncommon in the southwestern corner of the state (UDWR 2013b) (NatureServe 2013).

Song Sparrow (*Melospiza melodia*)

Natural History — Song sparrows occupy a variety of habitats, breeding mainly in streamside thickets and marshes, but it is found also in wet meadows, bogs, forest edges, clearings, and residential areas. The diet of the song sparrow is mostly terrestrial arthropods (especially insects), small seeds, some berries, and, in coastal areas, some crustaceans and mollusks. The nest is usually on the ground, often under a tuft of grass or small shrub, or sometimes above the ground a few feet up in a shrub, particularly among later broods. The clutch, usually consisting of three or four eggs, is incubated by the female for twelve to fourteen days. The nestlings, fed by both parents, fledge after about nine to twelve days. This species is multiple-brooded, producing two or three, sometimes even four, clutches each nesting season (UDWR 2013f) (Rodriguez 2006).

Population Status, Abundance and Trend – NatureServe shows species “apparently secure” in Utah (S4S5). BBS trend data from 1966-2011 show -2.5% change...stable to slightly decreasing in Utah (non-significant, N=65) (Sauer 2012) (NatureServe 2013). Song Sparrows range from Alaska and Canada to central Mexico. It occurs throughout Utah, where it is common during all seasons. Over thirty subspecies are recognized in this species, six (two breeding, four migrant or wintering) being known from Utah (UDWR 2013f).

6.4.1 Alternative A

Isolation/Habitat Fragmentation

Alternative A would maintain current land management and few Forests have specific desired conditions in Land Use Plans for shrubland associated species. Under this alternative there would be no changes to the current National Forest System Roads, transportation plan, or recreation management on the Forest relative to shrublands. This alternative has the highest potential to impact RSS due to the lack of restrictions on activities that cause these effects. Therefore all direct and indirect effects to the species and its habitat would likely allow current trends to continue. With Alternative A allowing continued impacts to sagebrush and surrounding vegetative communities, negative effects to these species would occur over time due to anthropogenic development and changes. Connectivity between seasonal habitats is decreased between isolated habitats effecting species which may be cut off from food, water, or cover at critical times of year. Isolation, in addition to reducing the land area available to support RSS, habitat loss and fragmentation also increase opportunities for other disturbances, such as human traffic, wildfire, and spread of invasive plants, and increase the risk from such threats.

Fire

Sagebrush is killed by wildfires and recovery requires many years, especially in the case of large fires. Prior to recovery, these sites are of limited use by RSS except along the edges and in unburned islands. As a result of this loss of habitat, fire has been identified as a primary factor associated with GSE population threats. Cheatgrass changes historical fire patterns by providing an abundant, continuous and easily ignitable fuel source that facilitates rapid fire spread. While most sagebrush subspecies are killed by fire and slow to reestablish, cheatgrass recovers within one to two years of a fire event from seed in the soil. Forest Service management to prevent or control wildfires can also affect RSS and habitat. Increased human activity and noise associated with fire suppression and prescribed fire in areas occupied by RSS could affect reproduction, hiding, or foraging behavior. Important habitats could be altered because of the use of heavy equipment, hand tools, and noise. In addition, continued suppression may result in higher rates of pinyon-juniper encroachment in some areas. In the initial stages of encroachment, fuel loadings remain consistent with the sagebrush understory. Existing Forest Plans typically do not include specific management decisions regarding fuels treatments in sagebrush/riparian habitat. In general, both prescribed fire and non-fire fuels treatments are allowed, and fire suppression is prioritized to protect fire fighter and public safety as the highest priority, with GRS habitat prioritized commensurate with property values and other critical habitat to be protected. These policies would not avoid the use of prescribed fire in sagebrush/riparian habitat nor prioritize protection of sagebrush/riparian communities; thus, loss of habitat to wildfire and prescribed fire would continue. Alternative A would have the fewest restrictions for fuels management actions and has a high potential for vegetation disturbance. As this alternative does

not prioritize fire operations beyond what has already been determined in the Fire Management Plans, potential impacts may include: removing or degrading habitat, disrupting reproduction, causing changes in species movement patterns due to areas devoid of vegetation; ultimately reducing habitat quality and quantity and negatively impacting RSS populations.

Invasive Weeds

Invasive weeds alter plant community structure and composition, productivity, nutrient cycling, and hydrology and may cause declines in native plant populations, including sagebrush/riparian habitats, through competitive exclusion and niche displacement, among other mechanisms. Invasive plants reduce and, in cases where monocultures occur, eliminate vegetation that RSS use for food and cover. Invasive plant communities do not provide suitable RSS habitat, since these species in some way depend on sagebrush and a variety of native forbs/grasses and very often the insects associated with them. Along with competitively excluding vegetation essential to RSS, invasive plants fragment existing RSS habitat or reduce habitat quality. Under current management (Alternative A), the Forest Service utilizes integrated weed management techniques, including mechanical, manual, chemical, and biological control to reduce the likelihood of invasive weed spread and the extent of current infestations. Under Alternative A, Forest Service would continue to implement noxious weed and invasive species control using integrated weed management actions per funding and plans in cooperation with State and Federal agencies, affected counties, and adjoining private lands. Though there are no specific objectives in Forest Plans to focus these efforts on cheatgrass or sagebrush/riparian communities. These actions would benefit RSS habitat along with other vegetation types as long as funding continues, but would not specifically prioritize management of these areas.

Conifer Encroachment

Pinyon-juniper woodlands may encroach into sagebrush/grassland ecosystems, which reduce and may eventually virtually eliminate RSS occupancy in these areas. In higher elevation areas, Douglas-fir may also encroach into mountain big sagebrush communities. The Forest Service frequently manages pinyon-juniper encroachment, especially in previously treated areas, utilizing mechanical, chemical, hand-cutting, and prescribed burning, to reduce conifer encroachment of sagebrush ecosystems. Alternative A does not take any specific actions to prevent conifer encroachment, but many Forest Plans contain objectives for maintaining improving, or restoring sagebrush/riparian plant communities often for big game winter range and/or livestock grazing. These approaches do not specifically address the threat of conifer encroachment to benefit RSS and thus would likely have limited effectiveness in controlling its spread.

Minerals/Energy Development

Energy development can result in direct habitat loss; fragmentation of important habitats by roads, pipelines, and power lines; noise; and direct human disturbance. The effects of energy development often add to the impacts from other human development and may result in RSS population declines. Nonrenewable (oil and gas) energy development impacts RSS and sagebrush/grassland habitats through direct disturbance and habitat loss from well pads, access construction, seismic surveys, roads, power lines, and pipeline corridors; indirectly from noise, gaseous emissions, changes in water availability and quality, and human presence. Renewable energy facilities, including solar and wind power, typically require many of the same features for construction and operation as do nonrenewable energy resources. Therefore, impacts from

direct habitat losses, habitat fragmentation through roads and power lines, noise, and increased human presence would generally be similar to those for nonrenewable energy development. Surface and subsurface mining for mineral resources (coal, uranium, copper, phosphate, and others) results in direct loss of habitat if they occur in sagebrush/grassland habitats. Surface mining usually has a greater impact than subsurface activity. Habitat loss from mining can be exacerbated by the storage of overburden (soil removed from mine shafts) in undisturbed habitat. If infrastructure is necessary, additional direct loss of habitat could result from structures, staging areas, roads, railroad tracks, and power lines. RSS could be directly affected by trampling or vehicle collision and indirectly from an increase in human disturbance, ground shock, noise, dust, reduced air and water quality, and changes in vegetation and topography. Industrial activity associated with the development of surface mines and infrastructure could result in noise and human activity that disrupt the habitat and life-cycle of RSS. Under this alternative, a small percentage of PPMA would be closed to non-energy leasable mineral leasing, with the majority or remainder of all occupied habitats open to leasing (including expansion of new leases) with no cap on surface disturbing activities. As such, this alternative would be expected to cause the greatest amount of direct and indirect habitat loss, degradation, and fragmentation for RSS. There would likely also be greater negative effects from noise, increased presence of roads/humans, and anthropogenic structures in an otherwise open landscape. Impacts from energy development on water quality and availability are especially important to RSS and some eventual negative impacts are expected from Alternative A.

Infrastructure

Human disturbance is increased over the short term during infrastructure construction. In the long term, increased threats from predators perching on infrastructure may cause declines in RSS. Power lines are linear and often extend for many miles. Thus, ground disturbance associated with power line construction, as well as vehicle and human presence during maintenance activities, may introduce or spread invasive weeds over large areas, thereby degrading habitat. Cellular and other communications towers have the potential to cause RSS mortality by influencing movements through avoidance of a tall structure or electromagnetic radiation, or to provide perches for corvids and raptors. Impacts from roads may include direct habitat loss from road construction and direct mortality from collisions with vehicles. Roads may also present barriers to migration corridors or seasonal habitats. Other impacts include facilitation of predator movements, spread of invasive plants, and human disturbance from noise and traffic. In addition, fence poles create predator perch sites and potentially predator corridors along fences (particularly if a road is adjacent). Fences and their associated roads may allow for the invasion or spread of invasive weeds along the fencing corridor. Furthermore, fences may effectively cause habitat fragmentation, as RSS may avoid habitat around the fences to escape predation. Also, under this alternative, there would be no changes to the current approach associated with exchange, acquisition, or disposal of lands or with permitting ROWs on Forest Service lands. All FS Lands would continue to be managed according to FS policy and regulation. Permitted ROWs would continue to allow construction, maintenance, and operation activities that may result in habitat loss, fragmentation, or degradation for RSS. Indirect effects may include new infestations of noxious or invasive weeds and an increase in edge habitat. Though most projects would be forced to mitigate or minimize impacts, this alternative would likely have the greatest negative impact on RSS habitat effectiveness.

Livestock Grazing and Feral Horses

Rangelands meeting Forest Plan Standards may provide effective RSS habitat. However, grazing at inappropriate intensity, season, or location may degrade sagebrush ecosystems over the long term, including changes in plant communities and soils, leading to loss of vegetative cover and plant litter, increased erosion, decreased water quality, and reduced overall habitat quality for wildlife especially RSS. The reduction of grass heights from grazing could reduce the suitability of cover and habitat availability by increasing exposure to predators. Livestock may also occasionally trample RSS nests, or disturb reproduction efforts. At the planning level, Forest Service can decide whether areas would be open or closed to livestock grazing. Future impacts would be eliminated in areas closed to grazing, but past impacts would likely persist, and closing grazing may result in other harmful impacts, such as fuel buildup. At the implementation level, Forest Service can consider changes in grazing practices or systems, which could reduce grazing intensity or change the season of use, for example. In addition, changes in grazing management within riparian and wet meadows can reduce impacts in these important seasonal habitats and benefit RSS. Under Alternative A, Forest Service would continue to make sage-grouse habitat available for livestock grazing. Active AUMs for livestock grazing would be 329,521 on BLM-administered lands and 265,373 on Forest Service-administered lands, though the number of AUMs on a permit may be adjusted during permit renewals, Allotment Management Plan (AMP) development, or other appropriate administrative activity. Wild horse and burro AUMs would also remain at current levels. These policies may contribute to RSS habitat degradation if current grazing practices are not meeting Forest Plan proper use parameters. Under this alternative, there would be no change in the numbers, timing, or method of livestock grazing on the Forest. Other potential effects to RSS habitat could include: overgrazing, reduction in cover, structure, and diversity of vegetation due to consumption, and degradation of meadow/wetland/spring/stream habitat.

Cumulative Effects for Seven Resource Areas in Alternative A

There could be cumulative effects in addition to impacts described above. Sagebrush/riparian habitat also occurs on private, state, and BLM land adjacent to the Forest units. Activities occurring in the seven resource areas also occur on these ownerships. There are some existing conservation measures on these other lands. Cumulatively, however, there could be additional loss, degradation, or disturbance from recreation and travel, rights-of-way granted, energy and mineral development, range management, and fire and fuels management in sagebrush/riparian habitat. See also: Cumulative Effects analysis in Chapter 4 the Environmental Impact Statement prepared for the Utah planning area.

6.4.2 Alternative B

Isolation/Habitat Fragmentation

Alternative B would encourage consolidation RSS habitat, facilitating habitat conservation. These conservation measures would be more protective than conservation measures in Alternatives A and D, but less protective than Alternative C. This represents a concerted effort to maximize connectivity and minimize fragmentation of sagebrush habitats. Alternative B would not establish any Zoological areas for sage-grouse. These actions would protect against additional fragmentation of sage-grouse habitat, but would do little to reduce existing isolation and fragmentation. Under this alternative there would be limited opportunities for road

construction in PPMA, with minimum standards applied and no upgrading of current roads. In addition, recreational use permits would only be given in PPMA if there was a neutral or beneficial impact to GRSG and no driving cross country would be permitted in PPMA. This is more restrictive than Alternative A, allowing fewer anthropogenic influence to sagebrush habitats and RSS by minimizing human use and construction or upgrading of roads. Negative impacts to RSS will be associated with displacing anthropogenic development and activities outside of PPMA/PGMA to other areas in the sagebrush ecosystem occupied by RSS.

Fire

Under Alternative B, in PPMA, fuels treatments would be designed and implemented to emphasize protection of existing sagebrush ecosystems. Fuels management programs would consider sage-grouse habitat needs, and fire suppression would prioritize protection of habitat after firefighter and public safety and protection of property. These policies would be likely to reduce the acres of sagebrush/riparian burned in wildfires, or lost during fuels treatment programs. As such, these policies would protect RSS and habitat more than Alternative A. Sagebrush communities outside of sage-grouse habitat will likely not see the protection afforded to PPMA/PGMA and impacts to it may negatively impact RSS.

Invasive Weeds

Alternative B would likely protect more acres of sagebrush from invasive weeds because of the greater emphasis placed on sagebrush re-establishment than Alternative A but focusing again only on sage-grouse habitat. However, the actual change in the probability of invasive weed establishment would depend on the resources available to devote to the effort. Controlling noxious and invasive plants will generally benefit RSS.

Conifer Encroachment

Under Alternative B, invasive vegetation will be monitored and controlled in fuels treatment areas and in relation to PPMA. More emphasis on actively conserving sagebrush ecosystems than those described under Alternative A will generally benefit RSS.

Minerals/Energy Development

Under Alternative B, lands within PPMA would be closed to non-energy leasable mineral leasing and to mineral material sales, including not permitting expansions of existing mines. This action would greatly reduce the acreage open to mineral leasing compared to Alternative A. These policies would reduce the acreage affected by energy development in the planning area compared to Alternative A, by limiting the impacts of energy development, including disturbance and habitat degradation. This alternative would provide protection now and into the future for the most important GRSG habitats, which would encompass many acres of RSS habitat. Though this alternative may push energy and mineral development to less desirable sagebrush or non-GRSG habitat, there may be negative effects of not protecting all RSS habitat.

Infrastructure

Under Alternative B, PPMA would be exclusion areas for new ROWs and the acreage excluded from ROW construction would be greatly increased over Alternative A. These policies would protect PPMA from ROW and road construction more than Alternative A. Under this alternative, PPMA would be managed as an exclusion area and general habitat would be managed as an avoidance area for new rights-of-way projects. This benefits RSS where habitat with

GRSG overlaps but may increase negative impacts outside of GRSG habitat in other sagebrush communities suitable and/or occupied by RSS.

Livestock Grazing and Feral Horses

Alternative B would not reduce acres open to livestock or feral horse grazing, nor reduce AUMs per say, but within PPMA, Forest Service would incorporate sage-grouse habitat objectives and management considerations into grazing allotments through AMPs or permit renewals administratively. The NTT alternative would adjust grazing direction in GSG PPMA. This accounts for less than 10% of the land cover of the National Forests in Utah. The potential effects due to livestock grazing, vegetation disturbance, and range improvements is expected to be the same under Alternative B, as it would be under Alternative A, except that it would provide a few more restrictions to protect some RSS habitat. Though this would occur at a very small scale, some effects to local populations would likely prove beneficial especially where water quality and springs/wetlands were improved.

Cumulative Effects for Seven Resource Areas in Alternative B

There could be cumulative effects in addition to impacts described above. Sagebrush/riparian habitat also occurs on private, state, and BLM land adjacent to the Forest units. Activities occurring in the seven resource areas also occur on these ownerships. There are some existing conservation measures on these other lands. Cumulatively, however, there could be additional loss, degradation, or disturbance from recreation and travel, rights-of-way granted, energy and mineral development, range management, and fire and fuels management in sagebrush/riparian habitat. See also: Cumulative Effects analysis in the Environmental Impact Statement prepared for the Utah planning area, Chapter 4.

6.4.3 Alternative C

Isolation/Habitat Fragmentation

Under Alternative C, Zoological Areas are proposed on Forest Service lands in each of the fifteen GRSG population areas to function as sagebrush reserves in PPMA, totaling 318,200 acres and would conserve habitat against surface disturbance and fragmentation. These actions and the establishment of sagebrush reserves would protect against additional fragmentation of a portion of sagebrush communities generally benefiting RSS where they overlap. In addition, Alternative C would encourage consolidation of sage-grouse habitats, facilitating habitat conservation and management. This alternative would be expected to have the least negative impacts and most positive impacts to wildlife species whose ranges overlap with PGMA and PPMA.

Fire

Alternative C would follow the same policies as Alternative B, with the additional provision that livestock would be excluded from habitat areas post-fire to allow for recovery. As with Alternative B, these policies would prioritize sagebrush preservation more than current management under Alternative A and thus would conserve more RSS habitat. Alternative C would have the most protective measures for RSS.

Invasive Weeds

Alternative C would follow the same approach as Alternative A and B, using integrated vegetation management, to control/suppress and eradicate noxious and invasive plants. As under Alternative B, vegetation management would prioritize sagebrush re-establishment and noxious weed control. In addition, Alternative C would develop methods for prioritizing and restoring sagebrush steppe invaded or even once reseeded by nonnative plants. These policies would place greater emphasis on sagebrush re-establishment than Alternative A and be generally beneficial to RSS.

Conifer Encroachment

Impacts from conifer encroachment under Alternative C would be the same as those described under Alternative B, but with emphasis on a wider range of GSG habitats focusing on sagebrush communities in general and benefiting RSS more than Alternative A and more similar to Alternative D.

Minerals/Energy Development

Under Alternative C, lands within all GRSG occupied habitat would be closed to non-energy leasable mineral leasing and to mineral material sales, including not permitting expansions of existing mines. This action would greatly reduce the acreage open to mineral leasing. Under Alternative C, proposed policy changes would be the same as those described for Alternative B, but would have greater impacts because they would be applied to all occupied habitat. Lands within PPMA and PGMA would also be defined unsuitable for surface exploration of coal and would be proposed for withdrawal from locatable mineral entry. Un-leased areas would be closed to fluid mineral leasing, greatly increasing the amount of habitat protected from energy development. Existing lease areas would have conservation measures applied, including NSO stipulations. These policies would substantially reduce the available acreage for energy development, which would limit impacts such as disturbance and habitat degradation. Under this alternative, effects would be similar to those described under Alternative B, except more restrictive increasing habitat effectiveness for RSS except outside GRSG habitat where impacts are the same as Alternative A.

Infrastructure

Under Alternative C, all occupied sage-grouse habitat would be exclusion areas for new ROWs; the acreage excluded from ROW construction would be greatly increased over Alternative A. These policies would protect RSS habitat from ROW and road construction more than Alternatives A, B, D or E. Limiting infrastructure construction would reduce the risks posed by roads and transmission lines as well as fragmentation of habitat.

Livestock Grazing and Feral Horses

Alternative CI:

Under Alternative CI, grazing would be closed in sage-grouse habitat for livestock and wild horses. This change would avoid direct impacts of grazing, such as loss of herbaceous cover, erosion, and diminished water quality. However, removal of livestock and feral horse grazing may eventually lead to increased fuel loading in the way of fine flashy dry vegetation in late summer. Wild ungulates would still be using these areas and their use may also increase as

available forage increases. The complete removal of livestock and feral horse grazing could improve sagebrush/riparian habitat quality initially and help to restore important wetland and adjacent riparian habitats that support RSS.

Alternative C2:

Alternative C2 would reduce acres open to livestock grazing and limit AUMs in allotments that overlap GRSG habitats. This alternative would also reduce wild horse AUMs by 25 percent. These policy changes would reduce the direct impacts of grazing from Alternative A, while also maintaining the vegetation diversity and fuel reduction promoted by livestock grazing. Not exceeding proper use grazing levels, according to Forest Plan standards, will be more easily attainable if proposed grazing reductions are followed. Wild ungulates would still be using these areas and their use may also increase as available forage increases. The reduction of livestock and feral horse grazing could improve sagebrush habitat quality and help to restore important wetland and adjacent riparian habitats that support RSS. There would be few if any negative effects on RSS due to alternative C with respect to range resources. Additionally, under this alternative, habitat treatments would only be allowed that benefit GRSG. Therefore, Alternative C would have the least negative effects and the most positive impacts on RSS.

Cumulative Effects for Seven Resource Areas in Alternative C

There could be cumulative effects in addition to impacts described above. Sagebrush/riparian habitat also occurs on private, state, and BLM land adjacent to the Forest units. Activities occurring in the seven resource areas also occur on these ownerships. There are some existing conservation measures on these other lands. Cumulatively, however, there could be additional loss, degradation, or disturbance from recreation and travel, rights-of-way granted, energy and mineral development, range management, and fire and fuels management in sagebrush/riparian habitat. See also: Cumulative Effects analysis in Chapter 4 of the Environmental Impact Statement prepared for the Utah planning area.

6.4.4 Alternative D

Isolation/Habitat Fragmentation

Under this alternative, the effects of most suggested management actions would be similar to Alternative B, with the exception that more flexibility or discretion would be given to the land management agency for site specific analysis to allow for example, route construction in PPMA, road improvements, and issuance of Special Use Permits if it is determined that these actions would not adversely affect GRSG. Under Alternative D, PPMA would be managed as an avoidance area, however, new ROW projects would be allowed in designated corridors. ROWs would also be allowed in PPMA if the project would not adversely affect sage-grouse populations. Under this alternative if populations and habitats are healthy or improving, it could permit disturbance above the 5% cap of disturbance for the UT management zone. Effects of this alternative include continued disturbance of some RSS habitat that does not overlap GRSG along with some disruption of normal life history behaviors if disturbance was permitted in PPMA/PGMA.

Fire

Under Alternative D, impacts would be similar to Alternative B. In addition, fuel breaks would be constructed to protect large blocks of sagebrush habitat. Fuels management programs would consider sage-grouse habitat needs, and grazing management would be considered as a tool to reduce fuel loading. These policies would be likely to reduce the acres of sagebrush burned in wildfires or lost during fuels treatment programs. As such, they would protect sage-grouse habitat from fire more than Alternative A. This alternative would be more protective than Alternative A, but less protective than Alternatives B and C for RSS.

Invasive Weeds

Alternative D would follow the same approach as Alternative B, using integrated vegetation management and prioritizing sagebrush re-establishment and noxious/invasive weed control. In addition, as under Alternative C, Alternative D would develop methods for prioritizing and restoring sagebrush steppe invaded by nonnative plants. These policies would place greater emphasis on sagebrush re-establishment than Alternative A.

Conifer Encroachment

Under Alternative D, vegetation management programs would include treatment of PPMAs facing conifer encroachment in order to meet sage-grouse habitat objectives to reduce conifer encroachment within PPMA. Because this alternative has a specific goal of reducing conifer encroachment to protect sage-grouse habitat, it would likely be more effective in lowering pinyon-juniper spread than Alternative A and will likely generally benefit RSS.

Minerals/Energy Development

Under Alternative D, lands within PPMA would be closed to non-energy leasable mineral new leasing and mineral material sales, including not permitting expansions of existing mines. This action would greatly reduce the acreage open to mineral leasing compared to Alternative A. Existing lease areas would have conservation measures applied, including NSO stipulations. However, Alternative D is more similar to Alternative B regarding energy development using stipulations to protect GSG compared to Alternative A; as a result, impacts on sage-grouse from energy development as described under Alternative A would be reduced. Under this alternative, PPMA would be closed to new fluid mineral leases and existing leases would have a 4 mile no surface occupancy buffer around leks similar to Alternative B. However with some mineral development, this alternative would allow up to 5% disturbance in any Utah Management Zone. Effects would be similar to those associated with Alternative B. There may be a few more impacts if the disturbance allowance is increased from 3% to 5%. However the potential for this difference to have negative impacts on RSS is minimal. Therefore effects would be most similar to those described under Alternative B including displacing energy/minerals development to RSS habitats not overlapping GRSG.

Infrastructure

Limiting infrastructure construction would reduce the risks posed by roads and transmission lines, such as increased predation and habitat fragmentation. Under Alternative D, PPMA within four miles of an occupied lek would be exclusion areas for most types of new ROWs. These proposed policies would protect PPMA from ROW and road construction more than Alternative A, by limiting road and ROW construction in habitat areas. Although Alternative D

would provide less protection to PPMA from ROW construction, it would restrict development more than Alternative A, while allowing for increased management flexibility to improve the effectiveness of protection measures. Alternative D is generally the same as Alternative B except that the potential for direct habitat loss and indirect impacts would be greater under this alternative compared with Alternatives B and C due largely to the five percent disturbance cap and allowance for development to occur in PPMA (open for development). As such, this alternative would be expected to provide fewer protective measures to RSS where range and/or habitats are coincident with priority sage-grouse areas than Alternatives B and C, but more than Alternative A.

Livestock Grazing and Feral Horses

Alternative D would not reduce acres open to livestock or feral horse grazing, nor reduce AUMs. Impacts would be similar to Alternative B, but under Alternative D Forest Service would incorporate sage-grouse habitat objectives and management considerations into grazing allotments within PPMA. Other actions are similar to Alternative B, and as GRSG objectives are added to grazing permit renewals habitat quality will improve over the long-term. Alternative D would be similar to Alternative B, but would be slightly more restrictive as GRSG habitat objectives within grazing allotments would be applied to occupied habitat not just PPMA. This alternative would have much fewer negative impacts than Alternative A, but slightly greater impacts than Alternative C to RSS. Generally speaking, if GRSG habitat is taken into consideration before applying the management action, then RSS would likely benefit from that protection or management action though some additional RSS habitat is still at risk as it is outside of GRSG habitat.

Cumulative Effects for Seven Resource Areas in Alternative D

There could be cumulative effects in addition to impacts described above. Sagebrush/riparian habitat also occurs on private, state, and BLM land adjacent to the Forest units. Activities occurring in the seven resource areas also occur on these ownerships. There are some existing conservation measures on these other lands. Cumulatively, however, there could be additional loss, degradation, or disturbance from recreation and travel, rights-of-way granted, energy and mineral development, range management, and fire and fuels management in sagebrush/riparian habitat. See also: Cumulative Effects analysis in the Environmental Impact Statement prepared for the Utah planning area, Chapter 4.

6.4.5 Alternative E

Alternative E2 – Wyoming Governor’s EO...where noted, E2 applies to those Ashley National Forest lands in Wyoming and will be discussed in seven resource areas below. Also, in Wyoming, under alternative E2, habitat is designated core and non-core areas.

Isolation/Habitat Fragmentation

Under Alternative E, the Forest Service would not establish any Zoological areas, would not strive to retain federal lands in sage-grouse habitat under public ownership, and would not seek to acquire state and private lands to conserve, enhance or restore sage-grouse habitat. Water developments, along with seeps, springs, and wetlands are not evaluated and modified and/or enhanced except in priority habitat. Impacts to RSS, may continue as in Alternative A regarding water and wetlands relative to sagebrush ecosystems.

Fire

Under Alternative E, a statewide fire agency agreement would be created to eliminate jurisdictional boundaries and allow for immediate response to natural fire in priority habitat. It would allow the use of fire-retardant vegetation to buffer areas of high quality GRSG habitat from catastrophic fire. Prescribed burns would be used with caution in sagebrush habitat. These policies would be more likely to reduce the acres of sagebrush/riparian burned in wildfires or lost during fuels treatment programs compared to Alternative A and generally benefit RSS.

Invasive Weeds

Under Alternative E, interagency focus groups-- likely by GRSG population area--would respond to new infestations to control invasive species. Additionally, containment of known infestations in or near sagebrush habitats would be a high priority for all land management agencies. These actions would focus invasive species control on sage-grouse habitat more than Alternative A, and effects will be generally positive for RSS.

Conifer Encroachment

Under Alternative E, vegetation management programs would include aggressive treatment to remove encroaching conifers and other plant species to expand sage-grouse habitat or increase the carrying capacity and effectiveness of habitat areas. Because this alternative has a specific goal of reducing conifer encroachment to protect sage-grouse habitat, it would likely be more effective in lowering the probability of pinyon-juniper spread than Alternative A and generally be beneficial to RSS.

Minerals/Energy Development

Alternative E would not close any lands to mineral material sales or non-energy mineral leasing, but would limit impacts from mineral leasing and development through the use of conservation measures, such as seasonal timing restrictions, and best management practices to minimize disturbance of sage-grouse. In PGMA no specific management actions would be taken. Coal leases in priority habitat would be allowed, provided special conditions, conservation measures, and pre-project mitigation requirements were met. Similarly, areas not presently petitioned for withdrawal from locatable mineral entry would remain open, but conservation measures would be applied to claimants. Existing lease areas would remain under current management. These policies would reduce the acreage open to energy development without stipulations compared to Alternative A. However, the changes compared to existing policy are minor; thus, Alternative E would provide some protection to RSS where coincident with GRSG but impacts will be similar to Alternative A overall.

Infrastructure

Limiting infrastructure construction would reduce the risks posed by roads and transmission lines such as predation, collision and fragmentation of habitat. Under Alternative E, priority habitat would be avoidance areas for new ROWs. No specific management actions are provided for general habitat. These proposed policies provide limited measures to protect priority habitat from ROW and road construction and would reduce impacts compared to Alternative A for RSS only where coincident with GRSG priority habitat.

Livestock Grazing and Feral Horses

Alternative E would not reduce acres open to livestock or feral horse grazing, nor reduce AUMs. Existing grazing operations would utilize rangeland best management practices to increase the necessary vegetation to improve nesting success and population recruitment for GRSG. To limit impacts to nesting and lekking areas, the intensity and timing of grazing in sagebrush habitats would be controlled. Alternative E may improve RSS habitat quality on grazing lands over the long-term through use of best management practices but doesn't go as far to protect and enhance habitat for RSS like other action alternatives.

Cumulative Effects for Seven Resource Areas in Alternative E

There could be cumulative effects in addition to impacts described above. Sagebrush/riparian habitat also occurs on private, state, and BLM land adjacent to the Forest units. Activities occurring in the seven resource areas also occur on these ownerships. There are some existing conservation measures on these other lands. Cumulatively, however, there could be additional loss, degradation, or disturbance from recreation and travel, rights-of-way granted, energy and mineral development, range management, and fire and fuels management in sagebrush/riparian habitat. See also: Cumulative Effects analysis in Chapter 4 of the Environmental Impact Statement prepared for the Utah planning area.

6.4.6 Summary

Direct, indirect, and cumulative effects to grassland/shrubland edge species and their habitat will be similar to those described for the Sagebrush Associated Species (SAS) in the Wildlife and Botany Specialist Report. Overall, the highest potential for any negative effects would be from Alternative A. Though populations of these species (vesper sparrow) appear to be stable or slightly increasing, effects from management actions that might change the structural makeup of the vegetation, not already considered in the Land and Resource Management Plans, could have detrimental effects. All action alternatives protect and conserve GRSG habitat to some degree and increase habitat effectiveness generally for these species. Alternatives B and D have similar generally positive effects to conserve GRSG habitats more than Alternative E (most liberal protection), but somewhat less than Alternative C (most conservative protection). These species mentioned above, have affinities for sagebrush communities and though will benefit from protections offered to GRSG by the action alternatives, may be negatively impacted by the displacement of anthropogenic disturbances from GRSG habitats into other areas of sagebrush communities. Differences in negative effects between action alternatives would be negligible and likewise, differences in positive effects are difficult to discern at this scale.

7. CONCLUSION AND DETERMINATIONS BY FOREST UNIT

When considering the potential for population-level impacts on these species across the planning area of Forest Service system lands in Utah, it is important to consider that the analysis area makes up less than 12% of the entire acreage of the total Forest Service surface lands. Therefore it is unlikely that any population-level trends would be significantly altered by one of the action alternatives. Instead, a more likely scenario under the action alternatives is that there could be slight increases in the numbers of individuals and quality of habitat in the highly localized areas of GRSG designated habitat that is coincident with a particular MIS. Some negative impacts may occur where action alternatives seek to protect GRSG specific habitat and displace anthropogenic disturbances to other areas within the sagebrush ecosystem.

This MIS analysis indicates that implementation of any of the action alternatives **would maintain stable populations and habitat, and would not result in a loss of viability in the planning area or cause a trend toward federal listing** for all of the species analyzed in detail.

7.1 DETERMINATIONS BY FOREST

7.1.1 Ashley NF

This MIS analysis indicates that implementation of any of the action alternatives would maintain stable populations and habitat, and would not result in a loss of viability in the planning area or cause a trend toward federal listing for Golden eagle, Greater Sage-grouse, Lincoln's sparrow, Song sparrow, Mule deer, and Rocky Mountain elk.

7.1.2 Dixie NF

This MIS analysis indicates that implementation of any of the action alternatives would maintain stable populations and habitat, and would not result in a loss of viability in the planning area or cause a trend toward federal listing for Wild turkey, Mule deer, and Rocky Mountain elk.

7.1.3 Fishlake NF

This MIS analysis indicates that implementation of any of the action alternatives would maintain stable populations and habitat, and would not result in a loss of viability in the planning area or cause a trend toward federal listing for Brewer's sparrow, Lincoln's sparrow, MacGillivray's warbler, Mountain bluebird, Sage Thrasher, Song sparrow, Vesper sparrow, Western bluebird, Mule deer, and Rocky Mountain elk.

7.1.4 Manti-LaSal NF

This MIS analysis indicates that implementation of any of the action alternatives would maintain stable populations and habitat, and would not result in a loss of viability in the planning area or cause a trend toward federal listing for Golden eagle, Greater Sage-grouse, Mule deer, and Rocky Mountain elk.

7.1.5 Uinta-Wasatch-Cache NF

No MIS species habitat or effects due to implementation of these alternatives; thus, no MIS species were considered in detail in this document.

8. LITERATURE CITED

- Baker, M. F., Eng, R. L., Gashwiler, J. S., Schroeder M. H., and Braun, C. E. 1976. Conservation committee report on effects of alteration of sagebrush communities on the associated avifauna. *Wilson Bulletin* 88:165-171.
- Braun, C.E., M.F. Baker, R.L. Eng, J.W. Gashwiler and M.H. Schroeder. 1976 Conservation committee report on effects of alteration of sagebrush communities on the associated avifauna. *Wilson Bulletin* 88:165–171.
- Connelly, J.W., M.A. Schroeder, A.R. Sands, and C.E. Braun. 2000. Guidelines to manage sage grouse populations and their habitats. *Wildlife Society Bulletin* 28:967-985.
- Connelly, J.W., S.T. Knick, M.A. Schroeder, and S.J. Stiver. 2004. Conservation assessment of greater sage-grouse and sagebrush habitats. Unpublished Report, Western Association of Fish and Wildlife Agencies. Cheyenne, WY. 610pp
- Connelly, J.W., C.A. Hagen, and M.A. Schroeder. 2011a. Characteristics and dynamics of greater sage-grouse populations. Pp. 53-68 in S.T. Knick and J.W. Connelly (eds). *Greater Sage-Grouse: ecology and conservation of a landscape species and its habitats. Studies in Avian Biology* (vol. 38). University of California Press, Berkeley, CA.
- Connelly, J.W., E.T. Rinkes, and C.E. Braun. 2011b. Characteristics of greater sage-grouse habitats: a landscape species at micro and macro scales. Pp. 69-84 in S.T. Knick and J.W. Connelly (eds). *Greater Sage-Grouse: ecology and conservation of a landscape species and its habitats. Studies in Avian Biology* (vol. 38). University of California Press, Berkeley, CA.
- Garton, E.O., J.W. Connelly, J.S. Horne, C.A. Hagen, A. Moser, and M. Schroeder. 2011. Greater sage-grouse population dynamics and probability of persistence. Pp. 293-382 in S.T. Knick and J.W. Connelly (eds). *Greater Sage-Grouse: ecology and conservation of a landscape species and its habitats. Studies in Avian Biology* (vol. 38). University of California Press, Berkeley, CA.
- Miller, R.F., S.T. Knick, D.A. Pyke, C.W. Meinke, S.E. Hanser, M.J. Wisdom, and A.L. Hild. 2011. Characteristics of sagebrush habitats and limitations to long-term conservation. Pp. 145-184 in S. T. Knick and J. W. Connelly (eds). *Greater Sage-Grouse: ecology and conservation of a landscape species and its habitat. Studies in Avian Biology* (vol. 38). University of California Press, Berkeley, CA
- NatureServe. 2013. NatureServe Explorer: An online encyclopedia of life [web application]. Version 7.1. NatureServe, Arlington, Virginia. Available <http://www.natureserve.org/explorer>. (Accessed: April 30, 2013).
- Parrish, J. R., F. P. Howe, and R. E. Norvell. 1999. Utah Partners in Flight draft conservation strategy. UDWR publication number 99-40. Utah Partners in Flight Program, Utah Division of Wildlife Resources, Salt Lake City.
- Patterson, R.L. 1952. The sage grouse in Wyoming. Wyoming Game and Fish Commission, Sage Books Inc., Denver, CO. 344pp

- Rodriguez, R.L. 2006. Life history and analysis of endangered, threatened, candidate, and management indicator species of the Fishlake National Forest, Version 4.1
- Rodriguez, R.L. 2012. Life History and analysis of endangered, threatened, candidate, sensitive and management indicator species of the Dixie National Forest. USDA, Dixie NF, Cedar City, Utah.
- Sauer, J. R., J. E. Hines, J. E. Fallon, K. L. Pardieck, D. J. Ziolkowski, Jr., and W. A. Link. 2012. The North American Breeding Bird Survey, Results and Analysis 1966 - 2011. Version 12.13.2011 USGS Patuxent Wildlife Research Center, Laurel, MD
- Schroeder, M.A., J.R. Young, and C.E. Braun. 1999. Sage grouse (*Centrocercus urophasianus*). 28 pages In Poole, A. and F. Gill, eds. The Birds of North America, No. 425. The Birds of North America, Inc., Philadelphia, PA
- Tait, D. 2013. Personal communication. Rydberg,s milkvetch. May 3, 2013.
- USDA, Forest Service. 1986a. Land and resource management plan—Forest Plan. U.S. Department of Agriculture, Forest Service, Ashley National Forest, Vernal, UT.
- USDA, Forest Service. 1986b. Land and resource management plan—Forest Plan. U.S. Department of Agriculture, Forest Service, Fishlake National Forest, Richfield, UT.
- USDA, Forest Service. 1986c. Land and resource management plan—Forest Plan. U.S. Department of Agriculture, Forest Service, Dixie National Forest, Cedar City, UT.
- USDA, Forest Service. 1986d. Land and resource management plan—Forest Plan. U.S. Department of Agriculture, Forest Service, Manti-La Sal National Forest, Price, UT.
- USDA, Forest Service. 2003a. Land and resource management plan—Forest Plan. U.S. Department of Agriculture, Forest Service, Wasatch-Cache, South Jordan, UT.
- USDA, Forest Service. 2003b. Land and resource management plan—Forest Plan. U.S. Department of Agriculture, Forest Service, Uinta National Forest, South Jordan, UT.
- USDI, Bureau of Land Management. 2013. Draft EIS for Greater Sage-Grouse Resource Management Plans Amendments in Utah.
- USDI Fish and Wildlife Service (USFWS). 2010. Endangered and threatened wildlife and plants: 12-month findings for petitions to list the Greater Sage-Grouse (*Centrocercus urophasianus*) as threatened or endangered. Federal Register 75(55): 13910-14014.
- USDI Fish and Wildlife Service (USFWS). 2013. Greater Sage-grouse (*Centrocercus urophasianus*) Conservation Objectives Team: Final Report. U.S. Fish and Wildlife Service, Denver, CO. February 2013
- UDWR 2013a. Utah Division of Wildlife Resources, Utah Conservation Data Center. <http://dwrcdc.nr.utah.gov/rsgis2/Search/Display.asp?FINm=aquichry> (accessed April 25, 2013)

- UDWR 2013b. Utah Division of Wildlife Resources, Utah Conservation Data Center.
<http://dwrcdc.nr.utah.gov/rsgis2/Search/Display.asp?FINm=melolinc> (accessed April 25, 2013)
- UDWR 2013c. Utah Division of Wildlife Resources, Utah Conservation Data Center.
<http://dwrcdc.nr.utah.gov/rsgis2/Search/Display.asp?FINm=oportolm> (accessed April 25, 2013)
- UDWR 2013d. Utah Division of Wildlife Resources, Utah Conservation Data Center.
<http://dwrcdc.nr.utah.gov/rsgis2/Search/Display.asp?FINm=sialcurr> (accessed April 25, 2013)
- UDWR 2013e. Utah Division of Wildlife Resources, Utah Conservation Data Center.
<http://dwrcdc.nr.utah.gov/rsgis2/Search/Display.asp?FINm=oreomont> (accessed April 25, 2013)
- UDWR 2013f. Utah Division of Wildlife Resources, Utah Conservation Data Center.
<http://dwrcdc.nr.utah.gov/rsgis2/Search/Display.asp?FINm=melomelo> (accessed April 25, 2013)
- UDWR 2013g. Utah Division of Wildlife Resources, Utah Conservation Data Center.
<http://dwrcdc.nr.utah.gov/rsgis2/Search/Display.asp?FINm=pooegram> (accessed April 25, 2013)
- UDWR 2013h. Utah Division of Wildlife Resources, Utah Conservation Data Center.
<http://dwrcdc.nr.utah.gov/rsgis2/Search/Display.asp?FINm=sialmexi> (accessed April 25, 2013)
- UDWR 2013i. Utah Division of Wildlife Resources, Utah Conservation Data Center.
<http://dwrcdc.nr.utah.gov/rsgis2/Search/Display.asp?FINm=melegain> (accessed April 25, 2013)
- UDWR 2008. Utah Statewide mule deer management plan.
http://wildlife.utah.gov/hunting/biggame/pdf/mule_deer_plan.pdf
- UDWR 2010. Utah Statewide elk management plan.
http://wildlife.utah.gov/hunting/biggame/pdf/elk_plan.pdf