1. **Species:** Brewer's Sparrow (*Spizella breweri*)

2. **Status:** Table 1 summarizes the current status of this species or subspecies by various ranking entity and defines the meaning of the status.

Table 1. Current status of *Spizella breweri*

Entity	Status	Status Definition
NatureServe	G5	*Species is Secure* At very low risk or extinction or elimination due to a very extensive range, abundant populations or occurrences, and little to no concern from declines or threats.
CNHP	S4B	*Species is Apparently Secure* At fairly low risk of extinction or elimination due to an extensive range and/or many populations or occurrences, but with possible cause for some concern as a result of local recent declines, threats, or other factors. (B=Breeding)
Colorado State List Status	SGCN, Tier 2	Species of Greatest Conservation Need
USDA Forest Service	R2 Sensitive	Region 2 Regional Forester's Sensitive Species
USDI FWS[b]	N/A	N/A

[a] Colorado Natural Heritage Program.
[b] US Department of Interior Fish and Wildlife Service.

The 2012 U.S. Forest Service Planning Rule defines Species of Conservation Concern (SCC) as "a species, other than federally recognized threatened, endangered, proposed, or candidate species, that is known to occur in the plan area and for which the regional forester has determined that the best available scientific information indicates substantial concern about the species' capability to persist over the long-term in the plan area" (36 CFR 219.9). This overview was developed to summarize information relating to this species' consideration to be listed as a SCC on the Rio Grande National Forest, and to aid in the development of plan components and monitoring objectives.

3. Taxonomy

Genus/species *Spizella breweri* is accepted as valid (ITIS 2015).

4. Distribution, abundance, and population trend on the planning unit [12.53.2,3,4]:

Brewer's sparrow breeds in western, central, and portions of eastern Colorado.

Breeding Bird Survey (BBS) data for Brewer's sparrows at the continental (survey-wide), western regional, and central regional scales indicate significant declining trends in relative abundance between 1966 and 2002. Although Brewer's sparrows are considered common in western Colorado, trend estimates show significant decreases from 1966 to 2002. Detection frequencies during this period on routes in southern and eastern Colorado declined, while in north-central Colorado they increased (Holmes and Johnson 2005). Sauer et al. (2011) report significant declining trends of this species in the Southern Rockies/Colorado Plateau, and non-significant declines in Colorado for the period 1966-2009.

A total of 10 observations have been reported for the planning area during the past 20 years (NRIS database, RMBO 2015). No population trend or abundance estimates are available specific to the planning area.

Table 2. Known Occurrence Frequency within the Planning Area (NRIS and RMBO databases)

Known Occurrences in the past 20 years	10
Year Last Observed	2014

5. Brief description of natural history and key ecological functions [basis for other 12.53 components]:

The majority of Brewer's sparrows breed in the Great Basin and winter in the Sonoran and Chihuahuan deserts of the southwestern United States, western Mexico, and the Mexican Plateau (Rappole et al. 1993, Rotenberry et al. 1999 summarized in Holmes and Johnson 2005). The primary migratory route is through the intermountain west, but actual migration pathways are unknown.

Landscape level attributes that are positively associated with Brewer's sparrow density include sagebrush with high shrub cover, large patch size, little fragmentation, low disturbance, and habitat heterogeneity. Knick and Rotenberry (2002) found that the occurrence of Brewer's sparrows increased with increasing area of sagebrush patches and decreasing fragmentation (cited in Holmes and Johnson 2005). In Colorado, 75 percent of Brewer's sparrow detections were in sagebrush habitat (Knick and Rotenberry 1995, Lambeth 1998 cited in Holmes and Johnson 2005).

Nesting season extends from mid-April to early August, with peak nesting occurring from mid-May to late July. Most young have fledged by mid to late July. Breeding territories reported from several states range from 0.25 acres in Washington to 5.8 acres in northern Nevada and central Oregon. The species is capable of producing replacement clutches and frequently double-broods after loss of the first nest (Holmes and Johnson 2005).

Within its shrubland breeding habitat, local (e.g., within-patch) components that have been positively correlated with Brewer's sparrow densities are sagebrush cover, shrub cover, above-average vegetation height, vigor of the shrub patch, and measures of horizontal habitat heterogeneity. Conversely, densities of Brewer's sparrows have been negatively correlated with grass cover, rock outcrops, hopsage (*Atriplex spinosa*) cover, saltbush (*A. canescens*) cover, budsage (*Artemisia spinescens*) cover, and shrub species diversity (Rotenberry and Wiens 1980a, Wiens and Rotenberry 1980, Wiens and Rotenberry 1981a, Larson and Bock 1984, Knopf et al. 1990, Paige and Ritter 1999 cited in Holmes and Johnson 2005).

Nests are most often placed in taller, more vigorous big sagebrush. Shrubs utilized for nesting in Idaho averaged 27 inches and 26 inches in Idaho (). In Montana, nesting shrub height ranged from 11 to 25 inches tall (), while in Oregon and Nevada average nest shrub height was 28 inches (Best 1972, Best 1980, Peterson and Best 1985, Rotenberry et al. 1999, all cited in Holmes and Johnson 2005).

During migration and in the winter, Brewer's sparrows are found in habitats similar to their breeding habitats. They are associated with sagebrush shrublands and brushy desert habitat,

including desert scrub dominated by various saltbush species (*Atriplex* spp.) and creosote (*Larrea tridentata)* (Rotenberry et al. 1999).

6. Overview of ecological conditions for recovery, conservation, and viability [12.53 7, 9?, 10, 11, 12]:

At a regional scale, the maintenance of Brewer's sparrows depends on the existence of extensive tracts of sagebrush shrublands and associated habitat physiognomy, while on a more localized scale, the occurrence and abundance of Brewer's sparrows depend on high sagebrush cover, large patch size, habitat heterogeneity, low disturbance, and little fragmentation. The minimum patch size and degree of patch isolation required for breeding have not been determined. However, Brewer's sparrows do appear to be area-sensitive, and isolated stands of sagebrush smaller than 2 ha are not likely to be nesting habitat (Knick and Rotenberry 1995).

In general, management of sagebrush landscapes should attempt to mimic the natural disturbance regime in order to approximate naturally occurring landscapes. The maintenance of the largest, most continuous stands of sagebrush that exist within the landscape will benefit Brewer's sparrows, as will small openings (e.g., <1 ha) of short vegetation surrounded by sagebrush (Paige and Ritter 1999 cited in Holmes and Johnson 2005).

7. Threats and Risk Factors

The synergistic pattern of ground disturbance (due to excessive livestock grazing, failed agriculture, and intentional eradication of sagebrush), fire occurrence, and increased dominance of exotic vegetation, has caused the fragmentation and loss sagebrush habitat.

Habitat loss and fragmentation are attributable to a number of activities, including land conversion to tilled agriculture, urban and suburban development, development of road and power-line rights of way, and range improvement programs that remove sagebrush by burning, herbicide application, and mechanical treatment, replacing sagebrush with annual grassland to promote forage for livestock. The pace of the loss and fragmentation has accelerated because of complex interactions among agriculture, livestock grazing, and invasion of exotic plants, especially cheatgrass (Holmes and Johnson 2005).

In addition, livestock grazing can directly affect Brewer's sparrow by trampling or disturbing nests which can lead to nest failure. Livestock may also increase the potential for brown-headed cowbird presence, which is known to parasitize Brewer's sparrow nests. Other risk factors include direct and indirect effects of mining and oil/gas development and invasion of exotic annual grasses and the effects on fire frequency and intensity (Holmes and Johnson 2005).

8. Key literature:

Holmes, J.A. and M.J. Johnson. 2005. Brewer's Sparrow (*Spizella breweri*): a technical conservation assessment. [Online]. USDA Forest Service, Rocky Mountain Region. Available: http://www.fs.fed.us/r2/projects/scp/assessments/brewerssparrow.pdf [06/29/2015].

Rocky Mountain Bird Observatory (RMBO). 2015. Rocky Mountain Avian Data Center. Accessed online at: http://rmbo.org/v3/avian/ExploretheData.aspx [07/01/2015].

Rotenberry, J. T., M. A. Patten and K. L. Preston. 1999. Brewer's Sparrow (*Spizella breweri*), The Birds of North America Online (A. Poole, Ed.). Ithaca: Cornell Lab of Ornithology;

Retrieved from the Birds of North America Online: http://bna.birds.cornell.edu/bna/species/390. [07/08/2015].

9. Map of Known Occurrences and Modeled Suitable Habitat

Although the species has been sighted a number of times, there is relatively little suitable habitat within the planning area. Sagebrush cover types selected from the FSVeg database show that only 976 acres of sagebrush occurs within the planning area (Figure 1).

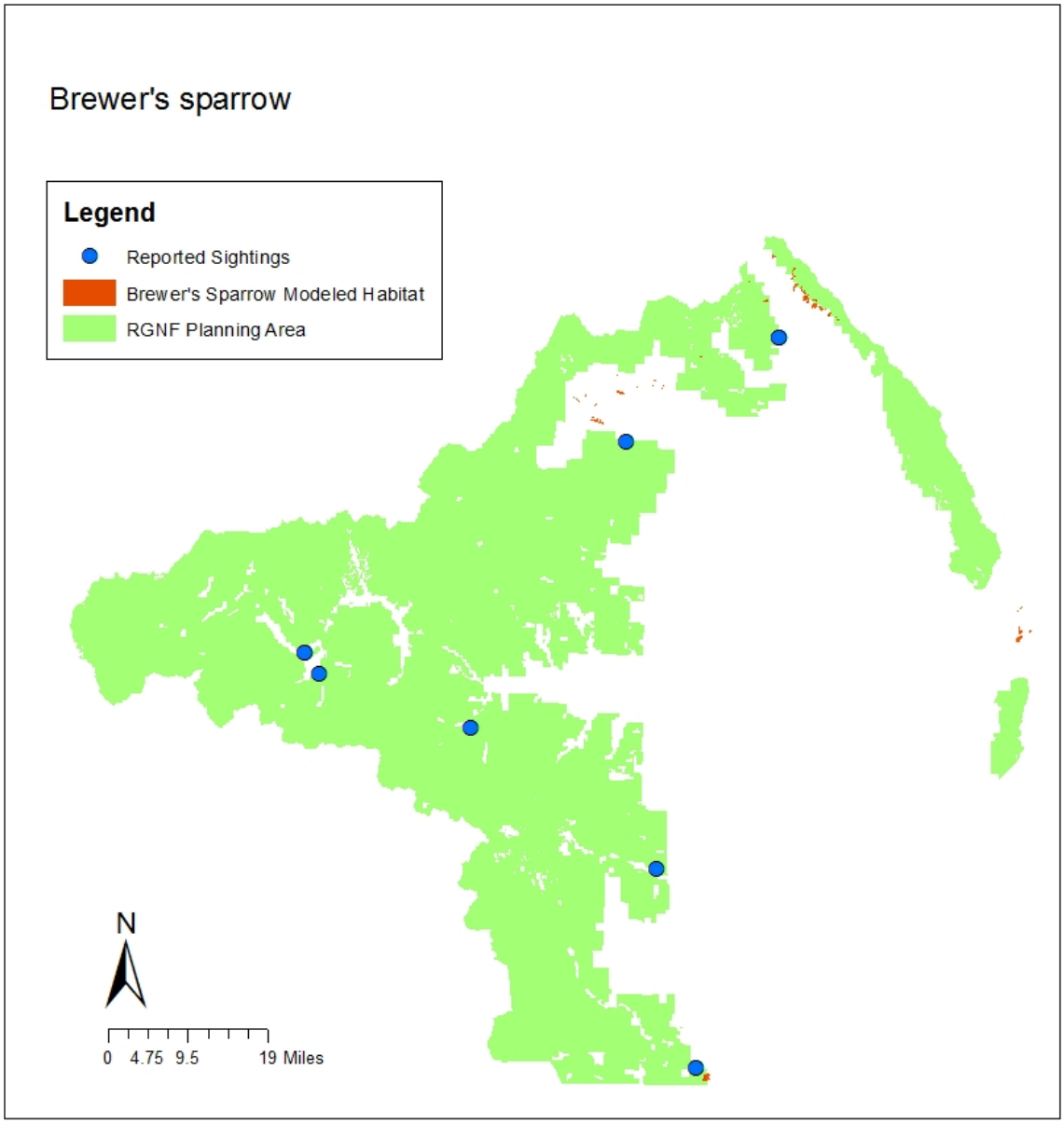

Figure 1. Brewer's Sparrow Modeled Habitat and Known Occurrences.