SPECIES: Scientific [common]	*Aegolius funereus* [Boreal Owl]
Forest:	Bridger-Teton National Forest
Forest Reviewer:	Randall Griebel, James Wilder
Date of Review:	02/28/2018; reviewed 5/13/2025
Forest concurrence (or recommendation if new) for inclusion of species on list of potential SCC: (Enter Yes or No)	NO

FOREST REVIEW RESULTS:

1. The Forest concurs or recommends the species for inclusion on the list of potential SCC:
   Yes____ No__X__

2. Rationale for not concurring is based on (check all that apply):
   Species is not native to the plan area _____
   Species is not known to occur in the plan area _____
   Species persistence in the plan area is not of substantial concern __X_____

FOREST REVIEW INFORMATION:

1. Is the Species Native to the Plan Area? Yes_X__ No___

   If no, provide explanation and stop assessment.

2. Is the Species Known to Occur within the Planning Area? Yes_X__ No___

   If no, stop assessment.

Table 1. All Known Occurrences, Years, and Frequency within the Planning Area

Year Observed	Number of Individuals	Location of Observations	Source of Information
Pre 1991	0	Greys River Ranger District	Wyoming Natural Diversity Database; USFS Natural Resource Information System (February 2018)
2005	6		
1982	2	Kemmerer Ranger District	Wyoming Natural Diversity Database; USFS Natural Resource Information System (February 2018)
2000-2008	12		
Pre 1991	0	Pinedale Ranger District	Wyoming Natural Diversity Database; USFS Natural Resource Information System (February 2018)
Post 1991	0		
1982	1	Big Piney Ranger District	Wyoming Natural Diversity Database; USFS Natural Resource Information System (February 2018)
2005-2013	14		
1976-1990	6	Blackrock Ranger District	Wyoming Natural Diversity Database; USFS Natural Resource Information System (February 2018)
1996-2012	7		
1985-1990	7	Jackson Ranger District	Wyoming Natural Diversity Database; USFS Natural Resource Information System (February 2018)
2005-2017	2		
2013-2017	75*	Jackson Valley Vicinity; Jackson Blackrock, and Greys River Ranger Districts	Teton Raptor Center (February 2018)

**Recent data from 2013-2017 for the Forest surrounding the Jackson Hole valley depicts the increase in known occupancy when acoustic recorder surveys started to be implemented.*

a. Are all Species Occurrences Only Accidental or Transient?

Yes___ No_X__

If yes, document source for determination and stop assessment.

b. For species with known occurrences on the Forest since 1990, based on the number of observations and/or year of last observation, can the species be presumed to be established or becoming established in the plan area?

Yes_X__ No___

If no, provide explanation and stop assessment.

c. For species with known occurrences on the Forest predating 1990, does the weight of evidence suggest the species still occurs in the plan area?

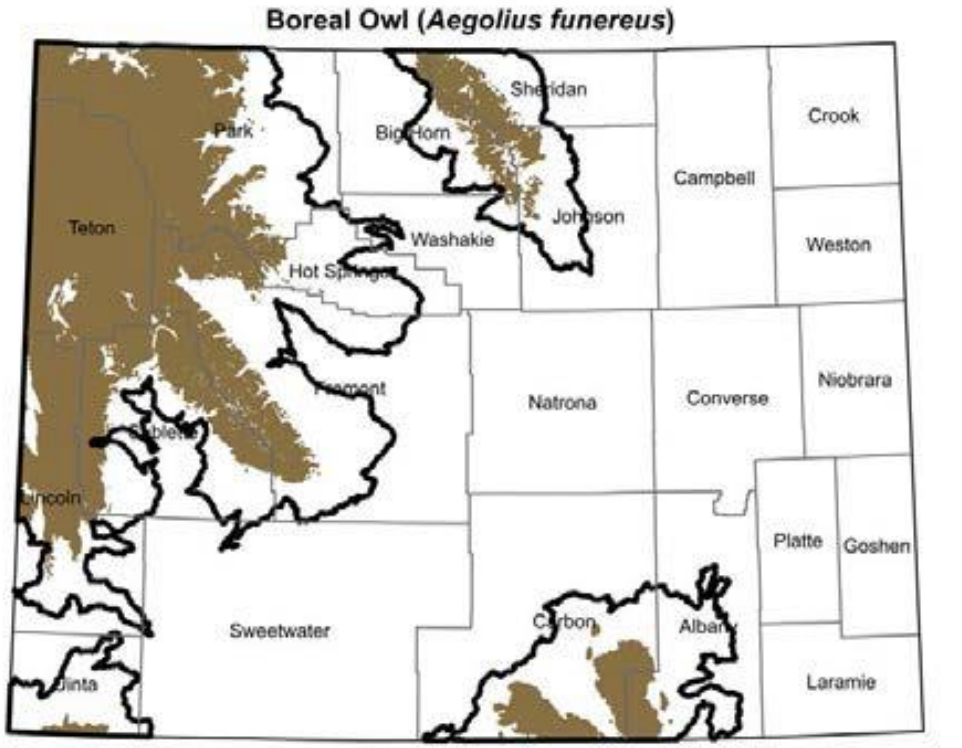
Yes_ X__ No___

If no, provide explanation and stop assessment.

d. **Map 1**, Boreal owl range map of North America

Wyoming Game and Fish Department. 2017. State Wildlife Action Plan. Boreal owl (*Aegolius funereus*).

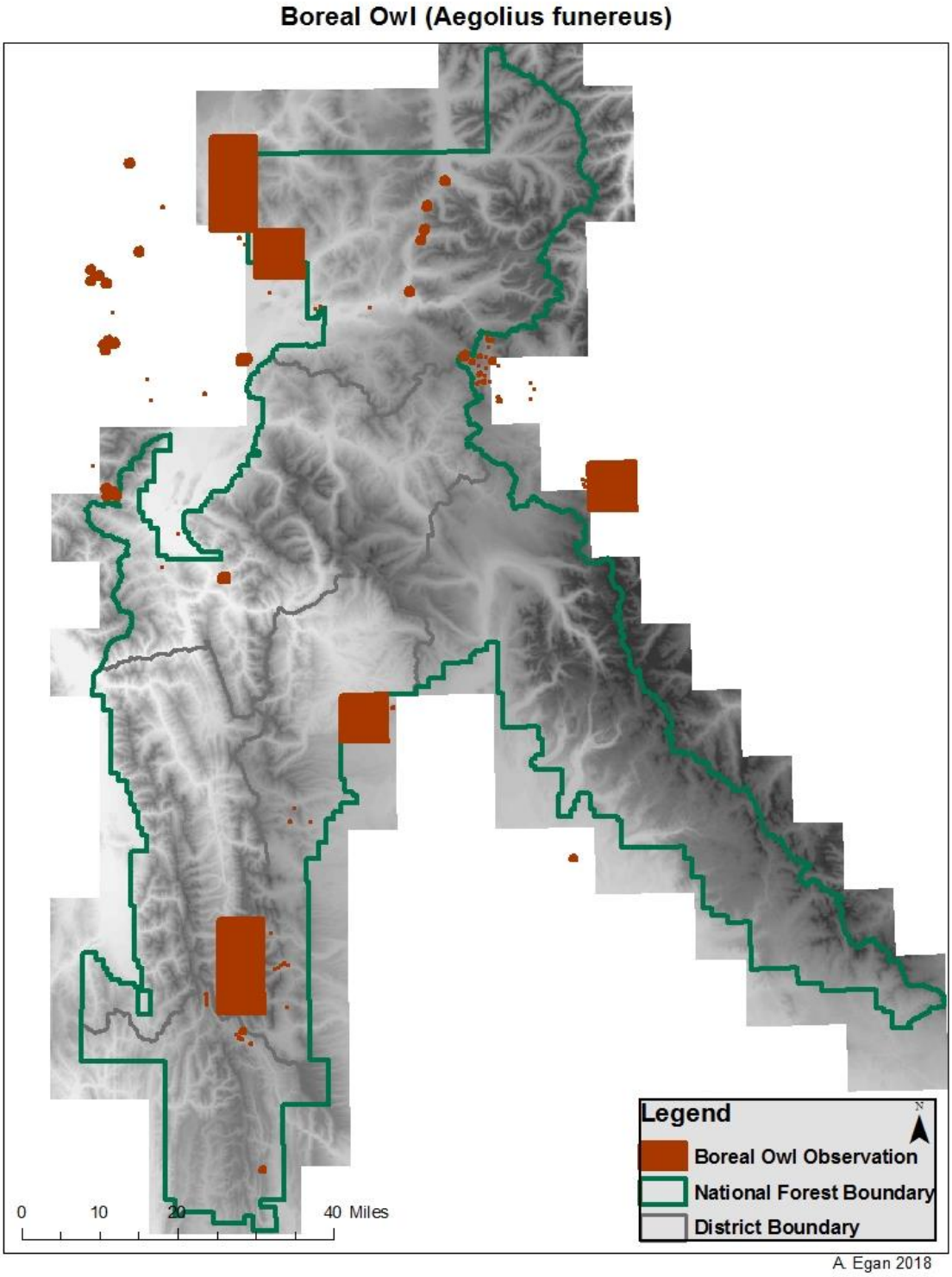
e. **Map 2**, Range and predicted distribution of *Aegolius funereus* in Wyoming.



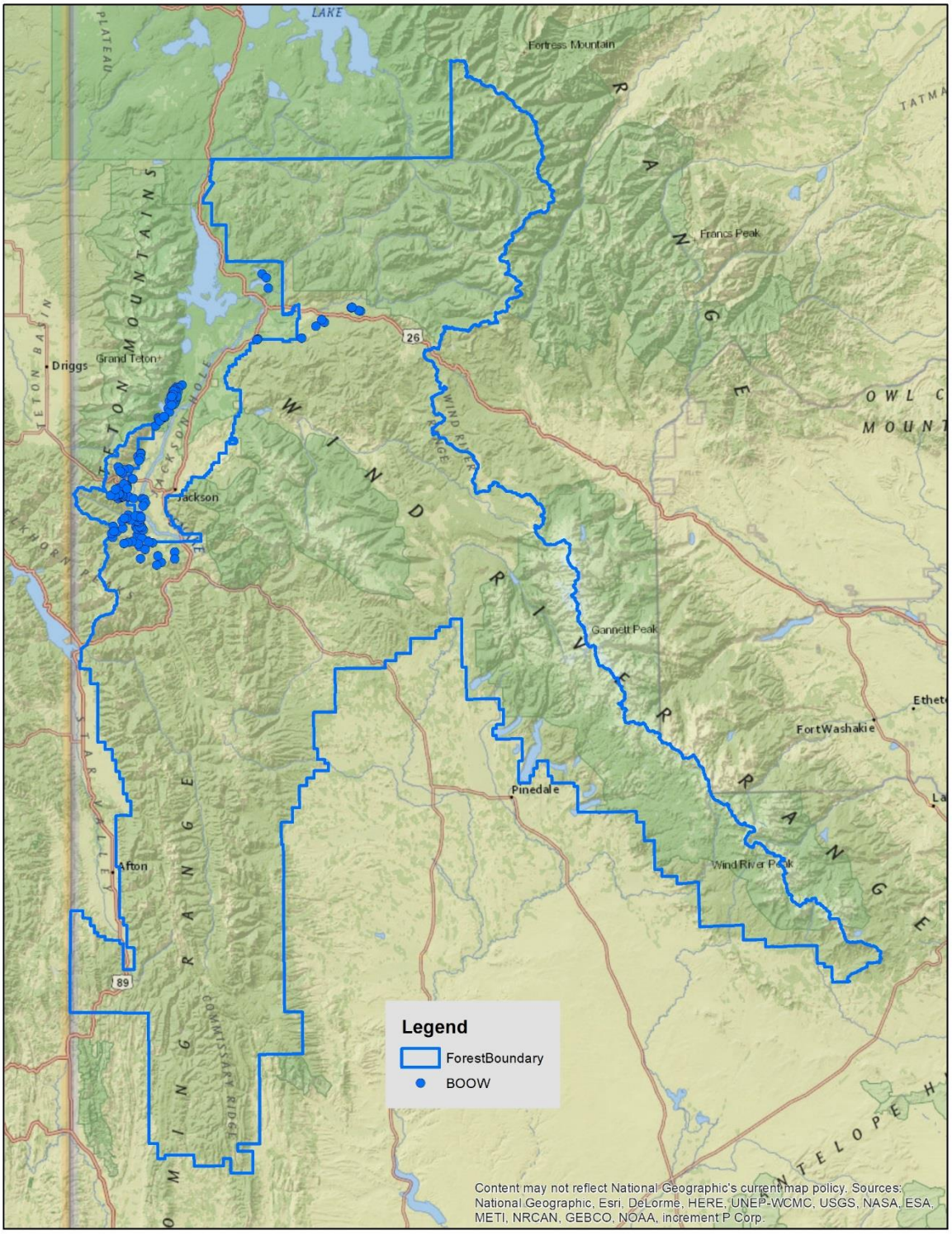
SOURCE: Digital maps of ranges for Wyoming Species of Greatest Conservation Need: Sept. 2016.
Wyoming Game and Fish Department and Wyoming Natural Diversity Database, University of Wyoming, Laramie, Wyoming.
Note that brown indicates the predicted distribution of the species;
heavy black lines indicate outermost boundaries of possible occurrence.

Wyoming Game and Fish Department. 2017. State Wildlife Action Plan. Boreal owl (*Aegolius funereus*).

f. **Map 3**, Map of Boreal owl occurrences on the Bridger-Teton National Forest (Wyoming Natural Diversity Database, USFS Natural Resource Information System [February 2018])



g. **Map 4**, Map of additional Boreal owl occurrences on the Bridger-Teton National Forest from 2013-2017 acoustic surveys (Map courtesy of Teton Raptor Center [February 2018])



3. Is There Substantial Concern for the Species' Capability to persist Over the Long-term in the Plan Area Based on Best Available Scientific Information?

Table 2. Status summary based on existing conservation assessments

Entity	Status/Rank (include definition if Other)
NatureServe Global Status	**G5— Secure** *Common; widespread and abundant. Wide range and apparently large numbers and occurrences seem to make this species secure.*
NatureServe State Status	**S2— Imperiled** *Imperiled because of rarity due to very restricted range, very few populations (often 20 or fewer), steep declines, or other factors making it very vulnerable to extirpation.*
WGFD	**NSS3 (Bb), Tier II** *Population Status: Population size or distribution is restricted or declining but extirpation is not imminent.* *Limiting Factors: Limiting factors are severe and not increasing significantly.* *Tier II: Moderate priority* *[The WGFD's Species of Greater Conservation Need (SGCN) designation process is based upon its **Native Species Status (NSS)** classification system that compares population and limiting factor variables using a 16 cell matrix. As a species moves from a placement closest to the upper left corner of the matrix (Aa/NSS1) toward the lower right corner (Dd/NSS7) the species' population status in Wyoming is considered more secure. Numerical scores were assigned to each of these variables and summed to provide a total score (i.e. NSS3). SGCN were placed into one of three tiers based on their total score: Tier I – highest priority, Tier II – moderate priority, and Tier III – lowest priority.]* (WGFD - Wyoming Species of Greatest Conservation Need)
WYNDD	**Species of Concern** *Species vulnerable to extirpation at the global or state level due to:* *a. their rarity (e.g., restricted distribution, small population size, low population density)* *b. inherent vulnerability (e.g., specialized habitat requirements, restrictive life history)* *c. threats (e.g., significant loss of habitat, sensitivity to disturbances)* (Wyoming Natural Diversity Database - Species of Concern)

USDA Forest Service	**Region 4: Sensitive Species** *Those plant and animal species identified by a Regional Forester for which population viability is a concern, as evidenced by* *a. Significant current or predicted downward trends in population numbers or density.* *b. Significant current or predicted downward trends in habitat capability that would reduce a species' existing distribution.* (FSM 2670.5 – Threatened, Endangered & Sensitive Species)
UDI FWS	**No Special Status; Migratory Bird**
WY BLM	**No Special Status**
IUCN	**LC – Least Concern** *A taxon is Least Concern when it has been evaluated against the criteria and does not qualify for Critically Endangered, Endangered, Vulnerable or Near Threatened. Widespread and abundant taxa are included in this category.* (IUCN – Red List Categories and Criteria)
Partners in Flight (PIF) Continental Concern Score	**NA**

Table 3. Status summary based on best available scientific information.

Species (Scientific and Common Name): ***Aegolius funereus [Boreal Owl]***		
Criteria	**Rationale**	**Literature Citations**
Distribution on Bridger-Teton National Forest	In Wyoming, the Boreal owl is a year-round resident throughout a portion of the state (Map 1), including the Bridger-Teton National Forest. The Boreal owl occurs principally in the Yellowstone Ecosystem, the Bighorn Mountain Range, and the Medicine Bow Mountains (Map 2) with most of the distribution and habitat located in the northwestern portion of the state, overlapping with the BTNF almost entirely. On the BTNF, the Boreal owl has been documented on 5 of the 6 ranger districts (Map 3 & 4), although it appears the species is not well distributed throughout its suitable habitat on the Forest and there are significant gaps where occupancy is currently unknown. Until recently, Boreal owls have not been comprehensively surveyed on the BTNF. They were	

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	detected during occasional surveys in the Snake River Range conducted from 2002 to 2012 on the Jackson Ranger District (unpublished data, BTNF files). However, an increase in acoustic surveys from 2013-2017 has resulted in an increase in known Boreal owl occupancy on the BTNF (Map 4). The recent observation data suggests that Boreal owls may be more common on the BTNF than previously assumed.	
Abundance on the Bridger-Teton National Forest	In Wyoming, the Boreal owl has an abundance rank of *very rare* based on the rather small area of the state known to be occupied in any given season and limited suitable habitat within that area (WGFD 2017). According to the WGFD, within the occupied area, the Boreal owl appears to be uncommon and occurs in relatively low densities where suitable habitat is present. Surveys on the Jackson Ranger District in 2017 found that "Boreal owls are abundant throughout the study area and we recorded owls at 30 of 50 locations surveyed during the early season". They concluded that Boreal owls are generally ubiquitous across the study area and populations may be more robust than previously thought (Unpublished Project Report, Teton Raptor Center 2017). This suggests that the uncertainty of Boreal owl population trend and abundance on the BTNF is likely correlated to the lack of survey efforts, since recent surveys have determined that the species possibly occurs in relatively high densities in areas of the Forest.	Teton Raptor Center. 2017. 2017 Teton To Snake Project Report. Jackson, WY. Wyoming Game and Fish Department. 2017. State Wildlife Action Plan. Boreal Owl (*Aegolius funereus*).
Population Trend on the Bridger-Teton National Forest	Currently, there are no population estimates for Wyoming and a long-term population trend is unknown for the BTNF. However, suspected population declines and a reduction in habitat capability prompted a sensitive status for the Boreal owl. See above section for additional discussion on Boreal owl population.	
Habitat Trend on the Bridger-Teton National Forest	In the Rocky Mountains, the species prefers old-growth and mature subalpine forests dominated by Subalpine fir and Engelmann spruce (WGFD 2017). In Wyoming, a mix of spruce-fir and mature Lodgepole pine, and mixed-forest and aspen forests are used. Boreal owls are secondary cavity nesters and may use old woodpecker holes or dead broken-topped subalpine fir. The presence of	Hayward, G. D., P. H. Hayward, and E. O. Garton. 1993. Ecology of the boreal owls in the Northern Rocky Mountains, USA. Wildlife Monograph 124.25. Helmbrecht, D., M. Williamson, and D. Abendroth. 2012. Bridger-Teton National

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	this habitat and availability of nesting cavities is the limiting factor for persistence of this species in the state (WGFD 2017). Forests used for nesting have high structural complexity, abundant trees with large basal areas, and understories that permit unobstructed flight during foraging (Hayward et al. 1993). Boreal owls may be common in the extensive subalpine forests of the BTNF. Using a spatial model, biologists estimated that the BTNF currently supports about 300,000 acres (approx. 8.8%) of mature or old subalpine forests that potentially provide nesting, roosting, and/or foraging habitat for Boreal owls. A vegetation assessment completed in 2012 for the BTNF determined that "Rocky Mountain Subalpine Mesic-Wet Spruce-Fir Forest and Woodland" vegetation class– the preferred habitat type of Boreal owl– encompasses 9% of the BTNF. This system is typically found on north facing slopes, high elevation ravines, or other areas where cold, mesic conditions exist, where Engelmann spruce and subalpine fir dominate the overstory but Lodgepole pine may be found on drier sites or in early successional stages (Helmbrecht et al. 2012). Of the 9% identified habitat, 60% has been identified as providing ideal habitat for Boreal owl, where late development Engelmann spruce, Sub-alpine fir, and Lodgepole pine is present. With increased fire suppression and less stand replacing wildfires on the landscape, early successional stands are being converted to late successional, resulting in an increase in Boreal owl habitat.	Forest Vegetation Condition Assessment. Wyoming Game and Fish Department. 2017. State Wildlife Action Plan. Boreal Owl (*Aegolius funereus*).
Threats to the Species and its Habitat on the Bridger-Teton National Forest	The primary threat to Boreal owl may be indirect effects of forest harvesting practices. Forest management, insect infestations such as the recent Mountain Pine Beetle epidemic, disease, and wildfires threaten the species by reducing the amount of mature forest and therefore reducing nesting and foraging habitat. Habitat shifts due to climate change also could affect Boreal Owl in parts of the species' range (WGFD 2017). These risk factors, as described in more detail below, are prevalent on the BTNF. <u>*Forest Management Activities & Wildfire*</u> Anthropogenic threats to mature and old subalpine forests include regional-	Wyoming Game and Fish Department. 2017. State Wildlife Action Plan. Boreal Owl (*Aegolius funereus*). Hayward, G. D. 1997. Forest management and conservation of Boreal Owls in North America. Journal of Raptor Research 31:114–124. Hayward, G. D., and P. H. Hayward. 1993. Boreal owl (*Aegolius funereus*), *in* The

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	scale fragmentation and loss of acreage from silvicultural practices that promote young, even-age forests (Hayward et al. 1993). These activities may negatively affect habitat because Boreal owls are strongly tied to mature and old forests for foraging and nesting (Hayward et al. 1993). Timber harvest often eliminates large-diameter snags and live trees used for nesting, reduces primary prey populations, and removes forest structure needed for foraging and roosting (Hayward 1997). As an obligate cavity nester, Boreal owl populations may be-influenced by changes in cavity availability resulting from changes in snag abundance or woodpecker populations. Changes in forest structure that reduce the number and dispersion of trees larger than 45 cm dbh could limit owl nesting. Similarly, changes in forest structure that alter woodpecker prey availability or the foraging ability of cavity excavators such as northern flickers and pileated woodpeckers, will affect Boreal owl nest site availability. Finally, changes in tree species composition, regardless of tree size class, could influence nest site availability as tree species differ in their longevity as a snag and in suitability for cavities (McClelland 1977). Results from an experiment in Idaho (Hayward et al. 1993) found that the pattern of nest site use indicated that older forest sites were preferred and that nesting efforts might decline if silvicultural practices converted forests to younger age classes. Small-scale mechanical treatments for fuel (fire) abatement within old-growth and mature forests can negatively affect the quality of Boreal owl habitat if they reduce forest structure by removing ladder fuels and clumps of large trees, and increase ambient temperatures of forests by decreasing overstory canopy cover. Likewise, high intensity prescribed fire treatments that result in stand replacement and reduce the amount of large old-growth trees can negatively affect Boreal habitat. Similarly, Wildfires that burn at high intensity may directly reduce the quality and abundance of old growth forests—habitats preferred by boreal owls—at a landscape scale. Widespread fire suppression that promotes forest succession and reduces the coverage of aspen forest,	Birds of North America, No. 63 (A. Poole and F. Gill, Eds.) Philadelphia, the Academy of Natural Sciences, Washington, D.C. The America Ornothologists' Union. Hayward, G. D., P. H. Hayward, and E. O. Garton. 1993. Ecology of the boreal owls in the Northern Rocky Mountains, USA. Wildlife Monograph 124.25. Korpimäki, E. 1981. On the ecology and biology of Tengmalm's owl (*Aegolius funereus*) in Southern Ostrobothnia and Suomenselkä, Western Finland. Acta Univ. Ouluensis, Serie A Scientia rerum naturalium 118:1-84. McClelland, B. R. 1977. Relationships between hole-nesting birds, forest snags, and decay in western larch/Douglas-fir forests of the northern Rocky Mountains. Dissertation. University of Montana, Missoula, Montana, USA. Wyoming Game and Fish Department. 2017. Wyoming State Wildlife Action Plan. Wyoming Game and Fish Department, Cheyenne, Wyoming, USA.

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	causes conifer to supplant aspen and may indirectly reduce live trees and snags with cavities that are useable by nesting Boreal owls. *Direct Habitat Loss* Activities that occur in mature and old-growth subalpine forests such as road construction, mining and drilling, timber harvest, and facility improvements at ski-areas may negatively affect boreal owl habitat quantity and quality because they directly reduce the coverage of these forest types. Where such stands are limited and the habitat change occurs over a large spatial scale, the loss of Boreal owl habitat may be significant. *Human Disturbance* Winter recreation (i.e. snowmobile use) in forest habitat has dramatically increased over the past several years and may have a detrimental effect on range occupancy, nesting, foraging and productivity (WGFD 2010). However, there is little evidence that disturbance is an important factor in nest loss or owl movements. Boreal owls readily tolerate human and mechanical noise. For example, in Colorado, owls nested within 30 meters of a major highway (R. A. Ryder; pers. comm. as cited in Hayward and Verner 1994). In Europe, nests were located within farmsteads and were associated with agriculture (Korpimaki 1981). Owls tolerated frequent (every 4-5 days) direct nest inspection (except during laying) and delivered prey to the nest while humans observed from several meters away (Korpimaki 1981). *Climate Change* Long-term effect due to climate change may effect Boral owl habitat where spruce-fir forest communities are affected by warming temperatures, decrease humidity, and a change in precipitation patters. This trend, overtime, would decrease the amount of nesting, roosting and foraging habitat for the Boreal owl. In combination with other factors, impacts from climate change may be exemplified and cause more severe consequences to the species.	

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Summary and recommendations: The Bridger-Teton National Forest overlaps with a large portion of Boreal owl habitat in Wyoming. Although few Boreal owl observations have been recorded across the BTNF, recent survey efforts on the Forest concluded the species may actually be present in high numbers throughout suitable habitat compared to what was previously thought. Threats to the species are primarily associated with processes that decrease old-growth spruce-fir forest. On the BTNF, this type of habitat is typically found on north-facing slopes, high elevation ravines, or other areas where cold, mesic conditions exist. These areas are characterized by long fire return intervals and are typically not a primary focus for large-scale forest management actions. It is unknown whether the impacts of climate change on these cooler-mesic sites will result in minor or major changes to the vegetative conditions. Recent survey efforts indicate Boreal owls may occur in relatively high densities on the Forest. The lack of forest-wide observations is likely a result of survey effort versus the reality that the species is probably fairly common in suitable habitat. With increased fire suppression and less stand replacing wildfires on the landscape, early successional stands are being converted to late successional, resulting in an increase in Boreal owl habitat across the forest. Thus, evidence suggests that Boreal owl populations are not of substantial concern on the BTNF and that observations have increased with increased survey effort. The Subalpine Mesic-Wet Spruce-Fir Forest and Woodland vegetation class is stable and there is little concern for habitat decline, concluding that the species' capability to persist over the long-term within the planning unit is currently adequate. Therefore, it is recommended that the Boreal owl is not a Species of Conservation Concern for the Bridger-Teton National Forest. Evaluator(s): Ashley Egan, Randall Griebel		Date: February 23, 2018