

SPECIES: Scientific [common]	<i>Accipiter gentilis</i> [Northern Goshawk]
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
1978-1981	8	Greys River Ranger District	Wyoming Natural Diversity Database; USFS Natural Resource Information System (February 2018)
1993-2003	8		
1980-1988	16	Kemmerer Ranger District	Wyoming Natural Diversity Database; USFS Natural Resource Information System (February 2018)
1991-2016	22		
1939-1989	22	Pinedale Ranger District	Wyoming Natural Diversity Database; USFS Natural Resource Information System (February 2018)
1993-2016	56		
1978-1989	26	Big Piney Ranger District	Wyoming Natural Diversity Database; USFS Natural Resource Information System (February 2018)
1993-2016	93		
1979-1989	9	Blackrock Ranger District	Wyoming Natural Diversity Database; USFS Natural Resource Information System (February 2018)
1991-2011	11		
1979-1988	14	Jackson Ranger District	Wyoming Natural Diversity Database; USFS Natural Resource Information System (February 2018)
1991-2017	20		
2013-2017	40	Forest surrounding Jackson valley; Jackson, Blackrock, and Greys River Ranger Districts	Teton Raptor Center (February 2018)

**Numbers are approximations. Due to an overlap in data from multiple datasets, duplicate occupancy records are expected. This is avoided to the extent practicable.*

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___

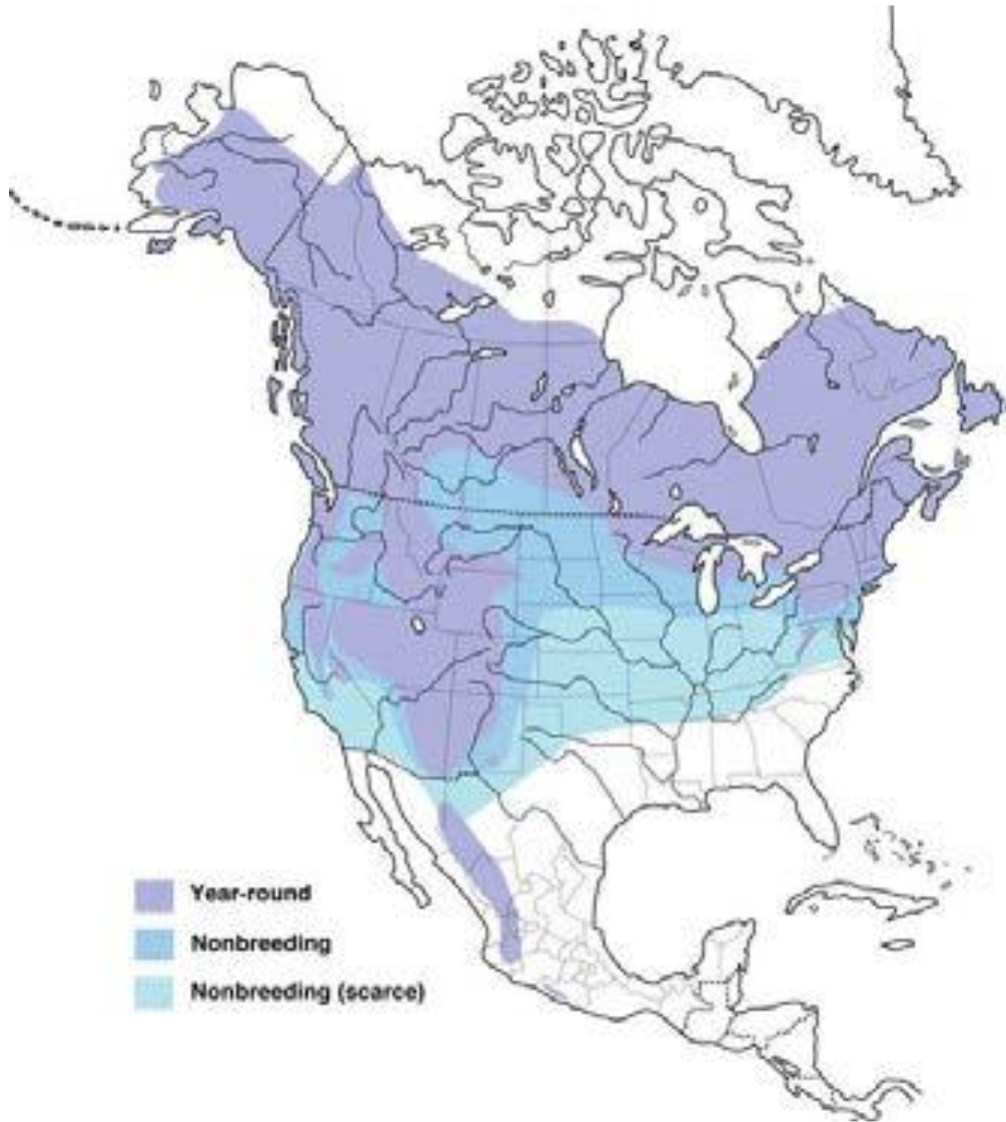
If no, provide explanation and stop assessment.

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**, Northern goshawk range map of North America



Wyoming Game and Fish Department. 2017. State Wildlife Action Plan. Northern goshawk (*Accipiter gentilis*).

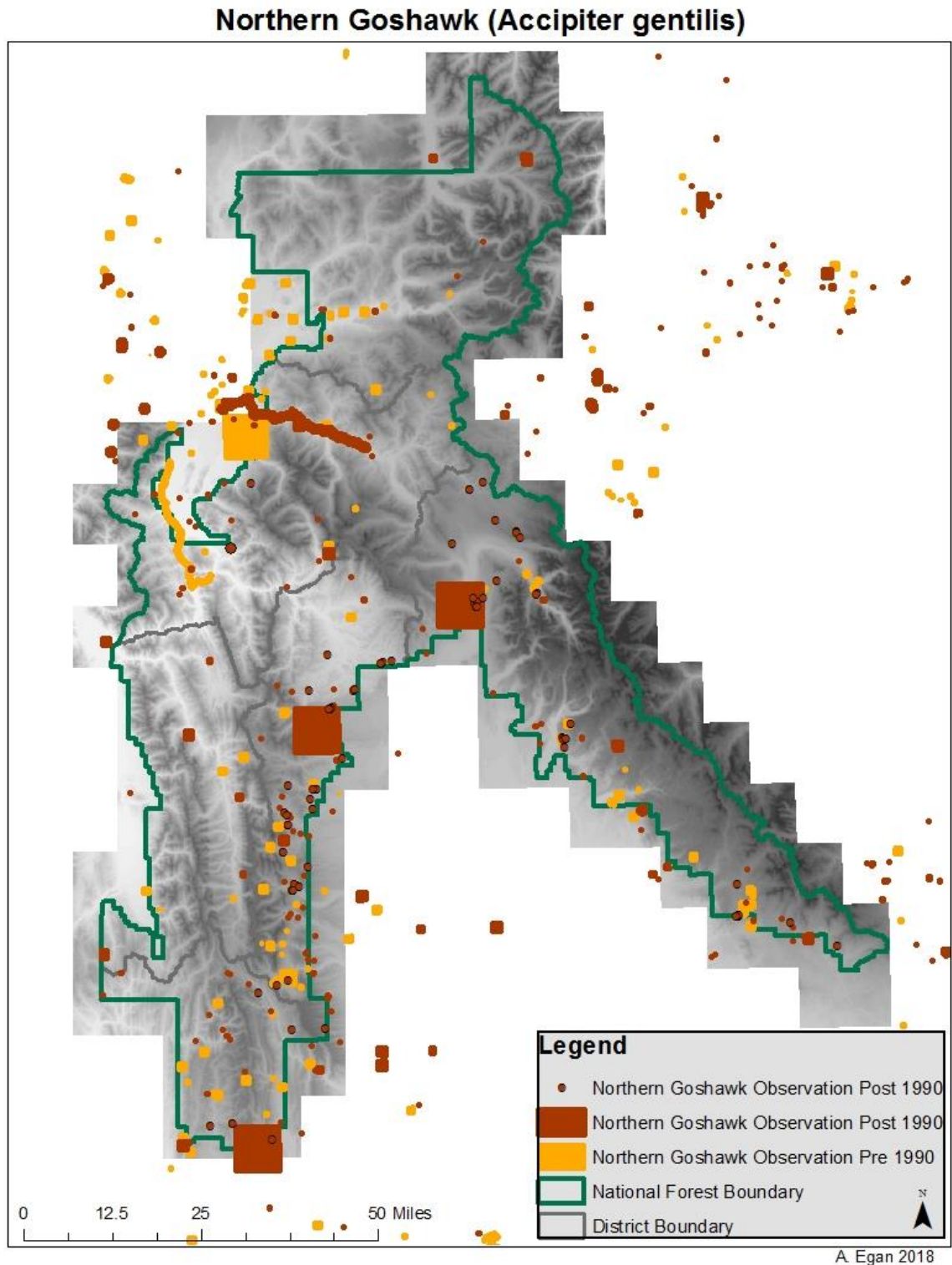
- e. **Map 2**, Range and predicted distribution of *Accipiter gentilis* in Wyoming.



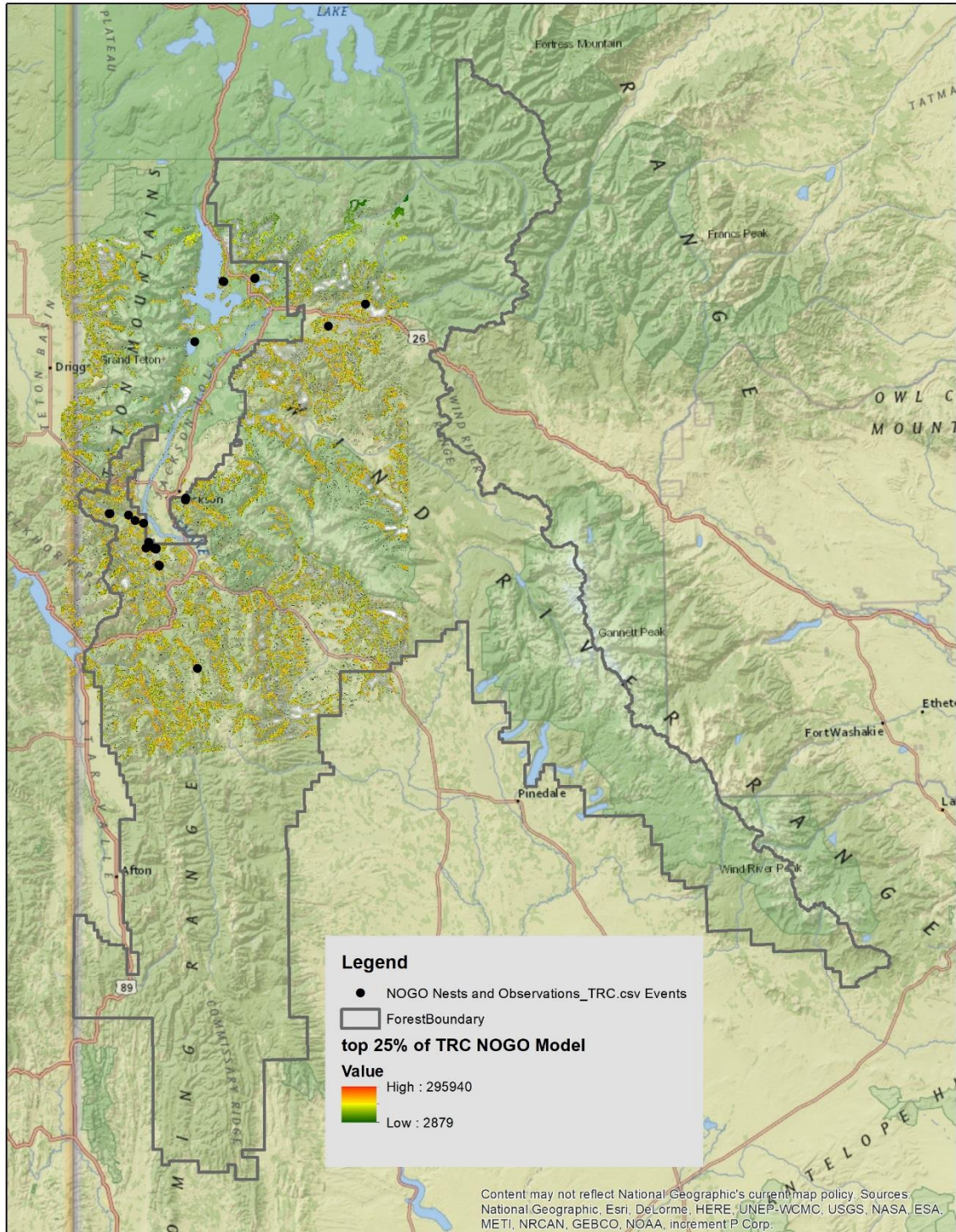
SOURCE: Digital maps of ranges for Wyoming Species of Greatest Conservation Need: Sept. 2016. Wyoming Game and Fish Department and Wyoming Natural Diversity Database, University of Wyoming, Laramie, Wyoming.
Note that brown indicates the predicted distribution of the species;
heavy black lines indicate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

Wyoming Game and Fish Department. 2017. State Wildlife Action Plan. Northern goshawk (*Accipiter gentilis*).

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



g. **Map 4**, Map of additional Northern goshawk nests & occurrences from 2013-2016, and modeled habitat on the Bridger-Teton National Forest (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	<p>G5— Secure</p> <p><i>Common; widespread and abundant.</i></p>
NatureServe State Status	<p>S2S3B/S3N— Imperiled/Vulnerable</p> <p><i>Breeding - 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.</i></p> <p><i>Non-Breeding - vulnerable due to a restricted range, relatively few populations (often 80 or fewer), recent and widespread declines, or other factors making it vulnerable to extirpation.</i></p>
WGFD	<p>NSSU (U), Tier I</p> <p><i><u>Population Status:</u> Unknown — necessary information is lacking; NSS Unknown (NSSU) category is used until additional information is obtained.</i></p> <p><i><u>Limiting Factors:</u> Unknown – necessary information is lacking; NSS Unknown (NSSU) category is used until additional information is obtained.</i></p> <p><i><u>Tier I:</u> High priority</i></p> <p><i>[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.]</i></p> <p><i>(WGFD - Wyoming Species of Greatest Conservation Need)</i></p>
WYNDD	<p>Species of Concern</p> <p><i>Species vulnerable to extirpation at the global or state level due to:</i></p>

	<p><i>a. their rarity (e.g., restricted distribution, small population size, low population density)</i></p> <p><i>b. inherent vulnerability (e.g., specialized habitat requirements, restrictive life history)</i></p> <p><i>c. threats (e.g., significant loss of habitat, sensitivity to disturbances)</i></p> <p>(Wyoming Natural Diversity Database - Species of Concern)</p>
USDA Forest Service	<p>Region 4: Sensitive Species</p> <p><i>Those plant and animal species identified by a Regional Forester for which population viability is a concern, as evidenced by</i></p> <p><i>a. Significant current or predicted downward trends in population numbers or density.</i></p> <p><i>b. Significant current or predicted downward trends in habitat capability that would reduce a species' existing distribution.</i></p> <p>(FSM 2670.5 – Threatened, Endangered & Sensitive Species)</p>
UDI FWS	No Special Status; Listing Not Warranted
WY BLM	<p>Sensitive</p> <p><i>1. Sensitive species must be native species found on BLM-administrated lands for which BLM has the capability to significantly affect the conservation status of the species through management, and either:</i></p> <p><i>a. There is information that a species has recently undergone, is undergoing, or is predicted to undergo a downward trend such that the viability of the species or a distinct population segment of the species is at risk across all or a significant portion of the species range, or</i></p> <p><i>b. The species depends on ecological refugia or specialized or unique habitats on BLM-administrated lands, and there is evidence that such areas are threatened with alteration such that the continued viability of the species in that area would be at risk.</i></p> <p><i>2. All federally designated candidate species, proposed species, and delisted species in the 5 years following their delisting shall be conserved as Bureau sensitive species</i></p> <p>(BLM Wyoming Sensitive Species Policy and List; March 31, 2010)</p>
IUCN	<p>LC – Least Concern</p> <p><i>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.</i></p> <p>(IUCN – Red List Categories and Criteria)</p>
Partners in Flight (PIF) Continental Concern Score	NA

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

Species (Scientific and Common Name): <i>Accipiter gentilis</i> [Northern goshawk]		
Criteria	Rationale	Literature Citations
Distribution on Bridger-Teton National Forest	In Wyoming, the Northern goshawk is both a year-round resident and a short-distance winter migrant (Map 1). The Northern goshawk has been found throughout the state of Wyoming, including the Bridger-Teton National Forest. The distribution and habitat for the Northern goshawk covers much of the BTNF (Map 2), and consists typically of Lodgepole pine, Douglas–Fir, and Aspen. Based on documented occurrence records, the species is fairly well distributed throughout suitable habitat on the BTNF and occurs on all 6 Ranger Districts (Maps 3 & 4). Distribution appears to be higher on the southern portion of the forest, particularly on the Kemmerer Ranger District and along the foothills of the Wind River Mountains and Wyoming Range, where a larger portion of suitable habitat is present.	
Abundance on the Bridger-Teton National Forest	<p>Strong estimates of abundance are not available for Northern goshawk in Wyoming, including the Bridger-Teton National Forest. Across the western United States, densities of nesting individuals are relatively low, ranging from 3.6 to 10.7 pairs per 100 km² (WGFD 2017) . It is assumed that densities of nesting individuals in suitable habitat are roughly similar in Wyoming (WGFD 2017).</p> <p>According to the WGFD (2017), the Northern goshawk is considered uncommon within the state of Wyoming. The North American Breeding Bird Survey (BBS) relative abundance for Northern goshawk is .02 for the state of Wyoming and for the Northern Rockies (Sauer et al. 2017). Thus, the species represents 2% of the proportion of species populations within the state of Wyoming, suggesting a relatively low abundance for the state and likely the BTNF.</p>	<p>Sauer, J. R., D. K. Niven, J. E. Hines, D. J. Ziolkowski, Jr, K. L. Pardieck, J. E. Fallon, and W. A. Link. 2017. The North American Breeding Bird Survey, Results and Analysis 1966 - 2015. Version 2.07.2017 USGS Patuxent Wildlife Research Center, Laurel, MD</p> <p>Wyoming Game and Fish Department. 2017. State Wildlife Action Plan. Northern goshawk (<i>Accipiter gentilis</i>).</p>
Population Trend on the Bridger-Teton National Forest	Population trends are difficult to determine for the Northern goshawk and while no hard evidence of a significant decline in recent decades is apparent, the species is likely declining in some areas primarily as a result of habitat	Kennedy, P. L. 1997. The northern goshawk (<i>Accipiter gentilis atricapillus</i>): is there evidence of a population decline?

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	<p>alteration – particularly due to logging (Nature Serve 2018). While population trend data is lacking for the BTNF, the species is believed to be in moderate decline throughout the state of Wyoming and relatively common in the main part of its range. North American Breeding Bird Survey data indicates a non-significant, long-term (1966–2015) decrease of 0.45% per year and short-term (2005–2015) increase of 4.85% per year in populations across Wyoming (Sauer et al. 2017). Corresponding data for the Northern Rockies show a non-significant decrease of 1.07% and increase of 1.44% per year, respectively. Conversely, IMBCR data shows that American Goshawk are estimated to have declined by 12% in the intermountain region from 2017-2024. On the BTNF , American Goshawk are estimated to have decline by approximately 2% from 2010-2024 (Shivik 2025).</p> <p>Site occupancy and breeding success of the Northern goshawk across the species’ range have declined. Recent monitoring efforts on the Medicine Bow-Routt National Forest in Wyoming have shown a decline in goshawk territory occupancy. On the Targhee National Forest in northeastern Idaho, a forest neighboring the Bridger-Teton, occupancy rates of Northern goshawk territories declined from 64% to 31%, and nest success declined from 56% to 19% from 1990–1994 and 1998–2002, respectively (WGFD 2017). Occupancy estimation based on the United States Forest Service (USFS) regional monitoring protocols was calculated for two study areas in Wyoming but low sample numbers hindered interpretation of results (WGFD 2017).</p> <p>In the west, clearcut logging of old-growth forests, fire suppression, and catastrophic fire are postulated to be reducing habitat and thus populations (Nature Serve 2018). However, as mentioned above, conclusive data supporting the purported decline in the western U.S. are lacking (Kennedy 1997).</p>	<p>Journal of Raptor Research 31:95-106.</p> <p>Nature Serve. Accessed February 2018. Northern Goshawk (<i>Accipiter gentilis</i>).</p> <p>Sauer, J. R., D. K. Niven, J. E. Hines, D. J. Ziolkowski, Jr, K. L. Pardieck, J. E. Fallon, and W. A. Link. 2017. The North American Breeding Bird Survey, Results and Analysis 1966 - 2015. Version 2.07.2017 USGS Patuxent Wildlife Research Center, Laurel, MD.</p> <p>Shivik, J. A. 2025 2025 Intermountain Region Broad-Scale Bird Monitoring Report, draft. 76 pp.</p> <p>Wyoming Game and Fish Department. 2017. State Wildlife Action Plan. Northern goshawk (<i>Accipiter gentilis</i>).</p>
Habitat Trend on the Bridger-Teton National Forest	On the BTNF, Northern goshawks typically nest in mature or old-growth forests dominated by Lodgepole pine, Douglas-fir, or Quaking aspen. On the Targhee National Forest, adjacent to the BTNF, all goshawk nests were found in the	Clough, L. T. 2000. Nesting habitat selection and productivity of northern goshawks in west-central Montana. Missoula, MT: University of Montana. 87

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	<p>montane zone, dominated by pure douglas-fir and lodgepole pine or in mixed conifer forests with Engelmann spruce, subalpine fir, whitebark pine or limber pine. A few nests were found in aspen stands along the lower elevation edges of the montane zone, or mixed within predominantly conifer forests at higher elevations (Patla 1997).</p> <p>Overall, the goshawk is a habitat generalist, but more of a habitat specialist around the nest. Nests are generally constructed in the largest trees of dense, old or mature stands with high canopy closure (>50 percent) and sparse groundcover, near the bottom of moderate slopes, and near water or dry openings (Bull and Hohmann 1994, Daw et al 1998, Daw and DeStefano 2001, Hargis et al. 1994, Reynolds et al 1982, Siders and Kennedy 1994, Squires and Ruggiero 1996, Younk and Bechard 1994 in Nature Serve 2018). This preference seems strongest within approximately 250 acres of the nest stand. Clough (2000) found in a random sample of available vegetation types in west-central Montana, that goshawks selected for nest stands of mature and older forest that were approximately 40 acres in size, surrounded by a mix of younger forest and non-forested openings.</p> <p>The vegetation class that has been identified as providing ideal nesting habitat for the Northern goshawk on the BTNF is “Rocky Mountain Subalpine Dry-Mesic Spruce-Fir Forest and Woodland” and encompasses 37% of the Forest. Under this habitat classification “Lodgepole pine dominates this cold, subalpine system; while inclusions of aspen and mixed-conifer stands may be present where topography and soil conditions allow. Understories may consist of shrubs and/or grasses or be absent of vegetation” (Helmbrecht et. al 2012). Under this classification, preferred goshawk nesting habitat is identified as “Late Development”, where the successional class is defined by “Mature trees, generally greater than 9 inch DBH and 10 meters in height and a canopy cover generally greater than 50 percent” (Helmbrecht et. al 2012). This successional class encompasses half of the vegetation class identified as the most suitable for nesting goshawks. Thus, ~19% of this vegetation type on the BTNF is</p>	<p>p. Thesis.</p> <p>Helmbrecht, D., M. Williamson, and D. Abendroth. 2012. Bridger-Teton National Forest Vegetation Condition Assessment.</p> <p>Nature Serve. Accessed February 2018. Northern Goshawk (<i>Accipiter gentilis</i>).</p> <p>Patla, S. 1997. Nesting ecology and habitat of the northern goshawk in undisturbed and timber harvest areas on the Targhee National Forest, Greater Yellowstone Ecosystem. M.S. Thesis, Idaho State University, Pocatello, ID. 149p.</p>

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	considered suitable nesting habitat. The combination of forest management, tree disease, fire suppression/wildfire, and human disturbance (as described in the "Threats to the Species and its Habitat on the Bridger-Teton National Forest" section below) have likely contributed to a decrease in the amount of available habitat and/or quality of habitat for this species on the BTNF.	
Threats to the Species and its Habitat on the Bridger-Teton National Forest	<p>Threats to Northern goshawks are primarily tied to the alteration of forests and include both anthropogenic and natural disturbances such as timber harvest, forest thinning, fire suppression, wildfire, and pine beetle outbreaks (WGFD 2007a). Management activities that pose a threat to goshawk populations include those that have a negative effect on prey populations, risk of predation, other mortality factors, or degrade or destroy nesting habitat within a home range (Squires and Ruggiero 1996). These risk factors are described in more detail below and are prevalent on the BTNF.</p> <p><u>Forest Management Activities & Wildfire</u></p> <p>The primary influences on the amount, distribution, and suitability of goshawk habitat and subsequently, goshawk populations (Reynolds, 1989, Crocker-Bedford 1990, Squires and Reynolds 1997) are management treatments in forest vegetation (e.g., thinning, timber harvest, prescribed fire) and stand-replacing wildfires (Squires and Ruggiero 1996). These impacts can either enhance or degrade goshawk habitat depending on the type and extent of habitat alterations, especially as they affect the density of large trees and canopy closure (Squires and Kennedy 2006, Squires and Reynolds 1997, Crocker-Bedford 1990, Reynolds 1989). Fire suppression, grazing, and insect and tree pathogen outbreaks also can result in the deterioration or loss of nesting habitat (Graham et al. 1999). Reynolds et al. (2005) concluded after 14 years of data collected on nesting goshawks from the southwestern United States that a number of factors, including; weather, predators, competitors, and disease, significantly compounded the effects from forest management on goshawk reproduction.</p> <p>Timber harvest is the primary threat to breeding Northern goshawk</p>	<p>Agee, J. K., 1998. The landscape ecology of western forest fire regimes. Northwest Sci., 72 (special issue): 24-34.</p> <p>Arno, S. F. 2000. Fire in western forest ecosystems [Chapter 5], in J. K. Brown and J. K. Smith eds., Wildland fire in ecosystems: effects of fire on flora. Ogden, UT, USDA Forest Service, Rocky Mountain Research Station, General Technical Report RMRS-GTR-42-vol. 2, p. 97-120.</p> <p>Beier, P. and J.E. Drennan. 1997. Forest structure and prey abundance in foraging areas of Northern Goshawk. Ecol. Appl., 7 (1997), pp. 564-571.</p> <p>Bloxtton, T. D., Jr. 2002. Prey abundance, space use, demography, and foraging habitat of Northern Goshawks in western Washington. M.S. thesis, Univ. of Washington, Seattle, WA U.S.A.</p> <p>Boal, C.W. and R.W. Mannan. 1994. Northern Goshawk diets in ponderosa pine forests on the Kaibab Plateau. pp. 97-102 In W.M. Block, M.L. Morrison, and M.H. Reiser [eds.]. The Northern Goshawk: ecology and management: proceedings of a symposium of the Cooper Ornithological Society, Sacramento, California, 14-15 April 1993. Studies in Avian Biology No.16.</p>

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	<p>populations (Squires and Reynolds 1997). Harvest methods that create large areas of reduced forest canopy cover (<35–40%) may be especially detrimental and increases the likelihood of goshawks not reoccupying the stand (Bright-Smith and Mannan 1994, Beier and Drennan 1997, Desimone and DeStefano 2005). Reducing canopy cover below a certain threshold in close proximity to occupied nests can increase solar radiation and heat stress, reduce buffering from adverse weather, increase vulnerability to predators, and affect nest success (USDI FWS 1998). Removal or excessive fragmentation of mature forests in habitat suitable for nesting and foraging is a considerable extrinsic threat to goshawks (Keane and Morrison 1994) and forest management that reduces the size of nest stands may decrease occupancy rates (Woodbridge and Detrich 1994). Additionally, timber harvest conducted near nests during the incubation and nestling periods can have immediate impacts on nest success due to abandonment (Boal and Mannan 1994, Squires and Reynolds 1997). Logging activities such as tree cutting, loading, and skidding within 165 to 330 feet of a nest can cause abandonment even with 20-day-old nestlings present (J. Squires, unpubl. data, <i>in</i> Squires and Kennedy 2006).</p> <p>On the Caribou-Targhee National Forest of Wyoming and Idaho, occupancy of known nesting territories was lower in timber harvest areas, which suggests that timber harvest may negatively affect Northern goshawk (WGFD 2017a). Patla (2005) concluded that on adjacent forests to the BTNF, analysis of habitat at three historical territories where goshawks no longer nested supported the idea that a threshold effect may occur when a certain level of habitat loss has been exceeded. Averages of mature forest cover within the Nesting Area, Post Fledgling Area, and Foraging Area at these territories were substantially lower than averages measured at current occupied territories. However, Moser and Garton (2009) concluded that timber harvest outside the breeding season (after August 15th) does not appear to affect northern goshawk breeding area occupancy, nest success, or productivity 2 years after harvest as long as suitable nesting habitat remains within the Post Fledgling Area following timber harvest</p>	<p>Cooper Ornithological Society, Camarillo, CA.</p> <p>Bright-Smith, D. J. and R. W. Mannan. 1994. Habitat use by breeding male northern goshawks in northern Arizona. <i>Studies in Avian Biology</i> 16:58-65.</p> <p>Brown, R. 2000. Thinning, fire and forest restoration: a science-based approach for national forests in the interior Northwest. <i>Defenders of Wildlife</i>, Washington D.C.</p> <p>Clough, L. T. 2000. Nesting habitat selection and productivity of northern goshawks in west-central Montana. Missoula, MT: University of Montana. 87 p. Thesis.</p> <p>Covington, W. W., and M. M. Moore. 1994. Post-settlement changes in natural fire regimes and forest structure: ecological restoration of old-growth ponderosa pine forests. <i>Journal of Sustainable Forestry</i> 2:153–181.</p> <p>Crocker-Bedford, D. C. 1990. Goshawk reproduction and forest management. <i>Wildlife Society Bulletin</i> 18:262-269.</p> <p>Desimone, S. M., and S. DeStefano. 2005. Temporal patterns of Northern Goshawk nest area occupancy and habitat: a retrospective analysis. <i>J. Raptor Res</i> 39:310–323.</p> <p>Erdman, T. C., D. F. Brinker, J. P. Jacobs, J. Wilde, and T. O. Meyer. 1998.</p>

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	<p>Fire suppression has altered the natural fire regime. Fire frequency has decreased and intensity/severity has increased in many forests since the early 20th century. Goshawks and goshawk prey species evolved in forests that were structured by fire, including low severity/high frequency understory fires, high severity/stand-replacing fires, and a mixture of both (Brown 2000, Covington and Moore 1994). Fire suppression continues to change vegetation composition and structure leading to further reductions in goshawk nesting habitat, prey numbers, and foraging opportunities. Transition of older forests dominated by shade-intolerant tree species to a dense structure of shade-tolerant tree species, primarily due to fire exclusion (Wisdom et al. 2000), is an on-going progression of changing forest conditions limiting suitable habitat. This increase in shade-tolerant species has increased the forest's susceptibility to stand-replacing fires, and has adversely affected habitat suitability by 1) obstructing flight corridors used by goshawks to obtain prey, and 2) reducing herbaceous understory that supports prey species (Wisdom et al. 2000). Increased densities of trees above some threshold ultimately may render habitats unsuitable for nesting and foraging goshawks as well as some prey species (Reynolds et al. 1992, USDI FWS 1998, and Squires and Kennedy 2006). Overtime, forests throughout much of the Intermountain West have become overstocked with small diameter trees due to suppression of fire (Agee 1998). Bloxton (2002) suggests this condition has likely reduced the ability of goshawks to hunt in these forests, particularly in younger stands, where less space exists between the overstory canopy and the shade tolerant understory conifers.</p> <p>In the Northern Region, goshawk nesting habitat in low- to mid-elevation Douglas-fir, such as present on the BTNF, on-going fire suppression over the past 80+ years may have caused a shift from frequent, low-intensity understory burns to stand-replacement regimes (Arno 2000, Hessberg and Agee 2003, Hessberg et al. 2005, Schoennagel et al. 2004, Sala et al. 2005). A reduction in goshawk habitat is probable following severe wildfires (McGarth et al. 2003).</p>	<p>Productivity, population trend, and status of northern goshawks, <i>Accipiter gentilis atricapillus</i>, in northeastern Wisconsin. Canadian Field-Naturalist 112:17-27.</p> <p>Graham, R. T., R. L. Rodriguez, K. M. Paulin, R. L. Player, A. P. Heap, and R. Williams. 1999. The northern goshawk in Utah: habitat assessment and management recommendations. General Technical Report RMRS-GTR-22. USDA Forest Service, Rocky Mountain Research Station, Fort Collins, Colorado.</p> <p>Greenwald, D. N., D. C. Crocker-Bedford, L. Broberg, K. F. Suckling, and T. Tibbitts. 2005. A review of northern goshawk habitat selection in the home range and implications for forest management in the western United States. Wildlife Society Bulletin 33; 120-129.</p> <p>Hessburg, P. F., and J. K. Agee. 2003. An environmental narrative of Inland Northwest United States forests, 1800–2000. Forest Ecology and Management 178:23–59.</p> <p>Hessberg, P. F., J. K. Agee, and J. F. Franklin. 2005. Dry Forests and Wildland Fires of the Inland Northwest USA: Contrasting the Landscape Ecology of the Pre-Settlement and Modern Eras. Forest Ecology and Management, 2005.</p> <p>Keane, J. J., and M. L. Morrison. 1994. Northern goshawk ecology: effects of scale and levels of biological organization.</p>

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	<p>Goshawk nest sites in lower-slope stands with high basal area and high stem densities probably are susceptible to fires because of their high fuel loads.</p> <p>Perhaps the largest potential stressor for Northern goshawk in Wyoming is the ongoing Mountain pine beetle outbreak occurring throughout much of the state in forests dominated by Lodgepole pine (WGFD 2017a), including the BTNF. It has been predicted that forests experiencing pine beetle infestations will become less suitable for Northern goshawk over the next 6–20 years as the species may not breed in open canopy forests. However, Northern goshawks on the Ashley National Forest in Utah continued to nest successfully in beetle-killed forests experiencing 80% tree mortality – it is unclear if the species will respond similarly in Wyoming (WGFD 2017a).</p> <p><u>Predation</u></p> <p>The incursion of Great-horned owls is especially significant as they prey on both adult and nestling goshawks (Boal and Mannan 1994, Erdman et al. 1998, Rohner and Doyle 1992). Increased forest fragmentation may favor interspecific competitors and predators of Northern goshawk such as Great-horned owls as well as the Red-tailed hawks (WGFD 2017a). Opening the canopy structure in nesting habitat may increase predation of goshawks, especially their nestlings by Great-horned owls. The creation of more open, fragmented habitat may lead to replacement of nesting goshawks by early successional competition and predation from Red-tailed hawks, Cooper’s hawks, Great-horned owls, Great- gray owls, and Ravens (Crocker-Bedford 1990, Woodbridge and Detrich 1994, Patla 1997 and Erdman et al. 1998). Other known or suspected predators on the BTNF include martens and wolverines.</p> <p><u>Human Disturbance</u></p> <p>The USFWS (USDI FWS 1998) reported that human disturbance generally does not appear to be a significant factor affecting the long-term survival of Northern goshawk populations. McGrath (2003) stated that human disturbance does not appear to be a factor for the goshawk as long as 70% of</p>	<p>Studies in Avian Biology 16:3-11.</p> <p>Lehikoinen, A., Lindén, A., Byholm, P., Ranta, E., Saurola, P., Valkama, J., Kaitala, V., and Lindén, H. 2013. Impact of climate change and prey abundance on nesting success of a top predator, the goshawk. <i>Oecologia</i> 171:283–293.</p> <p>Lucas, P., and R. J. Oakleaf. 1975. Population surveys, species distribution, and key habitats of selected non-game species. Federal Aid Wildlife Restoration Project W-53-R, Study 1. Nevada Department of Fish and Game, Reno, Nevada. 42 p.</p> <p>McGrath, M. T., S. DeStefano, R. A. Riggs, L. L. Irwin, and G. J. Roloff. 2003. Spatially explicit influences on Northern Goshawk nesting habitat in the interior Pacific Northwest. <i>Wildlife Monographs</i> 154:1–63.</p> <p>Moser, B. W., and E. O. Garton. 2009. Short-term effects of timber harvest and weather on goshawk reproduction in northern Idaho. <i>Journal of Raptor Research</i> 43:1-10.</p> <p>Nature Serve. Accessed February 2018. Northern Goshawk (<i>Accipiter gentilis</i>).</p> <p>Patla, S. 1997. Nesting ecology and habitat of the northern goshawk in undisturbed and timber harvest areas on the Targhee National Forest, Greater Yellowstone Ecosystem. M.S. Thesis,</p>

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	<p>the nest area structure is maintained and timber management operations are restricted to avoid activity during the breeding and fledging time periods. However, as addressed in detail above, human disturbance such as timber harvesting near nests can cause failure, especially during incubation (Squires and Reynolds 1997). Additionally, goshawk nest failure has been documented near camping locations (Speiser 1992 <i>in</i> Squires and Kennedy 2006) as well as reduced breeding success and territory occupancy in the vicinity of trails and roads (WGFD 2017a).</p> <p>The impacts from falconry are generally unknown. However, intentional take (shooting or trapping) of Northern goshawk is no longer considered a significant source of mortality (Nature Serve 2018). In 2016, the Wyoming Game and Fish Department issued 41 falconry capture licenses and 2 female Northern goshawks were captured (WGFD 2017b), suggesting a low capture success rate for this species and likely even lower on the BTNF.</p> <p><u>Livestock Grazing</u> In some areas, goshawk nesting habitat may be vulnerable to livestock grazing. Browsing by livestock, elk, deer and moose impacts aspen regeneration and can result in the loss of stands (Lucas and Oakleaf 1975). Grazing can also reduce herbaceous fuels and consequently suppress wildfires that can stimulate aspen regeneration. Livestock grazing can be particularly destructive to aspen stands because they often occur on more level benches in swales and next to streams where livestock tend to concentrate. Grazing pressure may contribute to a loss of habitat complexity and decline of goshawk prey base in aspen stands and riparian communities (Reynolds et al. 1992). Livestock grazing also alters the structure and composition of herbaceous and shrub cover under the forest canopy and in non-forest openings resulting in changes to goshawk prey species' habitat.</p> <p><u>Climate Change</u> Changes in forest structure and composition as a result of climate change may</p>	<p>Idaho State University, Pocatello, ID. 149p.</p> <p>Patla, S. M. 2005. Monitoring results of Northern Goshawk nesting areas in the Greater Yellowstone Ecosystem: is decline in occupancy related to habitat change?. <i>Journal of Raptor Research</i> 39:324-334.</p> <p>Reynolds, R. T. 1989. Accipiters. Pages 92-101 in Pendleton, B.G., ed. Proceedings of the western raptor management symposium and workshop. National Wildlife Federation, Washington, DC.</p> <p>Reynolds, R. T., E. C. Meslow, and H. M. Wight. 1982. Nesting habitat of coexisting Accipiters in Oregon. <i>Journal of Wildlife Management</i> 46:124-138.</p> <p>Reynolds, R. T., J. W. Wiens, S. M. Joy, and S. R. Salafsky. 2005. Sampling considerations for demographic and habitat studies of northern goshawks. <i>Journal of Raptor Research</i> 39:274–285.</p> <p>Reynolds, R. T., R. T. Graham, M. H. Reiser, R. L. Bassett, P. L. Kennedy, D. A. Boyce, G. Goodwin, R. Smith, and E. L. Fisher. 1992. Management recommendations for the Northern Goshawk in the Southwestern United States. General Technical Report RM-217, 90 pp. USDA Forest Service, Rocky Mountain Forest and Range Experiment Station, Fort Collins, CO, USA.</p> <p>Rohner, C. AND F.I. Doyle. 1992. Food-stressed Great Horned Owl kills adult</p>

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	<p>reduce suitable nesting and foraging habitat for the Northern goshawk. However, warmer late-winter and spring temperatures have been found to result in early breeding and ultimately more young (Lehikoinen et al. 2013). This increased breeding success is likely due to easier energy accumulation and goshawks are therefore in better condition, resulting in larger clutch sizes. Additionally, warmer seasonal temperatures associated with climate change advance the arrival of spring migrants, therefore increasing goshawk prey abundance. Increased breeding success associated with warmer temperatures and lower precipitation, suggests that Goshawk mortality is lower with climate changing conditions. Lehikoinen et al (2013) predicts that Northern goshawk populations would potentially improve due to climate change.</p>	<p>Goshawk: exceptional observation or community process? J. Raptor Res. 26:261-263.</p> <p>Sala, A., G. D. Peters, L. R. McIntyre, and M. G. Harrington. 2005. Physiological responses of ponderosa pine in western Montana to thinning, prescribed fire and burning season. Tree Physiol. 25:339-348.</p> <p>Schoennagel, T., T. T. Veblen, and W. H. Romme. 2004. The interaction of fire, fuels and climate across Rocky Mountain Forests. Bioscience 54:661-676.</p> <p>Squires, J. R., and L. F. Ruggiero. 1996. Nest-site preference of northern goshawks in south central Wyoming. Journal of Wildlife Management 60:170-177.</p> <p>Squires, J. R. and P. L. Kennedy. 2006. Northern goshawk ecology: an assessment of current knowledge and information needs for conservation and management. Studies in Avian Biology No. 31: 8-62.</p> <p>Squires, J. R. and R. T. Reynolds. 1997. Northern Goshawk (<i>Accipiter gentilis</i>), 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/298.</p> <p>USDI Fish and Wildlife Service. 1998. Status review of the northern goshawk in</p>

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		<p>the forested west. Portland, Oregon, USA.</p> <p>Wisdom, M. J., R. S. Holthausen, B. C. Wales, C. D. Hargis, V. A. Saab, D. C. Lee, W. J. Hann, T. D. Rich, M. M. Rowland, W. J. Murphy, and M. R. Eames. 2000. Source habitats for terrestrial vertebrates of focus in the interior Columbia basin: broad-scale trends and management implications. USDA Forest Service General Technical Report PNW,-GTR-485, Portland, Oregon, USA.</p> <p>Woodbridge, B., and P. J. Detrich. 1994. Territory occupancy and habitat patch size of northern goshawks in the southern Cascades of California. <i>Studies in Avian Biology</i> 16:83-87.</p> <p>Wyoming Game and Fish Department. 2017a. State Wildlife Action Plan. Northern goshawk (<i>Accipiter gentilis</i>).</p> <p>Wyoming Game and Fish Department Nongame Program. Statewide Wildlife and Habitat Management Section Wildlife Division. 2017b. Threatened, Endangered, and Nongame Bird And Mammal Investigations. Annual Completion Report.</p>
<p>Summary and recommendations:</p> <p>The Bridger-Teton National Forest overlaps with a large portion of the Northern goshawk distribution and habitat range in Wyoming. The species is found throughout the BTNF (Map 3), and while there are gaps in some areas of the Forest where occupancy is unknown, suitable habitat for the species is present to some degree forest-wide. Although the population trend on the forest is unknown, a short-term (2005–2015) increase of 4.85% per year in populations across Wyoming was documented (Sauer et al. 2017). However,</p>		<p>Date: February 15, 2018</p>

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	<p>American Goshawk on the BTNF have been estimated to have declined by approximately 2% from 2010-2024 (Shivik 2025).</p> <p>.</p> <p>This species is vulnerable to forest management practices that modify forest structure and decrease canopy cover. The risk factors described in detail above are an important component to the viability of this species and its persistence on the BTNF over the long-term. Habitat quality and quantity are suspected to be stable to decreasing due to fire suppression and logging. The projected logging program on the BTNF is not expected to contribute substantially to additional loss or degradation of habitat. Impacts of weather and prey availability on survival are probably not outside the normal range of variation, but reduced prey abundance could be an issue in the future resulting from changes in climate. However, impacts of changing climate are long-term projections and some goshawk and prey habitat are not affected by altered fire regimes. Additionally, there is uncertainty over the magnitude of changes in climate impacts and ecosystem responses.</p> <p>For the reasons listed above, particularly distribution and abundance across the forest, stable or only moderate declines in habitat quality, available habitat on the Forest (both currently and likely in the future), and low logging levels on the Forest, along with a life history that suggests goshawk populations have intermediate abilities to recover from disturbances, there is not evidence to indicate substantial concern for the capability of the northern goshawk to persist over the long-term. Thus, this species is not recommended as a species of conservation concern for the Bridger-Teton National Forest.</p> <p>Evaluator(s): Ashley Egan, Randall Griebel</p>	