



**USDA FOREST SERVICE
BRIDGER-TETON NATIONAL FOREST
JACKSON RANGER DISTRICT**

PROPOSED CACHE – GAME TRAIL PROJECTS

**BIOLOGICAL EVALUATION
AND
MANAGEMENT INDICATOR SPECIES EVALUATION**

Teton County, Wyoming
May 19, 2015

Prepared For:

USDA Forest Service
Bridger-Teton National Forest
Jackson Ranger District

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SIGNATURE PAGE

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1. INTRODUCTION

Within the Jackson Hole region, recreation use is growing rapidly and is evolving. Notably, there is more demand for close-to-home, day use opportunities and more desire for use-specific, high quality trails. There is also increasing demand for quiet activities that provide opportunities for release, reflection, and observing nature while at the same time there is increasing demand for activities that provide opportunities for easily-accessed adventures and social experiences with friends and family. Nowhere in Jackson Hole is this trend more apparent than in the Cache and Game Creek area due to its proximity to town and the community population centers.

Over the past four years, the Forest Service has been working with the public to address proposed trail system changes in the Cache-Game area while also developing a “master plan” to guide trail development throughout the entire Ranger District. Consistent with public input and the trail system master plan, a scoping document identifying five proposed trail projects in the Cache-Game area was released for public comment in August 2014. Although these projects do not address all of the needs associated with growing recreation use in the Greater Snow King Area (GSKA), they would address improvements needed to make the summer trail system work better for all visitors. The purpose of the proposed trail projects is to improve the quality of recreation opportunities close to town, reduce conflicts among different types of use, repair resource damage, and balance growing recreation use with the need to protect important wildlife habitat at the district-wide scale.

2. PROPOSED ACTION

The five proposed trail projects are:

- 1) Skyline Trail – Construct approximately 5.5 miles of shared-use trail to create a highly scenic loop opportunity to help accommodate growing use and concentrate use in Cache Creek drainage.
- 2) Putt-Putt trail extension – Construct approximately 1.5 miles of new trail to help separate bike use from horse/hike use so that the potential conflicts are avoided.
- 3) Nelson Drive trails – Construct or re-construct approximately 1.2 miles of trail to separate hiking and biking use to reduce conflict and provide a short hiking loop near town and close/ rehabilitate nearly 1 mile of non-system trail.
- 4) Josie’s Ridge trail – Reconstruct the lower portion of Josie’s ridge trail to improve sustainability and provide a short hiking loop near town.
- 5) Game Creek road – Change the season of motor vehicle use for a portion of the Game Creek road to allow vehicle use only between September 1st – October 30th annually to help protect the road surface and reduce conflict among different types of use.

The Jackson District Ranger decided not to implement project #2 – Putt-Putt trail extension, based on initial analysis. Consequently, the Putt-Putt Trail will not be analyzed further in this report.

Project #4 – Josie’s Ridge trail – involves reconstruction of an existing system trail. No new ground disturbance would occur beyond efforts to close and rehabilitate non-system trails in the area. **Josie’s Ridge trail would have no impact on threatened, endangered, sensitive, Management Indicator Species (MIS), or migratory bird species; and will not be further analyzed in this document.** Construction-related physical disturbance would be of very limited scope (within the existing trail alignment) and duration. Habitat conditions would not be changed from the existing baseline as a result of the reconstruction. The effects of the work would be non-existent or so insignificant as to not be measurable.

Project #5 – Game Creek road - involves no ground disturbance, only a change in the season of motor vehicle use. Since motor vehicle use rarely occurs during the July 1 - September 1 time period, the road would now be closed. There would be no physical change or disturbance to wildlife habitat that exists in the current baseline. The elimination of motor vehicle use would increase the effectiveness of wildlife habitat within the zone of influence of Game Creek Road. **This project would have no impact or beneficial impact on wildlife, and will consequently not be analyzed further in this document.**

Project #3 – Nelson Drive trails - involves some new trail construction to re-design the existing network of system and non-system trails to separate bike use from horse/hike use. The project also includes the closure and rehabilitation of many user-created and abandoned system trails. The project is within an area where there is already considerable human activity due to the network of existing trails and very close (< .25 miles) of an existing housing development. The project is not expected to change the existing level of disturbance or human activity in the area.

Project #1 – Skyline trail – involves 5.5 miles of new trail construction in an area that currently has no system trail. The trail would connect Ferrin’s saddle with the Game Creek trail. The trail would generally follow the ridge with preference given to placing the trail on the north-facing aspect to avoid ungulate foraging areas. The final layout would be done in coordination with biologists including personnel from the Wyoming Game and Fish Department. The finished product would be approximately 18 inch wide native surface trail designed and built to accommodate shared non-motorized use with attention to ensuring sustainability and good line of sight. Trail design elements, such as pinch points, would be used to encourage trail users to take the time to absorb the beauty and scenery afforded by the ridge. The trail would take advantage of key viewpoints and offers a gradient from a moderately developed trail starting at Ferrin’s saddle to a more rustic, primitive trail as one travels towards the Game Creek saddle.

Signage, consistent with what currently exists in the Cache-Game area, would be installed at trail junctions and allow for wildlife specific messages. Construction would be done in a way that minimizes overnight human activity, avoids cutting of trees, and ensures crew safety. Less than 20 trees of < 10 inches are expected to be removed. Construction may include use of a small trail machine in the more difficult terrain as well as hand-tools. Construction would be completed using a combination of paid staff, service corps, and volunteers with supervision and oversight provided by the Forest Service. All existing user-created trails and any future user-created trails would be closed and rehabilitated to prevent use. Implementation of this project would include the following two key provisions:

- a) Lift-served bike access from the summit of Snow King would not be permitted. The current accepted 2014 Snow King Master Development Plan would be amended to reflect this decision.

- b) A seasonal restriction would be placed on the trail prohibiting human use from May 1st through June 30th to reduce human disturbance during the calving season for elk, deer, and other wildlife. This seasonal restriction would also apply to construction crews.

Human activity currently does occur on the ridge in the form of occasional hike, horse and XC ski use and there is some development of user-created trails near Ferrin’s saddle. There is also evidence of fire suppression activities from the 2012 Horsethief Fire. However, because this project would introduce more human activity into an area that is relatively undisturbed, it has the most potential to affect wildlife. Therefore, the analysis provided in this document focuses on the proposed Skyline trail, as well as on the Nelson Drive Trails.

Best Management Practices established by the Forest Service for trail construction, re-construction and rehabilitation would be followed for all projects (see section 2.4).

2.1 PURPOSE AND NEED

The purpose of the proposed trail projects is to respond to growing recreational use by re-designing the Cache-Game trail system to work better for all non-motorized uses in a manner that concentrated use in areas near town where use can be better managed, so that backcountry areas can be managed with less human disturbance. Specific purposes include:

- Reduce congestion and conflict between hikers and bikers by separating use where necessary immediately adjacent to town.
- Improve loop opportunities for quality recreation experiences promoting shared trail use to the extent possible.
- Improve resource conditions by reducing the presence and development of unmaintained, non-system trails and increasing the sustainability of system trails.
- Provide additional opportunities to enhance the connection between the community and the National Forest through involvement in trail stewardship, restoration, and monitoring projects.

2.2 ANALYSIS AREA

The analysis area for this project varies, depending on the species under evaluation. In the case of many sensitive wildlife species, the analysis area includes the disturbance footprint and the broader “zone of influence” associated with construction and use of the project. The zone of influence varies dependent on individual species’ response to disturbance.

2.3 CATEGORICAL EXCLUSION

Due to the minimal amount of disturbance associated with the construction of the Skyline trail and re-design of the Nelson area trails, the Forest Service is considering categorically excluding this project from analysis in an environmental assessment (EA) or environmental impact statement (EIS). For a proposed action to be categorically excluded from further analysis in an EA or EIS, it must fit one of the categories contained in Forest Service Handbook 1909.15, Chapter 30, and there can be no extraordinary circumstances related to the specific proposed action that would warrant further analysis. The proposed Cache-Game Trail Project falls under category 31.2(1), “Construction and reconstruction of trails,” 36 CFR 220.6(e)(1).

2.4 SITE SPECIFIC PROJECT DESIGN CRITERIA INCORPORATED INTO THE PROPOSED ACTION

Table 1. MANAGEMENT REQUIREMENTS AND BEST MANAGEMENT PRACTICES INCLUDED IN THIS DECISION
Geology and Soils
Soil-disturbing activities such as trail construction will be avoided during periods of heavy rain or very wet soils.
Cultural
If undocumented historic and/or prehistoric properties are located during planning or construction, they will be treated as specified in 36 CFR 800.11 concerning Properties Discovered During Implementation of an Undertaking.
Vegetation
Disturbed areas will be re-vegetated with native plants. Rehabilitation of user-created and abandoned sections of trail will follow guidelines in the 2014 Forest Service Restoration Technical Guide and will be designed to prevent continued trail use and encourage native plant re-growth.
Trail machinery will be cleaned prior to entry onto NFS lands.
Any new weed infestations will be monitored and treated for a minimum of three years after project completion.
Watershed
Layout will achieve sustainable trail grades using clinometers and will incorporate features for drainage such as grade reversals and out-sloping to minimize erosion potential.
All wetlands will be avoided during trail construction.
Wildlife
Great gray owl and boreal owl – To prevent direct impacts to this species, surveys shall be conducted in suitable habitat prior to project activities. If owls are detected, the forest biologist shall determine appropriate mitigation measures.
Trail construction and maintenance will incorporate design elements to reduce bike speed and also provide good line-of-sight to avoid potential collisions with black bears and cougars.
Educational signage, field patrols, and electronic media will emphasize behaviors to reduce adverse encounters with bears, cougars, moose or other animals. For example, messaging will reinforce staying alert, not wearing earbuds, carrying bear spray, knowing how to appropriately respond to an encounter, controlling dogs.
Visual Resources
Adhere to the Visual Quality Objectives (VQOs) as defined for the area in the Bridger-Teton National Forest Land Management Plan. Trails will be constructed to visually blend into the natural environment.

3. VEGETATION/AFFECTED ENVIRONMENT

When identifying wildlife habitats, biologists generally consider both the type of vegetation and landscape a species uses, as well as particular attributes of the vegetation, such as structural stage. For

instance, there are many different wildlife species that occur in forests. Of these, some require older forests, while others require young forests. So it is important when thinking about habitats to consider both the type of vegetation community and the successional stage of forests (e.g., young or mature), if present. Other attributes often important to wildlife are the presence of snags or down wood in forests, the density of shrubs in sagebrush steppe, or whether water can be found nearby.

Habitats are important for predicting where wildlife can be found and for developing strategies for their conservation and management. To assist with the evaluation of the impacts the 4 trail projects may have on species considered in this report, the BTNF GIS Vegetation mapping was utilized to define the major vegetation cover types present along the alignments of the trails. These are presented in the list below, for each project area:

- 1) Skyline Trail – Primarily young Douglas fir, with some sites dominated by lodgepole pine, aspen, mountain big sagebrush, and grass-forbland.
- 2) Nelson Drive trails – A relatively evenly distributed mix of grass-forbland, mountain big sagebrush, and aspen.
- 3) Josie’s Ridge trail – Douglas fir mix and mountain big sagebrush
- 4) Game Creek road – Douglas fir, mountain big sagebrush, lodgepole pine, and aspen.

4. WILDLIFE EVALUATION

This wildlife report provides a summary of the impacts of the proposed project on Forest Service sensitive species, Management Indicator Species, and birds that are listed under the federal Migratory Bird Treaty Act (MBTA). A brief discussion of the regulatory requirements of each category is included below.

4.1 USDA FOREST SERVICE SENSITIVE SPECIES

The Regional Forester has identified a list of sensitive animal species for which population viability is a concern. The Regional Forester’s list, edited for the BTNF, is included in Table 2. For each sensitive species in Table 2, an assessment is presented along with a determination of the impact the project may have on the species or its habitat.

4.2 MANAGEMENT INDICATOR SPECIES

The National Forest Management Act (NFMA) requires the Forest Service to monitor and evaluate whether and how well objectives have been met and how closely Forest Management Plan standards and guidelines have been implemented. The Forest Service monitors the response of Management Indicator Species (MIS) to management activities as a means of complying with NFMA and identifying how the implementation of the Forest Plan has affected long-term population and habitat trends of representative MIS.

4.3 MIGRATORY BIRD TREATY ACT AND PRESIDENTIAL ORDER

On January 10, 2001, President Clinton signed Executive Order 13186 (Federal Register, Vol. 66, No. 11, 2001), which outlines responsibilities of federal agencies to protect migratory birds under the *Migratory Bird Treaty Act*. The Order required development of a Memorandum of Understanding (MOU) between the FS and the USFWS, and in December of 2008 a MOU to Promote the Conservation of Migratory Birds was signed. Pursuant to the Executive Order and the MOU, the USFS shall ensure that environmental analyses of Federal actions required by NEPA evaluate the effects of actions and agency plans on migratory birds, with emphasis on: **1) species of management concern along with their priority habitats; and 2) species of conservation concern.**

On the BTNF, bird species of management concern include the bald eagle, peregrine falcon, yellow-billed cuckoo, flammulated owl, and Brewer's sparrow. Birds of Conservation Concern (BCC) are identified in the MOU and defined as those USFWS listed migratory and non-migratory birds of the United States and its territories that are of conservation concern. The list is published and maintained by the USFWS, Division of Migratory Bird Management (USFWS 2008). The Bridger-Teton National Forest is located within the Northern Rockies Bird Conservation Region (BCR 10). Birds of Conservation Concern on the BTNF listed for BCR 10 include (in addition to the species of management concern addressed above) an additional 4 species that could occur within the proposed project area. Those additional species include the Calliope hummingbird, olive-sided flycatcher, willow flycatcher, and Cassin's finch.

4.4 OTHER SPECIES

Scoping efforts elicited questions about the response of mountain lions and black bears to the proposed trails. These species are addressed in the following two sections.

4.4.1 Mountain Lion

A successful generalist predator, the mountain lion will eat any animal it can catch, from insects to large ungulates. Like all cats, it is an obligate carnivore, feeding exclusively on meat. It's most important prey species are deer and elk; even bull moose are occasionally taken. An investigation in Yellowstone National Park showed that elk, followed by mule deer, were the cougar's primary targets (Murphy 1998). The prey base is shared with the park's gray wolves, with which the cougar competes for resources (Husseman 2002).

Construction of the Nelson Drive Trails would have little impact on mountain lions. Trails are prevalent in the Nelson Drive area currently and lions are seemingly habituated to their existence. Construction of the Skyline Trail would increase human presence in an area not commonly used by humans. While lions will likely habituate to recreationists along the Skyline Trail, there may be an increase in energy expenditures as lions are forced to abandon prey remains in response to human presence along the trail (see below). Such an increase in energetics would not lead to a decline in survival or fecundity because the effect is confined to the vicinity of the trail and because the cats have many alternative hunting sites in their home ranges.

Human activities do not necessarily deter lions from utilizing the immediate vicinity. Lions also occupy areas 250 m from heavily used campgrounds and picnic sites, sometimes placing natal dens in thick conifers nearby (Hompeesch 1999). However, they may also shift their activities to avoid the period when humans are more active. One female whose home range bordered a relatively busy recreational area shifted to the backcountry to give birth. Another female also shifted her home range to reduce human contact when her offspring were very young.

Lions typically select foraging areas to match ungulate movements. While they appear to be capable of habituating to human recreation, they remain sensitive to human disturbance at kill sites. Smith et al (2015) observed strong behavioral responses by female lions to human development. Lions' fidelity to kill sites and overall consumption time of prey declined with increasing housing density by 36 and 42%, respectively. Females responded to this decline in prey consumption time by increasing the number of deer they killed in areas of high housing density by 36% over what they killed in areas with little residential development. In addition, greater carcass availability is likely to alter community dynamics by augmenting food resources for scavengers.

The addition of 5.5 miles of the Skyline Trail to the Forest Service trail system will be likely to increase the rate of human-lion encounters. A mountain biker encountered a lion on the Game Creek trail in 2013; no injury resulted from the encounter. Most lion encounters end with the human and lion parting ways peacefully. However, between 1991 and 2004 there were 50 confirmed lion attacks in North America (AZ Game and Fish- http://www.azgfd.gov/w_c/mtn_lion_attacks.shtml), 10 of which were fatal.

While there are no published statistics available for this specific area, it seems likely that mountain bikers will encounter mountain lions at a greater rate than that of hikers, due to their increased speed and likelihood of surprising a lion on the trail. Overall risk of lion attacks on the Bridger-Teton National Forest will not increase as a result of construction of the Nelson Drive or Skyline trails. However it is likely that any increase in trail mileage brings with it an increased risk of a lion encounter. It is unlikely that any increased reporting of lion encounters would result in management deleterious to lions.

4.4.2 Black Bear

The Cache-Game Trail projects will be implemented in a landscape inhabited by black bears. Impacts of recreating humans on black bears are not well understood. Separating effects of hunting from other forms of recreation is complicated, and it appears that most research on effects of human recreational travel deals mostly with black bear mortality due to increased road access to bear habitats. Black bears, however, appear better able to tolerate human use of roads and trails than are grizzly bears (Olson 1999). The addition of 5.5 miles of the Skyline Trail to the Forest Service trail system will be likely to increase the rate of human/black bear encounters. Most black bear encounters end with the human and bear parting ways peacefully.

Removals of bears due to the increased human presence along the Skyline Trail are unlikely due to the remote location and the low probability of bears becoming a nuisance due to the lack of food attractants (odors) associated with day hiking. Most human-bear conflicts in Yellowstone National Park have involved food-conditioned bears seeking human foods or bears seeking natural foods within developed areas and along roadsides. The Skyline and Nelson Drive trails would see primarily day use. Hikers would store food in their day packs, and the bear attractant associated with cooking would not be prevalent along either trail.

The Cache – Game Trail projects and subsequent public use is unlikely to lead to management removals or relocations associated with food storage issues, since the BTNF food storage order is and will continue to be in effect. Consequently, while it is likely that the increased access provided by the Skyline Trail will lead to bear-human encounters, it is not likely to result in bear removals. The trail would not be expected to decrease survival or fecundity of black bears.

4.5 SUMMARY OF IMPACTS TO FEDERALLY LISTED, SENSITIVE, MIS, AND MIGRATORY BIRD SPECIES

Table 2 provides a list of BTNF Sensitive Species, Management Indicator Species, and MBTA Species. For most of the species in the table, the impact of the project is presented only within the Table itself. The effects of the trail project are mostly due to human disturbance, not to changes in habitat. Less than 20 trees of < 10 inches are expected to be removed. This applies to most of the wildlife species in Table 2 that use forests.

Table 2. IMPACT SUMMARY TABLE BY SPECIES			
SPECIES	STATUS/PRESENCE	Determination ¹	SPECIES/HABITAT ASSESSMENT SUMMARY (for Species Known or Suspected to Occur on the Bridger-Teton NF)
Grizzly bear	Threatened; Possible; Habitat present	Consistent with Forest Plan Direction and the Grizzly Bear Recovery Plan. Consistent with the species' future recovery.	The Cache – Game Trail projects and subsequent public use is unlikely to lead to management removals or relocations associated with food storage issues (Forest storage order in effect and food is typically carried in daypack, not stored overnight), is unlikely to disturb bears (at least based on their current distribution), and would result in no net loss in grizzly bear habitat. Grizzly bear human conflicts will increase if the bears begin to use the Snow King area. Some injuries to humans may occur. Surprise encounters between bears and people are unlikely to trigger bear removal (not the bear's fault and not a nuisance bear).
Gray wolf	Experimental Non-essential; Possible; Habitat present	Consistent with Forest Plan Direction and the Gray Wolf Recover Plan. Consistent with the species' future recovery.	Day-use activities associated with the proposed Cache – Game Trail projects will not occur in areas currently used by wolf packs. There are no den or rendezvous sites known to occur in or adjacent to the project areas (Kerry Murphy, pers. comm. w/ Kelly Colfer). Increased recreational use of the Skyline ridge area will reduce habitat effectiveness from that which currently exists. However, no mortality effects would be associated with reduced habitat effectiveness due to construction or subsequent public use, since food storage regulations will be in effect. Limited vegetation clearing associated with new and reconstructed trails would not carry negative effects on ungulate (prey) habitat. The trail will be located on the north-facing aspects where possible to avoid ungulate foraging areas. Adverse effects on gray wolves, as species classified as experimental, non-essential under the Act, should be addressed in informal, rather than formal, consultation with the Service (M. Jimenez, U.S. Fish and Wildlife Service, pers. comm. With Kerry Murphy, March, 2011).
Canada lynx	Threatened; Possible; Habitat present	Consistent with Forest Plan Direction (Northern Rockies Lynx Management Direction). Consistent with the species' future recovery.	Construction and subsequent recreational use of the Skyline Trail may cause lynx to avoid conifer-dominated segments of the trail alignment during the day. However, the physical characteristics of lynx habitat would not be significantly altered. The proposal is consistent with standards and guidelines provided in the Northern Rockies Lynx Management Direction. Trails are not considered vegetation management. The project is consistent with the goals, standards, and guidelines in the direction.
Canada lynx Critical Habitat	Designated as present	NI	The proposed action will not carry negative effects on the primary constituent elements of critical habitat: boreal forest and associated snowshoe hare habitat, lynx denning habitat, snow depth and character, and matrix (travel) habitat for lynx.

Table 2. IMPACT SUMMARY TABLE BY SPECIES			
SPECIES	STATUS/PRESENCE	Determination ¹	SPECIES/HABITAT ASSESSMENT SUMMARY (for Species Known or Suspected to Occur on the Bridger-Teton NF)
Yellow-billed cuckoo	Threatened; Not present; Habitat not present	NI	<i>The proposed action will have no impact on the yellow-billed cuckoo because there are no individuals present and there is no suitable habitat present in the project area.</i>
Yellow-billed cuckoo Critical Habitat	Proposed	NI	Proposed Critical Habitat is not present in this area.
Sage Grouse	Sensitive & Candidate for Listing under ESA Presence: Not Suspected Habitat: No	NI	Sage grouse are a sagebrush obligate species, dependent on shrub-steppe habitats dominated by big sagebrush. While mountain big sagebrush plant communities are prevalent in the Nelson Drive and Skyline Trail alignments, there are no sage grouse populations present in either area, and no adverse impacts are anticipated. None of the trail projects occur in general or core sage grouse habitats.
Wolverine	Sensitive Presence: Not Suspected Habitat: No	NI	A small number of individuals are known to occur on the BTNF, but are not likely to occur within the influence zone of the projects. Wolverines occupy high elevations with deep, persistent, and reliable spring snow cover. The project area does not provide such habitat. Therefore, no adverse impacts are anticipated.
Bighorn Sheep	Sensitive & Management Indicator Species (MIS) Presence: Possible Habitat: No	MIIIH	<p>The project area is located within mapped bighorn sheep (BHS) spring/summer/fall habitat for the Jackson Herd; there is no mapped BHS crucial range or parturition area located at the Nelson Drive Trails or the Skyline Trail. BHS are occasionally seen along the ridge of Snow King Mountain and on the ski area, most recently during fall 2014 and spring 2015. Thus, the area may serve as a migration corridor. However, WGF has not mapped the area as a migration corridor. Currently, non-system trails provide access to horseback riders and hikers along the proposed route of the Skyline Trail. Courtemanch (2014) cited several authors' findings that BHS and other ungulates exhibit stronger responses (by fleeing) to unpredictable disturbances such as people traveling off-trail, than they do to recreationists on known trails. She further cited additional studies demonstrating that ungulates do not habituate to off-trail recreation and instead become increasingly sensitized.</p> <p>Frequency, predictability, timing, and location of recreational disturbances appear to guide the degree to which wildlife species habituate to disturbance (Knight and Cole 1995). Construction of the Skyline Trail may, in fact, allow BHS that use the Snow King ridge to habituate to hiking and mountain biking in the area, more than they would be expected to habituate to occasional use of non-system trails that currently occurs. Taylor and Knight (2003) calculated a zone of influence along hiking trails in their Utah study</p>

Table 2. IMPACT SUMMARY TABLE BY SPECIES			
SPECIES	STATUS/PRESENCE	Determination ¹	SPECIES/HABITAT ASSESSMENT SUMMARY (for Species Known or Suspected to Occur on the Bridger-Teton NF)
			<p>area of 200 meters. Within species, they did not find that response to disturbance varied depending on hikers or bikers. Also, much of the trail will occur in forested areas where bighorn sheep are unlikely to spend much time (other than for migration) and visual contact with hikers will be limited.</p> <p>Based on the foregoing information, it is likely that the more common disturbances of BHS on the new Skyline Trail, while likely to cause a flight response in sheep within 200 m of the trail, will in the long run allow BHS to habituate to the disturbance and continue to utilize the area at the current level.</p> <p>A seasonal restriction would be placed on the Skyline Trail prohibiting human use (including construction activities) from May 1st through June 30th to reduce human disturbance during the calving season for elk, deer, BHS, and other wildlife.</p>
Fisher	Sensitive Presence: Not Suspected Habitat: No	NI	This species is extremely rare or does not occur on the Forest. Some observation records exist for areas on the Forest adjacent to Grand Teton National Park, but none are known for areas within the influence zone of the proposed project. This species prefers maritime (moist) forest habitats with large trees and down logs, such as would occur in mature and old coniferous forest types. The proposed action would not affect such habitat. Therefore, no adverse impacts are anticipated.
Common Loon	Sensitive Presence: Not Suspected Habitat: No	NI	Common loons prefer high-mountain lakes and may occur on several lakes on the Jackson Ranger District when migrating. The only known nest in the area occurs on a lake in the nearby Buffalo Ranger District. However, no loons occur within the influence zone of the project, and lakes do not occur in the project area. No adverse impacts are anticipated.
Trumpeter Swan	Sensitive Presence: Not Suspected Habitat: No	NI	Trumpeter swans prefer larger lakes and ponds and are known to occur within a few isolated areas on the Forest. Trumpeters have been observed along Flat Creek near Jackson. However, there are no lakes or other waterways in the project area. Therefore, no adverse impacts are anticipated.
Harlequin Duck	Sensitive Presence: Not Suspected Habitat: No	NI	Harlequin ducks occur within a limited number of high mountain streams on the Forest, and are known to nest in a few remote mountain streams in Wyoming. Nesting pairs are known to occur within some isolated mountain streams in the Teton and Bridger Wilderness areas, but none occur within the influence zone of the proposed project. There are no streams in the vicinity of the trail projects. Therefore, no adverse impacts are anticipated.
Bald Eagle	Sensitive and Management Indicator Species (MIS)	NI	Bald eagles have been observed on Snow King Mountain, but the area is used for foraging rather than nesting. Bald eagles occur on the Forest, and nest at traditional sites immediately adjacent to large streams or rivers and some large lakes. Such nesting sites are not known to occur within the influence zone of the

Table 2. IMPACT SUMMARY TABLE BY SPECIES			
SPECIES	STATUS/PRESENCE	Determination ¹	SPECIES/HABITAT ASSESSMENT SUMMARY (for Species Known or Suspected to Occur on the Bridger-Teton NF)
	Presence: Not Suspected Habitat: No		proposed project. Outside the spring and early summer nesting season, bald eagles have been observed within terrestrial habitats in search of carrion. The Skyline trail project would occur in part within higher elevation coniferous forest types, and use of these areas by bald eagles is unlikely. The Nelson Drive trail project will occur in bald eagle foraging habitat. If carrion occurs within non-forested sites in any of the trail projects, eagles would likely avoid foraging on the carcass during the construction period or during human recreational visits. However, abundant additional foraging sites are available across the forest without human recreational disturbances. Therefore, no adverse impacts are anticipated.
Northern Goshawk	Sensitive Presence: Present Habitat: Yes	MIIH	<p>Goshawks are relatively common on the Forest; nesting pairs occupy territories averaging around 7,000 acres in size. Nesting and foraging habitats on the BTNF are known to occur within lodgepole pine, spruce/fir, Douglas fir, and aspen cover types below 8000 to 9000 feet elevation. Goshawks return to the same nest stand each year to lay eggs and fledge their young. Three to four nests may be built within an 80-acre nest stand.</p> <p>The Skyline Trail would be built within goshawk habitat, and nest surveys would be completed prior to construction. A goshawk nest located between Nordic Hagen and Tiny Hagen trails (within 200 feet) has been occupied yearly since at least 2013. During May 2015, the nest was again active near the 2012 and 2013 nest locations. FS trail use monitoring suggests that 2-3 persons per hour pass within 200’ of the nests. The Ferrin’s Trail will provide access to the proposed Skyline Trail.</p> <p>Currently, the Ferrin’s trail is a popular weekday hike. On weekends it is used to access longer excursions (connecting with West Game or Wilson Canyon trails). The Skyline trail may get used multi-directionally since Ferrin’s saddle is about the same elevation as Game Creek saddle but the general use direction will most likely be more from Ferrin’s to Game Creek.</p> <p>The Snow King goshawk nest is located in a lodgepole pine tree, within a lodgepole pine stand with Engelmann spruce and subalpine fir numerically abundant and unevenly distributed in the understory. Mature spruce and aspen are found in the small drainages that dissect the lodgepole stand. Continuous mature forest, primarily mid-age Douglas fir and lodgepole pine occurs between the nest and the Rafferty project area. A residential subdivision, containing dozens of homes, begins approximately 600 feet downhill and north of the nest site.</p> <p>Snow King Mountain Resort is located 2100 feet to the west of the nest and currently supports high levels of human activity during the daylight hours, including hikers, bicyclists, horse-back riders (Snow King concession), maintenance vehicles, maintenance activity (hazard tree and shrub removal), and an Alpine Slide (summer amusement sled track—up to 700 riders per day); all within both the open meadows and</p>

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SPECIES	STATUS/PRESENCE	Determination ¹	SPECIES/HABITAT ASSESSMENT SUMMARY (for Species Known or Suspected to Occur on the Bridger-Teton NF)
			<p>forested areas on the same mountain slope, west of the current goshawk nest. During summer 2013 a water tank was installed near the project area and approximately 2200 feet west of the goshawk nest. In 2014, a water line, electric cable, and communications cable was installed in a trench near the location of the SKMR Rafferty Lift. These projects required extensive use of heavy equipment for excavation and placement of the tank.</p> <p>Based on the location of the nest adjacent to a residential subdivision, heavily used trails, and within 2000’ of a heavily used summer recreation site (Snow King), this pair of goshawks are apparently well habituated to human noise and activity. They nested at their current location, were exposed to significant noise and visual disturbance in their foraging area. Based on the apparent high tolerance of the nesting pair to human disturbance, it is not likely that the increased use of the Tiny Hagen and Nordic Hagen trails that may result from construction of the Skyline Trail would lead to abandonment of the goshawk nest stand, nor is it likely that the project would lead to abandonment of nestlings or fledglings.</p> <p>The USFWS reported that human disturbance generally does not appear to be a significant factor affecting the long-term survival of any North American goshawk population (Squires and Kennedy 2006). Recreation disturbances that have been documented to cause nest failure include camping (2 instances) and shooting. Goshawks in Britain, central Europe, and Japan nest in close proximity to humans in rural landscapes suggesting that some populations are not especially prone to disturbance. As a North American example, 2 pairs of goshawks nesting in a ski resort were able to fledge young successfully where they were subjected to daily disturbance in winter and summer due to skiers, snowmobilers, construction, hikers, and horseback riders.</p> <p>Surveys for additional goshawk nests will be conducted prior to the layout of the Skyline Trail. If a nest is located, the Forest Service biologist will develop site-specific mitigation, depending on the location of the nest. Trail construction activities would be of limited scope and duration.</p> <p>Since there is some uncertainty surrounding the response of nesting goshawks to the extra disturbance associated with the Skyline Trail construction and subsequent use by the public. Because the cumulative effects of past, present, and future activities, in combination with the presently proposed project cannot be predicted with absolute certainty, construction of the Skyline Trail May Impact Individuals or Their Habitat, but Will Not Likely Contribute to a Trend Toward Federal Listing or Loss of Population Viability.</p>
Peregrine Falcon	Sensitive & Management Indicator Species (MIS)	NI	Peregrine falcons prefer large cliffs for nesting, in association with a wide variety of coniferous forest types. Nest sites are selected based on prey abundance in nearby habitats, and are often situated near or overlooking large water bodies or large streams. Peregrine nest sites do not occur within the influence

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SPECIES	STATUS/PRESENCE	Determination ¹	SPECIES/HABITAT ASSESSMENT SUMMARY (for Species Known or Suspected to Occur on the Bridger-Teton NF)
	Presence: Possible Habitat: Yes		zone of the proposed project, and potential nesting habitat in the form of large cliffs does not exist in the vicinity of the project area. A peregrine nest occurs near South Park feed ground, approximately 4 miles distant, but the adult pair has not been observed in the Snow King area. Thus, no adverse effects on peregrine falcon populations or habitats are anticipated. The conifer forest habitat that comprises most of the project area is not ideal foraging habitat for the species.
Flammulated Owl	Sensitive Presence: Not Suspected Habitat: No	NI	This species is strongly associated with mature and old-growth ponderosa pine and Douglas-fir forest with open understories throughout the northern and central Rocky Mountains. Ponderosa pine forests do not occur on the Bridger-Teton, and Douglas fir forests with open understories are very uncommon. The conifer stands where the proposed projects would be implemented are relatively young Douglas fir and mixed conifer stands with abundant understory cover that do not provide suitable habitat for flammulated owl. Thus, no impacts are anticipated.
Great Gray Owl	Sensitive Presence: Suspected Habitat: Yes	MIIH	<p>This species is present on the BTNF, and occupies habitats similar to those described above for Northern goshawks. Nesting and fledging seasons for great grays are also similar to those described for goshawks. Although no great gray nesting territories are known within the influence zone of the proposed project, potential habitat for this species does exist along portions of the Skyline Trail. There is no habitat for these owls along the section of the Nelson Drive trail that is targeted for improvement. Abundant nest habitat exists nearby and in conifer stands across the forest.</p> <p>The survey period for great gray owls is late winter and early spring. Surveys will not be able to be conducted prior to a proposed layout of the trail location, but will occur before construction next year. There are no studies available relative to the effects of human disturbance on great gray owls. However, Delaney et al (1999) studied the flushing frequency, in response to helicopter and chainsaw disturbances, of nesting Mexican spotted owls. Their findings indicate that Mexican spotted owls did not flush from the nest if the disturbance was greater than 105 m from the nest site. Therefore, if a nest is located within 105 meters of the trail alignment, and that portion of trail is not avoided during construction and subsequent recreational use, it is likely that the owl will be continually flushed, however nest abandonment is unlikely if eggs or nestlings are present. Regardless, since their presence is unknown on the alignment, the project may impact great gray owls.</p> <p>If a nest is located within the zone of influence of the proposed project (105 meters), the Forest Service biologist will develop site-specific mitigation, depending on the location of the nest. Trail construction activities would be of limited scope and duration. If an owl nest were located adjacent to the proposed Skyline Trail alignment, disturbance effects during the nesting season would be mitigated by delaying construction activity near the nest until offspring were fledged. Ongoing use of the trail by recreationists could be a source of disturbance to foraging and roosting adults and fledglings, but this effect would be</p>

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			highly localized around the proposed Skyline Trail. Great gray owls have large territories and would have alternative foraging habitat away from the trail.
Boreal Owl	Sensitive Presence: Suspected Habitat: Yes	MIIH	<p>This species prefers mature and old spruce/fir ES/AF forest types with high canopy cover at higher elevations. There are dense spruce-fir pockets in the vicinity of the Skyline Trail alignment that could support boreal owls. The survey period for boreal owls is late winter and early spring. Surveys will not be able to be conducted prior to a proposed layout of the trail location, but will occur before construction next year.</p> <p>Construction activities and subsequent recreational use could disturb nesting adults, if nests occur within the zone of influence of the project. There are no studies available relative to the effects of human disturbance on boreal owls. However, Delaney et al (1999) studied the flushing frequency, in response to helicopter and chainsaw disturbances, of nesting Mexican spotted owls. Their findings indicate that Mexican spotted owls did not flush from the nest if the disturbance was greater than 105 m from the nest site.</p> <p>Therefore, if a nest is located within 105 meters of the trail alignment, and that portion of trail is not avoided during construction and subsequent recreational use, it is likely that the owl will be continually flushed, however nest abandonment is unlikely if eggs or nestlings are present. Regardless, since their presence is unknown on the alignment, the project may impact boreal owls.</p> <p>If a nest is located within the zone of influence of the proposed project (105 meters), the Forest Service biologist shall develop site-specific mitigation, depending on the location of the nest.</p>
Northern 3-Toed Woodpecker	Sensitive Presence: Suspected Habitat: Yes	NI	This species is a habitat indicator for cavity dependent wildlife and is dependent on snags for nesting and feeding. The project would be implemented within suitable woodpecker habitat; however, impacts to possible nest trees and existing coniferous vegetation would be limited since trail construction would avoid clearing trees. Less than 20 trees, all less than 10 inch diameter would be removed. Therefore, there would be a very low chance of direct impacts on individuals. Indirect impacts would be limited to disturbance of suitable foraging habitat by trail construction crews. The proposed projects would not reduce the available nesting and foraging habitat for woodpeckers.
Spotted Bat	Sensitive Presence: Not Suspected	NI	Spotted bats prefer forested habitats in close proximity to cliffs that provide for nesting and roosting sites. They are also known to use a wide variety of habitat types, including sagebrush. In Wyoming, they have been documented up to about 8,300 feet in elevation. The status of the species is not well known on the forest. Potential habitat within close proximity of cliffs does not exist within the influence zone of the

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SPECIES	STATUS/PRESENCE	Determination ¹	SPECIES/HABITAT ASSESSMENT SUMMARY (for Species Known or Suspected to Occur on the Bridger-Teton NF)
	Habitat: No		proposed project. Adverse effects due human disturbances during trail-clearing activities would not be likely since bats forage primarily during night time hours. Thus, no adverse impacts would be anticipated.
Townsend's Big-eared Bat	Sensitive Presence: Not Suspected Habitat: No	NI	This species is most commonly found in forest edge habitats near nesting sites such as caves or mining shafts. Such nesting sites are not known or suspected to occur within the influence zone of the proposal and no adverse impacts are anticipated.
Columbia Spotted Frog	Sensitive Presence: Possible Habitat: Yes	NI	This species can occur within a variety of forested and shrubland habitat types adjacent to riparian habitats that include ponds, wet meadows with high water tables, and/or slow moving streams that provide breeding sites. The proposed projects would not occur within suitable habitat, thus, the project would have no adverse impacts on spotted frogs or their habitat. No effects of sediment transport down slope to Cache Creek are expected. A broad filter strip of undisturbed vegetation between the project areas and the Creek will prevent migration of sediment to Cache Creek. Reclamation of non-forest trails in Nelson Drive area would benefit this and other amphibians by reducing sediment contribution of these trails that currently occurs.
Boreal Toad	Sensitive & Management Indicator Species (MIS) Presence: Possible Habitat: Yes	NI	This species can occur within a variety of forested and shrubland habitat types; riparian habitats that include ponds, wet meadows with high water tables, and/or slow moving streams provide breeding sites. The proposed project would not occur within the immediate influence zone of breeding habitats; however, adult boreal toads can migrate as far as 4 miles from breeding sites. Trail construction and recreational use would be unlikely to affect migrating toads. Reclamation of non-forest trails in Nelson Drive area would benefit this and other amphibians by reducing sediment contribution of these trails that currently occurs.
Elk, Moose, and Mule Deer	Management Indicator Species (MIS) Presence: Present Habitat: Yes	Provides for achieving Wyoming Game and Fish population objectives	Elk, moose, and deer populations exist in the Nelson Drive Trails and Skyline Trail project areas. These species use the Snow King area during all seasons. Elk Winter Range as identified by the Wyoming Game and Fish Department is located on the National Elk Refuge immediately to the north of the Nelson Drive Trails. The Nelson Drive Trails are located in Mule Deer Winter Range. While there are no parturition ranges mapped within the proposed trail project areas, elk are known to calve in the vicinity of the proposed Skyline Trail, and moose and mule deer may calve there as well. An annual seasonal restriction (May 1 st through June 30 th) would be placed on the trail prohibiting human use during parturition to reduce human disturbance during the calving season. This seasonal restriction would also apply to construction crews. Outdoor recreation has the potential to disturb wildlife, resulting in energetic costs, impacts to animals' behavior and fitness, and avoidance of otherwise suitable habitat. An abundance of literature exists on the sensitivity of elk to roads, and to a lesser extent to non-motorized recreation. Specific to non-motorized

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			<p>recreation, the literature suggests that elk, deer, moose, and other ungulates respond to the greater degree to unpredictable encounters with humans, such as off-trail hikers, than they do to predictable encounters on developed, more heavily used trails (Taylor and Knight 2003, Courtemanch 2014, Knight and Cole 1995). Ungulate reactions are similar for hikers and mountain bikers, and slightly less for horseback riders (Wisdom et al 2005). Currently, non-system trails provide access to horseback riders and hikers along the proposed route of the Skyline Trail. Thus, these ungulates already experience some human disturbance.</p> <p>Construction of the Skyline Trail may, in fact, allow elk, moose, and mule deer that use the Snow King ridge to habituate to hiking and mountain biking in the area, more than they would be expected to habituate to occasional use of non-system trails that currently occurs. Taylor and Knight (2003) calculated a zone of influence along hiking trails in their Utah study area of 200 meters. Others (Wisdom et al 2005) have calculated that zone as 500m, but did not specify the location (on or off trail).</p> <p>Based on the foregoing information, it is likely that the more frequent, predictable disturbances of ungulates on the new Skyline Trail, while likely to cause a flight response within 200 m of the trail, will in the long term allow elk to habituate to the disturbance and continue to utilize the area at the current level.</p> <p>The project will not affect the ability of the Wyoming Game and Fish Department to achieve herd objectives and will not affect its economic goals. Therefore, adverse impacts are not anticipated. WYNDD range mapping is included in Appendix A.</p>
Pronghorn	Management Indicator Species (MIS) Presence: Not Suspected Habitat: No	Provides for achieving Wyoming Game and Fish population objectives (No Impact)	Antelope populations do not occur within the project area. The project will not affect the ability of the Wyoming Game and Fish Department to achieve herd objectives and will not affect its economic goals.
American Marten	Management Indicator Species (MIS) Presence: Probable Habitat: Yes	No Impact	According to the Wyoming Natural Diversity Database, martens have been observed just outside the town of Jackson. This species prefers mature and old coniferous forest types; martens are likely to utilize portions of the project areas that occur in conifer stands. The limited disturbance created by trail construction in conifer stands is not significant at the scale of the forest. The project would not be implemented in old-growth conifer for which the pine marten is an indicator.
Brewer’s Sparrow	Management Indicator Species (MIS)	No Impact	Brewer’s sparrows have been observed along the ridge extending to the east from Snow King Mountain Resort (WYNDD database via Jason Wilmot, personal communication). This species is a sage brush eco-

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	Presence: Not Suspected Habitat: No		type obligate and prefers extensive, open sage brush habitats. Trail construction would not alter sagebrush ecosystems at a scale that is significant on the forest. Thus, there would be no adverse effects on Brewer’s sparrow or its habitat.
Whooping Crane	Management Indicator Species (MIS) Presence: Not Suspected Habitat: No	No Impact	This species is not known to occur on the forest; no adverse effects are anticipated.
Boreal Chorus Frog	Management Indicator Species (MIS) Presence: Possible Habitat: Yes	No Impact	This species can occur within a variety of forested and shrubland habitat types; riparian habitats that include ponds, wet meadows with high water tables, and/or slow moving streams provide breeding sites. Individuals have been observed to migrate up to 500 yards from suitable wetland habitat. The project would not impact wetlands. Trail construction in uplands would be unlikely to adversely impact individuals who have migrated into upland areas. Therefore, no impact to boreal chorus frog is anticipated.
Migratory Birds	Protected by the Migratory Bird Treaty Act Presence: Present Habitat: Yes	No Impact	<p>On the BTNF, species of management concern include the bald eagle, peregrine falcon, yellow-billed cuckoo, flammulated owl, and Brewer’s sparrow; effects of the proposed project on these species were addressed above in this table.</p> <p>Birds of Conservation Concern on the BTNF listed for BCR 10 include (in addition to the species of management concern addressed above) an additional 4 species that could occur within the proposed project area. Those additional species include the Calliope hummingbird, olive-sided flycatcher, willow flycatcher, and Cassin’s finch. Tree clearing associated with trail construction would be avoided where possible. Thus, no direct impacts on Birds of Conservation Concern are anticipated.</p> <p>There would be no loss of habitat for willow flycatcher, thus no indirect impact whatsoever on this species.</p> <p>Calliope hummingbirds inhabit open montane forest, mountain meadows, and willow and alder thickets. The project areas include montane forest and mountain meadows. However, trail construction will not alter habitat to a level that is significant at the scale of the forest.</p> <p>Cassin’s finch and olive-sided flycatchers breed and forage in conifer forest. However, trail construction</p>

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			will not alter habitat to a level that is significant at the scale of the forest.

¹ Key to Determinations:

FEDERALLY LISTED THREATENED OR ENDANGERED SPECIES

NE = No Effect

NLAA = May Affect, Not Likely to Adversely Affect

LAA = May Affect, Likely to Adversely Affect

FOREST SERVICE SENSITIVE SPECIES

NI = No Impact

MIH = May Impact Individuals or Their Habitat, but Will Not Likely Contribute to a Trend Toward Federal Listing or Loss of Population Viability

WIFV = Will Impact Individuals or Their Habitat That May Contribute to a Trend Toward Federal Listing or Cause a Loss of Population Viability

5. MITIGATION

5.1 BLACK BEARS AND MOUNTAIN LIONS

Provide education about living in bear and lion country, proper techniques for minimizing bear/lion-human conflicts, the negative effects of habituating bears to human foods, and the importance of keeping bears/lions wild. People living in bear habitat must understand that nuisance bears/lions often will be destroyed when nuisance situations occur.

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APPENDIX A – MAPPING