A Summary of Fish and Wildlife Resources in Teton County, Idaho

Prepared for the Teton County Idaho Board of County Commissioners
by the Upper Snake Region Idaho Department of Fish and Game

Revised: April 2022

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1.0 Introduction

This report was updated at the request of the Teton County Commissioners and additional information can be requested from IDFG at any time. The information contained within the report broadly summarizes key fish and wildlife resources, primarily on lower elevation lands in Teton County, Idaho for the purpose of providing information that can be used by the county to inform county land use and planning. In most instances wildlife use of habitats transcends property boundaries, therefore some of this summary references lands administered by the Caribou-Targhee National Forest (CTNF) and Bureau of Land Management (BLM) in addition to lands that might be subject to the county land use and planning process (Fig. 1). Sustaining important habitats and maintaining connectivity for wildlife movement between public and private lands will be an important factor in perpetuating the fish and wildlife populations into the future. However, this document sometimes considers a wider area of potential effect (areas outside of Teton County) to better document landscape-scale habitat function. Rather than attempt to describe the habitat needs of hundreds of fish and wildlife species, we focus on flagship species because of their economic importance as fished and hunted species, Species of Greatest Conservation Need (SGCN) as designated in the Idaho State Wildlife Action Plan (SWAP; IDFG 2017), and keystone or umbrella species or guilds (group of species that use the same set of resources and often behave in similar ways), whose conservation may benefit many other species that use similar habitats. Several species or species groups discussed here fit in to more than one of these categories. In this document we refer to both Teton County, which includes public and private lands, and Teton Valley which refers to lower elevation, primarily private lands.

1.1 Significance of Teton County, Idaho for Fish and Wildlife

Teton County supports fish and wildlife resources of great importance to the cultural and economic well-being of local residents, and provides habitats of regional and continental significance for several high priority species. Much of this habitat occurs on private lands which is important throughout portions of the annual cycle and provide connectivity to seasonal habitats on public lands. Recent telemetry data collected by IDFG and Grand Teton National Park (GTNP) documents interstate mule deer movements between Teton County and Grand Teton/Yellowstone National Parks (IDFG and GTNP, unpublished data). Also, in 2004 the National Audubon Society and IDFG formally designated Teton Basin as a State Important Bird Area (IBA). "The IBA program is a global effort to identify areas that are most important for maintaining bird populations, and it focuses conservation efforts at protecting these sites" (Audubon Society 2006). The Teton River from the center of Teton Valley to the Teton Canyon, and Bitch Creek on the County's northern boundary support a highly prized sport fishery and comprise one of several important strongholds for Yellowstone cutthroat trout in the upper portions of the Snake River watershed.

In a comprehensive assessment of ecological values throughout the Greater Yellowstone Ecosystem (GYE), the Teton River Basin was ranked as the highest private lands conservation priority among 43 such sites within the entire GYE for its combination of ecological irreplaceability and vulnerability (Noss et al. 2002). This assessment considered 3 primary aspects of biological diversity: 1) rare and sensitive plant and animal species and populations; 2) representation of a full spectrum of vegetative, abiotic, and aquatic habitat features; and 3) support for a select group of large, wide-ranging focal species such as elk. This ranking reflects other work by Hansen (2006) that suggests, in general, lower elevation lands in the GYE have some of the most productive habitats, but also face the most uncertainty related to long-term persistence; particularly on private lands. Also, it

highlights the importance of sustaining fish and wildlife habitats in Teton County in order to maintain the ecological integrity of the GYE.

Among Teton County's most notable ecological features (i.e., landscapes that support the greatest diversity of plants and animals) are its prominent wetlands. The National Wetlands Inventory classifies 26,760 acres of Teton County (9% of total area) as wetlands (U.S. Fish and Wildlife Service 1993). These wetlands include cottonwood forests along streams, expansive areas of wet meadows, emergent marshes, sloughs, shrub/scrub willow thickets, and fens (Fig. 2).

In this document we frequently refer to certain habitats as "ecotones". Ecotones are transitional areas between ecological communities or habitats that can occur at multiple spatial scales and encompass the transitions between two or more natural or human-influenced habitats. For example, an ecotone exists where forest land transitions into mountain shrub or sagebrush steppe; or where the Teton River is bordered by grain fields. Numerous studies have shown that wildlife species richness and abundances tend to peak in ecotone areas, although there are exceptions to this pattern. Some researchers argue that ecotones deserve high conservation priority because ecotones are often small in size (relative to the larger landscape) and rich in wildlife habitat value (Kark 2013).

The main potential impacts to fish and wildlife populations from human development are habitat loss, degradation, and/or fragmentation. Development includes construction associated with residential, commercial, agricultural, energy, infrastructure, and other human activities. In recent years, Fremont and Teton Counties experienced some of the most significant growth within the Idaho. In the 1990's and 2000's, Teton County had one of the highest population growth rates in the Western United States. Its new-home growth was the 6th fastest in the United States. Most of that real estate development occurred in rural areas outside of towns (within the Teton River riparian corridor, and the foothills of the Teton and Big Hole mountain ranges). The U.S. Census Bureau reported that Idaho is the 2nd fastest growing state in the union with a 17.32%population growth since the 2010 Census (https://www.census.gov/library/stories/state-by-state/idaho-population-change-between-census-decade.html).

2.0 Habitat and Open Space

Conserving ecologically valuable open space is a key strategy Teton County leaders and planners should consider to conserve wildlife habitat. Conserving habitat is essential to maintain fish and wildlife populations. Habitat is a combination of food, water, shelter, and space arranged to meet the species needs. Teton County's Natural Resource Overlay provides a good starting point for prioritizing the conservation of open space. Space is an often overlooked aspect of wildlife habitat. Most people generally understand wildlife's requirements for food, water, and shelter, but the concept of space can be abstract and complex. Wildlife need space to forage, reproduce, rest, travel, and hide. In general larger areas of undeveloped habitat better avoid disturbing or displacing many species.

IDFG is available to provide technical assistance to county planners/leaders to identify a proposed project's potential effects on fish, wildlife, and botanical resources, and recommend avoidance and minimization measures to offset adverse project effects. The following are some general guidelines to consider during planning efforts to conserve fish and wildlife habitat:

- In coordination with stakeholders, develop a locally based, long-term open space conservation plan that focuses on conserving key fish and wildlife habitat (e.g., wetlands, riparian, aspen, migration routes, and winter range), with an emphasis on maintaining habitat connectivity across seasonal ranges. For example, incentivize the voluntary maintenance of open spaces on privately owned working lands that support big game migrations

- Consider avoidance, minimization, and compensatory mitigation measures (onsite and/or offsite) as appropriate and feasible to offset adverse development effects on fish and wildlife habitat.

- Align open space conservation with existing fish and wildlife habitat on both public and private lands. For example, open space in foothills habitats abutting public lands, or alongside private lands enrolled in conservation easements can increase the likelihood of maintaining functional wildlife habitat.

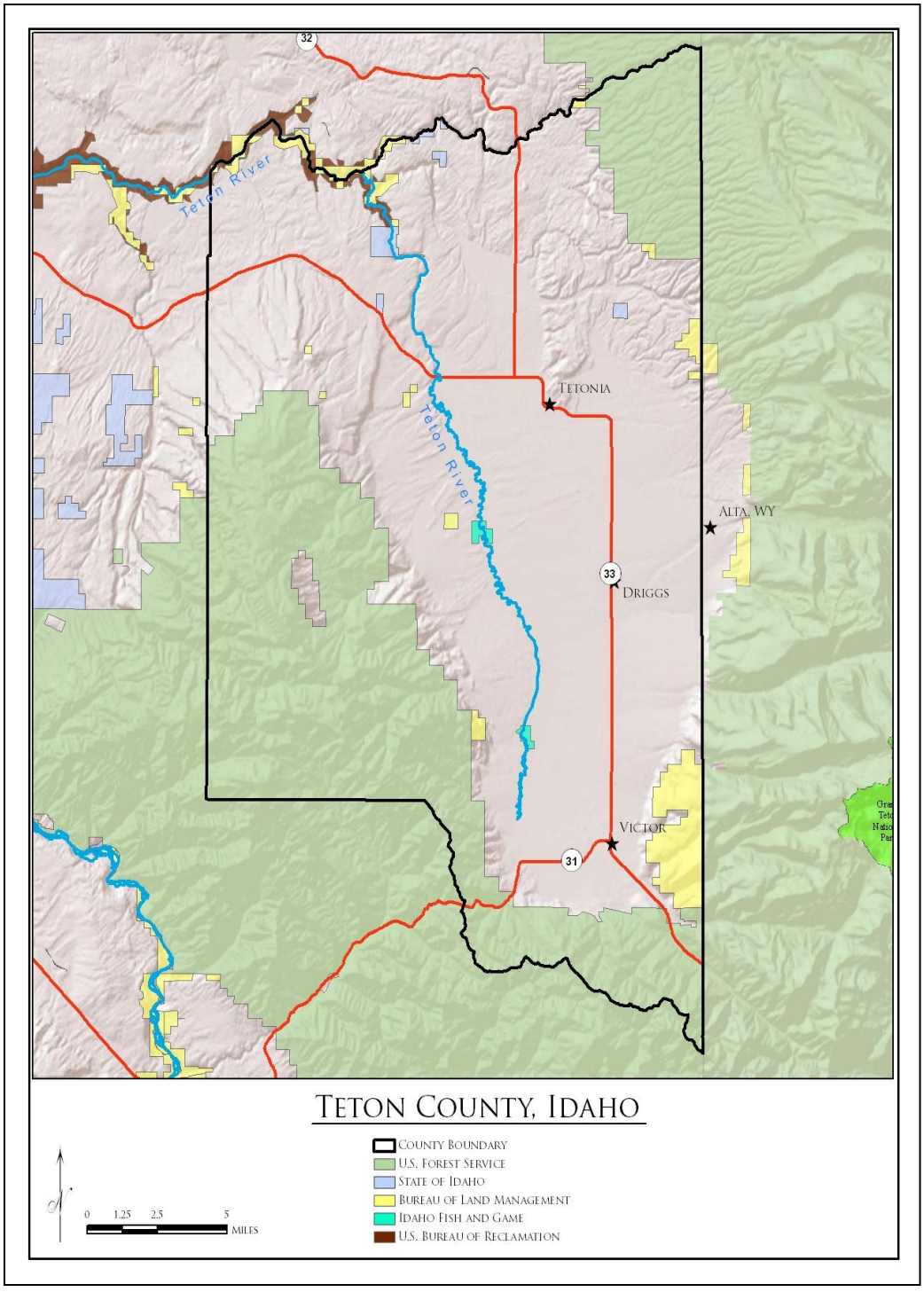

Figure 1. Teton County, Idaho with land ownership.

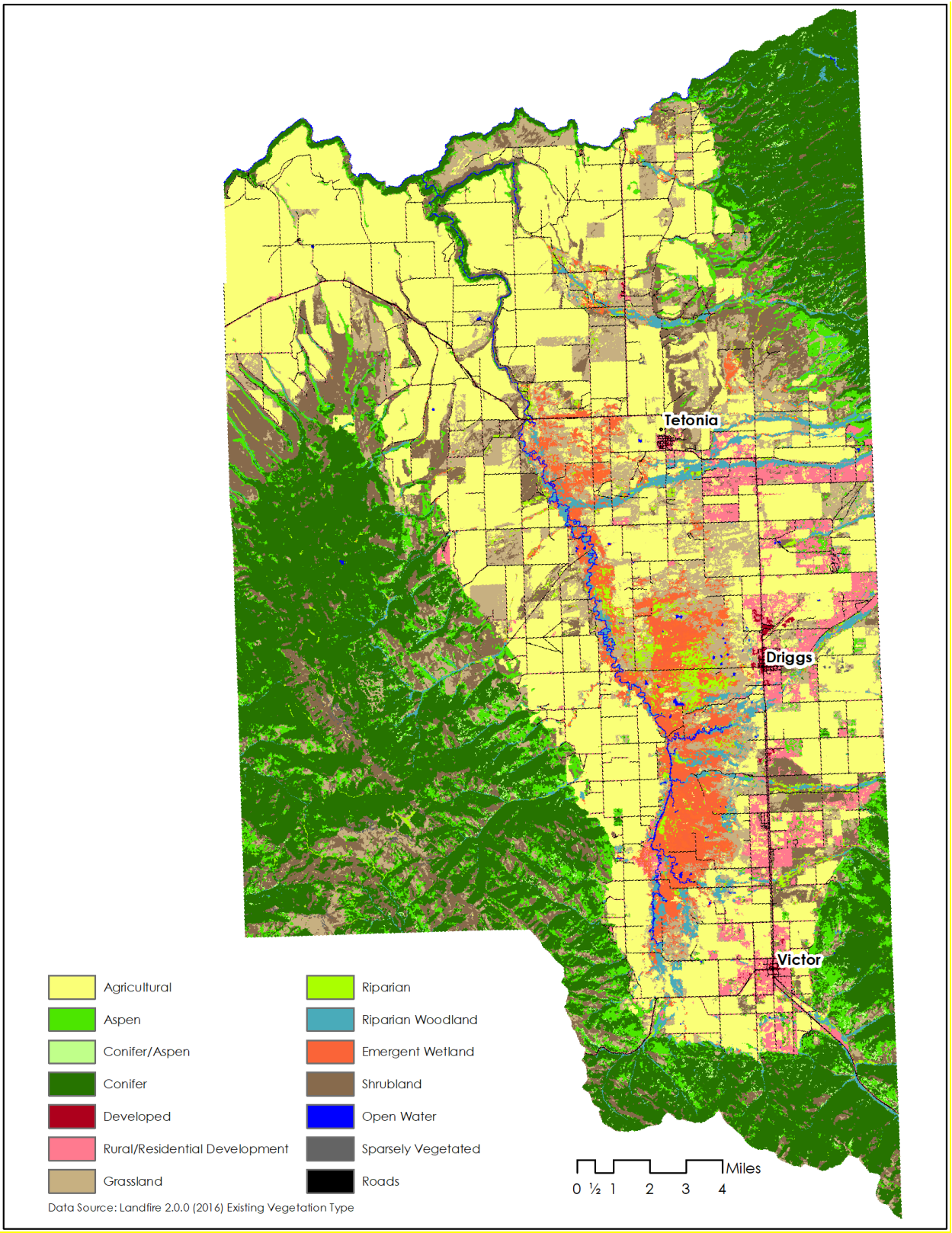

Figure 2. Major plant communities of Teton County, Idaho.

3.0 Large Carnivores and Wolverine

Large carnivores periodically utilize private lands in Teton County but the main body of habitat for these species is higher-elevation public lands on the margins of the county. Large carnivores are considered in this report due to their potential for conflict with homeowners and livestock producers. Also, while not considered a large carnivore, wolverine are covered here due to their conservation status and documented use of Teton County (and valley) habitats. Large carnivore/human interactions are not uncommon in parts of Teton County. In recent years, IDFG staff has moved or killed mountain lions, black bears, and grizzly bears in Teton County because of conflicts with people, property, or due to human safety concerns. The most common conflict in Teton County is black bears foraging/wandering in residential areas that have been established in close proximity to the National Forest boundary.

Grizzly bears are designated as threatened under the Endangered Species Act and are an Idaho Species of Greatest Conservation Need (SGCN). Grizzly bears have been documented in the Big Hole, Teton, and Snake River Ranges around the periphery of Teton County and also within Teton Valley. The Interagency Grizzly Bear Study Team (IGBST) has identified a Demographic Monitoring Area (DMA) to monitor and manage grizzly bear mortalities in the future across state and administrative boundaries and prioritize future conservation efforts. The DMA is drawn from suitable habitat defined by the IGBST (2012), expanded to include adjacent potential mortality sink areas to facilitate mortality management in a scope appropriate to long-term conservation (IGBST 2012). Most of the DMA in Idaho lies within Island Park and adjacent areas of the Henrys Mountains, Centennial Range, Shotgun Valley, and Teton Valley. In Teton County, the DMA covers the Victor Front and the northeastern portion of the County around Bitch Creek and a narrow band of habitat between these 2 areas along the boundary with east-side public lands. The DMA boundary can be accessed and viewed via an interactive mapper created by the U.S. Geologic Survey (USGS) https://www.sciencebase.gov/catalog/item/5911cbd5e4b0e541a03c1b24.

From a conservation planning and management perspective, the most likely areas for human interaction and conflict with large carnivores in Teton County occur near the Caribou-Targhee National Forest Boundary. However, it is worth noting that carnivores may also utilize creek corridors that extend from National Forest Lands onto the valley floor. Grizzly bears are documented utilizing valley creek corridors and other private lands in Teton County, including multiple documented occurrences within Teton and South Leigh Creeks (Fig. 3). Recognizing the potential for human-bear conflicts, Teton County implemented a bear ordinance in 2010 (Teton County Code Title 4 Chapter 7) to minimize the potential for attracting bears into residential areas. Additional useful information and recommendations for avoiding conflicts with grizzlies, black bears, mountain lions, and gray wolves are available through the Grizzly Bear Outreach Project website at http://bearinfo.org/.

Wolverines are an Idaho SGCN (IDFG 2017) and are well documented in both the Teton and Big Hole Ranges within Teton County. The Victor Front area of Teton County is identified as lying within a "major block of wolverine habitat in Idaho" and is also a predicted low-use dispersal area (IDFG 2014*a*). The most likely interaction between county land use planning and sustaining wolverine populations will be through consideration of preserving functional habitat within areas that may facilitate movement of wolverines at the landscape scale.

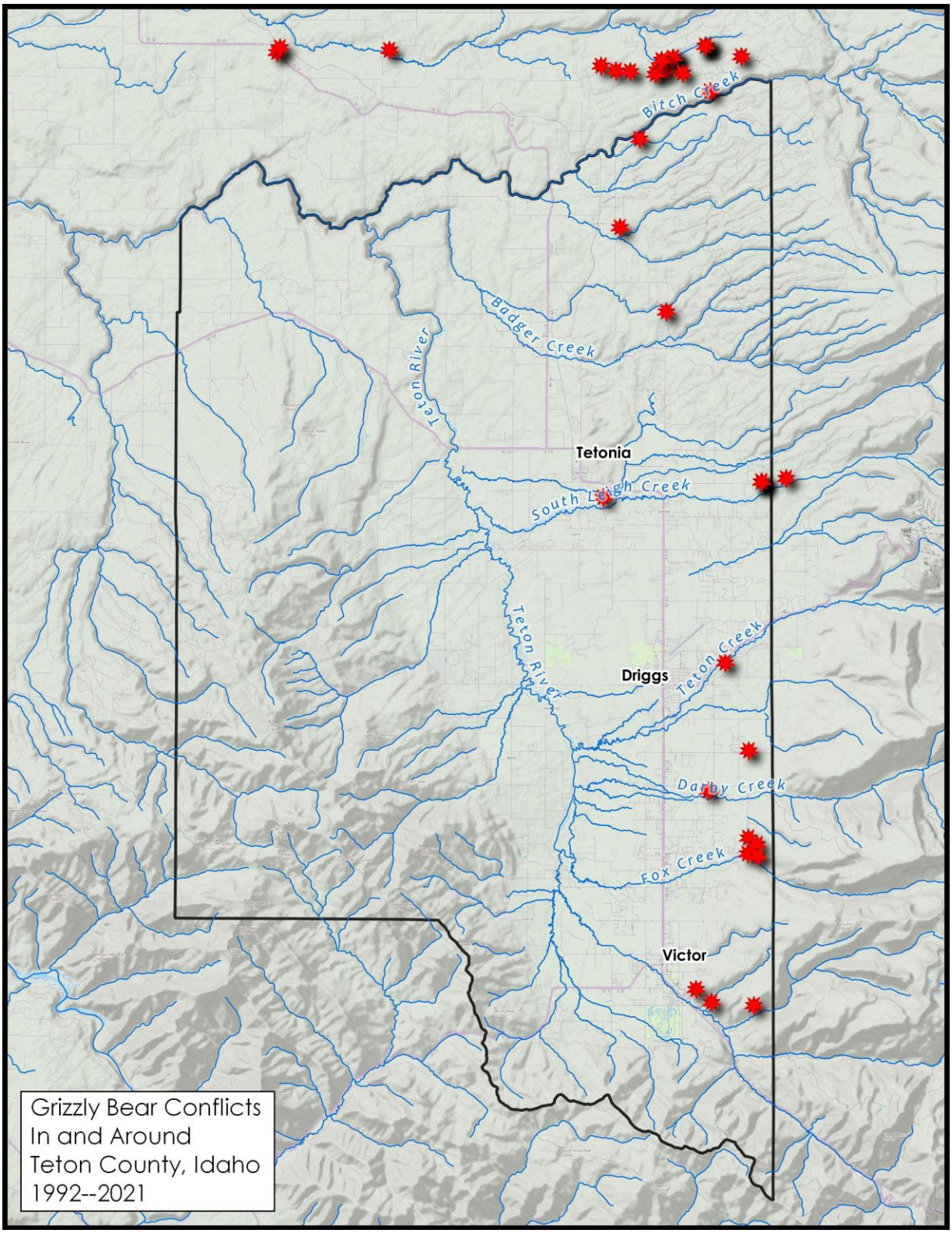

Figure 3. Locations of grizzly bear conflicts in Teton County and immediate vicinity, 1992–2021.

4.0 Big Game

Big game animals that occur in Teton County include several large carnivores and ungulates (hoofed animals). Gray wolves, black bears and mountain lions are the large carnivores currently managed as big game species in Idaho. The most common ungulates in Teton County are elk, white-tailed deer, mule deer, and moose. Pronghorn, although common in Teton Basin prior to settlement, are rare visitors today. Bighorn sheep and mountain goats summer at high elevation in the Tetons east of Teton County and in the Snake River and Big Hole mountains on the county borders, and also occur on some lower elevation lands in the Valley. However, for the purpose of this discussion, we consider elk, mule deer and moose as the primary big game populations in Teton County.

Most mule deer, elk, and moose are migratory in Teton County and depend on habitats in the valley for a portion of the year. Migration is complex behavior that enables animals to exploit many seasonally-productive and spatially-discrete habitats to gain various survival and fitness benefits (e.g., growth, reproduction, predator avoidance; Lennox et al. 2016). New studies on migratory ungulates indicate that learning and cultural transmission are the mechanisms by which ungulate migrations evolve. The loss of migration is likely to erase generations of knowledge about the locations of high-quality forage and likely suppress population abundance (Jesmer et al. 2018). Conserving migratory ungulate populations across a mosaic of land ownerships will require cooperation amongst county leaders, private landowners, and federal land managers to ensure the adequate availability of functional wildlife habitat at the landscape-scale during all portions of the annual cycle.

It is worth noting that any ungulate conservation efforts in Teton County has relevance at the Greater Yellowstone Ecosystem (GYE) scale as many deer and elk that summer on high elevation lands in Yellowstone and Grand Teton National Parks are dependent on winter and spring ranges in Teton Valley. Two examples of habitat areas known to support these interstate migrations include the Teton River Canyon system (i.e., lower Teton River, Bitch, and Badger Creeks) at the northern end of the county; and the Teton Front (i.e., National Forest-private ecotone area between Moose and Fox Creeks) at the southern end of the county.

Due to the societal interest in mule deer and elk, IDFG has focused considerable effort on understanding the population dynamics and habitat relationships of these species across Idaho, including Teton County. Figure 4 provides a generalized overview of seasonal mule deer and elk movements and winter use areas. This depiction is an extrapolation based on past and ongoing collection of data from radio or GPS-collared animals, aerial surveys, and staff observations collected by IDFG for decades in Teton County and adjacent areas. Winter aerial surveys have long been IDFG's primary method for quantifying mule deer and elk populations.

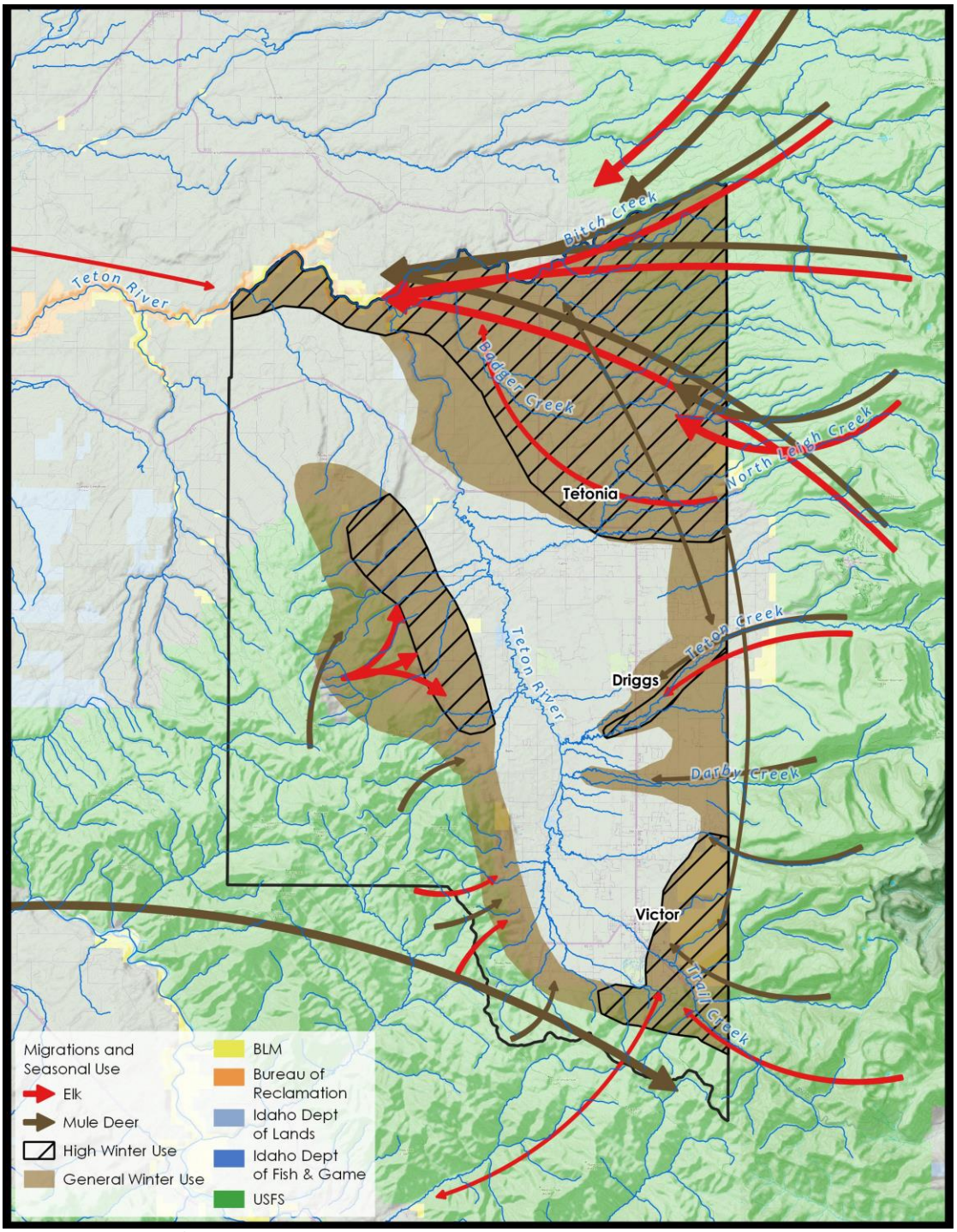

Figure 4. Map of mule deer and elk seasonal movements, and generalized and high use winter habitat areas in Teton County, Idaho.

4.2 Rocky Mountain Elk

Rocky Mountain elk are one of Idaho's premier big game animals and are a vital part of the cultural, socioeconomic, and ecological heritage of Idaho. A Region 1 Forest Service publication describes elk as a vital economic driver in Montana and Idaho, accounting for well over $100 million to state economies annually from hunting alone (Christiensen et al. 1993).

IDFG monitors elk populations within designated elk management zones. Teton County lies within 2 elk management zones: the Island Park Zone, which is comprised of the northern portion of Teton County that falls within Game Management Unit (GMU) 62 and the Palisades Zone, portions of GMU's 65 and 67 fall within Teton County. IDFG aerial surveys completed during the winter of 2020 documented the following number of elk per GMU (data provided is raw count from the survey): GMU 62 (156 elk), GMU 65 (134 elk), and GMU 67 (310 elk).

Elk are habitat generalists, but have certain basic habitat requirements. These include food, water, hiding cover, and security areas (i.e., blocks of elk habitat with limited human access). Availability and distribution of these habitat components on each seasonal range ultimately determine the distribution and numbers of elk that may be supported (IDFG 2014*b*). In Teton County, elk are found through a wide range of elevations from the valley bottom along the Teton River in winter to subalpine zones during summer. Lower elevation habitats are most often utilized by elk during calving and as winter range.

During an IDFG elk calf survival and movement research project in nearby Island Park, the sagebrush-forest ecotone was heavily utilized for calving and early calf rearing by elk. This work also found that private lands were proportionally more important for elk calving than higher elevation public lands. Elk cows bed calves in the open sagebrush or sagebrush/aspen ecotones, and seek hiding cover and thermal refuge within nearby forested habitat. In the Island Park study >60% of cow elk calved at the sagebrush-forest ecotone on private lands. Once calves become mobile, cow elk take them to higher elevations that have more productive forage resources (Idaho Department of Fish and Game, unpublished data).

Important calving areas for elk within Teton Valley likely include the ecotone where National Forest Lands (or other large forested habitats) align with more open sagebrush steppe habitats. Recent data collected from GPS-collared elk in the Victor Front area show that some wintering elk between Moose Creek and Fox Creek are calving just upslope from wintering areas on lands administered by BLM and the CTNF. This highlights the potential benefits of cooperation among county planners/leaders, private landowners, and public land managers for open space planning that maintains or enhances important wildlife habitats.

Noss et al. (2002) consider elk winter range as one of the most threatened natural elements in the GYE. Teton County exemplifies this condition as public land managed for habitat is very limited at lower elevations. Recent GPS elk collaring efforts in Teton County and surrounding area has provided some detailed migration and habitat utilization information. Marked individuals moving from higher elevation summer range (found mostly on public lands) move onto lower elevation valley habitats to winter. Important wintering areas include the Teton River Canyon (i.e., lower Teton River, Bitch Creek, and Badger Creek), Teton River valley corridor, fluvial cottonwood corridors extending from the western slope of the Tetons into the valley (particularly but not exclusively South Leigh and Teton Creeks) and the ecotone at the CTNF boundary around the perimeter of the valley particularly between Horseshoe and Packsaddle Creeks, the Teton Front east of Victor, and various east side habitats from Game Creek to Bitch Creek.

Teton County and adjacent areas are currently below IDFG elk population objectives. The habitat parameters used for developing elk population objectives are the amount and condition of existing

habitats, particularly winter range, and private landowner tolerance for elk utilizing their lands. Elk rely on relatively snow-free locations found in the lower elevations of Teton County. And during severe winters, elk are more likely to come in conflict with people and their property as they are forced by snow depths into the valley. For this reason IDFG's ability to increase elk population objectives (and future populations) is limited in Teton County by a lack of suitable winter range and associated low landowner tolerance to elk in some areas. It is, however, possible that population objectives (and populations) could decrease with loss of additional winter range.

Specific habitat management goals outlined in IDFG's Elk Management Plan relating to Teton County include: 1) expanding protected winter range and improving winter range security from human disturbance on the west side of Teton Valley adjacent to the Big Holes and 2) improving the security cover of elk summer and transition habitats in the Big Hole Mountains (IDFG 2014*b*). These recommendations are designed to sustain the viability of elk populations into the future and maintain elk hunting opportunity. For more detail on the history and management of elk in Idaho please refer to IDFG's Elk Management Plan at: https://idfg.idaho.gov/old-web/docs/wildlife/planElk.pdf .

Recent elk movement studies and associated modeling has further refined IDFG's understanding of spatial use by wintering elk in the Teton River Canyon, and so, additional detail on this population segment is provided below. IDFG may be able to provide this level of information for elk use in other areas of the county in coming years.

4.1.1 Teton River Canyon Elk

The Teton River elk herd, comprised of approximately 500 individuals, is managed as part of the larger Island Park Population. Historically, these elk wintered in aspen and shrub communities associated with the Teton Canyon and migrated east to summer range along forested habitats in the eastern portion of Game Management Unit 62 and into Wyoming. This herd, over time, has largely shifted to summer habitats associated with agriculture in GMU 62 with fewer individuals migrating to Wyoming. This has resulted in increased conflict with agricultural producers. Winter distributions have also shifted in response to habitat loss and human disturbance, with most individuals now wintering in the Hog Hollow area along the Teton River. In February of 2019, about 300 of these elk moved west, crossing US 20, and wintered along the Henry's Fork of the Snake River and the Sand Creek Desert near Egin. This pattern was followed in 2020 and 2021 and presents concerns related to wildlife vehicle collisions and increased conflict with livestock operations and associated fencing infrastructure.

Recently, IDFG completed a Brownian Bridge movement model analysis for elk that winter in and around Teton River Canyon. This effort is based on 75 seasonal migrations of GPS-collared elk from March 2018 to February 2020. The average length of migration for elk wintering in Teton River Canyon was 35.5 miles and the longest migration was 93.3 miles coming from Yellowstone National Park. (Fig. 5).

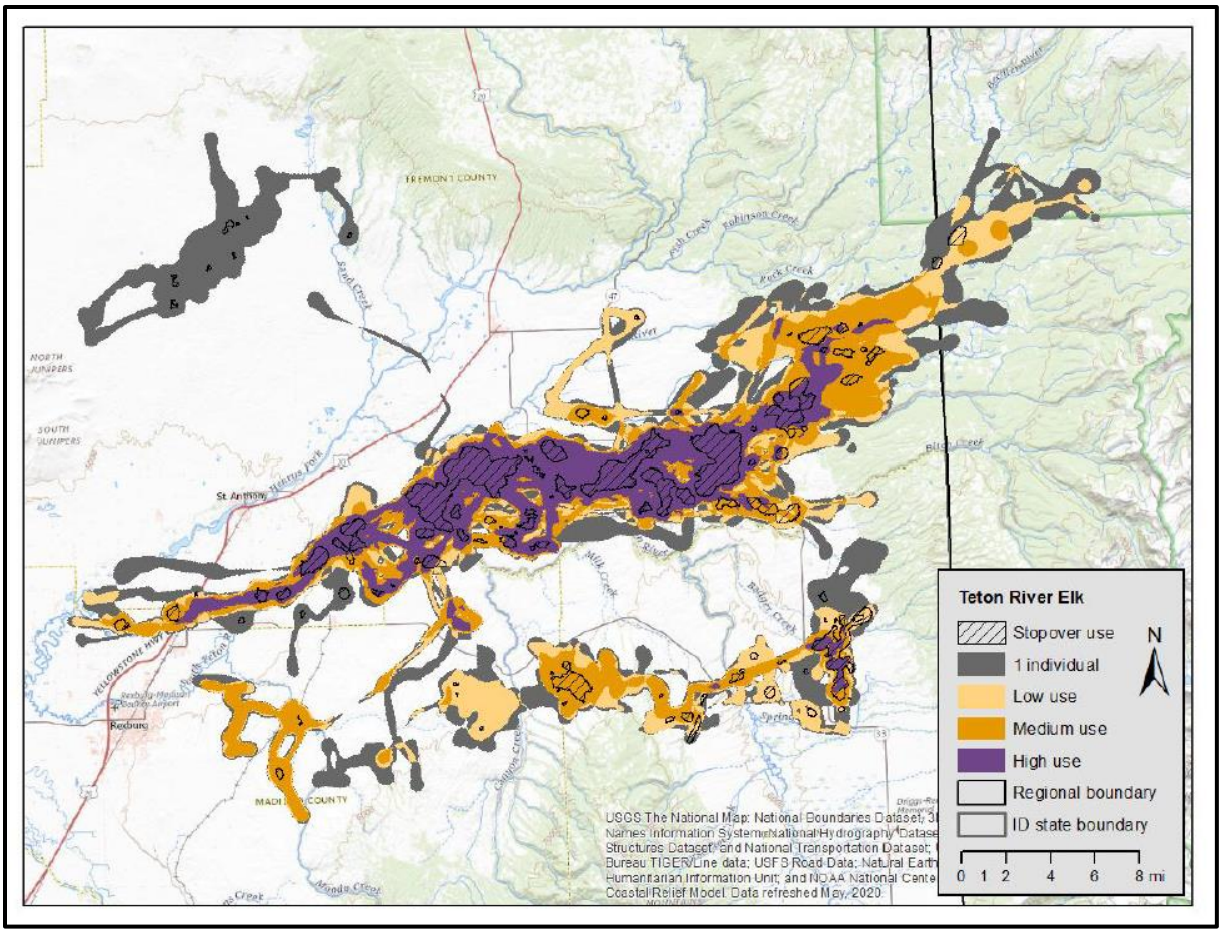

Figure 5. Brownian bridge movement model migration analysis of elk that winter along the Teton River Canyon and vicinity.

4.2 Mule Deer

Mule deer are emblematic of wild lands in the American West, providing recreational, aesthetic, social, and cultural values for millions of outdoor enthusiasts. Mule deer hunters spend tens of millions of dollars on trip related expenses in Idaho (IDFG 2019*b*). Many of these expenditures are for fuel, meals, and lodging in small rural towns, with the total economic impact of mule deer hunting to Idaho's economy estimated to be over $100 million annually (Cooper and Unsworth 2000).

Over the last 10 years, Idaho's mule deer population has ranged from 250,000 to 325,000 deer (IDFG 2019*b*). Teton County is divided between 2 IDFG mule deer data analysis units (DAU's; which are based on deer populations and their connectedness): the Island Park DAU that includes the northern portion of Teton County and falls within Game Management Unit (GMU) 62 and the Palisades DAU with GMU 65 within Teton County. IDFG's aerial abundance surveys completed during the winter of 2020 documented the following number of mule deer per GMU: GMU 62 (1,310 mule deer) and GMU 65 (350 mule deer). GMU 62 is comprised of deer that winter in the Teton River Canyon System. This population can fluctuate significantly depending on winter conditions, but has averaged approx. 2,000 animals over the last 10 years. The GMU 65 population is comprised of mule deer wintering in Teton Valley, most notably the Teton Front, Horseshoe Canyon, and fluvial cottonwood corridors on the east side of the valley.

Mule deer forage varies with season. In spring mule deer seek early-greening grasses and forbs that are highly palatable and nutritionally rich. Important valley habitats in spring include cottonwood and aspen forests or stringers, Conservation Reserve Program (CRP) fields, and sage-steppe and National Forest boundary ecotones. Some cultivated agricultural lands also provide important forage for spring migrating deer. During summer, forbs make up as much as 2/3 of the mule deer diet and animals may utilize valley habitats that sustain succulent vegetation and some security from human disturbance. However, most deer give birth and summer at higher elevations on National Park and National Forest lands. As grasses and forbs dry up in late summer, deer consume more shrubs. Important browse plants include serviceberry, mountain mahogany, currant, bitterbrush, sagebrush, willow, and quaking aspen; forbs will be used as long as they are available and may make up 25 percent of the diet. Woody browse becomes increasingly important as mule deer put on fat stores in preparation for winter. Mountain shrub communities near the forest boundary, along with aspen and cottonwood forests provide vital forage and cover for valley deer. Winter diets are made up of 75 percent browse species where shrubs are available. During winter, Teton County's mule deer prefer south-facing shrub-dominated slopes that are relatively snow free and fluvial creek corridors that support cottonwood forests. These habitats provide forage, thermal refuge, and security cover (IDFG 2019*b*).

Mule deer can be a valuable indicator of landscape-scale habitat quality and function due to their need for varied habitat resources throughout the year and the connectedness of those habitats. Therefore, if Teton County leaders, partners, and residents can conserve habitat that supports viable migratory mule deer populations, then other species will benefit. Teton County leaders can maximize benefits to regional mule deer populations by focusing on winter range and transitional habitats that facilitate migration to and from higher elevation public lands.

Given that mule deer migrations occur along traditional routes that are learned and passed on from mother to young, the protection of relatively small key habitats can benefit large numbers of deer (Sawyer et al. 2009). Conversely, a small land use change in a key area can influence the larger ecological conditions of a region undergoing rapid rural residential development (Duncan and Burcsu 2011).

During severe winter weather many deer will be concentrated in very limited areas that have a shallow snowpack (i.e., terminal winter range). Mule deer distribution on winter range will vary annually with winter conditions with deer being more widely distributed during less severe winters. Figure 3 identifies important mule deer wintering areas in Teton County including the Teton River Canyon and the northeastern portion of the valley, the CTNF boundary area, most fluvial cottonwood corridors extending from the westslope of the Tetons into the valley, and the Teton Front. Recently, an analysis of GPS collar data from mule deer wintering along the Teton Front revealed that some deer fawn in this area. Also, there are migratory connections from this winter range to the Heise Front within the South Fork Snake River, GTNP and the westslope of the Tetons, and north to Fox, Darby and Teton Creeks along the CTNF Boundary (Fig. 4).

For more detail on the ecology and management of mule deer in Idaho please refer to IDFG's Mule Deer Management Plan at: https://idfg.idaho.gov/sites/default/files/plan-deer-mule-2020-25.pdf (IDFG 2019*b*).

Recent mule deer movement studies and associated modeling has further refined IDFG's understanding of spatial use by wintering mule deer in the Teton River Canyon, and so, additional detail on this population segment is provided below. IDFG may be able to provide this level of information for mule deer use in other areas of the county in coming years.

4.2.1 Teton River Canyon Mule Deer

Teton River mule deer winter adjacent to the Teton River in eastern Idaho. Due to limited quality and quantity of winter habitat, the 1,000–2,500 individuals within this population are greatly influenced by winter severity. The deer—and especially the fawns—experience dramatic swings in productivity and mortality. Teton River mule deer migrate eastward across the Idaho-Wyoming border to two areas west of the Teton Range: the northern summer range southwest of Pitchstone Plateau and the southern summer range in the western foothills of the Teton Range. On average, Teton River mule deer migrate 25 mi (40 km) between summer and winter ranges, with the longest migration spanning more than 70 mi (113 km) coming from Yellowstone National Park. Challenges to Teton River deer migration include human activity related to residential subdivision development and recreation in rural residential areas northeast of Driggs.

IDFG completed a Brownian bridge movement model analysis for mule deer that winter in and around Teton River Canyon (Figure 6). Additional information about this model can be found in the *Ungulate Migrations of the Western United States, Volume* 1 (https://doi.org/10.3133/sir20205101).

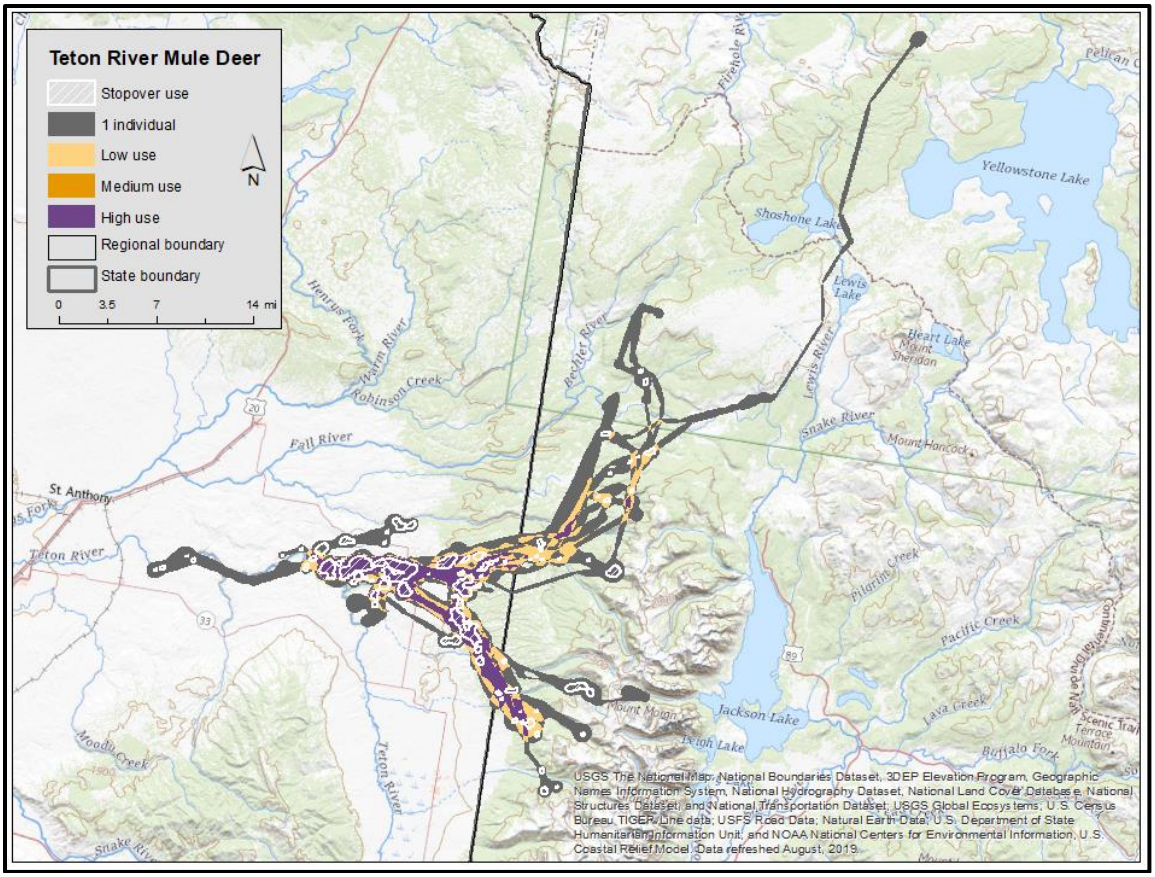

Figure 6. Brownian bridge movement model migration analysis of GPS-collared mule deer that winter along the Teton River Canyon and vicinity.

4.3 Moose

Moose occur across much of Idaho, except in the southwestern corner of the state. Moose are highly valued by both hunters and non-hunters, providing recreational opportunities that have economic and aesthetic values. Idaho's statewide moose management priorities include direction to "collaborate with private landowners and land management agencies to incorporate measures that benefit moose in land use and resource management plans" (IDFG 2020). Specific management direction for the Southeast Idaho Habitat Zone (including Teton County) is to "collaborate with private landowners, land management agencies, forest managers, counties, tribes, hunters, and other interested parties to improve moose habitat and minimize threats such as recreational impacts, barriers to dispersal, and development".

Over the past century, the range of moose in Idaho has expanded from small areas of northern and eastern Idaho to its current distribution. Population size also increased during this time, likely peaking around the late 1990's or early 2000's. Current survey data, anecdotal information, and harvest data indicate moose populations are declining in parts of the state. Several factors may be impacting moose populations, both positively and negatively, including habitat change (e.g., roads, development, timber harvest), changing climate, disease, predators, parasites, and combinations thereof (IDFG 2020).

The Teton moose DAU encompasses GMU's 62, 64, 65, and 67. Ownership consists of mostly CTNF and BLM lands, followed by private, Idaho Department of Lands (IDL) and IDFG lands. The DAU is bounded to the east by Wyoming and to the northeast by Yellowstone National Park. Developing a population estimate for moose is difficult because they are more solitary than other big game living in dispersed low-density populations, have a large geographic distribution, select heavily forested or brushy habitats, and IDFG has limited monitoring resources. While no specific population surveys are conducted for moose in Teton County, moose are counted during aerial elk and mule deer surveys incidentally. During recent deer and elk surveys conducted during the winter of 2020, 153 moose observations were recorded across Teton County (GMU 62 [15 moose], GMU 65 [81 moose], and GMU 67 [57 moose]).

Moose that live near residential development within Teton County often results in property damage or human safety concerns requiring IDFG staff to respond. As development has advanced in the foothills and riparian corridors of Teton Valley, more moose conflicts occur, often resulting in removal of moose from historical moose habitat.

Ritchie (1978) completed a study of moose ecology in Fremont County, Idaho and found their summer diets consist primarily of browse (56%; e.g., leaves, twigs and buds of woody plants), particularly willow, aspen, and bitterbrush. Non-woody forage comprised 44% of summer diets and fireweed was a dominant forb. Winter diets were 87% browse with a notable increase in occurrence of evergreen Ceanothus and a decline in non-woody forage species. Other documented forage species in Teton County include chokecherry, serviceberry, mountain maple, Douglas-fir, and subalpine fir (Ritchie 1978).

IDFG is currently studying moose across Idaho, utilizing animals fitted with GPS collars. Some moose marked in and around Teton Valley show relatively far ranging seasonal movements. Moose have been documented traveling across Teton Valley from the Big Hole Mountains to Jackson,

Wyoming. Another individual moved from Sand Creek Wildlife Management Area in Fremont County to the Teton River to summer along the river's riparian corridor. Open spaces and intact habitat types allow for this type of movement and are important to maintain and sustain moose in Teton County. Priority habitat areas for moose populations within Teton County are National Forest boundary areas, fluvial cottonwood and willow riparian corridors, large wetland areas (such as Woods Creek Fen), and the Teton River Corridor. Moose also depend on winter range traditionally associated with mule deer and elk (i.e., open south-facing slopes with shrub dominated vegetation). Numerous moose utilized seasonally protected winter ranges such as Horseshoe Canyon in the Big Holes and Teton (Creek) Canyon in Alta, Wyoming.

For more detail on the ecology and management of moose in Idaho please refer to IDFG's Moose Management Plan at: https://idfg.idaho.gov/sites/default/files/plan-moose.pdf (IDFG 2020).

5.0 Yellowstone Cutthroat Trout and Teton River Fishery

The Teton River, a tributary of the Henrys Fork Snake River, drains 890 square miles from its headwaters in the west slope of the Teton Range, the Snake River Range, and Big Hole Mountains to its confluence with the Henrys Fork Snake River near Rexburg, Idaho. The Teton River is fed by snowmelt and spring-fed discharge with peak flows typically occurring between late May and early June (Koenig 2006). According to USDA's Natural Resources Conservation Service (NRCS 2008) the Teton River is a major natural resource in Teton County and the region, and is of key importance to fish, wildlife, recreation, and agriculture. Two reaches of the river are highlighted in this report, the Teton Valley Reach and the Teton River Canyon Reach. A major feature of the Teton River fishery is the presence of a native Yellowstone cutthroat trout (YCT) population. Low YCT populations in the early 2000's raised serious concerns about the persistence of this species in the Teton Valley Reach of the river, and despite recent large increases in YCT numbers, competition with non-native trout remains a management/conservation concern. In February 2001, the US Fish and Wildlife Service (USFWS) found that a petition to list the YCT under the Endangered Species Act was not warranted. On 21 February 2006 the USFWS announced the results of a review of the status of YCT for possible listing under the Endangered Species Act. The USFWS determined that listing of YCT, found in Montana, Wyoming, Idaho, Utah and Nevada remained unwarranted (USFWS 2006). Yellowstone cutthroat trout are currently designated as a *Sensitive* species by both the BLM and CTNF.

The primary objective of recent Fisheries Management Plans (2007–2024) for fishery management activities on the Teton River is to protect the genetic integrity and population viability of the native cutthroat trout population (IDFG 2019*a*). Prior to 1976 (and the construction and subsequent collapse of the Teton Dam), the proportion of the YCT population declined as you went upstream with the highest concentrations occurring downstream of the dam site, followed by lower concentrations in the canyon reach of the Teton River, and the lowest concentrations occurring in the Teton Valley Reach (57%, 31%, and 22%, respectively). A 2003 census of YCT in the Teton Valley Reach of the river revealed a 96% decline to densities < 2 fish/ha in 1 sample site. Continued monitoring surveys conducted by IDFG indicate increasing trends for YCT numbers in the upper Valley and lower Teton River of the Valley Reach, and stable numbers in the Canyon Reach of the Teton River (High et al. 2011). While the recent stable or upward trend is encouraging, the species continues to face numerous risks to long-term persistence and remains a high conservation priority (Fredericks and Schrader 2006).

5.1 Teton Valley Reach

Since 1987, IDFG has routinely sampled 2 parts in the upper Teton River (Valley Reach) to monitor fish population trends (Fig. 7). Abundances of YCT, rainbow trout (including cutthroat x rainbow hybrids; hereafter collectively referred to as RBT) and brook trout (BKT) have been increasing in the Teton River since historic lows in 2003, and now are similar to or exceed abundances observed in the 1980's when quantitative monitoring efforts were initiated. Following are summaries for each sampling site.

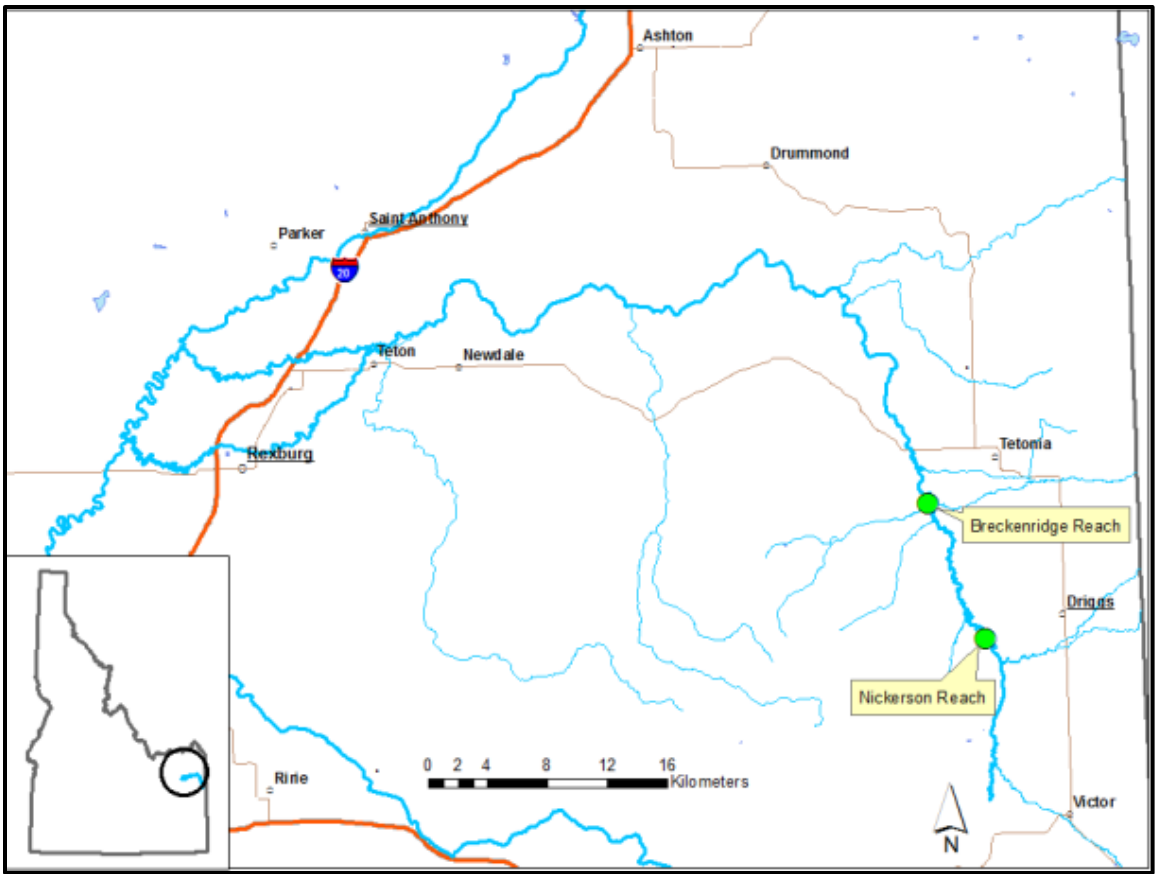

Figure 7. Nickerson and Breckinridge fish sampling sites on the Valley Reach of the Teton River.

5.1.2 Nickerson Site

IDFG estimates there are 697 YCT/mile which is similar to our 2017 estimate of 704 YCT/mile, and the 10-year average of 561 YCT/mile (Fig. 8). Rainbow trout (RBT) abundances have decreased over the last 2 surveys to an estimated 526 RBT/mile. The 10-year average for rainbow trout is 736 RBT/mile. Brook trout (BKT) followed the same downward trend as rainbow trout. IDFG estimates the 2019 brook trout abundance to be 1,603 BKT/mile, which is lower than our last 2 surveys but higher than the 10-year average of 1,351 BKT/mile.

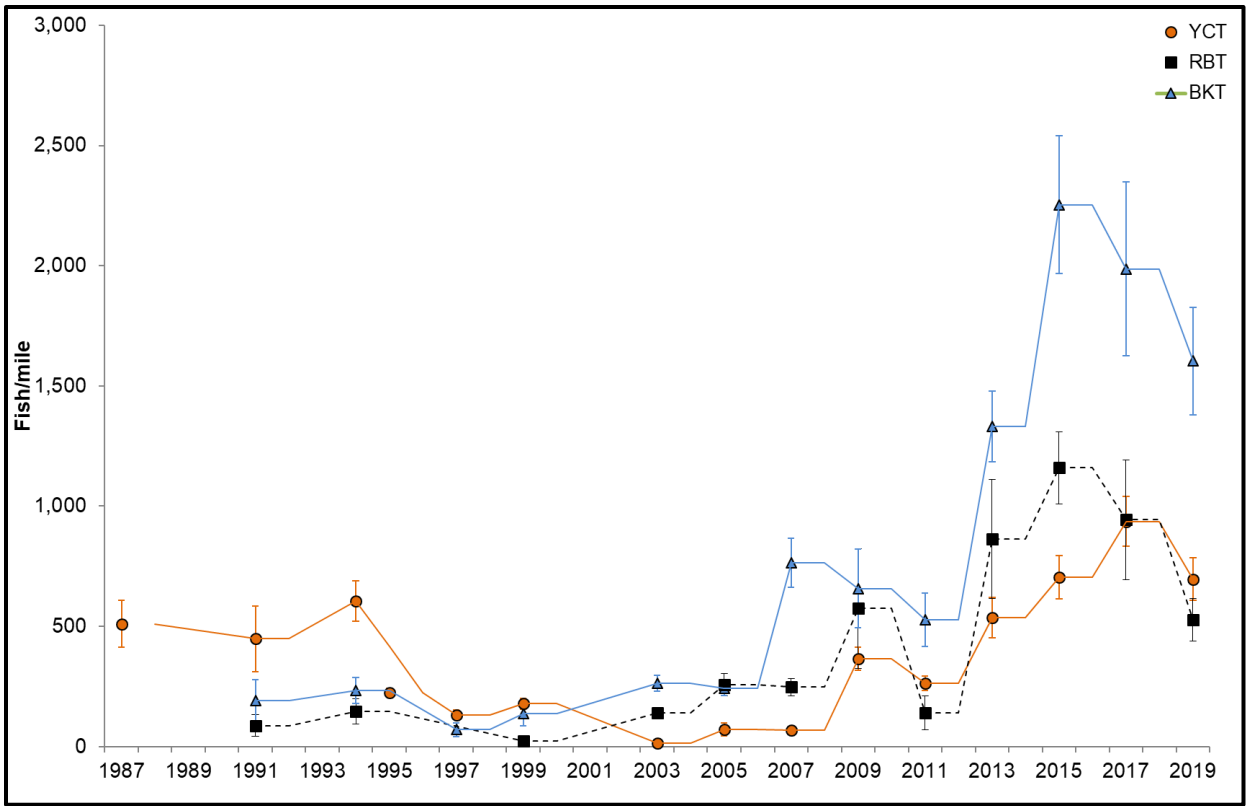

Figure 8. Abundance estimates and 95% confidence intervals for trout in the Nickerson monitoring site (1987–2019), Teton River. YCT = Yellowstone cutthroat trout, RBT = rainbow trout, and BKT = brook trout.

5.1.3 Breckenridge Site

The abundance of YCT in this site is similar to the estimates conducted over the last 8 survey years (Fig. 9). IDFG estimates there were 67 YCT/mile in 2019. The 10-year average is 31 YCT/mile. Rainbow trout (RBT) abundances have decreased over the last 3 surveys to the 2019 estimate of 802 RBT/mile, which is also lower than the 10-year average of 1,257 RBT/mile. IDFG estimates an abundance of 673 brook trout (BKT)/mile, which is slightly lower than the 2017 estimate of 886 BKT/mile. The 10-year average of is 549 BKT/mile. Brown trout (BNT) have been observed at the Breckenridge Site during electrofishing surveys since 2007. Between 2007 and 2013, we captured low numbers (1–7 fish) of BNT in our population surveys. Since 2013, BNT catches have increased to 28, 32, and 145 during the 2015, 2017, and 2019 surveys, respectively. This indicates a change in the trout species composition for this area. Over the last 3 survey years our precentage of catch has increased for YCT, BKT, and BNT while simulataneously decreasing the RBT catch.

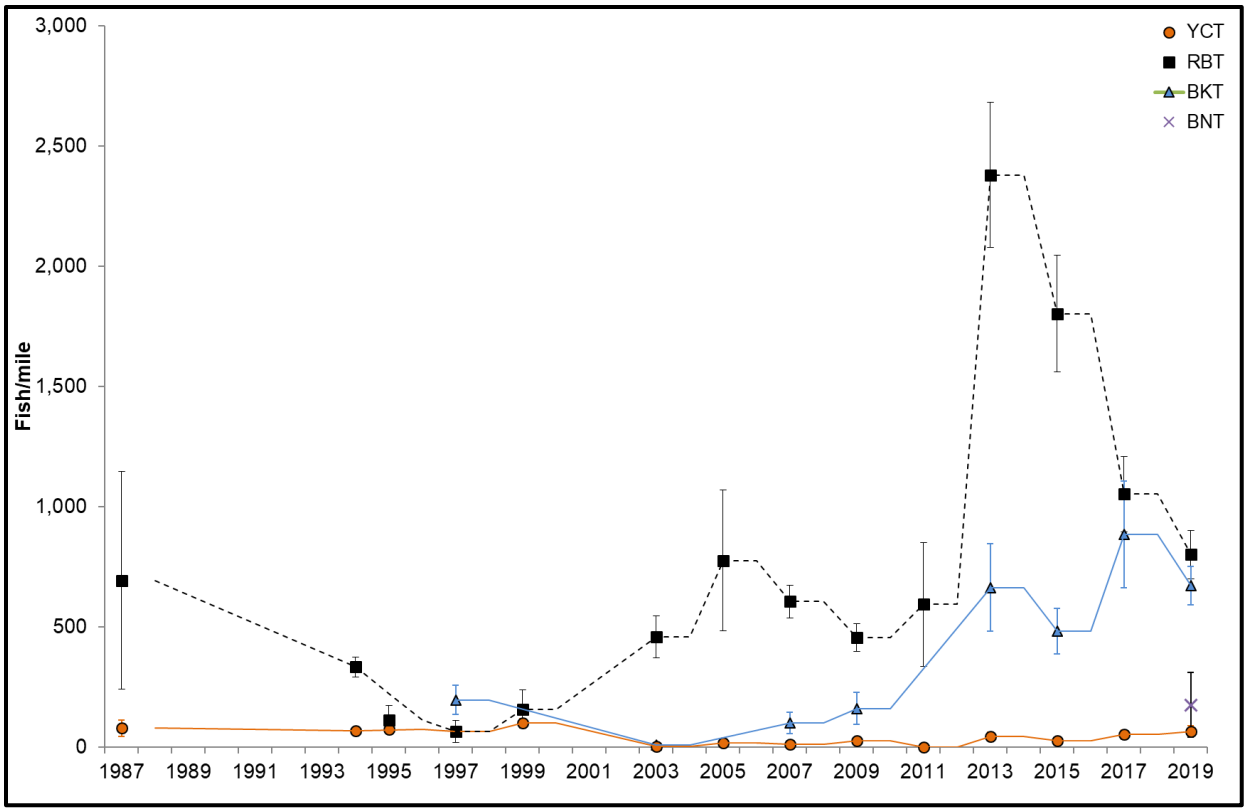

Figure 9. Abundance estimates and 95% confidence intervals for trout in the Breckenridge monitoring site (1987–2019), Teton River. YCT = Yellowstone cutthroat trout, RBT = rainbow trout, BKT = brook trout, and BNT = brown trout.

The abundances of total trout in the Nickerson monitoring site and the non-native trout abundances in the Breckenridge monitoring site currently exceed historical highs, indicating habitat conditions have changed, angler harvest has changed, or a combination of the two. However, continued efforts to conserved native YCT will be required due to threats from increasing abundances of nonnative RBT, BKT, and BNT.

Principal causes of conservation concern for YCT include habitat alteration and degradation through human exploitation (Koenig 2006), stocking of non-native fishes and whirling disease (USFWS 2006, Koenig 2006), and flow alteration (Van Kirk and Jenkins 2005). According to USFWS (2006), angler harvest and stocking of non-native fish "can be effectively countered by the ongoing current management actions of State and Federal agencies". However, research by Van Kirk and Jenkins (2005) suggests that the greatest threat to the future of YCT in Teton Valley may be the conversion of the upper Teton watershed from a runoff-dominated system, which benefits cutthroat, to a system that essentially functions as a large spring creek with little influence from runoff, which favors non-native competitors.

Fishing regulations geared to protect YCT are currently in place on the Teton River including no harvest or catch-and-release for YCT, an unlimited daily bag limit for RBT to reduce hybridization and competition with YCT, and a 25-fish daily limit for BKT to limit competition with YCT. Other management actions for YCT on the Teton include maintaining fencing of riparian areas to protect habitat conditions, maintenance of fish screens on major irrigation diversions to reduce entrainment

of YCT, stream habitat restoration to reduce sediment inputs and improve instream habitat conditions, aquifer recharge to improve summer stream flows and water temperatures, non-native trout removal to reduce hybridization and competition risks for YCT, and stream reconnection efforts to allow migratory YCT access to spawning and rearing areas in important tributaries (IDFG 2019*a*).

Ensuring persistence of YCT in the Teton Valley Reach is a complex task that will involve efforts to protect and/or mitigate threats to Teton River floodplains, riparian habitat, and stream flows. However, maintenance of instream and riparian habitat conditions along fluvial tributaries and spring creeks is also important to any future YCT recovery as well as protecting existing wild trout populations. Teton and Fox Creeks currently provide the most important spawning and rearing habitat for fluvial YCT in the upper Valley (Koenig 2006). Trail Creek and Six Springs Creek also are used by fluvial spawning cutthroat and these streams, as well as South Leigh Creek, may also be important to YCT conservation in the Teton River (Koenig 2006).

The current Idaho Department of Fish and Game Fisheries Management Plan (IDFG 2019*a*) for the Teton River identifies a key objective relevant to land use and conservation planning:

- *Minimize impacts of land use and development on fish habitat and water quality.*
- *Work with government agencies, private landowners and developers, and conservation groups to make protection and enhancement of fish habitat and water quality a primary concern in land use decisions.*
- *Ensure restoration of habitat or mitigation of habitat loss whenever possible.*

5.2 Teton Canyon Reach

The Teton River Canyon Reach is one of the top 5 YCT trout systems range-wide along with Yellowstone Lake; Snake River, Wyoming; South Fork Snake River; and the Blackfoot River. In this system native YCT are dominant over non-native trout. In the Teton Canyon Reach, the YCT fluvial life history strategy is intact with Bitch Creek still functioning as a major spawning/rearing tributary followed in importance by Canyon Creek (in Madison County). This system maintains excellent connectivity of habitats that support good growth and survival for YCT.

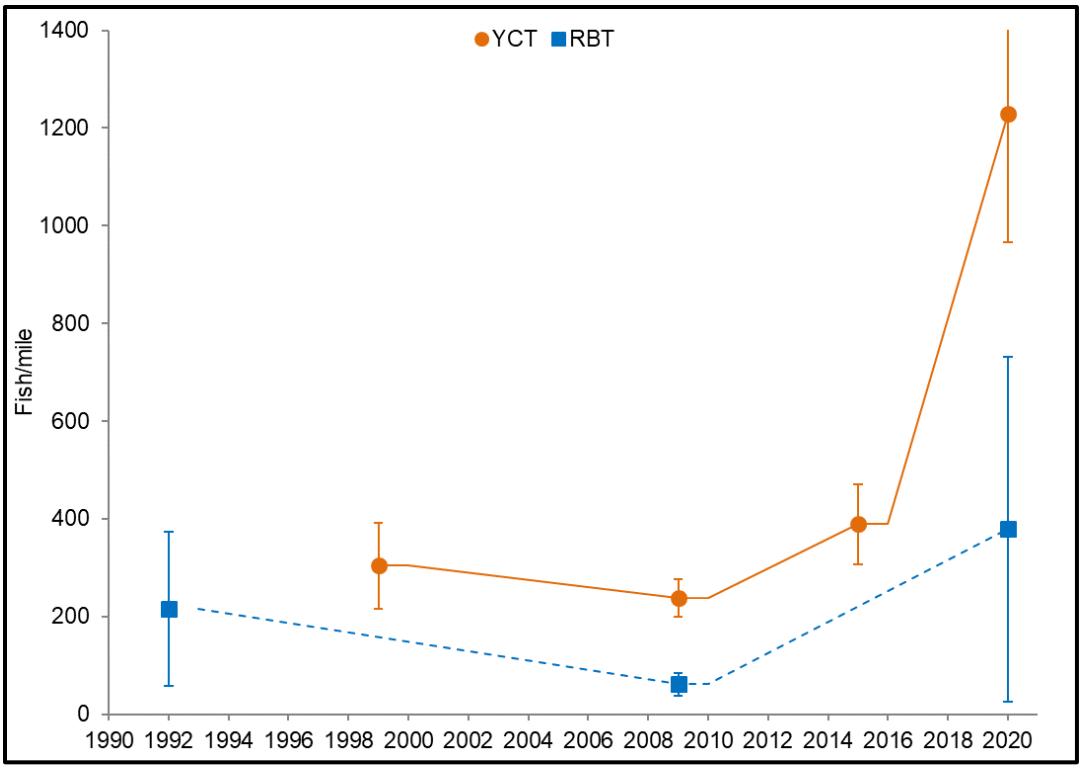

Figure 10. Trout abundance estimates for the Teton River Canyon Reach.

In September 2020, IDFG conducted a fish population survey on the Parkinson monitoring site of the Teton River, which has been sampled 5 times since the early 1990's. The site begins near the confluence of Canyon Creek and continues approximately 3.6 miles downstream. IDFG estimates YCT abundance at over 1,200 fish/mile and RBT at 375 fish/mile (Fig. 10). A wide range of size classes were present for YCT (<6"–20"). This indicates YCT have had good success reproducing in recent years suggesting strong fish populations in the near future.

Challenges to YCT in the Teton Canyon Reach include 1) competition and hybridization with increasing non-native trout, and 2) habitat alteration following the Teton Dam failure, which resulted in loss of riparian habitat throughout the floodplain as well as the creation of the current rock slide/rapid structures that both reduce instream habitat diversity.

6.0 Landbirds

Landbird species and guilds that serve as keystone or umbrella species useful for conservation and land-use planning in Teton County include Columbian sharp-tailed grouse, songbirds and raptors.

6.1 Columbian Sharp-tailed Grouse

Columbian sharp-tailed grouse (CSTG) are a medium-sized, gallinaceous upland game bird with a light brown appearance, pointed tail, and conspicuous white spots on the wings. They are 1 of 6 extant subspecies of sharp-tailed grouse in North America and are an important upland game species to upland game hunters of Idaho. Columbian sharp-tailed grouse were once considered the most abundant upland game bird in the Pacific Northwest, but now occupy <5% of their historical range in the U.S. Habitat loss, degradation, and fragmentation are primary causes for the decline and remain threats across remaining occupied range.

Petitions to list CSTG under the Endangered Species Act (ESA) were submitted in 1995 and again in 2004 in response to dramatic declines in populations and distribution. However, in each case, the U.S. Fish and Wildlife Service concluded listing was not warranted. IDFG classifies CSTG as a *Species of Greatest Conservation Need* (IDFG 2015) and they are designated as a *Sensitive* species by the U.S. Forest Service and the BLM. Approximately 60–65% of remaining CSTG occupied habitat in the U.S. is found in Idaho. Therefore, continued and improved CSTG population monitoring and maintenance, research efforts, and habitat conservation in Idaho, are paramount to the range-wide status of the subspecies.

Habitat loss and fragmentation are responsible for extirpation of CSTG across most of their historical range (Bart 2000). Furthermore, habitat loss and degradation continue to be the 2 most unequivocal threats to CSTG throughout their range (Hart et al. 1950, Giesen and Connelly 1993, McDonald and Reese 1998, Hoffman and Thomas 2007). Historically, the primary cause of habitat loss was conversion to intensive agriculture; however, in recent years, the primary causes of habitat loss have been residential and commercial development (IDFG 2015).

Columbian sharp-tailed grouse habitat is comprised of both native and managed perennial bunchgrass prairie and shrub-bunchgrass rangelands with a small percentage in tall, deciduous shrub thickets. These rangeland communities provide nesting and brood-rearing habitat, whereas riparian zones and mountain-shrub thickets are essential during winter months. Columbian sharp-tailed grouse breed at lek sites, which are small elevated areas within their nesting habitat where males gather and display to attract mates.

Columbian sharp-tailed grouse are grassland habitat generalists and can benefit from habitat restoration and enhancement, such as Conservation Reserve Program (CRP) or State Acres for Wildlife (SAFE) lands that convert eligible croplands to semi-permanent cover. Because approx. 70% of CSTG nesting and brood-rearing habitat occurs on private lands in Idaho, programs such as CRP and SAFE have provided many thousands of acres of suitable perennial grassland habitat for CSTG. As a result, grouse populations increased in recent years, in contrast to their general decline over the past century. Potential loss of CRP habitat is the most immediate threat to CSTG in Idaho and across their range.

During spring males gather on traditional breeding areas called leks. Leks contain as few as 2 males to ≥30, but in Idaho average lek attendance is approximately 12 males. Leks are typically located on

low knolls, benches, and ridge tops slightly higher than surrounding terrain (Hart et al. 1950, Rogers 1969, Parker 1970, Ward 1984, Boisvert 2002). A display area for an average-sized lek of 12 males occupies an area approx. 100 ft in diameter. Vegetation on leks is usually a sparse grass or shrub-grass mix that allows good visibility and unrestricted movement. Tall, dense shrubs and grasses near a lek provide important escape cover (Boisvert 2002). Meints et al. (1992) suggested the single most important factor for lek locations was proximity to suitable nesting and brood-rearing cover. Ongoing lek surveys conducted in Teton County by IDFG (2003–present) have documented that a large number of known leks in Teton County are on lands enrolled in CRP. In Idaho, most nest and brood locations were within 2 km (1.2 miles) of the lek where the hen was bred (Meints 1991, Apa 1998). Figure 11. depicts the area within Teton County that is located within 2 km of known CSTG leks.

After breeding, females construct a nest on the ground and lay 10–12 eggs (Hoffman et al. 2015). Chicks hatch in late May or early June. If a first clutch is abandoned or depredated before chicks hatch, a hen will often return to a lek for breeding and establish a new nest. During the first 2-4 weeks of life, CSTG chicks are heavily dependent on high-protein foods such as small arthropods (e.g., beetles, grasshoppers, insect larvae, and ants). Thereafter, flowering parts and leaves of forbs make up a significant portion of their diet (IDFG 2015).

In Teton County, CSTG breeding habitat is concentrated in the northern portion of the county where a mosaic of large open habitats comprised of agricultural fields, CRP, and native shrub-steppe persists. Also, there are several active leks in Teton Valley on the west side of the Teton River associated with open space in shrub steppe, agricultural, and CRP habitats.

When snow covers herbaceous vegetation or agricultural crops, CSTG utilize shrubby riparian zones and patches of mountain shrubs. Columbian sharp-tailed grouse winter habitats occur along the Teton River Canyon, within aspen groves and stringers, fluvial forested riparian habitat, Teton River (valley reach), and along the National Forest Boundary. Columbian sharp-tailed grouse will often move to higher elevations where higher moisture levels support greater amounts of these shrub habitats. However, if winter conditions are mild, CSTG often stay in open grassland and shrub-grassland communities used for breeding, nesting, and brood-rearing. Distance traveled from leks to wintering areas varies from 0.3–>25 mi; (Meints 1991, Ulliman 1995, Giesen 1997, McDonald 1998, Collins 2004, Boisvert et al. 2005). Giesen and Connelly (1993) suggested presence of mountain-shrub or riparian communities were essential for long-term persistence of CSTG populations.

For more detail on the ecology and management of CSTG in Idaho please refer to IDFG's Columbian Sharp-tailed Grouse Management Plan at: https://idfg.idaho.gov/sites/default/files/columbian-sharp-tailed-grouse-management-plan-2015-2025.pdf (IDFG 2015).

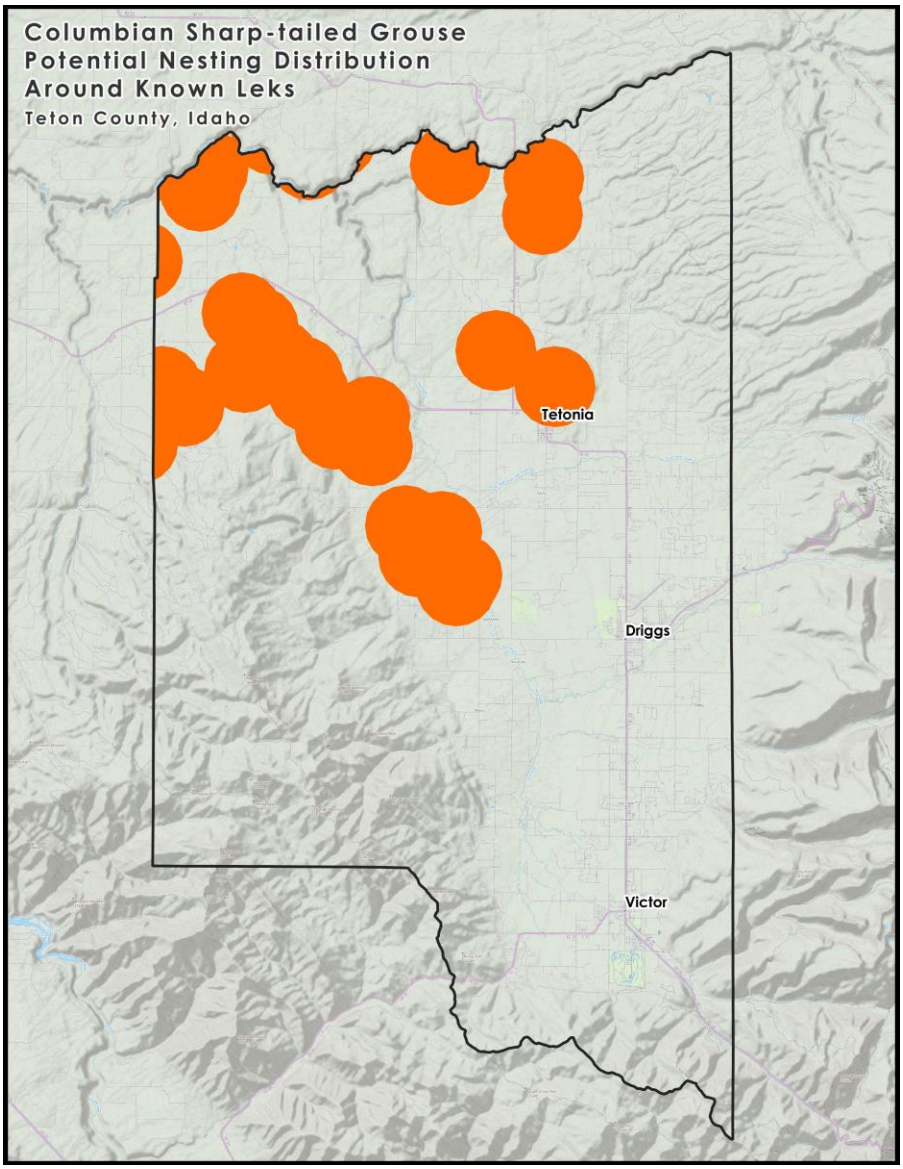

Figure 11. Depicts areas within 2 km (1.2 miles) of known Columbian sharp-tail grouse (CSTG) leks, in Idaho most CSTG nest within 2 km of a lek.

6.2 Songbirds

Songbird is a term generally used to describe a subset of passerines (perching birds) called *oscines*. Due to the anatomy of their syrinx, oscines have a high level of mastery of their vocalizations, hence the common name songbird.

Songbirds that breed in the United States and Canada and winter south of the Tropic of Cancer in Mexico, the Caribbean and Central and South America are termed neotropical migrants. Some songbirds such as American robin and song sparrow are short range migrants, meaning some members of the breeding population move to lower latitudes or elevations during winter, while some may remain on their breeding grounds depending on local conditions. Idaho has 243 breeding bird species, 119 (49%) of which are neotropical migrants. Many neotropical migrant songbirds are experiencing serious population declines and the status of this guild is of special concern to state and

federal agencies and conservation groups. Two main problems contributing to the population declines of neotropical migrants and other songbirds are habitat fragmentation and the loss of breeding, migratory, staging, and wintering grounds.

The Idaho Bird Conservation Plan (Idaho Partners in Flight 2000) categorizes high conservation priority bird species based on their relative vulnerability and also classifies priority bird habitats. Table 1 below summarizes the number of bird species dependent on various habitats in Idaho. Approximately 48% of Idaho's birds depend on riparian and wetlands habitats as primary breeding habitat. These habitats also shelter 39% of Idaho's high conservation priority bird species. Western riparian habitats, particularly willow stands and cottonwood forests, attract 10 times the number of migratory birds (short range and neotropical migrants) during the breeding season than adjacent uplands and 14 times as many birds during fall migration. Neotropical migrants, in particular, rely heavily on riparian landscapes and ongoing population declines of this group are partially attributed to loss and degradation of riparian habitat.

In addition to breeding habitat, riparian areas provide important migration stopover habitat for neotropical migrants. While migratory species seek out their own specialized stopover habitats, most preferred stopover habitats have forest with dense undergrowth. Forests consisting of several layers of vegetation provide more feeding and resting niches, and the dense undergrowth and closed canopy provide cover from predators. Songbird monitoring conducted by Intermountain Research on the Snake River in Jackson Hole, Wyoming (Smith 2002), suggests that residential development in riparian areas may have numerous negative landscape-level effects on breeding bird populations, including an overall decline in species richness and diversity, an increase in avian nest predators, and increase in food generalists (e.g. magpies, robins) at the expense of more vulnerable specialist species (e.g., MacGillivray's warbler, warbling vireo). Therefore, increased residential development in riparian areas of Teton County has the potential to cause habitat degradation not just on private lands but also on adjacent protected public lands. Neotropical migrants are likely most sensitive to habitat fragmentation from residential development and are most negatively impacted by these effects.

All habitats in Teton County support birds. The most important low elevation habitats in Teton County for maintaining bird diversity are riparian habitats (especially the Teton River and cottonwood-lined creek corridors), low-elevation mixed conifers (National Forest boundary), wetlands, and sagebrush-steppe. The grassland, aspen, and juniper mosaic associated with the Teton River Canyon system is also important for conserving songbird diversity.

Table 1. The number of species by Idaho Partners In Flight habitat (Idaho Partners in Flight 2000).

Idaho Habitat Type	# Species Using Habitat (Breeding, Migration, Winter)	# Species Using Habitat as Primary Breeding Habitat	# High Conservation Priority Species Using Habitat as Primary Habitat
Riparian	114	61	13
Low Elevation Mixed Conifer	83	34	9
Marshes, Wetlands	77	55	11
Sagebrush	49	19	9
High Elevation Mixed Conifer	49	16	2
Grassland	48	16	4

Aspen	34	5	1
Lodgepole Pine	31	1	0
Ponderosa Pine	31	5	2
Juniper, Pinyon, Mountain Mahogany	29	14	6
Cliff/Rock	19	10	3
Mountain Brush	18	3	0
Cedar/Hemlock	15	1	1
Alpine	10	3	1
Totals	**607**	**243**	**62**

6.3 Raptors

6.31 Bald Eagle

The bald eagle was listed as endangered, and then threatened, under the federal Endangered Species Act (ESA). Their former status as an endangered, then threatened, species was due primarily to population declines from DDT poisoning that was prevalent in the middle decades of the 20th century. In 2007, the bald eagle was de-listed from the ESA, but it is still federally protected by the Migratory Bird Treaty Act, and the Bald and Golden Eagle Protection Act. Bald eagles in Teton County are primarily associated with the Teton River and the lower reaches of river tributaries for breeding and wintering, although bald eagles are sometimes found foraging far from water. In winter, bald eagles may be found throughout Teton County.

There are 9 known bald eagle breeding areas in Teton County (Whitfield 2018). Bald eagles typically nest in the largest available trees near waterways, usually within uneven-aged, multi-storied stands with additional large trees suitable for perching. Bald eagles typically build alternate nests within a breeding area that may be used variably from year to year. In Teton County, bald eagle pairs initiate nesting in late February and young-of-the-year eagles generally fledge from the nest in late June to early July.

Teton County Christmas bird counts averaged 15 bald eagles (1994–2021) with a high of 30 eagles in 2001 (www.Audubon.org 2022), however as many as 60 bald eagles may be found in the entire county during mid-winter. Snags and large trees are used for roosting, hunting and loafing perches. There are no known traditional roost sites in Teton County, although the Teton River corridor and cottonwood forested tributaries such as South Leigh Creek and Teton Creek comprise the most important roosting habitat for wintering bald eagles in Teton County.

The Greater Yellowstone Bald Eagle Management Plan (Bald Eagle Plan) identifies the following management goal for nesting bald eagles throughout the GYE, including Teton County: *to maintain bald eagle populations in the Greater Yellowstone at levels with high probabilities of persistence and in sufficient numbers to provide significance to the ecosystem, academic research, and readily accessible enjoyment by the recreational and residential public* (Greater Yellowstone Bald Eagle Working Group 1996).

The Bald Eagle Plan identifies several obstacles to achievement of conservation goals including "unguided and excessive development of private lands". The Bald Eagle Plan describes 1 potential solution of this problem: "private conservation organizations (e.g., Teton Regional Land Trust) and private landowners have greatly facilitated maintenance of bald eagle habitat on private lands. Resource managers should continue to assist these groups wherever possible" (Greater Yellowstone Bald Eagle Working Group 1996).

6.32 Other Raptors

As top of the food chain predators that are sensitive to human disturbance, raptors, or birds of prey, can be valuable indicators of ecological function. All raptors are protected species. The CTNF lists peregrine falcon, northern goshawk and great gray owl as *Sensitive* species and the Bureau of Land Management also classifies peregrines and northern goshawk as *Sensitive* in Idaho. Short-eared owl, great gray owl and golden eagle are all designated as Idaho SGCN's.

Among Teton County's sensitive raptor species, peregrine falcons nest on the eastern and southern peripheries of Teton Valley and in Teton Canyon, and commonly hunt in wetlands in the southern portion of Teton County. Northern goshawk are primarily dependent on National Forest Lands around the valley edges, although use of private lands is known in the Packsaddle Bench Area. Short-eared owls, a ground nesting species, are found in marsh and grassland habitat in the lower elevations of Teton Valley. The eastern Idaho/northwestern Wyoming portion of the Greater Yellowstone Ecosystem features a notably large and productive population of great gray owls (Franklin 1987, Whitfield and Gaffney 1997). Franklin (1987) also discovered that unusual numbers of great gray owls were descending to lower elevation habitats in Teton Basin in winters with deep snow at higher elevations. Several Forest Service personnel took considerable interest in great gray winter habitats within the area. Whitfield et al. (1996) documented historic observations during the 1990's. In 1993, and again in 1995, 20–40 wintering great gray owls were observed in an approx. 10 square kilometer area on lower South Leigh Creek between Idaho State Highway 33 and the Teton River. At the time these concentrations represented one of the highest recorded winter concentrations of great gray owls in the Lower 48 United States.

Important raptor nesting habitat in Teton County is found along the Teton River Canyon (where active territories of golden eagle, bald eagle, and peregrine falcon all occur), forested foothills, scattered aspen groves, wet meadow, and major cottonwood corridors (Darby Creek, Teton Creek, South, Middle and North Leigh Creeks, Badger Creek) that extend from the eastern foothills along stream courses to the Teton River at the valley bottom (Whitfield et al. 1996).

7.0 Waterbirds

Waterbirds include waterfowl (ducks, geese and swans), shorebirds, marshbirds, and colonial nesting species such as gulls and terns. Priority waterbirds in Teton County include trumpeter swan, waterfowl, greater sandhill crane and long-billed curlew (IDFG 2020).

7.1 Trumpeter Swan

Trumpeter swans, the largest waterfowl species in the world, were nearly driven extinct in the early 20th century due to commercial hunting. Trumpeter swans are currently listed as a *Sensitive* species by the CTNF and the Idaho BLM. They are designated as a *Species of Greatest Conservation Need* by IDFG (IDFG 2017) and the State Wildlife Action Plan identifies Teton County as having habitat of statewide significance. Trumpeter swans are also listed as a conservation priority species in the North American Waterfowl Management Plan and the Idaho Bird Conservation Plan. There are approximately 11,700 trumpeter swans in the Rocky Mountain Population (RMP) of western Canada and portions of the U.S. Rockies (Groves 2015).

The Rocky Mountain Population (RMP) of trumpeter swans consists of birds nesting from western Canada southward to Nevada and Wyoming and is composed of 2 breeding segments: the U.S. breeding segment and Canadian breeding segment. Trumpeter swans seen in Teton County are part

of the Greater Yellowstone flock (of the US Breeding Segment), that summer in Yellowstone National Park and the portions of Idaho, Montana, and Wyoming within the Greater Yellowstone Area (Olson et al. 2021). Most swans in the Greater Yellowstone flocks remain within this area in winter, where they intermingle with the much larger numbers of RMP migrant trumpeter swans from Canada. During September 2021, the U.S. Fish and Wildlife Service counted 528 trumpeters in the Greater Yellowstone flock and only 100 swans occupied wetlands in Idaho (Olson et al. 2021).

Conservation actions for trumpeter swans recommended in the current State Wildlife Action Plan (IDFG 2017) are:

- maintaining or improving suitable habitat at breeding sites on both public and private lands (through incentives and assistance programs)
- reducing disturbance at breeding sites
- maintaining suitable roost and feeding sites at wintering locations
- installing bird diverters on power lines to limit collisions
- examining broad-scale landscape stressors (e.g., drought and anthropogenic changes) that influence rangewide demographic patterns in the RMP

The 2008 Pacific Flyway Management Plan identifies Teton Basin as a suitable landscape to advance Greater Yellowstone flock goals and sets a minimum of 2 active nests and 10 adults/subadults in Teton Basin. Currently there are 0 nests and increasing summer use by 5-10 birds in the valley. Teton Basin is uniquely situated amid active breeding sites in Yellowstone National Park; Jackson Hole, Wyoming; Sand Creek Wildlife Management Area; Camas National Wildlife Refuge; and Island Park, Idaho. Therefore, establishing nesting and regular summer use by adults/subadults in Teton Basin can increase connectivity between the current nesting habitats in the Greater Yellowstone Area.

In 2013, IDFG, in collaboration with the Teton Regional Land Trust, initiated a swan translocation project in Teton Valley with the goals of establishing summer occupancy and breeding pairs. Captive-reared trumpeter swans have been released at suitable wetland breeding sites in Teton Valley in 2013, 2014, 2016, 2017, 2018, 2020, and 2021. To date the collaborative effort has resulted in summer occupancy by trumpeter swans in most years since 2013, but no nesting attempts as of Summer 2021.

Trumpeter swans are documented winter residents of Teton County since at least 1949 (Maj and Shea 1994). Swans typically concentrate on open water sections of the Teton River and lower sections of its spring-fed tributaries during winter. Small groups start arriving in early November and generally begin leaving by the end of March. The open water that remains in areas free from direct human disturbance, especially the reach from Fox Creek to Teton Creek, allows trumpeters to feed and rest. Open, isolated terrestrial habitats along the Teton River such as meadows or pastures are also valuable roosting/loafing habitats. Trumpeter swans feed heavily on tubers of sago pondweed, which is a common aquatic plant within some reaches of the Teton River and its tributaries.

The U.S. Fish and Wildlife Service has coordinated summer and winter aerial surveys of RMP swans since the 1970's. These surveys reveal that Teton Valley (a sub-sample of Teton County that does not include the canyon reaches of the Teton River) is a key wintering area for trumpeter swans. The

number of trumpeters found along the Teton River in winter is a function of available open-water habitat. Swan use of the Teton River is dynamic and daily numbers vary throughout the winter according to ice conditions. Therefore, data based on a single count during winter is an estimate of minimum documented use. The high count recorded during aerial counts (1978–2005) in Teton Valley is 470 swans in 1986. The low count (20) was recorded in 1981 when the majority of the river was frozen. The 27-year average count along the River within Teton Valley is 186. Christmas bird count data compiled since 1994 in Teton Valley is another index of trumpeter swan winter use. Since 1994, an average of 130 trumpeter swans were counted in a sample area of Teton Valley (M. C. Boeh, personal communication). The Teton River Canyon typically supports 100-200 wintering swans. The most important habitats for wintering trumpeter swans in Teton County include the Teton River (valley reach) and lower tributaries and the Teton River Canyon. For summer resident birds the large block of wetlands east of the Teton River from Woods Creek to Fox Creek are important.

7.2 Other Waterfowl

Waterfowl are an important recreational and economic resource in Teton County. Waterfowl utilize the Teton River, its tributaries and associated wetlands and uplands for nesting, brood-rearing, foraging, and as a corridor for migration for both the Pacific and Central Flyways (Bellrose 1980, Jankovsky-Jones 1996). Teton Basin lies along a northern pintail migration route (P. Thorpe, U.S. Fish and Wildlife Service, personal communication) between central California and the northern plains of the U.S. and Canada. During spring of some years thousands of pintails may rest briefly in Teton Valley on their way north. Mallards migrate along the Teton River and occur in the thousands during spring and fall migration. Mallards, common goldeneye, and Barrow's goldeneye are common wintering ducks in Teton Basin (Audubon 2003). Nineteen species of waterfowl are documented as occurring in Teton Basin during the breeding season, including harlequin duck, mallard, northern pintail, American wigeon, northern shoveler, gadwall, green-winged teal, blue-winged teal, cinnamon teal, ruddy duck, lesser scaup, canvasback, redhead, ring-necked duck, Barrow's goldeneye, bufflehead, hooded merganser, common merganser and Canada goose (TRLT 2001). Several of these waterfowl are considered species of conservation concern by conservation plans and various state and federal agencies.

In 2001 and 2002, biologists conducted waterfowl brood count surveys on 13 selected sites in Teton Valley (TRLT 2001, TRLT 2002). Sites surveyed in 2001 included the Foster Slough wetland complex, several managed wetland areas and portions of 8 stream reaches including Warm Creek, Trail Creek, Darby Creek, Teton Creek, South Leigh Creek, Woods Creek, and Lower Spring Creek. Three additional sites, Upper Spring Creek, Foster's Slough-west, and the Rainbow Bend area of the Teton River, were surveyed in 2002. Surveys were conducted in late June and early July 2001 and 2002. Surveyors found that marsh habitat and portions of lower tributaries of the Teton River are very productive duck breeding areas, particularly for mallard, American wigeon, green-winged teal, and cinnamon teal. Early-nesting duck females likely depend on riparian areas where shrubs, sedges, and other robust grasses and grass-like plants provide early season cover. Later nesting is more widespread throughout the lower elevations of Teton Valley in marsh, grass, and shrub habitats. Crucial habitats for maintaining waterfowl migration, wintering, and nesting habitat include the Teton River corridor and associated wetland and riparian habitat, lower (perennial) sections of Teton River tributaries, slough creeks, Foster Slough wetland complex, and Spring Creek marsh.

7.3 Greater Sandhill Crane

The greater sandhill crane is classified as a *Species of Greatest Conservation Need* by the Idaho State Wildlife Action Plan (IDFG 2017) and is designated as a species conservation priority by the North American Waterbird Conservation Plan and the Intermountain West Waterbird Conservation Plan. The Rocky Mountain Population (RMP) September 2020 survey of greater sandhill cranes counted 25,636 birds with 5,096 individuals in Idaho (Seamans 2021).

Birds from the RMP nest from northwestern Colorado to southwestern Montana (Drewien et al. 1999). Teton County is an important nesting area for greater sandhill cranes. Teton Regional Land Trust biologists have documented approx. 40 greater sandhill crane nests in Teton Valley, all within seasonally or perennially flooded habitat. These nests are a subsample of cranes nesting in Teton County and do not represent a complete breeding population estimate. Greater sandhill cranes typically initiate nesting in April or May within flooded wetlands in Teton County and spend the summer rearing 1–2 colts.

In September cranes from the RMP gather in staging areas to feed and rest prior to undertaking their fall migration to central New Mexico and Mexico. Teton Basin is numerically the top pre-migration staging area for greater sandhill cranes in the Greater Yellowstone Area (Figure 12). In counts conducted by the USFWS between 2003 and 2021 Teton Basin has averaged approximately 1,200 staging cranes per year (Thorpe et al. 2003-2021). This average is down from the 1995-2005 annual average of 1,489 cranes (Drewien et. al. 1995-2005).

Important sandhill crane habitats in Teton County include the Teton River (valley reach) for nesting and spring and fall roosting, wetlands throughout the valley but particularly the greater Foster's Slough area, Woods Creek Fen, and Spring Creek wetland. Important foraging habitat in fall include grain harvested grain fields and wetlands on the west side of the Teton River from Packsaddle Road to Highway 31 (Pine Creek Pass Road).

The importance of working farms to crane conservation in the Rockies is increasingly apparent to biologists. According to Drewien et al. (1999):

> *"RMP cranes have come to depend on private agricultural lands and associated wetlands in intermountain valleys, and their annual movements have been modified by availability of grain crops. Recently, development has increased in many of these valleys, including Teton Basin, and wildlife habitat is decreasing. Innovative partnerships and incentive programs, including easements and cooperative agreements, are needed to maintain habitats on private lands. Maintaining farms and ranches in important use areas would help secure the future for cranes, waterfowl, and other wildlife dependent on these lands."*

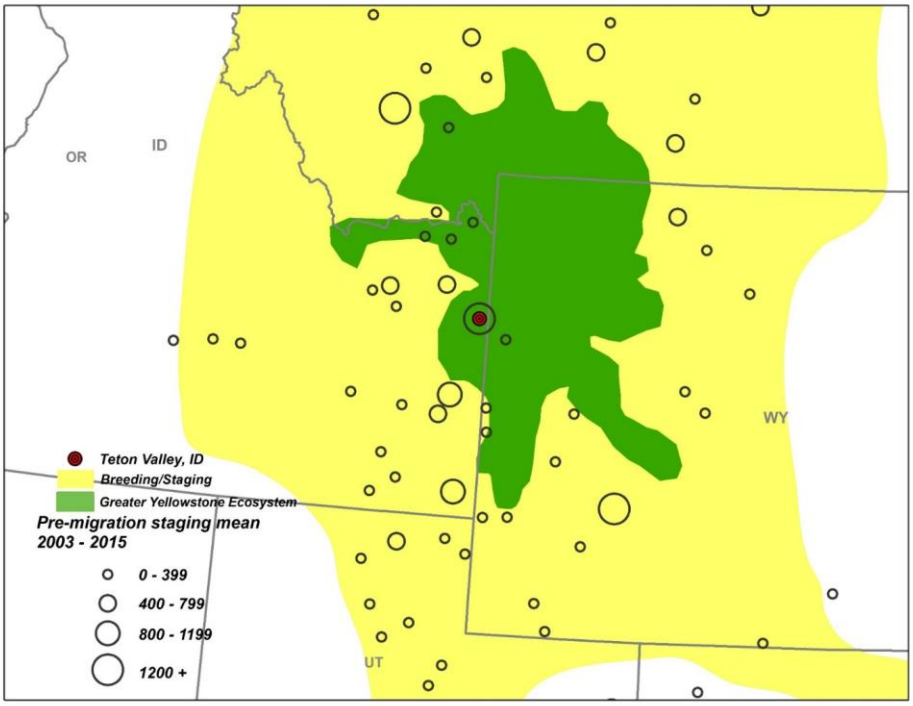

Figure 12. Pre-migration staging areas for Rocky Mountain Population of Sandhill Cranes. Circle size represents relative numerical importance. Source: Intermountain West Joint Venture.

7.4 Long-billed Curlew

The long-billed curlew is a shorebird that breeds in prairie and intermountain grassland basins of western North America, including southern and eastern Idaho. As of 1980, 3,000–5,000 pairs nested in Idaho (IDFG 2017), but the current population is unknown. Curlews that breed in Idaho winter in California and Mexico. Nesting curlews require large, open, and contiguous grasslands. They prefer areas interspersed with emergent wetlands (important at the local scale) and associated with irrigated hay and pasture landscapes. Nesting areas are generally flat or slightly rolling and dominated by grasses. Curlews nest on the ground and lay 1 clutch of 4 eggs per season. They feed on terrestrial insects, aquatic invertebrates, and small vertebrates. Flood-irrigated and sub-irrigated fields are crucial foraging habitats in breeding, transitional, and wintering areas (IDFG 2017) and comprise the most important curlew habitat in Teton County.

The primary threats to long-billed curlew are habitat loss, fragmentation, and degradation of large, open grassland nesting habitats (IDFG 2017). On private lands, major threats include the conversion of grasslands to croplands, rural residential development in landscapes formally dominated by ranching, loss and degradation of wetlands and wet meadows, and loss of flood irrigation (IDFG 2017).

Surveys in Teton County conducted cooperatively by biologists from IDFG and Teton Regional Land Trust have documented a regionally significant, semi-colonial breeding concentration with a high of 59 birds counted during pre-nesting courtship period (mid-late April) in 2004. Counts were also conducted during the summer post nesting period when fewer birds were present (Fig. 13). The goal of the summer count was to count curlew chicks. Completed long-billed curlew surveys were conducted in 2004, 2005, 2007, and 2014 (Fig. 13). A 2011 survey was abandoned due to extreme

weather conditions.

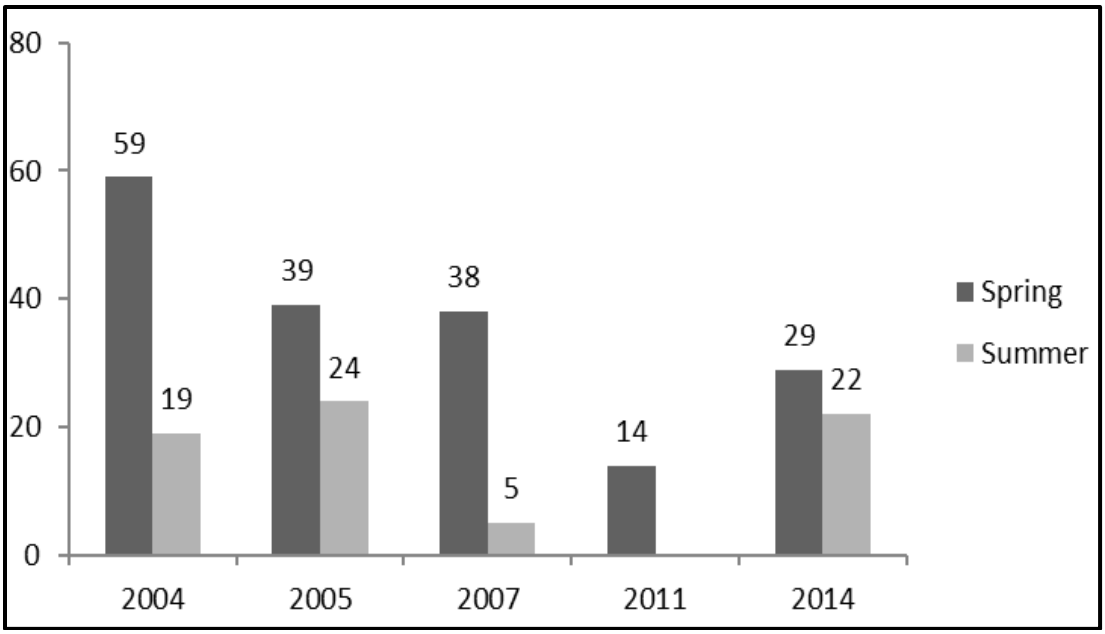

Figure 13. Long-billed curlew counts from the greater Foster's Slough area.

The main nesting habitat for long-billed curlew is the greater Foster's Slough wetland complex that lies on the east side of the Teton River roughly between the mouths of Teton Creek and Fox Creek. Smaller curlew nesting areas are present where patches of open, flood irrigated or sub-irrigated patches remain in Teton Valley.

8.0 Priority Wildlife Habitats in Teton County

Based on the fish and wildlife resources in Teton County and covered in this report, we suggest that some of the most important areas to focus planning for wildlife would be:

- Teton County canyon lands including lower Badger and Bitch Creeks
- The boundary area of the Caribou-Targhee National Forest (Teton Front, Horseshoe Canyon, etc.)
- Teton River corridor (valley reach)
- Fluvial Cottonwood corridors
- Large valley wetland complexes on the east side of the Teton River

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10.0 Appendix A. Summary of Vertebrate Fish and Wildlife Occurrence in Teton County, Idaho

Table 3. Vertebrate fish and wildlife species known or expected to occur in Teton County, Idaho and immediate vicinity, and their relevant conservation status. Based on IDFG data and estimates.

Common Name	*Scientific Name*	Federal	State
Fish			
Bluehead Sucker	*Catostomus discobolus*		S3
Brook Trout	*Salvelinus fontinalis*		SNA
Longnose dase	*Rhinichthys cataractae*		S4
Mottled sculpin	*Cottus bairdi*		S4
Mountain whitefish	*Prosopium williamsoni*		S5
Paiute sculpin	*Cottus beldingi*		S4
Rainbow Trout	*Salmo gairdneri*		SNA
Yellowstone cutthroat trout	*Oncorhynchus clarki bouvieri*	BLM(2)	S4
Redside shiner	*Richardsonius balteatus*		S5
Mountain sucker	*Catostomus platyrhynchus*		S4
Utah sucker	*Catostomus ardens*		S5
Amphibians			
Western tiger salamander	*Ambystoma mavortium*		S4
Boreal chorus frog	*Pseudacris triseriata maculata*		S4
Columbia spotted frog	*Rana pretiosa*	USFS	S4
Western toad	*Anaxyrus boreas boreas*	BLM(3)	Tier 2 SGCN
Northern Leopard Frog	*Rana pipiens*	BLM(2)	Tier 2 SGCN
Reptiles			
Gopher snake	*Pituophis catenifer*		S5
Great Basin rattlesnake	*Crotalis oreganus*		S4

Common Name	*Scientific Name*	Federal	State
North American Racer	*Coluber constrictor*		S5
Northern Rubber boa	*Charine bottae*		S5
Sagebrush lizard	*Sceloporus graciosus*		S5
Short-horned lizard	*Phrynosoma hernandesi*		S3
Common garter snake	*Thamnophis sirtalis*		S4
Terrestrial garter snake	*Thamnophis elegans*		S5
Painted turtle	*Chrysemys picta*		S3
Western skink	*Plestiodon skiltonianus*		S4
Birds			
American Avocet	*Recurvirostra americana*		S3B, S3M
American Bittern	*Botaurus lentiginosus*		Tier 2 SGCN, S1B
American Coot	*Fulica americana*		S4B,S4N
American Crow	*Corvus brachyrhynchos*		S5
American Dipper	*Cinclus mexicanus*		S3
American Golden Plover	*Pluvialis dominica*		S1M
American Goldfinch	*Carduelis tristis*		S5
American Kestrel	*Falco sparverius*		S4
American Redstart	*Setophaga ruticilla*		S2B
American Robin	*Turdus migratorius*		S5
American Tree Sparrow	*Spizella arborea*		S3N
American Wigeon	*Anas americana*		S4B,S4N
American White Pelican	*Pelecanus erythrorhynchos*		Tier 2 SGCN
Baird's Sandpiper	*Calidris bairdii*		S2M
Bald Eagle	*Haliaeetus leucocephalus*	BLM(2)	S5

Common Name	*Scientific Name*	Federal	State
Barn Swallow	*Hirundu rustica*		S5B
Bank Swallow	*Riparia riparia*		S4B
Barrow's Goldeneye	*Bucephala islandica*		S3B, S3N
Belted Kingfisher	*Ceryle alcyon*		S4
Black Tern	*Chlidonias niger*	BLM(2)	Tier 2 SGCN
Black-backed Woodpecker	*Picoides arcticus*	USFS	S4
Black-billed Magpie	*Pica pica*		S5
Black-capped Chickadee	*Parus atricapillus*		S4
Black-crowned Night-Heron	*Nycticorax nycticorax*		
Black-Headed Grosbeak	*Pheucticus melanocephalus*		S5B
Black-necked Stilt	*Himantopus mexicanus*		S4B
Black Rosy-Finch	*Leucosticte atrata*		Tier 3 SGCN
Black Tern	*Childonias niger*	BLM(3)	Tier 2 SGCN
Black- throated Gray Warbler	*Dendroica nigrescens*		
Blue-winged Teal	*Anas discors*		S2B
Bobolink	*Dolichonyx oryzivorus*		Tier 2 SGCN
Bohemian Waxwing	*Bombycilla garrulus*		S4N
Boreal Owl	*Aegolius funereus*	USFS	S1
Black-bellied Plover	*Pluvialis squatarola*		S1M
Brewer's Blackbird	*Euphagus cyanocephalus*		S4
Brewer's Sparrow	*Spizella breweri*	BLM(3)	S4B
Broad-Tailed Hummingbird	*Selasphorus platycercus*		S5B

Common Name	*Scientific Name*	Federal	State
Brown Creeper	*Certhia americana*		S4
Bullock's Oriole	*Icterus bullockii*		S4B
Burrowing Owl	*Athene cunucularia*	BLM(2)	Tier 2 SGCN
Bufflehead	*Bucephala albeola*		S1B, S1N
California Gull	*Larus californicus*		Tier 2b SGCN
Calliope Hummingbird	*Stellula calliope*	BLM(3)	S4B
Canada Goose	*Branta canadensis*		S5B, S5N
Canvasback	*Aythya valisineria*		S3B, S3N
Caspian Tern	*Sterna caspia*		Tier 2b SGCN
Cassin's Finch	*Carpodacus cassinii*	BLM(2)	S4
Cassin's Vireo	*Vireo cassinii*		S5B
Cattle Egret	*Bubulcus ibis*		S1B
Cedar Waxwing	*Bombycilla cedrorum*		S5
Chipping Sparrow	*Spizella passerina*		S5B
Cinnamon Teal	*Anas cyanoptera*		S4B
Clark's Grebe	*Aechmophorus clarkii*		Tier 2 SGCN
Clark's Nutcracker	*Nucifraga columbiana*		Tier 3 SGCN
Cliff Swallow	*Pettrochelidon pyrrhonota*		S5B
Common Goldeneye	*Bucephala clangula*		S5B, S5N
Common Loon	*Gavia immer*	USFS	Tier 2 SGCN
Common Nighthawk	*Chordeiles minor*		Tier 3 SGCN
Common Merganser	*Mergus merganser*		S3
Common Poorwill	*Phalaenoptilus nutallii*		S4B
Common Raven	*Corvus corax*		S5
Common Yellowthroat	*Geothlypis trichas*		S5B

Common Name	*Scientific Name*	Federal	State
Cooper's Hawk	*Accipiter cooperii*		S4
Cordilleran Flycatcher	*Empidonax occidentalis*		S5B
Dark-eyed Junco	*Junco hyemalis*		S5
Double-crested Cormorant	*Phalacrocorax penicilatus*		S4B
Downy Woodpecker	*Picoides pubescens*		S4
Dusky Flycatcher	*Empidonax oberholseri*		S4B
Dusky Grouse	*Dendragapus obscurus*		S5
Eastern Kingbird	*Tyrannus tyrannus*		S5B
Eared Grebe	*Podiceps nigricollis*		S1N, S2B
Eurasion Collared Dove	*Streptopelia decaocto*		SNA
Evening Grosbeak	*Cocothraustes vespertinus*		S4
Ferruginous Hawk	*Buteo regalis*	BLM(3)	Tier 2 SGCN
Flammulated Owl	*Otus flammeolus*	USFS, BLM(3)	S3B
Forster's Tern	*Sterna forsteri*		S2B
Fox Sparrow	*Passerella iliaca*		S4B
Franklin's Gull	*Larus pipixcan*		Tier 3 SGCN
Gadwall	*Anas strepera*		S3
Golden Eagle	*Aquila chrysaetos*	BLM(2)	Tier 2 SGCN
Golden-crowned Kinglet	*Regulus satrapa*		S5
Grasshopper's Sparrow	*Ammmodramus savannarum*	BLM(2)	Tier 3 SGCN
Gray Jay	*Perisoreus canadensis*		S2
Gray Partridge	*Perdix perdix*		SNA
Great Blue Heron	*Ardea herodias*		S5B
Great Egret	*Ardea alba*		S2B

Common Name	*Scientific Name*	Federal	State
Great Gray Owl	*Strix nebulosa*	USFS	Tier 3 SGCN
Great Horned Owl	*Bubo virginianus*		S5
Greater Sage Grouse	*Centrocercus urophasianus*	BLM(1)	Tier 1 SGCN
Greater Yellowlegs	*Tringa melanoleuca*		S3M
Green-winged Teal	*Anas crecca*		S4B, S3N
Green-tailed Towhee	*Pipilo chlorursus*	BLM(2)	S4B
Hairy Woodpecker	*Picoides villosus*		S4
Hammond's Flycatcher	*Empidonax hammondi*	BLM(3)	S5B
Harlequin Duck	*Histrionicus histrionicus*	USFS, BLM(2)	Tier 2 SGCN
Hermit Thrush	*Catharus guttatus*		S4B
Herring Gull	*Larus argentatus*		S2N
Hoary Redpoll	*Carduelis hornemanni*		SNA
Hooded Merganser	*Lophodytes cucullatus*		S2B, S2N
Horned Grebe	*Podiceps auritus*		S2N
Horned Lark	*Eremophilia alpestri*		S5
House Sparrow	*Passer domesticus*		SNA
House Wren	*Troglodytes aedon*		S4B
Juniper Titmouse	*Baeolophus bicolor*		S1
Killdeer	*Charadrius vociferus*		S4B, S4N
Lark Bunting	*Calamospiza melanocorys*		S1B
Lazuli Bunting	*Passerina amoena*		S4B
Least Flycatcher	*Empidonax minimus*		S2B
Least Sandpiper	*Calidris minutilla*		S3M
Lesser Snow Goose	*Chen caerulescens*		S5M

Common Name	*Scientific Name*	Federal	State
Lesser Scaup	*Aythya affinis*		S3B, S3N
Lesser Yellowlegs	*Tringa flavipes*		S2M
Lewis's Woodpecker	*Melanerpes lewis*	BLM(3)	Tier 2 SGCN
Lincoln's Sparrow	*Melospiza lincolnii*		S5B
Loggerhead shrike	*Lanius ludovicianus*	BLM(3)	S3
Long-Billed Curlew	*Numenius americanus*	BLM(2)	Tier 2 SGCN
Long-Billed Dowitcher	*Limnodromus scolopaceus*		S4M
Long-eared Owl	*Asio otus*		S5
MacGillivray's Warbler	*Oporornis tolmiei*		S5B
Mallard	*Anas platyrhynchos*		S4B, S4N
Marbled Godwit	*Limosa fedoe*		S2M
Marsh Wren	*Cistothorus palustris*		S5B, S5N
Merlin	*Falco columbarius*		S4
Mountain Bluebird	*Sialia currucoides*		S5B
Mountain Chickadee	*Poecile gambeli*		S4
Mourning Dove	*Zenaida macroura*		S5
Northern Flicker	*Colaptes auratus*		S5
Northern Goshawk	*Accipiter gentilis*	USFS, BLM(3)	S3
Northern Harrier	*Circus cyaneus*		S4
Northern Pintail	*Anas acuta*		S4B, S4N
Northern Pygmy-Owl	*Glaucidium gnoma*		S3
Northern Rough-winged Swallow	*Stelgidopteryx serripennis*		S4B
Northern Saw-whet Owl	*Aegolius acadicus*		S4
Northern Shoveler	*Anas clypeata*		S4B, S4N
Northern Shrike	*Lanius excubitor*		S3N

Common Name	*Scientific Name*	Federal	State
Northern Waterthrush	*Seiurus noveboracensis*		S4B
Olive-sided Flycatcher	*Contopus borealis*	BLM(2)	Tier 3 SGCN
Orange-crowned Warbler	*Vermivora celata*		S4B
Osprey	*Pandion haliaetus*		S4B
Pectoral Sandpiper	*Calidris melanotos*		S2M
Peregrine Falcon	*Falco peregrinus*	USFS, BLM(3)	S3B
Pied-billed Grebe	*Podilymbus podiceps*		S3
Pine Grosbeak	*Pinicola enucleator*		S4
Pine siskin	*Carduelis pinus*		S4
Prairie Falcon	*Falco mexicanus*	BLM(3)	S4
Red crossbill	*Loxia curvirostra*		S4
Red-breasted Nuthatch	*Sitta canadensis*		S4
Redhead	*Aythya americana*		S4
Red-naped Sapsucker	*Sphyrapicus nuchalis*		S4B
Red-necked Grebe	*Podiceps grisegena*		S2B
Red-necked Phalarope	*Phalaropus tricolor*		S3M
Red-tailed Hawk	*Buteo jamaicensis*		S4
Red–winged Blackbird	*Agelaius phoeniceus*		S5
Ring-Billed Gull	*Larus delawarensis*		Tier 3b SGCN
Ring-Necked Duck	*Aythya collaris*		S4B, S4N
Ring-necked Pheasant	*Phasianus colchicus*		SNA
Rock Dove	*Columba livia*		SNA
Rock Wren	*Salpinctes obsoletus*		S5B
Ross's Goose	*Chen Rossii*		S3M
Rough-Legged Hawk	*Buteo lagopus*		S4N

Common Name	*Scientific Name*	Federal	State
Ruby-crowned Kinglet	*Regulus calendula*		S4
Ruddy Duck	*Oxyura jamaicensis*		S2
Ruffed Grouse	*Bonasa umbellus*		S4
Rufous Hummingbird	*Selasphorus rufus*		S4B
Sage Grouse	*Centrocercus urophasianus*	BLM (2) USFS	Tier 1 SGCN
Sagebrush Sparrow	*Artemisiospiza nevadensis*	BLM(3)	Tier 2 SGCN
Sage Thrasher	*Oreoscoptes montanus*	BLM(3)	Tier 2 SGCN
Sanderling	*Calidris alba*		S1M
Sandhill Crane	*Grus canadensis*		Tier 3 SGCN
Savannah Sparrow	*Passerculus sandwichensis*		S5B
Say's Phoebe	*Sayornis saya*		S5B
Semipalmated Plover	*Charadrius nilsonia*		S1M
Semipalmated Sandpiper	*Calidris pusilla*		S1M
Sharp-shinned Hawk	*Accipiter striatus*		S4
Sharp-tailed Grouse	*Tympanuchus pasianellus*	USFS, BLM	Tier 2 SGCN
Short-billed Dowitcher	*Limnodromus griseus*		SNA
Short-eared Owl	*Asio flammeus*	BLM(2)	Tier 3 SGCN
Snow Bunting	*Plectrophenax nivalis*		S4N
Snow Goose	*Chen caerulescens*		S5M
Snowy Egret	*Egretta thula*		S1B
Solitary Sandpiper	*Tringa solitaria*		S1M
Song Sparrow	*Melospiza melodia*		S5
Sora	*Porzana carolina*		S1N, S4B
Spotted Sandpiper	*Actitis macularia*		S3B
Stellar's Jay	*Cyanocitta stelleri*		S5

Common Name	*Scientific Name*	Federal	State
Swainson's Hawk	*Buteo swainsoni*		S5B
Swainson's Thrush	*Catharus ustulatus*		S5B
Three-toed Woodpecker	*Picoides tridactylus*	USFS	S4
Townsend's Solitaire	*Myadestes townsendi*		S5
Tree Swallow	*Tachycineta bicolor*		S5B
Trumpeter Swan	*Cygnus buccinator*	USFS, BLM(3)	Tier 2 SGCN
Tundra Swan	*Cygnus columbianus*		S4M, S4N
Turkey Vulture	*Cathartes aura*		S5B
Vesper Sparrow	*Pooecetes gramineus*		S5B
Violet-green Swallow	*Tachycineta thalassina*		S5B
Virginia Rail	*Rallus limicola*		S2N, S3B
Virginia's Warbler	*Vermivora virginae*	BLM(4)	S3B
Warbling Vireo	*Vireo gilvus*		S5B
Western Grebe	*Aechmophorous occidendentalis*		Tier 2 SGCN
Western Kingbird	*Tyrannus verticalis*		S5B
Western Meadowlark	*Sturnella neglecta*		S5
Western Sandpiper	*Calidris mauri*		S3M
Western Tanager	*Piranga ludoviciana*		S5B
Western Wood-Pewee	*Contopus sordidulus*		S5B
Western-Screech Owl	*Otus kennicottii*		S1
White-breasted nuthatch	*Sitta carolinensis*		S4
White-crowned Sparrow	*Zonotrichia leucophrys*		S5

Common Name	*Scientific Name*	Federal	State
White-faced ibis	*Plegadis chihi*	BLM(4)	Tier 2 SGCN
White-throated Swift	*Aeronautes saxatalis*		S1N
White-winged Crossbill	*Loxia leucoptera*		S4
Whooping Crane	*Grus americana*		SNA
Wild Turkey	*Meleagris gallopavo*		SNA
Willet	*Catoptrophorus semipalmatus*		S3B
Williamson's Sapsucker	*Sphyrapicus thyroideus*	BLM(3)	S4B
Willow Flycatcher	*Empidonax traillii*	BLM(2)	S4B
Wilson's Phalarope	*Phalaropus tricolor*		S4B
Wilson's Warbler	*Wilsonia pusilla*		S4B
Wilson's Snipe	*Gallinago gallinago*		S3N, S4B
Wood Duck	*Aix sponsa*		S4B, S4N
Yellow-headed Blackbird	*Xanthocephalus xanthocephalus*		S4B
Yellow-rumped Warbler	*Dendroica coronata*		S5
Yellow Warbler	*Dendroica petechia*		S5B
Mammals			
American Marten	*Martes americana*		S5
Badger	*Taxidea taxus*		S4
Beaver	*Castor canadensis*		S4
Big Brown Bat	*Eptesicus fuscus*	BLM(2)	S3
Bighorn Sheep	*Ovis canadensis*	BLM(2)	Tier 2 SGCN
Black Bear	*Ursus americanus*		S4
Black-tailed Jackrabbit	*Lepus californicus*		S4
Bobcat	*Lynx rufus*		S4

Common Name	*Scientific Name*	Federal	State
Bushy-tailed Woodrat	*Neotoma cinerea*		S5
California Myotis	*Myotis californicus*	BLM(2)	S3
Canyon Bat	*Parastrellus hesperus*	BLM(2)	S3
Cliff Chipmunk	*Neotamias dorsalis*		S3
Coyote	*Canis latrans*		S5
Deer Mouse	*Peromyscus maniculatus*		S5
Dusky Shrew	*Sorex monticolus*		S5
Dwarf Shrew	*Sorex nanus*		S2
Elk	*Cervus canadensis*		S5
Ermine	*Mustela erminea*		S4
Fringed Myotis	*Myotis Thysanodes*	USFS BLM(2)	S3
Golden-mantled Ground Squirrel	*Spermophilus lateralis*		S5
Gray wolf	*Canis lupus*	DL, BLM(2)	S4
Grizzly Bear	*Ursus arctos*	LT, BLM(1)	Tier 1 SGCN
Heather Vole	*Phenacomys intermedius*		S5
Hoary Bat	*Lasiurus cinereus*	BLM(2)	Tier 2 SGCN
Idaho Pocket Gopher	*Thommoys idahoensis*		S4
Least Chipmunk	*Neotamias minimus*		S5
Little Brown Bat	*Myotis lucifugus*	BLM(2)	Tier 3 SGCN
Little Pocket Mouse	*Perognathus longimembris*		S1
Long-eared Myotis	*Myotis evotis*	BLM(2)	S3
Long-legged Myotis	*Myotis volans*	BLM(2)	S3

Common Name	*Scientific Name*	Federal	State
Long-tailed Vole	*Microtus longicaudus*		S5
Long-tailed Weasel	*Mustela frenata*		S5
Masked Shrew	*Sorex cinereus*		S5
Meadow Vole	*Microtus pennsylvanicus*		S5
Merriam's Shrew	*Sorex merriami*		S4
Mink	*Mustela vison*		S3
Montane Vole	*Microtus montanus*		S4
Moose	*Alces alces*		S3
Mountain Cottontail	*Sylvilagus nuttallii*		S4
Mountain Goat	*Oreamnos americanus*		Tier 3 SGCN
Mountain Lion	*Puma concolor*		S5
Mule Deer	*Odocoileus hemionus*		S4
Muskrat	*Ondatra zibethica*		S4
Northern Flying Squirrel	*Glaucomys volans*		S4
Northern Grasshopper Mouse	*Onychomys leucogaster*		S4
Northern Pocket Gopher	*Thomomys talpoides*		S5
Pallid Bat	*Antrozous pallidus*	BLM(2)	S3
Pika	*Ochotona princeps*		S3
Pine Squirrel	*Tamiasciurus hudsonicus*		S5
Porcupine	*Erethizon dorsatum*		S5
Pronghorn	*Antilocapra americana*		S4
Raccoon	*Procyon lotor*		S5
Red Fox	*Vulpes fulva*		S4
River Otter	*Lontra canadensis*		S4
Sagebrush Vole	*Lemmiscus curtatis*		S5

Common Name	*Scientific Name*	Federal	State
Silver-haired Bat	*Lasionycteris noctivagans*	BLM(2)	Tier 2 SGCN
Snowshoe Hare	*Lepus americanus*		S3
Southern red-backed vole	*Clethrionomys spp.*		S4
Striped Skunk	*Mephitus mephitus*		S4
Townsend's Big-eared Bat	*Corynorhinus townsendii*	USFS, BLM(2)	Tier 3 SGCN
Townsend's Pocket Gopher	*Thomomys townsendii*		S4
Uinta Chipmunk	*Neotamias umbrinus*		S4
Uinta Ground Squirrel	*Spermophilus armatus*	BLM(4)	S4
Vagrant Shrew	*Sorex vagrans*		S5
Western Water shrew	*Sorex navigator*		S4
Water vole	*Microtus richardsoni*		S4
Western Harvest Mouse	*Reithrodontomys megalotis*		S4
Western jumping mouse	*Zapus princeps*		S4
Western Small-footed Myotis	*Myotis ciliolabrum*	BLM(2)	Tier 3 SGCN
Western spotted skunk	*Spilogale gracilis*		S4
White-tailed deer	*Odocoileus virginianus*		S5
White-tailed Jackrabbit	*Lepus townsendii*		S4
Wolverine	*Gulo gulo*	USFS, BLM(2)	Tier 1 SGCN
Wyoming Ground Squirrel	*Spermophilus elegans*		S3
Yellow-bellied Marmot	*Marmota flaviventris*		S4
Yellow Pine Chipmunk	*Neotamias amoenus*		S5
Yuma Myotis	*Myotis yumanensis*	BLM(2)	S3

Common Name	*Scientific Name*	Federal	State

Federal

- US Fish and Wildlife Service
  - LT=listed Threatened
  - LE=listed Endangered
  - C=Candidate for listing
  - DL= DeListed
  - XN=Experimental-non-essential population
- Bureau of Land Management (BLM)—Sensitive, listed as:
  - Type 1-Threatened, Endangered, Proposed and Candidate Species
  - Type 2-Rangewide/Globally Imperiled Species
  - Type 3-Regional/State Imperiled Species
  - Type 4-Peripheral species
- USDA Forest Service (USFS)– Sensitive

State

Species of Greatest Conservation Need are vertebrate species (except fishes) identified in the Idaho State Wildlife Action Plan (IDFG 2017) for which the Snake River Basalts represents a significant portion of their range.

S = State rank indicator; denotes rank based on status within Idaho.

S1 = Critically imperiled because of extreme rarity or because some factor of its biology makes it especially vulnerable to extinction (typically 5 or fewer occurrences).
S2 = Imperiled because of rarity or because other factors demonstrably make it very vulnerable to extinction (typically 6 to 20 occurrences).
S3 = Rare or uncommon but not imperiled (typically 21 to 100 occurrences).
S4 = Not rare and apparently secure, but with cause for long-term concern (usually more than 100 occurrences).
S5 = Demonstrably widespread, abundant, and secure.