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## Species of Interest Report

### Shoshone National Forest

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## Introduction

This report covers plant and animal species on the Shoshone National Forest for which the responsible official has determined that management actions may be necessary or desirable to achieve ecological, social, or economic objectives.

## Species of interest list

Direction in the 2008 planning rule guides development of the potential species of interest list based on the following criteria (Forest Service Handbook 1909.12, 43.22c). The presence of one or more of the following factors would suggest, but not require, that a species be included as a species of interest.

- Species with ranks of S-1, S-2, N-1, or N-2 on the NatureServe ranking system<sup>1</sup>
- State-listed threatened or endangered species that do not meet the criteria as species of concern
- Species identified as species of conservation concern in state comprehensive wildlife strategies
- Bird species on the U.S. Fish and Wildlife Service Birds of Conservation Concern National Bird Priority List
- Additional species for which valid existing information indicates they are of regional or local conservation concern due to factors that may include:
  - Significant threats to populations or habitat
  - Declining trends in populations or habitat
  - Rarity
  - Restricted ranges
  - Rocky Mountain Region regional forester's sensitive species
- Species that are hunted or fished
- Species of public interest
- Invasive species may also be considered

The potential species of interest list for the Shoshone included over 300 species that are known to exist or have habitat on the Shoshone National Forest and met any of the above criteria. They are shown in appendix 1.

To arrive at the final list, we sought input from Wyoming Game and Fish Department biologists as well as other Forest Service personnel, and prioritized the species based on how many criteria the species met. We discussed threats, local trends, and whether plan components developed for ecosystem diversity were sufficient to conserve the species. This screening process is documented in appendix 2. The final list is shown in Table 1.

The final species of interest list includes species that satisfied all screening criteria and were analyzed further to see if additional plan components were deemed necessary or desirable. Species that met both the criteria of species of concern and species of interest were considered under the species of concern category.

## Species of interest that require additional plan components

Specific plan components were developed for species of interest. For these species, the ecosystem diversity components do not adequately address the needs of the species or

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<sup>1</sup> The NatureServe ranking system is available at <http://www.natureserve.org/>.

there was desire to have additional plan direction for the species. Species on this list are managed to maintain or improve species distribution. The final species of interest list consists of species that may have a very limited distribution, have declining populations, are potentially impacted by management activities, or for which additional plan direction is desired and we have adequate information about their life histories and habitats to create plan components. For each species or species group, the following section includes information on habitat, occurrences, and management risks. There is also an explanation of why the species or group was selected as a species of interest and the purpose of any plan components tied to the species or group.

Most species of interest were grouped using a hierarchical approach to facilitate a fine scale species evaluation and to develop plan components. Some species were not grouped because their needs are unique. Wildlife species were grouped based on ecological requirements (habitat needs) and identified risk factors or threats. In many cases, the ecological understanding and resources needed to manage all species on an individual basis are not available. Efficiencies can be gained from managing groups of species. Often species were chosen that represent habitat needs of other species including species that were not chosen as species of interest. Plant species of interest were placed into habitat guilds established for the major habitat types on the Shoshone.

**Table 1—Shoshone National Forest species of interest**

| Group    | Type      | Common name           | Scientific name                  |
|----------|-----------|-----------------------|----------------------------------|
|          | Bird      | Greater sage grouse   | <i>Centrocercus urophasianus</i> |
|          | Bird      | Northern goshawk      | <i>Accipiter gentilis</i>        |
|          | Mammal    | Bighorn sheep         | <i>Ovis canadensis</i>           |
|          | Mammal    | Elk                   | <i>Cervus elaphus</i>            |
| Riparian | Amphibian | Boreal toad           | <i>Bufo boreas boreas</i>        |
| Riparian | Amphibian | Columbia spotted frog | <i>Rana luteiventris</i>         |
| Riparian | Mammal    | Beaver                | <i>Castor canadensis</i>         |
| Riparian | Mammal    | Moose                 | <i>Alces alces</i>               |
| Riparian | Mammal    | Water vole            | <i>Microtus richardsoni</i>      |
| Riparian | Bird      | Harlequin duck        | <i>Histrionicus histrionicus</i> |
|          | Plant     | Hall's fescue         | <i>Festuca hallii</i>            |
| Alpine   | Plant     | Alpine poppy          | <i>Papaver kluanense</i>         |
| Alpine   | Plant     | Arctic cottongrass    | <i>Eriophorum callitrix</i>      |
| Alpine   | Plant     | Icegrass              | <i>Phippsia algida</i>           |
| Alpine   | Plant     | Island purslane       | <i>Koenigia islandica</i>        |
| Alpine   | Plant     | Northern fescue       | <i>Festuca vivipara</i>          |
| Alpine   | Plant     | Smoothstem parrya     | <i>Parrya nudicaulis</i>         |

### Greater sage grouse

| Common name         | Scientific name                  |
|---------------------|----------------------------------|
| Greater sage grouse | <i>Centrocercus urophasianus</i> |

Greater sage grouse, although still considered common in Wyoming, are experiencing declining population levels throughout their range and are being considered for listing under the Endangered Species Act. Populations are mostly being impacted by the reduction in quality and quantity of sagebrush habitats and by West Nile virus. Greater sage grouse have a very limited distribution on the Shoshone. There are no current occupied lek locations on the Shoshone. Observations of greater sage grouse on the Shoshone have been only during the summer/fall period; plan components will focus on summer/fall brood rearing habitat in known locations on the Shoshone. Map 1 displays

information from the Wyoming Game and Fish Department on greater sage grouse observations and sagebrush habitat on the Shoshone National Forest.

#### **Greater sage grouse summer and late summer habitat**

Summer use areas are those with abundant succulent forbs, and live, tall, and robust sagebrush useful for cover. These areas continue to be used into fall when greater sage grouse move to higher benches/ridges where they forage on remaining succulent forbs such as buckwheat and switch to more utilization of sagebrush leaves.

Habitats used by greater sage grouse in summer (early to mid June to mid to late September) are those that provide adequate forage, especially succulent forbs, and cover useful for escape. The habitats may include those used for agriculture, especially for native and cultivated hay production, edges of bean and potato fields, as well as typical sagebrush uplands and moist drainages. Taller (>16 inches) and robust (10 to 25 percent canopy cover) sagebrush is needed for loafing and escape cover as well as sources of food. Grass and forb cover can exceed 60 percent. Provided moisture is available through water catchments or from succulent foliage, greater sage grouse may be widely dispersed over a variety of habitats during this period (Connelly et al. 2000a). As late summer approaches, there is movement from lower sites to benches and ridges where greater sage grouse forage extensively on leaves of sagebrush.

Insects and forbs compose the bulk of the diet of juvenile greater sage grouse and as chicks age, consumption of sagebrush increases. During summer, diets of adult greater sage grouse are diverse and consist of sagebrush, forbs, and insects.

#### **Summer late brood-rearing habitats**

As sagebrush habitats desiccate, greater sage grouse usually move to more mesic<sup>2</sup> sites during June and July (Gill 1965, Connelly et al. 1988). Greater sage grouse broods occupy a variety of habitats during summer, including sagebrush (Martin 1970), relatively small, burned areas within sagebrush (Pyle and Crawford 1996), wet meadows, farmland, and other irrigated areas adjacent to sagebrush habitats (Connelly et al. 1988) from late June to early November (Connelly 1982, Hanf et al. 1994). Generally, these habitats are characterized by relatively moist conditions and many succulent forbs in or adjacent to sagebrush cover. Apa (1998) reported that sites used by greater sage grouse broods had twice as much forb cover as independent sites.

Threats to greater sage grouse include activities that fragment or degrade habitat components. Invasive plants, erosion, and human disturbance on lek sites are also threats.

#### **Rationale for selection and plan components**

Though greater sage grouse habitat on the Shoshone is very limited, greater sage grouse are experiencing declining population levels and are being considered for listing under the Endangered Species Act. The greater sage grouse was selected as a species of interest given the uncertainty of its future status. Species-specific plan components are designed to maintain habitat conditions for greater sage grouse.

Several plan components not specific to greater sage grouse will benefit this species. The desired conditions to increase sagebrush communities and have a mosaic of age classes, high ground cover of associated grasses and forbs, and natural fire frequencies will benefit greater sage grouse. The objective to increase sagebrush communities by 4,000 acres over the Shoshone will also provide more habitat for greater sage grouse.

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<sup>2</sup> Mesic sites contain a moderate amount of moisture

Plan components specifically for this species consist of guidelines for conducting activities within summer habitat that will be applied in the areas shown in green on Map 1. These components ensure these key habitat components are maintained when projects are conducted in greater sage grouse habitat.

### **Northern goshawk**

| <b>Common name</b> | <b>Scientific name</b> |
|--------------------|------------------------|
|--------------------|------------------------|

|                  |                           |
|------------------|---------------------------|
| Northern goshawk | <i>Accipiter gentilis</i> |
|------------------|---------------------------|

The northern goshawk has typically been labeled an indicator of mature forests. Population fluctuations over its range have led to much controversy about how to manage mature forests. Currently, in the intermountain west, goshawk populations appear to be stable and may even be increasing.

Goshawks prefer to nest in dense, mature, or old growth conifers and aspen/conifer mixed forests, but use a variety of forest ages, structural conditions, and successional stages. The nesting area (about 30 acres) is usually in a mature forest stand that has a multilayered canopy with open understory, small openings, and water within 0.25 mile. Nest stands are often on either slopes with northerly exposures or in drainages or canyon bottoms (Kennedy 2003).

Small mammals and birds make up the majority of goshawk prey and many of these prey species are less abundant in fragmented forest areas (Kennedy 2003). Goshawks need snags, down logs, large trees, and gaps with herbaceous plants consistent with old growth conditions. Nesting and fledgling periods are critical for goshawks. Goshawks need freedom from disturbance.

Northern goshawk surveys have been completed on the Shoshone several times in the past five years. Surveys are completed in areas of highest habitat probability. These surveys have encountered four nesting pairs of goshawks on the Shoshone. Habitat conditions for the northern goshawk are considered moderate, due to the lack of aspen distribution and lack of large old trees.

In 2006, the Shoshone was surveyed for goshawks as part of the Forest Service Rocky Mountain Region's implementation of the national goshawk protocol. In the primary habitat, goshawks were detected in two out of five blocks surveyed.

The primary threat to northern goshawk habitat is from timber management (Kennedy 2003). On the Shoshone, the small relative amount of timber that is harvested is generally harvested in lower elevation areas, which are where most goshawk nests are found. Other sources of threats include fire suppression that has altered stand dynamics (which affects prey availability), disturbance during nesting, and falconry. The current large-scale insect infestations related to drought conditions have resulted in loss of mature forests stands, and this is likely decreasing available goshawk habitat.

#### **Rationale for selection and plan components**

Northern goshawk is a species of high public interest. It is unclear whether population declines are occurring across its range but in some areas, declines appear to have been associated with timber harvesting. Though monitoring on the Shoshone indicates the species is stable at low levels in this area and its habitat is not broadly threatened, it is a species that is tracked in most of the surrounding forests in the Greater Yellowstone Area and throughout the Forest Service Rocky Mountain Region. The Shoshone is currently involved in a regional survey protocol, tiered to the national goshawk protocol. This effort will further define the extent of goshawk populations on the Shoshone.

Goshawks will benefit from several desired conditions described in the plan. Increasing aspen, maintaining mature forests of certain ages, and maintaining snags (and therefore large down wood) are included under ecosystem diversity. Desired conditions and guidelines for snags and coarse woody debris are also important for supporting prey species for the northern goshawk. The guideline specifically for goshawk addresses disturbance during the nesting period. This guideline also protects habitat for brood rearing.

### **Bighorn sheep**

| <b>Common name</b> | <b>Scientific name</b> |
|--------------------|------------------------|
|--------------------|------------------------|

|               |                        |
|---------------|------------------------|
| Bighorn sheep | <i>Ovis canadensis</i> |
|---------------|------------------------|

Bighorn sheep inhabit most of the western mountain ranges of Wyoming, with the largest bighorn sheep population of any national forest occurring on the Shoshone. Bighorn sheep are largely grass dependent and are well adapted to life in high mountain terrain, spending most of the summer at high elevations inhabiting grass/forb covered ridges, mountain slopes and high basin meadows, typically between 8,000 and 12,000 feet. During late fall, many bighorn sheep migrate to lower elevations, foraging along south-facing foothill slopes and ridges. Much bighorn sheep winter habitat is seral,<sup>3</sup> depending on periodic fire to remove shrubs/trees that hinder visibility; periodic fire also recycles nutrients and provides favorable growing conditions for perennial bunchgrasses, their preferred forage.

Bighorn sheep core areas provide habitat for established bighorn sheep herds on the Forest (Map 2). Much of the area contains cliffs, rocky points, and benches intermixed with grass, forb, and shrub communities. Forested stands may also be present but are often avoided by sheep. Population trends for bighorn sheep on the Shoshone are relatively stable, except for the Whiskey Mountain herd, which has sustained substantial declines that are just beginning to be understood.

Because of disease issues in several areas, the sustainability of bighorn sheep herds is a concern. In recent years, the transmission of diseases from domestic livestock, especially domestic sheep, has resulted in significant herd die-offs. Research indicates that diseases such as pasturella and conjunctivitis are transmitted from even apparently healthy domestic sheep to wild sheep when the two are grazing in the same area. Bighorns are more susceptible to respiratory diseases carried by domestic livestock than other ungulates, and the more opportunity for contact they have with domestic stock, the greater the risk that disease will be transmitted. Bighorn sheep are often attracted to domestic sheep and seek their company.

The greatest threat to bighorn sheep is disease. Other threats include conifer encroachment into winter ranges and migration corridors, drought, and anything that reduces quality forage, i.e., invasive plants.

#### **Rationale for selection and plan components**

Bighorn sheep were selected as a species of interest based on their status as a 1) game species, 2) popular viewable species, 3) the Shoshone's status as a major source population, and 4) disease risk from domestic livestock. The selection is weighted more toward social and economic sustainability issues than from ecological diversity sustainability.

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<sup>3</sup> Seral refers to the gradual supplanting of one community of plants by another, the sequence of communities being termed a sere and each stage seral (successional).

Plan components are designed to maintain bighorn sheep habitat and guard against risks from domestic goats and sheep.

Ecosystem diversity plan components will maintain habitat for bighorn sheep. Desired conditions described for grasslands and sagebrush areas are beneficial to sheep. Desired conditions for connectivity and winter range also describe conditions favorable to bighorn sheep. In addition, guidelines for winter range ensure effects from activities on winter range will be minimized.

Specific desired conditions, objectives, and guidelines have been developed to provide for success of bighorn sheep populations on the Shoshone. The desired condition describes quality bighorn sheep habitat, including access to quality winter range and escape terrain, and a low risk of any disease transmission from domestic livestock. It also describes desired bighorn sheep population levels. The objective is to apply fire to improve 3,000 acres of sheep habitat over the planning period. Four guidelines are written for sheep. One is to ensure fire activities maintain quality forage. The second is to ensure domestic sheep grazing does not occur in bighorn sheep range, and the third that domestic goats should not be used to for weed control in bighorn sheep range. The last guideline is to ensure any permitted goat outfitting occurring in bighorn sheep range contains mitigation measures needed to reduce the risk of disease transmission to bighorn sheep.

## Elk

| Common name | Scientific name       |
|-------------|-----------------------|
| Elk         | <i>Cervus elaphus</i> |

Elk occur throughout the west and are especially abundant in the Rocky Mountains. The elk is a symbol of the wild and wide open landscapes of the west. They dwell in forested systems in the summer and in grass and sagebrush areas in the winter. They migrate long distances between summer and winter ranges; transitional ranges used in these movements often represent key habitats. Elk are highly affected by disturbance and rely on secure areas of cover for rest.

Currently on the Shoshone, elk occur at population levels sufficient to support a substantial recreational outfitting industry, provide traditional high quality hunting experiences, and support non-consumptive viewing opportunities.

Threats to elk include anything that impacts migration routes or lowers quality and quantity of forage, human disturbance on winter and parturition (birthing) areas, and human development of winter range areas on private land.

### Rationale for selection and plan components

Elk were selected as a species of interest based on their status as a game species and a species that hunters and non-hunters alike enjoy viewing. The selection is based on social and economic sustainability issues. There are few concerns connected to sustaining elk on the Shoshone.

Plan components are designed to maintain elk habitat and assist the Wyoming Game and Fish Department in population management.

The desired conditions described for cover types will result in the maintenance of vegetation habitat conditions that will maintain elk over time. In addition, the desired condition to have more watersheds with secure habitat will directly benefit elk. Plan components for secure habitat, big game winter range and parturition areas, and management of rangeland are crucial to sustaining elk habitat.

## Riparian group

| Common name           | Scientific name                  |
|-----------------------|----------------------------------|
| Boreal toad           | <i>Bufo boreas boreas</i>        |
| Columbia spotted frog | <i>Rana luteiventris</i>         |
| Beaver                | <i>Castor Canadensis</i>         |
| Moose                 | <i>Alces alces</i>               |
| Water vole            | <i>Microtus richardsoni</i>      |
| Harlequin duck        | <i>Histrionicus histrionicus</i> |

Riparian areas account for a small amount of acres throughout the west, but for a great deal of ecological diversity. Riparian communities support more than just obligatory riparian species; almost all species use riparian areas, especially in the intermountain west where water is at a premium. Habitat types are aspen, cottonwood, willow in lower elevation areas, and spruce/fir types in high elevation areas. Most watersheds on the Shoshone are functioning well from a hydrologic standpoint, although many riparian areas are being heavily encroached by conifers, possibly due to drought and fire suppression, leaving less deciduous vegetation and fewer beavers. Additionally, the introduction of non-native fish, especially in naturally fishless waters, has altered the function of these areas.

### Boreal toad

Boreal toads live in a wide range of habitats in western North America: wetlands, forests, woodlands, sagebrush, meadows, and floodplains in the mountains and valleys. While they primarily use wetland habitats, boreal toads may be observed in other habitats during dispersal to and from breeding sites. Although they have been observed in a wide range of elevations (from sea level to near or above tree line), boreal toads generally occur between 7,380 and 11,800 feet in the Rocky Mountains. In Wyoming, boreal toads use wet habitats in foothills, montane, and subalpine areas, and they are seldom far from water. They may be found in all riparian habitat types (Keinath and McGee 2005).

Breeding takes place in shallow, quiet water in lakes, marshes, bogs, ponds, riparian areas, and wet meadows, often with egg placement optimizing thermal effects of the summer sun. There are no empirical data to suggest a pattern in selection of water body type or size. Breeding has been recorded from large permanent lakes, glacial kettle ponds, human-made ponds, beaver ponds, marshes, and roadside ditches (Keinath and McGee 2005). Bartelt (2000 cited in Keinath and McGee 2005) observed extensive use of terrestrial habitats that contained a variety of microhabitats. Patterns of habitat use by adult toads after breeding may vary according to the sex of the toad and composition of the terrestrial landscape (Campbell 1970 cited in Keinath and McGee 2005). Available evidence indicates that female toads disperse farther and into drier habitats than do males.

Bartelt (2000) also observed that willows, woody debris, and breaks in the shrub or tree canopy layers that allowed sunlight to reach the ground were also frequently used terrestrial habitat features.

Specific threats to boreal toads include disease, decreased water and air quality, roads, timber harvest, livestock grazing, fire and fire management activities, environmental pollutants, non-native species and their management, habitat development and fragmentation, harvest, and commerce (Keinath and McGee 2005). Loss of willow areas and large woody debris in riparian areas can be detrimental as well as loss of properly functioning stream conditions. Further, it is important to preserve critical wetland and terrestrial habitats by directly protecting these areas.

### Columbia spotted frog

Columbia spotted frogs inhabit a variety of vegetation communities, including coniferous or mixed forests, grasslands, and riparian areas of sage-juniper brush lands. Elevation range for the species is reported up to 9,960 feet, with frogs ranging up to 9,480 feet in the Greater Yellowstone Ecosystem (Reaser and Pilliod 2005 cited in Patla and Keinath 2005). Generally, habitat for the spotted frog is restricted to higher elevations or moist riparian zones in arid western landscapes. Because both breeding and over-wintering occur at aquatic sites, populations are located in the general vicinity of ponds, lakes, springs, and/or streams. The examination of movement distances suggests that breeding and wintering sites are generally less than 1,960 feet apart although adults are capable of moving longer distances. Surveys for amphibians in Yellowstone National Park during 2000-2001 found a strong association of Columbia spotted frogs with particular National Wetland Inventory classifications (Cowardin et al. 1979). The highest percentage of frogs was found in palustrine<sup>4</sup> and emergent wetlands. With regard to water regime, the majority were in seasonally flooded areas. As with boreal toads, down woody debris is an important habitat component providing moist microclimates.

Habitat loss, degradation, and fragmentation are potential threats to spotted frogs. Sport fish introduction, water manipulation, road construction, and livestock grazing are identified as the activities most likely to affect habitat. Drought is also a threat to frogs and their habitat, and its effects may be exacerbated by management activities and land uses. Two infectious diseases, chytridiomycosis and ranavirus, have been found in spotted frogs elsewhere in northwest Wyoming and could threaten the persistence of local populations and the abundance of frogs. Spotted frog populations also may be directly affected, in terms of survival and reproduction, by elevated mortality rates from a variety of human and management activities (e.g., road kill, trampling), predation by fish, and exposure to toxic chemicals. On the Bighorn National Forest, the spotted frog population is particularly vulnerable due to its geographical isolation and the small number of active breeding sites (Patla and Keinath 2005).

Human or management activities that may negatively affect spotted frogs and their habitat on the Shoshone include all the above listed threats, particularly road building (e.g., highway along the North Fork of the Shoshone River, forest roads to access timber), fish stocking in naturally fishless lakes and streams, timber management, livestock grazing, and oil and gas exploration/development. Natural events that may affect spotted frogs include drought, wildfire, and range expansion of predators such as raccoons. Also, the occurrence of amphibian disease and mortality events elsewhere in northwest Wyoming suggests a high likelihood for spotted frog populations on the Shoshone to be affected eventually, if not currently, by the diseases chytridiomycosis and ranavirus.

### **Beaver**

When Captains Lewis and Clark traveled through the Rocky Mountains during their exploration of the western United States, they found the region contained more “beaver and common otter, than any other streams on earth.”

Beaver have been extirpated from over 24 percent of the streams in Wyoming due to overtrapping, disease, and conflicts with landowners. Loss of deciduous habitats, possibly due to drought and fire suppression, may be impacting populations. Even in

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<sup>4</sup> Palustrine relates to a system of inland, nontidal wetlands characterized by the presence of trees, shrubs, and emergent vegetation (vegetation rooted below water but grows above the surface). Palustrine wetlands range from permanently saturated or flooded land (as in marshes, swamps, and lake shores) to land that is wet only seasonally (as in vernal pools).

streams where they are currently present, they have often been reduced in numbers to the point of being ecologically absent.

The beaver is a large, highly specialized aquatic rodent found in the immediate vicinity of aquatic habitats. The species occurs in streams, ponds, and the margins of large lakes throughout North America. Beavers are generalized herbivores; however, they show strong preferences for particular plant species and size classes. Generally, beavers select aspen (*Populus tremuloides*), willow (*Salix* spp.), cottonwood (*P. balsamifera*), and alder (*Alnus* spp.) for foraging, den making, and dam making. Aspen and willow are considered preferred beaver foods; these are generally riparian tree species that may be more available for beaver foraging but are not necessarily preferred over all other deciduous tree species.

Beaver habitat is very important in the Rocky Mountains where less than 2 percent of the area is considered wetlands and yet over 80 percent of the wildlife species are dependent on these habitats during some portion of their life cycles. As an example of the importance of these habitats, it is estimated that the removal of beaver has caused a subsequent reduction in habitat for approximately 250,000 breeding waterfowl in Wyoming. In addition to improving wildlife habitat, beaver ponds also provide stock-watering sites, improve water quality, store water throughout the year, and sub-irrigate valuable riparian vegetation.

Threats to beaver habitat include grazing, fire suppression, and some recreation activities. Trapping may be altering the distribution of beaver on the Forest.

#### **Moose**

Moose are the largest members of the deer family and an important game species. In North America, moose occur from Alaska, south along the Rocky Mountains, to Colorado. In Wyoming, moose are found from high spruce/fir zones down to willow and other deciduous riparian communities. Seasonal food items for moose include willow species, bitterbrush, Douglas fir, subalpine fir, aspen, cottonwood, sedges, and rushes. Moose tend to be solitary animals with short movements between summer and winter ranges. Historical records show that moose were very rare in northwest Wyoming in the mid-1800s. By the early 1900s, moose were common throughout northwest Wyoming with good populations inhabiting most of western Wyoming. However, drastic declines in moose numbers have been observed in northwest Wyoming over the past 20 years.

Lack of lower intensity periodic fire, loss of spruce/fir forests due to diseases, drought, and large scale wildfires have altered moose habitats and likely caused declines in moose numbers across the Shoshone. Declining availability of aspen and willow has also likely contributed to a decline in moose numbers/distribution on the Shoshone.

#### **Water vole**

Water voles have a limited and discontinuous geographic range (Map 3), small local populations, and are habitat specialists. Water voles are distributed along alpine and subalpine streams in linear patches with small populations of eight to 40 animals. They occur at elevations between 3,000 and 10,500 feet in the United States and between 5,000 and 7,800 feet in Canada. Water voles are semi-aquatic and use clear, spring-fed mountain streams with gravel bottoms for escape and as transportation routes for daily movement and post-juvenile dispersal. Preferred habitat includes sites with about 11 percent slope, narrow stream channels, and a well-developed substratum of soil for burrowing next to the stream. Water voles use mid-to-late seral stage streamside vegetation of willow, sedges, grasses, and mesic forbs that provide 75 percent cover.

They live at higher elevations with a short three- to four-month period of vegetation growth (Klaus and Beauvais 2004).

Population status, trends, and distribution of the water vole are largely unknown in Wyoming, although they appear to be widespread on the Shoshone (Map 3). Although suitable habitat in Wyoming is widely distributed, it is naturally fragmented and limited. Geographical isolation of existing sub-populations leaves the species vulnerable to large population declines from a large scale environmental event.

Threats to water voles are mainly from anything (mainly livestock grazing) that compacts soils in stream banks and reduces vegetation cover.

#### **Harlequin duck**

Harlequin populations have been declining and because they reproduce slowly, have high site fidelity and low population densities, they are not a species that recovers quickly from any factor (such as habitat degradation) that lowers population numbers (Wiggins 2005).

This species prefers cold, shallow, rapid mountain streams away from concentrated human activities. It nests on the ground along streams with less than 5 percent gradient, dense shrubs lining the banks, braided channels, swift currents, abundant aquatic insects, and good water quality. They feed on invertebrates on the stream bottom and nest in large woody debris (Wiggins 2005).

The Shoshone has known breeding sites on seven streams identified in 1998. These areas were re-surveyed in 2007 with no breeding pairs observed, possibly due to earlier than normal run-off.

Threats that can lower reproduction include disturbance at breeding sites and anything that decreases water quality. Harlequins breed in habitats that are susceptible to management activities, water development projects, and human recreation.

#### **Rationale for selection and plan components**

The boreal toad and Columbia spotted frog were chosen because of precipitous declines in the southern Rockies from a combination of habitat fragmentation and disease impacts. The distribution of these two species on the Shoshone is uncertain and the diseases that impact them, chytridiomycosis and ranavirus, have been documented in Wyoming. These two species were selected because of the possible downward trend that could be occurring on the Shoshone. The ecosystem diversity components of the plan, which benefit these species, may not do enough.

The beaver was chosen as a species of interest primarily because of its role as a keystone species. Beavers play important roles in creating, maintaining, and enhancing habitats used by boreal toads, Columbia spotted frogs, Yellowstone cutthroat trout, moose, and most riparian dependent species. Through dam construction, beavers create breeding habitat; elevate water tables, which leads to enhanced riparian vegetation; and reduce stream flow velocity, which leads to more riparian habitat. Stored water behind dams is available as habitat for amphibians and fish during droughts when isolated and temporary ponds dry up. The selection of beavers provides the opportunity to focus on one species that has the potential to impact and improve habitat conditions for a number of species of interest and concern. For these reasons, additional plan components specifically for beaver were developed.

Moose was selected as a species of interest based upon its status as a game species and on the steadily declining populations that have occurred on the Shoshone. These factors represent a combination of social, economic, and ecological sustainability issues.

The water vole was selected because it is a good indicator of the health of riparian systems where it occurs, particularly in how it relates to compaction and vegetation cover. This provides a finer scale evaluation of riparian health. Though the extent of its distribution on the Shoshone is not fully known, it has been readily found when suitable habitat is surveyed. The conservation assessment for the water vole indicated the Shoshone is an important source population (Klaus and Beauvais 2004). Additional plan components, besides those described for ecosystem diversity, were developed for this species.

The harlequin duck was selected because, while the ecosystem diversity plan components provide good protection of harlequin habitat, harlequins are sensitive to disturbance during the breeding season so an additional plan component was developed.

For all riparian species of interest, the ecosystem diversity plan components for riparian habitat and for willow and aspen cover types will improve and maintain habitat for riparian species. These include the desired conditions for general riparian health, connectivity of riparian areas, availability of snags and down wood, beavers being commonly found, deciduous vegetation, and more willow communities. An objective for increasing willow and removing conifers from willow areas will benefit these species. Guidance from the Watershed Conservation Practices handbook will add to stream and streambank health.

Species-specific plan components were included for boreal toad and Columbia spotted frog. By maintaining down woody debris and willow communities within riparian areas and avoiding use of chemicals in streams, habitat for these species will be protected.

Moose does not have species-specific plan components. The plan components for the other riparian species and the big game winter range plan components support maintenance of moose habitat.

For the water vole, in addition to the above mentioned plan components, a desired condition was added to maintain stable stream banks at 74 percent of reference condition and a mix of vegetation that provides 75 percent cover.

A specific guideline for harlequin ducks was added to protect the species at known breeding sites from disturbance during the breeding season.

One plan objective for riparian species is tied directly to beaver only, and that is to improve deciduous vegetation in two watersheds. The rationale for this objective to improve suitability for beaver occupancy; by improving habitat distribution for this keystone species, habitat for all riparian species will be improved.

### Hall's fescue

| Common name   | Scientific name       |
|---------------|-----------------------|
| Hall's fescue | <i>Festuca hallii</i> |

Hall's fescue is a rare grass species found on calcareous sedimentary soils on Bald Ridge and Rattlesnake Mountain of the Shoshone National Forest. Over grazing may lead to a decline in habitat quality and potentially to direct impacts to the species.

#### Rationale for selection and plan components

Halls' fescue was selected as a species of interest because of its status as a rare endemic, its limited distribution, and its potential for management impacts.

Species-specific plan components were designed to manage grazing impacts on Hall's fescue.

#### Alpine group

| Common name        | Scientific name             |
|--------------------|-----------------------------|
| Alpine poppy       | <i>Papaver Kluanense</i>    |
| Arctic cottongrass | <i>Eriophorum callitrix</i> |
| Icegrass           | <i>Phippisia algida</i>     |
| Island purslane    | <i>Koenigia islandica</i>   |
| Northern fescue    | <i>Festuca vivipara</i>     |
| Smoothstem parrya  | <i>Parrya nudicaulis</i>    |

The alpine group habitat consists of alpine wetland communities that are found in the Beartooth and Wind River Mountains. Recreational livestock pressures may lead to decline in habitat quality and potentially to direct impacts to these species.

#### Rationale for selection and plan components

The alpine species were selected as species of interest because of their status as rare endemics, limited distribution, and potential for management impacts.

Specific plan components were designed to avoid or mitigate impacts identified during recreation management.

## References cited (in progress)

## Appendix A—Species of interest

Table 2—Species that qualify as species of interest under Forest Service Handbook 1909.12, 43.22b

| Type      | Common name           | Scientific name                        | S1-S2 <sup>5</sup> | RFSS <sup>6</sup> | S/E <sub>7</sub> | SGCN <sup>8</sup> | NBPL <sup>9</sup> |
|-----------|-----------------------|--|--------------------|-------------------|------------------|-------------------|-------------------|
| Amphibian | Boreal western toad   | <i>Bufo boreas boreas</i>              |                    | X                 |                  |                   |                   |
| Amphibian | Columbia spotted frog | <i>Rana luteiventris</i>               |                    | X                 |                  | X                 |                   |
| Amphibian | Northern leopard frog | <i>Rana pipiens</i>                    |                    | X                 |                  |                   |                   |
| Bird      | Northern goshawk      | <i>Accipiter gentilis atricapillus</i> |                    | X                 |                  |                   |                   |
| Bird      | Clark's grebe         | <i>Aechmophorus clarkii</i>            |                    |                   |                  | X                 |                   |
| Bird      | Western grebe         | <i>Aechmophorus occidentalis</i>       |                    |                   |                  | X                 |                   |
| Bird      | Boreal owl            | <i>Aegolius funereus</i>               |                    | X                 |                  |                   |                   |
| Bird      | Cassin's sparrow      | <i>Aimophila cassinii</i>              |                    |                   |                  |                   | X                 |
| Bird      | Wood duck             | <i>Aix sponsa</i>                      |                    |                   | X                |                   |                   |
| Bird      | Sage sparrow          | <i>Amphispiza belli</i>                |                    |                   |                  | X                 |                   |
| Bird      | Northern pintail      | <i>Anas acuta</i>                      |                    |                   |                  | X                 |                   |
| Bird      | Great blue heron      | <i>Ardea herodias</i>                  |                    |                   |                  | X                 |                   |
| Bird      | Short-eared owl       | <i>Asio flammeus</i>                   |                    | X                 |                  | X                 | X                 |
| Bird      | Burrowing owl         | <i>Athene cunicularia</i>              |                    |                   |                  | X                 | X                 |
| Bird      | Lesser scaup          | <i>Aythya affinis</i>                  |                    |                   |                  | X                 |                   |
| Bird      | Redhead               | <i>Aythya americana</i>                |                    |                   |                  | X                 |                   |
| Bird      | Canvasback            | <i>Aythya valisineria</i>              |                    |                   |                  | X                 |                   |
| Bird      | Upland sandpiper      | <i>Bartramia longicauda</i>            |                    |                   |                  | X                 |                   |
| Bird      | Ruffed grouse         | <i>Bonasa umbellus</i>                 |                    |                   | X                |                   |                   |
| Bird      | Dusky (blue) grouse   | <i>Dendragapus obscurus</i>            |                    |                   | X                |                   |                   |

<sup>5</sup> NatureServe ranking

<sup>6</sup> Rocky Mountain regional forester sensitive species

<sup>7</sup> Social/economic

<sup>8</sup> Species of greatest conservation need

<sup>9</sup> National Bird Priority List

| Type | Common name               | Scientific name                   | S1-S2 <sup>5</sup> | RFSS <sup>6</sup> | S/E <sub>7</sub> | SGCN <sup>8</sup> | NBPL <sup>9</sup> |
|------|---------------------------|-----------------------------------|--------------------|-------------------|------------------|-------------------|-------------------|
| Bird | American bittern          | <i>Botaurus lentiginosus</i>      |                    |                   |                  | X                 |                   |
| Bird | Barrow's goldeneye        | <i>Bucephala islandica</i>        |                    |                   | X                |                   |                   |
| Bird | Ferruginous hawk          | <i>Buteo regalis</i>              |                    | X                 |                  |                   | X                 |
| Bird | Swainson's hawk           | <i>Buteo swainsoni</i>            |                    |                   |                  | X                 | X                 |
| Bird | McCown's longspur         | <i>Calacarius mccownii</i>        |                    |                   |                  | X                 | X                 |
| Bird | Lark bunting              | <i>Calamospiza melanocorys</i>    |                    |                   |                  | X                 |                   |
| Bird | Chesnut-collared longspur | <i>Calcarius ornatus</i>          |                    |                   |                  | X                 | X                 |
| Bird | Greater sage grouse       | <i>Centrocercus urophasianus</i>  |                    |                   | X                | X                 |                   |
| Bird | American dipper           | <i>Cinclus mexicanus</i>          |                    |                   | X                |                   |                   |
| Bird | Black-billed cuckoo       | <i>Coccyzus erythrophthalmus</i>  |                    |                   |                  |                   | X                 |
| Bird | Olive-sided flycatcher    | <i>Contopus cooperi</i>           |                    | X                 |                  |                   | X                 |
| Bird | Trumpeter swan            | <i>Cygnus buccinator</i>          |                    | X                 |                  | X                 |                   |
| Bird | Black swift               | <i>Cypseloides niger</i>          |                    |                   |                  |                   | X                 |
| Bird | Bobolink                  | <i>Dolichonyx oryzivorus</i>      |                    |                   |                  | X                 |                   |
| Bird | Snowy egret               | <i>Egretta thula</i>              |                    |                   |                  | X                 |                   |
| Bird | Willow flycatcher         | <i>Empidonax traillii</i>         |                    |                   |                  | X                 |                   |
| Bird | Prairie falcon            | <i>Falco mexicanus</i>            |                    |                   |                  |                   | X                 |
| Bird | American peregrine falcon | <i>Falco peregrinus anatum</i>    |                    | X                 |                  |                   | X                 |
| Bird | Common loon               | <i>Gavia immer</i>                |                    |                   |                  | X                 |                   |
| Bird | Greater sandhill crane    | <i>Grus canadensis</i>            |                    |                   |                  | X                 |                   |
| Bird | Bald eagle                | <i>Haliaeetus leucocephalus</i>   |                    |                   |                  | X                 |                   |
| Bird | Harlequin duck            | <i>Histrionicus histrionicus</i>  |                    | X                 |                  |                   |                   |
| Bird | Loggerhead shrike         | <i>Lanius ludovicianus</i>        |                    | X                 |                  |                   | X                 |
| Bird | Red-headed woodpecker     | <i>Melanerpes erythrocephalus</i> |                    |                   |                  |                   | X                 |
| Bird | Black-crowned night heron | <i>Nycticorax nycticorax</i>      |                    |                   |                  | X                 |                   |
| Bird | Sage thrasher             | <i>Oreoscoptes montanus</i>       |                    |                   |                  | X                 |                   |
| Bird | Le Conte's sparrow        | <i>Passerherbulus caudacutus</i>  |                    |                   |                  |                   | X                 |
| Bird | American white pelican    | <i>Pelecanus erythrorhynchos</i>  |                    |                   |                  | X                 |                   |
| Bird | Black-backed woodpecker   | <i>Picoides arcticus</i>          |                    | X                 |                  |                   |                   |

| Type   | Common name                    | Scientific name                           | S1-S2 <sup>5</sup> | RFSS <sup>6</sup> | S/E <sub>7</sub> | SGCN <sup>8</sup> | NBPL <sup>9</sup> |
|--------|--------------------------------|---|--------------------|-------------------|------------------|-------------------|-------------------|
| Bird   | American three-toed woodpecker | <i>Picoides dorsalis</i>                  |                    | X                 |                  |                   |                   |
| Bird   | Virginia rail                  | <i>Rallus limicola</i>                    |                    |                   |                  | X                 |                   |
| Bird   | Rufous Hummingbird             | <i>Selasphorus rufus</i>                  |                    |                   |                  |                   | X                 |
| Bird   | Red-naped sapsucker            | <i>Sphyrapicus ruber</i>                  |                    |                   |                  |                   | X                 |
| Bird   | Williamson's sapsucker         | <i>Sphyrapicus thyroideus</i>             |                    |                   |                  |                   | X                 |
| Bird   | Dickcissel                     | <i>Spiza americana</i>                    |                    |                   |                  | X                 | X                 |
| Bird   | Brewer's sparrow               | <i>Spizella breweri</i>                   |                    | X                 |                  | X                 | X                 |
| Bird   | Canada warbler                 | <i>Wilsonia canadensis</i>                |                    |                   |                  |                   | X                 |
| Bird   | Harris's sparrow               | <i>Zonotrichia querula</i>                |                    |                   | X                |                   | X                 |
| Bird   | Flammulated owl                | <i>Otus flammeolus</i>                    |                    |                   |                  |                   | X                 |
| Fish   | Mountain sucker                | <i>Catostomus platyrhynchus</i>           |                    | X                 |                  |                   |                   |
| Fish   | Burbot                         | <i>Lota lota</i>                          |                    |                   | X                |                   |                   |
| Fish   | Golden trout                   | <i>Oncorhynchus aguabonita</i>            |                    |                   | X                |                   |                   |
| Fish   | Yellowstone cutthroat trout    | <i>Oncorhynchus clarki bouveri</i>        |                    | X                 |                  |                   |                   |
| Fish   | Rainbow trout                  | <i>Oncorhynchus mykiss</i>                |                    |                   | X                |                   |                   |
| Fish   | Brown trout                    | <i>Salmo trutta</i>                       |                    |                   | X                |                   |                   |
| Fish   | Brook trout                    | <i>Salvelinus fontinalis</i>              |                    |                   | X                |                   |                   |
| Fish   | Lake trout                     | <i>Salvelinus namaycush</i>               |                    |                   | X                |                   |                   |
| Fish   | Hybridized trout               | <i>Spp</i>                                |                    |                   | X                |                   |                   |
| Fish   | Arctic grayling                | <i>Thymallus arcticus</i>                 |                    |                   | X                | X                 |                   |
| Fish   | Mountain whitefish             | <i>Prosopium williamsoni</i>              |                    |                   | X                |                   |                   |
| Insect | Hudsonian emerald              | <i>Somatochlora hudsonica</i>             |                    | X                 |                  |                   |                   |
| Mammal | Moose                          | <i>Alces alces</i>                        |                    |                   | X                |                   |                   |
| Mammal | Pronghorn antelope             | <i>Antilocarpa americana</i>              |                    |                   | X                |                   |                   |
| Mammal | American bison                 | <i>Bos bison</i>                          |                    |                   | X                |                   |                   |
| Mammal | Beaver                         | <i>Castor canadensis</i>                  |                    |                   | X                |                   |                   |
| Mammal | Elk                            | <i>Cervus elaphus</i>                     |                    |                   | X                |                   |                   |
| Mammal | Townsend's big-eared bat       | <i>Corynorhinus townsendii pallescens</i> |                    | X                 |                  |                   |                   |

| Type   | Common name                | Scientific name                      | S1-S2 <sup>5</sup> | RFSS <sup>6</sup> | S/E <sub>7</sub> | SGCN <sup>8</sup> | NBPL <sup>9</sup> |
|--------|----------------------------|--------------------------------------|--------------------|-------------------|------------------|-------------------|-------------------|
| Mammal | White-tailed prairie dog   | <i>Cynomys leucurus</i>              |                    | X                 | X                |                   |                   |
| Mammal | Spotted bat                | <i>Euderma maculatum</i>             |                    | X                 | X                |                   |                   |
| Mammal | North American wolverine   | <i>Gulo gulo luscus</i>              |                    | X                 |                  |                   |                   |
| Mammal | Silver haired bat          | <i>Lasionycteris noctivagans</i>     |                    |                   | X                |                   |                   |
| Mammal | Hoary bat                  | <i>Lasiurus cinereus</i>             |                    |                   | X                |                   |                   |
| Mammal | River otter                | <i>Lutra canadensis</i>              |                    | X                 |                  |                   |                   |
| Mammal | Canada lynx                | <i>Lynx canadensis</i>               |                    |                   | X                |                   |                   |
| Mammal | American marten            | <i>Martes americana</i>              |                    | X                 |                  |                   |                   |
| Mammal | Water vole                 | <i>Microtus richardsoni</i>          |                    | X                 |                  |                   |                   |
| Mammal | Long-tailed weasel         | <i>Mustela frenata</i>               |                    |                   | X                |                   |                   |
| Mammal | Fringed myotis             | <i>Myotis thysanodes</i>             |                    | X                 |                  |                   |                   |
| Mammal | American pika              | <i>Ochotona princeps</i>             |                    |                   | X                |                   |                   |
| Mammal | Mule deer                  | <i>Odocoileus hemionus</i>           |                    |                   | X                |                   |                   |
| Mammal | Whitetail deer             | <i>Odocoileus virginianus</i>        |                    |                   | X                |                   |                   |
| Mammal | Mountain goat              | <i>Oreamnos americanus</i>           |                    |                   | X                |                   |                   |
| Mammal | Bighorn sheep              | <i>Ovis canadensis</i>               |                    |                   | X                | X                 |                   |
| Mammal | Western heather vole       | <i>Phenacomys intermedius</i>        |                    |                   | X                |                   |                   |
| Mammal | Mountain lion              | <i>Puma concolor</i>                 |                    |                   | X                |                   |                   |
| Mammal | Dwarf shrew                | <i>Sorex nanus</i>                   |                    |                   | X                |                   |                   |
| Mammal | Vagrant shrew              | <i>Sorex vagrans</i>                 |                    |                   | X                |                   |                   |
| Mammal | Badger                     | <i>Taxidea taxus</i>                 |                    |                   | X                |                   |                   |
| Mammal | Grizzly bear               | <i>Ursos horribilis Ursus arctos</i> |                    |                   | X                | X                 |                   |
| Mammal | Black bear                 | <i>Ursus americanus</i>              |                    |                   | X                |                   |                   |
| Plant  | Muskroot                   | <i>Adoxa moschatellina</i>           | X                  |                   |                  |                   |                   |
| Plant  | Idaho bent                 | <i>Agrostis idahoensis</i>           | X                  |                   |                  |                   |                   |
| Plant  | Northern bent              | <i>Agrostis mertensii</i>            | X                  |                   |                  |                   |                   |
| Plant  | Oregon bent                | <i>Agrostis oregonensis</i>          | X                  |                   |                  |                   |                   |
| Plant  | Sitka alder                | <i>Alnus viridis var. sinuata</i>    | X                  |                   |                  |                   |                   |
| Plant  | <i>Alopecurus borealis</i> | <i>Alopecurus alpinus</i>            | X                  |                   |                  |                   |                   |

| Type  | Common name                          | Scientific name  | S1-S2 <sup>5</sup> | RFSS <sup>6</sup> | S/E <sub>7</sub> | SGCN <sup>8</sup> | NBPL <sup>9</sup> |
|-------|--------------------------------------|--|--------------------|-------------------|------------------|-------------------|-------------------|
| Plant | Roundleaf orchid                     | <i>Amerorchis rotundifolia</i>   |                    | X                 |                  |                   |                   |
| Plant | Sweetflower rockjasmine              | <i>Androsace chamaejasme</i> var. <i>carinata</i>  | X                  |                   |                  |                   |                   |
| Plant | Little Belt Mountain thimbleweed     | <i>Anemone lithophila</i>  | X                  |                   |                  |                   |                   |
| Plant | Smallflower thimbleweed              | <i>Anemone parviflora</i>  | X                  |                   |                  |                   |                   |
| Plant | Scented pussytoes                    | <i>Antennaria aromatica</i>  | X                  |                   |                  |                   |                   |
| Plant | Whip pussytoes                       | <i>Antennaria flagellaris</i>  | X                  |                   |                  |                   |                   |
| Plant | Woolly pussytoes                     | <i>Antennaria lanata</i>   | X                  |                   |                  |                   |                   |
| Plant | Pygmy pussytoes                      | <i>Antennaria monocephala</i>  | X                  |                   |                  |                   |                   |
| Plant | Blue limestone columbine             | <i>Aquilegia jonesii</i>   | X                  |                   |                  |                   |                   |
| Plant | Boechera lemmonii var. drepanoloba   | <i>Arabis lemmonii</i> var. <i>drepanoloba</i>   | X                  |                   |                  |                   |                   |
| Plant | Wind River rockcress                 | <i>Arabis microphylla</i> var. <i>saximontana</i> ; <i>A. pendulocarpa</i> var. <i>saximontana</i> | X                  |                   |                  |                   |                   |
| Plant | Boechera sparsiflora var. subvillosa | <i>Arabis sparsiflora</i> var. <i>subvillosa</i>   | X                  |                   |                  |                   |                   |
| Plant | Arctous rubra                        | <i>Arctostaphylos rubra</i>  | X                  |                   |                  |                   |                   |
| Plant | Narrowleaf leopardbane               | <i>Arnica angustifolia</i> var. <i>tomentosa</i>   | X                  |                   |                  |                   |                   |
| Plant | Artemisia norvegica var. saxatilis   | <i>Artemisia arctica</i> ssp. <i>arctica</i>   | X                  |                   |                  |                   |                   |
| Plant | Pacific wormwood                     | <i>Artemisia campestris</i> var. <i>borealis</i>   | X                  |                   |                  |                   |                   |
| Plant | Broadkeel milkvetch                  | <i>Astragalus platytropis</i>  | X                  |                   |                  |                   |                   |
| Plant | American alpine lady fern            | <i>Athyrium distentifolium</i> var. <i>americanum</i>  | X                  |                   |                  |                   |                   |
| Plant | Lanceleaf moonwort                   | <i>Botrychium lanceolatum</i>  | X                  |                   |                  |                   |                   |
| Plant | Common moonwort                      | <i>Botrychium lunaria</i>  | X                  |                   |                  |                   |                   |
| Plant | Mingan moonwort                      | <i>Botrychium minganense</i>   | X                  |                   |                  |                   |                   |
| Plant | Leathery grape fern                  | <i>Botrychium multifidum</i>   | X                  |                   |                  |                   |                   |
| Plant | Least moonwort                       | <i>Botrychium simplex</i>  | X                  |                   |                  |                   |                   |
| Plant | Rattlesnake fern                     | <i>Botrychium virginianum</i>  | X                  |                   |                  |                   |                   |
| Plant | Alpine northern-rockcress            | <i>Braya humilis</i>   | X                  |                   |                  |                   |                   |

| Type  | Common name                      | Scientific name                                | S1-S2 <sup>5</sup> | RFSS <sup>6</sup> | S/E <sub>7</sub> | SGCN <sup>8</sup> | NBPL <sup>9</sup> |
|-------|----------------------------------|--|--------------------|-------------------|------------------|-------------------|-------------------|
| Plant | Ditch reedgrass                  | <i>Calamagrostis scopulorum</i>                | X                  |                   |                  |                   |                   |
| Plant | Bigpod mariposa lily             | <i>Calochortus eurycarpus</i>                  | X                  |                   |                  |                   |                   |
| Plant | Blackfoot River evening primrose | <i>Camissonia andina</i>                       | X                  |                   |                  |                   |                   |
| Plant | Arctic bellflower                | <i>Campanula uniflora</i>                      | X                  |                   |                  |                   |                   |
| Plant | Bebb's sedge                     | <i>Carex bebbii</i>                            | X                  |                   |                  |                   |                   |
| Plant | Arctic harefoot sedge            | <i>Carex bipartita</i>                         | X                  |                   |                  |                   |                   |
| Plant | Carex deweyana var. bolanderi    | <i>Carex bolanderi</i>                         | X                  |                   |                  |                   |                   |
| Plant | Brownish sedge                   | <i>Carex brunnescens</i>                       | X                  |                   |                  |                   |                   |
| Plant | Buxbaum's sedge                  | <i>Carex buxbaumii</i>                         | X                  |                   |                  |                   |                   |
| Plant | Hairlike sedge                   | <i>Carex capillaris</i>                        | X                  |                   |                  |                   |                   |
| Plant | low northern sedge               | <i>Carex concinna</i>                          | X                  |                   |                  |                   |                   |
| Plant | Lesser tussock sedge             | <i>Carex diandra</i>                           |                    | X                 |                  |                   |                   |
| Plant | Ebony sedge                      | <i>Carex ebenea</i>                            | X                  |                   |                  |                   |                   |
| Plant | Northern bog sedge               | <i>Carex gynocrates</i>                        | X                  |                   |                  |                   |                   |
| Plant | Inland sedge                     | <i>Carex interior</i>                          | X                  |                   |                  |                   |                   |
| Plant | Jones' sedge                     | <i>Carex jonesii</i>                           | X                  |                   |                  |                   |                   |
| Plant | Bristly-stalk sedge              | <i>Carex lasiocarpa</i>                        | X                  |                   |                  |                   |                   |
| Plant | Bristlystalked sedge             | <i>Carex leptalea</i>                          |                    | X                 |                  |                   |                   |
| Plant | Mud sedge                        | <i>Carex limosa</i>                            | X                  |                   |                  |                   |                   |
| Plant | Livid sedge                      | <i>Carex livida</i>                            |                    | X                 |                  |                   |                   |
| Plant | False uncinia sedge              | <i>Carex microglochin</i>                      | X                  |                   |                  |                   |                   |
| Plant | Shortleaf sedge                  | <i>Carex misandra</i>                          | X                  |                   |                  |                   |                   |
| Plant | Nard sedge                       | <i>Carex nardina</i>                           | X                  |                   |                  |                   |                   |
| Plant | Alpine nerve sedge               | <i>Carex neurophora</i>                        | X                  |                   |                  |                   |                   |
| Plant | Western sedge                    | <i>Carex occidentalis</i>                      | X                  |                   |                  |                   |                   |
| Plant | Parry's sedge                    | <i>Carex parryana</i>                          | X                  |                   |                  |                   |                   |
| Plant | Canadian singlespike sedge       | <i>Carex scirpoidea</i> var. <i>scirpoidea</i> | X                  |                   |                  |                   |                   |
| Plant | Dark mountain sedge              | <i>Carex subnigricans</i>                      | X                  |                   |                  |                   |                   |
| Plant | Quill sedge                      | <i>Carex tenera</i>                            | X                  |                   |                  |                   |                   |

| Type  | Common name                   | Scientific name                            | S1-S2 <sup>5</sup> | RFSS <sup>6</sup> | S/E <sub>7</sub> | SGCN <sup>8</sup> | NBPL <sup>9</sup> |
|-------|-------------------------------|--|--------------------|-------------------|------------------|-------------------|-------------------|
| Plant | Carex foetida var. vernacula  | <i>Carex vernacula</i>                     | X                  |                   |                  |                   |                   |
| Plant | Little green sedge            | <i>Carex viridula</i>                      | X                  |                   |                  |                   |                   |
| Plant | Dryland sedge                 | <i>Carex xerantica</i>                     | X                  |                   |                  |                   |                   |
| Plant | Cockscomb Indian paintbrush   | <i>Castilleja crista-galli</i>             | X                  |                   |                  |                   |                   |
| Plant | Nodding chickweed             | <i>Cerastium nutans</i>                    | X                  |                   |                  |                   |                   |
| Plant | Coon's tail                   | <i>Ceratophyllum demersum</i>              | X                  |                   |                  |                   |                   |
| Plant | Chaenactis alpina var. alpina | <i>Chaenactis douglasii var. alpina</i>    | X                  |                   |                  |                   |                   |
| Plant | Slender woodreed              | <i>Cinna latifolia</i>                     | X                  |                   |                  |                   |                   |
| Plant | Small enchanter's nightshade  | <i>Circaea alpina var. pacifica</i>        | X                  |                   |                  |                   |                   |
| Plant | Elk thistle                   | <i>Cirsium foliosum</i>                    | X                  |                   |                  |                   |                   |
| Plant | White thistle                 | <i>Cirsium hookerianum</i>                 | X                  |                   |                  |                   |                   |
| Plant | Rosy pussypaws                | <i>Cistanthe rosea</i>                     | X                  |                   |                  |                   |                   |
| Plant | Potentilla palustris          | <i>Comarum palustre</i>                    | X                  |                   |                  |                   |                   |
| Plant | Williams' miterwort           | <i>Conimitella williamsii</i>              | X                  |                   |                  |                   |                   |
| Plant | Pacific coralroot             | <i>Corallorhiza mertensiana</i>            | X                  |                   |                  |                   |                   |
| Plant | Spring coralroot              | <i>Corallorhiza wisteriana</i>             | X                  |                   |                  |                   |                   |
| Plant | Smoothseed pygmyweed          | <i>Crassula solieri</i>                    | X                  |                   |                  |                   |                   |
| Plant | Snake River catseye           | <i>Cryptantha spiculifera</i>              | X                  |                   |                  |                   |                   |
| Plant | Yellow lady's slipper         | <i>Cypripedium parviflorum</i>             |                    | X                 |                  |                   |                   |
| Plant | Fragile rockbrake             | <i>Cryptogramma stelleri</i>               | X                  |                   |                  |                   |                   |
| Plant | California oatgrass           | <i>Danthonia californica</i>               | X                  |                   |                  |                   |                   |
| Plant | Annual hairgrass              | <i>Deschampsia danthonioides</i>           | X                  |                   |                  |                   |                   |
| Plant | Slender hairgrass             | <i>Deschampsia elongata</i>                | X                  |                   |                  |                   |                   |
| Plant | Sierra tansymustard           | <i>Descurainia californica</i>             | X                  |                   |                  |                   |                   |
| Plant | Wind River tansymustard       | <i>Descurainia torulosa</i>                |                    | X                 |                  |                   |                   |
| Plant | Longhorn steershead           | <i>Dicentra uniflora</i>                   | X                  |                   |                  |                   |                   |
| Plant | Boreal whitlowgrass           | <i>Draba borealis</i>                      | X                  |                   |                  |                   |                   |
| Plant | Denseleaf whitlowgrass        | <i>Draba densifolia</i>                    | X                  |                   |                  |                   |                   |
| Plant | Austrian whitlowgrass         | <i>Draba fladnizensis var. pattersonii</i> | X                  |                   |                  |                   |                   |

| Type  | Common name                   | Scientific name                                      | S1-S2 <sup>5</sup> | RFSS <sup>6</sup> | S/E <sub>7</sub> | SGCN <sup>8</sup> | NBPL <sup>9</sup> |
|-------|-------------------------------|--|--------------------|-------------------|------------------|-------------------|-------------------|
| Plant | Smooth whitlowgrass           | <i>Draba glabella</i>                                | X                  |                   |                  |                   |                   |
| Plant | Payson's whitlowgrass         | <i>Draba paysonii</i> var. <i>treleasii</i>          | X                  |                   |                  |                   |                   |
| Plant |                               | <i>Draba porsildii</i>                               | X                  |                   |                  |                   |                   |
| Plant | Tall whitlowgrass             | <i>Draba praealta</i>                                | X                  |                   |                  |                   |                   |
| Plant | English sundew                | <i>Drosera anglica</i>                               | X                  | X                 |                  |                   |                   |
| Plant | Spreading wood fern           | <i>Dryopteris expansa</i>                            | X                  |                   |                  |                   |                   |
| Plant | Garrett's firechalice         | <i>Epilobium canum</i> var. <i>garrettii</i>         | X                  |                   |                  |                   |                   |
| Plant | Glaucus willowherb            | <i>Epilobium glaberrimum</i> var. <i>fastigiatum</i> | X                  |                   |                  |                   |                   |
| Plant | Swamp willowherb              | <i>Epilobium palustre</i> var. <i>palustre</i>       | X                  |                   |                  |                   |                   |
| Plant | Narrowleaf goldenbush         | <i>Ericameria discoidea</i> var. <i>linearis</i>     | X                  |                   |                  |                   |                   |
| Plant | Rubber rabbitbrush            | <i>Ericameria nauseosa</i> var. <i>oreophila</i>     | X                  |                   |                  |                   |                   |
| Plant | Parry's rabbitbrush           | <i>Ericameria parryi</i> var. <i>howardii</i>        | X                  |                   |                  |                   |                   |
| Plant | Trailing fleabane             | <i>Erigeron flagellaris</i>                          | X                  |                   |                  |                   |                   |
| Plant | Arctic alpine fleabane        | <i>Erigeron humilis</i>                              | X                  |                   |                  |                   |                   |
| Plant | Desert yellow fleabane        | <i>Erigeron linearis</i>                             | X                  |                   |                  |                   |                   |
| Plant | Slender fleabane              | <i>Erigeron tener</i>                                | X                  |                   |                  |                   |                   |
| Plant | Piper's yellow buckwheat      | <i>Eriogonum flavum</i> var. <i>piperi</i>           | X                  |                   |                  |                   |                   |
| Plant | Parsnipflower buckwheat       | <i>Eriogonum heracleoides</i>                        | X                  |                   |                  |                   |                   |
| Plant | Arctic cottongrass            | <i>Eriophorum callitrix</i>                          | X                  |                   |                  |                   |                   |
| Plant | Chamisso's cottongrass        | <i>Eriophorum chamissonis</i>                        |                    | X                 |                  |                   |                   |
| Plant | Slender cottongrass           | <i>Eriophorum gracile</i>                            |                    | X                 |                  |                   |                   |
| Plant | White cottongrass             | <i>Eriophorum scheuchzeri</i>                        | X                  |                   |                  |                   |                   |
| Plant | Tassel cottongrass            | <i>Eriophorum viridicarinatum</i>                    | X                  |                   |                  |                   |                   |
| Plant | Howard's alpine forget-me-not | <i>Eritrichium howardii</i>                          | X                  |                   |                  |                   |                   |
| Plant | Baffin fescue                 | <i>Festuca baffinensis</i>                           | X                  |                   |                  |                   |                   |
| Plant | Hall's fescue                 | <i>Festuca hallii</i>                                | X                  | X                 |                  |                   |                   |
| Plant | Smallflower fescue            | <i>Festuca minutiflora</i>                           | X                  |                   |                  |                   |                   |
| Plant | Red fescue                    | <i>Festuca rubra</i> var. <i>rubra</i>               | X                  |                   |                  |                   |                   |

| Type  | Common name                     | Scientific name                       | S1-S2 <sup>5</sup> | RFSS <sup>6</sup> | S/E <sub>7</sub> | SGCN <sup>8</sup> | NBPL <sup>9</sup> |
|-------|---------------------------------|---------------------------------------|--------------------|-------------------|------------------|-------------------|-------------------|
| Plant | Northern fescue                 | <i>Festuca vivipara</i>               | X                  |                   |                  |                   |                   |
| Plant | False mermaidweed               | <i>Floerkea proserpinacoides</i>      | X                  |                   |                  |                   |                   |
| Plant | Alpine spicywintergreen         | <i>Gaultheria humifusa</i>            | X                  |                   |                  |                   |                   |
| Plant | Dwarf groundsmoke               | <i>Gayophytum humile</i>              | X                  |                   |                  |                   |                   |
| Plant | Whitish gentian                 | <i>Gentiana algida</i>                | X                  |                   |                  |                   |                   |
| Plant | Pygmy gentian                   | <i>Gentiana prostrata</i>             | X                  |                   |                  |                   |                   |
| Plant | Fourpart dwarf gentian          | <i>Gentianella propinqua</i>          | X                  |                   |                  |                   |                   |
| Plant | Bicknell's cranesbill           | <i>Geranium bicknellii</i>            | X                  |                   |                  |                   |                   |
| Plant | Small floating mannagrass       | <i>Glyceria borealis</i>              | X                  |                   |                  |                   |                   |
| Plant | Hooker's alpine oatgrass        | <i>Helictotrichon hookeri</i>         | X                  |                   |                  |                   |                   |
| Plant | Morton's alpine oatgrass        | <i>Helictotrichon mortonianum</i>     | X                  |                   |                  |                   |                   |
| Plant | Pacific alpinegold              | <i>Hulsea algida</i>                  | X                  |                   |                  |                   |                   |
| Plant | Juncus triglumis var. albescens | <i>Juncus albescens</i>               | X                  |                   |                  |                   |                   |
| Plant | Baltic rush                     | <i>Juncus balticus var. vallicola</i> | X                  |                   |                  |                   |                   |
| Plant | Twoflower rush                  | <i>Juncus biglumis</i>                | X                  |                   |                  |                   |                   |
| Plant | Chestnut rush                   | <i>Juncus castaneus</i>               | X                  |                   |                  |                   |                   |
| Plant | Thread rush                     | <i>Juncus filiformis</i>              | X                  |                   |                  |                   |                   |
| Plant | Hall's rush                     | <i>Juncus hallii</i>                  | X                  |                   |                  |                   |                   |
| Plant | Regel's rush                    | <i>Juncus regelii</i>                 | X                  |                   |                  |                   |                   |
| Plant | Juncus triglumis var. triglumis | <i>Juncus triglumis</i>               | X                  |                   |                  |                   |                   |
| Plant | Vasey's rush                    | <i>Juncus vaseyi</i>                  | X                  |                   |                  |                   |                   |
| Plant | Milky kelloggia                 | <i>Kelloggia galioides</i>            | X                  |                   |                  |                   |                   |
| Plant | Oneflower kelseya               | <i>Kelseya uniflora</i>               | X                  |                   |                  |                   |                   |
| Plant | Pacific bog sedge               | <i>Kobresia myosuroides</i>           | X                  |                   |                  |                   |                   |
| Plant | Siberian bog sedge              | <i>Kobresia sibirica</i>              | X                  |                   |                  |                   |                   |
| Plant | Simple bog sedge                | <i>Kobresia simpliciuscula</i>        |                    | X                 |                  |                   |                   |
| Plant | Island purslane                 | <i>Koenigia islandica</i>             | X                  |                   |                  |                   |                   |
| Plant | Trapper's tea                   | <i>Ledum glandulosum</i>              | X                  |                   |                  |                   |                   |
| Plant | Star duckweed                   | <i>Lemna trisulca</i>                 | X                  |                   |                  |                   |                   |

| Type  | Common name                          | Scientific name                                | S1-S2 <sup>5</sup> | RFSS <sup>6</sup> | S/E <sub>7</sub> | SGCN <sup>8</sup> | NBPL <sup>9</sup> |
|-------|--------------------------------------|--|--------------------|-------------------|------------------|-------------------|-------------------|
| Plant | Dense bladderpod                     | <i>Lesquerella condensata</i>                  | X                  |                   |                  |                   |                   |
| Plant | Fremont's bladderpod                 | <i>Lesquerella fremontii</i>                   |                    | X                 |                  |                   |                   |
| Plant | Threelobed bitterroot                | <i>Lewisia triphylla</i>                       | X                  |                   |                  |                   |                   |
| Plant | Canby's wild lovage                  | <i>Ligusticum canbyi</i>                       | X                  |                   |                  |                   |                   |
| Plant | Leptosiphon nuttallii                | <i>Linanthus nuttallii</i>                     | X                  |                   |                  |                   |                   |
| Plant | King's flax                          | <i>Linum kingii</i>                            | X                  |                   |                  |                   |                   |
| Plant | Northern twayblade                   | <i>Listera borealis</i>                        | X                  |                   |                  |                   |                   |
| Plant | Heartleaf twayblade                  | <i>Listera cordata</i>                         | X                  |                   |                  |                   |                   |
| Plant | Streambank desertparsley             | <i>Lomatium ambiguum</i>                       | X                  |                   |                  |                   |                   |
| Plant | Velvet lupine                        | <i>Lupinus leucophyllus</i>                    | X                  |                   |                  |                   |                   |
| Plant | Lupinus polyphyllus var. prunophilus | <i>Lupinus prunophilus</i>                     | X                  |                   |                  |                   |                   |
| Plant | Smooth woodrush                      | <i>Luzula glabrata</i> var. <i>hitchcockii</i> | X                  |                   |                  |                   |                   |
| Plant | Common woodrush                      | <i>Luzula multiflora</i>                       | X                  |                   |                  |                   |                   |
| Plant | Piper's woodrush                     | <i>Luzula wahlenbergii</i>                     | X                  |                   |                  |                   |                   |
| Plant | Stiff groundpine                     | <i>Lycopodium annotinum</i> L.                 | X                  |                   |                  |                   |                   |
| Plant | Variiegated-bract blazingstar        | <i>Mentzelia montana</i>                       | X                  |                   |                  |                   |                   |
| Plant | Spindle bluebells                    | <i>Mertensia fusiformis</i>                    | X                  |                   |                  |                   |                   |
| Plant | Brewer's monkeyflower                | <i>Mimulus breweri</i>                         | X                  |                   |                  |                   |                   |
| Plant | Muskflower                           | <i>Mimulus moschatus</i>                       | X                  |                   |                  |                   |                   |
| Plant | Subalpine monkeyflower               | <i>Mimulus tilingii</i>                        | X                  |                   |                  |                   |                   |
| Plant | Columbian stitchwort                 | <i>Minuartia austromontana</i>                 | X                  |                   |                  |                   |                   |
| Plant | Hypopitys monotropa                  | <i>Monotropa hypopitys</i>                     | X                  |                   |                  |                   |                   |
| Plant | Chamisso's minerslettuce             | <i>Montia chamissoi</i>                        | X                  |                   |                  |                   |                   |
| Plant | Foxtail muhly                        | <i>Muhlenbergia andina</i>                     | X                  |                   |                  |                   |                   |
| Plant | Marsh muhly                          | <i>Muhlenbergia glomerata</i>                  | X                  |                   |                  |                   |                   |
| Plant | Whorled water-milfoil                | <i>Myriophyllum verticillarum</i>              | X                  |                   |                  |                   |                   |
| Plant | Coyote tobacco                       | <i>Nicotiana attenuata</i>                     | X                  |                   |                  |                   |                   |
| Plant | Flattop broomrape                    | <i>Orobanche corymbosa</i>                     | X                  |                   |                  |                   |                   |
| Plant | Parry's locoweed                     | <i>Oxytropis parryi</i>                        | X                  |                   |                  |                   |                   |

| Type  | Common name                        | Scientific name   | S1-S2 <sup>5</sup> | RFSS <sup>6</sup> | S/E <sub>7</sub> | SGCN <sup>8</sup> | NBPL <sup>9</sup> |
|-------|------------------------------------|---|--------------------|-------------------|------------------|-------------------|-------------------|
| Plant | Stalkpod locoweed                  | <i>Oxytropis podocarpa</i>                              | X                  |                   |                  |                   |                   |
| Plant | Weakstem groundsel                 | <i>Packera debilis</i>                                  | X                  |                   |                  |                   |                   |
| Plant | Payson's groundsel                 | <i>Packera dimorphophylla</i> var. <i>paysonii</i>      | X                  |                   |                  |                   |                   |
| Plant | Rayless mountain groundsel         | <i>Packera indecora</i>                                 | X                  |                   |                  |                   |                   |
| Plant | Streambank groundsel               | <i>Packera pseud aurea</i> var. <i>pseud aurea</i>      | X                  |                   |                  |                   |                   |
| Plant | Alpine poppy                       | <i>Papaver kluanense</i>                                | X                  |                   |                  |                   |                   |
| Plant | Kotzebue's grass-of-parnassus      | <i>Parnassia kotzebuei</i>                              |                    | X                 |                  |                   |                   |
| Plant | Smoothstem parrya                  | <i>Parrya nudicaulis</i>                                | X                  |                   |                  |                   |                   |
| Plant | Coiled lousewort                   | <i>Pedicularis contorta</i> var. <i>contorta</i>        | X                  |                   |                  |                   |                   |
| Plant | Oeder's lousewort                  | <i>Pedicularis oederi</i>                               | X                  |                   |                  |                   |                   |
| Plant | Giant lousewort                    | <i>Pedicularis procera</i>                              | X                  |                   |                  |                   |                   |
| Plant | Absaroka Range beardtongue         | <i>Penstemon absarokensis</i>                           |                    | X                 |                  |                   |                   |
| Plant | Stiffleaf beardtongue              | <i>Penstemon aridus</i>                                 | X                  |                   |                  |                   |                   |
| Plant | Shrubby beardtongue                | <i>Penstemon fruticosus</i>                             | X                  |                   |                  |                   |                   |
| Plant | Petasites frigidus var. sagittatus | <i>Petasites sagittatus</i>                             | X                  |                   |                  |                   |                   |
| Plant | Icegrass                           | <i>Phippisia algida</i>                                 | X                  |                   |                  |                   |                   |
| Plant | Yellow mountainheath               | <i>Phyllodoce glanduliflora</i>                         | X                  |                   |                  |                   |                   |
| Plant | White spruce                       | <i>Picea glauca</i>                                     | X                  |                   |                  |                   |                   |
| Plant | Bluntleaf orchid                   | <i>Platanthera obtusata</i>                             | X                  |                   |                  |                   |                   |
| Plant | Slender bog orchid                 | <i>Platanthera stricta</i>                              | X                  |                   |                  |                   |                   |
| Plant | Prairie bluegrass                  | <i>Poa arida</i>  | X                  |                   |                  |                   |                   |
| Plant | Letterman's bluegrass              | <i>Poa lettermanii</i>                                  | X                  |                   |                  |                   |                   |
| Plant | Polygonum spergulariiforme         | <i>Polygonum douglasii</i> ssp. <i>spergulariiforme</i> | X                  |                   |                  |                   |                   |
| Plant | Douglas' knotweed                  | <i>Polygonum douglasii</i> var. <i>austiniae</i>        | X                  |                   |                  |                   |                   |
| Plant | Broadleaf knotweed                 | <i>Polygonum minimum</i>                                | X                  |                   |                  |                   |                   |
| Plant | Northern holly fern                | <i>Polystichum lonchitis</i>                            | X                  |                   |                  |                   |                   |
| Plant | Alpine pondweed                    | <i>Potamogeton alpinus</i>                              | X                  |                   |                  |                   |                   |

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|-------|------------------------|--|--------------------|-------------------|------------------|-------------------|-------------------|
| Plant | Flatstalk pondweed     | <i>Potamogeton friesii</i>                           | X                  |                   |                  |                   |                   |
| Plant | Illinois pondweed      | <i>Potamogeton illinoiensis</i>                      | X                  |                   |                  |                   |                   |
| Plant | Whitestem pondweed     | <i>Potamogeton praelongus</i>                        | X                  |                   |                  |                   |                   |
| Plant | Robbin's pondweed      | <i>Potamogeton robbinsii</i>                         | X                  |                   |                  |                   |                   |
| Plant | Stuckenia vaginata     | <i>Potamogeton vaginatus</i>                         | X                  |                   |                  |                   |                   |
| Plant | Shortleaf cinquefoil   | <i>Potentilla brevifolia</i>                         | X                  |                   |                  |                   |                   |
| Plant | Hooker's cinquefoil    | <i>Potentilla hookeriana</i>                         | X                  |                   |                  |                   |                   |
| Plant | Potentilla hyparctica  | <i>Potentilla nana</i>                               | X                  |                   |                  |                   |                   |
| Plant | Snow cinquefoil        | <i>Potentilla nivea</i>                              | X                  |                   |                  |                   |                   |
| Plant | Sheep cinquefoil       | <i>Potentilla ovina</i> var. <i>decurrens</i>        | X                  |                   |                  |                   |                   |
| Plant | Brook cinquefoil       | <i>Potentilla rivalis</i>                            | X                  |                   |                  |                   |                   |
| Plant | Colorado cinquefoil    | <i>Potentilla subjuga</i>                            | X                  |                   |                  |                   |                   |
| Plant | Oneflower cinquefoil   | <i>Potentilla uniflora</i>                           | X                  |                   |                  |                   |                   |
| Plant | Greenland primrose     | <i>Primula egaliksensis</i>                          |                    | X                 |                  |                   |                   |
| Plant | Whitevein wintergreen  | <i>Pyrola picta</i> var. <i>dentata</i>              |                    | X                 |                  |                   |                   |
| Plant | Manysted goldenweed    | <i>Pyrrocoma integrifolia</i>                        |                    | X                 |                  |                   |                   |
| Plant | Ice cold buttercup     | <i>Ranunculus gelidus</i> ssp. <i>grayi</i>          |                    | X                 |                  |                   |                   |
| Plant | Sharpleaf buttercup    | <i>Ranunculus acriformis</i> var. <i>montanensis</i> | X                  |                   |                  |                   |                   |
| Plant | Alpine buttercup       | <i>Ranunculus adoneus</i>                            | X                  |                   |                  |                   |                   |
| Plant | Northern buttercup     | <i>Ranunculus pedatifidus</i> var. <i>affinis</i>    | X                  |                   |                  |                   |                   |
| Plant | Pennsylvania buttercup | <i>Ranunculus pennsylvanicus</i>                     | X                  |                   |                  |                   |                   |
| Plant | Dwarf buttercup        | <i>Ranunculus pygmaeus</i>                           | X                  |                   |                  |                   |                   |
| Plant | Alderleaf buckthorn    | <i>Rhamnus alnifolia</i>                             | X                  |                   |                  |                   |                   |
| Plant | Nootka rose            | <i>Rosa nutkana</i> var. <i>hispida</i>              | X                  |                   |                  |                   |                   |
| Plant | Barclay's willow       | <i>Salix barclayi</i>                                | X                  |                   |                  |                   |                   |
| Plant | Barratt's willow       | <i>Salix barrattiana</i>                             | X                  | X                 |                  |                   |                   |
| Plant | Sageleaf willow        | <i>Salix candida</i>                                 | X                  | X                 |                  |                   |                   |
| Plant | Cascade willow         | <i>Salix cascadiensis</i>                            | X                  |                   |                  |                   |                   |

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|-------|---|--|--------------------|-------------------|------------------|-------------------|-------------------|
| Plant | Farr's willow                           | <i>Salix farriae</i>                                   | X                  |                   |                  |                   |                   |
| Plant | Lemmon's willow                         | <i>Salix lemmonii</i>                                  | X                  |                   |                  |                   |                   |
| Plant | Myrtle-leaf willow                      | <i>Salix myrtillifolia</i> var. <i>myrtillifolia</i>   |                    | X                 |                  |                   |                   |
| Plant | Roundleaf willow                        | <i>Salix rotundifolia</i> var. <i>dodgeana</i>         | X                  |                   |                  |                   |                   |
| Plant | Sierran blacksnakeroot                  | <i>Sanicula graveolens</i>                             | X                  |                   |                  |                   |                   |
| Plant | Yellowspot saxifrage                    | <i>Saxifraga bronchialis</i> var. <i>austromontana</i> | X                  |                   |                  |                   |                   |
| Plant | Saxifraga serpyllifolia var. chrysantha | <i>Saxifraga chrysantha</i>                            | X                  |                   |                  |                   |                   |
| Plant | Peak saxifrage                          | <i>Saxifraga nidifica</i>                              | X                  |                   |                  |                   |                   |
| Plant | Purple mountain saxifrage               | <i>Saxifraga oppositifolia</i>                         | X                  |                   |                  |                   |                   |
| Plant | Watson's spikemoss                      | <i>Selaginella watsonii</i>                            | X                  |                   |                  |                   |                   |
| Plant | Shoshone carrot                         | <i>Shoshonea pulvinata</i>                             |                    | X                 |                  |                   |                   |
| Plant | Arctic burreed                          | <i>Sparganium natans</i>                               | X                  |                   |                  |                   |                   |
| Plant | Fleshy starwort                         | <i>Stellaria crassifolia</i>                           | X                  |                   |                  |                   |                   |
| Plant | Northern bog aster                      | <i>Symphyotrichum boreale</i>                          | X                  |                   |                  |                   |                   |
| Plant | Woolbearing dandelion                   | <i>Taraxacum eriophorum</i>                            | X                  |                   |                  |                   |                   |
| Plant | Twicehairy groundsel                    | <i>Tephrosia lindstroemii</i>                          | X                  |                   |                  |                   |                   |
| Plant | Alpine meadow rue                       | <i>Thalictrum alpinum</i>                              | X                  |                   |                  |                   |                   |
| Plant | Thelesperma marginatum                  | <i>Thelesperma subnudum</i> var. <i>marginatum</i>     | X                  |                   |                  |                   |                   |
| Plant | Cushion Townsend daisy                  | <i>Townsendia condensata</i> var. <i>condensata</i>    |                    | X                 |                  |                   |                   |
| Plant | Common Townsend daisy                   | <i>Townsendia leptotes</i>                             | X                  |                   |                  |                   |                   |
| Plant | Tundra clover                           | <i>Trifolium nanum</i>                                 | X                  |                   |                  |                   |                   |
| Plant |   | <i>Triglochin palustre</i>                             | X                  |                   |                  |                   |                   |
| Plant | Large flower triteleia                  | <i>Triteleia grandiflora</i>                           | X                  |                   |                  |                   |                   |
| Plant | Lesser bladderwort                      | <i>Utricularia minor</i>                               | X                  | X                 |                  |                   |                   |
| Plant | Hoary verbena                           | <i>Verbena stricta</i>                                 | X                  |                   |                  |                   |                   |
| Plant | Squashberry                             | <i>Viburnum edule</i>                                  | X                  |                   |                  |                   |                   |

| Type  | Common name         | Scientific name              | S1-S2 <sup>5</sup> | RFSS <sup>6</sup> | S/E <sub>7</sub> | SGCN <sup>8</sup> | NBPL <sup>9</sup> |
|-------|---------------------|------------------------------|--------------------|-------------------|------------------|-------------------|-------------------|
| Plant | Darkwoods violet    | <i>Viola orbiculata</i>      | X                  |                   |                  |                   |                   |
| Plant | Sunflower mule-ears | <i>Wyethia helianthoides</i> | X                  |                   |                  |                   |                   |

## Appendix B—Screening for species of interest

See Table 4—Definitions used in Table 3 and Table 5—Numbers in the rationale column in Table 3 as a guide for information included in Table 3.

Table 3—Screening of species of interest under Forest Service Handbook 1909.12, 43.22c

| Type      | Common name                    | Scientific name                  | Secure in the plan area | Affected by management | Included for further analysis | Rationale for selection/ non-selection          |
|-----------|--------------------------------|----------------------------------|-------------------------|------------------------|-------------------------------|---|
| Amphibian | Boreal western toad            | <i>Bufo boreas boreas</i>        | N                       | Y                      | Y                             | Selected; plan components will be developed     |
| Amphibian | Columbia spotted frog          | <i>Rana luteiventris</i>         | N                       | Y                      | Y                             | Selected; plan components will be developed     |
| Amphibian | Northern leopard frog          | <i>Rana pipiens</i>              | U                       | Y                      | N                             | Transient, migrant or accidental occurrence (2) |
| Bird      | American bittern               | <i>Botaurus lentiginosus</i>     | U                       | N                      | N                             | Uncertain occurrence (1)                        |
| Bird      | American dipper                | <i>Cinclus mexicanus</i>         | U                       | Y                      | N                             | Plan components not necessary (10)              |
| Bird      | American peregrine falcon      | <i>Falco peregrinus anatum</i>   | Y                       | N                      | N                             | Secure in the plan area (3)                     |
| Bird      | American three-toed woodpecker | <i>Picoides dorsalis</i>         | U                       | Y                      | N                             | Plan components not necessary (10)              |
| Bird      | American white pelican         | <i>Pelecanus erythrorhynchos</i> | U                       | N                      | N                             | Uncertain occurrence (1)                        |
| Bird      | Bald Eagle                     | <i>Haliaeetus leucocephalus</i>  | Y                       | N                      | N                             | Secure in the plan area (3)                     |
| Bird      | Barrow's goldeneye             | <i>Bucephala islandica</i>       | Y                       | N                      | N                             | Secure in the plan area (3)                     |
| Bird      | Black swift                    |                                  | U                       | N                      | N                             | Uncertain occurrence (1)                        |

| Type | Common name                | Scientific name                  | Secure in the plan area | Affected by management | Included for further analysis | Rationale for selection/ non-selection          |
|------|----------------------------|----------------------------------|-------------------------|------------------------|-------------------------------|---|
| Bird | Black-backed woodpecker    | <i>Picoides arcticus</i>         | U                       | Y                      | N                             | Plan components not necessary (10)              |
| Bird | Black-billed cuckoo        | <i>Coccyzus erythrophthalmus</i> | U                       | N                      | N                             | Uncertain occurrence (1)                        |
| Bird | Black-crowned night heron  | <i>Nycticorax nycticorax</i>     | U                       | N                      | N                             | Uncertain occurrence (1)                        |
| Bird | Bobolink                   | <i>Dolichonyx oryzivorus</i>     | U                       | N                      | N                             | Transient, migrant or accidental occurrence (2) |
| Bird | Boreal owl                 | <i>Aegolius funereus</i>         | U                       | Y                      | N                             | Plan components not necessary (10)              |
| Bird | Brewer's sparrow           | <i>Spizella breweri</i>          | Y                       | Y                      | N                             | Plan components not necessary (10)              |
| Bird | Canada warbler             | <i>Wilsonia canadensis</i>       | U                       | N                      | N                             | Uncertain occurrence (1)                        |
| Bird | Canvasback                 | <i>Aythya valisineria</i>        | U                       | N                      | N                             | Plan components not necessary (3)               |
| Bird | Cassin's sparrow           | <i>Aimophila cassinii</i>        | U                       | N                      | N                             | Uncertain occurrence (1)                        |
| Bird | Chestnut-collared longspur | <i>Calcarius ornatus</i>         | U                       | N                      | N                             | Uncertain occurrence (1)                        |
| Bird | Clark's grebe              | <i>Aechmophorus clarkii</i>      | U                       | N                      | N                             | Uncertain occurrence (1)                        |
| Bird | Common loon                | <i>Gavia immer</i>               | U                       | N                      | N                             | Plan components not needed (3)                  |
| Bird | Dickcissel                 | <i>Spiza americana</i>           | U                       | N                      | N                             | Transient, migrant or accidental occurrence (2) |
| Bird | Ferruginous hawk           | <i>Buteo regalis</i>             | U                       | N                      | N                             | Uncertain occurrence (1)                        |

| Type | Common name            | Scientific name                        | Secure in the plan area | Affected by management | Included for further analysis | Rationale for selection/ non-selection          |
|------|------------------------|--|-------------------------|------------------------|-------------------------------|---|
| Bird | Great blue heron       | <i>Ardea herodias</i>                  | Y                       | N                      | N                             | Secure in the plan area (3)                     |
| Bird | Greater sage grouse    | <i>Centrocercus urophasianus</i>       | U                       | Y                      | Y                             | Selected; plan components will be developed     |
| Bird | Greater sandhill crane | <i>Grus canadensis</i>                 | U                       | N                      | N                             | Transient, migrant or accidental occurrence (2) |
| Bird | Harlequin duck         | <i>Histrionicus histrionicus</i>       | N                       | Y                      | Y                             | Selected; plan components will be developed     |
| Bird | Harris's sparrow       | <i>Zonotrichia querula</i>             | U                       | N                      | N                             | Uncertain occurrence (1)                        |
| Bird | Lark bunting           | <i>Calamospiza melanocorys</i>         | Y                       | N                      | N                             | Transient, migrant or accidental occurrence (2) |
| Bird | Le Conte's sparrow     | <i>Passerherbulus caudacutus</i>       | U                       | N                      | N                             | Uncertain occurrence (1)                        |
| Bird | Lesser scaup           | <i>Aythya affinis</i>                  | U                       | N                      | N                             | No known occurrences on the forest (2)          |
| Bird | Loggerhead shrike      | <i>Lanius ludovicianus</i>             | U                       | N                      | N                             | Transient, migrant or accidental occurrence (2) |
| Bird | McCown's longspur      | <i>Calacarius mccownii</i>             | U                       | N                      | N                             | Transient, migrant or accidental occurrence (2) |
| Bird | Northern goshawk       | <i>Accipiter gentilis atricapillus</i> | U                       | Y                      | Y                             | Selected; plan components will be developed     |
| Bird | Northern pintail       | <i>Anas acuta</i>                      | Y                       | N                      | N                             | Secure in the plan area (3)                     |

| Type | Common name            | Scientific name                   | Secure in the plan area | Affected by management | Included for further analysis | Rationale for selection/ non-selection          |
|------|------------------------|-----------------------------------|-------------------------|------------------------|-------------------------------|---|
| Bird | Olive-sided flycatcher | <i>Contopus cooperi</i>           | U                       | Y                      | N                             | Plan components not needed (10)                 |
| Bird | Prairie falcon         | <i>Falco mexicanus</i>            | Y                       | N                      | N                             | Secure in the plan area (3)                     |
| Bird | Redhead                | <i>Aythya americana</i>           | Y                       | N                      | N                             | Secure in the plan area (3)                     |
| Bird | Red-headed woodpecker  | <i>Melanerpes erythrocephalus</i> | U                       | Y                      | N                             | Uncertain occurrence (1)                        |
| Bird | Red-naped sapsucker    | <i>Sphyrapicus nuchalis</i>       | U                       | Y                      | N                             | Plan components not needed (10)                 |
| Bird | Ruffed grouse          | <i>Bonasa umbellus</i>            | Y                       | Y                      | Y                             | Plan components not needed (3)                  |
| Bird | Rufous hummingbird     | <i>Selasphorus rufus</i>          | Y                       | N                      | N                             | Secure in the plan area (3)                     |
| Bird | Sage sparrow           | <i>Amphispiza belli</i>           | Y                       | Y                      | N                             | Plan components not needed (10)                 |
| Bird | Sage thrasher          | <i>Oreoscoptes montanus</i>       | Y                       | Y                      | N                             | Plan components not needed (10)                 |
| Bird | Short-eared owl        | <i>Asio flammeus</i>              | U                       | N                      | N                             | Transient, migrant or accidental occurrence (2) |
| Bird | Snowy egret            | <i>Egretta thula</i>              | U                       | N                      | N                             | Uncertain occurrence (1)                        |
| Bird | Swainson's hawk        | <i>Buteo swainsoni</i>            | Y                       | N                      | N                             | Secure in the plan area (3)                     |
| Bird | Trumpeter swan         | <i>Cygnus buccinator</i>          | U                       | N                      | N                             | Transient, migrant or accidental occurrence (2) |
| Bird | Upland sandpiper       | <i>Bartramia longicauda</i>       | U                       | N                      | N                             | Uncertain occurrence (1)                        |
| Bird | Virginia rail          | <i>Rallus limicola</i>            | U                       | N                      | N                             | Uncertain occurrence (1)                        |

| Type   | Common name            | Scientific name                  | Secure in the plan area | Affected by management | Included for further analysis | Rationale for selection/non-selection           |
|--------|------------------------|----------------------------------|-------------------------|------------------------|-------------------------------|---|
| Bird   | Western grebe          | <i>Aechmophorus occidentalis</i> | Y                       | N                      | N                             | Secure in the plan area (3)                     |
| Bird   | Williamson's sapsucker | <i>Sphyrapicus thyroideus</i>    | U                       | Y                      | N                             | Plan components not needed (10)                 |
| Bird   | Willow flycatcher      | <i>Empidonax traillii</i>        | U                       | Y                      | N                             | Plan components not needed (10)                 |
| Bird   | Wood duck              | <i>Aix sponsa</i>                | U                       | N                      | N                             | Transient, migrant or accidental occurrence (2) |
| Fish   | Arctic grayling        | <i>Thymallus arcticus</i>        | U                       | N                      | N                             | Secure in the plan area (3)                     |
| Fish   | Brook trout            | <i>Salvelinus fontinalis</i>     | Y                       | N                      | N                             | Secure in the plan area (3)                     |
| Fish   | Brown trout            | <i>Salmo trutta</i>              | Y                       | N                      | N                             | Secure in the plan area (3)                     |
| Fish   | Burbot                 | <i>Lota lota</i>                 | Y                       | N                      | N                             | Secure in the plan area (3)                     |
| Fish   | Golden trout           | <i>Oncorhynchus aguabonita</i>   | Y                       | N                      | N                             | Secure in the plan area (3)                     |
| Fish   | Hybridized trout       | NA                               | Y                       | N                      | N                             | Secure in the plan area (3)                     |
| Fish   | Lake trout             | <i>Salvelinus namaycush</i>      | Y                       | N                      | N                             | Secure in the plan area (3)                     |
| Fish   | Mountain sucker        | <i>Catostomus platyrhynchus</i>  | U                       | N                      | N                             | Secure in the plan area (3)                     |
| Fish   | Mountain whitefish     | <i>Prosopium williamsoni</i>     | Y                       | N                      | N                             | Secure in the plan area (3)                     |
| Fish   | Rainbow trout          | <i>Oncorhynchus mykiss</i>       | Y                       | N                      | N                             | Secure in the plan area (3)                     |
| Insect | Hudsonian emerald      | <i>Somatochlora hudsonica</i>    | U                       | N                      | N                             | Uncertain occurrence (1)                        |

| Type   | Common name        | Scientific name            | Secure in the plan area | Affected by management | Included for further analysis | Rationale for selection/ non-selection             |
|--------|--------------------|----------------------------|-------------------------|------------------------|-------------------------------|--|
| Mammal | American bison     | <i>Bos bison</i>           | Y                       | Y                      | N                             | Plan components not needed (3)                     |
| Mammal | American marten    | <i>Martes americana</i>    | Y                       | Y                      | N                             | Plan components not needed (10)                    |
| Mammal | American pika      | <i>Ochotona princeps</i>   | Y                       | N                      | N                             | Secure in the plan area (3)                        |
| Mammal | Badger             | <i>Taxidea taxus</i>       | Y                       | N                      | N                             | Secure in the plan area (3)                        |
| Mammal | Beaver             | <i>Castor canadensis</i>   | N                       | Y                      | Y                             | Selected; plan components will be developed        |
| Mammal | Bighorn sheep      | <i>Ovis canadensis</i>     | U                       | Y                      | Y                             | Selected; plan components will be developed        |
| Mammal | Black bear         | <i>Ursus americanus</i>    | Y                       | N                      | N                             | Secure in the plan area (3)                        |
| Mammal | Dwarf shrew        | <i>Sorex nanus</i>         | Y                       | N                      | N                             | Secure in the plan area (3)                        |
| Mammal | Elk                | <i>Cervus elaphus</i>      | Y                       | Y                      | Y                             | Represents social/economic group                   |
| Mammal | Fringed myotis     | <i>Myotis thysanodes</i>   | U                       | N                      | N                             | Plan components not needed (10)                    |
| Mammal | Hoary bat          | <i>Lasiurus cinereus</i>   | U                       | U                      | N                             | Plan components not needed (3)                     |
| Mammal | Long-tailed weasel | <i>Mustela frenata</i>     | Y                       | N                      | N                             | Secure in the plan area (3)                        |
| Mammal | Moose              | <i>Alces alces</i>         | Y                       | Y                      | Y                             | Plan components will be developed for this species |
| Mammal | Mountain goat      | <i>Oreamnos americanus</i> | Y                       | N                      | N                             | Secure in the plan area (3)                        |
| Mammal | Mountain lion      | <i>Puma concolor</i>       | Y                       | N                      | N                             | Secure in the plan area (3)                        |

| Type   | Common name              | Scientific name                           | Secure in the plan area | Affected by management | Included for further analysis | Rationale for selection/ non-selection                                  |
|--------|--------------------------|---|-------------------------|------------------------|-------------------------------|---|
| Mammal | Mule deer                | <i>Odocoileus hemionus</i>                | Y                       | Y                      | N                             | Secure in the plan area (3)   |
| Mammal | North American wolverine | <i>Gulo gulo luscus</i>                   | U                       | N                      | N                             | Plan components not needed (10)   |
| Mammal | Pronghorn antelope       | <i>Antilocarpa americana</i>              | Y                       | N                      | N                             | Secure in the plan area (3)   |
| Mammal | River otter              | <i>Lutra canadensis</i>                   | Y                       | N                      | N                             | Secure in the plan area (3)   |
| Mammal | Silver haired bat        | <i>Lasionycteris noctivagans</i>          | U                       | N                      | N                             | Transient, migrant or accidental occurrence (2)                         |
| Mammal | Spotted bat              | <i>Euderma maculatum</i>                  | U                       | N                      | N                             | Transient, migrant or accidental occurrence (2)                         |
| Mammal | Townsend's big-eared bat | <i>Corynorhinus townsendii pallescens</i> | U                       | N                      | N                             | Plan components not needed (10)   |
| Mammal | Vagrant shrew            | <i>Sorex vagrans</i>                      | Y                       | N                      | N                             | Secure in the plan area (3)   |
| Mammal | Water vole               | <i>Microtus richardsoni</i>               | U                       | Y                      | Y                             | Selected; Plan components will be developed                             |
| Mammal | Western heather vole     | <i>Phenacomys intermedius</i>             | Y                       | N                      | N                             | Secure in the plan area (3)   |
| Mammal | White-tailed deer        | <i>Odocoileus virginianus</i>             | Y                       | N                      | N                             | Secure in the plan area (3)   |
| Mammal | White-tailed prairie dog | <i>Cynomys leucurus</i>                   | Y                       | N                      | N                             | Secure in the plan area (3)   |
| Plant  | Muskroot                 | <i>Adoxa moschatellina</i>                | U                       | Y                      | N                             | Uncertain distribution, affected by management, not carried forward (9) |

| Type  | Common name                      | Scientific name                            | Secure in the plan area | Affected by management | Included for further analysis | Rationale for selection/ non-selection                                       |
|-------|----------------------------------|--|-------------------------|------------------------|-------------------------------|--|
| Plant | Idaho bent                       | <i>Agrostis idahoensis</i>                 | U                       | U                      | N                             | Uncertain distribution, abundance, or knowledge of life history (7)          |
| Plant | Northern bent                    | <i>Agrostis mertensii</i>                  | U                       | U                      | N                             | Uncertain distribution, abundance, or knowledge of life history (7)          |
| Plant | Oregon bent                      | <i>Agrostis oregonensis</i>                | U                       | U                      | N                             | Uncertain distribution, abundance, or knowledge of life history (7)          |
| Plant | Sitka alder                      | <i>Alnus viridis var. sinuata</i>          | U                       | Y                      | N                             | Uncertain distribution, affected by management, not carried forward (9)      |
| Plant | Alopecurus borealis              | <i>Alopecurus alpinus</i>                  | U                       | Y                      | N                             | Uncertain distribution, affected by management, not carried forward (9)      |
| Plant | Roundleaf orchid                 | <i>Amerorchis rotundifolia</i>             | Y                       | Y                      | N                             | Plan components not necessary (10)   |
| Plant | Sweetflower rockjasmine          | <i>Androsace chamaejasme var. carinata</i> | Y                       | N                      | N                             | Species within potential research natural area or special interest area (11) |
| Plant | Little Belt Mountain thimbleweed | <i>Anemone lithophila</i>                  | Y                       | N                      | N                             | Species within potential research natural area of special interest area (11) |
| Plant | Smallflower thimbleweed          | <i>Anemone parviflora</i>                  | U                       | Y                      | N                             | Uncertain distribution, affected by management, not carried forward (9)      |

| Type  | Common name                          | Scientific name  | Secure in the plan area | Affected by management | Included for further analysis | Rationale for selection/ non-selection                                  |
|-------|--------------------------------------|--|-------------------------|------------------------|-------------------------------|---|
| Plant | Scented pussytoes                    | <i>Antennaria aromatica</i>  | U                       | Y                      | N                             | Uncertain distribution, affected by management, not carried forward (9) |
| Plant | Whip pussytoes                       | <i>Antennaria flagellaris</i>  | U                       | Y                      | N                             | Uncertain distribution, affected by management, not carried forward (9) |
| Plant | Woolly pussytoes                     | <i>Antennaria lanata</i>   | Y                       | Y                      | N                             | Uncertain distribution, affected by management, not carried forward (9) |
| Plant | Pygmy pussytoes                      | <i>Antennaria monocephala</i>  | Y                       | Y                      | N                             | Secure in the plan area (3)   |
| Plant | Blue limestone columbine             | <i>Aquilegia jonesii</i>   | Y                       | N                      | N                             | Needs category  |
| Plant | Boechera lemmonii var. drepanoloba   | <i>Arabis lemmonii</i> var. <i>drepanoloba</i>   | U                       | U                      | N                             | Uncertain distribution, abundance, or knowledge of life history (7)     |
| Plant | Wind River rockcress                 | <i>Arabis microphylla</i> var. <i>saximontana</i> ; <i>A. pendulocarpa</i> var. <i>saximontana</i> | U                       | U                      | N                             | Uncertain distribution, abundance, or knowledge of life history (7)     |
| Plant | Boechera sparsiflora var. subvillosa | <i>Arabis sparsiflora</i> var. <i>subvillosa</i>   | U                       | U                      | N                             | Uncertain distribution, abundance, or knowledge of life history (7)     |
| Plant | Arctous rubra                        | <i>Arctostaphylos rubra</i>  | Y                       | Y                      | N                             | Secure in the plan area (3)   |
| Plant | Narrowleaf leopardbane               | <i>Arnica angustifolia</i> var. <i>tomentosa</i>   | U                       | U                      | N                             | Uncertain distribution, abundance, or knowledge of life history (7)     |

| Type  | Common name                        | Scientific name                                | Secure in the plan area | Affected by management | Included for further analysis | Rationale for selection/ non-selection                                  |
|-------|------------------------------------|--|-------------------------|------------------------|-------------------------------|---|
| Plant | Artemisia norvegica var. saxatilis | <i>Artemisia arctica ssp. arctica</i>          | U                       | U                      | N                             | Uncertain distribution, abundance, or knowledge of life history (7)     |
| Plant | Pacific wormwood                   | <i>Artemisia campestris var. borealis</i>      | U                       | U                      | N                             | Uncertain distribution, abundance, or knowledge of life history (7)     |
| Plant | Broadkeel milkvetch                | <i>Astragalus platytropis</i>                  | U                       | U                      | N                             | Uncertain distribution, abundance, or knowledge of life history (7)     |
| Plant | American alpine lady fern          | <i>Athyrium distentifolium var. americanum</i> | Y                       | N                      | N                             | Secure in the plan area (3)   |
| Plant | Lanceleaf moonwort                 | <i>Botrychium lanceolatum</i>                  | U                       | Y                      | N                             | Uncertain distribution, affected by management, not carried forward (9) |
| Plant | Common moonwort                    | <i>Botrychium lunaria</i>                      | U                       | Y                      | N                             | Uncertain distribution, affected by management, not carried forward (9) |
| Plant | Mingan moonwort                    | <i>Botrychium minganense</i>                   | U                       | Y                      | N                             | Uncertain distribution, affected by management, not carried forward (9) |
| Plant | Leathery grape fern                | <i>Botrychium multifidum</i>                   | U                       | Y                      | N                             | Uncertain distribution, affected by management, not carried forward (9) |
| Plant | Least moonwort                     | <i>Botrychium simplex</i>                      | U                       | Y                      | N                             | Uncertain distribution, affected by management, not carried forward (9) |

| Type  | Common name                      | Scientific name                 | Secure in the plan area | Affected by management | Included for further analysis | Rationale for selection/non-selection                                   |
|-------|----------------------------------|---------------------------------|-------------------------|------------------------|-------------------------------|---|
| Plant | Rattlesnake fern                 | <i>Botrychium virginianum</i>   | U                       | Y                      | N                             | Uncertain distribution, affected by management, not carried forward (9) |
| Plant | Alpine northern-rockress         | <i>Braya humilis</i>            | Y                       | Y                      | N                             | Secure in the plan area (3)   |
| Plant | Ditch reedgrass                  | <i>Calamagrostis scopulorum</i> | U                       | Y                      | N                             | Uncertain distribution, affected by management, not carried forward (9) |
| Plant | Bigpod mariposa lily             | <i>Calochortus eurycarpus</i>   | U                       | Y                      | N                             | Uncertain distribution, affected by management, not carried forward (9) |
| Plant | Blackfoot River evening primrose | <i>Camissonia andina</i>        | U                       | Y                      | N                             | Uncertain distribution, affected by management, not carried forward (9) |
| Plant | Arctic bellflower                | <i>Campanula uniflora</i>       | U                       | U                      | N                             | Uncertain distribution, abundance, or knowledge of life history (7)     |
| Plant | Bebb's sedge                     | <i>Carex bebbii</i>             | U                       | Y                      | N                             | Uncertain distribution, affected by management, not carried forward (9) |
| Plant | Arctic harefoot sedge            | <i>Carex bipartita</i>          | U                       | U                      | N                             | Uncertain distribution, abundance, or knowledge of life history (7)     |
| Plant | Carex deweyana var. bolanderi    | <i>Carex bolanderi</i>          | U                       | Y                      | N                             | Uncertain distribution, affected by management, not carried forward (9) |

| Type  | Common name          | Scientific name          | Secure in the plan area | Affected by management | Included for further analysis | Rationale for selection/non-selection  |
|-------|----------------------|--------------------------|-------------------------|------------------------|-------------------------------|--|
| Plant | Brownish sedge       | <i>Carex brunnescens</i> | Y                       | N                      | N                             | Species within potential research natural area or special interest area (11) |
| Plant | Buxbaum's sedge      | <i>Carex buxbaumii</i>   | Y                       | N                      | N                             | Species within potential research natural area or special interest area (11) |
| Plant | Hairlike sedge       | <i>Carex capillaris</i>  | Y                       | N                      | N                             | Species within potential research natural area or special interest area (11) |
| Plant | Low northern sedge   | <i>Carex concinna</i>    | Y                       | N                      | N                             | Species within potential research natural area or special interest area (11) |
| Plant | Lesser tussock sedge | <i>Carex diandra</i>     | Y                       | N                      | N                             | Species within potential research natural area or special interest area (11) |
| Plant | Ebony sedge          | <i>Carex ebenea</i>      | U                       | Y                      | N                             | Uncertain distribution, affected by management, not carried forward (9)      |
| Plant | Northern bog sedge   | <i>Carex gynocrates</i>  | Y                       | N                      | N                             | Species within potential research natural area or special interest area (11) |

| Type  | Common name          | Scientific name           | Secure in the plan area | Affected by management | Included for further analysis | Rationale for selection/non-selection  |
|-------|----------------------|---------------------------|-------------------------|------------------------|-------------------------------|--|
| Plant | Inland sedge         | <i>Carex interior</i>     | Y                       | N                      | N                             | Species within potential research natural area or special interest area (11) |
| Plant | Jones' sedge         | <i>Carex jonesii</i>      | U                       | Y                      | N                             | Uncertain distribution, affected by management, not carried forward (9)      |
| Plant | Bristly-stalk sedge  | <i>Carex lasiocarpa</i>   | Y                       | Y                      | N                             | Species within potential research natural area or special interest area (11) |
| Plant | Bristlystalked sedge | <i>Carex leptalea</i>     | Y                       | Y                      | N                             | Species within potential research natural area or special interest area (11) |
| Plant | Mud sedge            | <i>Carex limosa</i>       | Y                       | Y                      | N                             | Species within potential research natural area or special interest area (11) |
| Plant | Livid sedge          | <i>Carex livida</i>       | Y                       | Y                      | N                             | Species within potential research natural area or special interest area (11) |
| Plant | False uncinia sedge  | <i>Carex microglochin</i> | Y                       | Y                      | N                             | Species within potential research natural area or special interest area (11) |

| Type  | Common name                | Scientific name                                | Secure in the plan area | Affected by management | Included for further analysis | Rationale for selection/non-selection  |
|-------|----------------------------|--|-------------------------|------------------------|-------------------------------|--|
| Plant | Shortleaf sedge            | <i>Carex misandra</i>                          | Y                       | Y                      | N                             | Species within potential research natural area or special interest area (11) |
| Plant | Nard sedge                 | <i>Carex nardina</i>                           | U                       | U                      | N                             | Uncertain distribution, abundance, or knowledge of life history (7)          |
| Plant | Alpine nerve sedge         | <i>Carex neurophora</i>                        | U                       | Y                      | N                             | Uncertain distribution, affected by management, not carried forward (9)      |
| Plant | Western sedge              | <i>Carex occidentalis</i>                      | U                       | Y                      | N                             | Uncertain distribution, affected by management, not carried forward (9)      |
| Plant | Parry's sedge              | <i>Carex parryana</i>                          | U                       | Y                      | N                             | Uncertain distribution, affected by management, not carried forward (9)      |
| Plant | Canadian singlespike sedge | <i>Carex scirpoidea</i> var. <i>scirpoidea</i> | U                       | Y                      | N                             | Uncertain distribution, affected by management, not carried forward (9)      |
| Plant | Dark mountain sedge        | <i>Carex subnigricans</i>                      | U                       | Y                      | N                             | Uncertain distribution, affected by management, not carried forward (9)      |
| Plant | Quill sedge                | <i>Carex tenera</i>                            | U                       | Y                      | N                             | Uncertain distribution, affected by management, not carried forward (9)      |

| Type  | Common name                   | Scientific name                                | Secure in the plan area | Affected by management | Included for further analysis | Rationale for selection/ non-selection                                       |
|-------|-------------------------------|--|-------------------------|------------------------|-------------------------------|--|
| Plant | Carex foetida var. vernacula  | <i>Carex vernacula</i>                         | U                       | Y                      | N                             | Uncertain distribution, affected by management, not carried forward (9)      |
| Plant | Little green sedge            | <i>Carex viridula</i>                          | Y                       | Y                      | N                             | Species within potential research natural area or special interest area (11) |
| Plant | Dryland sedge                 | <i>Carex xerantica</i>                         | U                       | Y                      | N                             | Uncertain distribution, affected by management, not carried forward (9)      |
| Plant | Cockscomb Indian paintbrush   | <i>Castilleja crista-galli</i>                 | U                       | Y                      | N                             | Uncertain distribution, affected by management, not carried forward (9)      |
| Plant | Nodding chickweed             | <i>Cerastium nutans</i>                        | U                       | Y                      | N                             | Uncertain distribution, affected by management, not carried forward (9)      |
| Plant | Coon's tail                   | <i>Ceratophyllum demersum</i>                  | U                       | N                      | N                             | Uncertain distribution, no known management impacts (8)                      |
| Plant | Chaenactis alpina var. alpina | <i>Chaenactis douglasii</i> var. <i>alpina</i> | Y                       | U                      | N                             | Species within potential research natural area or special interest area (11) |
| Plant | Slender woodreed              | <i>Cinna latifolia</i>                         | U                       | Y                      | N                             | Uncertain distribution, affected by management, not carried forward (9)      |

| Type  | Common name                  | Scientific name                     | Secure in the plan area | Affected by management | Included for further analysis | Rationale for selection/ non-selection                                  |
|-------|------------------------------|-------------------------------------|-------------------------|------------------------|-------------------------------|---|
| Plant | Small enchanter's nightshade | <i>Circaea alpina var. pacifica</i> | U                       | Y                      | N                             | Uncertain distribution, affected by management, not carried forward (9) |
| Plant | Elk thistle                  | <i>Cirsium foliosum</i>             | Y                       | N                      | N                             | Secure in the plan area (3)   |
| Plant | White thistle                | <i>Cirsium hookerianum</i>          | U                       | U                      | N                             | Uncertain distribution, abundance, or knowledge of life history (7)     |
| Plant | Rosy pussypaws               | <i>Cistanthe rosea</i>              | U                       | U                      | N                             | Uncertain distribution, abundance, or knowledge of life history (7)     |
| Plant | Potentilla palustris         | <i>Comarum palustre</i>             | Y                       | Y                      | N                             | Secure in the plan area (3)   |
| Plant | Williams' miterwort          | <i>Conimitella williamsii</i>       | U                       | N                      | N                             | Uncertain distribution, no known management impacts (8)                 |
| Plant | Pacific coralroot            | <i>Corallorhiza mertensiana</i>     | U                       | Y                      | N                             | Uncertain distribution, affected by management, not carried forward (9) |
| Plant | Spring coralroot             | <i>Corallorhiza wisteriana</i>      | U                       | Y                      | N                             | Uncertain distribution, affected by management, not carried forward (9) |
| Plant | Smoothseed pygmyweed         | <i>Crassula solieri</i>             | U                       | U                      | N                             | Uncertain distribution, abundance, or knowledge of life history (7)     |

| Type  | Common name            | Scientific name                  | Secure in the plan area | Affected by management | Included for further analysis | Rationale for selection/non-selection                                   |
|-------|------------------------|----------------------------------|-------------------------|------------------------|-------------------------------|---|
| Plant | Snake River catseye    | <i>Cryptantha spiculifera</i>    | U                       | U                      | N                             | Uncertain distribution, abundance, or knowledge of life history (7)     |
| Plant | Fragile rockbrake      | <i>Cryptogramma stelleri</i>     | U                       | N                      | N                             | Uncertain distribution, no known management impacts (8)                 |
| Plant | California oatgrass    | <i>Danthonia californica</i>     | U                       | Y                      | N                             | Uncertain distribution, affected by management, not carried forward (9) |
| Plant | Annual hairgrass       | <i>Deschampsia danthonioides</i> | U                       | Y                      | N                             | Uncertain distribution, affected by management, not carried forward (9) |
| Plant | Slender hairgrass      | <i>Deschampsia elongata</i>      | U                       | Y                      | N                             | Uncertain distribution, affected by management, not carried forward (9) |
| Plant | Sierra tansymustard    | <i>Descurainia californica</i>   | U                       | Y                      | N                             | Uncertain distribution, affected by management, not carried forward (9) |
| Plant | Longhorn steershead    | <i>Dicentra uniflora</i>         | U                       | Y                      | N                             | Uncertain distribution, affected by management, not carried forward (9) |
| Plant | Boreal whitlowgrass    | <i>Draba borealis</i>            | U                       | N                      | N                             | Uncertain distribution, no known management impacts (8)                 |
| Plant | Denseleaf whitlowgrass | <i>Draba densifolia</i>          | U                       | N                      | N                             | Uncertain distribution, no known management impacts (8)                 |

| Type  | Common name           | Scientific name                                      | Secure in the plan area | Affected by management | Included for further analysis | Rationale for selection/ non-selection                                       |
|-------|-----------------------|--|-------------------------|------------------------|-------------------------------|--|
| Plant | Austrian whitlowgrass | <i>Draba fladnizensis</i> var. <i>pattersonii</i>    | U                       | N                      | N                             | Uncertain distribution, no known management impacts (8)                      |
| Plant | Smooth whitlowgrass   | <i>Draba glabella</i>                                | U                       | N                      | N                             | Uncertain distribution, no known management impacts (8)                      |
| Plant | Payson's whitlowgrass | <i>Draba paysonii</i> var. <i>treleasii</i>          | U                       | N                      | N                             | Uncertain distribution, no known management impacts (8)                      |
| Plant |                       | <i>Draba porsildii</i>                               | Y                       | U                      | N                             | Species within potential research natural area or special interest area (11) |
| Plant | Tall whitlowgrass     | <i>Draba praealta</i>                                | Y                       | N                      | N                             | Secure in the plan area (3)  |
| Plant | English sundew        | <i>Drosera anglica</i>                               | Y                       | Y                      | N                             | Plan components not necessary (10)   |
| Plant | Spreading wood fern   | <i>Dryopteris expansa</i>                            | U                       | Y                      | N                             | Uncertain distribution, affected by management, not carried forward (9)      |
| Plant | Garrett's firechalice | <i>Epilobium canum</i> var. <i>garrettii</i>         | U                       | N                      | N                             | Uncertain distribution, no known management impacts (8)                      |
| Plant | Glaucus willowherb    | <i>Epilobium glaberrimum</i> var. <i>fastigiatum</i> | U                       | Y                      | N                             | Uncertain distribution, affected by management, not carried forward (9)      |

| Type  | Common name              | Scientific name                                  | Secure in the plan area | Affected by management | Included for further analysis | Rationale for selection/non-selection  |
|-------|--------------------------|--|-------------------------|------------------------|-------------------------------|--|
| Plant | Swamp willowherb         | <i>Epilobium palustre</i> var. <i>palustre</i>   | Y                       | Y                      | N                             | Species within potential research natural area or special interest area (11) |
| Plant | Narrowleaf goldenbush    | <i>Ericameria discoidea</i> var. <i>linearis</i> | U                       | Y                      | N                             | Uncertain distribution, affected by management, not carried forward (9)      |
| Plant | Rubber rabbitbrush       | <i>Ericameria nauseosa</i> var. <i>oreophila</i> | Y                       | Y                      | N                             | Secure in the plan area (3)  |
| Plant | Parry's rabbitbrush      | <i>Ericameria parryi</i> var. <i>howardii</i>    | U                       | Y                      | N                             | Uncertain distribution, affected by management, not carried forward (9)      |
| Plant | Trailing fleabane        | <i>Erigeron flagellaris</i>                      | U                       | Y                      | N                             | Uncertain distribution, affected by management, not carried forward (9)      |
| Plant | Arctic alpine fleabane   | <i>Erigeron humilis</i>                          | U                       | N                      | N                             | Uncertain distribution, no known management impacts (8)                      |
| Plant | Desert yellow fleabane   | <i>Erigeron linearis</i>                         | U                       | Y                      | N                             | Uncertain distribution, affected by management, not carried forward (9)      |
| Plant | Slender fleabane         | <i>Erigeron tener</i>                            | U                       | N                      | N                             | Uncertain distribution, no known management impacts (8)                      |
| Plant | Piper's yellow buckwheat | <i>Eriogonum flavum</i> var. <i>piperi</i>       | U                       | Y                      | N                             | Uncertain distribution, affected by management, not carried forward (9)      |

| Type  | Common name                 | Scientific name                   | Secure in the plan area | Affected by management | Included for further analysis | Rationale for selection/non-selection  |
|-------|-----------------------------|-----------------------------------|-------------------------|------------------------|-------------------------------|--|
| Plant | Parsnipflower buckwheat     | <i>Eriogonum heracleoides</i>     | U                       | Y                      | N                             | Uncertain distribution, affected by management, not carried forward (9)      |
| Plant | Arctic cottongrass          | <i>Eriophorum callitrix</i>       | U                       | Y                      | Y                             | Plan components will be developed for this species                           |
| Plant | Chamisso's cottongrass      | <i>Eriophorum chamissonis</i>     | U                       | Y                      | N                             | Plan components not necessary (10)   |
| Plant | Slender cottongrass         | <i>Eriophorum gracile</i>         | U                       | Y                      | N                             | Uncertain distribution, affected by management, not carried forward (9)      |
| Plant | White cottongrass           | <i>Eriophorum scheuchzeri</i>     | U                       | Y                      | N                             | Uncertain distribution, affected by management, not carried forward (9)      |
| Plant | Tassel cottongrass          | <i>Eriophorum viridicarinatum</i> | U                       | Y                      | N                             | Uncertain distribution, affected by management, not carried forward (9)      |
| Plant | Howard's alpine forgetmenot | <i>Eritrichium howardii</i>       | U                       | Y                      | N                             | Species within potential research natural area or special interest area (11) |
| Plant | Baffin fescue               | <i>Festuca baffinensis</i>        | U                       | Y                      | N                             | Uncertain distribution, affected by management, not carried forward (9)      |
| Plant | Hall's fescue               | <i>Festuca hallii</i>             | N                       | Y                      | Y                             | Plan components will be developed for this species                           |

| Type  | Common name             | Scientific name                  | Secure in the plan area | Affected by management | Included for further analysis | Rationale for selection/ non-selection                                  |
|-------|-------------------------|----------------------------------|-------------------------|------------------------|-------------------------------|---|
| Plant | Smallflower fescue      | <i>Festuca minutiflora</i>       | U                       | N                      | N                             | Uncertain distribution, no known management impacts (8)                 |
| Plant | Red fescue              | <i>Festuca rubra var. rubra</i>  | U                       | Y                      | N                             | Uncertain distribution, affected by management, not carried forward (9) |
| Plant | Northern fescue         | <i>Festuca vivipara</i>          | U                       | Y                      | Y                             | Plan components will be developed for this species                      |
| Plant | False mermaidweed       | <i>Floerkea proserpinacoides</i> | U                       | Y                      | N                             | Uncertain distribution, affected by management, not carried forward (9) |
| Plant | Alpine spicywintergreen | <i>Gaultheria humifusa</i>       | U                       | Y                      | N                             | Uncertain distribution, affected by management, not carried forward (9) |
| Plant | Dwarf groundsmoke       | <i>Gayophytum humile</i>         | Y                       | N                      | N                             | Secure in the plan area (3)   |
| Plant | Whitish gentian         | <i>Gentiana algida</i>           | U                       | Y                      | N                             | Uncertain distribution, affected by management, not carried forward (9) |
| Plant | Pygmy gentian           | <i>Gentiana prostrata</i>        | U                       | Y                      | N                             | Uncertain distribution, affected by management, not carried forward (9) |
| Plant | Fourpart dwarf gentian  | <i>Gentianella propinqua</i>     | U                       | Y                      | N                             | Uncertain distribution, affected by management, not carried forward (9) |
| Plant | Bicknell's cranesbill   | <i>Geranium bicknellii</i>       | Y                       | Y                      | N                             | Secure in the plan area (3)   |

| Type  | Common name                     | Scientific name                       | Secure in the plan area | Affected by management | Included for further analysis | Rationale for selection/ non-selection                                       |
|-------|---------------------------------|---------------------------------------|-------------------------|------------------------|-------------------------------|--|
| Plant | Small floating mannagrass       | <i>Glyceria borealis</i>              | U                       | Y                      | N                             | Uncertain distribution, affected by management, not carried forward (9)      |
| Plant | Hooker's alpine oatgrass        | <i>Helictotrichon hookeri</i>         | U                       | Y                      | N                             | Uncertain distribution, affected by management, not carried forward (9)      |
| Plant | Morton's alpine oatgrass        | <i>Helictotrichon mortonianum</i>     | U                       | Y                      | N                             | Uncertain distribution, affected by management, not carried forward (9)      |
| Plant | Pacific alpinegold              | <i>Hulsea algida</i>                  | Y                       | N                      | N                             | Secure in the plan area (3)  |
| Plant | Juncus triglumis var. albescens | <i>Juncus albescens</i>               | U                       | Y                      | N                             | Uncertain distribution, affected by management, not carried forward (9)      |
| Plant | Baltic rush                     | <i>Juncus balticus var. vallicola</i> | U                       | Y                      | N                             | Uncertain distribution, affected by management, not carried forward (9)      |
| Plant | Twoflower rush                  | <i>Juncus biglumis</i>                | U                       | Y                      | N                             | Uncertain distribution, affected by management, not carried forward (9)      |
| Plant | Chestnut rush                   | <i>Juncus castaneus</i>               | U                       | Y                      | N                             | Uncertain distribution, affected by management, not carried forward (9)      |
| Plant | Thread rush                     | <i>Juncus filiformis</i>              | Y                       | Y                      | N                             | Species within potential research natural area or special interest area (11) |

| Type  | Common name                     | Scientific name                | Secure in the plan area | Affected by management | Included for further analysis | Rationale for selection/ non-selection                                       |
|-------|---------------------------------|--------------------------------|-------------------------|------------------------|-------------------------------|--|
| Plant | Hall's rush                     | <i>Juncus hallii</i>           | U                       | Y                      | N                             | Uncertain distribution, affected by management, not carried forward (9)      |
| Plant | Regel's rush                    | <i>Juncus regelii</i>          | U                       | Y                      | N                             | Uncertain distribution, affected by management, not carried forward (9)      |
| Plant | Juncus triglumis var. triglumis | <i>Juncus triglumis</i>        | U                       | Y                      | N                             | Uncertain distribution, affected by management, not carried forward (9)      |
| Plant | Vasey's rush                    | <i>Juncus vaseyi</i>           | U                       | Y                      | N                             | Uncertain distribution, affected by management, not carried forward (9)      |
| Plant | Milky kelloggia                 | <i>Kelloggia galioides</i>     | U                       | Y                      | N                             | Uncertain distribution, affected by management, not carried forward (9)      |
| Plant | Oneflower kelseya               | <i>Kelseya uniflora</i>        | Y                       | N                      | N                             | Species within potential research natural area or special interest area (11) |
| Plant | Pacific bog sedge               | <i>Kobresia myosuroides</i>    | U                       | Y                      | N                             | Uncertain distribution, affected by management, not carried forward (9)      |
| Plant | Siberian bog sedge              | <i>Kobresia sibirica</i>       | U                       | Y                      | N                             | Uncertain distribution, affected by management, not carried forward (9)      |
| Plant | Simple bog sedge                | <i>Kobresia simpliciuscula</i> | Y                       | Y                      | N                             | Secure in the plan area (3)  |

| Type  | Common name           | Scientific name               | Secure in the plan area | Affected by management | Included for further analysis | Rationale for selection/ non-selection                                  |
|-------|-----------------------|-------------------------------|-------------------------|------------------------|-------------------------------|---|
| Plant | Island purslane       | <i>Koenigia islandica</i>     | U                       | Y                      | Y                             | Plan components will be developed for this species                      |
| Plant | Trapper's tea         | <i>Ledum glandulosum</i>      | U                       | Y                      | N                             | Uncertain distribution, affected by management, not carried forward (9) |
| Plant | Star duckweed         | <i>Lemna trisulca</i>         | U                       | N                      | N                             | Uncertain distribution, no known management impacts (8)                 |
| Plant | Dense bladderpod      | <i>Lesquerella condensata</i> | U                       | Y                      | N                             | Uncertain distribution, affected by management, not carried forward (9) |
| Plant | Threeleaf bitterroot  | <i>Lewisia triphylla</i>      | U                       | Y                      | N                             | Uncertain distribution, affected by management, not carried forward (9) |
| Plant | Canby's wild lovage   | <i>Ligusticum canbyi</i>      | U                       | Y                      | N                             | Uncertain distribution, affected by management, not carried forward (9) |
| Plant | Leptosiphon nuttallii | <i>Linanthus nuttallii</i>    | U                       | U                      | N                             | Uncertain distribution, abundance or knowledge of life history (7)      |
| Plant | King's flax           | <i>Linum kingii</i>           | U                       | U                      | N                             | Uncertain distribution, abundance or knowledge of life history (7)      |
| Plant | Northern twayblade    | <i>Listera borealis</i>       | U                       | Y                      | N                             | Uncertain distribution, affected by management, not carried forward (9) |

| Type  | Common name                          | Scientific name                                | Secure in the plan area | Affected by management | Included for further analysis | Rationale for selection/non-selection                                   |
|-------|--------------------------------------|--|-------------------------|------------------------|-------------------------------|---|
| Plant | Heartleaf twayblade                  | <i>Listera cordata</i>                         | U                       | Y                      | N                             | Uncertain distribution, affected by management, not carried forward (9) |
| Plant | Streambank desertparsley             | <i>Lomatium ambiguum</i>                       | U                       | Y                      | N                             | Uncertain distribution, affected by management, not carried forward (9) |
| Plant | Velvet lupine                        | <i>Lupinus leucophyllus</i>                    | U                       | Y                      | N                             | Uncertain distribution, affected by management, not carried forward (9) |
| Plant | Lupinus polyphyllus var. prunophilus | <i>Lupinus prunophilus</i>                     | U                       | Y                      | N                             | Uncertain distribution, affected by management, not carried forward (9) |
| Plant | Smooth woodrush                      | <i>Luzula glabrata</i> var. <i>hitchcockii</i> | U                       | Y                      | N                             | Uncertain distribution, affected by management, not carried forward (9) |
| Plant | Common woodrush                      | <i>Luzula multiflora</i>                       | U                       | Y                      | N                             | Uncertain distribution, affected by management, not carried forward (9) |
| Plant | Piper's woodrush                     | <i>Luzula wahlenbergii</i>                     | U                       | Y                      | N                             | Uncertain distribution, affected by management, not carried forward (9) |
| Plant | Stiff groundpine                     | <i>Lycopodium annotinum</i> L.                 | U                       | Y                      | N                             | Uncertain distribution, affected by management, not carried forward (9) |
| Plant | Variegated-bract blazingstar         | <i>Mentzelia montana</i>                       | U                       | Y                      | N                             | Uncertain distribution, affected by management, not carried forward (9) |

| Type  | Common name              | Scientific name                | Secure in the plan area | Affected by management | Included for further analysis | Rationale for selection/ non-selection                                       |
|-------|--------------------------|--------------------------------|-------------------------|------------------------|-------------------------------|--|
| Plant | Spindle bluebells        | <i>Mertensia fusiformis</i>    | U                       | Y                      | N                             | Uncertain distribution, affected by management, not carried forward (9)      |
| Plant | Brewer's monkeyflower    | <i>Mimulus breweri</i>         | U                       | Y                      | N                             | Uncertain distribution, affected by management, not carried forward (9)      |
| Plant | Muskflower               | <i>Mimulus moschatus</i>       | U                       | Y                      | N                             | Uncertain distribution, affected by management, not carried forward (9)      |
| Plant | Subalpine monkeyflower   | <i>Mimulus tilingii</i>        | Y                       | N                      | N                             | Secure in the plan area (3)  |
| Plant | Columbian stitchwort     | <i>Minuartia austromontana</i> | U                       | Y                      | N                             | Uncertain distribution, affected by management, not carried forward (9)      |
| Plant | Hypopity's monotropa     | <i>Monotropa hypopitys</i>     | U                       | Y                      | N                             | Uncertain distribution, affected by management, not carried forward (9)      |
| Plant | Chamisso's minerslettuce | <i>Montia chamissoi</i>        | U                       | Y                      | N                             | Uncertain distribution, affected by management, not carried forward (9)      |
| Plant | Foxtail muhly            | <i>Muhlenbergia andina</i>     | U                       | Y                      | N                             | Uncertain distribution, affected by management, not carried forward (9)      |
| Plant | Marsh muhly              | <i>Muhlenbergia glomerata</i>  | Y                       | Y                      | N                             | Species within potential research natural area or special interest area (11) |

| Type  | Common name                | Scientific name                                    | Secure in the plan area | Affected by management | Included for further analysis | Rationale for selection/ non-selection                                       |
|-------|----------------------------|--|-------------------------|------------------------|-------------------------------|--|
| Plant | Whorled water-milfoil      | <i>Myriophyllum verticillarum</i>                  | Y                       | N                      | N                             | Secure in the plan area (3)  |
| Plant | Coyote tobacco             | <i>Nicotiana attenuata</i>                         | N                       | Y                      | N                             | Uncertain distribution, affected by management, not carried forward (9)      |
| Plant | Flattop broomrape          | <i>Orobanche corymbosa</i>                         | U                       | Y                      | N                             | Uncertain distribution, affected by management, not carried forward (9)      |
| Plant | Parry's locoweed           | <i>Oxytropis parryi</i>                            | U                       | Y                      | N                             | Uncertain distribution, affected by management, not carried forward (9)      |
| Plant | Stalkpod locoweed          | <i>Oxytropis podocarpa</i>                         | Y                       | N                      | N                             | Secure in the plan area (3)  |
| Plant | Weakstem groundsel         | <i>Packera debilis</i>                             | Y                       | Y                      | N                             | Secure in the plan area (3)  |
| Plant | Payson's groundsel         | <i>Packera dimorphophylla</i> var. <i>paysonii</i> | U                       | Y                      | N                             | Uncertain distribution, affected by management, not carried forward (9)      |
| Plant | Rayless mountain groundsel | <i>Packera indecora</i>                            | Y                       | Y                      | N                             | Species within potential research natural area or special interest area (11) |
| Plant | Streambank groundsel       | <i>Packera pseud aurea</i> var. <i>pseud aurea</i> | U                       | Y                      | N                             | Uncertain distribution, affected by management, not carried forward (9)      |
| Plant | Alpine poppy               | <i>Papaver kluanense</i>                           | U                       | Y                      | Y                             | Plan components will be developed for this species                           |

| Type  | Common name                        | Scientific name                                  | Secure in the plan area | Affected by management | Included for further analysis | Rationale for selection/non-selection  |
|-------|------------------------------------|--|-------------------------|------------------------|-------------------------------|--|
| Plant | Kotzebue's grass-of-parnassus      | <i>Parnassia kotzebuei</i>                       | U                       | Y                      | N                             | Uncertain distribution, affected by management, not carried forward (9)      |
| Plant | Smoothstem parrya                  | <i>Parrya nudicaulis</i>                         | U                       | Y                      | Y                             | Plan components will be developed for this species                           |
| Plant | Coiled lousewort                   | <i>Pedicularis contorta</i> var. <i>contorta</i> | U                       | Y                      | N                             | Uncertain distribution, affected by management, not carried forward (9)      |
| Plant | Oeder's lousewort                  | <i>Pedicularis oederi</i>                        | U                       | Y                      | N                             | Uncertain distribution, affected by management, not carried forward (9)      |
| Plant | Giant lousewort                    | <i>Pedicularis procera</i>                       | U                       | Y                      | N                             | Uncertain distribution, affected by management, not carried forward (9)      |
| Plant | Stiffleaf beardtongue              | <i>Penstemon aridus</i>                          | U                       | Y                      | N                             | Uncertain distribution, affected by management, not carried forward (9)      |
| Plant | Shrubby beardtongue                | <i>Penstemon fruticosus</i>                      | Y                       | N                      | N                             | Secure in the plan area (3)  |
| Plant | Petasites frigidus var. sagittatus | <i>Petasites sagittatus</i>                      | Y                       | Y                      | N                             | Species within potential research natural area or special interest area (11) |
| Plant | Icegrass                           | <i>Phippisia algida</i>                          | U                       | Y                      | Y                             | Plan components will be developed for this species                           |
| Plant | Yellow mountainheath               | <i>Phyllodoce glanduliflora</i>                  | Y                       | N                      | N                             | Secure in the plan area (3)  |

| Type  | Common name                | Scientific name                                  | Secure in the plan area | Affected by management | Included for further analysis | Rationale for selection/ non-selection                                  |
|-------|----------------------------|--|-------------------------|------------------------|-------------------------------|---|
| Plant | White spruce               | <i>Picea glauca</i>                              | Y                       | Y                      | N                             | Secure in the plan area (3)   |
| Plant | Bluntleaf orchid           | <i>Platanthera obtusata</i>                      | U                       | Y                      | N                             | Uncertain distribution, affected by management, not carried forward (9) |
| Plant | Slender bog orchid         | <i>Platanthera stricta</i>                       | U                       | Y                      | N                             | Uncertain distribution, affected by management, not carried forward (9) |
| Plant | Prairie bluegrass          | <i>Poa arida</i>                                 | U                       | Y                      | N                             | Uncertain distribution, affected by management, not carried forward (9) |
| Plant | Letterman's bluegrass      | <i>Poa lettermanii</i>                           | U                       | Y                      | N                             | Uncertain distribution, affected by management, not carried forward (9) |
| Plant | Polygonum spergulariiforme | <i>Polygonum douglasii ssp. spergulariiforme</i> | U                       | U                      | N                             | Uncertain distribution, abundance or knowledge of life history (7)      |
| Plant | Douglas' knotweed          | <i>Polygonum douglasii var. austiniae</i>        | Y                       | U                      | N                             | Uncertain distribution, abundance or knowledge of life history (7)      |
| Plant | Broadleaf knotweed         | <i>Polygonum minimum</i>                         | Y                       | U                      | N                             | Uncertain distribution, abundance or knowledge of life history (7)      |
| Plant | Northern holly fern        | <i>Polystichum lonchitis</i>                     | U                       | Y                      | N                             | Uncertain distribution, affected by management, not carried forward (9) |

| Type  | Common name           | Scientific name                | Secure in the plan area | Affected by management | Included for further analysis | Rationale for selection/ non-selection                             |
|-------|-----------------------|--------------------------------|-------------------------|------------------------|-------------------------------|--|
| Plant | Alpine pondweed       | <i>Potamogeton alpinus</i>     | Y                       | N                      | N                             | Secure in the plan area (3)  |
| Plant | Flatstalk pondweed    | <i>Potamogeton friesii</i>     | U                       | N                      | N                             | Uncertain distribution, no known management impacts (8)            |
| Plant | Illinois pondweed     | <i>Potamogeton illinoensis</i> | U                       | N                      | N                             | Uncertain distribution, no known management impacts (8)            |
| Plant | Whitestem pondweed    | <i>Potamogeton praelongus</i>  | U                       | N                      | N                             | Uncertain distribution, no known management impacts (8)            |
| Plant | Robbin's pondweed     | <i>Potamogeton robbinsii</i>   | U                       | N                      | N                             | Uncertain distribution, no known management impacts (8)            |
| Plant | Stuckenia vaginata    | <i>Potamogeton vaginatus</i>   | U                       | N                      | N                             | Uncertain distribution, no known management impacts (8)            |
| Plant | Shortleaf cinquefoil  | <i>Potentilla brevifolia</i>   | U                       | U                      | N                             | Uncertain distribution, abundance or knowledge of life history (7) |
| Plant | Hooker's cinquefoil   | <i>Potentilla hookeriana</i>   | U                       | U                      | N                             | Uncertain distribution, abundance or knowledge of life history (7) |
| Plant | Potentilla hyparctica | <i>Potentilla nana</i>         | U                       | U                      | N                             | Uncertain distribution, abundance or knowledge of life history (7) |

| Type  | Common name           | Scientific name                        | Secure in the plan area | Affected by management | Included for further analysis | Rationale for selection/ non-selection                                  |
|-------|-----------------------|--|-------------------------|------------------------|-------------------------------|---|
| Plant | Snow cinquefoil       | <i>Potentilla nivea</i>                | U                       | U                      | N                             | Uncertain distribution, abundance or knowledge of life history (7)      |
| Plant | Sheep cinquefoil      | <i>Potentilla ovina var. decurrens</i> | U                       | Y                      | N                             | Uncertain distribution, affected by management, not carried forward (9) |
| Plant | Brook cinquefoil      | <i>Potentilla rivalis</i>              | U                       | Y                      | N                             | Uncertain distribution, affected by management, not carried forward (9) |
| Plant | Colorado cinquefoil   | <i>Potentilla subjuga</i>              | U                       | U                      | N                             | Uncertain distribution, abundance or knowledge of life history (7)      |
| Plant | Oneflower cinquefoil  | <i>Potentilla uniflora</i>             | Y                       | N                      | N                             | Secure in the plan area (3)   |
| Plant | Greenland primrose    | <i>Primula egaliksensis</i>            | Y                       | Y                      | N                             | Plan components not necessary (10)                                      |
| Plant | Whitevein wintergreen | <i>Pyrola picta var. dentata</i>       | U                       | Y                      | N                             | Uncertain distribution, affected by management, not carried forward (9) |
| Plant | Manysted goldenweed   | <i>Pyrrocoma integrifolia</i>          | U                       | Y                      | N                             | Uncertain distribution, affected by management, not carried forward (9) |
| Plant | Ice cold buttercup    | <i>Ranunculus gelidus ssp. grayi</i>   | U                       | N                      | N                             | Uncertain distribution, no known management impacts (8)                 |

| Type  | Common name            | Scientific name                                      | Secure in the plan area | Affected by management | Included for further analysis | Rationale for selection/ non-selection                                  |
|-------|------------------------|--|-------------------------|------------------------|-------------------------------|---|
| Plant | Sharpleaf buttercup    | <i>Ranunculus acriformis</i> var. <i>montanensis</i> | U                       | Y                      | N                             | Uncertain distribution, affected by management, not carried forward (9) |
| Plant | Alpine buttercup       | <i>Ranunculus adoneus</i>                            | U                       | Y                      | N                             | Uncertain distribution, affected by management, not carried forward (9) |
| Plant | Northern buttercup     | <i>Ranunculus pedatifidus</i> var. <i>affinis</i>    | U                       | Y                      | N                             | Uncertain distribution, affected by management, not carried forward (9) |
| Plant | Pennsylvania buttercup | <i>Ranunculus pensylvanicus</i>                      | U                       | Y                      | N                             | Uncertain distribution, affected by management, not carried forward (9) |
| Plant | Dwarf buttercup        | <i>Ranunculus pygmaeus</i>                           | U                       | Y                      | N                             | Uncertain distribution, affected by management, not carried forward (9) |
| Plant | Alderleaf buckthorn    | <i>Rhamnus alnifolia</i>                             | U                       | U                      | N                             | Uncertain distribution, abundance or knowledge of life history (7)      |
| Plant | Nootka rose            | <i>Rosa nutkana</i> var. <i>hispida</i>              | U                       | U                      | N                             | Uncertain distribution, abundance or knowledge of life history (7)      |
| Plant | Barclay's willow       | <i>Salix barclayi</i>                                | Y                       | Y                      | N                             | Secure in the plan area (3)   |
| Plant | Barratt's willow       | <i>Salix barrattiana</i>                             | Y                       | Y                      | N                             | Secure in the plan area (3)   |
| Plant | Sageleaf willow        | <i>Salix candida</i>                                 | Y                       | N                      | N                             | Plan components not necessary (10)                                      |

| Type  | Common name   | Scientific name  | Secure in the plan area | Affected by management | Included for further analysis | Rationale for selection/ non-selection                                       |
|-------|---|--|-------------------------|------------------------|-------------------------------|--|
| Plant | Cascade willow  | <i>Salix cascadenensis</i>                             | U                       | U                      | N                             | Uncertain distribution, abundance or knowledge of life history (7)           |
| Plant | Farr's willow   | <i>Salix farriae</i>                                   | U                       | Y                      | N                             | Uncertain distribution, affected by management, not carried forward (9)      |
| Plant | Lemmon's willow                                       | <i>Salix lemmonii</i>                                  | U                       | Y                      | N                             | Uncertain distribution, affected by management, not carried forward (9)      |
| Plant | Myrtle-leaf willow                                    | <i>Salix myrtillifolia</i> var. <i>myrtillifolia</i>   | Y                       | Y                      | N                             | Species within potential research natural area or special interest area (11) |
| Plant | Roundleaf willow                                      | <i>Salix rotundifolia</i> var. <i>dodgeana</i>         | U                       | U                      | N                             | Uncertain distribution, abundance or knowledge of life history (7)           |
| Plant | Sierran blacksnakeroot                                | <i>Sanicula graveolens</i>                             | U                       | Y                      | N                             | Uncertain distribution, affected by management, not carried forward (9)      |
| Plant | Yellowspot saxifrage                                  | <i>Saxifraga bronchialis</i> var. <i>austromontana</i> | Y                       | N                      | N                             | Secure in the plan area (3)  |
| Plant | <i>Saxifraga serpyllifolia</i> var. <i>chrysantha</i> | <i>Saxifraga chrysantha</i>                            | U                       | Y                      | N                             | Uncertain distribution, affected by management, not carried forward (9)      |
| Plant | Peak saxifrage  | <i>Saxifraga nidifica</i>                              | Y                       | N                      | N                             | Secure in the plan area (3)  |

| Type  | Common name               | Scientific name                  | Secure in the plan area | Affected by management | Included for further analysis | Rationale for selection/non-selection  |
|-------|---------------------------|----------------------------------|-------------------------|------------------------|-------------------------------|--|
| Plant | Purple mountain saxifrage | <i>Saxifraga oppositifolia</i>   | U                       | Y                      | N                             | Uncertain distribution, affected by management, not carried forward (9)      |
| Plant | Watson's spikemoss        | <i>Selaginella watsonii</i>      | U                       | Y                      | N                             | Uncertain distribution, affected by management, not carried forward (9)      |
| Plant | Arctic burreed            | <i>Sparganium natans</i>         | Y                       | Y                      | N                             | Species within potential research natural area or special interest area (11) |
| Plant | Fleshy starwort           | <i>Stellaria crassifolia</i>     | U                       | Y                      | N                             | Uncertain distribution, affected by management, not carried forward (9)      |
| Plant | Northern bog aster        | <i>Symphotrichum boreale</i>     | U                       | Y                      | N                             | Uncertain distribution, affected by management, not carried forward (9)      |
| Plant | Woolbearing dandelion     | <i>Taraxacum eriophorum</i>      | U                       | Y                      | N                             | Uncertain distribution, affected by management, not carried forward (9)      |
| Plant | Twicehairy groundsel      | <i>Tephrosieris lindstroemii</i> | U                       | Y                      | N                             | Uncertain distribution, affected by management, not carried forward (9)      |
| Plant | Alpine meadow rue         | <i>Thalictrum alpinum</i>        | Y                       | Y                      | N                             | Species within potential research natural area or special interest area (11) |

| Type  | Common name            | Scientific name                                     | Secure in the plan area | Affected by management | Included for further analysis | Rationale for selection/ non-selection                                  |
|-------|------------------------|---|-------------------------|------------------------|-------------------------------|---|
| Plant | Thelesperma marginatum | <i>Thelesperma subnudum</i> var. <i>marginatum</i>  | U                       | U                      | N                             | Uncertain distribution, abundance or knowledge of life history (7)      |
| Plant | Cushion Townsend daisy | <i>Townsendia condensata</i> var. <i>condensata</i> | U                       | Y                      | N                             | Needs category  |
| Plant | Common Townsend daisy  | <i>Townsendia leptotes</i>                          | U                       | Y                      | N                             | Uncertain distribution, affected by management, not carried forward (9) |
| Plant | Tundra clover          | <i>Trifolium nanum</i>                              | U                       | Y                      | N                             | Uncertain distribution, affected by management, not carried forward (9) |
| Plant |                        | <i>Triglochin palustre</i>                          | Y                       | Y                      | N                             | Secure in the plan area (3)   |
| Plant | Large flower triteleia | <i>Triteleia grandiflora</i>                        | U                       | Y                      | N                             | Uncertain distribution, affected by management, not carried forward (9) |
| Plant | Lesser bladderwort     | <i>Utricularia minor</i>                            | Y                       | Y                      | N                             | Secure in the plan area (3)   |
| Plant | Hoary verbena          | <i>Verbena stricta</i>                              | U                       | U                      | N                             | Uncertain distribution, abundance or knowledge of life history (7)      |
| Plant | Squashberry            | <i>Viburnum edule</i>                               | U                       | Y                      | N                             | Uncertain distribution, affected by management, not carried forward (9) |
| Plant | Darkwoods violet       | <i>Viola orbiculata</i>                             | U                       | Y                      | N                             | Uncertain distribution, affected by management, not carried forward (9) |

| Type  | Common name         | Scientific name              | Secure in the plan area | Affected by management | Included for further analysis | Rationale for selection/ non-selection                                  |
|-------|---------------------|------------------------------|-------------------------|------------------------|-------------------------------|---|
| Plant | Sunflower mule-ears | <i>Wyethia helianthoides</i> | U                       | Y                      | N                             | Uncertain distribution, affected by management, not carried forward (9) |

**Table 4—Definitions used in Table 3**

| In the table                   | Definition  |
|--------------------------------|---|
| U                              | Uncertain information exists about the population of the species or no surveys have been conducted to ascertain the species population(s) on the Shoshone. Data for species distribution or habitat on the Shoshone were obtained from Rocky Mountain Bird Observatory data in Monitoring Wyoming Birds, NatureServe, <i>Atlas of Birds, Mammals, Amphibians, and Reptiles of Wyoming</i> , and surveys conducted by and for the Shoshone National Forest |
| Secure in the plan area        | The species abundance provides for continued distribution in the plan area or population trends appear stable to increasing.  |
| Affected by management actions | Actions or activities conducted by the Forest Service may impact the species populations or habitats.   |

**Table 5—Numbers in the rationale column in Table 3**

| Number | Description   | Species  |
|--------|---|--|
| 1      | <p>Uncertain occurrence in the plan area—these species have an uncertain distribution or no known habitat within the planning area. Wildlife surveys and incidental observation have not confirmed their distribution on the Shoshone National Forest. These species are listed due to their occurrence adjacent to the plan area or unconfirmed occurrence reports within the plan area. There are no anticipated management actions that will have long-term impacts to these species if they are found in the plan area.</p> | <p>American bittern, American white pelican, black swift, black-billed cuckoo, black-crowned night heron, Canada warbler, Cassin’s sparrow, chestnut collared longspur, Clark’s Grebe, ferruginous hawk, Harris’s sparrow, LeConte’s sparrow, red-headed woodpecker, snowy egret, Virginia rail, upland sandpiper, Hudsonian emerald</p>   |
| 2      | <p>These species are suspected to occur on the Forest or have a low known population/habitat in the plan area or are transient on the Shoshone. According to records, occurrences of these species are very rare. If a species occurs on the Forest, it is in very low numbers. Some species are transient and use the Forest as a refuge while completing migration, so it is very unlikely any management actions would impact these species.</p>   | <p>Northern leopard frog, bobolink, dickcissel, great blue heron, lark bunting, lesser scaup, loggerhead shrike, greater sandhill crane McCown’s longspur, short-eared owl, trumpeter swan, wood duck, silver-haired bat, spotted bat</p>  |
| 3      | <p>These species have secure populations in the plan area and management activities would not measurably limit habitat or distribution. Currently, populations of these species are considered secure. No plan components or management activities would limit the distribution of these species. The trout species are non-native and stocked in many rivers/lakes on the Shoshone</p>   | <p>American peregrine falcon, bald eagle, Barrow’s goldeneye, canvasback, common loon, great blue heron, northern pintail, prairie falcon, Swainson’s hawk, Western grebe, redhead, ruffed grouse, rufous hummingbird, brook trout, brown trout, burbot, golden trout, hybridized trout, lake trout, mountain sucker, mountain whitefish, rainbow trout, American bison, American pika, badger, black bear, dwarf shrew, hoary bat, mountain goat, mountain lion, mule deer, pronghorn antelope, vagrant shrew, western heather vole, whitetailed deer, long-tailed weasel, river otter, white-tailed prairie dog, pygmy pussytoes, actous rubra, American alpine lady fern, alpine northern rockcress, elk thistle, potentilla palustris, tall whitlowgrass, rubber rabbitbrush, dwarf groundsmoke, Bicknell’s cranesbill, Pacific alpinegold, simple bog sedge, subalpine monkeyflower, whorled water milfoil, stalkpod locoweed, weakstem groundsel, shrubby beardtongue, yellow mountainheath, white spruce, alpine pondweed. oneflower cinquefoil, barclay’s willow, Barratt’s willow, yellowspot saxifrage, peak saxifrage, trigloch in palustre, lesser bladderwort</p> |

| Number | Description  | Species  |
|--------|--|--|
| 4      | Category dropped   |  |
| 5      | Category dropped   |  |
| 6      | Category dropped   |  |
| 7      | Uncertain distribution, abundance, or knowledge of life history                      | Idaho bent, northern bent, Oregon bent, Boechera lemmonii var drepanoloba, wind river rockcress, Boechera sparsiflora var subvillosa, narrowleaf leopardbane, Artemisia norvegica var saxatalis, Pacific wormwood, broadkeel milkvetch, arctic bellflower, arctic harefoot sedge, nard sedge, white thistle, rosy pussypaws, smoothseed pygmyweed, snake river catseye, Leptosiphon nuttallii, king's flax, Polygonum spergulariforme, Douglas' knotweed, broadleaf knotweed, shortleaf cinquefoil, Hooker's cinquefoil, Potentilla hyperactica, snow cinquefoil, Colorado cinquefoil, alderleaf buckthorn, nootka rose, cascade willow, roundleaf willow, Thelesperma marginatum, hoary verbena |
| 8      | Uncertain distribution in the plan area; no known impacts from management activities | Coon's tail, Williams' miterwort, fragile rockbrake, boreal whitlowgrass, denseleaf whitlowgrass, Austrian whitlowgrass, smooth whitlowgrass, Payson't whitlowgrass, Garrett's firechalice, arctic alpine fleabane, slender fleabane, smallflower fescue, star duckweed, flatstalk pondweed, Illinois pondweed, whitestem pondweed, Robbin's pondweed, Stuckenia vaginata, ice cold buttercup  |

| Number | Description  | Species   |
|--------|--|---|
| 9      | Uncertain distribution, potentially impacted by management activities, but not carried forward for further analysis or plan components | <p>Mustkroot, Sitka alder, Alopecurus borealis, Smallflower thimbleweed, scented pussytoes, whip pussytoes, woolly pussytoes, lanceleaf moonwort, common moonwort, mingan moonwort, leathery grape fern, least moonwort, rattlesnake fern ditch reedgrass, bigpod mariposa lily, Blackfoot River evening primrose, Bebb's sedge, Carex deweyana var. bolanderi, ebony sedge, Jones's sedge, alpine nerve sedge, western sedge, Parry's sedge, Canadian singlespike sedge, dark mountain sedge, quill sedge, Carex foetida var vernacular, dryland sedge, Cockscomb Indian paintbrush, nodding chickweed slender woodreed, small enchanter's nightshade, Pacific coralroot, spring coralroot, California oatgrass, annual hairgrass, slender hairgrass, Sierra tansymustard, longhorn steershead, spreading wood fern, glaucous willowherd, narrowleaf goldenbush, Parry's rabbitbrush, trailing fleabane, desert yellow fleabane, Piper's yellow buckwheat, parsnipflower buckwheat, slender cottongrass, white cottongrass, Tassel cottongrass, Baffin fescue, red fescue, false mermaidweed, alpine spicywintergreen, whitish gentian, pygmy gentian, fourpart dward gentian, small floating mannagrass, Hooker's alpine oatgrass, Morton's alpine oatgrass, juncus triglumis var. albescens, Baltic rush, twoflower rush, chestnut rush, Hall's rush, Regal's rush, Juncus triglumis var triglumis, Vasey's rush, milky kelloggia, Pacific bog sedge, Siberian bog sedge, trapper's tea, dense bladderpod, threeleaf bitterroot, Canby's wild lovage, northern twayblade, heartleaf twayblade, streambank desertparsley, velvet lupine, Lupinus polyphyllus var prunophilus, smooth woodrush, common woodrush, Piper's woodrush, stiff groundpine, variegated bract blazingstar, spindle bluebells, Brewer's monkeyflower, muskflower, Columbian stitchwort, Hypopoity's monotropa, Chamisso's minerslettuce, foxtail muhly, coyote tobacco, flattop broomrape, Parry's locoweed, Payson's groundsel, streambank groundsel, Kotzebue's grass-of-parnassus, coiled lousewort, Oeder's lousewort, giant lousewort, stiffleaf beardtongue, bluntleaf orchid, slender bog orchid, prairie bluegrass, Letterman's bluegrass, northern holly fern, sheep cinquefoil, brook cinquefoil, whitevein wintergreen, manysted goldenweed, sharpleaf buttercup, alpine buttercup, northern buttercup, Pennsylvania buttercup, dwarf buttercup, Farr's willow, Lemmon's willow, Sierran black snakeroot, Saxifraga serpyllifolia var chrysantha, purple mountain saxifrage, Watson's spikemoss, fleshy starwort, northern bog aster, woolbearing dandelion, twicehairy groundsel, common townsend daisy, tundra clover, large flower triteleia, squashberry, darkwoods violet, sunflower mule-ear</p> |

| Number | Description  | Species  |
|--------|--|--|
| 10     | Plan components are not necessary for these species. Plan components developed for ecosystem diversity will adequately provide habitat for these species; no other plan components are needed for species conservation for the life of this plan. The section following this table outlines the rationale for this determination. The interdisciplinary team highlighted these species for review at the five-year plan review to determine if additional plan direction is warranted. | American dipper, American three-toed woodpecker, black-backed woodpecker, boreal owl, Brewer's sparrow, olive-sided flycatcher, willow flycatcher, red-naped sapsucker, Williamson's sapsucker, sage sparrow, sage thrasher, American marten, fringed myotis, North American wolverine, Townsend's big-eared bat, roundleaf orchid, english sundew, chamisso's cottongrass, greenland primrose, sageleaf willow  |
| 11     | Species within a potential research natural area or special interest area—these species, though rare and/or endemic, are secure within the plan area.  | Sweetflower rockjasmine, Little Belt Mountain thimbleweed, Brownish sedge, Buxbaum's sedge, Hairlike sedge, Low northern sedge, Lesser tussock sedge, Northern bog sedge, Inland sedge, Bristly-stalk sedge, Bristlystalked sedge, Mud sedge, Livid sedge, False uncinia sedge, Shortleaf sedge, Little green sedge, Chaenactis alpina var. alpine, Draba porsildii, Swamp willowherb, Howard's alpine forgetmenot, Thread rush, Oneflower kelseya, marsh muhly, Rayless mountain groundsel, Petasites frigidus var. sagittatus, Myrtle-leaf willow, Arctic burreed, Alpine meadow rue |

## Rationale for species covered by ecosystem plan components (number 10 in Table 3)

This section addresses those species considered for additional plan components to address species needs, but were later dropped from consideration because ecosystem plan components provide the addressed species needs and additional direction was not needed. The section describes the rationale for this determination.

### Stream/riparian habitat group

| Common name            | Scientific name           |
|------------------------|---------------------------|
| American dipper        | <i>Cinclus mexicanus</i>  |
| Olive-sided flycatcher | <i>Contopus cooperi</i>   |
| Willow flycatcher      | <i>Empidonax traillii</i> |

#### American dipper

Dippers utilize clear, fast-flowing streams in areas with rocks, sand, and rubble bottoms (Kingery 1996). This rubble type of substrate is also associated with the highest levels of aquatic invertebrates (Pennak and van Gerpen 1947), the dippers' main food source. In Yellowstone National Park, the birds are found from 1,600 m (5,249 feet) to over 2,400 m (7,875 feet) elevation, and even winter at 2,400 m (7,875 feet) if the water does not freeze (Skinner 1922).

Dippers may be especially vulnerable to habitat degradation because they occupy a very specific niche: they rarely leave the stream corridor, so they are unlikely to move to other areas; they have many specific physical adaptations to their environment; and their main food source is aquatic invertebrates. Road construction, mining, excessive livestock grazing, or timber management practices that increase sedimentation into the stream and negatively affect aquatic invertebrates are detrimental to the American dipper. Other impacts to American dipper habitat include recreational activities that disturb nesting, water diversions, and dams.

#### Olive-sided flycatcher

The olive-sided flycatcher is found in mature coniferous and aspen forests throughout central and western Wyoming. It is dependent on burned areas for snags and is often found near forest openings and edges near water (Kotliar 2007). Breeding Bird Surveys have shown a decline in populations of this species across its range, although not as much in the Forest Service Rocky Mountain Region. Extensive timber harvest, loss of the aspen component in forested areas, and grazing that reduces deciduous trees in riparian areas would be threats.

#### Willow flycatcher

The willow flycatcher is a riparian obligate that inhabits willow or alder thickets along streams located below 10,000 feet in elevation. This species prefers low-structured riparian habitat in early to mid-successional stages of development, and requires at least five acres per breeding pair to nest successfully.

Population declines appear to be a result of riparian habitat degradation from heavy livestock grazing, incompatible recreational activities, and willow removal. Heavy nest parasitism by cowbirds can affect populations where livestock grazing occurs.

#### Rationale for not needing additional plan components

Species in this group are lumped based on their dependence on aquatic and riparian habitats and their status as species with decreasing or uncertain population trends.

Plan components developed for ecosystem diversity will provide habitat conditions favorable to these species, and habitat is the limiting factor for conservation of these species. The desired

conditions for watersheds describe systems of high integrity and natural conditions. Desired conditions for vegetation encourage strong vegetation diversity including increases in willow and aspen from current levels. Plan objectives are set for increasing healthy willow, aspen and riparian communities. The Watershed Conservation Practices Handbook provides direction for water quality and riparian health. Plan guidelines direct that management activities (including grazing) in riparian areas support long-term health. Also, guidelines for Yellowstone cutthroat trout benefit these riparian species.

With all this plan direction to maintain and enhance aquatic and riparian habitats, there are no additional plan components needed to conserve these species.

### **Sagebrush group**

| <b>Common name</b> | <b>Scientific name</b>      |
|--------------------|-----------------------------|
| Brewer's sparrow   | <i>Spizella breweri</i>     |
| Sage sparrow       | <i>Amphispiza belli</i>     |
| Sage thrasher      | <i>Oreoscoptes montanus</i> |

#### **Brewer's sparrow**

Brewer's sparrows require sage and grassland habitats with tall shrubs and patchy distribution of sagebrush and grasses (Nicholoff 2003). Although the species appears to be in decline regionally, local monitoring has shown it appear to be common where high quality habitat exists in Wyoming and on the Shoshone (186 individuals, robust sample sizes are obtained in montane grassland).

Brewer's sparrows rely on these sagebrush communities and any degradation of that habitat is a threat, such as overgrazing, which can change species composition, exclusion of natural fire, and introduction of noxious weeds.

#### **Sage sparrow**

The sage sparrow is both a sagebrush obligate and an area-sensitive species that benefits from maintaining large blocks of unfragmented tall, older, dense stands of sagebrush habitat. This sparrow prefers continuous areas greater than 50 acres that provide areas of short vegetation surrounded by various heights of sagebrush. Wyoming Partners in Flight rated this species as a Priority One species for which conservation action is needed. The primary threats to the sage sparrow are loss or degradation of large areas of sagebrush habitats, including invasive weeds (Nicholoff 2003).

#### **Sage thrasher**

This species is a sagebrush obligate and area-sensitive species. Its habitat requirements are very similar to the sage sparrow and are described above. Wyoming Partners in Flight rates this species as a Priority Two, which needs monitoring. Primary threats to this species are similar for those listed under sage sparrow (Nicholoff 2003).

#### **Rationale for not needing additional plan components**

Species in this group are lumped based on their dependence on sagebrush communities and their status as species with decreasing population trends.

The limiting factor for all three species is the availability of healthy sagebrush ecosystems, and this is addressed in plan components in the ecosystem diversity section of the plan. The desired conditions for sagebrush communities and the objectives pertaining to grassland and sagebrush cover will provide more habitat for these species in the future. Guidelines for greater sage grouse will also benefit this species. Plan components addressing noxious weeds will benefit these species. Therefore, no other plan components are needed to provide for the conservation of these species.

## Snag and mature habitat group

| Common name                    | Scientific name               |
|--------------------------------|-------------------------------|
| American three-toed woodpecker | <i>Cooides dorsalis</i>       |
| Black-backed woodpecker        | <i>Picooides arcticus</i>     |
| Boreal owl                     | <i>Aegolius funereus</i>      |
| Red-naped sapsucker            | <i>Sphyrapicus nuchalis</i>   |
| Williamson's sapsucker         | <i>Sphyrapicus thyroideus</i> |
| American marten                | <i>Martes americana</i>       |

### American three-toed woodpecker

American three-toed woodpeckers are widely considered a barometer of the health of old-growth conifer forests due to their dependence on old growth and mature conifer forests. There is not much data on species trends, but Wyoming Partners in Flight lists the American three-toed woodpecker as a conservation Priority Two species. Three-toeds widely use post-fire disturbed areas where boring insects are prevalent.

Published studies suggest the most likely threats to three-toed woodpeckers are salvage logging (especially of burned stands less than two years post-fire), suppression of bark beetle outbreaks, and logging of old-growth forests (Wiggins 2004). While these threats may be important at the local level where woodpeckers occur at low densities, they appear to be less important at the regional level where existing old-growth conifer forests appear to be providing suitable conditions for viable populations.

### Black-backed woodpecker

Although the black-backed woodpecker is considered rare in the Rocky Mountains and throughout its range, it is locally common in recently burned forests and those with infestations of wood-boring beetles. Similarly to the American three-toed woodpecker, the black-backed woodpecker prefers mature and old-growth spruce, fir, Douglas fir, and lodgepole pine forests, and is considered even more dependent on post-fire conditions.

Threats to this species include habitat loss due to logging of mature/old growth forests and salvage logging of post-fire stands.

### Boreal owl

Population trends for this species are uncertain but Wyoming Partners in Flight list it as a conservation Priority Two species.

Boreal owls use areas with high densities of snags with average sizes of 25 inches diameter at breast height and large amounts of down wood for prey habitat. The main threat to this species is timber harvest that fragments mature forest and removes potential sources of snags and down wood, although small patch cuts and uneven-aged harvest do not seem to have an impact.

### Williamson's sapsucker

This species needs montane conifer mixed with deciduous trees, particularly aspen, cottonwood, birch, and willow. This species needs snags, but also a mix of live and dead trees with minimum tree size being 10 inches. Burned forest areas are important foraging areas. Population trends for this species are uncertain (Nicholoff 2003).

Threats to this species are loss of aspen, loss of large trees and snags, and grazing if it reduces deciduous trees.

### Red-naped sapsucker

Red-naped sapsuckers utilize snags and mature, live trees. They prefer aspen and hardwoods and they produce nest cavities and sap wells that other species use. They are often associated

with riparian communities. Population trends for this species are uncertain. Threats to this species are similar to those listed under the Williamson's sapsucker.

#### **American marten**

Marten prefer mature forest, especially mesic conifers with complex understories including down wood. Forest Service personnel commonly see marten in suitable habitats. Monitoring has been completed several winters over the last 10 years and marten are commonly encountered. These data indicate marten are common on the Shoshone and probably have a stable trend.

Marten habitat is probably declining with the current insect and disease outbreaks. The primary threat to this species is loss or fragmentation of habitat.

#### **Rationale for not needing additional plan components**

Species in this group are grouped based on their dependence on mature forest, snags and down woody debris, and their status as species with decreasing or uncertain population trends.

Plan components for this group of species are predominantly provided by the ecosystem diversity plan components for snags. In the Ecosystem Diversity Report, we conclude that the distribution, density, and size classes of snags in high elevation spruce/fir and lodgepole pine are largely within their historic ranges. The desired conditions for snags reflect a continuation of this situation. For lower elevations where timber harvest may occur, guidelines allow for the maintenance of levels of two to three snags per acre averaged over 1,000 acres, which provides the snags and future down wood needed by these species. In addition, there is a guideline to retain a mature forest habitat in areas where timber is harvested. It should also be noted that the underlying assumption in the revised plan is that adequate levels of snags (standing dead) will lead to adequate levels of dead and down coarse woody debris, which is an important habitat component for this group of species as well as many others not designated as species of interest

Both the American three-toed and black-backed woodpeckers require the availability of large areas of snags resulting from wildfires. Currently on the Shoshone, this habitat is not in short supply, but during the late 1990s, fire history analysis indicates that blocks of this habitat component were in short supply on the Shoshone. The desired conditions for vegetation includes language for maintaining this habitat component. Given the current conditions of increasing wildfires and the intent of the plan to maintain a level of fire across the Shoshone, it seems unlikely this plan component will ever be binding on plan implementation decisions. For this reason, additional guidelines are not included in the plan to maintain this habitat component.

#### **Bat group**

| <b>Common name</b>       | <b>Scientific name</b>                    |
|--------------------------|---|
| Fringed myotis           | <i>Myotis thysanodes</i>                  |
| Townsend's big-eared bat | <i>Corynorhinus townsendii pallescens</i> |

#### **Fringed myotis**

Fringed myotis utilize caves and rock outcrops as well as snags for roosting and hibernating (Keineth 2004). In 1997, fringed myotis was documented in caves on the Shoshone. Information about population trend of this species is scant, but researchers believe they are in decline. The primary threat to this species is lack of suitable roosts and disturbance in caves while hibernating.

#### **Townsend's big-eared bat**

This species is associated with caves and abandoned mines, which are used for roosting and hibernating. These bats forage in forested and edge environments (Gruver and Keinath 2006). In 1997, Townsend's big-eared bat was documented in caves on the Shoshone. The current

trend for this species appears to be steadily downward, as it has been for some time. US Fish and Wildlife Service had this species on the candidate list for federal listing when such a category existed. The limiting factors are disturbance in caves while the bats are hibernating, losing hibernation areas when abandon mines are closed, and loss of foraging areas due to large clear cuts.

**Rationale for not needing additional plan components**

Plan components for this group of species are predominantly provided by the ecosystem diversity plan components for mature forest and snags. The desired conditions for vegetation on the Shoshone describe between 10 percent and 25 percent of the forest in older age classes and having large blocks of these older age classes. The additional habitat component of importance is undisturbed cave environments. The Shoshone does not have many caves or mines and there are no activities that take place in those features. We are aware of one cave with a small population of Townsend’s big-eared bats that is experiencing human disturbance and a plan is developing to address that problem by gating the cave or using other methods of eliminating that disturbance.

**Wolverine**

| Common name              | Scientific name         |
|--------------------------|-------------------------|
| North American wolverine | <i>Gulo gulo luscus</i> |

Wolverine are present but rare on the Shoshone. This species inhabits high elevation areas that receive heavy and sustained snowpacks. In winters of 2005-06 and 2006-07, Yellowstone Park Foundation funded a wolverine survey project on the east side of Yellowstone National Park and the west side of the north end of the Shoshone. No wolverines were captured even though habitat models show this area of the Shoshone as high potential, and wolverines captured elsewhere are using the Shoshone. Other survey methods are being employed currently to ascertain wolverine movements in this area. Although this species is rare, the US Fish and Wildlife Service decided not to federally list the species after review in March 2009.

There are few activities occurring on the Forest that threaten this species, although high snowmobile use can be detrimental.

**Rationale for not needing additional plan components**

There are few activities that happen on the Shoshone in the high elevation habitats used by wolverines. Much of the Shoshone’s high elevation areas are in wilderness. Retained direction from the Northern Rocky Mountain Lynx Record of Decision limits creation of additional snowmobile areas. With what is known about threats to wolverine at this time, there are no additional plan components needed for its conservation.

**Montane fen group**

| Common name            | Scientific name                |
|------------------------|--------------------------------|
| Chamisso’s cottongrass | <i>Eriophorum chamissonis</i>  |
| English sundew         | <i>Drosera anglica</i>         |
| Greenland primrose     | <i>Primula egaliksensis</i>    |
| Roundleaf orchid       | <i>Amerorchis rotundifolia</i> |
| Sageleaf willow        | <i>Salix candida</i>           |

Fens located on Shoshone National Forest provide habitat for many of the Forest Service Rocky Mountain Region’s sensitive plants and other Wyoming species of concern. The greatest distribution of fen types is in the Beartooth Mountains.

Roundleaf orchid is a forested fen species found near the base of spruce tree roots around Swamp Lake and other sites within the Clarks Fork Ranger District. English sundew and

Chamisso's cottongrass are endemic to acidic/granitic fen types found on the Beartooth and Wind River Mountains. Greenland primrose, a basic (pH) fen obligate, is found only near Swamp Lake. Sageleaf willow is found in extremely rich fens with a high pH on the Beartooth and Wind River Mountains.

Potential impacts to species result from grazing, invasive plants, water diversion, and other ground disturbing impacts. Grazing is normally an impact only during dry years when livestock may enter areas that are normally too wet for them in normal years. Invasive plants can impact native plant distribution. Water diversions and other ground disturbing activities can alter the water tables associated with fens, changing habitat conditions.

**Rationale for not needing additional plan components**

Plan components under ecosystem diversity for fens contribute toward sustaining populations of these species. Plan components for invasive species include direction that will also protect fen species. Direction from the Watershed Conservation Practices handbook provides protection from ground disturbing activities and water diversions. A guideline for grazing and fens addresses concerns with potential impacts from livestock grazing.

## **Appendix C—Maps**

**Map 1—Greater sage grouse distribution on the Shoshone National Forest**

**Map 2—Bighorn sheep core areas in Wyoming**

**Map 3—Water vole locations on the Shoshone National Forest**