Specialist's Report

Project Name: **PIQUETT CREEK PROJECT**
Resource: **Rare Plants/Invasive Species**
Ranger District: West Fork Ranger District
Specialist's Name: Robin Taylor-Davenport
Date Completed: October 18, 2019

Introduction

Within the Piquett Creek Project several different activities are proposed. Treatments may occur on up to 3,000 acres within the project area. Across the project area, treatments will be designed to maximize the retention of healthy large diameter trees, provide diversity in structure and composition while affecting fire behavior and insects and disease hazard at the landscape scale, not just individual stands. Based on the existing conditions some areas may need a combination of activities.

Activities could include:

- Intermediate and regeneration harvests utilizing both ground based and skyline yarding, machine piling and burning, temporary road construction.
    - No harvest activities would occur within established RHCA buffers.
    - Hauling is restricted to FSR 49, 731, 5720, and 5724 and their spur roads.
    - A maximum of 500 trucks loads. Hauling will only occur on dry roads and prior to November 15th.
    - Within project watersheds, harvest would leave a residual stand and limit the increase in ECA (equivalent clearcut area) to 25%.
    - Ground-based yarding would generally be restricted to slopes 35 percent or less.

- Fuels Reduction activities such as understory thinning, hand piling, pile burning, fireline construction and understory burning.

- Road maintenance activities such as drainage maintenance, reconditioning, reconstruction.
    - No permanent road construction is proposed.
    - All temporary roads will be decommissioned no later than 3 years after the date the project is completed.
    - The resurfacing of FSR 49 with new gravel aggregate would be completed between mileposts 0.2 and 1.1. prior to hauling.
    - Drive thru dips would be installed to the approaches on two bridges that cross Piquett Creek located on FSR 49 and FSR 5720 prior to hauling.
    - All roads that cross streams will be graveled prior to any hauling.

Current Resource Condition:

Rare Plants

An evaluation of threatened species, endangered species, sensitive species, plant species of concern, and Forest plant species of interest was conducted, for the Piquett Creek Project, in order to determine species of rare plants most likely to be affected by the proposed activities.

Habitat for several rare plant species are scattered throughout the project area. Habitats such as open ponderosa pine, meadows, grassland, open mixed conifer, riparian, talus slopes, and high elevation lodge pole.

This project is a condition based project that does not have units identified. Surveys are unable to be conducted in areas where disturbance will occur since those areas are still unknown. The project area was partially surveyed for rare species, due to habitat and some known sites being present within the project area. Rare plant species were found within the project area. Surveys will need to be conducted when areas where implementation will occur are determined.

The project area was partially surveyed in 2005-2008, 2019 for rare plant species by the Forest Botanist and a Botany Technicians. Table 3 lists the habitat and rare plants found within the project area.

Montana Natural Heritage Program database, Forest Service database, aerial photographs, spatial information, and Bitterroot National Forest records were reviewed to identify known rare plant populations in or near the proposed project area. This document was based on this data and a table was compiled showing rare plant species that were known to occur within the project area or had the potential to occur in the area.

Since our knowledge of most of the species on the Bitterroot National Forest rare plant list is still fairly limited it is important to be aware that species may be found in areas outside of what is currently thought to be "suitable" habitat. Therefore, during the course of field surveys, plant species taken out of consideration due to distribution or habitat unsuitability were also cursorily surveyed for.

This Biological Evaluation was prepared based on presently available information. If the action is modified in a manner that causes effects not considered, or if new information becomes available that reveals that the action may impact rare plants in a manner or to an extent not previously considered, a new or revised Biological Evaluation may be required. The Regional sensitive plant list will be updated in 2020, therefore, table 4 has the potential to change prior to additional surveys and implementation.

No plants listed as threatened or endangered species were found in the project area and will not be analyzed or discussed in this analysis. However a candidate species, Pinus albicaulis, was found in the area. Sensitive plants are species, subspecies or varieties of plants whose populations or habitat capability have current or predicted downward trends (FSM 2670.5). Species of Concern are determined by the State of Montana to be rare or threatened plants or plants with declining populations. Sensitive plants and plant Species of Concern may have a restricted range in Montana, or they may be sparsely distributed over a larger area. Plants designated as ‘species of concern’ by the Montana Natural Heritage Program (MTNHP) include species that are listed as threatened, endangered, or sensitive by Federal agencies.

The Bitterroot National Forest currently analyzes and manages for 84 species of rare plants (USDA Forest Service 2011) and three species that are forest species of interest because of tribal interest in these plants. These 84 plants are known, suspected, or have potential to occur on the Bitterroot National Forest, due to habitat being present.

Based on the project methodology, the Forest Botanist compiled a list of rare plant species and forest species of interest, which were known or had the potential to occur in the project area (Table 3).

PINUS ALBICAULIS

Whitebark pine is found across most of western North America and scattered along the western and central ranges of Montana. Populations of *Pinus albicaulis* have been found in the Bitterroot and Sapphire mountain ranges on the Bitterroot National Forest. Populations are found in higher elevation areas in subalpine and krummhotz habitats and it is also found with lodgepole pine. Whitebark pine is known as a keystone species for the many ecosystem functions it provides in upper subalpine habitats: biodiversity, nurse tree, erosion control, food source, snow retention, pioneer species, etc. (Tomback et al. 2001).
Whitebark pine depends on Clark's nutcracker, a jay-sized bird, to collect and disperse its seeds. Nutcrackers cache seeds, usually near the seed source, but occasionally up to 6-9 miles away (Keane et al 2012). Each bird can cache thousands of whitebark pine seeds per year. Nutcrackers select cache sites with distinctive landscape features, often patches of open or recently burned forest where the ground is readily visible.

Within the project area, whitebark pine occurs in higher elevations at 6,407 feet and above. Populations are found in the southern portion of the project area.

Roughly 98% of the range for whitebark pine occurs on public lands in the United States (Schwandt 2006). Region 1 of the US Forest Service is mapped as having over 5 million acres of whitebark pine (USDA Forest Service 2010a). Data gathered by FIA (Forest Inventory and Analysis) show a reduction in the extent of live whitebark pine within the region, as well as an increase in dead whitebark pine trees (USDA Forest Service 2010a).

Whitebark pine populations have experienced sharp declines in recent decades due to altered wildfire regimes, forest succession, non-native white pine blister rust, mountain pine beetle, and possibly climate change (USFWS 2011). Studies in northwestern Montana have documented population declines of 40% to nearly 100% in 50-60 years (Keane and Arno 1993; Kendall and Keane 2001).

Whitebark pine is a Region 1 sensitive plant and a US Fish and Wildlife Service Candidate for federal listing under the Endangered Species Act. Whitebark pine is experiencing decline, rangewide, due to several factors: fire and fire suppression activities, climate change, white pine blister rust (*Cronartium ribicola*), and mountain pine beetle (*Dendroctonus ponderosae*) attack (USDI Fish and Wildlife Service 2011). The USFWS (US Fish and Wildlife Service) found that the above four factors, in conjunction with inadequate regulatory mechanisms to reduce these impacts, warranted whitebark pine for federal listing; however USFWS precluded the listing, instead giving it candidate status (USDI Fish and Wildlife Service 2011). In the interim, the Forest Service Northern Region is managing whitebark pine as a sensitive species.

In 2011, the USFWS filed a Notice of 12-month petition finding in the Federal Register (Docket No. FWS-R6-ES-2010-0047; MO 92210-0-0008) to list *Pinus albicaulis* (whitebark pine) as endangered or threatened with critical habitat. In this notice, the USFWS states that listing whitebark pine as threatened or endangered is warranted but listing is precluded by higher priority actions to amend the existing Lists of Endangered and Threatened Wildlife and Plants (76 FR 42631-42654). However, whitebark pine will be added to the candidate species list until a proposed rule is developed as priorities and funding will allow. Critical habitat will be designated at that time as well.

Section 4(a)(1) of the ESA states a species may be determined endangered or threatened based on any of the five following factors:

A. The present or threatened destruction, modification, or curtailment of its habitat or range;
B. Overutilization for commercial recreation, scientific, or educational purposes;
C. Disease or predation;
D. The inadequacy of existing regulatory mechanisms;
E. Other natural or manmade factors affecting its continued existence.

The USFWS determined the primary threat to the species is from disease (blister rust, mountain pine beetle) and its interaction with other threats (fire and fire suppression, climate change). The effects analysis of this BA/BE will be based on these threats.

The Bitterroot National Forest shows indications of blister rust activity. Some trees are completely dead and other trees show signs of infection (cankers, flagging) caused by a nonnative fungus whitepine blister rust (*Cronartium ribicola*). Infection limits seed cone production. Even with a complicated life cycle, whitepine blister rust is widespread, its current distribution is western North America (except Utah and the Great Basin Desert), and British Columbia and Alberta, Canada (Tomback and Achuff 2010).

Considering all the threats to whitebark pine and its current decline, it is important to note that timber harvest is not an activity associated with the decline of the species (USDI Fish and Wildlife Service 2011).

ALIUM PARVUM

Dwarf onion is associated with grasslands, sagebrush and openings in ponderosa pine (*Pinus ponderosa*) stands, usually in exposed areas with sandy or gravelly soil. Bitterroot (*Lewisia rediviva)* is found in similar habitat and the two species may be seen growing together. The greatest threat to dwarf onion plants and habitat is spotted knapweed *(Centaurea biebersteinii {C. maculosa})* encroachment, along with other invasive species like cheatgrass *(Bromus tectorum).* Weeds currently encroach on dwarf onion habitat and compete with the plants. Ultimately, this could adversely affect the viability of the dwarf onion population in the project area. It is highly likely that the small size of existing populations is from competition from invasive species.

Of the areas surveyed, populations of *Allium parvum* have been found throughout the project area.

Of the dwarf onion found in Montana, the majority of the populations are found on the Bitterroot National Forest. Most of the Bitterroot National Forest populations are on the south end of the Forest on the West Fork and Sula Ranger Districts with a few populations just to the north on the southern end of the Darby Ranger District. Populations are usually small, with less than 200 individuals. Upon revisiting known existing populations, populations have decreased in number of individuals. Dwarf onion is on the periphery of its range, which extends from eastern Oregon to California, east to Idaho, Nevada, and southwest Montana. Species on the periphery of their range have often adapted to habitats different from those in the main species range and may be

important for overall species viability as environmental changes occur, such as global warming (Lesica and Allendorf 1995).

CASTILLEJA COVILLEANA

Rocky Mountain paintbrush is associated with open, rocky areas at higher elevations, and in open ponderosa pine stands and grasslands at lower elevations. It is a regional endemic, occurring only in central Idaho and western Montana. Occurrences are located on the southern end of the Bitterroot National Forest. Threats to populations are from spotted knapweed and cheatgrass encroachment and fire.

Harsh paintbrush (Castilleja hispida) has similar morphological characteristics to Rocky Mountain paintbrush and has been monitored since 1994. The population size has fluctuated in the fourteen years of monitoring, and monitoring since the fires in 2000 indicates that this species is slow to respond to a natural fire event (USDA Forest Service 2003b).

PENSTEMON LEMHIENSIS

Lemhi penstemon is found on open, east to southwest facing slopes in grasslands, open ponderosa pine or Douglas-fir stands, and often associated with big sagebrush (Artemisia tridentata var. vasseyana) and bitterbrush (Purshia tridentata). It is a regional endemic, found only in southwestern Montana and adjacent Lemhi County, Idaho. Elevations range from 3,200-8,100 feet (Elzinga 1997). Occurrences are found throughout the eastern and southern portions of the Bitterroot National Forest. Spotted knapweed and cheatgrass encroaches on most of the Lemhi penstemon sites on the Bitterroot National Forest, particularly in areas that burned. Fire appears to be critical to Lemhi penstemon survival, which also favors encroachment of invasive plants.

Monitoring three Lemhi penstemon populations in Beaverhead County over a six-year period demonstrates population trends are closely tied to the existence of a seed bank (Heidel and Shelly 2001). Seeds appear to remain viable for at least six years and germination occurs during years of high moisture and disturbances such as fire. This determination concurs with recent monitoring on the Bitterroot National Forest. Botanists noted an increase in Lemhi penstemon during the wet summers of 1993 and 1995, and for three years after the fires of 2000, hundreds of seedlings germinated from a population that had burned during the fire (USDA Forest Service 2003b).

The MNHP ranks Lemhi penstemon as G3/S3, which means that the species is potentially at risk globally and at risk in Montana due to limited occurrences and vulnerability to extirpation in the state. A conservation strategy for Lemhi penstemon was prepared in 1997 and lists threats to the species from grazing, mining, road maintenance and reconstruction, timber harvest, noxious weed encroachment, herbicide application, fire suppression, interaction of invasive plant infestation and prescribed fire, and small population sizes (Elzinga 1997).

LEWISIA REDIVIVA

Found in well-drained exposed sites in gravelly to heavy soils, often found growing near rocks. Flowering times are from mid-April to mid-July.

The Bitterroot is the state flower of MT. Native Americans may have introduced the plant into eastern Flathead Co. and elsewhere (DeSanto 1993). Bitterroot is culturally important to the Salish and Kootenai tribes.
Bitterroot (Lewisia rediviva) was used by tribes and was collected just before blooming. Roots were dried and later steamed for eating. It was often cooked with berries to sweeten the bitter flavor.
Plants were likely gathered with sustainability in mind, since to do otherwise, would mean no food for the next year. Bitterroots were dug with care to leave part of the root in the ground so it could regenerate. The disturbance caused by digging bitterroots may have been important in sustaining plant populations.

Invasive plants, such as spotted knapweed and cheatgrass, are spreading through much of the habitat of these native species.
There is a concern that Bitterroot (Lewisia rediviva) species are being threatened due to habitat loss in the valley from development and competition from invasive species.

EFFECTS FOR ALL SPECIES

Dwarf onion, Rocky Mountain paintbrush, Lemhi penstemon, Bitterroot, and Whitebark pine were found within the project area, but there is a large amount of potentially suitable habitat for other species found in table 3. Minor amounts of suitable habitat exist for riparian species. These riparian areas would be protected from any proposed treatments due to RHCA buffers being in place.

If proposed treatments were not to occur and with continued fire suppression, changes in fuel loadings may result in more intense fires, increasing the possibility of soil heating and damage to below ground plant tissue. This may also create more bare soil and an increase of spread of knapweed, cheatgrass, and ventenata. Continued vegetation succession would also produce higher canopy cover and a continued decline in the quality of habitat for species adapted to habitats with frequent fire regimes.

Dwarf onion, Lemhi penstemon, Whitebark pine, and Bitterroot are adapted to frequent, low to moderate severity fires (Arno 1976). Dwarf onion and Bitterroot have an underground bulb and Lemhi penstemon has a deep taproot both of which survive the types of fires that historically burned through grasslands, open ponderosa pine, and dry to moderately dry Douglas-fir stands in this area. However, fire suppression has increased fuel loads leading to more severe fires. These higher severity fires burn more of the duff and soil and increase the possibility of damaging the below ground plant tissue. A higher severity fire is also more likely to create large areas of bare soil and increase the spread of spotted knapweed and other invasive plants (Sutherland 2003).

If proposed treatments were to be implemented, the effects would be the following:

The proposed treatment is to thin conifers reducing the fuel for potential wildfire. Handpiling and pile burning are proposed for the project area. Areas of pile burning take many years to recover (based on observations from the Forest botanist and Invasive Plant Coordinator). Based

on past observations, hand piles have a high risk for invasive plant infestations and a reduction in native plant establishment. The establishment of invasive species reduces and threatens habitat for rare plants and reduces native plant diversity. The high intensity burning of the confined area essentially sterilizes the soil and greatly inhibits native revegetation (Hebel, et al. 2009). Although invasive species are also inhibited by the lack of nutrients, they are better adapted to these sterile conditions, and once they are introduced, there are no natural barriers to prevent establishment and persistence of invasive plant species. Observations by the Forest Botanist and Invasive Weed Coordinator have observed that even after six years of hand piles being burned, very little vegetation has returned and of that vegetation, half were invasive plants.

Harvesting activities disturb soil, which increases the potential for invasive plant colonization. Invasive plants can out-compete native plants and reduce rare plant habitats. However, design features in the project area would limit the spread of invasive plants. These design criteria have been applied to other timber sales and this includes heavy equipment moving over the ground, as well as skid trails necessary for tree removal. Soil disturbance carries a higher risk of establishment, and if equipment is contaminated, also has a higher risk of introduction of invasive species. Soil disturbance also exposes the dormant seed bank in the soil. The introduction and establishment of invasive plant species threatens rare plants, native plant diversity, and their habitats. Disturbance can become detrimental to native plant habitat if it spreads invasive plant species. Populations of invasive plants do occur within the project area and could increase with logging disturbance and a more-open forest canopy. Habitat quality for rare plants could diminish if invasive plants increase in the project area, as most invasive plant species aggressively compete with many native plants (Olson 1999). As invasive species increases, cover of more desirable, but less competitive native plant species can be significantly reduced, sometimes by as much as 60 to 90 % (Duncan 1997). Rare plant species can be particularly vulnerable since their numbers tend to be lower. See the invasive plants section for further discussion of invasive species risks and mitigation measures to reduce the risk of the spread of invasive species.

The infested units have a high risk of spread when heavy equipment moves through them, disturbing the soil and removing canopy cover. Areas which are not currently infested but have infestations within one-quarter mile of their unit boundary puts these units at a high risk of introduction, most likely by equipment or machinery transporting seed from another unit or nearby infestations along the road. Tractor yarding over bare ground can displace up to 15% of the soil within a unit, therefore it is expected that 15% or less of the unit would become infested with invasive plant species and increases the likelihood of transporting invasive plant seed into new areas with harvest equipment. Skid trails will be evaluated post-harvest to determine the need for seeding. If the spread of invasive species is minimized and soil/vegetation displacement is kept to a minimum, the risk of introduction of invasive species or spread will be reduced.

The proposed treatments such as harvesting timber and underburning at lower elevation slopes would reduce fuel loads and open the forest canopy, which would improve sensitive plant habitat. However, these same practices would facilitate the spread of invasive species, especially spotted knapweed on south or west-facing slopes. Rare plant species would be particularly vulnerable since there are fewer populations and individuals in the populations.

Dwarf onion, Rocky Mountain paintbrush, Bitterroot, and Lemhi penstemon are all adapted to open, dry ponderosa pine habitat types. Lemhi penstemon is also adapted to the moister mixed ponderosa pine/Douglas-fir habitats. These habitat types burned historically at 5 to 25 year intervals (USDA Forest Service 1995). Fire suppression has increased the fire interval to about 50 years, creating higher fuel loads and the potential for high severity fires. Spotted knapweed and cheatgrass are highly adapted to disturbance and open canopies, particularly on drier sites (Zouhar 2001). Spotted knapweed and cheatgrass also appear to thrive and spread to new areas following wildfire; particularly after high severity burns (Sutherland 2003, Ferguson et al. 2007) (see Section 3.8). In Douglas-fir habitats, disturbance is a prerequisite for spotted knapweed infestation (Ferguson et al. 2007).

Other weeds encroach in these habitats following fire but are not as competitive as spotted knapweed for rare plant habitat. Cheatgrass was observed after the fires of 2000, especially under ponderosa pine trees where needle litter, often several inches thick, had burned off (personal observations). On north and east-facing sites not previously infested with weeds, native vegetation was recovering well enough to compete with any potential new invaders (personal observations). Ferguson et al (2007) confirmed this observation when they noted that west-facing slopes were the most prone to spotted knapweed invasion.

The potential to spread spotted knapweed would be less, especially in Douglas-fir habitats, in units treated by timber harvest or prescribed fire than on units that receive both treatments. However, without reducing fuels prior to burning there would be a greater potential for the fire to carry into the forest canopy and burn hotter. Ground-based timber harvest activities increase the risk of weed spread by scarifying the soil and potentially carrying invasive plant seed to the project area on equipment. Tractor harvest increases the risk of introducing or spreading invasive plant species because it typically disturbs soil in the harvest unit and more soil than skyline cable systems. The potential is higher that weeds would spread on lower elevation (below 6500 feet), south and west-facing aspects, where the most suitable weed habitat exists and the majority of activities are proposed. Underburning after harvest further increases the potential to open the canopy and create more bare soil.

Treating within the project area would improve dwarf onion and bitterroot habitat by removing forest encroachment and opening the canopy. However, scheduling the prescribed fires would be problematic because burning in spring has a high probability of damaging above ground plant parts but burning in fall has a high risk of spreading spotted knapweed and cheatgrass. Weed prevention measures would be imperative to treating areas where implementation would occur since spotted knapweed and cheatgrass are present in the project area.

Effects would be similar to dwarf onion. Opening the canopy would benefit Lemhi penstemon but harvest/burning activities would increase the risk of spreading invasive plant species. Lemhi penstemon is a fire adapted species. Road cut populations that burned in Robbins Gulch during the fires of 2000 expanded up slope as hundreds of new seedlings appeared a year after the fire (personal observation). Studies done elsewhere confirm that fire releases dormant seed stored in the soil (seed bank) (Elzinga 1997; Heidel and Shelly 2001). If post-treatment monitoring indicates invasive species are moving into previously uninfested areas then spot herbicide treatments will be applied, avoiding directly spraying Lemhi penstemon plants. In addition,

roadside spraying of NFSR 13423 and 5723 will avoid directly spraying over Lemhi penstemon plants located in the road cuts.

Effects would be similar to those for dwarf onion (above); however, Rocky Mountain paintbrush occupies areas with more canopy cover than dwarf onion. Opening the canopy would benefit Rocky Mountain paintbrush but timber harvest and prescribed burning also increase the risk of spreading invasive plant species. If post-treatment monitoring indicates noxious weeds are moving into previously uninfested areas, then spot herbicide treatments will be applied, avoiding directly spraying Rocky Mountain paintbrush plants.

It is expected that Rocky Mountain paintbrush densities would decrease when exposed to low and moderate fire severity.

For all species, it would be important to implement weed prevention mitigations.

Whitebark pine habitat historically experienced periodic wildfire. In the moist, warmer parts of its range (including the project area) whitebark pine depends on an occasional fire to kill competing conifers that increase in the absence of fire and to create patches of exposed soil for nutcracker seed caching and seedling establishment (Arno 2001). Historic fires in whitebark pine habitat were commonly mixed-severity, leaving areas of fire-killed forest next to intact forest. This allowed whitebark pine seeds from surviving trees to be dispersed into burned areas and cached by nutcrackers, where the newly open conditions favored whitebark pine seedling establishment (Keane et al 2012). While individual whitebark pine stands might come and go depending on varying degrees of forest succession and wildfire burn patterns, the species persisted on the landscape and, on balance, benefitted from periodic fire. Both prescribed fires and wildfires are an important tool in restoring whitebark pine (Keane et al 2012).

Yet fire readily kills whitebark pine trees, especially in denser forests with abundant woody fuels which are seen in the project area. Prescribed burning under carefully controlled conditions reduces this risk, but does not eliminate it (Keane et al 2012). Burning treatment units after logging could kill most of the whitebark pine seedlings there. Sapling of whitebark that are found in the project area may be more susceptible to fire mortality than larger trees because their thin bark is less able to shield the cambium from fire's heat and their branches are closer to the ground. Abundant standing dead and fallen conifer logs in these units also increase the risk that a prescribed burn would be too hot for whitebark pine survival. Consistent with Keane et al (2012), mixed-severity prescribed burns near existing cone-producing whitebark trees, will create patches of fire-killed forest and bare ground near seed sources that are favorable for nutcracker seed caching and natural whitebark pine regeneration.

An evaluation of threatened species, endangered species, sensitive species, plant species of concern, and Forest plant species of interest determined the species of rare plants most likely to be affected by the proposed activities If mitigation measures in this BE are followed, than the population viability of rare plants would not be adversely affected at the Forest level.

Invasive Species

Invasive plants were partially surveyed for, in the project area, in 2019. An intensive survey was conducted in portions of the project area. The survey focused on plants listed on the most current Montana State invasive plants list. Invasive species were found during partial surveys throughout the project area. Majority of invasive species were found in open ponderosa pine and grassland habitats. Spotted knapweed and cheatgrass are spread throughout the project area in low to high infestation amounts. Ventenata was found in the project area. It is an annual invasive grass which has just been added to the state invasive species list. Venenata increases the fire frequency and decreases forage production, ecological diversity, wildlife habitat, and pollinator habitat. Ventenata is a recent invader to the Forest.

Table 1. Invasive species found within the project area.

Scientific Name	Common Name	Listing Status
Bromus tectorum	Cheatgrass	Priority 3
Centaurea stoebe	Spotted Knapweed	Priority 2B
Ventenata dubia	Ventenata	Priority 2A

Table 2. Species are listed using the guidelines from the state of Montana.

Priority 1A	These weeds are not present in Montana. Management criteria will require eradication if detected; education; and prevention
Priority 1B	These weeds have limited presence in Montana. Management criteria will require eradication or containment and education.
Priority 2A	These weeds are common in isolated areas of Montana. Management criteria will require eradication or containment where less abundant. Management shall be prioritized by local weed districts.
Priority 2B	These weeds are abundant in Montana and widespread in many counties. Management criteria will require eradication or containment where less abundant. Management shall be prioritized by local weed districts.
Priority 3	Regulated plants: (Not Montana listed noxious weeds). These regulated plants have the potential to have significant negative impacts. The plant may not be intentionally spread or sold other than as a contaminant in agricultural products. The state recommends research, education and prevention to minimize the spread of the regulated plant.

Cheatgrass *(Bromus tectorum)*

Cheatgrass is known to occur in scattered or patchy distribution on many open grasslands and roadsides. This plant can alter the ecosystem process and change structure and function of plant

communities. The ability of this plant to dry completely, accumulate litter, and its structure make it extremely flammable. Cheatgrass invasion has increased the frequency of fires from once every 60 to 110 years to once every 3 to 5 years on millions of acres of rangeland in the Great Basin (Whisenant 1990). The threat of invasion of many open grasslands and areas on the Forest is potentially high, given the amount of fire experienced during the summer of 2000. This species is spread by seed. Cheatgrass typically dries out and disperses seed by mid-June.

Spotted Knapweed (*Centaurea biebersteinii {C. maculosa}*)

The Bitterroot National Forest is currently infested with about 274,000 acres of spotted knapweed (USDA Forest Service 2004). It generally occurs below 6,500 feet on the Bitterroot National Forest, except on extreme southern aspects. There is a strong correlation between canopy closure and knapweed coverage; with more sunlight, there is an increased likelihood of infestation. Knapweed infestation is also correlated with aspect, soil type and the degree of soil disturbance. It is most commonly found on dry, sterile, gravelly, or sandy soils in pastures, and will quickly invade disturbed sites such as road and railroad rights-of-way, waste places, abandoned fields, timber harvest units and overgrazed rangeland. It is not common on cultivated land or on irrigated pasture. Spotted knapweed is not usually found in shaded areas. Ponderosa pine and/or Douglas-fir bunchgrass types, dry shrub communities and scree types are the most susceptible to knapweed invasion (Losensky 1987).

Current treatments for spotted knapweed include mechanical (hand pulling and mowing), biological and chemical. Hand pulling has proven to be up to 35% effective, costs up to $8,498 per acre and can only be accomplished for small areas (USDA Forest Service 2003a). Mowing has been done at recreation sites to make outdoor activities more accessible, although it does not reduce the number of plants. Several biological agents specific to spotted knapweed have been released throughout the Bitterroot National Forest.

The Forest has been releasing biological control agents for 20 years. Biological controls are long-term solutions and no decrease in knapweed populations is expected until the insect populations increase. Biological control agents should decrease knapweed seed production by up to 80% once they become well established. In the meantime, chemical control methods (especially Picloram) appear to be the most successful treatment of smaller knapweed infestations and containing existing populations (USDA Forest Service 1996a).

Methodology Used:
The effects of proposed management activities on rare plant habitat were assessed by evaluating impacts to population numbers, habitat, and population viability of these species at several geographic scales: 1) global range; 2) statewide range; 3) on the Bitterroot National Forest and; 4) within the project area. Surveys and data were collected to obtain management direction.

Recommended Mitigation Measures:

a) Implementation sites should be communicated by April first in order to ensure enough time to plan for surveys if needed. If surveys are not conducted once treatment areas are selected, then areas where habitat are found would need to be buffered from any treatment.

b) Surveys must be conducted between early May and late July based on seasonal conditions.
c) Implement during winter conditions over snow if possible.
d) Rare plant populations will be identified and buffered from project activities based on the needs for management for each species. Buffer widths are based on habitat requirements of the specific plant populations. Rare plant populations needing buffers will be mapped and identified in the field.
e) If new rare plant populations are discovered after any contracts are awarded, the Forest Botanist will determine the appropriate protection measures to be implemented.
f) If roads must be widened where cut banks are disturbed locations should be mapped and reviewed by the Forest Botanist before disturbance occurs.
g) Construction of new landings will be at least 300' from known sites.
h) Tree falling, yarding or anchor tree location will not occur in or across rare plant buffers.
i) Hand piles should not be placed within 75ft of known identified rare plant populations.
j) If habitat conditions are correct for rare plant management, then unburning can occur in spring. Habitats with high levels of invasive species infestation should not be burned. Avoid ignition and burning in high risk areas (as defined by the Forest Noxious Weed Coordinator & Forest Botanist) that cannot be treated before or after prescribed fire.
k) Use local seeding guidelines for detailed procedures and appropriate mixes. Refer to the Bitterroot National Forest Seed Mix to determine which species to use (FSM 2070.3).
l) When feasible, treat invasive species before obliterating decommissioned roads; re-vegetate after obliteration.
m) Use only seed mixes, propagule species, proportions, and application prescriptions approved by the Forest Botanist and included in the contract specifications. Follow seed source recommendation or requirements identified in the Botany Design Criteria items. Proposed modifications to prescribed seed mixes must be approved by the Forest Botanist.
n) Seed and fertilize areas where handpiles are placed and burned.
o) Move slash onto the post burned handpiles.
p) Pressure wash equipment thoroughly before moving it onto the project area. Remove all mud, dirt, and plant parts from all equipment before moving into project area. Cleaning must occur off National Forest lands before bringing equipment onto Forest Service Lands.
q) Regularly inspect, remove, and properly dispose of weed seed and plant parts found on clothing and equipment.
r) Minimize the creation of sites suitable for weed establishment. Soil disturbance should be minimized to meet project objectives.
s) Treat any populations of invasive species pre and post implementation.
t) Re-establish vegetation (such as seed) on bare ground (bladed areas, skid trails, landings, and pile burned sites) due to disturbance activities. Using weed free Forest approved seed mixes, approved by the Forest Botanist/Native Plant Coordinator.
u) Use Forest weed free approved seed mix. Use local seeding guidelines for detailed procedures and appropriate mixes. Refer to the Forest Seed Mix to determine which species to use. (Contact the Forest Botanist/Native Plant Coordinator for guidelines and seed coordination).
v) Block any unauthorized motorized access.

w) If post-treatment monitoring indicates noxious weeds are moving into previously uninfested areas, then spot herbicide treatments will be applied, avoiding directly spraying rare plants.

Applicable Laws and Regulations (Rare Plants)

Consistency with the Bitterroot Forest Plan and Other Regulatory Direction
The Forest Plan specifies (p. II-21) that vascular plants identified as rare, pending study, or proposed as threatened or endangered will be identified and protected. Stated goals of Forest Service policy (FSM 2670.22 and 2670.32) are to maintain the population viability of sensitive species across their geographic range, implement management practices to ensure that sensitive species do not become threatened or endangered because of Forest Service actions, and minimize impacts to all species whose viability has been identified as a concern. Information on the number of plants required for maintenance of viable populations is not available. Therefore, a conservative approach is taken when determining the effects of management activities.

National Forest Management Act of 1976
The National Forest Management Act of 1976, as amended, directs the Forest Service to provide for diversity of plant and animal communities and requires the development and implementation of a resource management plan for a National Forest.

Forest Service Manual 2600 Wildlife, Fish and Sensitive Plant Habitat Management
Forest Service Sensitive Species Policy (FSM 2670) directs national forests to assist states in achieving conservation goals for endemic species; complete biological evaluations of programs and activities; avoid and minimize impacts to species with viability concerns; analyze the significance of adverse effects on populations or habitat; and coordinate with states and USFWS. The Forest Service Manual (2670. 5) further defines sensitive species as those plant species identified by the Regional Forester for which population viability is a concern, as evidenced by significant current or predicted downward trend in numbers, density or habitat capability that would reduce a species distribution. By analyzing the effects on sensitive rare plants through this document, and ensuring that sensitive plants are not trending toward federal listing as a result of project implementation, the project will be in compliance with the manual direction.

Endangered Species Act
The Endangered Species Act of 1973, (as amended (16 U.S.C. 1531 *et seq*) Section 2, directs federal agencies to conserve endangered and threatened species and to ensure that actions authorized, funded, or carried out by these agencies are not likely to jeopardize the continued existence of threatened or endangered species, or result in the destruction or adverse modification of their critical habitats. Within the state of Montana, water howellia (*Howellia aquatilis*), Spalding's catchfly (*Silene spaldingii*), and Ute ladies' tresses (*Spiranthes diluvialis*) are listed as threatened under the Endangered Species Act (USDA, Forest Service 2011a). There are no plants listed as endangered, and whitebark pine (*Pinus albicaulis*) is a candidate for federal listing (USDI, FWS 2011a). Of the species listed or candidate, only whitebark pine occurs on the Bitterroot National Forest. Whitebark pine does not occur within the analysis area. The project area was surveyed and analyzed for habitat and threatened, endangered, and candidate plants to ensure the project does not jeopardize the continued existence of any species. Therefore, this project will be in compliance with the act.

National Environmental Policy Act of 1969
The National Environmental Policy Act requires federal agencies to integrate environmental values into their decision making processes by considering the environmental impacts of their proposed actions and reasonable alternatives to those actions. Impacts to rare plants have been evaluated under four different alternatives and are presented in this document, therefore meeting the National Environmental Policy Act of 1969.

Applicable Laws and Regulations (Invasive Plants/Noxious Weeds)

The Bitterroot National Forest Plan (USDA FS 1987)
The Bitterroot National Forest Land and Resource Management Plan (USDA FS 1987) guides natural resource management activities and establishes standards, guidelines, goals, and objectives for the Forest. The Forest-wide management goal for noxious weeds is to "control noxious weeds to protect resource values and minimize adverse effects on adjacent private lands."
Goals and objectives on the Bitterroot National Forest Plan (Forest Plan, FP) states that noxious weeds (invasive plants) will be controlled to protect resource values (FP p. II-3 & II-29). The primary means of preventing, containing, or controlling noxious weeds will be through vegetative management practices. In this project, all of the alternatives would be consistent with the Forest Plan.
Direction and authority for invasive plant management is provided in the National Forest Management Act (PL94-588), Federal Land Policy and Management Act (PL 94-579), Carlson-Foley Act (PL-583), Federal Noxious Weed Control Act (PL-629) and the Montana Weed Management Plan (2001).

The Federal Noxious Weed Act of 1974
The Federal Noxious Weed Act of 1974 defines a noxious weed as a "plant which is of foreign origin, is new to or is not widely prevalent in the United States, and can directly or indirectly injure crops or useful plants, livestock or fish and wildlife resources in the United States, or the public health" (P.L. 93-629).

The Bitterroot National Forest Noxious Weed Treatment Project Environmental Impact Statement and Record of Decision, March 2003
The Bitterroot National Forest Noxious Weed Treatment Project Environmental Impact Statement and Record of Decision (March 2003) implemented Forest Plan direction and authorized the treatment of invasive plants on areas of the Bitterroot National Forest.

The Montana Noxious Weed Control Act
The Montana Noxious Weed Control Act defines a noxious weed as "any exotic plant species established or potentially could be established in the State which may render land unfit for agriculture, forestry, livestock, wildlife, or other beneficial uses, and is further designated as either a state-wide or county-wide noxious weed" (MCA 7-22-2101).

Executive Order 13112 (1999)
Executive Order 13112 (1999) directs all federal agencies to conduct activities that reduce invasive plant populations and provide for their control. The direction applies to activities that prevent introduction of invasive plants and minimize their economic, ecological, and human health impacts.

US Forest Service Manual 2080
US Forest Service Manual (FSM) 2080, Supplement R1-2000-2001-1, implements an Integrated Weed Management approach for management of noxious weeds on National Forest System lands in Region 1. The manual direction specifically requires the following practices for invasive plant management during ground disturbing activities, including activities associated with timber harvest: FSM 2080 defines noxious weeds as "those plant species designated as noxious by the Secretary of Agriculture or by the responsible State official. "

National Strategic Framework for Invasive Species Management (August 2013)
The US Forest Service developed a National Strategic Framework for Invasive Species Management (August 2013) to assist in protection of our Nation's terrestrial and aquatic ecosystems. This Framework supersedes the agency's 2004 Invasive Species Strategy and Implementation Plan and provides a guide for Forest Service invasive species management activities.

Forest Service Manual (FSM) 2900
Forest Service Manual (FSM) 2900 establishes code and a new manual for Invasive Species Management. FSM 2900 sets forth National Forest System policy, responsibilities, and direction for the prevention, detection, control, and restoration of effects from aquatic and terrestrial invasive species (including vertebrates, invertebrates, plants, and pathogens).

Table 3. Rare plants and rare plant habitat found within the project area.

THREATENED, ENDANGERED, AND CANDIDATE SPECIES			
Species	**Habitat**	**Presence**	**Effects Determination**
Howellia aquatilis Water howellia	Low elevation wetlands surround by deciduous trees.	SPECIES: No HABITAT: No	NI NI
Pinus albicaulis White bark pine	Mixed conifer stands at treeline.	SPECIES: Yes HABITAT: Yes	MIIH MIIH
Silene spaldingii Spalding's catchfly	Open mesic grasslands in valleys and foothills.	SPECIES: No HABITAT: No	NI NI
Spiranthes diluvialis Ute ladies' tresses	Alkaline wetlands, swales and old, meander channels.	SPECIES: No HABITAT: No	NI NI
VASCULAR SENSITIVE SPECIES			
Species	**Habitat**	**Presence**	**Effects Determination**
Allium acuminatum Taper-tip onion	Grasslands and Ponderosa pine.	SPECIES: No HABITAT: Yes	NI MIIH
Allium parvum Dwarf onion	Grasslands and open Ponderosa pine.	SPECIES: Yes HABITAT: Yes	MIIH MIIH
Arabis fecunda Sapphire rockcress	Calcareous soils.	SPECIES: No HABITAT: No	NI NI
Astragalus paysonii Payson's milk-vetch	Found in granite and sandy soils in disturbed areas such as road cuts and edges of clear cuts (ID side).	SPECIES: No HABITAT: No	NI NI
Athysanus pusillus Sandweed	Vernally moist rocky areas.	SPECIES: No HABITAT: No	NI NI
Carex paupercula Poor sedge (Idaho only)	Fens and Bogs (ID side).	SPECIES: No HABITAT: No	NI NI
Castilleja covilleana Rocky Mountain paintbrush	Grasslands, Ponderosa pine, and Rocky alpine.	SPECIES: Yes HABITAT: Yes	MIIH MIIH
Clarkia rhomboidea Common clarkia	Open Ponderosa pine stands.	SPECIES: No HABITAT: Yes	NI MIIH
Cypripedium parviflorum Yellow lady's slipper	Riparian areas.	SPECIES: No HABITAT: Yes	NI MIIH
Douglasia idahoensis Idaho douglasia (Idaho only)	Subalpine zones (ID side).	SPECIES: No HABITAT: No	NI NI
Drosera anglica English sundew	Fens and Bogs.	SPECIES: No HABITAT: No	NI NI

Dryopteris cristata Crested shield-fern	Fens, Bogs, and Wetland areas.	SPECIES: No HABITAT: No	NI NI
Epipactis gigantea Giant helleborine	Riparian and Thermal sites.	SPECIES: No HABITAT: No	NI NI
Erigeron asperugineus Rough fleabane	Alpine Rocky areas.	SPECIES: No HABITAT: No	NI NI
Erigeron evermannii Evermann's fleabane	Alpine Rocky areas.	SPECIES: No HABITAT: No	NI NI
Eupatorium occidentale Western boneset	Talus sites.	SPECIES: No HABITAT: Yes	NI MIIH
Glossopetalon spinescens Green-bush	Granite outcrops.	SPECIES: No HABITAT: Yes	NI MIIH
Halimolobos perplexa Perplexed halimolobos	Grasslands, Sagebrush, and Open Ponderosa pine stands.	SPECIES: No HABITAT: Yes	NI MIIH
Happlopappus macronema* var. *macronema Whitestem goldenbush	Alpine Rocky areas.	SPECIES: No HABITAT: No	NI NI
Heterocodon rariflorum Western pearl-flower	Canyon seeps.	SPECIES: No HABITAT: No	NI NI
Idahoa scapigera Scalepod	Vernally moist rocky areas.	SPECIES: No HABITAT: No	NI NI
Mimulus ampliatus Stalk-leaved monkeyflower	Open seeps and vernally moist soil along slopes, cliffs, and streams from the valleys to the subalpine zones.	SPECIES: No HABITAT: No	NI NI
Mimulus nanus Dwarf purple monkey flower	Grasslands, Sagebrush, and Open Ponderosa pine stands.	SPECIES: No HABITAT: Yes	NI MIIH
Mimulus primuloides Primrose monkeyflower	Fens and Bogs.	SPECIES: No HABITAT: No	NI NI
Penstemon lemhiensis Lemhi penstemon	Grasslands, Ponderosa pine stands, and Sagebrush areas.	SPECIES: Yes HABITAT: Yes	MIIH MIIH
Penstemon payettensis Payette penstemon	Grasslands, Ponderosa pine stands, and Sagebrush areas.	SPECIES: No HABITAT: Yes	NI MIIH
Physaria humilis Bitterroot bladderpod	Alpine Rocky areas.	SPECIES: No HABITAT: No	NI NI
Saxifraga tempestiva Storm saxifrage	Alpine Vernal Rocky areas.	SPECIES: No HABITAT: No	NI NI

Scheuchzeria palustris Pod grass	Fens and Bogs.	SPECIES: No HABITAT: No	NI NI
Tonestus aberrans Idaho goldenweed	Granite outcrops.	SPECIES: No HABITAT: Yes	NI MIIH
Trifolium eriocephalum Woolly-head clover	Mixed conifer and Open meadows.	SPECIES: No HABITAT: Yes	NI MIIH
Trifolium gymnocarpon Hollyleaf clover	Grasslands, Ponderosa pine, and Doug fir stands.	SPECIES: No HABITAT: Yes	NI MIIH
Veratrum californicum California false hellebore	Riparian areas.	SPECIES: No HABITAT: Yes	NI MIIH
NON-VASCULAR SENSITIVE SPECIES			
Species	**Habitat**	**Presence**	**Effects Determination**
Meesia triquetra 3-Angled threadmoss	Fens and Bogs.	SPECIES: No HABITAT: No	NI NI
Nodobryoria subdivergens Old Man's beard	Alpine rocky areas.	SPECIES: No HABITAT: No	NI NI
VASCULAR SPECIES OF CONCERN			
Species	**Habitat**	**Presence**	**Effects Determination**
Allium columbianum Columbian onion	Found in moist swales along vernal ponds and streams in valleys.	SPECIES: No HABITAT: No	NI NI
Allium simillimum Dwarf onion	Found in meadows and grasslands in montane and lower subalpine zones in moist gravelly soil.	SPECIES: No HABITAT: No	NI NI
Arctostaphylos patula Greenleaf manzanita	Rocky soil in open coniferous forests in the montane zone.	SPECIES: No HABITAT: No	NI NI
Calamagrostis tweedyi Cascade reedgrass	Found in seral stage Douglas Fir and subalpine fir forests in the montane zone.	SPECIES: No HABITAT: No	NI NI
Carex scoparia Pointed broom sedge	Found in wet soil along rivers and sloughs in valleys.	SPECIES: No HABITAT: Yes	NI MIIH

Centunculus minimus Chaffweed	Vernally wet, sparsely vegetated soil found around ponds, rivers, and streams in valleys and plains.	SPECIES: No HABITAT: No	NI NI
Collomia debilis* var. *camporum Alpine Collomia	Found on low elevation scree, talus, and rocky slopes near valley bottoms in the montane zone.	SPECIES: No HABITAT: Yes	NI MIIH
Cyperus bipartitus Shining flat sedge	Wet gravelly shores of rivers, lakes, and ponds.	SPECIES: No HABITAT: No	NI NI
Draba daviesiae Bitterroot Draba	Found on rocky slopes and talus near or above timberline.	SPECIES: No HABITAT: No	NI NI
Erigeron linearis Linear-leaf fleabane	Dry rocky soil often found with sagebrush.	SPECIES: No HABITAT: No	NI NI
Eriogonum capistratum* var. *muhlickii Muhlick's buckwheat	Talus slopes, cliffs, and rocky ridges in subalpine to alpine zones.	SPECIES: No HABITAT: No	NI NI
Ipomopsis minutiflora Small-flower standing cypress	Fine textured soils, in sparsely vegetated open slopes with sagebrush.	SPECIES: No HABITAT: No	NI NI
Juncus covillei Coville's rush	Variety *covillei* found in moist, gravelly, or sandy soil along major water courses in valley zones. Variety *obtusatus* found in moist to wet, seepy soil of slopes and meadows in montane and subalpine zones.	SPECIES: No HABITAT: No	NI NI
Lewisia columbiana Columbian Bitterroot	Moist rock crevices along streams.	SPECIES: No HABITAT: Yes	NI MIIH
Listera borealis Northern twayblade	Grows in seepy, marshy places along cold-air drainages, often where calcareous soil exists.	SPECIES: No HABITAT: No	NI NI
Mimulus floribundus Floriferous monkeyflower	Moist to wet places in lower elevations.	SPECIES: No HABITAT: Yes	NI MIIH

Najas guadalupensis Guadalupe water-nymph	Submerged in shallow freshwater of sloughs, ponds, and reservoirs in valleys.	SPECIES: No HABITAT: No	NI NI
Pedicularis contorta* var. *rubicunda Selway coil-beaked lousewort	Ridgetops and meadows in the upper subalpine and alpine zones.	SPECIES: No HABITAT: No	NI NI
Penstemon flavescens Yellow beardtongue	Open or wooded, often rocky slopes in mountains.	SPECIES: No HABITAT: Yes	NI MIIH
Ribes triste Swamp red currant	Forest openings in moist soil in montane to subalpine zones.	SPECIES: No HABITAT: No	NI NI
Rotala ramosior Toothcup	Open, wet, gravelly soil around ponds and sloughs in the valley zones.	SPECIES: No HABITAT: No	NI NI
Satureja douglasii Yerba buena	Found in partial to deep shade in moist forests in the montane zones.	SPECIES: No HABITAT: No	NI NI
Wolffia columbiana Columbia water-meal	Fresh shallow ponds and sloughs in valleys.	SPECIES: No HABITAT: No	NI NI

NON-VASCULAR SPECIES OF CONCERN

Species	Habitat	Presence	Effects Determination
Dicranum acutifolium Acuteleaf Dicranum moss	Found in calcareous soils, on boulders, and rock outcrops.	SPECIES: No HABITAT: No	NI NI
Grimmia incurva Curved dry rock moss	Moist rock.	SPECIES: No HABITAT: No	NI NI
Hennediella heimii Heim's Desmatodon Moss	Found on moist saline or alkaline soils near streams or lakeshores.	SPECIES: No HABITAT: No	NI NI
Orthotrichum praemorsum Orthotrichum moss	Found on rock.	SPECIES: No HABITAT: Yes	NI MIIH
Phascum cuspidatum Toothed Phascum moss	Found on dry soil in open areas among grasses or shrubs.	SPECIES: No HABITAT: Yes	NI MIIH
Psuedocrossidium obtusulum Pseudocrossidium moss	Found on soil and calcareous outcrops 90 - 3,300 ft.	SPECIES: No HABITAT: No	NI NI

Sphagnum magellanicum Magellan's peatmoss	Found along the edges of bogs or fens.	SPECIES: No HABITAT: No	NI NI
Syntrichia bartramii Bartram's tortula moss	Found on dry soil and rocks in mid to high elevations.	SPECIES: No HABITAT: No	NI NI
Syntrichia papillosissima	Found on dry soil and rocks in mid to high elevations.	SPECIES: No HABITAT: No	NI NI
Lobaria linita Cabbage lungwort lichen	Montane to alpine habitats. Found on alpine sod or mossy rocks.	SPECIES: No HABITAT: No	NI NI
Normandina pulchella Elf-ear lichen	Found on bark and mosses in moist habitats.	SPECIES: No HABITAT: No	NI NI
Parmeliella triptophylla Lead lichen	Found in moist habitats on tree bases, and rocks.	SPECIES: No HABITAT: No	NI NI
Peltigera hydrothyrid Hydrothyria lichen	Found on rocks and gravel in mountain streams and springs without seasonal fluctuations.	SPECIES: No HABITAT: No	NI NI
Ramalina obtusata Hooded Ramalina lichen	Found on tree and shrub bark in low elevation riparian forests.	SPECIES: No HABITAT: No	NI NI
Wolffia columbiana Columbia water-meal	Fresh shallow ponds and sloughs in valleys.	SPECIES: No HABITAT: No	NI NI
FERN AND FERN ALLIES SPECIES OF CONCERN			
Species	**Habitat**	**Presence**	**Effects Determination**
Botrychium lunaria Common moonwort	Montane meadows and grasslands in disturbed sites from low to moderate elevations.	SPECIES: No HABITAT: Yes	NI MIIH
Botrychium pinnatum Northern moonwort	Wet to moist grassy slopes, streambanks, roadsides, and mossy woods in mountains. In Idaho found in shaded cedar forests.	SPECIES: No HABITAT: No	NI NI

Botrychium simplex Least moonwort	Montane meadows and grasslands in disturbed sites from low to moderate elevations.	SPECIES: No HABITAT: Yes	NI MIIH
Polystichum scopulinum Mountain holly-fern	Moist rock crevices in subalpine zones or on moist rocks along rivers in valleys.	SPECIES: No HABITAT: No	NI NI
POTENTIAL SPECIES OF CONCERN			
Species	**Habitat**	**Presence**	**Effects Determination**
Allotropa virgata Candystick	Lodgepole stands.	SPECIES: No HABITAT: Yes	NI MIIH
Linanthus nuttallii Nuttall's linanthus	Open soil in grasslands and on rock outcrops.	SPECIES: No HABITAT: No	NI NI
Umbilicaria havaasii Rock Tripe lichen	On siliceous rock.	SPECIES: No HABITAT: No	NI NI
FOREST SPECIES OF INTEREST			
Species	**Habitat**	**Presence**	**Effects Determination**
Camassia quamash Small camas	Found in wet meadows and along streams.	SPECIES: No HABITAT: No	NI NI
Lewisia pygmaea var. nevadensis Nevada lewisia	Moist meadows and Open forests.	SPECIES: No HABITAT: No	NI NI
Lewisia rediviva var. rediviva Bitterroot	Rocky Open Dry Soils	SPECIES: Yes HABITAT: Yes	MIIH MIIH

NI = No Impact

MIIH = May Impact Individuals or Habitat, but Will Not Likely Result in a Trend Toward Federal Listing or Reduced Viability for the Population or Species.

LIFV* = Likely To Impact Individuals or Habitat with a Consequence that the Action may Contribute Towards Federal Listing or Result in Reduced Viability for the Population or Species.

BI = Beneficial Impact

***Trigger for a Significant Action**

Prepared by: /s/Robin Taylor-Davenport Date: 10/218/2019

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