

# Biological Evaluation and Assessment for Forest Service Sensitive and Federally Listed Plant Species

Wildfire Adapted Missoula

Missoula Ranger District

Lolo National Forest

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# Introduction

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National Forest System (NFS) lands are home to numerous sensitive plant species. Understanding the status and distribution of such species is a key component in managing land-use activities to avoid or minimize impacts to species whose viability has been identified as a concern (Forest Service Manual 2670.32). As manager of these lands, the Forest Service is tasked with maintaining populations of all native plants, including sensitive species, where they occur on NFS lands. Sensitive plant species receive special conservation emphasis because their scarcity, often coupled with narrow habitat requirements, may increase the risk of NF management activities inadvertently impacting them. The purpose of this Biological Evaluation and Assessment is to determine how the proposed WAM project would affect rare plants – specifically, species designated as endangered, threatened, or sensitive.

There are no endangered plants in Montana. The two threatened species are water howellia (*Howellia aquatilis*) and Spalding's catchfly (*Silene spaldingii*). Spalding's catchfly nor its habitat were observed in the project area. Therefore, there would be no effect on Spalding's catchfly from the proposed activities. Populations of water howellia are known to inhabit vernal ponds on the Swan Lake Ranger District, Flathead National Forests. Similar vernal ponds exist on the Lolo NF within the Seeley Lake Ranger District but not within the WAM project area. Ponds where water howellia occur on the Swan Lake Ranger District dry out at some point during the summer. Dry ponds create conditions for seed germination. Germinants over winter under snow and develop into adult plants as the snow melts and the ponds fill back up with water. It is theorized that seed dispersal is from animals that drink from the ponds and seed gets caught in the fur (Shelly 1997). The seeds are small and quickly deposited. Only when seeds are deposited on banks of ponds (that also dry out) will they germinate otherwise the seed will not be viable. Over 700 ponds have been surveyed in the Swan Valley (including on Seeley Lake Ranger District) over the last ten years (Shelly et al. 2016). Of all the ponds surveyed on Seeley Lake Ranger District, not one supported a population or single plant of water howellia; similar results would be expected on the Missoula Ranger District; therefore, there would be no effect on water howellia from the proposed activities.

The U.S. Fish and Wildlife Service has proposed whitebark pine for listing as a threatened species under the ESA (85 Fed. Reg. 77408-77424, December 2, 2020). The proposed listing is based on the results of a rigorous Species Status Assessment involving review of the best available science. The proposed activities for this project that could potentially affect whitebark pine trees fit the exception of forest management and restoration. Project activities would not exacerbate the factors attributed to the species' decline. The proposed actions include prescribed fire across areas greater than 300 acres which, if it resulted in planting blister rust-resistant whitebark pine trees on high elevation sites following burning, would be beneficial. Therefore, the proposed activities would not jeopardize the continued existence of the species.

# Regulatory Framework

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Under the Endangered Species Act of 1973, federal departments and agencies are required to conserve threatened or endangered species by ensuring their activities “are not likely to jeopardize the continued existence of any threatened or endangered species or result in the destruction or adverse modification of their critical habitats”. The U.S. Fish and Wildlife Service (USFWS) is responsible for listing species as

threatened or endangered. Federal agencies such as the Forest Service must consult with the USFWS when their activities would affect threatened or endangered species (Forest Service Manual 2670.31).

The U.S. Fish and Wildlife Service has proposed whitebark pine for listing as a threatened species under the ESA (85 Fed. Reg. 77408-77424, December 2, 2020). The proposed listing is based on the results of a rigorous Species Status Assessment involving review of the best available science. The Service concluded that altered fire regimes, white pine blister rust, mountain pine beetle, and climate change are the leading factors attributed to the decline. As part of the proposed listing, the Service determined it is not prudent to designate critical habitat for whitebark pine because habitat loss or range restriction are not considered threats to this species' continued survival.

The threatened status proposal includes a "4(d) rule" authorized under section 4 of the ESA, which allows the Service to tailor protections and prohibitions pertinent to the specific threats and conservation needs of a threatened species. This proposed 4(d) rule would prohibit the following activities (except in the case of the exceptions listed below), unless otherwise authorized or permitted:

- Import or export of the species
- Delivery, receipt, transport, or shipment of the species in interstate or foreign commerce in the course of commercial activity
- Sale or offer for sale of the species in interstate or foreign commerce
- Removal and reduction to possession of the species from areas under Federal jurisdiction
- Malicious damage or destruction of the species on any area under Federal jurisdiction
- Removal, cutting, digging up, or damage or destruction of the species on any area under Federal jurisdiction in knowing violation of any law or regulation of any State or in the course of any violation of a State criminal trespass law.

These prohibitions and the exceptions below would apply to whitebark pine trees and any tree parts, such as cones, tree cores, etc. The following activities would be excepted from the prohibitions identified above:

- Activities authorized by a permit under 50 CFR 17.72.
- Forest management, restoration, or research-related activities conducted or authorized by the Federal agency with jurisdiction over the land where the activities occur.
- Removal, cutting, digging up, or damage or destruction of the species on areas not under Federal jurisdiction by any qualified employee or agent of the Service or State conservation agency which is a party to a Cooperative Agreement with the Service in accordance with section 6(c) of the Act, who is designated by that agency for such purposes, when acting in the course of official duties.

The Service stated, "*As no forest management, restoration, or research-related activities pose any threat to the whitebark pine in any form, we purposefully do not specify in detail what types of these activities are included in this exception, or how, when, or where they must be conducted, as long as they are conducted or authorized by the Federal agency with jurisdiction over the land where the activities occur. Therefore, this proposed 4(d) rule would allow the continuation of all such forest management, restoration, and research-related activities conducted by or authorized by relevant Federal land management agencies, as these activities pose no threat to the whitebark pine and are crucial to the species' conservation into the future, while allowing for flexibility to accommodate specific physical conditions, resource needs, and constraints across the species' vast range.*" (85 Fed. Reg. 77422).

Forest Service sensitive plant species, designated by the agency’s Regional Foresters, are species “for which population viability is a concern, as evidenced by significant current or predicted downward trends in 1) population numbers or density and/or 2) habitat capability that would reduce a species’ existing distribution” (FSM 2670.5). Forest Service management practices should “avoid or minimize impacts” on sensitive species to ensure they do not become threatened or endangered because of Forest Service actions and to maintain viable populations of all native species throughout their geographic range on NFS lands (FSM 2670.22 and 2670.32). Where impacts cannot be avoided, the agency will analyze “the significance of potential adverse effects on the population or its habitat within the area of concern and on the species as a whole” (FSM 2670.32). For sensitive species, effects are considered adverse if they “contribute to a trend toward federal listing or loss of viability for the species”.

## Methodology

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### Pre-field Review

Given the size of the WAM project area, only the first focal treatment area was analyzed for pre-field review for potential habitat. The Blue Mountain Focal Treatment Area was reviewed since specific treatments have been proposed there. The area was reviewed for existing and known locations. Information from those surveys was used to identify areas of potential habitat for sensitive plant species based on knowledge of habitat compared to NAIP imagery data. Personal knowledge of the area and NAIP imagery further refined in potential habitat locations. This information combined with project activity information further distinguished areas for field survey.

The following 64 species were determined to have potential habitat (35 species) or were observed (29 species, 109 observation counts) in the project area (Appendix A). Most of the habitats associated with these species occur in wet or riparian areas. These areas would be buffered for multiple resource concerns (fish, hydro, soils, wildlife, and botany) as part of the design criteria for the project. Therefore, it is unlikely management actions approved for this project would impact the species associated with wet or riparian areas. These species were excluded from further analysis. The following 30 species were retained (Table 1)

Table 1: Sensitive plants and species of concern observed or with potential habitat in the WAM project area.

Common Name	Scientific Name	Habitat	Distribution	OBS Count
Necker's Thamnobryum Moss	<i>Thamnobryum neckeroides</i>	Shady banks, bluffs, boulders, tree bases	Unknown/Undeter mined	1
Subcentric Ring Lichen	<i>Arctoparmelia subcentrifuga</i>	Siliceous rock (montane to subalpine sites)	Present	1
Howell's Gumweed	<i>Grindelia howellii</i>	Vernally moist sites (Open, low elevation)	Present	5
Whitebark Pine	<i>Pinus albicaulis</i>	Subalpine forest, timberline	Present	25

Common Name	Scientific Name	Habitat	Distribution	OBS Count
Coville Indian Paintbrush	<i>Castilleja covilleana</i>	Subalpine slopes	Present	
Missoula Phlox	<i>Phlox kelseyi</i> var. <i>missoulensis</i>	Slopes/ridges (Open, foothills to subalpine)	Present	16
Alpine Collomia	<i>Collomia debilis</i> var. <i>camporum</i>	Rock/Talus (Valleys to Montane)	Present	4
Idaho Lovage	<i>Ligusticum verticillatum</i>	Moist forest, moist spruce-fir forest and streambanks (montane) SNOWBOWL	Present	1
Stalk-leaved Monkeyflower	<i>Mimulus ampliatus</i>	Vernally moist soil (Valleys to subalpine)	Present	
Woolly Clover	<i>Trifolium microcephalum</i>	Moist meadows, sandy banks along rivers to dry hillsides	Present	1
Obscure Evening-primrose	<i>Camissonia andina</i>	Sandy sites	Present	1
Limestone Larkspur	<i>Delphinium bicolor</i> ssp. <i>calicicola</i>	Shortgrass prairie and grass-sagebrush communities on limestone-derived soils	Present	1
Suksdorf Monkeyflower	<i>Mimulus suksdorfii</i>	Vernally moist soil of grasslands and rocky slopes (foothills and montane)	Present	
Musk-root	<i>Adoxa moschatellina</i>	Rock/Talus	Potential	
Tapertip Onion	<i>Allium acuminatum</i>	Dry Forest-Grassland	Potential	
Letterman's Needlegrass	<i>Stipa lettermanii</i>	Talus and Grasslands (low-elevation)	Potential	
Hollyleaf Clover	<i>Trifolium gymnocarpon</i>	Open areas (foothills and montane)	Potential	
Mission Mountain kittentails	<i>Synthyris canbyi</i>	Alpine	Potential	

Common Name	Scientific Name	Habitat	Distribution	OBS Count
Idaho Goldenweed	<i>Tonestus aberrans</i>	Rock/Talus	Potential	
Yerba Buena	<i>Satureja douglasii</i>	Forest (Moist, montane)	Potential	
Clustered Lady's-slipper	<i>Cypripedium fasciculatum</i>	Forests (Montane)	Potential	
Mat Buckwheat	<i>Eriogonum caespitosum</i>	Sagebrush steppe (Montane)	Potential	
Wavy Moonwort	<i>Botrychium crenulatum</i>	Various Mesic Sites	Potential	
Oregon Bluebells	<i>Mertensia bella</i>	Vernally moist soil (Montane)	Potential	
Bitterroot Bladderpod	<i>Physaria humilis</i>	Alpine	Potential	
Western Snakeroot	<i>Ageratina occidentalis</i>	Rock/Talus	Potential	
Cliff Toothwort	<i>Cardamine rupicola</i>	Alpine	Potential	
Storm Saxifrage	<i>Micranthes tempestiva</i>	Alpine	Potential	
Yellow Beardtongue	<i>Penstemon flavescens</i>	Rocky slopes (Open, montane)	Potential	
Weber's Saw-wort	<i>Saussurea weberi</i>	Alpine	Potential	

Additionally, two culturally sensitive species, bitterroot (*Lewisia rediviva*) and camas (*Camassia quamash*), are known to occur within the project area. And the Shoefly Meadows Botanical Area (76 acres) is within the project area. The botanical area was first designated in 1986 in the Forest Plan and was further expanded and designated as an Research Natural Area (926 acres) in 1997 for its uncommon peatland composition of several unique assemblages of species and provides habitat for a disproportionately large share of the regional sensitive and uncommon plant species. The Shoofly Meadows Botanical Area is not within any of the focal treatment areas and would not likely be impacted by the proposed actions of this project.

## Field Surveys

The Blue Mountain FTA was surveyed in the summer of 2020 focusing on proposed temp and permanent roads. Surveys were completed on three occasions. No sensitive plant species or species of concern were observed during site visits. The other proposed FTAs would have surveys conducted as soon as prescriptions included actions listed in Table 3 with a high to moderate potential for disturbance.

## Threatened and Endangered Species Consultation

The USFWS website was checked to determine if any threatened or endangered plant species or their critical habitat occur on the Lolo NF

([https://www.fws.gov/montanafieldoffice/endangered\\_species/listed\\_species/Forests/Lolo\\_sp\\_list.pdf](https://www.fws.gov/montanafieldoffice/endangered_species/listed_species/Forests/Lolo_sp_list.pdf)).

Two threatened plant species are present north of the Lolo NF: water howellia (*Howellia aquatilis*) and Spalding’s catchfly (*Silene spaldingii*). Water howellia occurs in small vernal ponds and sloughs in valley bottoms in the Swan Valley, and Spalding’s catchfly has been found in Palouse prairie remnants near and north of Flathead Lake (Montana Natural Heritage Program and Montana Fish Wildlife and Parks 2019). Neither species has been found on the Lolo NF. Critical habitat has not been designated for either species. A determination of “no effect” for both species is warranted.

The proposed activities for this project that could potentially affect whitebark pine trees fit the exception of forest management and restoration. Project activities would not exacerbate the factors attributed to the species’ decline. The proposed prescribed fire in areas greater than 300 acres would potentially benefit whitebark pine if there was a need to plant rust-resistant whitebark pine seedlings after the burning; however, the likelihood of this happening is low. Therefore, the proposed activities would “not jeopardize” the continued existence of the species and consultation is not necessary.

## Federally listed and Regionally Sensitive Plant Protection Measures

Table 2: List of Resource Protection Measures for Sensitive Plants

RPM	Botany Resource Objective	Description	Unit/Location	Sale, Service, Others	S, P	Driver (FP, Reg, Effects)
BOT-1		Information regarding subsequent treatment areas will be provided and coordinated with a Forest Service botanist prior to field season or as soon as possible. Treatment will be evaluated for sensitive plant habitat suitability and suitable habitats will be surveyed as necessary. Prescriptions involving high to moderate/high potential for	Project Area/Disturbance Level Chart	Service	S	Forest Plan Standard 27, Regional Plant Survey Strategy 2020

		disturbance within or adjacent to known TES plant populations will include mitigations to protect those populations. Site specific mitigation to protect TES plant populations may include timing, buffers or avoidance.				
BOT-2	Protection of TES species	Changes to the project during layout that could cause impacts that vary from what was analyzed (e.g., increased canopy cover reduction or logging system change) would be reviewed by a qualified Forest Service botanist, and rare/sensitive plant surveys would be conducted as necessary prior to project implementation.	Project Area/Disturbance Level Chart	Service	S	Forest Plan Standard 27, Regional Plant Survey Strategy 2020
BOT-3	Promote revegetation of disturbed sites with native plant species	Use the Lolo NF Seeding and Revegetation Guidelines, available in the Botany Project File or Soil File 6, for detailed procedures and appropriate mixes. Consult with the Forest Native Plants Coordinator or the Botanist if changes to the seed mix are necessary due to supply. Do not include restricted species (FSM 2070).  Where prescribed by a Forest Service Botanist or Soil Scientist, shrub planting may also be used as a revegetation technique. Shrub ordering procedures and planting guidance are available in the Lolo NF Seeding and Revegetation Guidelines.	Project Area	Sale, Service	S	Forest Plan Standard 27, Regional Plant Survey Strategy 2020

# Ecological Risk Assessment

Once a list of known or potential at-risk plant species and habitats specific to the project analysis area is compiled, a risk assessment considers the potential biological and ecological effects of the proposed project on these resources. This assessment is used to determine the need for field surveys and the level of survey where needed. Individual species, guilds of species that share a common habitat, and the types of management activities can be incorporated in the risk assessment based on project characteristics.

## 1) Geographic/spatial context of known occurrences

The geographic context of known or suspected occurrences and habitat relative to other occurrences outside the project analysis area, on the national forest or grassland, and range-wide, is an important consideration for risk assessment. Factors such as proximity to other known occurrences or suitable habitat, occurrence size (including number of plants and acres of occupied habitat), status on the specific national forest or grassland, and location of the occurrences in relation to the overall range of the species, should be considered. Habitat conditions in the analysis area are also important. Specific approaches and examples for

assessing geographic context are provided in the sensitive plants chapter in the regional desk guide to effects analysis.

## 2) Information on species biology and ecology

Biological and ecological risks to at-risk plant species are determined by professional evaluation of the pre-field review information to assess 1) the likelihood that proposed activities will impact species at risk or their suitable habitat (e.g., estimated levels of potential disturbance), and 2) the potential consequences of the impacts to species at risk (Table 3). The Survey Needs Assessment flow chart (Appendix B) would be used with the disturbance levels listed in the table to determine the need for future surveys.

Although some project types may have a narrow scope, such as trail or temporary road construction, the disturbance level to that specific site may be high. Project analysis and design criteria can then be used to avoid impacts to at-risk plants, for example by moving a trail tread slightly to avoid a population. The disturbance levels in Table 1 are general and it is possible to have some species- or project-specific variations depending on the habitat, life history requirements for individual species, season, and location. Some activities have a disturbance level that may not be related to soil disturbance but is related to direct impacts or stresses to plant populations themselves. This is not a comprehensive list of resource management activities that may be conducted. For any project type not listed in this table, the botanist should determine the disturbance level based on site conditions and the proposed project activity.

Table 3: Estimated Project Disturbance Levels and associated need for survey

Disturbance Level				
High	Moderate to High	Low to High	Low to Moderate	Low
<ul style="list-style-type: none"> <li>• Construction at campgrounds, administrative sites</li> <li>• Machine scarification</li> <li>• Road construction (specified and temporary)</li> <li>• Road decommissioning</li> <li>• Sub-soiling</li> <li>• Summer Timber harvest activities (tractor, whole tree yarding, cut to length, landings)</li> <li>• Machine piling and burning</li> <li>• Fuel break/fire line construction</li> <li>• Trail construction</li> </ul>	<ul style="list-style-type: none"> <li>• Prescribed fire: broadcast or underburning</li> <li>• Hand piling and burning</li> <li>• Summer timber harvest activities – skyline</li> <li>• Mechanized pre-commercial thinning (biomass removal, daylighting)</li> <li>• Commercial firewood harvest</li> <li>• Road maintenance and reconditioning</li> <li>• Aquatic Organism Passage (AOP) structure installation</li> </ul>	<ul style="list-style-type: none"> <li>• Hand piling and burning</li> <li>• Herbicide application</li> <li>• Wildlife habitat improvement</li> <li>• Hazard tree removal (roadside, administrative, campgrounds)</li> <li>• Meadow restoration</li> <li>• Post and pole sales</li> <li>• Salvage (fire, disease, insect)</li> </ul>	<ul style="list-style-type: none"> <li>• Winter timber harvest activities (tractor, skyline, whole tree yarding, cut to length, landings)</li> <li>• Trail maintenance</li> <li>• Road storage</li> <li>• Revegetation – trees, shrubs, and native plant materials</li> <li>• Aspen restoration</li> <li>• Whitebark pine daylighting*</li> </ul> <p>*depending on status determination of whitebark pine by USFWS</p>	<ul style="list-style-type: none"> <li>• Carbaryl spraying of verbenone treatments</li> <li>• Non-mechanized pre-commercial thinning (lop-scatter)</li> <li>• Biological weed control</li> <li>• Facility and sign maintenance</li> <li>• Gate installation</li> </ul>

## Affected Environment

Most of the underlying vegetation of the forest canopy consists of native forbs, shrubs, and grasses. Most commonly occurring are ninebark, Oregon grape, kinnikinnick, spirea, wood's rose, thimbleberry, baneberry, buffalo berry, currents, service berry, rocky mountain maple, huckleberry, snowberry, pine grass and elk sedge.

### Sensitive Plant Characteristics in WAM project area

The tables in Appendix A lists all the potential proposed, sensitive, and species of concern that may occur in the WAM project area. This broad query of potential species included areas such as lake, rivers, stream, ponds, and wet area. Species associated with wet habitats would likely be protected by avoidance buffers to protect multiple resource areas; reducing the number of potential species impacted by proposed and future activities (Table 1). The list in Table 1 is further reduced by only reviewing species that are included in the Region One Sensitive Species List with the likelihood of occurring on NFS Lands in the project area. Whitebark pine is considered a proposed threatened species but is included in this table as well.

Table 4: Region One Sensitive Plants and Whitebark (candidate) in WAM

Common Name	Scientific Name	Habitat
<b>Sensitive</b>		
Musk-root	<i>Adoxa moschatellina</i>	Rock/Talus
Western Snakeroot	<i>Ageratina occidentalis</i>	Rock/Talus
Tapertip Onion	<i>Allium acuminatum</i>	Dry Forest-Grassland
Wavy Moonwort	<i>Botrychium crenulatum</i>	Various Mesic Sites
Coville Indian Paintbrush	<i>Castilleja covilleana</i>	Subalpine slopes
Clustered Lady's-slipper	<i>Cypripedium fasciculatum</i>	Forests (Montane)
Howell's Gumweed	<i>Grindelia howellii</i>	Vernally moist sites (Open, low elevation)
Oregon Bluebells	<i>Mertensia bella</i>	Vernally moist soil (Montane)
Missoula Phlox	<i>Phlox kelseyi</i> var. <i>missoulensis</i>	Slopes/ridges (Open, foothills to subalpine)
Hollyleaf Clover	<i>Trifolium gymnocarpon</i>	Open areas (foothills and montane)
<b>Proposed Threatened</b>		
Whitebark Pine	<i>Pinus albicaulis</i>	Subalpine forest, timberline

### Muskroot (*Adoxa moschatellina*)

Muskroot is a small, delicate, musky-scented herbaceous perennial, 5-20 cm tall in the Adoxaceae family. Plants have a short, scaly rhizome. The several basal leaves have long petioles and blades divided into threes 2-3 times, with the ultimate segments broadly egg-shaped and lobed. There is one opposite pair of smaller stem leaves which are less dissected. Usually 5 flowers are borne in a compact head-like inflorescence at the tip of the stem. The inconspicuous, yellowish-green flowers, 5-8 mm wide, are of two types: outside flowers usually have 3 sepals and 5 united petals, while the terminal flowers have 2 sepals and 4 united petals. The sepals are united to the wall of the ovary. The small dry fruit has 4-5 seeds.

The plants flower in June through early July; and fruiting continues through July. All muskroot plants found on the Lolo NF have been located adjacent to forest cover. In addition, running or standing water is usually adjacent or not far from a population or subpopulation. On the Lolo NF, plants have been found at elevations from 4200-4500 feet.

### Western Snakeroot (*Ageratina occidentalis*)

Western snakeroot is a rhizomatous perennial herb in the Asteraceae family. Boneset has clustered stems that are often woody at the base and is 15-70 cm tall. Leaves are alternate on the stem, triangular or ovate in outline, and 2-7 cm long with toothed margins. The lower leaves are reduced with small, unstalked glands on the under surface. Flowering heads are borne in an open, branched inflorescence and the subtending bracts are 3-5 mm long and mostly equal in length. The heads lack ray flowers, and have 9-21 purple or pink disk flowers in each head. The top of the achene bears a tuft of numerous fine bristles western snakeroot

This plant flowers in August and found in rocky outcrops and slopes in the montane and lower subalpine zones. This plant has been found at elevations from 5500-7800 feet.

### Tapertip Onion (*Allium acuminatum*)

Tapertip onion is a perennial herb in the Liliaceae family. It has solitary or clustered, nearly globose bulbs with brown finely meshed, honeycombed, outer coats. The 2-3 sheathing long leaves are u-shaped in cross-section and are 1-3 mm wide and arise from near the base of the stem. The leaves frequently wither by flowering time. The umbrella like inflorescence is subtended by 2, 3- to 7-nerved, lance-shaped papery bracts. Tapertip onion can be distinguished from other species of onions by its honey-combed brown coat over the bulb and its withering thin leaves.

Plants flower in May and June. Plants on the Lolo NF are in full flower from mid to late June. Habitat for this plant is described as dry, open forests and grasslands in the montane zone Tapertip onion plants found on the Lolo NF are in patches scattered throughout open Douglas-fir and ponderosa pine forests at elevations from 2700-3200 feet but ranges between 2460 and 6000 feet in general.

### Wavy Moonwort (*Botrychium crenulatum*)

Wavy moonwort is a small perennial fern in the Ophioglossaceae family. This moonwort has a single aboveground frond that is usually 10 cm or less tall, yellow-green, and divided into two segments which share a common stalk. The mostly sterile segment is one pinnatifid with usually three or four well separated pairs of thin textured, broadly fan-shaped pinnae which have distinct veins and crenulate margins. The fertile segment is longer than the sterile segment, is branched and bears grape-like sporangia. Spores germinate underground and develop into minute, subterranean, non-photosynthetic gametophytes which depend on an endophytic fungus for nourishment.

Fronds mature in June through July. Wavy moonwort is found in wet, marshy, and springy areas, including marshy meadows, edges of marshes, saturated soils of seeps, bottoms and stabilized margins of small streams, and wet roadside swales, ditches, and drainage ways. Sites tend to be partly to heavily shaded and usually have a dense, diverse cover of forbs and graminoids. Dominant plant species include spruce, alders, and dogwood, and red cedar. Often found on soils influenced by reprecipitated calcium. Plants are found at mid to high elevations in the montane zone (3,000-7,000 feet).

## Coville Paintbrush (*Castilleja covilleana*)

Coville Indian Paintbrush is a perennial with clusters of several unbranched, erect or ascending stems, which can be up to 30 cm tall. All leaves but the lowermost are deeply divided into 3-7 spreading, linear lobes, and are alternate on the stem. The herbage is covered with long, soft hairs. The inflorescence is usually bright red or scarlet but may be orangish-yellow; it is short and compact at first but elongates greatly at maturity. This species can be distinguished from other red paintbrushes in its range by the covering of long, soft hairs (rather than stiff and straight), and by the middle leaf segments that are almost as narrow as the lateral segments.

Flowering occurs late June to early August and is found on stony soil of slopes and summits in the montane and subalpine zones.

## Clustered Lady's Slipper (*Cypripedium fasciculatum*)

Clustered lady's slipper is a perennial plant in the Orchidaceae family. This orchid has densely hairy, solitary stems. The stems are 5-20 cm tall and arise from a rhizome. A single leaf wraps around the base of the stem and there is also a pair of sessile, subopposite leaves located near the middle or upper half of the stem. These opposite leaves are broadly oval-shaped and are 4-8 cm wide. Flowering plants typically have 2-4 flowers that are clustered at the top of the stem. Each flower is subtended by a green, lance-shaped bract. The sepals are lance-shaped and greenish brown to purplish with purple lines or spots. Two of the three petals are similar to the sepals in color and shape, while the third or lower petal is pouch-shaped and shorter than the sepals. The pouch or slipper is greenish yellow with brownish purple margins and often has a purple tinge.

On the Lolo NF, this plant flowers from May through July. Most occurrences have been found in warm, dry montane forests in the Douglas-fir/ninebark, grand fir/ninebark, grand fir/twinflower, and grand fir/queencup beadlily habitat types. It also occurs in the western red cedar/queencup beadlily habitat type. Clustered lady's slipper plants have been found on all aspects and slopes, on elevations ranging from 3000-4700 feet.

## Howell's Gumweed (*Grindelia howellii*)

Howell's gumweed is a short-lived perennial in the Asteraceae family. This gumweed has stems up to 90 cm in length that are woody at the base and clustered on a taproot. The basal leaves are lance-shaped, broadest toward the tip, and up to 20 cm long. The clasping stem leaves are reduced in size and entire-margined or with shallow, ill-defined teeth. Herbage is resinous and glandular. The stem is glandular-haired and usually has some additional long, soft hairs. Flowering heads are borne in a terminal, open, leafy yellow inflorescence. The numerous, narrow, involucre bracts are resinous and have green, recurved tips.

This plant flowers in July and August and occurs around ponds and shallow depressions in soil that receive extra moisture in the spring but dry by mid-summer. Plant populations are typically found growing on disturbed roadsides, where a seasonal supply of moisture is available for plant growth. Howell's gumweed has also been located on disturbed pastures on private and state lands. This plant has been found at elevations from 3350-5500 feet.

## Oregon Bluebells (*Mertensia bella*)

Oregon Bluebells is a perennial herb of the Boraginaceae family. This plant has solitary stems that arise from

a bulb-like root. It grows 10-40 cm tall. The ovate leaves are thin, entire-margined, and evidently veiny. The blue flowers are stalked and borne in open inflorescences at the top of the stem and in the axils of the upper leaves. The lower two-thirds of the 5 petals are united into a small bell-shaped flower. The bell-shaped flowers, which lack a distinct lower tubular portion and flaring upper portion, distinguish this species from all other bluebells.

This plant flowers in late May and June. Habitat for this plant is described as wet, seepy, open or partially shaded slopes in the montane zone along clearcuts and wet, seepy, open roadsides adjacent to clearcuts. The vegetative community found at all locations is in the subalpine fir habitat types. Plants are located within a 6100 to 6600 feet.

### Missoula Phlox (*Phlox kelseyi* v. *missoulensis*)

Missoula phlox is a perennial plant in the Polemoniaceae family. This mat-forming plant has numerous prostrate, branching stems that are up to 10 cm long and arise from a branched root crown. The leaves are sharply pointed and linear and are opposite on the stem and have thickened margins and long, spreading hairs at the base. The herbage is otherwise glabrous or short-hairy or glandular. The flowers are solitary at the ends of the stems. The five-lobed calyx is densely hairy and sometimes glandular. The corolla is white or various shades of pink and blue. Missoula phlox is a state endemic species.

This plant flowers in May and June. Missoula phlox grows on open, exposed, limestone-derived slopes in the foothills and montane zones from elevations of 3600 to 8100 feet.

### Hollyleaf Clover (*Trifolium gymnocarpon*)

Hollyleaf clover is a perennial in the Fabaceae family. This clover grows in clumps with many stems averaging 15 cm long, arising from a thick taproot and branched root crown. Leaves have three ovate, sharply toothed leaflets arising from the base of the stems. Leaves and stems are sparsely covered with straight, appressed hairs. Flowers are borne in clusters of 3 to 15 in a nodding or spreading form at the end of leafless stalks that are shorter than the leaves. The light yellow to flesh-colored flowers are hood-shaped. The calyx is densely hairy a third to one half as long as the corolla, tubular at the base, with five long, triangular teeth at the mouth. The small fruit pod usually has a single seed.

Plants flower in late-May through July and is on the periphery of its range in Montana. Habitat for hollyleaf clover is open slopes and woods, usually is dry soil of sagebrush steppe to ponderosa pine forest in the foothills to lower montane zone. This plant has been found at elevations from 4800 to 6300 feet.

### Whitebark Pine (*Pinus albicaulis*)

Whitebark pine (*Pinus albicaulis*) occurs in the Rocky Mountains from northern British Columbia and Alberta into Idaho, Montana, Wyoming, and Nevada. On the Missoula Ranger District, whitebark pine is common in mixed conifer forests above 5800 feet, where it grows in mixed stands with Douglas fir (*Pseudotsuga menziesii*), lodgepole pine (*Pinus contorta*), western larch (*Larix occidentalis*), and an occasional ponderosa pine (*Pinus ponderosa*). Whitebark pine may occur at all successional stages: as a climax species (late), pioneer species (early), or dominant with other tree species (mid). The majority of the project area is more similar to the typical mid-successional stage with whitebark occurring in a mixed species forest community. The project area in general contains limited whitebark pine.

The seed of the whitebark pine is nut-like and provides important nutritional value to several species of wildlife, mostly bears, birds, and rodents. The dispersal of the heavy seed is mostly dependent on the Clark's nutcracker (Tomback 2001, Keane and Schoettle 2011). This bird transfers the seed from the cone and creates caches of nuts in the ground. Red squirrels are also known to cache nuts in the ground. These caches are utilized later in the year by the Clark's nutcracker or red squirrel. Whitebark pine is also an important food source for grizzly and black bears, and bears will often find these caches and consume the large quantity of nuts. (Grizzly bears have not been observed in the area.) The caches are usually in large openings that have recently been burned to mineral soil and are void of low-lying vegetation (Tomback 2001, Keane and Schoettle 2011). These site conditions are also favorable for whitebark pine regeneration (Tomback 2001, Keane and Schoettle 2011).

Favorable sites are open, burned areas that lack competitive vegetation, allowing the whitebark pine to establish early if the seeds are not consumed by other predators (Tomback 2001, Keane and Schoettle 2011). Clark's nutcrackers have been observed in the area during site visits. The nearest available seed sources within the project area include Rattlesnake Wilderness/NRA, Montana Snowbowl Ski Area, upper Gold Creek, Gilbert Creek, Plant Creek, and Bear Creek (Appendix C). Due to years of fire suppression and private land development, the project area lacks openings needed for natural regeneration. The cones from trees, known as Plus Trees, are collected on a regular basis to build a stock of genetically tested rust-resistant seedlings to be planted in whitebark pine restoration projects.

Wildfire plays an important role in the lifecycle of whitebark pine. Vegetation recycling is an important component in sustaining whitebark pine stands. Historical fire frequencies in whitebark pine stands range from 35 to 300 years (Fischer and Bradley 1987). The stand conditions of the project area show indications of lack of fire due to the buildup of fuels and density of trees. Tree density increases shade in the stand preventing growth and development of understory species. Once shade-tolerant conifer species become firmly established, the habitat is effectively lost to whitebark pine until a disturbance (like fire) opens up the stand (Keane and Arno 1993). Denser stands also eliminate openings that are utilized for seed caching by the Clark's nutcracker, which can reduce the viability of the species at the stand level. Whitebark pines are shade intolerant and will not germinate under these conditions (Keane and Arno 1993, Kendall and Keane 2001).

The project area shows minimal indications of white pine blister rust activity with some dead trees and some trees showed signs of infection (cankers, flagging). White pine blister rust is a disease of 5-needled pines caused by a non-native fungus, *Cronartium ribicola*. The fungus enters the pine through stomata as the plant is photosynthesizing. As the hyphae of the fungus develop, it moves through the needles, twig, branches, and eventually to the trunk causing swelling and cankers to form along the way. If the swelling or cankers become too large, the tree is damaged or eventually killed by girdling branches and stems (Hoff 1992). Infection also limits seed cone production. The life cycle of white pine blister rust is a five-stage process requiring alternate hosts (*Ribes* spp., *Pedicularis* spp., and *Castilleja* spp.) and fertilization by insects (Keane et al. 2012). The rate and intensity of spread is influenced by multiple environmental factors. Even with a complicated life cycle, white pine blister rust is widespread, and its current distribution is in western North America (except Utah and the Great Basin Desert), including British Columbia and Alberta, Canada (Tomback and Achuff 2010).

Mountain pine beetle is another factor in the decline of whitebark pine. This insect feeds on the cambium of all western pines. The beetle is native to North America and western pines have developed defense mechanisms to prevent the beetle from entering the tree (pitching). However, once the tree is successfully

preyed upon, the adult females emit pheromones that attract adult male mountain pine beetles and other adult beetles. If enough beetles successfully attack a tree, beetle galleries used for reproduction can girdle the bole and kill the tree. Mountain pine beetle outbreaks have played an important role in changing stand structure and species composition in western forests. Historically, temperature has helped control beetle levels with extreme cold temperatures occurring in the spring or late fall when beetles are most susceptible to mortality. With the rising temperatures life cycles are completed in 1 year (Amman et al. 1997). These conditions can cause epidemic levels of infestation causing greater tree loss over a widespread area (Keane et al. 2012). Though mountain pine beetle is prevalent in Montana, the project area has a minimal level of infestation compared to other parts of the western United States.

This leads to the final factor in the decline of whitebark pine, climate change. Evidence of climate change has been observed in northwestern Montana as well as around the world. Whitebark pine is a long-lived species and has undoubtedly survived climatic changes in the past. The concern about climate change in regards to whitebark pine involves the rate of change and how the species' complex regeneration process may make it difficult to adjust to rapid climate change (Keane et al. 2012). Climate change may impact whitebark pine by 1) direct loss of habitat, 2) increased competition from other species, 3) increased CO<sub>2</sub> levels, 4) regeneration, and 5) interaction with other factors (fire intervals, disease, and predation).

## Sensitive Plant Resource Issues

Basic knowledge of population ecology is lacking for most sensitive plant species on the Lolo NF. Much of the current knowledge regarding sensitive plant species is based on observational (non-empirical) and even anecdotal information. Not to mention, effects to populations from disturbance events (natural or human-caused) are not well documented and, therefore, difficult to quantify with certainty for all sensitive plant species. A review completed in 1993, revealed past projects on the Lolo NF did not complete sensitive species biological evaluations most of the time or post decision (Haskins 1993) which further complicates the lack of knowledge of ecology and effects to sensitive plant species. For example, for unsurveyed habitat that is highly suitable for supporting sensitive plants, presence is assumed but not field verified, and consequently not able to be monitored after the project is implemented for effects.

## Desired Condition

Vegetation Treatments - Proposed treatments would result in forested stands being closer to their historic conditions and stand structures that would promote forest health and resilience. Current tree densities are greater than the historic conditions. Stand densities in all forest types (e.g., warm, dry lower slopes, moist mid-slopes, and cool dry upper slopes) would be reduced in the short term. Within 20 to 30 years of implementation, the moist mid-slopes and upper slopes would be expected to return approximately to current conditions.

Opening the canopies of the warm dry forest types would increase the amount of light reaching the forest floor and create warmer, drier conditions. Opening might produce conditions that would be more suitable for sensitive species that inhabit dry coniferous forests. Opening the more mesic areas in this type may render those forests less likely to support sensitive species that require cool, moist conditions, but more likely to support the species requiring drier conditions.

Several sensitive species rely on disturbance to maintain their habitat. The amount of habitat for those species may be increased in the project area.

Noxious Weed Establishment and Spread - The possibility of weed establishment and spread is a serious concern. The proposed action has been planned to include weed treatment before and after project implementation in order to result in no net increase in weed establishment and spread. See the Noxious Weed Specialist's Report for more details.

## Compliance with Laws, Regulations, Lolo Forest Plan, and Policies

The WAM project is consistent with the Lolo Forest Plan, NFMA, ESA and sensitive plant policy.

## Summary of Determinations of the No Action

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Management activities would not change from current levels, and current vegetation growth and successional trends would be expected to continue. There would be no new road construction, timber harvest or underburning; however, some road maintenance and trail maintenance activities would continue according to present management plans. Therefore, the no-action alternative would result in the potential for very low direct impacts to rare plants or their habitat.

Indirectly, the continued increase in forest fuel loading could pose a threat to suitable rare plant habitat in the context of a slightly higher risk of stand-replacing fires. Such fires could extirpate documented occurrences and/or undetected occurrences and other rare plants in the project area, particularly those associated with moist and wet forest habitats. Habitat suitability may be reduced if fire intensity is sufficient to destroy soil mycorrhizae on which these species depend. Should such a fire occur, it may impact populations and/or reduce habitat suitability temporarily. No action could result in low, moderate, or high cumulative effects to these species and/or their associated habitats, depending on where a fire occurs and the severity or intensity of the fire. However, the occurrence and intensity of a future wildfire in suitable habitat for these species would be difficult to predict.

Past, present, and future wildfire suppression activities in the project area would continue to disturb forest floor habitat with dozer lines, hand lines, retardant applications, increased traffic and on the ground personnel. Implementation of the no action would contribute to the continued accumulation of forest fuels in the project area, thereby increasing the potential need for wildfire suppression activities. This would result in the potential of extirpating documented occurrences and/or undetected occurrences and other rare plants in the project area.

## Summary of Determinations of Alternative B

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This biological evaluation and assessment was prepared to document potential effects to federally-listed, proposed, or Regional Forester Sensitive species.

There would be "no effect" on the two federally listed, threatened plant species. Both plant species occur near (north of) the Lolo NF: *Howellia aquatilis* and *Silene spaldingii*. *Howellia aquatilis* occurs in small vernal ponds and sloughs in valley bottoms. *Silene spaldingii* has been found in low-elevation grasslands and/or adjacent forest edges, generally in draws or swales and/or on north to east aspects where soil moisture is

greater. Neither species has been found on the Lolo NF. Critical habitat has not been designated for either species. There are no endangered plants in Montana.

Analysis determined proposed activities would have “no effect” to whitebark pine due to the unlikelihood of whitebark pine occurring in the project area or proposed treatments and would not result in jeopardy to the species.

As a result of this evaluation for Sensitive species, there is not adequate information to determine effects to all the potential species listed for the Lolo NF. Effects are considered adverse if they “contribute to a trend toward federal listing or loss of viability for the species”. Proposed management actions are not expected to reach this level of impacts; however, individuals or their habitat “may be impacted but not likely to result in the trend toward federal listing or loss of viability to the population or the species”. A “no impact” determination cannot be determined without adequate surveys.

Additionally, Resource Protection Measures are included that would alter management activities in the event of any threatened, endangered, proposed, or sensitive species being located during project layout or implementation.

## **Appendix A**

Summary of WAM Potential

Threatened, Endangered, and Sensitive Plants

Table 5: Documented Occurrences of Forest Service Sensitive Plant Species (purple) and State Species of Concern (green)

Common Name	Scientific Name	Habitat	Distribution	OBS Count	USF WS Sec7	Global Rank	MT State Rank	USFS
Brown Hair Peatmoss	<i>Sphagnum fuscum</i>	Wet soils and peat, high mountain tops	Present	1		G5	S2	
Streamside Peatmoss	<i>Sphagnum riparium</i>	Wet soils and peat, marshes and along streams	Present	2		G5	S1	
Necker's Thamnobryum Moss	<i>Thamnobryum neckeroides</i>	Shady banks, bluffs, boulders, tree bases	Unknown/Undetermined	1		G4	SH	
Subcentric Ring Lichen	<i>Arctoparmelia subcentrifuga</i>	Siliceous rock in (montane to subalpine sites)	Present	1		G4G5	S1	
Pointed Broom Sedge	<i>Carex scoparia</i>	Wetland/Riparian (Valleys)	Present	3		G5	S1S2	
Howell's Gumweed	<i>Grindelia howellii</i>	Vernally moist sites (Open, Low-elevation)	Present	5		G3	S2S3	SENSITIVE
Whitebark Pine	<i>Pinus albicaulis</i>	Subalpine forest, timberline	Present	25	Y	G3?	S3	CANDIDATE
Coville Indian Paintbrush	<i>Castilleja covilleana</i>	Subalpine slopes	Present			G3G4	S3	SENSITIVE
Missoula Phlox	<i>Phlox kelseyi</i> var. <i>missoulensis</i>	Slopes/ridges (Open, foothills to subalpine)	Present	16		G3	S3	SENSITIVE
Alpine Collomia	<i>Collomia debilis</i> var. <i>camporum</i>	Rock/Talus (Valleys to Montane)	Present	4		G5T2	S1S2	
Crested Shieldfern	<i>Dryopteris cristata</i>	Wetland/Riparian	Present	3		G5	S3	SENSITIVE
Toothcup	<i>Rotala ramosior</i>	Wetland/Riparian	Present	34		G5	S1S2	
Short-pointed Flatsedge	<i>Cyperus acuminatus</i>	Wetland/Riparian	Present	1		G5	S1	

Common Name	Scientific Name	Habitat	Distribution	OBS Count	USF WS Sec7	Global Rank	MT State Rank	USFS
Pod Grass	<i>Scheuchzeria palustris</i>	Wetland/Riparian	Present	2		G5	S3	SENSITIVE
Coville's Rush	<i>Juncus covillei</i>	Wetland/Riparian	Present	1		G5	S2S3	
Columbia Water-meal	<i>Wolffia columbiana</i>	Aquatic	Present	2		G5	S2S3	
Small Yellow Lady's-slipper	<i>Cypripedium parviflorum</i>	Fens, damp mossy woods, seepage areas, moist forest-meadow ecotones (Valley to lower montane)	Present	1		G5	S3S4	SENSITIVE
Pale-yellow Jewel-weed	<i>Impatiens aurella</i>	riparian	Present	3		G4	S3	
Idaho Lovage	<i>Ligusticum verticillatum</i>	Moist forest, moist spruce-fir forest and streambanks (montane) SNOWBOWL	Present	1		G4G5	S3	
Stalk-leaved Monkeyflower	<i>Mimulus ampliatus</i>	Vernally moist soil (Valleys to subalpine)	Present			G3	S3	SENSITIVE
Cup Clover	<i>Trifolium cyathiferum</i>	Wet meadows, sandy streambanks, roadsides (valleys and montane)	Present	1		G4	S3	
Woolly Clover	<i>Trifolium microcephalum</i>	Moist meadows, sandy banks along rivers to dry hillsides	Present	1		G5	S3	
Obscure Evening-primrose	<i>Camissonia andina</i>	Sandy sites	Present	1		G4	S2	
Deer Indian Paintbrush	<i>Castilleja cervina</i>	Wetland/Riparian	Unknown/Undetermined			G4	SH	
Limestone Larkspur	<i>Delphinium bicolor ssp. calcicola</i>	Shortgrass prairie and grass-sagebrush communities on limestone-derived soils	Present	1		G4G5 T3T4	S3S4	
Spiny-spore Quillwort	<i>Isoetes echinospora</i>	freshwater lakes	Present			G5	S3	

Common Name	Scientific Name	Habitat	Distribution	OBS Count	USFWS Sec7	Global Rank	MT State Rank	USFS
Small-headed Tarweed	<i>Madia minima</i>	Vernally moist, often moss-covered soil on impermeable bedrock in openings of coniferous forest (valleys and montane)	Present	3		G4	S3S4	
Suksdorf Monkeyflower	<i>Mimulus suksdorfii</i>	Vernally moist soil of grasslands and rocky slopes (foothills and montane)	Present			G4	S3S4	
Annual Muhly	<i>Muhlenbergia minutissima</i>	Moist soil along rivers and streams (valley)	Present	1		G5	S3	

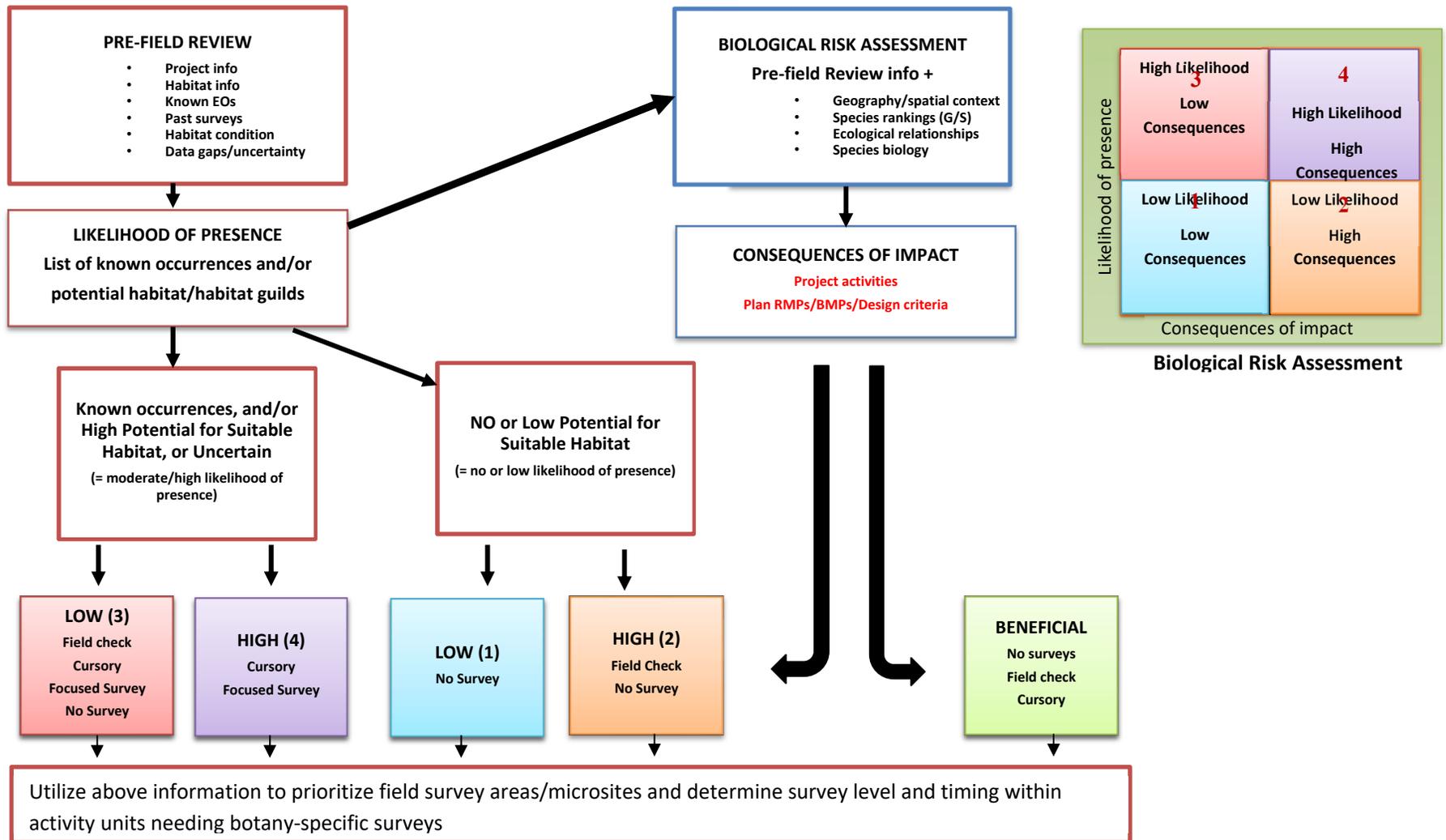
Table 6: Potential Occurrences based on Habitat Presences of Forest Service Threatened (orange) and Sensitive Plant Species (purple) and State Species of Concern (green)

Common Name	Scientific Name	Habitat	Distribution	USFWS Sec7	Global Rank	MT State Rank	USFS
Musk-root	<i>Adoxa moschatellina</i>	Rock/Talus	Present		G5	S3	SENSITIVE
Flatleaf Bladderwort	<i>Utricularia intermedia</i>	Fens (Aquatic)	Present		G5	S2	SENSITIVE
Beaked Spikerush	<i>Eleocharis rostellata</i>	Wetlands (Alkaline)	Present		G5	S3	SENSITIVE
Tufted Club-rush	<i>Trichophorum cespitosum</i>	Fens and wet meadows	Present		G5	S2	SENSITIVE
Tapertip Onion	<i>Allium acuminatum</i>	Dry Forest-Grassland	Present		G5	S2S3	SENSITIVE
Dwarf woolly-heads	<i>Psilocarphus brevissimus</i>	Wetland/Riparian	Present		G4	S2S3	SENSITIVE
Letterman's Needlegrass	<i>Stipa lettermanii</i>	Talus and Grasslands (low-elevation)	Present		G5	S1S3	
Hollyleaf Clover	<i>Trifolium gymnocarpon</i>	Open areas (foothills and montane)	Present		G5	S2	SENSITIVE
Long-sheath Waterweed	<i>Eloдея bifoliata</i>	Wetland/Riparian (Shallow water)	Present		G4G5	S2?	
Blunt-leaved Pondweed	<i>Potamogeton obtusifolius</i>	Aquatic	Present		G5	S3	SENSITIVE
Water Bulrush	<i>Schoenoplectus subterminalis</i>	Wetland/Riparian	Present		G5	S3	SENSITIVE

Common Name	Scientific Name	Habitat	Distribution	USFWS Sec7	Global Rank	MT State Rank	USFS
Northern Bog Clubmoss	<i>Lycopodium inundatum</i>	Fens	Present		G5	S2	SENSITIVE
Mission Mountain kittentails	<i>Synthyris canbyi</i>	Alpine	Present		G2G3	S2S3	
Idaho Goldenweed	<i>Tonestus aberrans</i>	Rock/Talus	Present		G3	S1S2	SENSITIVE
Yerba Buena	<i>Satureja douglasii</i>	Forest (Moist, montane)	Present		G5	S3	
Clustered Lady's-slipper	<i>Cypripedium fasciculatum</i>	Forests (Montane)	Present		G4	S3	SENSITIVE
Mat Buckwheat	<i>Eriogonum caespitosum</i>	Sagebrush steppe (Montane)	Present		G5	S2S3	
Spalding's Catchfly	<i>Silene spaldingii</i>	Grasslands (Intermountain)	Present	Y	G2	S2	THREATENED
Wavy Moonwort	<i>Botrychium crenulatum</i>	Various Mesic Sites	Present		G4	S3	SENSITIVE
California False-hellebore	<i>Veratrum californicum</i>	Wetland/Riparian	Present		G5	S2	SENSITIVE
Oregon Bluebells	<i>Mertensia bella</i>	Vernally moist soil (Montane)	Present		G4	S2S3	SENSITIVE
Bitterroot Bladderpod	<i>Physaria humilis</i>	Alpine	Present		G2	S2	SENSITIVE
Adder's Tongue	<i>Ophioglossum pusillum</i>	Fens, Wet meadows	Present		G5	S3	SENSITIVE
Western Snakeroot	<i>Ageratina occidentalis</i>	Rock/Talus	Present		G4	S2	SENSITIVE
Beck Water-marigold	<i>Bidens beckii</i>	Aquatic	Present		G5	S2	SENSITIVE
Watershield	<i>Brasenia schreberi</i>	Aquatic	Present		G5	S1S2	SENSITIVE
Cliff Toothwort	<i>Cardamine rupicola</i>	Alpine	Present		G3	S3	
English Sundew	<i>Drosera anglica</i>	Fens	Present		G5	S3	SENSITIVE
Slender Cottongrass	<i>Eriophorum gracile</i>	Fens	Present		G5	S3	SENSITIVE
Water Howellia	<i>Howellia aquatilis</i>	Aquatic	Present		G3	S3	THREATENED
Storm Saxifrage	<i>Micranthes tempestiva</i>	Alpine	Present		G2G3	S2S3	SENSITIVE

Common Name	Scientific Name	Habitat	Distribution	USFWS Sec7	Global Rank	MT State Rank	USFS
Yellow Beardtongue	<i>Penstemon flavescens</i>	Rocky slopes (Open, montane)	Present		G3	S3	
Weber's Saw-wort	<i>Saussurea weberi</i>	Alpine	Present		G3	S2	SENSITIVE
Meesia Moss	<i>Meesia triquetra</i>	Wet soils and peat in fens and bogs	Present		G5	S2	SENSITIVE
A Scorpidium Moss	<i>Scorpidium</i>	Exposed or submerged rocks in rivers and streams	Present		G5	S2	SENSITIVE

# Appendix B – Survey Needs Assessment



**Notes:**

- 1) Where beneficial impacts are predicted, no surveys may be needed, or a lower intensity survey may be indicated.
- 2) Where more than one survey level is indicated, professional judgment based on project- and species-specific information determines survey level.
- 3) In landscape-scale projects, different survey levels may be indicated for different treatment units or parts of the analysis area.
- 4) During implementation of surveys, survey intensity may change to FOCUSED SURVEY when potential habitat or new occurrences are detected.
- 5) Where consequences are uncertain, a different survey level may be needed.



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