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SENSITIVE PLANT SURVEY IN THE TENDOY MOUNTAINS
BEAVERHEAD COUNTY, MONTANA

BUTTE DISTRICT, BUREAU OF LAND MANAGEMENT

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Agreement No. E950-A1-0006, Task Order No. 22

January 1994

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This document should be cited as follows:

Vanderhorst, J. and P. Lesica. 1994. Sensitive plant survey in the Tendoy Mountains, Beaverhead County, MT. Unpublished report to the Bureau of Land Management. Montana Natural Heritage Program, Helena. iv + 59 pp. plus appendices

EXECUTIVE SUMMARY

Nearly a hundred populations of thirty-one potentially sensitive plant species were found on or adjoining Bureau of Land Management holdings in the Tendoy Mountains. At least two of the species discovered, tapertip biscuitroot (*Lomatium attenuatum*) and Nuttall's townsendia (*Townsendia nuttallii*), represent the first time they have been documented in Montana, and this may also be the case for mat buckwheat (*Eriogonum caespitosum*). An undescribed *Delphinium* was found to be common in the Tendoy Mountains; documentation and consultation was initiated and this taxon will be described as a new subspecies of *D. bicolor*.

Of the thirty-one species, it is recommended that fifteen be dropped from further BLM consideration, eleven be added to the three species proposed for sensitive designation, and that two be considered watch species. Recommendations that pare the list of Montana State Species of Special Concern are also presented. A total of 382 vascular plant taxa were identified in the study area, reflecting high diversity for the relatively narrow range in study area elevation

TABLE OF CONTENTS

INTRODUCTION	1
THE STUDY AREA	1
METHODS	3
RESULTS	4
<i>Agastache cusickii</i>	6
<i>Arenaria kingii</i>	8
<i>Astragalus argophyllus</i>	10
<i>Astragalus lentiginosus</i>	11
<i>Astragalus leptaleus</i>	12
<i>Astragalus scaphoides</i>	13
<i>Astragalus terminalis</i>	15
<i>Carex parryana</i> ssp. <i>idaho</i> a	17
<i>Cirsium subniveum</i>	19
<i>Delphinium bicolor</i> ssp. <i>novum</i>	20
<i>Erigeron gracilis</i>	22
<i>Eriogonum caespitosum</i>	23
<i>Eriogonum ovalifolium</i> var. <i>nevadense</i>	25
<i>Gentiana aquatica</i>	27
<i>Halimolobos virgata</i>	28
<i>Haplopappus macronema</i> var. <i>linearis</i>	29
<i>Hutchinsia procumbens</i>	31
<i>Lomatium attenuatum</i>	32
<i>Mimulus suksdorfii</i>	34
<i>Pediocactus simpsonii</i>	35
<i>Penstemon lemhiensis</i>	36
<i>Phacelia incana</i>	37
<i>Senecio debilis</i>	39
<i>Sphaeromeria argentea</i>	40
<i>Sphaeromeria capitata</i>	41
<i>Stanleya viridiflora</i>	42
<i>Taraxacum eriophorum</i>	43
<i>Thalictrum alpinum</i>	45
<i>Thelypodium sagittatum</i>	46
<i>Thlaspi parviflorum</i>	48
<i>Townsendia nuttallii</i>	50
DISCUSSION	52
LITERATURE CITED	56
APPENDIX A. Maps showing principle travel routes	
APPENDIX B. Floristic species list of the study area	
APPENDIX C. Distribution maps of sensitive species	
APPENDIX D. Element Occurrence Record printouts and maps	
APPENDIX E. Photographic slides	

TABLES

Table 1.	Target species in the Tendoy Mountains	5
Table 2.	Species recommended for BLM sensitive species status	52
Table 3.	Species recommended for deletion from BLM sensitive species consideration	53
Table 4.	Tendoy Mountains priority species, by habitat	54

INTRODUCTION

This report describes a sensitive species botanical survey of Bureau of Land Management (BLM) lands in the Tendoy Mountains, in southwestern Montana. The purpose of this work was to locate and evaluate populations of potential sensitive or watch species as proposed by the Bureau of Land management in Montana (USDI Bureau of Land Management 1993). Surveys to determine the location and size of populations of rare species are being conducted on public lands through the west as a result of the Federal Endangered Species Act of 1973 and subsequent Bureau of Land management species conservation initiatives. These surveys to determine the location and size of rare plant populations represent a botanical baseline to aid in identifying conservation priorities and developing protection and compatible management strategies. An additional goal of this study was to document the general flora of the Tendoy and provide preliminary data on floristic diversity as a whole.

THE STUDY AREA

The Tendoy Mountains are an isolated range located in Beaverhead County in the southwest corner of the state (Figure 1). They lie about 30 miles south-southwest of the county seat, Dillon, and directly west of the small communities of Red Rock, Kidd, and Dell. The Tendoy study area was demarcated by the Red Rock River on the east and by Medicine Lodge Creek on the west. The canyon of Big Sheep Creek bisects the range towards its southern end.

Bureau of Land Management holdings in the Tendoy are mostly at lower elevations in the foothills and canyons on the periphery and in the Muddy Creek drainage, an interior basin, but higher elevation BLM lands are represented in the north. The survey project was focused on BLM lands, with few data taken on adjacent state, federal, and private lands incidental to traveling and camping in the study area.

The Tendoy Mountains were formed by folding and faulting of Precambrian, Paleozoic and Mesozoic strata as described by Geach (1972) and Alt and Hyndman (1986). The north-south trending Red Rock fault is evidenced by the steep eastern flank of the range, visible from Interstate 15 between Dell and Red Rock. Exposed bedrock in the mountains and foothills includes some precambrian granite and gneiss along with extensive beds of Mississippian and Pennsylvanian sedimentary rocks, mostly limestone and quartzite, respectively. Much of the lower foothills and the Muddy Creek basin are covered by Tertiary sediments (conglomerates, shales, sandstones, limestones, and tuff). Quaternary deposits include alluvial

Figure 1. Tendoy Mountains Study Area

flood plains, terraces, and fans, and extensive talus and boulder fields mass-wasted from the steep cliffs.

The dominant vegetation of the study area is grasslands and shrublands, with limited areas of forest. A considerable area is also occupied by mostly barren rock outcrops and slides. Most of the drier grasslands are dominated by *Agropyron spicatum* (bluebunch wheatgrass), but other graminoids common (or dominant) in certain situations include *Carex filifolia*, *Festuca idahoensis*, *Koeleria cristata*, *Oryzopsis hymenoides*, *Stipa comata*, and species of *Poa*. *Elymus cinereus* (Great Basin wild rye) is dominant in some bottomlands and may have been more common in the past as this species is sensitive to grazing (Mueggler and Stewart 1980). Wet meadows, often alkaline, occupy a small area but are floristically unique, with dominants that include *Deschampsia cespitosa*, *Juncus balticus*, *Potentilla fruticosa* and species of *Carex*. Sagebrush steppe communities are most commonly dominated by *Artemisia tridentata* or *Artemisia nova*, but low sagebrush types dominated by *A. arbuscula* also occur. Scrub or dwarf woodland communities dominated by *Cercocarpus ledifolius* and/or *Juniperus scopulorum* are found on dryer, rockier slopes. Species of *Salix* form thickets in riparian zones, especially along Big Sheep Creek. Willows are mostly absent along Muddy Creek, but within exclosures show some signs of establishment (Hockett, pers. commun.). Cottonwoods (*Populus* spp.) are also found along streams but rarely form extensive woodlands. Closed canopy coniferous forests are mostly confined to north facing slopes and are dominated by *Pseudotsuga menziesii* (Douglas fir). More open coniferous woodlands dominated by *Pinus flexilis* (limber pine) occur on rocky slopes.

The flora of the Tendoy's, and of southwest Montana in general, is characterized by the presence of many species with their centers of distribution in the Great Basin. These are species which have a peripheral or disjunct distribution in Montana, with their central distribution in southern Idaho, western Wyoming and Colorado, Utah, Nevada, and eastern Washington, Oregon, and California. Examples include many of the target species which are discussed later in this report. Most of these taxa have Montana distributions confined to the southwestern part of the state.

METHODS

Prior to fieldwork, the Biological Conservation Database maintained by the Montana Natural Heritage Program was queried for records of BLM potential sensitive and watch species known from the study area vicinity. This produced information on ten species from twelve sites, mostly outside of BLM lands, which nevertheless was useful in planning the timing of fieldwork.

Surveys were conducted in the Tendoy Mountains during June and July of 1993. Peter Lesica worked in the area on June 7-8 and July 9-13 and July 26-27. Jim Vanderhorst worked here on June 11-17, 22, 26, 27, and 30, and July 1. Searches were made on foot in both known and potential habitats for sensitive species, representing many of the typical and unusual habitats scattered throughout the range. Maps showing primary travel routes are given in Appendix A.

At the time this survey was conducted, only two species were proposed by BLM as sensitive in the Tendoy Mountains while twenty more were proposed as watch. This reflected the paucity of botanical studies in the area. Montana plant species of special concern in general were added to the list of target species (Heidel and Poole 1993) to ensure that species were not omitted which may warrant consideration as sensitive. The compiled lists of species sought is referred to here as the target species or potentially sensitive species throughout this report.

Field notes were taken, including lists of all vascular plant taxa which could be identified. Whenever populations of target species were encountered, more detailed notes were taken, standard field survey forms were filled out, and the populations were mapped. Data collected included information on habitat (associated vegetation, landscape position, soils), demography (population numbers, flowering extent and area covered), plant biology (phenology, vigor, reproductive success), and potential threats to the populations. Photographs (35 mm slides) were taken of most target species and their habitats.

Voucher specimens were collected when adequate material was available and will be deposited at the herbaria at the University of Montana (MONTU) or at Montana State University (MONT). Some collections were also made of the general flora, especially when field identification was difficult. Following the field season, specimens in certain groups were verified by specialists; these included the Apiaceae, Caryophyllaceae, and *Haplopappus* (Ronald Hartman, Rocky Mountain Herbarium at University of Wyoming, Laramie), and *Delphinium* (Michael Warnock, Sam Houston State University at Huntsville, Texas).

The field guides most commonly used to key out plants were Dorn (1984) and Hitchcock and Cronquist (1973). Nomenclature used in this report generally follows one or both of these books. Names for target species coincides with the conventions of the Montana Natural Heritage Program (Heidel and Poole 1993).

RESULTS

We located nearly a hundred populations of thirty-one target species. The species and resulting rank recommendations are listed in Table 2. This included two native species not previously known from the state, automatically added to the Montana state list of species of concern, and a third which had been reported but not verified was documented in the Montana for the first time. In addition, a *Delphinium* taxon was discovered that was previously tracked under two different species epithets. The ensuing field and lab investigations will result in it being named as a new subspecies. This does not include three other species which have been or are in the process of being dropped from further consideration by Montana Natural Heritage Program: *Castilleja rustica*, *Eriogonum cespitosum* and *Orobancha corymbosa*. No further information on these taxa are given in this report.

A total of 382 vascular plant taxa were identified in the study area (Appendix B). This indicates high species diversity for an area spanning limited range of elevation.

The remainder of this section is devoted to synopses of each of the 30 target species. Descriptions of the taxa are given to supplement floras (Dorn 1984, or Hitchcock and Cronquist 1973) and to facilitate field identification. Information is presented on the distribution and biology of the species in addition to information specific to the populations within the study area. For each target species, a map showing its distribution in the study area is provided in Appendix C. Information is conveyed concerning the conservation status and management of each taxon. It is recommended that some of the taxa be removed from further consideration by the Bureau of Land Management, and this study provides the basis for their exclusion. These occurrences have not been entered into the Biological Conservation Database, so Appendix D printouts are not supplied, but they are documented on the Appendix C individual species distribution maps. For those species which we recommend retaining, more complete information is given including technical descriptions of the taxa, and EOR's and 1:24,000 scale topographic maps showing precise locations and boundaries of all populations (Appendix D). Photographic

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TABLE 1. Target species documented in the Tendency Mountains

<u>Scientific name</u>	<u>Current MTHP</u>	<u>Recommended</u>	<u>Current BLM status</u>	<u>Recommended</u>
<u>Aastache cusickii</u>	<u>GRANK/STRANK</u>	<u>GRANK/STRANK</u>	<u>sensitive</u>	<u>sensitive</u>
<u>Arenaria Kingii</u>	G3T? S1	S1	sensitive	delete
<u>Astragalus argophyllus</u>	G4 S1	S3	watch	delete
<u>Astragalus lentiginosus</u>	G5T4 S1	S3	watch	delete
<u>Astragalus leptaleus</u>	G5 S2	S2S3	watch	delete
<u>Astragalus scaphoides</u>	G4 S2	S3	watch	delete
<u>Astragalus terminalis</u>	G3 S1	S1	sensitive	sensitive
<u>Carex parryana</u>	G3G4 S2	S2	watch	sensitive
<u>Carex parryana</u>	G2Q S1	S2	watch	sensitive
<u>Cirsium idaho</u>	G3G4 S2	S3	watch	delete
<u>Cirsium subnivium</u>	G3 S3	S3	watch	delete
<u>Delphinium bicolor</u>	G3 S3	S3	watch	delete
<u>Eriogonum gracilis</u>	G4 S2	S3	-	delete
<u>Eriogonum caespitosum</u>	G5 SU	S1	sensitive	delete
<u>Eriogonum ovalifolium</u>	G5T4 S2	S3S4	watch	delete
<u>var. nevadense</u>	G5T4 S2	S3S4	watch	delete
<u>Gentiana aquatica</u>	G4 S2S3	S3	watch	delete
<u>Halmilobos virgata</u>	G2G3 S1	S1	watch	watch
<u>Haplopappus macronema</u>	G4T? S2	S2	watch	sensitive
<u>var. linearis</u>	G4T? S2	S2	watch	sensitive
<u>Hutchinsia procumbens</u>	G5 S1	S1	watch	sensitive
<u>Lomatium attenuatum</u>	G3 -	S1	-	sensitive
<u>Mimulus suksdorfii</u>	G4? S1	S3S4	-	delete
<u>Pediocactus simpsonii</u>	G4 S1	S3	watch	delete
<u>Penstemon lemhiensis</u>	G3 S2	S2	sensitive	sensitive
<u>Placella incana</u>	G3G4 S1	S1	watch	sensitive
<u>Senecio debilis</u>	G3G4 S1	S3	watch	delete
<u>Sphaeromeria argentea</u>	G? SU	S1	-	sensitive
<u>Sphaeromeria capitata</u>	G3 S3	S3	-	delete
<u>Stanleya viridiflora</u>	G4 S1	S3	watch	delete
<u>Taraxacum eriochorum</u>	G4 S1	S3	watch	sensitive
<u>Thalictrum alpinum</u>	G5 S1	S1	-	sensitive
<u>Thelypodium sagittatum</u>	G3G4T? S1	S2	watch	sensitive
<u>Thlaspi parviflorum</u>	G3 S2	S2	watch	sensitive
<u>Townsendia nuttallii</u>	G3 -	SU	-	watch

Agastache cusickii (Greenman) A. A. Heller
Cusick's horse-mint

A. DESCRIPTION

1. General description: *A. cusickii* is an aromatic perennial in the mint family (Lamiaceae). Its habit, low growing from a long, flexible, branching woody caudex, is adapted to growing in loose talus. The small simple leaves are diamond to egg shaped with serrated margins and short petioles and are borne oppositely on relatively short aerial stems which are square in cross section. The small flowers are borne in a dense spike-like inflorescence with leaf like bracts. The flowers are bilaterally symmetrical with a fused 5-toothed calyx and a tubular, 2-lipped, usually lavender corolla. There are 4 exerted stamens and a single pistil with a bilobed stigma.

2. Technical species description (quoted from Cronquist et al. 1984):

Stems numerous from a woody taproot and branching caudex, 1-2(3) dm tall, simple or branched, tending to be somewhat woody at the base; stem, leaves, bracts, and calyces finely hirtellous-puberulent; leaf blades ovate, deltoid-ovate, or a little narrower, crenate, mostly (0.5)1-2(2.5) cm long and (4)6-15 mm wide, borne on petioles up to 1(1.5) cm long; inflorescence mostly (1)1.5-4 cm long (exclusive of any remote verticillasters), the bracts and calyces usually tinted with lavender-purple (seldom whitish in part); calyx teeth 2-5 mm long, lance-subulate, obscurely veined, or only the midrib evident, seldom more evidently trinerved; corolla 8-12 mm, measured to the tip of the upper lip, this 1-2 mm long and evidently bilobed; lower pair of stamens ascending under the upper lip and exerted 1-2 mm past it; upper stamens thrust downward and outward between the lower stamens, exerted 2-5 mm.

3. Diagnostic characters: In Montana, *Agastache urticifolia*, nettle-leaved horse-mint, and *A. foeniculaceum* are the other species in the genus; only the former is in Beaverhead County and the Tendoy Mountains. The *A. cusickii* and *A. urticifolia* are easily distinguished based on their overall size; *A. cusickii* is dwarf (1-3 dm high) with small leaves (1-2.5 cm), while *A. urticifolia* is large and coarse (>4 dm) with large leaves (3.5-10 cm; Hitchcock and Cronquist 1973).

B. GEOGRAPHICAL DISTRIBUTION

1. Species range: Scattered in the mountains of southeastern Oregon, north and central Nevada, central Idaho (Cronquist et al. 1984), and southwestern Montana. The species is not included in Dorn (1984).

2. Montana distribution: Known only from one site in the Tendo Mountains, Beaverhead County.

3. Occurrences in the study area: The study area population is the only one known in the state, located in the southwestern part of the study area along upper Big Sheep Creek. This occurrence was discovered by Peter Lesica in 1985. Despite intensive surveys of talus habitats in the Tendos by this project, no other populations have been found.

C. HABITAT

The species grows at middle to high elevations in dry, rocky places, often on talus (Cronquist et al. 1984). In the Tendos the population is on dry, steep, generally southern exposed slopes of loose, relatively fine, limestone talus at 6,800-7,200 ft. elevation (see slide 1 in Appendix E). Soil development on the talus is minimal, however, where the banks have been cut by quarrying, some horizontal zonation can be seen; fine particles have been weathered and leached from the surface layer and deposited at depths. These clays were quite moist in June and July, 1993 (a wet season). Other plants growing on these mostly barren slopes include *Phacelia hastata* and *Oenothera caespitosa*. Woody vegetation on slightly more stable adjacent talus includes *Artemisia tridentata*, *Chrysothamnus nauseosus*, *Juniperus communis*, and *Potentilla fruticosa*. Three other Montana Plant Species of Concern which occupy the site are the annuals *Hutchinsia procumbens*, *Mimulus suksdorfii* and *Phacelia incana*, which are mostly confined to spots with a surface accumulation of litter, often under sagebrush.

D. POPULATION BIOLOGY

The population is large with two subpopulations. The main roadside population is quite dense in places with *A. cusickii* the most common plant in its habitat, while the subpopulation to the east consists of scattered plants. Vegetative reproduction is probably common. Plants were flowering in June.

E. MANAGEMENT CONSIDERATIONS

The fine talus of the main population has been quarried in the past for use as road material in at least 4 locations (Vanderhorst 1993). Although removal of material by the state and BLM has been curtailed in recent years, illicit quarrying has probably continued to a limited extent. Plants are generally absent from the disturbed slopes but in a few spots have become re-established. The plants seem more tolerant of disturbance on level ground and have colonized the bottoms of the quarried areas and the roadside. A monitoring program was established this past summer to document further disturbance to the site and to study recolonization of the quarries by *A. cusickii* (Vanderhorst 1993). It is recommended that this site

not be used as a source for road building materials in the future. Besides direct damage to the population, quarrying affects upslope habitat by removing lateral support, thus increasing the probability of landslides. In 1993, plants were located away from the road on the east facing slopes along Big Sheep Creek, a tract which has been considered for a possible land trade. Due to its extremely limited distribution in Montana and potentially threatened occurrence, it is recommended that *A. cusickii* be designated BLM sensitive species.

Arenaria kingii (Wats.) Jones
King's arenaria

A. DESCRIPTION

1. General description: This arenaria is a member of the Caryophyllaceae (the pink family). It is a perennial with narrow grass-like leaves borne mostly in tufts at the base of the plants with a few on the upright flowering stems arranged oppositely and forming distinct swollen nodes. The flowers are borne in an open inflorescence and have five separate acute sepals, five white petals, usually 10 stamens and 3 styles, and a single superior ovary which develops into a 6 valved capsule. See slides 2 and 3 in Appendix E.

2. Diagnostic characters: *A. kingii* is distinguished from the other tall, narrow leaved sandworts in Montana by having an open inflorescence (in contrast to *A. congesta*) and sharply acute sepals (as opposed to the obtuse or broadly acute sepals of *A. aculeata* and *A. cappilaris*).

B. GEOGRAPHIC DISTRIBUTION

1. Species range: Mostly of the Great Basin, in California, Oregon, Idaho, Utah, Wyoming (Hitchcock and Cronquist 1973) and in Montana.

2. Montana distribution: Prior to this study, the species was known in Montana from four sites in Beaverhead County, in the Beaverhead and Pioneer Ranges. It was erroneously reported in Broadwater County based on a misidentified specimen.

3. Occurrences in the study area: One population was surveyed in the foothills just south of Clark Canyon Reservoir. In addition, Lesica collected two specimens from the Big Sheep Creek drainage, where he found the species to be common. All three specimens were verified by R. L. Hartman (Rocky Mountain Herbarium, University of Wyoming, Laramie), a specialist in the Caryophyllaceae.

C. HABITAT

The species is found over a broad elevation range, from the sagebrush zone to alpine (Dorn 1984). The one population which was surveyed in the Tendoys occurred on rolling hills in shallow gravelly soil on limestone bedrock (slide 4, Appendix E). Common associates included *Artemisia frigida*, *Oxytropis lagopus*, *Oryzopsis hymenoides*, *Koeleria cristata*, *Penstemon aridus* and *Penstemon eriantherus*. Lesica found the species in grasslands and steppe communities on gravelly, limestone derived soils, on ridges and warm slopes.

D. POPULATION BIOLOGY

The population in the northern foothills was dense and extensive, consisting of thousands of plants, occurring in patches, over at least 50 acres. Many populations were seen elsewhere in the range but not surveyed because the species was found to be so common.

E. MANAGEMENT CONSIDERATIONS

Due to its abundance in the Tendoys and its relatively broad distribution in Beaverhead County, we recommend that *A. kingii* be dropped from further BLM consideration and state tracking.

***Astragalus* species Milkvetch**

Five species of *Astragalus* found in the study area were among the target species, so a description of the genus is given here to avoid duplication in the individual synopses. Commonly called milk vetches or locoweeds, plants of this extremely diverse genus belong to the Fabaceae (bean or pea family). The family (at least in Montana) is distinguished by their fruit type, a legume, their zygomorphic corollas, and by their usually compound stipitate leaves. The genus *Astragalus* has a perianth which consists of five fused sepals and a corolla which includes a banner (the top segment), a keel (the boat shaped bottom segment), and two wings (the side segments). There are ten stamens, nine connected in a group and one free, and a single ovary which develops into a several seeded, bean-like fruit. All of the MPSSC in the study area have pinnately compound leaves. Species of *Astragalus* resemble some species of *Oxytropis* and *Hedysarum*. *Oxytropis* has a beaked keel and flowers usually borne on leafless stalks unlike *Astragalus* with leafy flowering stems. The fruit of *Hedysarum* is a loment, a special kind of legume which is contracted and dehisces between the seeds, and the keel is usually longer than the banner and wings, in contrast to *Astragalus* with shorter keels. The species of *Astragalus* are distinguished by differences in their stipules, leaves, flowers, and fruits.

Astragalus argophyllus Nutt.
Silverleaf milkvetch

A. DESCRIPTION

1. General description: See the preceding genus description. These are prostrate plants with silvery-pubescent leaves and relatively large purple flowers (slide 5 in Appendix E).

2. Diagnostic characters: The following combination of characters separates this from other Montana species of *Astragalus* (adapted from Dorn 1984):

- stems short or lacking
- silvery pubescent leaves
- leaflets more than 5, not awl shaped, with stiff straight hairs
- hairs attached at base
- stipules not united on side of stem opposite petiole
- 2-8 flowers per raceme
- calyx 9-17 mm long
- Pods unilocular, not inflated, not thick wooly-hairy, without a stipe, more or less dorsoventrally compressed
- ovaries and young pods pubescent

B. GEOGRAPHIC DISTRIBUTION

1. Species range: "Snake River, Idaho, south to Nevada and eastern California, east to Montana, Wyoming, and Colorado (Hitchcock and Cronquist 1973)."

2. Montana distribution: Prior to this study the species was known from ten sites in Beaverhead and Madison Counties.

3. Occurrences in the study area: Five populations of *A. argophyllus* were located, all of them in the southern part of the study area within the Big Sheep Creek drainage.

C. HABITAT

Barneby (1989) states that *A. argophyllus* var. *argophyllus*, to which our material belongs, is restricted to "moist alkaline or lowland meadow habitats." The known populations in the study area occur in moist, often alkaline soils on lowland floodplains and terraces at elevations ranging from 6,800 to 7,100 ft (see slide 5 in Appendix E). Woody dominants at these sites include *Artemisia arbuscula*, *Artemisia cana*, *Artemisia tridentata* and *Potentilla fruticosa*. Dominant or subdominant graminoids include *Juncus balticus* and *Poa nevadensis*. These habitats are often subject to livestock grazing.

D. POPULATION BIOLOGY

Estimated numbers for the 5 populations range from less than 50 to over 1,000 plants. Three of the populations are of intermediate size, between 100 and 500 individuals. The plants were flowering and fruiting when populations were visited in June and July.

E. MANAGEMENT CONSIDERATIONS

This species is fairly widespread in southwestern Montana, and has a broad distribution outside of the state. Although its habitat is limited and often heavily used by cattle, the species may not be impacted by grazing due to its prostrate habit. For these reasons, *A. argophyllus* should be dropped from further BLM consideration and from state tracking.

Astragalus lentiginosus Dougl. ex Hook. Freckled milkvetch

A. DESCRIPTION

1. General description: See the genus description (page 9). *A. lentiginosus* is a variable species most easily recognized in Montana by its inflated two chambered pod with a flattened beak. The species as a whole consists of numerous varieties, but var. *salinus* (Howell) Barneby is the only one in Montana (Barneby 1989).

2. Diagnostic characters: The following combination of characters can be used to distinguish *A. lentiginosus* from other *Astragalus* in Montana (adapted from Dorn 1984):

- leaflets more than 5, not awl shaped
- hairs attached at base
- stipules not united on side of stem opposite petiole
- flowers exceeded by the leaves
- banner > 15 mm, calyx 5-8.5 mm
- ovaries pubescent
- Pods bilocular, without a stipe, glabrous, inflated, with a tapered laterally compressed beak

B. GEOGRAPHIC DISTRIBUTION

1. Species range: *A. lentiginosus* var. *salinus* has a broad distribution from central Oregon and northeast California to southwestern Montana and Utah (Hitchcock and Cronquist 1973).

2. Montana distribution: Previously known from five sites in Beaverhead County.

3. Occurrences in the study area: Five populations were documented from the northern Tendency foothills and in the lower

Big Sheep Creek drainage in the southern part of the study area.

C. HABITAT

Barneby describes the habitat for var. *salinus* as "sagebrush plains, valleys and foothills, in sandy or clayey soils, sometimes on dunes, on alkaline playas with *Sarcobatus* and *Atriplex*, or in foothill washes." Within the study area, populations were found at elevations ranging from 6,000 to 7,000 ft. on dry slopes and benches dominated by sagebrush (*Artemisia tridentata*) or rabbitbrush (*Chrysothamnus nauseosus*) and bluebunch wheatgrass (*Agropyron spicatum*).

D. POPULATION BIOLOGY

Two of the populations are small with estimated numbers less than 100 plants. The other three are quite large with between 1,000 and 10,000 estimated individuals each. The large population south of Bell Canyon covered over 100 acres at many aspects, and had many plants with mature fruits. One population visited in early June was flowering, but not yet in fruit; both flowers and mature fruits were seen at populations visited later in June and July.

E. MANAGEMENT CONSIDERATIONS

A. lentiginosus is of limited distribution in southern Beaverhead County. Some of the populations in the study area are quite large. We recommend that it be dropped from further BLM consideration, but it may be appropriate for recognizing as a limited distribution species in Montana.

Astragalus leptaleus Gray Park milkvetch

A. DESCRIPTION

1. General description: See the genus description (page 9). The plants have low, inconspicuous foliage arising from long rhizome-like caudex branches.

2. Diagnostic characters: The following combination of characters distinguishes this species from other *Astragalus* in Montana (adapted from Dorn 1984):

Perennial with stems arising from buried points of renewal

Leaflets 5 or more, all jointed to the rachis

Stipules united on side of stem opposite petiole

Hairs attached at base

Racemes with less than 6 flowers

Banners less than 14 mm long, keel 5.5-7.5 mm long

Pods unilocular, not thick wooly-hairy, not inflated, without a stipe, obcompressed, pendulous

B. GEOGRAPHICAL DISTRIBUTION

1. Species range: Limited to western Montana, east central Idaho, and northcentral Colorado (Hitchcock and Cronquist 1973).

2. Montana distribution: Previously known from ten sites in Beaverhead and Madison Counties, including one site in the study area.

3. Occurrences in the study area: Eight new populations were found in the central and southern parts of the study area, in the Muddy Creek basin and basins of other tributaries of Big Sheep Creek.

C. HABITAT

Within the study area, this species occurs at elevations ranging from 6,800 to 7,100 ft. in moist alkaline meadows. Vegetation at these sites is dominated by shrubs (*Artemisia arbuscula*, *Artemisia cana*, and *Potentilla fruticosa*) or by graminoids (*Deschampsia caespitosa*, *Poa pratensis*, and *Juncus balticus*).

D. POPULATION BIOLOGY

Populations are large with numbers estimated from over 100 to over 10,000 aerial stems.

E. MANAGEMENT CONSIDERATIONS

A. leptaleus is quite common in nearly all of the alkaline meadows visited in the study area, and it is quite widespread in southwest Montana. It has probably been overlooked because of its diminutive size and growth habit. The plant was common even in meadows that were heavily grazed and trampled. For these reasons it is recommended that this species no longer be further considered for BLM special status designation or state tracking.

Astragalus scaphoides (Jones) Rydb. Bitterroot milkvetch

A. DESCRIPTION

1. General description: See the genus description (page 9). These are erect perennials with large white-yellowish flowers and stalked fruits.

2. Technical species description (quoted from Hitchcock and Cronquist 1961):

Sparsely strigillose perennial with a taproot and branched crown; stems several, stout, ascending to erect, 2-6 dm tall; leaves 10-25 cm long; stipules lanceolate,

1-4 mm long, not connate; leaflets 15-21, lance-oblong to elliptic-oblong, 1.5-3.5 cm long, as much as 13 mm broad, glabrous on the upper surface at least; peduncles mostly 10-15 cm long; racemes closely 15- to 30-flowered but elongating and open in fruit; pedicels 2-5 mm long; flowers spreading to slightly reflexed, white to ochroleucous, about 2 cm long; calyx usually blackish-hairy, 8-10 mm long, the narrowly lanceolate lower teeth about 2 mm long; banner erect; wings 2-4 mm longer than the keel; pod erect, with a stout upward-arching stipe about twice as long as the calyx, the body 1.5-2 cm long, cartilaginous, glabrous, slightly mottled, corrugate-wrinkled, oblong-ovoid, inflated and slightly obcompressed, 4-6 mm broad, 6-10 mm thick, with both sutures sulcate, the lower intruded to form a 3/4 complete partition.

3. Diagnostic characters: The following combination of characters separates this from other Montana species of *Astragalus* (adapted from Dorn 1984):

Leaflets more than 5, not awl shaped

Hairs attached at their base

Stipules not united on side of stem opposite the petiole

Pods stipitate, glabrous, obcompressed with the lower suture nearly forming a partition within the fruit,

7-20 mm wide, less than 3 times as long as wide

Calyx 8-12.5 mm long, banner more than 15 mm long

B. GEOGRAPHIC DISTRIBUTION

1. Species range: "Beaverhead County, Montana to Lemhi County Idaho (Hitchcock and Cronquist 1973)." This species is a regional endemic and has the narrowest global distribution of all species surveyed in the Tendoy Mountains.

2. Distribution in Montana: Beaverhead County, prior to this study, known from six general localities (total 9 EOR's in the BCD) in the drainages of Grasshopper and Medicine Lodge Creeks.

3. Occurrences in the study area: One population was found in the vicinity of Johnson Gulch, in the northwestern part of the range.

C. HABITAT

The Johnson Gulch population occurs on a dry, southwest exposed slope in a *Artemisia tripartita*/*Festuca idahoensis* community. Additional associates are *Agropyron spicatum*, *Antennaria microphylla*, *Carex filifolia*, and *Chrysothamnus nauseosus*. The soil is loamy and derived from limestone. There was evidence of past grazing but the habitat was in excellent condition.

D. POPULATION BIOLOGY

The single occurrence is a large population with estimated size of between 1,000 and 5,000 plants covering about 20 acres. When the population was discovered in late July, most of the plants were in fruit with some still flowering. There was evidence of inflorescence predation. The quality and viability of this occurrence were rated excellent.

E. MANAGEMENT CONSIDERATIONS

Astragalus scaphoides is a narrow endemic that is locally common in Idaho (Lesica and Elliott 1987) but uncommon in Montana. The plant was recently listed as 3C by the USFWS (FR Notice of Review Vol. 58, No. 158 of 9/30/93). Only three of the currently known populations in the state are large. All but one population are subject to livestock grazing, and populations are damaged under heavy spring grazing (Lesica and Elliott 1987, Lesica 1994). Spring grazing of pastures having populations of *A. scaphoides* should be kept to a minimum. This species is recommended for retaining as sensitive by the BLM and for tracking by the state.

Astragalus terminalis Wats. Railhead milkvetch

A. DESCRIPTION

1. General description: See the genus description (page 9). These are erect plants with white, nodding flowers.

2. Technical species description (quoted from Barneby 1989):

Potentially but sometimes shortly or obscurely caulescent perennial herbs with superficial root-crown or caudex, densely strigulose throughout with dolabriform hairs, the foliage usually canescent, the inflorescence fuscous-strigulose; stems decumbent or ascending, (2.5)5-20 cm long, with at least (1)2 developed internodes, the cauline axis commonly shorter than the longer inflorescences; stipules submembranous, 2-6 mm long, the lowest ovate, strongly or fully amplexicaul but free, the upper deltate-, triangular-, or lance-acuminate, often reflexed; leaves (3)5-17 cm long; leaflets (11)13-21, either oblong-ovate, emarginate to retuse, or narrowly oblong-elliptic, obtuse to subacute, 3-17 mm long; peduncles incurved-ascending, 6-20(24) cm long; racemes 7-25 flowered, the flowers nodding at full anthesis, the early elongating axis becoming (1.5)3-12(16) cm long; calyx 4-7 mm long, the campanulate teeth 0.6-1.5 mm long; petals white or suffused with palest lilac, the keel-tip deeply maculate, the abruptly recurved banner (11)12-16.5 mm, the wings $\pm$ 1-4 mm shorter, the obtuse keel (8)8.5-

10.5 mm long; ovary glabrous; ovules 24-36; pod erect, sessile, continuous with receptacle, in profile narrowly oblong or ovate-oblong, 12-17 x 3-6.5 mm, strait or slightly incurved, obtuse at base, abruptly contracted into a short, laterally compressed beak, otherwise dorsoventrally compressed, carinate ventrally by the cordlike suture, flattened or openly sulcate dorsally, the lateral angles rounded, the green, fleshy valves becoming coriaceous, stramineous, inflexed as an almost complete or complete septum ± 1 mm wide; dehiscence through the narrowly gaping beak while pod yet attached to raceme-axis.

3. Diagnostic characters: The following combination of features can be used to separate *A. terminalis* from other Montana species of *Astragalus* (adapted from Dorn 1984):
- Leaves on stem, with 11-21 leaflets, these not awl shaped
 - Hairs on leaflets attached towards their middle (dolabriform)
 - Stipules not united on the side of the stem opposite the petiole
 - Calyx tube less than 6.5 mm long, banner 11-16.5 mm long

B. GEOGRAPHIC DISTRIBUTION

1. Species range: "the sources of the Missouri, Snake, and Salmon Rivers in central Idaho, southwest Montana, and immediately adjacent Wyoming (Barneby 1989)."
2. Montana distribution: scattered populations across southern Beaverhead and Madison counties.
3. Occurrences in the study area: One population was found on BLM land in Limekiln Canyon in the northeast part of the Tendoy's.

C. HABITAT

For the Intermountain region, Barneby (1989) describes the habitat as "open stony hillsides and benches along rivers, commonly associated with low sagebrush and calcareous bedrock." In this study area, the Limekiln Canyon population occurs in undisturbed *Festuca idahoensis*/*Agropyron spicatum* grasslands on dry, northeast facing slopes above an ephemeral stream. Other associated plants include *Castilleja pallescens*, *Chrysothamnus nauseosus*, *Lesquerella alpina*, and *Phlox hoodii*. Soils are silty and derived from limestone.

D. POPULATION BIOLOGY

The population at the Limekiln Canyon site was estimated to consist of 500 to 1,000 plants covering 2 to 5 acres. On June 8, the population was at an early flowering stage. The viability and health of this population were rated excellent.

E. MANAGEMENT CONSIDERATIONS

A. terminalis appears to be a rare species in Montana. Nearly all known populations are subject to livestock grazing; however, the effects of grazing on this species are not known. The population in Limekiln Canyon is in relatively pristine habitat - heavy livestock grazing or other severe disturbances should be avoided in the immediate area of known populations. The species is recommended for sensitive species status by the BLM and for tracking by the state.

Carex parryana Dewey ssp. *idaho* (Bailey) Murray Idaho sedge

A. DESCRIPTION

1. General description: This sedge taxon is part of variable species, but is distinguished by having bracts that are longer than their perigynia (the sacs which hold the fruit). The plants arise from a sparsely branched underground caudex, are diffusely distributed and are nearly impossible to distinguish from surrounding vegetation unless they are flowering. There are usually three spikes with the large terminal spike producing anthers only at the tip or not at all. It is treated by the Montana Natural Heritage Program as a variety rather than a full species in keeping with the most recent taxonomic treatment (Murray 1969).

2. Technical description for the subspecies (quoted from Hermann 1970 for *C. idaho*, a synonym):

Loosely cespitose from prolonged scaly, horizontal rootstocks; culms 2-3.5 dm high, much exceeding the leaves, somewhat fibrillose and reddish-brown-tinged at the base, the dried leaves of the previous year conspicuous; leaves 5-10, clustered near the base, the thin blades flat but with more or less revolute margins, 2-4 mm wide, long-attenuate, the ventrally very thin, hyaline sheaths concave at the mouth, the ligule about as wide as long; spikes usually three, often all pistillate, linear-oblong to cylindric, erect on short, stiff, and scabrous peduncles, approximate, forming a narrow head 3.5-5 cm long, the terminal spike 2-3 cm long, 6-8 mm wide, the lateral 1-2 cm long, 4-6 mm wide, the numerous perigynia appressed-ascending; bracts sheathless, usually not over 1 cm long and much shorter than the spikes; pistillate scales ovate to ovate-lanceolate, long acute to acuminate, brown with a conspicuous lighter center and very narrow hyaline margins, wider and 2-3 times as long as the perigynia; perigynia obovoid, obtusely trigonous, somewhat flattened on one side, 3 mm long, 1.5 mm long, glabrous, punctulate, two-ribbed but otherwise

nerveless or essentially so, substipitate, yellowish-green, rounded and abruptly short beaked at the apex, the beak brownish-red, 0.5 mm long, emarginate or shallowly bidentate; achenes obovoid, 2 X 1.35 mm, trigonous with concave sides, sessile, granular, abruptly apiculate.

3. Diagnostic characters (Hermann 1970):

- 3 spikes, the terminal one with staminate flowers, if present, only at the apex.
- scales longer than their perigynia
- perigynia glabrous, with very short beaks
- achenes triangular in cross section, style jointed to achene, with 3 stigmas

B. GEOGRAPHIC DISTRIBUTION

1. Range of the subspecies: Narrowly endemic in eastern Idaho and western Montana (Murray 1969), with one of the most globally restricted distributions of the taxa surveyed in the Tendoy Mountains. Though it is called "Idaho sedge", there are no recent records in Idaho and it has not been well-studied (Mosely pers. commun.).

2. Montana distribution: previously known from three sites in Silver Bow County and four sites in Beaverhead County, including the Tendoy Mountains and Centennial Valley.

3. Occurrences in the study area: Four new populations were found, two in the upper Muddy Creek basin and two near the confluence of Nicholia and Big Sheep Creeks.

C. HABITAT

Carex parryana ssp. *idaho* occurs in moist alkaline meadows, often along streams. These productive bottomlands are dominated by graminoids (*Deschampsia caespitosa*, *Juncus balticus*, *Carex praeegracilis*) with or without shrubby cinquefoil (*Potentilla fruticosa*). Additional associates include *Aster occidentalis*, *Crepis runciniata*, *Agropyron caninum*, *Potentilla anserina*, *Potentilla gracilis*, *Antennaria microphylla*, and *Valeriana edule*. The soils are silty and calcareous. These habitats are often heavily grazed and trampled by cattle.

D. POPULATION BIOLOGY

The populations are relatively small, ranging in numbers from less than 50 to 500 estimated plants, and covering usually 1 or 2 acres. The largest population covers about 10 acres. In early July the plants were in an early fruiting stage.

E. MANAGEMENT CONSIDERATIONS

C. parryana ssp. *idaho* is rare throughout its range in Montana and Idaho. Nearly all of the known populations are small and local and many are in apparent decline under the

influence of livestock grazing. Hermann (1970) states that this taxon is "excellent" forage for cattle and horses, suggesting that it may be especially susceptible to grazing. This plant should continue to be tracked by the Montana Natural Heritage Program. It should also be nominated for BLM sensitive status and be given high conservation priority. Spring and summer grazing of sensitive meadow habitats should be restricted. Studies to determine the effects of livestock grazing on this species should be conducted.

Cirsium subniveum Rydb.
Jackson Hole thistle

A. DESCRIPTION

1. General description: This thistle belongs to the sunflower family (Asteraceae). It is a large, spiny, branching perennial from a taproot. The spine tipped pinnately lobed leaves are basal and alternate along the stem. The pinkish flowers are all tubular with a pappus of feather-like bristles and are borne in a tight head surrounded by several series of spiny bracts.

2. Diagnostic characters: The following combination of features is used to key out *C. subniveum* from other species of *Cirsium* in southwestern Montana (adapted from Dorn 1984):

Involucres of largest heads > 1.8 cm
heads solitary and terminal on branches (not in dense clusters)
upper leaf surfaces lacking spines
leaves decurrent along stem with "wings" > 15mm
underside of leaves tomentose

B. GEOGRAPHIC DISTRIBUTION

1. Species range: western Wyoming to northeastern Oregon (Hitchcock and Cronquist 1973).

2. Montana distribution: Previously known from over 30 records in Beaverhead, Madison, and Park counties.

3. Occurrences in the study area: Seven populations are known, these concentrated in the southern part of the area in the Big Sheep Creek drainage and in the northern part in the vicinity of Johnson Gulch.

C. HABITAT

In the Tendoys this species occurs in grasslands, sagebrush steppe and woodlands, especially in soils derived from limestone. The communities are commonly dominated by *Artemisia*

tridentata or *Cercocarpus ledifolius* with *Agropyron spicatum*. Most of these habitats are subject to livestock grazing.

D. POPULATION BIOLOGY

Estimated population numbers range from 100 to 10,000 individuals. Thistles, in general, were not yet blooming in June, but were by late July. Although its habitats are often grazed, no predation of *C. subniveum* was observed.

E. MANAGEMENT CONSIDERATIONS

The species is widespread in southern Beaverhead and Madison counties, with some extensive populations. Furthermore, thistles are often ignored or avoided by botanists or plant collectors; thus, this species may be more common than is currently known. We recommend that *C. subniveum* be dropped from further BLM consideration and from state tracking.

Delphinium bicolor Nutt. ssp. novum

New subspecies of Montana larkspur

A. DESCRIPTION

1. General description: This larkspur (Ranunculaceae) has been identified in the past as *D. andersonii* or *D. geyeri*. Specimens were shown to Stan Welsh (Brigham Young University, Provo, Utah) who suggested that description as a variety under *D. geyeri* was warranted, but these plants may be more closely related to *D. bicolor*. A specialist in the genus, Michael Warnock (Sam Houston State University, Huntsville, Texas) plans to name this taxon as a subspecies of *D. bicolor*. The plants are relatively short, with deep, strong roots. The deeply palmately cleft leaves are mostly basal and are nearly hairless to fairly densely hairy. The large, showy blue flowers are borne on long, spreading pedicels and are irregular with the large sepals flaring in front and the upper one producing a prominent spur in back. The petals are smaller, the upper are blue tipped (sometimes solid white) without pigmented veins. There are usually 3 pistils, which develop into follicles. A slide (7) of the plant is attached in Appendix E.

2. Technical description: not yet available.

3. Diagnostic characters: These plants are geographically sympatric to *D. bicolor*, which they resemble. The key distinction in the field is the upper petals, which are blue tipped or solid white, in contrast to the blue veined petals of *D. bicolor*. In addition, the flowers are somewhat larger, the sepals are deeper blue and the lower petals are more deeply cleft (Warnock, pers. commun.). There also seems to be

(observed at Doherty and Dutchman Mountains, Jefferson and Beaverhead counties, respectively). Other species of *Delphinium* seen in this study area are tall plants which grow in wetter areas and bloom later in the season.

B. GEOGRAPHIC DISTRIBUTION

1. Range: The range of this undescribed taxon is not yet known but apparently it is endemic to Montana.

2. Montana distribution: Similar material has been collected from the Pryor Mountain desert (Carbon County), the Big Belt Mountains (Lewis and Clark County), the Jefferson River drainage (Broadwater and Jefferson Counties; Vanderhorst 1993a), and Pioneer Mountains (Vanderhorst 1993b).

3. Occurrences in the study area: Six populations were located, four of them in the northeastern foothills of the range, the others on hills above Big Sheep Creek in the southern part.

C. HABITAT

In the Tendoy, these plants occur on rolling uplands, in shallow, gravelly soils on limestone bedrock (slide 8 in Appendix E). They occur in communities dominated by grasses (*Agropyron spicatum*, *Poa secunda*) and/or shrubs (*Cercocarpus ledifolius*) or in small patches of soil on mostly barren rock pavement. Other plants commonly associated include *Allium textile*, *Artemisia frigida*, *Oryzopsis hymenoides*, and *Penstemon aridus*. This taxon seems to be more tightly restricted to edaphic substrate than the common *D. bicolor*, occurring in the study area almost exclusively on shallow, limestone derived soils.

D. POPULATION BIOLOGY

The populations were generally large, with estimated numbers between 200 and 10,000, but one occurrence consisted of a single plant. Private land adjacent to the lone individual was not surveyed and may have been potential habitat for a larger population. The populations in the northeast are close to each other, with patchy distribution of plants in suitable habitat; further survey is likely to reveal a patchy distribution throughout these foothills. Plants were blooming but not yet in fruit when they were surveyed in early June. One population had numerous, small vegetative plants, evidence of successful reproduction.

E. MANAGEMENT CONSIDERATIONS

This is an undescribed state endemic taxon which has been misidentified in the past as *D. andersonii* or *D. geyeri*, both species with a broad range. Specimens have been sent to Michael Warnock who plans to name the taxon as a subspecies of *D. bicolor*. Due to its status as a Montana endemic this taxon should continue to be tracked by the Montana Natural Heritage

C. HABITAT

The population occurs in bottomland which is moist early in the season. The vegetation is dominated by *Artemisia cana*, *Juncus balticus*, and *Poa nevadensis*. Additional associates include *Antennaria microphylla*, *Penstemon procerus*, *Polygonum bistortoides*, and *Taraxacum officinale*. The soil is loamy and derived from limestone.

D. POPULATION BIOLOGY

The single population was not large, however, the area was not thoroughly surveyed for this species.

E. MANAGEMENT CONSIDERATIONS

E. gracilis is now known to be widespread and fairly common in southwest Montana. Although only a single population was recorded for the study area, there are other populations known just to the south. This plant would more appropriately be placed in the limited distribution category by Montana Natural Heritage Program, and does not warrant BLM sensitive species designation.

Eriogonum caespitosum Nutt.

Mat buckwheat

A. DESCRIPTION

1. General description: A low growing wild buckwheat in the Polygonaceae. The leaves are all basal. The flowers are borne in a compact head subtended by a single involucre. The perianth parts are externally pubescent and fused and contracted to a stalk-like base. Each flower has 9 stamens and 3 styles.

2. Technical species description (quoted from Hitchcock and Cronquist 1964):

A low, spreading, cushion-forming perennial, often partially buried in soil or talus; leaves numerous, strongly macrescent, linear-oblongate to obovate or oval and attenuate-based, (5)10-15(20) mm long, including the sometimes slender petiole, (1)1.5-3(5) mm broad, grayish-lanate (or somewhat sericeous) often slightly revolute; flowering stems leafless, glabrate-lanate, (1)3-8(10) cm tall; involucre single, non-involucrate, campanulate, the tubular portion about 3 mm long, the 6-7 lobes at least as long, oblong, recurved; flowers numerous, exserted, yellow (-rose tinged) but usually aging to rose or brownish-purple, generally (perhaps always) functionally imperfect; perianth (2.5)3-5 mm long at anthesis, rather strongly accrescent and up to 10 mm long in fruit, turbinate and attenuate to a stipitate

base 0.5-1 mm long, pilose-lanate on the lower half, the segments obovate-lanceolate, the inner ones often 2-3 mm the longer in fruit; filaments pilose; styles slender, about (1) 1.5 mm long; ovary glabrous to somewhat pilose above.

3. Diagnostic characters: *E. caespitosum* is the only Montana wild buckwheat with a stipitate perianth which has a single involucre.

B. GEOGRAPHIC DISTRIBUTION

1. Species range: "...southeastern Oregon to northern and southeastern Sierran California, east to central Idaho, Montana, Wyoming, and Colorado (Hitchcock and Cronquist 1964)"

2. Montana distribution: Listed for Montana by both Hitchcock and Cronquist (1973) and for southern Montana by Dorn (1984). However, Reveal (pers. commun.) stated that this species was actually not in Montana, but some other species had been mistaken for it. Due to these problems Lesica and Shelly (1991) placed it in the undetermined category, treating the identification of two collections at MONT (Ryerson and Vogel 554, W. E. Booth s.n.) as uncertain. The specimen from the Tendoys might be the first verified collection of this plant from Montana, but it is not the first report.

3. Occurrences in the study area: Found at one location in the southern part.

C. HABITAT

The population occurs on dry, rolling uplands in a unusual habitat type dominated by *Artemisia arbuscula* and *Festuca idahoensis*. *Phlox hoodii* and *Poa secunda* also grew at the site. The soil is a stony loam, derived from limestone. The habitat is grazed.

D. POPULATION BIOLOGY

The population was not thoroughly surveyed, but there was a large area of potential habitat.

E. MANAGEMENT CONSIDERATIONS

There may be only one verified location for this species in the state. At this time, *E. caespitosum* should be considered for designation as sensitive by BLM and tracked by the state.

Eriogonum ovalifolium Nutt. var. *nevadense* Gand.
Oval-leaved buckwheat

A. DESCRIPTION

1. General description: This is a yellow flowered wild buckwheat in the Polygonaceae (slide 9, Appendix E). The leaves are all basal and covered by white wooly hairs. The flowers are borne in a dense head on a long leafless stalk. The 6 perianth parts are nearly free from each other, with the outer series somewhat broader than the inner. Each flower has 9 stamens and 3 styles.

2. Diagnostic characters: Apparently, the single most important character separating this taxon from other varieties of *E. ovalifolium* is the yellow flower color (Reveal 1985). It should be noted that in his original description of the species, Nuttall (1834) described the flower color as "bright sulfur yellow." Thus, it is necessary to consider *E. ovalifolium* var. *ovalifolium* as the correct name for this taxon, a position which is adopted by Dorn (1988, 1992) but by few others. The likely type for the species came from the Big Hole Valley (Dorn 1988, p. 306). Other synonyms for this taxon are *E. o.* var. *orthocaulon* and *E. o.* var. *celsum* as used by Hitchcock and Cronquist (1964) and Hitchcock and Cronquist (1973), respectively. They differentiate this taxon primarily on leaf shape and size (the variety of concern, regardless of name, having oblong or obovate leaves 3-6 cm long), putting less emphasis on flower color. Plants collected by Vanderhorst in 1993 in the Tendoys and on Dutchman Mountain had both bright yellow flowers and relatively large obovate leaves, in contrast to the white (cream-purple) flowered variety with small rhombic to oval leaves. These characters were correlated when both varieties were found growing together close to each other on Dutchman Mountain near Dillon (Vanderhorst, 1994), but some plants in the Tendoys combined light yellow flowers with leaves of intermediate shape and size (see slide 11 in Appendix E).

B. GEOGRAPHIC DISTRIBUTION

1. Variety Range: For *E. ovalifolium* var. *orthocaulon* (a synonym, see above), Hitchcock and Cronquist (1964) describe the range as "eastern Oregon and northeastern California, east, especially along the Snake River plain, to western Wyoming, Nevada, Utah, and northwestern Colorado, north sporadically to Chelan County, Washington, and southwestern Montana."

2. Montana distribution: Beaverhead County. Prior to 1993, two sites were entered in the BCD. In 1993, the species was found to be very common in the vicinity of Horse Prairie, in the foothills of the Pioneer Mountains (Vanderhorst 1994), and in the Centennial Valley.

3. Occurrences in the study area: Two rather large occurrences are known, one previously documented along Medicine Lodge Creek (possibly on private land), and one discovered by this project in the foothills just south of Clark Canyon Reservoir. Another possible occurrence is located in the foothills south of Bell Canyon, where plants with intermediate morphology were found.

C. HABITAT

In southwestern Montana, *E. ovalifolium* var. *nevadense* occurs in a range of dry, open habitats. In the Tendoys area it was found on flats dominated by *Artemisia tridentata*, on slopes dominated by *Juniperus scopulorum* and bunchgrasses (*Agropyron spicatum*, *Oryzopsis hymenoides*), and on rocky slopes and outcrops (slide 10, Appendix E). Additional associates include *Allium textile*, *Artemisia frigida*, *Artemisia ludoviciana*, *Chrysothamnus nauseosus*, *Opuntia polyacantha*, *Oxytropis lagopus*, and *Penstemon aridus*. The soil at the foothills site was dry and rocky, and the slope had a southern exposure.

D. POPULATION BIOLOGY

Both populations in the study area are fairly large. The Medicine Lodge Creek population was incompletely surveyed but was described as "extensive," while the foothills population was estimated to consist of over 500 plants covering at least 50 acres. The population of *E. ovalifolium* in the foothills south of Bell Canyon was assumed at the time to be var. *nevadense*, however, the collection taken is intermediate in morphology (light yellow flowers, medium sized leaves). The degree to which the varieties intergrade is not clear. North of this study area at Dutchman Mountain (Vanderhorst 1994) two varieties were collected but remained morphologically distinct and seemed to have individual habitat preferences. Plants were not collected or photographed at the Medicine Lodge Creek site.

E. MANAGEMENT CONSIDERATIONS

There is need for further work examining the morphological distinctions and distributions of varieties of *E. ovalifolium* in Montana as well as to resolve the confused nomenclature. However, yellow flowered forms of the species are common in Beaverhead County and the taxon has a broad range outside of the state. Large populations were seen along roadways outside of project boundaries in the vicinity of Horse Prairie and on BLM lands on Dutchman Mountain (Vanderhorst 1994). The plants often grow in dry rocky habitats which are relatively undisturbed. We recommend that this species be dropped from further BLM consideration and from state tracking.

Gentiana aquatica L.
Wet meadow gentian

A. DESCRIPTION

1. General description: This is a small annual (or possibly biennial) member of the Gentianaceae. The leaves are opposite on the stems, have white edges, and the pairs are fused, forming a tubular base. The flowers are solitary and terminal on the stems. The corollas are fused, shaped like a funnel or bell, with folded lobes and are white, greenish, or pale purplish or bluish.

2. Diagnostic characters: Similar to *G. prostrata*, both species with corollas less than 22 mm long. The corolla color of *G. prostrata* is deep blue and its long cylindrical capsule is borne on a slender stipe. The capsule of *G. aquatica* is barely longer than wide and is exserted from the pale colored corolla borne on a more stout stipe. (adapted from Dorn 1984, Weber 1987)

B. GEOGRAPHIC DISTRIBUTION

1. Species range: Occurs from southern Alberta and southwest Saskatchewan south to Colorado; Asia (Lesica and Shelly 1991).

2. Montana distribution: Previously known from eleven sites in Beaverhead and Silver Bow Counties.

3. Occurrences in the study area: Nine new populations were found in the basins of Muddy Creek and upper Big Sheep Creek.

C. HABITAT

The populations occur in moist, alkaline bottomlands at elevations ranging from 6,800 to 7,400 ft. Vegetation at these sites is dominated by shrubs (*Artemisia arbuscula*, *Artemisia cana*, *Potentilla fruticosa*) and/or graminoids (*Deschampsia caespitosa*, *Carex praegracilis*, *Juncus balticus*, *Poa nevadensis*, *Poa pratensis*). These habitats are restricted in distribution and are often grazed by livestock.

D. POPULATION BIOLOGY

The populations are large, with estimated numbers ranging from greater than 500 to more than 10,000 individuals. This annual species seems to respond positively to disturbance caused by livestock.

E. MANAGEMENT CONSIDERATIONS

This species occurs in large populations in the Tendoys. Although its habitat is often grazed, the populations do not seem to be adversely affected. It is recommended dropped from further BLM consideration and put in the state limited distribution category.

Halimolobos virgata (Nutt.) Schulz
Twiggy halimolobos

A. DESCRIPTION

1. General description: Plants of this species in the Brassicaceae (mustard family) are biennials and have a rosette of toothed basal leaves with petioles. The leaves on the flowering stems are smaller and lack petioles. The flowers have 4 sepals, 4 white petals, 6 stamens and a single pistil. The fruit is a silique which is not compressed in cross section or contracted between the seeds.

2. Technical species description (quoted from Hitchcock and Cronquist 1964):

Biennial (apparently sometimes flowering the first year) with a simple caudex; stems 1- several, simple to freely branched, 1-3.5 dm tall, more or less grayish (especially below) with a mixture of longer, simple or forked, straight hairs and finer, shorter, more freely branched hairs; leaves numerous, those of the basal rosette petiolate, lanceolate to oblanceolate, 3-6 cm long, 5-15(18) mm broad, denticulate to dentate; cauline leaves several, reduced, at least the upper ones sessile and auriculate; racemes many-flowered; pedicels slender, ascending, 7-11 mm long; sepals often purplish; petals white, usually prominently pinkish- or lavender-veined, about 4 mm long; siliques nearly or quite erect, terete-quadrangular or very slightly compressed, glabrous, 1.5-4 cm long, about 1 mm broad, not tortulose, the valves strongly nerved; style 0.2-0.5 mm long; stigma small, not lobed; seeds numerous, closely crowded, irregularly biseriate, not margined or winged; cotyledons incumbent.

3. Diagnostic characters: Coarsely hairy leaves with toothed but not lobed margins, clasping stem leaves, and erect fruits. It looks like a large *Descurainia*, but the leaves are not lobed.

B. GEOGRAPHIC DISTRIBUTION

1. Species range: Hitchcock and Cronquist (1964) list "Yukon, Alberta, and Saskatchewan to eastern Idaho, Wyoming, Utah, and Colorado" as its distribution. Also occurs in Montana.

2. Montana distribution: Two sites are known from the Sweetgrass Hills in Liberty County, one site in Sheridan County, and three now in Beaverhead County, including the two new records.

3. Occurrences in the study area: Two populations were found, one in Pileup Canyon in the southern part of the area, and one in Limekiln Canyon in the northeast.

C. HABITAT

The Limekiln Canyon site is on a small, seasonally moist terrace at 5,640 ft. elevation with vegetation dominated by *Artemisia tridentata* and *Agropyron smithii*. The site was weedy and impacted by livestock. The Pileup Canyon site was on dry stony slopes (7,500 ft. elevation) in the partial shade of an undisturbed *Cercocarpus ledifolius/Agropyron spicatum* community. Underlying rock type at both sites is limestone.

D. POPULATION BIOLOGY

The Limekiln population was estimated to consist of 100-500 plants covering 2-10 acres. The Pileup population was estimated at less than 100 plants covering five acres. Hitchcock and Cronquist (1964) state this species sometimes becomes weedy, but the populations located here were small. The plants were mainly in fruit when the occurrences were discovered in early June (Limekiln Canyon) and mid-July (Pileup Canyon).

E. MANAGEMENT CONSIDERATIONS

H. virgata is now known from six locations in Montana, at far corners of the state. Populations are small, but the species is in partially disturbed habitat in three of the six sites, and appears to be adventive in at least one of these. It is an early-blooming plant that may be more common than is currently known. It should continue to be tracked by the Montana Natural Heritage Program as "Status Undetermined" (SU), but is not appropriate for listing as sensitive by the BLM at least until further information on distribution has been gathered.

Haplopappus macronema Gray ssp. *linearis* Rydb. Linear-leaved discoid goldenweed

A. DESCRIPTION

1. General description: a low shrub in the Asteraceae (sunflower family). The leaves are long and narrow and borne on branches covered with white wooly hairs which also bear flower heads.

2. Technical description (quoted from Hartman et al. 1991):

Low, rounded, fragrant shrub 0.5-2 dm tall with numerous, usually procumbent, occasionally erect stems radiating from near base. Twigs tough, very leafy, densely white-tomentose, becoming glandular-puberlent under the heads. Leaves mostly linear, 1-3 cm long, 1-2.5 mm wide, canescent or tomentose or not. Heads solitary or few on each branch, turbinate or campanulate; involucre 8-15 mm high, glandular-puberlent, the bracts not much imbricate,

Hutchinsia procumbens (L.) Desv.
Hutchinsia

A. DESCRIPTION

1. General description: This is a small inconspicuous annual in the Brassicaceae with the family's typical floral formula of 4 sepals, 4 white petals, 6 stamens, and 1 pistil. The fruit is a broad silicle.

2. Technical species description (modified from Hitchcock and Cronquist 1973):

Plants glabrous annuals, 3-15 cm. high; leaves mostly on lower part of stem, from obovate and entire with petiole equal to the blade to lyrate-pinnatifid, reduced upward; racemes ebracteate; pedicels slender, spreading, 3-10 mm; sepals scarcely 1 mm, about equal to the white, cuneate-obovate petals; silicles sessile, strongly obcompressed, elliptic to elliptic-obovate, 3-3.5 mm; style about 0.2 mm long.

3. Diagnostic characters: broad siliques which are strongly flattened at right angles to the septum, very short styles, non-clasping stem leaves (Dorn 1992).

B. GEOGRAPHIC DISTRIBUTION

1. Species range: "B.C. to California, east to Wyoming and Colorado, also in Labrador and Newfoundland; Old World. Also occurs in Montana (Hitchcock and Cronquist 1973)."

2. Montana Distribution: Tendoy Mountains and Ovando Valley.

3. Occurrences in the study area: Recently known from one location on slopes above upper Big Sheep Creek, discovered by Lesica in 1986. There is also an old collection from Armstedt (confluence of Red Rock River and Medicine Lodge Creek, now submerged).

C. HABITAT

The primary habitat of this species is the edges of salt marshes along the coast. It occurs inland around saline or alkaline ponds and lakes. The Tendoy occurrence is somewhat anomalous. Plants were growing beneath sagebrush on steep limestone talus. See the habitat description for *Agastache cusickii* (also for *Mimulus suksdorfii* and *Phacelia incana*) in this report.

D. POPULATION BIOLOGY

The Big Sheep Creek Canyon population is probably small. It was not seen in surveys of the same site conducted in 1989 or 1993. The plants are very ephemeral; plants near Ovando were completely dried up by mid-July.

E. MANAGEMENT CONSIDERATIONS

This species has a broad distribution throughout the Northern Hemisphere but is apparently nowhere common (Weber 1987). Its sole occurrence in the study area has not been relocated since its discovery in 1986. Its occurrence near Ovando is also apparently quite limited, found at only one of 115 ponds which were searched. This species should be considered exceedingly rare in Montana and should continue to be tracked by the Montana Natural Heritage Program. Protection of the habitat at the site should be a high priority for the BLM, since it hosts several species of concern (see management concerns for *Agastache cusickii* and *Phacelia incana* in this report). Designation of BLM sensitive status is appropriate.

Lomatium attenuatum Evert Tapertip biscuitroot

A. DESCRIPTION

1. General description: This is a yellow flowered member of the Apiaceae (carrot family). The leaves are dissected and have a sheathing petiole. The flowers are borne in a compound umbel with an inconspicuous involucre subtending the umbels. The flowers are 5-merous except for the bicarpellate ovary. The fruits are schizocarps which are flattened parallel to their sutures, with low ribs on their faces.

2. Technical species description (quoted from Evert 1983):

Plant perennial, short-caulescent, with only one or two cauline leaves, more or less scaberulous, (7-)10-25 cm tall, from an elongated thickened taproot and also occasionally from a several-branched caudex; leaves petiolate, 3-pinnate or ternately 3-pinnate, blades 2.0-11 cm long, 1.5-10 cm wide, ovate in outline, the ultimate divisions linear to oblanceolate, 2-5 mm long, 0.5-1.5 mm wide, obtuse to somewhat acute and mucronate; petioles 1.5-5 cm long, the dilated and scariosus sheathing extending to the middle or above; peduncles 1-3(4), scaberulous, exceeding the leaves in fruit, 10-15 cm long; involucre usually absent but occasionally 1 inconspicuous, filiform bract present; fertile rays 5-8, spreading, angled, unequal, (1.5)3-5 cm long in fruit; sterile rays 4-8 spreading, 3-10 mm long in fruit; involucre absent or of 1-6 inconspicuous linear-lanceolate, attenuate, non-connate bractlets, 1-4 mm long; umbels ca. 15-flowered, only 2-6 developing into fruit; pedicels 3-10 mm long in fruit; petals 1.5 mm long including the incurved apex, yellow, obovate, glabrous; styles 1-1.5 mm long, spreading or reflexed; ovaries glabrous to slightly scaberulous; fruit oblong-elliptic, glabrous, glossy, 5-8 mm long, 3-5 mm wide, the wings ca.

0.5-0.75 mm wide, narrower than the body; oil tubes prominent, 1 in each interval, 2 on the commissure; carpophore bipartite.

3. Diagnostic characters: *L. attenuatum* differs from *L. cous* which it resembles in habit, leaf dissection, and fruit characters, by having a less conspicuous involucre and greater overall scabrosity (Evert 1983).

B. GEOGRAPHIC DISTRIBUTION

1. Species range: Before its discovery in the Tendoy, the species was known only from Park County in northwestern Wyoming (Evert 1983, Dorn 1992).

2. Montana distribution: State record (Lesica coll. # 5990) from the Tendoy Mountains, Beaverhead County.

3. Occurrences in the study area: Two populations were found in the northern Tendoy, one towards the head of Johnson Gulch and another in Limekiln Canyon. Duplicate specimens were verified by a specialist in the Apiaceae, R. L. Hartman (Rocky Mountain Herbarium, University of Wyoming, Laramie).

C. HABITAT

Plants grow in coarse limestone talus or stony soil on warm slopes, usually but not always associated with *Cercocarpus ledifolius*. Other associates include *Agropyron spicatum*, *Artemisia tridentata*, *Oryzopsis hymenoides*, and *Penstemon aridus*.

D. POPULATION BIOLOGY

The Johnson Gulch population was estimated to consist of over 200 plants covering at least 10 acres. The Limekiln Canyon population was estimated at 5,000-10,000+ plants and includes several subpopulations stretching for 2-3 miles in the canyon.

E. MANAGEMENT CONSIDERATIONS

L. attenuatum is a narrow endemic listed as 3C by USFWS. At this time it is known from only two sites in Montana. The sites are inaccessible and are not subject to unnatural disturbances. Nonetheless, the rarity of this species makes BLM sensitive species designation appropriate.

Mimulus suksdorfii Gray
Suksdorf monkeyflower

A. DESCRIPTION

1. General description: This is an inconspicuous member of the Scrophulariaceae (figwort family). These small taprooted annuals are branched or often unbranched in Montana. The flowers are borne two per node in the axils of the opposite leaves, which are narrow, entire margined, and without petioles. The green (with a reddish tinge) calyx is fused with a 5 angled tube and 5 short pointed lobes. The yellow corolla is tubular with 5 nearly equal lobes. There are 4 stamens and a single pistil with 2 stigmas. The tiny seeds are borne in a capsule which splits longitudinally. Slide 12 in Appendix E is a close-up of *M. suksdorfii*.

2. Diagnostic characters: Separated from other annual species of *Mimulus* by its narrow leaves and short (4-8 mm) yellow corolla. Resembles *Collinsia parviflora*, which occurs in similar habitat but has blue corollas.

B. GEOGRAPHICAL DISTRIBUTION

1. Species range: Southern Washington, eastern Oregon and California, east across Idaho, Nevada, and Utah, to western Wyoming, northern Colorado, and northern Arizona (Cronquist et al. 1984), and Montana (Dorn 1984).

2. Montana distribution: Previously known from 8 sites in Beaverhead, Carbon, Glacier, and Missoula/Ravallii counties.

3. Occurrences in the study area: Ten populations are known from the area, eight discovered by this project. These are distributed in the canyons throughout the range.

C. HABITAT

This species is common (almost predictable) in patches of surface accumulations of mineral soil and organic litter on limestone talus and in shrub communities. It is known from the Tendoyas at elevations ranging from 6,300 to 7,500 ft (1,919-2,284 m). Common woody associates include *Artemisia tridentata* and *Cercocarpus ledifolius*. *Agropyron spicatum*, *A. smithii*, and *Leucopoa kingii* are dominant grasses in these habitats. Although these are generally dry environments, at least ephemeral surface moisture is necessary, since these are annuals with shallow root systems. The extremely wet 1993 growing season may have been partially responsible for the many populations which were found. At a few sites another, small, annual, but less common MPSSC, *Phacelia incana*, grows intermixed with *M. suksdorfii*. Outside of the study area, the species is reported from moist areas beside water.

D. POPULATION BIOLOGY

Populations in the Tendoy range in estimated size from very small with less than 10 plants to very large with over 10,000; most are of intermediate size. There is a tendency for plants to grow in clumps. Plants were flowering in June.

E. MANAGEMENT CONSIDERATIONS

This inconspicuous species has turned out to be far more common than older records indicated, fulfilling Lesica and Shelly's (1991) predictions. The species has a wide distribution both rangewide and within Montana. It is often found on loose talus slopes, a habitat that is usually inherently protected from impacts such as grazing and recreational trampling, and is adapted to disturbance. For these reasons, we recommend that this species be dropped from further BLM consideration and from state tracking.

Pediocactus simpsonii (Engelm.) Britt. & Rose Simpson's hedgehog cactus

A. DESCRIPTION

1. General description: This is a small pincushion cactus (Cactaceae). The stem is spherical and partly buried and bears spines on raised tubercles. The showy pinkish flowers which bloom early in the season are borne on top of the spine bearing tubercles. See slide 13 in Appendix E.

3. Diagnostic characters: In Montana, the only other pincushions are species of *Coryphantha*. These two genera are distinguished by the position of attachment of the flowers and fruits. In *Coryphantha* they are attached at the base of the tubercles, away from the spines, while in *Pediocactus* they are borne on the tubercles, near the spines. A pocket knife is useful for dissecting the cactus to observe this feature in the field. Vegetatively, these genera are very similar. Species of *Coryphantha* were never seen in the Tendoy.

B. GEOGRAPHIC DISTRIBUTION

1. Species range: "Washington to Wyoming, south to Nevada, Arizona, and New Mexico (Welsh et al. 1987)." Also in southwestern Montana.

2. Montana distribution: Dorn (1984) lists as reported from southwestern Montana, but the occurrence was verified in Beaverhead County, from foothills of the Pioneer Mountains in 1992.

3. Occurrences in the study area: Eight populations were documented, scattered throughout the range.

C. HABITAT

Populations occupy dry grassland and sagebrush/grassland habitats on foothills and alluvial benches ranging in elevation from 5,600 to 7,000 ft (see slide 14 in Appendix E). The dominant graminoids include *Agropyron spicatum* and *Carex filifolia* and the sagebrush is *Artemisia tridentata* or *A. frigida*. Soils are generally fine textured. Plants occur in heavily grazed as well as in more pristine habitats.

D. POPULATION BIOLOGY

Estimated numbers ranged from less than 100 to 5,000; four populations were estimated to consist of greater than 1000 plants. At two sites which were surveyed there were mature fruiting plants and young vegetative plants, evidence of successful reproduction. Fruit was present in early June and the flowers were never seen. Plants tend to grow in small groups which are widely scattered over large areas. This species probably has a more or less contiguous distribution throughout the foothills of the Tendoys and other ranges in Beaverhead County.

E. MANAGEMENT CONSIDERATIONS

This species is common throughout the lower elevations in Beaverhead County. Until recently it has probably been mistaken for species of *Coryphantha*, however these were not seen in the area. *Pediocactus*, not *Coryphantha*, is the common pincushion in the area. Plants are resistant to heavy grazing. The populations seen are large and in good health, even in heavily disturbed habitat. It is recommended that this species be dropped from further BLM consideration and put in the state category of limited distribution species.

Penstemon lemhiensis (Keck) Keck & Cronq. *Lemhi beardtongue*

No new information was collected on this species, which is among the most extensively-studied of BLM sensitive species. For description, distribution and habitat, refer to the most recent status report (Schassberger 1990) and the distribution map and printouts at the end of this report in Appendices C and D, respectively. The BLM reports on *Penstemon lemhiensis* demographic monitoring will help understand population biology and pursue management questions (Heidel and Shelly 1993).

Phacelia incana A. Brand
Hoary phacelia

A. DESCRIPTION

1. General description: *P. incana* is a minute annual member of the Hydrophyllaceae (water-leaf family). Its leaves are elliptical to egg shaped and have petioles about as long as the blades. The very inconspicuous flower has a 5 lobed fused white corolla which is barely longer than the 5 narrow green calyx lobes. There are 5 stamens and a single style. The plant is covered by hairs which are mostly distinctly glandular tipped. See slide 15 in Appendix E.

2. Technical species description (quoted from Cronquist et al. 1984):

Branching, more or less erect annual up to 1.5 dm tall, softly spreading-hairy throughout, many of the hairs evidently gland-tipped; leaves chiefly cauline, evidently petiolate, at least the lower petioles longer than the blade; blades elliptic to nearly ovate, entire, 3-15 mm long and 2-10 mm wide; naked, helicoid cymes mostly terminal, appearing leaf-opposed, mostly relatively lax and elongate, rather few-flowered; pedicels 0.5-2 mm long at anthesis, up to about 5 mm in fruit, seldom longer; calyx 3-4.5 mm long at anthesis, up to 6 or 7 mm in fruit, its segments narrow, linear or linear-lanceolate, slightly or scarcely dissimilar; corolla small and inconspicuous, about equalling the calyx, tubular-campanulate, 3.5-4.5 mm long, 2-3 mm wide, the tube white or yellowish, the scarcely spreading limb white or blueish; stamens included, barely or scarcely reaching the level of the sinuses; style 1.0-1.7 mm long, the branches very short; capsule shorter than the calyx; ovules 23-27; seeds mostly 16-24, angular-ovoid, 0.6-1.0 mm long, pitted-reticulate.

3. Diagnostic field characters: Other annual phacelias in Montana are easily distinguished from *P. incana* by their larger size and generally lobed leaves (except sometimes *P. linearis* which has large pink flowers). Other minute annuals may superficially resemble this species (e.g. species of *Collinsia*, *Cryptantha* and *Mimulus*), but have different floral formulas, leaves, and vestiture (see the description for *Mimulus suksdorfii* in this report).

B. GEOGRAPHIC DISTRIBUTION

1. Species range: Generally a plant of the Great Basin, *P. incana* is most common in eastern Nevada and western Utah, but is also known sporadically from northeastern Utah, northwestern Colorado, Wyoming, and central Idaho (Cronquist et al. 1984). It has recently been found in southwestern

Montana but is not included in Dorn's (1984) flora of the state.

2. Montana distribution: All known populations occur in Beaverhead County within the boundaries of the present study area.

3. Occurrences in the study area: There are six sites known, (four discovered by this project) distributed around the periphery of the Tendoy's. These are from Big Sheep Creek, Bell, and Limekiln canyons and from above Johnson Gulch.

C. HABITAT

Cronquist et al. (1984) describe the habitat as "stony, often calcareous slopes." Within the study area, *P. incana* grows in ephemerally moist patches of soil or litter on dry limestone talus slopes (slide 16 in Appendix E). Dominant woody vegetation on these slopes is *Artemisia tridentata* or *Cercocarpus ledifolius*. *P. incana* often grows beneath these shrubs. Additional associates include *Collinsia parviflora*, *Cryptantha watsonii*, *Descurainia richardsonii*, *Phacelia hastata*, and *P. linearis*. Four associated MPSSC are *Agastache cusickii*, *Hutchinsia procumbens*, *Mimulus suksdorfii* and *Stanleya viridiflora*. The *Mimulus* seems to be especially close in microhabitat preference.

D. POPULATION BIOLOGY

The populations discovered in 1993 ranged in estimated numbers from 50 to as many as 10,000 plants. The species was considered "common" at the other two previously known sites. The population in Big Sheep canyon was revisited during 1993 and plants were readily found.

E. MANAGEMENT CONSIDERATIONS

This species has a very limited known distribution in Montana. Like its associate, *Mimulus suksdorfii*, it is very easily overlooked and future surveys may reveal that it is more common. However, at many of the *Mimulus* sites the *Phacelia* is absent, whereas the *Mimulus* is usually present at the *Phacelia* sites. Four rare species, including *P. incana*, are present at the upper Big Sheep Canyon site (see management considerations for *Agastache cusickii*), thus, protection of the habitat on these talus slopes should be given high priority. The other populations of *P. incana* are more remote and are not immediately threatened. This species should continue to be tracked by the Montana Natural Heritage Program and is recommended for BLM sensitive species designation.

Senecio debilis Nutt.
Rocky Mountain ragwort

A. DESCRIPTION

1. General description: This herbaceous perennial belongs to a large genus in the Asteraceae (sunflower family). The plants have a basal rosette of simple petioled leaves. Leaves along the flowering stem are progressively smaller toward the top, more deeply pinnately lobed and without petioles. The flower heads have a single series of green bracts of equal length. The yellow to orange flowers are all tubular and have pappuses of capillary bristles.

2. Diagnostic characters: *S. debilis* can be separated from other Montana species of *Senecio* by its lack of ray flowers and its stem leaves with deep, rounded lobes (Dorn 1984).

B. GEOGRAPHIC DISTRIBUTION

1. Species range: "...central Idaho and southwest Montana to Colorado (Hitchcock and Cronquist 1973)."

2. Montana distribution: Previously known from twelve sites in Beaverhead, Lewis and Clark, and Madison counties.

3. Occurrences in the study area: Six populations were documented in the basins of Muddy Creek and upper Big Sheep Creek.

C. HABITAT

Populations in the study area occur at elevations from 6,800 to 7,200 ft. in moist alkaline meadows dominated by *Potentilla fruticosa*, *Juncus balticus*, *Deschampsia caespitosa* and *Carex praeegracilis*. Most of the sites are subject to use by livestock, some are heavily grazed.

D. POPULATION BIOLOGY

Populations in the study area are relatively large with estimated numbers ranging from over 100 to 5,000 plants.

E. MANAGEMENT CONSIDERATIONS

S. debilis is now known from well over a dozen sites in southwest Montana. It was associated with almost every alkaline meadow in the study area. Although many Montana populations are small, a large percentage of those in the study area are relatively large. This species' alkaline meadow habitat is often along streams, and most populations are subject to livestock grazing, but *S. debilis* was most common at some of the most heavily grazed sites. It appears to be able to persist under moderate and even heavy livestock use. This species is not recommended further BLM consideration but may be appropriate to place in the state limited distribution category.

Sphaeromeria argentea Nutt.
Chicken sage

A. DESCRIPTION

1. General description: Commonly called a false sagebrush, this member of the Asteraceae (sunflower family) resembles some species of *Artemisia* due to its fragrance, three parted leaves, and small heads of flowers. Plants are often somewhat woody near the base. The leaves are mostly basal and the heads of yellow tubular flowers are borne on short pedicels in loose terminal clusters.

2. Technical species description (for *Tanacetum nuttallii*, a synonym, quoted from Cronquist 1955):

Aromatic perennial with many slender stems 0.5-2 dm. tall, often slightly woody at base, fibrous-rooted, or with a short, deliquescently branched taproot; herbage closely gray-tomentose; leaves appearing clustered at the base because of the numerous short sterile shoots, mostly cuneate and 3-toothed or -lobed at the apex, sometimes 4- to 5-lobed or entire, up to about 1.5 cm long including the slender base; heads several, mostly short-pedunculate in a subcapitate cluster, small. the involucre only 3-4 mm high, the disk 4-7 mm wide; receptacle glabrous, strongly convex; pappus essentially wanting.

3. Diagnostic characters: The genus *Sphaeromeria* is distinguished from lowland species of *Artemisia* by the arrangement of its flower heads in capitate clusters vs. racemes or panicles. *S. argentea* differs from *S. capitata* by having leaves which are merely toothed or shallowly lobed rather than deeply lobed and flower heads borne on pedicels in loose clusters rather than sessile in dense clusters.

B. GEOGRAPHIC DISTRIBUTION

1. Species range: "...central Idaho and adjacent Montana to Wyoming; Nevada (Hitchcock and Cronquist 1973)."

2. Montana distribution: Beaverhead County, previously known from two sites in the vicinity of the town of Dell, and near Matador Ranch.

3. Occurrences in the study area: One population was found on State land about 2 miles south of the confluence of Big Sheep and Meadow Creeks in the southern part of the Tendoy's.

C. HABITAT

The population in the southern Tendoy's occurs in seasonally moist clay soil on an alluvial terrace. The unusual plant community is dominated by *Artemisia arbuscula*, *Sarcobatus vermiculatus*, and *Poa nevadensis*. Other associates at the

site are *Atriplex gardneri*, *Agropyron smithii*, and *Haplopappus uniflora*. The site has been grazed.

D. POPULATION BIOLOGY

The occurrence is small, consisting of about one hundred plants covering a single acre.

E. MANAGEMENT CONCERNS

S. argentea is a narrow endemic which is rare in Montana with just three known sites, all in Beaverhead County. Recently located populations have been small. In the study area the species was associated with an unusual plant community, and although there may be other unmapped subpopulations in the vicinity, it is unlikely that this species is common. The plant is low to the ground and not likely harmed by livestock grazing; nonetheless, the rarity of this species is basis for recommending that it be considered for BLM sensitive species designation.

Sphaeromeria capitata Nutt. Rock-tansy

A. DESCRIPTION

1. General description: This is similar to *S. argentea* (see previous synopsis). The deeply lobed leaves are mostly at the woody base of the plant and form dense cushions over rocks. The inflorescence is a tight, spherical cluster of heads of yellow, tubular flowers which lack pappuses.

2. Diagnostic characters: *S. capitata* differs from *S. nuttallii* by having more dense clusters of flower heads and more deeply lobed leaves.

B. GEOGRAPHIC DISTRIBUTION

1. Species range: Wyoming and Montana (Hitchcock and Cronquist 1973).

2. Montana distribution: Carbon and Beaverhead Counties.

3. Occurrences in the study area: One population was surveyed in the foothills just south of Clark Canyon Reservoir in the northernmost part of the range. Lesica found it to be common in this vicinity and it was also seen by Vanderhorst just south of Bell Canyon.

C. HABITAT

Plants grow in cracks and form dense cushions on mostly barren limestone pavement. Other plants in this habitat were *Erigeron compositus*, *Haplopappus acaulis*, and *Petrophyton caespitosum*.

D. POPULATION BIOLOGY

The population which was surveyed was estimated to consist of more than 100 plants but was not thoroughly surveyed. Plants were in a flower bud stage in early June.

E. MANAGEMENT CONSIDERATIONS

S. capitata is common on limestone outcrops around Clark Canyon Reservoir. It is also abundant on the south side of the Pryor Mountains, where 16 populations were discovered in 1991 (Lesica and Achuff 1992). The limestone outcrop habitat is not generally threatened. This species is too common to be considered further for BLM sensitive species designation but is appropriately placed in the state limited distribution category.

Stanleya viridiflora Nutt. Green prince's plume

A. DESCRIPTION

1. General description: This is a large, showy member of the Brassicaceae (the mustard family). The blueish green leaves lack hairs and petioles. The small flowers are borne in a long raceme. There are 4 green sepals, 4 yellow petals, 6 stamens and a single ovary. The fruit is a silique (long, splitting along its length, with 2 chambers separated by a membrane) with a stalk above the attachment of the perianth parts.

2. Diagnostic characters: The long raceme of showy yellow flowers is very conspicuous in the field and gives the genus its common name, prince's plume. The genus is distinguished from other mustards in Montana by having a stipitate silique. *S. viridiflora* is separated from other Montana species of *Stanleya* by having auriculate, sessile (rather than petiolate) leaves.

B. GEOGRAPHIC DISTRIBUTION

1. Species range: Welsh et al. (1987) describe the range as "Idaho and Wyoming to Nevada and Oregon." It is also found in southwestern Montana.

2. Montana distribution: Nine previous records from Beaverhead and Madison Counties.

3. Occurrences in the study area: There are now 9 new populations known on BLM lands and another on state land in the foothills and canyons of the Tendoy Range.

C. HABITAT

The species occurs at elevations from 6,000 to 7,600 ft. in sagebrush (*Artemisia tridentata*) and mountain mahogany (*Cercocarpus ledifolius*) communities. Bluebunch wheatgrass (*Agropyron spicatum*) was subdominant in these habitats. The soils were dry sands, silts, and clays formed in conglomerate, shale, limestone, and alluvium. One population was on a disturbed roadside cutbank, others were in relatively pristine steep canyon slope habitats.

D. POPULATION BIOLOGY

Populations ranged in size from a single plant to estimated thousands. Two large populations consisted of thousands of plants covering over 40 acres each. Plants were in bud in early June and were flowering in late July.

E. MANAGEMENT CONSIDERATIONS

S. viridiflora is fairly common in southern Beaverhead and Madison counties and has a relatively broad range in the Great Basin. Plants are often scattered, but populations are frequently extensive in the canyon slope habitat. This species probably occurs in most of the canyons in the Tendoy Mountains and is abundant in the Big Sheep Creek area. The steep slopes occupied by this species are not heavily impacted by grazing and are not otherwise threatened. This species is too common to be further considered for BLM sensitive species designation but is appropriately placed in a state limited distribution category.

Taraxacum eriophorum Rydb. Rocky Mountain dandelion

A. DESCRIPTION

1. General description: This is a native dandelion in the Asteraceae (sunflower family). The plants are taprooted perennials with a rosette of simple, mostly entire margined leaves. The flowering stem is leafless and hollow, filled with milky juice. The heads have numerous yellow ray flowers; disk flowers are lacking. The achenes are beaked and reddish-brown colored at maturity. See slide 17 in Appendix E.

2. Technical species description (quoted from Harrington 1954):

Plants 3-10 cm tall, sometimes up to 30 cm; leaves lanceolate to oblanceolate, mostly shallowly pinnate, toothed or even entire, rather thickish, glabrous to sparsely pilose; heads 1.5-2.5 cm high; outer involucre bracts appressed or somewhat spreading, inner bracts either not corniculate appendaged or rarely dilated

corniculate at apex; achenes 4-5 mm long, murications rather spinelike, reddish or reddish-brown.

3. Diagnostic characters: differs from exotic dandelions by having mostly entire leaves. Distinguished from the other native species by having reddish-brown fruits and by its involucre bracts which do not usually have a terminal horn-like appendage (adapted from Dorn 1984).

B. GEOGRAPHIC DISTRIBUTION

1. Species range: Hitchcock and Cronquist (1973) describe the distribution as "cordilleran," meaning of the mountains of western North America. The species is infrequent and widely scattered on tundra in Colorado (Weber 1987) and occurs mostly in the mountains in Wyoming (Dorn 1992), but is not listed by Welsh (1987) for Utah.

2. Montana distribution: Collected twice from Beaverhead County in the 1980's and once from Madison County in 1892.

3. Occurrences in the study area: Known from a 1984 Klaus Lackschewitz collection taken from near the confluence of Meadow and Big Sheep Creeks. This species was found nearby by this project in the bottom of Pileup Canyon; two subpopulations were surveyed, one by each of the authors.

C. HABITAT

The Pileup Canyon population occurs in moist alluvial bottomland dominated at one site by big sagebrush (*Artemisia tridentata* var. *tridentata*) and Great Basin wild rye (*Elymus cinereus*). A slide (18) of this site is included in Appendix E. Dominants at the subpopulation further up the canyon are Douglas fir (*Pseudotsuga menziesii*) and Idaho fescue (*Festuca idahoensis*). *Taraxacum eriophorum* was growing in partial shade at both sites. The sites were heavily trampled and grazed and had many weeds including a heavy infestation of a common introduced dandelion, *Taraxacum laevigatum*. The soil is silty.

D. POPULATION BIOLOGY

Vanderhorst counted only 28 plants. Lesica estimated less than 50 plants at the subpopulation further up the canyon. Both subpopulations covered small areas. In 1984, Lackschewitz described a population nearby as "extensive," but this occurrence was not relocated by this project. Plants were in a fruiting stage by mid-June. Many of the heads were browsed, possibly by cattle. In spite of this, some mature dispersing fruits were observed.

E. MANAGEMENT CONSIDERATIONS

This species appears to be extremely rare within the study area and is uncommon throughout its range. The report of an

extensive population in 1986, and the occurrence of just a few plants in heavily disturbed habitat found in 1992 suggest a possible population decline. Further searches for this species in the vicinity are needed. If no large populations are found, then protection of the Pileup Canyon site should be considered. It is recommended that *T. eriophorum* be given BLM sensitive species designation in Montana.

Thalictrum alpinum L.
Alpine meadowrue

A. DESCRIPTION

1. General description: This is a small, inconspicuous perennial in the Ranunculaceae (buttercup family). The leaves are mostly or all basal and are twice ternately compound with lobed leaflets. The inconspicuous flowers are bisexual but lack petals. The fruits are ribbed lengthwise and have short beaks.

2. Technical species description (quoted from Hitchcock and Cronquist 1964):

Glabrous (glandular) and glaucous perennial 3-18 (28) cm tall, scapose or subscapose, with very slender rhizomes; leaves mostly or entirely basal, biternate or ternate-pinnate, the segments usually cuneate, 3(4-7)-lobed, 3-8 mm long, leathery, pale green above and even paler beneath, the margins slightly revolute; stems simple or forked above, leafless or with a single leaf; racemes long and loose, the pedicels slender, usually recurved; bracts small; flowers perfect; sepals grayish-purple; stamens 8-15, usually deciduous shortly after anthesis, the anthers about 1.5 mm long, apiculate, about equalling the slender filaments; pistils (2)3-4, scarcely stipitate; stigmas shorter than the ovary; achenes 2.5-3.5 mm long, prominently ribbed. 2N=14.

3. Diagnostic characters: *T. alpinum* is smaller than other Montana species of *Thalictrum* and differs in having bisexual flowers on mostly leafless, but sometimes single leaved stems (Dorn 1984).

B. GEOGRAPHICAL DISTRIBUTION

1. Species range: "Circumpolar, in North America south in the Rocky Mountains from Montana to New Mexico, in parts of Idaho and northeast Oregon, also in California and Nevada (Hitchcock and Cronquist 1973)."

2. Montana distribution: Previously known from three sites in southern Beaverhead County. A new county record was collected in 1993 from the Anaconda-Pintlar Range in Granite County.

3. Occurrences in the study area: One population was discovered with subpopulations along Tex and Cabin Creeks in the southern part of the area.

C. HABITAT

"Moist montane to alpine areas (Dorn 1984)." The population in the study area occurred in a broad alluvial valley in moist bottomland dominated by *Potentilla fruticosa*, *Juncus balticus*, and *Muhlenbergia richardsonis*. Other associates were *Antennaria microphylla*, *Iris missouriensis*, and *Taraxacum officinale*. The soil was silty clay. The habitat was degraded with many exotic and "increaser" species present.

D. POPULATION BIOLOGY

Population numbers were not estimated. The two subpopulations covered less than 2 acres. Plants had mature fruit in late July.

E. MANAGEMENT CONSIDERATIONS

This species mainly known from southern Beaverhead County, and all four of these are impacted by livestock grazing, some heavily (Lesica 1988, 1990). Although the grazing response of this rare species is not known, the habitat is so restricted and populations are so small that it is recommended for BLM sensitive species designation.

Thelypodium sagittatum (Nutt.) Endl. ex Walpers Slender thelypody

A. DESCRIPTION

1. General description: This is a biennial in the Brassicaceae (mustard family). The basal leaves have short petioles while the stem leaves are sessile and have prominent ear-like appendages at their bases. The flowers are borne in racemes and have 4 pink to purple sepals, 4 white to purple petals, 6 stamens, and a single pistil with an entire stigma. The fruit is a long, narrow silique, which is slightly contracted between the seeds. See slide 19 in Appendix E.

2. Technical species description (quoted from Hitchcock and Cronquist 1964):

Glaucous biennial from a simple taproot, glabrous throughout to hirsute at the base, 3-7 dm tall, the stem rather freely branched; basal and lowermost cauline leaves oblanceolate to elliptic-oblongate, 4-10 cm

oblanceolate, the clawlike base usually exceeding the sepals; filaments about equalling the sepals; anthers 2-2.5 mm long; siliques ascending, straight, (2)2.5-4(6) cm long, 1-2 mm broad, tortulose, sessile or subsessile, the stipe not over 0.5 mm long; stigma not lobed.

3. Diagnostic characters: This and *T. paniculatum* (another MPSSC not encountered by this project) are most easily recognized by their combination of tap roots, entire, auriculate stem leaves, white to purple flowers, and erect siliques. The two species can be separated based on the dimensions of their fruits and petals, which are larger in *T. paniculatum* (adapted from Dorn 1984).

B. GEOGRAPHIC DISTRIBUTION

1. Species range: "...southeast Washington to California, east to Montana and Wyoming (Hitchcock and Cronquist 1973)."

2. Montana distribution: Twelve populations have recently been documented in Beaverhead County, including the three from the Tendoy Mountains; see also Culver (1993). One 1951 record is from Flathead County.

3. Occurrences in the study area: Three populations were surveyed in the basins of Muddy creek and upper Big Sheep Creek.

C. Habitat

Hitchcock and Cronquist (1973) describe the habitat as "moist, often alkaline meadows that dry by summer; desert plains to lower mountains." The three populations in the study area occurred in moist or somewhat dry alluvial bottomlands. The Muddy Creek site was in and around a 28 year old enclosure in a heavily grazed drainage (see slide in Appendix E). The vegetation here was an *Artemisia tridentata*/*Elymus lanceolata* habitat type. The soil was fine fluffy clay. Dominants at the other two sites were *Juncus balticus* and *Chyrostamnus nauseosus* with *Poa nevadensis* at both sites; soils were silt and silty clay. All of the sites, except within the enclosure, were grazed by livestock.

D. POPULATION BIOLOGY

The populations are relatively small, with estimated numbers from around 50 to less than 500 plants. At the site along Muddy Creek, plants occurred both inside and outside of the enclosure. In July, plants were mostly in fruit, with a few flowers.

E. MANAGEMENT CONSIDERATIONS

The species is uncommon and occurs in small populations in the study area. These are in habitats that are often heavily

D. POPULATION BIOLOGY

The populations are relatively small, with estimated numbers from around 50 to less than 500 plants. At the site along Muddy Creek, plants occurred both inside and outside of the exclosure. In July, plants were mostly in fruit, with a few flowers.

E. MANAGEMENT CONSIDERATIONS

The species is uncommon and occurs in small populations in the study area. These are in habitats that are often heavily grazed. The degree to which livestock impact these populations is not known, but the location of plants both inside and outside the exclosure provides an opportunity to study this. Designation as a sensitive plant by BLM may be warranted at this time.

Thlaspi parviflorum A. Nels.
Small-flowered pennycress

A. DESCRIPTION

1. General description: A small glabrous herbaceous perennial in the Brassicaceae (mustard family). The basal leaves have petioles while the stem leaves are clasping, without petioles. The flowers are borne on pedicels and consist of four green sepals, four white petals, six stamens, and a single pistil. The fruit is a silicle which is flattened at right angles to the septum and has a very short style.

2. Technical species description (adapted from Hitchcock et al. 1964):

Glabrous perennial with a simple to freely branched caudex, the 1-many stems simple, or occasionally branched above, 3-25 (40) cm. tall; basal leaves usually many and rosulate, 1.5-4 (6) cm long, narrowly oblanceolate to broadly obovate or ovate, entire to few-toothed, narrowed rather abruptly to a slender petiole one-half to twice as long as the blade; cauline leaves usually several, lanceolate to oblong-elliptic, 5-35 mm long, sessile and auriculate; pedicels slender, spreading to ascending, 40-10 mm long; sepals 1-1.5 mm long, not saccate at base; petals white, 2.5-3 (4) mm long; silicles from more or less elliptic and acute at the apex, to cuneate (truncate at tip) or retuse and more nearly oblong-obcordate, 4-10 (13) mm long, the margins keeled and usually slightly indistinctly striate longitudinally (and concentrically), but apparently smooth except as viewed under a very strong lens.

3. Diagnostic characters: *T. parviflorum* is very similar to the more common native *T. montanum* (*T. fendleri*), but differs by having shorter sepals (2-3 mm long in *T. montanum*), petals (4-6 mm long in *T. montanum*), and styles (1-3 mm long in *T. montanum*). *Thlaspi arvense*, also in Montana, is a very common annual weed, with large notched or heart-shaped fruits with wide wings (adapted from Hitchcock et al 1964 and Dorn 1984).

B. GEOGRAPHIC DISTRIBUTION

1. Species range: "...central Idaho to northwest Wyoming and southwest Wyoming" (Hitchcock and Cronquist 1973).

2. Montana distribution: Eight previous records have been documented from Beaverhead, Carbon, Madison, and Silver Bow Counties.

3. Occurrences in the study area: One population was found about two miles south of the confluence of Meadow and Big Sheep Creeks, in the southern part of the area.

C. HABITAT

The population grows in moist bottomland on an alluvial terrace. Vegetation is dominated by *Artemisia cana*, *Juncus balticus*, and *Poa nevadensis*. Other associates are *Antennaria microphylla*, *Penstemon procerus*, and *Polygonum bistoides*. There is evidence of past grazing, and weeds occupy some of the area. The soil is a loam.

D. POPULATION BIOLOGY

There are at least four subpopulations which together consist of over 300 estimated plants and cover between one and ten acres. The fruit was mature and dispersing in early July. Plants were beyond the stage when they could be easily surveyed.

E. MANAGEMENT CONSIDERATIONS

T. parviflorum is a regional endemic now known from nine sites in Montana. Most populations are small even though habitat is abundant. The plants are small and inconspicuous, flower early, and are ephemeral. Consequently, it may be more abundant than is currently known. Many sites are grazed by livestock; however, this small, short-lived perennial may benefit from moderate disturbance episodes. It is not recommended for further BLM consideration, although it should be retained on the list of plants tracked by the Montana Natural Heritage Program.

Townsendia nuttallii Dorn
Nuttall's townsendia

A. DESCRIPTION

1. General description: This is a low-growing daisy (Asteraceae, sunflower family). The flower heads are without a stalk or on a very short one among the basal cluster of long, slender leaves. The ray flowers are white or pink or purple and have a pappus of short scales, which the disk flowers have a pappus of longer bristles.

2. Technical species description (quoted from Hartman et al. 1991, who cite Clark and Dorn's original 1979 description):

Pulvinate, perennial herb from a taproot and branched caudex. Leaves basal, crowded, oblanceolate or linear-oblanceolate, 0.5-2 cm long, 1-3 mm wide, entire, densely sericeous-strigose. Heads mostly sessile but some on peduncles up to 1 cm long; involucre 9-12 mm long; phyllaries mostly in three or four series, lanceolate, acute, 4-9 mm long, 0.7-2 mm wide, pubescent, the margins erose and ciliate. Rays ca. 8 mm. long, white to pink or lavender; disk corollas 4-5 mm long, yellow to reddish-purple. Achenes oblanceolate, flattened, 3-4 mm long, pubescent at first, becoming glabrous when mature except for a few scattered hairs near base, the hairs mostly glochidate; ray pappus about 0.5 mm. long; disk pappus ca. 5-6 mm. long, persistent.

3. Diagnostic characters: *T. nuttallii* differs from *T. hookeri*, to which it keys in Dorn (1984), by its leaves and ray pappus. *T. nuttallii* has leaves which are broadened towards the tip and a ray pappus of short scales, vs. the nearly linear leaves of *T. hookeri* and its ray pappus, like the disk pappus, of capillary bristles (Dorn 1992).

B. GEOGRAPHICAL DISTRIBUTION

1. Species range: "...scattered, primarily in the mountainous areas of the western 2/3 of Wyoming; endemic but likely will be found in Utah, Idaho, and/or Montana (Hartman et al. 1991).: Vanderhorst found Utah specimens of *T. nuttallii* identified as *T. hookeri* at Intermountain Herbarium in Logan, UT.

2. Montana distribution: The collection of a single plant in the Tendoy Mts. (Vanderhorst 4955) is the first time this species has been reported in the state. Subsequent to identification of the specimen, Lesica checked collections of *T. hookeri* at MONTU and found three additional specimens of *T. nuttallii*, representing half of the contents of the *T. hookeri* folder from southwestern Montana. Two are from southern Beaverhead County and one is from Granite County.

3. Occurrences in the study area: The collection was made on a rock outcrop overlooking the divide between the basins of Cabin and Medicine Lodge Creeks.

C. HABITAT

The plant was collected from a rocky knob at about 8,200 feet, Associated species included *Lomatium cous*, *Polemonium pulcherrimum*, *Phlox hoodii*, *Oxytropis lagopus* and *Saxifraga rhomboidea*.

D. POPULATION BIOLOGY

Only a few plants were seen. These were flowering in mid June.

E. MANAGEMENT CONSIDERATIONS

This species is no longer tracked in Wyoming as a species of special concern (Fertig 1993) as it has been found to be common. It is probably more common than records indicate in Montana because it is easily mistaken for *T. hookeri* and would be lumped there by some. There is also question whether this species has been legitimately published. It is recommended that this species be tracked by the Montana Natural Heritage Program in the "Status Undetermined" (SU) category to determine its abundance and distribution in the state. In the Tendoys the plants were growing in rocky habitat which is intrinsically well protected. It is not recommended for BLM sensitive species designation at this time.

DISCUSSION

Our evaluations identify sensitive species status changes for BLM consideration, habitats in which rare species are concentrated, and sites which are significant in harboring large numbers of single or multiple sensitive plant species. The data support designation of thirteen Tendency Mountains species as sensitive (See Table 2, below). These are rare taxa which have limited geographical distributions and perceived or potential threats. Populations are generally small and/or the species have very few known occurrences in Montana. Most grow in habitats which are potentially impacted by livestock and many of the surveyed populations were in degraded habitat. A few occur on dry, rocky slopes which are generally well protected, but they are otherwise extremely rare in Montana, and BLM lands in southwestern Montana represent a significant proportion of their remaining habitat.

Table 2. Species recommended for BLM sensitive status
(As summarized in Table 1)

Agastache cusickii
Astragalus scaphoides
Astragalus terminalis
Carex parryana ssp. *idahoensis*
Eriogonum caespitosum
Haplopappus macronema ssp. *linearis*
Hutchinsia procumbens
Lomatium attenuatum
Penstemon lemhiensis
Phacelia incana
Sphaeromeria argentea
Taraxacum eriophorum
Thalictrum alpinum
Thelypodium sagittatum

In addition, the data support list changes and rank changes among the Montana state species of concern. It is recommended that the *Delphinium bicolor* ssp. *novum* and *Townsendia nuttallii* be added to the tracking list with a "Status Undetermined" (SU) rank pending review and annotation of other Montana herbarium specimens, and that *Eriogonum caespitosum* and *Lomatium attenuatum* be added to the list with "S1" status.

Of the globally rare taxa, *Penstemon lemhiensis* is the only taxon currently under review for federal listing (FR NOR Vol. 58, No. 158 of 9/30/1993). Two other species have been considered for federal listing as threatened or endangered, but have subsequently been found to be more secure than previously known - *Astragalus scaphoides* and *Lomatium attenuatum* are placed in Category 3C. The *Carex parryana*

ssp. *idaho* is also placed in the Category 3C with no apparent documentation; reconsideration may be warranted.

Fifteen more species should be dropped from any further BLM consideration as well as active state tracking, though some of them represent limited distribution taxa of biogeographic interest and will be treated as such (See Table 3, below). They have been found to be more widespread than previously known, relatively unaffected by unnatural disturbance, or represented in a number of sites which are relatively secure at present.

Table 3. Species recommended for deleting from BLM sensitive species consideration
(As summarized in Table 1)

Arenaria kingii
Astragalus argophyllus
Astragalus leptaleus
Astragalus lentiginosus
Cirsium subniveum
Erigeron gracilis
Eriogonum ovalifolium var. *nevadense*
Gentiana aquatica
Mimulus suksdorfii
Pediocactus simpsonii
Senecio debilis
Sphaeromeria capitata
Stanleya viridiflora

Some sensitive species management concerns may be addressed in the course of habitat management. Conservation biologists generally agree that protecting biological diversity often most efficiently done at the level of communities or landscapes (Noss 1987, Franklin 1993). Focusing on critical plant communities accomodates sensitive plant protection by preserving potential as well as current habitat. It also promotes protection of less conspicuous associate species like insects. The fourteen species identified for consideration as sensitive are found in one of four habitats (Table 4; next page).

Table 4. Tendoy Mountains priority species targets, by habitat

HABITAT	SENSITIVE SPECIES
Alkaline meadows and riparian areas	<i>Carex parryana</i> ssp. <i>idaho</i> <i>Taraxacum eriophorum</i> <i>Thalictrum alpinum</i> <i>Thelypodium sagittatum</i>
Low sagebrush steppe	<i>Eriogonum caespitosum</i> <i>Haplopappus macronema</i> ssp. <i>linearis</i> <i>Sphaeromeria argentea</i>
Sagebrush steppe	<i>Astragalus scaphoides</i> <i>Astragalus terminalis</i> <i>Penstemon lemhiensis</i>
Limestone talus	<i>Agastache cusickii</i> <i>Hutchinsia procumbens</i> <i>Lomatium attenuatum</i> <i>Phacelia incana</i>

Alkaline meadows are uncommon in western Montana as a whole but are relatively common in southern Beaverhead County. Nonetheless, because this habitat, as well as other riparian meadows, are subirrigated and productive, most large examples are on private land and subject to livestock grazing, mowing, and agricultural conversion. Plant species that respond negatively to these management practices are likely to decline on private land. Consequently, any large intact examples of this habitat on public land should be protected or management in a way that allows continued existence of the rare species that occur there. These habitats are most to wet in the spring and early summer and the fine-textured soils are easily disturbed and compacted by livestock. Many of these sites occur along streams. Trampling of banks causes erosion and downcutting, eventually resulting in lowering of the water table and loss of the meadow habitat. Large alkaline meadows and riparian meadows on public lands that contain populations of sensitive species should be managed to minimize livestock impacts. One such area is along a tributary of Nicholia Creek (T15N R10W Sec. 9 W 1/2; see printouts and maps for *Carex parryana* ssp. *idaho* and *Thelypodium sagittatum*).

Steppe dominated by low sagebrush, *Artemisia arbuscula* var. *arbuscula*, is a Great Basin plant community type found in Montana only in southern Beaverhead County. It occurs on fine textured, usually alkaline soils of stream terraces and gentle lower slopes. Soils are saturated in the spring and early summer and are easily disturbed and compacted by livestock.

Large representative examples of these community type that support populations of sensitive species should be managed to minimize damage by livestock. An example of this habitat the occurs on state land nearby the above-mentioned alkaline meadow (T15S R10W Sec. 16; see printouts and maps for *Haplopappus macronema* ssp. *linearis* and *Sphaeromeria argentea*), but other sites are expected to occur on BLM lands.

Sagebrush steppe dominated by *Artemisia tridentata* or *A. nova* is abundant throughout the Tendoy Mountains. Consequently, it is not practical to address sensitive species management in the management of this habitat. Management considerations for *Astragalus scaphoides* have been addressed separately in recent monitoring work (Lesica 1994), and *Penstemon lemhiensis* management is also to be addressed separately.

Rare species on limestone talus are generally not threatened by land-use disturbances, nor requiring habitat management consideration. The exception is disturbance of talus slopes for gravel mining at one highly significant site. Populations of three rare species are threatened at a quarry site (T15S R10W Sec. 10 N 1/2). A monitoring program was established in 1993 to monitor the habitat and to determine the time required for *Agastache cusickii* to recolonize the disturbed slopes. Protection of this one site would benefit all three species and is easy to accomplish.

During this study, we did not explore every ridge, sidewlope, canyon and meadow. Hopefully, more populations of sensitive plants remain undiscovered. This work should be viewed as a baseline sampling of the area for sorting and setting a sensitive species agenda, rather than as an exhaustive inventory. Some of the species recommended for BLM sensitive species designation may be shown by future work to be more common.

In any case, the large number of rare species targets found in the Tendoy Mountains study area, including at least two new state records, is an indication of the opportunities to open to the Bureau of Land Management to make major strides in understanding and managing the natural resources represented in the native flora.

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APPENDIX A. Maps showing travel routes.

↑ N
survey routes
W MT interagency map

Survey routes
SW MT interagency map

APPENDIX B. Vascular plants observed on BLM lands and adjacent federal, state, and private lands in the Tendency Mountains in June and July, 1993. An asterisk (*) indicates an introduced species. Species for which there are voucher specimens deposited at MONTU are in bold; those with vouchers at MONT are italicized. 382 total taxa.

Aceraceae
Acer glabrum

Apiaceae
Cymopterus bipinnatus
Lomatium attenuatum
Lomatium cous
Lomatium foeniculaceum
Lomatium triternatum
Musineon divaricatum
Osmorhiza chilensis

Asteraceae
Achillea millefolium
Agoseris glauca
Antennaria anaphaloides
Antennaria microphylla
Antennaria parviflora
Antennaria racemosa
Arnica cordifolia
Arnica sorroria
Artemisia arbuscula
Artemisia cana
Artemisia dracunculus
Artemisia frigida
Artemisia ludoviciana
Artemisia michauxiana
Artemisia nova
Artemisia tridentata
Artemisia tripartita
Aster conspicuus
Aster laevis
Aster occidentalis
Aster scopulorum
Balsamorhiza sagittata
Brickellia grandiflora
Chrysothamnus nauseosus
Chrysothamnus viscidiflorus
Cirsium scariosum
Cirsium subniveum
Cirsium undulatum
Crepis acuminata
Crepis modocensis
Crepis nana
Crepis occidentalis

Crepis runcinata
Erigeron acris
Erigeron caespitosus
Erigeron compositus
Erigeron corymbosus
Erigeron glabellus
Erigeron gracilis
Erigeron lonchophyllus
Erigeron ochroleucus
Erigeron speciosus
Erigeron tweedyi
Grindelia squarrosa
Gutierrezia sarothrae
Haplopappus acaulis
Haplopappus integrifolius
Haplopappus macronema linearis
Haplopappus uniflorus
Helianthella uniflora
Hymenopappus filifolius
*Lactuca serriola**
Machaeranthera canescens
Senecio canus
Senecio crassulus
Senecio debilis
Senecio pauperculus
Senecio serra
Senecio streptanthifolius
Solidago missouriensis
Solidago multiradiata
Solidago spathulata
Sphaeromeria argentea
Sphaeromeria capitata
Stephanomeria runcinata
Taraxacum eriophorum
*Taraxacum laevigatum**
*Taraxacum officinale**
Tetradymia canescens
Townsendia hookeri
Townsendia parryi
Townsendia nuttallii
*Tragopogon dubius**

Berberidaceae
Berberis repens

Boraginaceae
Cryptantha celestioides
Cryptantha spiculifera
Cryptantha torreyana
Cryptantha watsonii
*Cynoglossum officinale**
Lappula echinata
Lappula redowskii
Lithospermum incisum
Lithospermum ruderales
Mertensia ciliata
Mertensia oblongifolia
Plagiobothrys scouleri

Brassicaceae
Arabis drummondii
Arabis hirsuta
Arabis holboellii
Arabis nuttallii
Descurainia pinnata
Descurainia richardsonii
*Descurainia sophia**
Draba cana
Draba nemorosa
Draba oligosperma
Erysimum asperum
Erysimum inconspicuum
Erysimum repandrum
Halimolobos virgata
Lepidium virginianum
Lesquerella alpina
Physaria didymocarpa
Schoenocrambe linifolia
*Sisymbrium altissimum**
Stanleya pinnata
Stanleya viridiflora
Thelypodium integrifolium
Thelypodium sagittatum
*Thlaspi arvense**
Thlaspi parviflorum

Cactaceae
Opuntia polyacantha
Pediocactus simpsonii

Caprifoliaceae
Symphoricarpos oreophilus

Caryophyllaceae
Arenaria capillaris
Arenaria kingii
Arenaria nuttallii

Cerastium arvense
Paronychia sessiliflora
Silene douglasii
Silene menziesii

Chenopodiaceae
Atriplex gardneri
Atriplex rosea
*Chenopodium album**
Chenopodium fremontii
Eurotia lanata
Monolepis nuttalliana
*Salsola kali**
Sarcobatus vermiculatus

Crassulaceae
Sedum lanceolatum

Cupressaceae
Juniperus communis
Juniperus scopulorum

Cyperaceae
Carex aquatilis
Carex aurea
Carex douglasii
Carex filifolia
Carex lanuginosa
Carex nebrascensis
Carex obtusata
Carex parryana idaho
Carex parryana parryana
Carex praegracilis
Carex rossii
Carex rostrata
Carex scirpoidea
Carex simulata
Eleocharis acicularis

Elaeagnaceae
Shepherdia canadensis

Ericaceae
Arctostaphylos uva-ursi
Pyrola secunda

Equisetaceae
Equisetum variegatum

Fabaceae
Astragalus adsurgens
Astragalus agrestis

Astragalus argophyllus
Astragalus atropubescens
Astragalus bisulcatus
Astragalus cibarius
Astragalus drummondii
Astragalus lentiginosus
Astragalus leptaleus
Astragalus miser
Astragalus purshii
Astragalus scaphoides
Astragalus terminalis
Lupinus wyethii
*Melilotus officinalis**
Oxytropis campestris
Oxytropis deflexa
Oxytropis lagopus
Oxytropis sericea
Oxytropis viscida
Thermopsis montana
*Trifolium hybridum**
Trifolium longipes

Fumariaceae
Corydalis aurea

Gentianaceae
Frasera speciosa
Gentiana affinis
Gentiana aquatica

Geraniaceae
Geranium viscosissimum

Grossulariaceae
Ribes cereum
Ribes lacustre
Ribes montigenum
Ribes setosum

Hippuridaceae
Hippuris vulgaris

Hydrophyllaceae
Phacelia franklinii
Phacelia hastata
Phacelia heterophylla
Phacelia linearis
Phacelia incana

Iridaceae
Iris missouriensis
Sisyrinchium angustifolium

Juncaceae
Juncus alpinus
Juncus balticus
Juncus bufonius
Juncus longistylis

Juncaginaceae
Triglochin maritima
Triglochin palustre

Lamiaceae
Agastache cusickii

Liliaceae
Allium brevistylum
Allium geyeri
Allium schoenoprasum
Allium textile
Disporum trachycarpum
Fritillaria atropurpurea
Smilacina stellata
Zigadenus venenosus

Linaceae
Linum perenne

Loasaceae
Mentzelia albicaulis
Mentzelia dispersa
Mentzelia laevicaulis

Malvaceae
Sphaeralcea coccinea

Onagraceae
Epilobium angustifolium
Epilobium glaberrimum
Epilobium palustre
Gayophytum humile
Gayophytum ramosissimum
Oenothera breviflora
Oenothera caespitosa

Orchidaceae
Habenaria hyperborea

Orobanchaceae
Orobanche corymbosa
Orobanche fasciculata

Pinaceae
Picea engelmannii

Pinus contorta
Pinus flexilis
Pseudotsuga menziesii

Poaceae

Agropyron caninum
Agropyron scribneri
Agropyron smithii
Agropyron spicatum
*Alopecurus pratensis**
Beckmannia syzigachne
*Bromus tectorum**
Calamagrostis montanensis
Calamagrostis neglecta
Catabrosa aquatica
Deschampsia cespitosa
Elymus cinereus
Elymus lanceolatus
Festuca idahoensis
Festuca occidentalis
Hesperocloa kingii
Hordeum brachyantherum
Hordeum jubatum
Koeleria cristata
Muhlenbergia richardsonis
Oryzopsis hymenoides
Poa cusickii
Poa interior
Poa nevadensis
*Poa pratensis**
Poa secunda
Puccinellia distans
Sitanion hystrix
Stipa comata
Stipa occidentalis

Polemoniaceae

Collomia linearis
Ipomopsis spicata
Leptodactylon pungens
Phlox hoodii
Phlox longifolia
Phlox multiflora
Phlox muscoides
Polemonium occidentale
Polemonium pulcherrimum

Polygonaceae

Eriogonum caespitosum
Eriogonum flavum
Eriogonum mancum

Eriogonum microthecum
Eriogonum ovalifolium var.
ovalifolium
Eriogonum ovalifolium var.
nevadense
Eriogonum umbellatum
*Polygonum aviculare**
Polygonum bistortoides
Polygonum douglasii
Polygonum kelloggii
Rumex occidentalis
Rumex salicifolius

Polypodiaceae

Cheilanthes feeii
Cystopteris fragilis

Portulacaceae

Lewisia rediviva
Lewisia pygmaea

Potamogetonaceae

Potamogeton pectinatus

Primulaceae

Androsace septentrionalis
Dodecatheon conjugens
Dodecatheon pulchellum
Glaux maritima
Primula incana

Ranunculaceae

Actaea rubra
Anemone drummondii
Anemone multifida
Delphinium andersonii
Delphinium bicolor
Delphinium glaucum
Delphinium occidentale
Myosurus aristatus
Ranunculus aquatilis
Ranunculus cymbalaria
Ranunculus glaberrimus
Ranunculus inamoenus
Ranunculus macounii
Ranunculus natans
Ranunculus sceleratus
Thalictrum alpinum
Thalictrum occidentale

Rosaceae

Cercocarpus ledifolius

Fragaria vesca
Geum macrophyllum
Geum triflorum
Ivesia gordonii
Petrophyton caespitosum
Potentilla anserina
Potentilla biennis
Potentilla diversifolia
Potentilla fruticosa
Potentilla glandulosa
Potentilla gracilis
Potentilla ovina
Potentilla pensylvanica
Prunus virginiana
Rosa woodsii
Rubus idaeus

Rubiaceae
Galium boreale

Salicaceae
Populus tremuloides
Populus trichocarpa
Salix bebbiana
Salix boothii
Salix exigua
Salix geyeriana
Salix lemmonii
Salix lutea
Salix melanopsis
Salix wolfii

Santalaceae
Commandra umbellata

Saxifragaceae
Conimitella williamsii
Heuchera cylindrica
Heuchera grossulariifolia
Heuchera parviflora
Lithophragma parviflorum
Saxifraga integrifolia
Saxifraga occidentalis
Saxifraga rhomboidea

Scrophulariaceae
Besseyia wyomingensis
Castilleja angustifolia
Castilleja hispida
Castilleja lutescens?
Castilleja miniata
Castilleja pallescens

Castilleja rustica?
Collinsia parviflora
Cordylanthus ramosus
Mimulus suksdorfii
Pedicularis contorta
Pedicularis groenlandica
Penstemon aridus
Penstemon attenuatus
Penstemon eriantherus
Penstemon fruticosus
Penstemon montanus
Penstemon procerus
Penstemon radicosus
Penstemon rydbergii
Veronica americana
Veronica peregrina

Selaginellaceae
Selaginella densa

Solanaceae
Hyocymus niger*
Solanum triflorum*

Sparganiaceae
Sparganium minimum

Urticaceae
Parietaria pensylvanica
Urtica dioica

Valerianaceae
Valeriana dioica
Valeriana edule
Valeriana occidentalis

Violaceae
Viola adunca
Viola nephrophylla
Viola nuttallii

APPENDIX C. Maps showing distribution of MPSSC in the study area.

Figure 2. Locations of *Agastache cusickii*

Figure 3. Locations of *Arenaria kingii*

Figure 4. Locations of *Astragalus argophyllus*

Figure 5. Locations of *Astragalus lentiginos*

Figure 6. Locations of *Astragalus leptaleus*

Figure 7. Locations of *Astragalus scaphoides*

Figure 8. Locations of *Astragalus terminalis*

Figure 9. Locations of *Carex parryana* ssp. *idahoensis*

Figure 10. Locations of *Cirsium subniveum*

Figure 11. Locations of *Delphinium bicolor* ssp. novum

Location of *Eriogonum caespitosum*

Figure 12. Locations of *Erigeron gracilis*

Figure 13. Locations of *Eriogonum ovalifolium* var. *nevadense*

Figure 14. Locations of *Gentiana aquatica*

Figure 14. Locations of *Gentiana aquatica*

Figure 16. Locations of *Haplopappus macronema* var. *linearis*

Figure 17. Locations of *Hutchinsia procumbens*

Figure 18. Locations of *Lomatium attenuatum*

Figure 19. Locations of *Mimulus suksdorfii*

Figure 20. Locations of *Pediocactus simpsonii*

Locations of *Penstemon lemhiensis*

Figure 21. Locations of *Phacelia incana*

Figure 22. Locations of *Senecio debilis*

Figure 23. Locations of *Sphaeromeria argentea*

Figure 24. Locations of *Sphaeromeria capitata*

Figure 25. Locations of *Stanleya viridiflora*

Figure 26. Locations of *Taraxacum eriophorum*

Figure 27. Locations of *Thalictrum alpinum*

Figure 28. Locations of *Thelypodium sagittatum*

Figure 29. Locations of *Thlaspi parviflorum*

Figure 30. Locations of *Townsendia nuttallii*

APPENDIX D. Element Occurrence Record printouts and topographic maps showing precise locations and population boundaries.

MONTANA NATURAL HERITAGE PROGRAM
Element Occurrence Record

Scientific Name: AGASTACHE CUSICKII
Common Name: CUSICK'S HORSE-MINT

Global rank: G3 Forest Service status:
State rank: S1 Federal Status: 3C

Element occurrence code: PDLAM03030.001
Element occurrence type:

Survey site name: UPPER BIG SHEEP CANYON
EO rank:
EO rank comments:

County: BEAVERHEAD

USGS quadrangle: CABOOSE CANYON

Township: Range: Section: TRS comments:
15S 010W 10 N2

Precision: M
Survey date: - - Elevation: 6790 -
First observation: 1985 Slope/aspect:
Last observation: 1989-06-26 Size (acres): 1

Location:
TENDRY MOUNTAINS, SLOPE ABOVE BIG SHEEP CREEK, 19 KM SW OF LIMA.

Element occurrence data:
COMMON; FIRST REPORT FOR MONTANA, A RANGE EXTENSION OF CA. 80 KM EAST
OF CENTRAL IDAHO.

General site description:
STEEP SOUTH-FACING SLOPE, IN LIMESTONE TALUS WITH ARTEMISIA TRIDENTATA
AND ORYZOPSIS HYMENOIDES.

Land owner/manager:
BLM: BUTTE DISTRICT, DILLON RESOURCE AREA

Comments:
SPECIMEN VERIFIED BY A. CRONQUIST, NY.

Information source: LESICA, P., K. LACKSCHEWITZ, J. PIERCE, S. GREGORY
AND M. O'BRIEN. 1986. NOTEWORTHY COLLECTIONS:
MONTANA. MADRONO 33:310-312.

Specimens: LESICA, P. (3519). 1985. MONTU. MONT. NY.

MONTANA NATURAL HERITAGE PROGRAM
Element Occurrence Record

Scientific Name: ASTRAGALUS SCAPHOIDES
Common Name: BITTERROOT MILKVETCH

Global rank: G3 Forest Service status:
State rank: S1 Federal Status: 3C

Element occurrence code: PDFAB0F7V0.010
Element occurrence type:

Survey site name: JOHNSON GULCH
EO rank: A
EO rank comments: LARGE POPULATION.

County: BEAVERHEAD

USGS quadrangle: DEER CANYON

Township: Range: Section: TRS comments:
011S 011W 20 E2

Precision: S
Survey date: 1993-07-27 Elevation: 6800 -
First observation: 1993-07-27 Slope/aspect: 5% / SW
Last observation: 1993-07-27 Size (acres): 20

Location:

GO WEST FROM CLARK CANYON RESERVOIR TO MEDICINE LODGE ROAD. GO SOUTH
CA. 11 MILES TO JOHNSON GULCH ROAD, THEN EAST CA. 2 MILES.

Element occurrence data:
1000-5000 PLANTS, SOME FLOWERING, MOSTLY FRUIT.

General site description:

DRY, OPEN LOWER SLOPE, NON-GLACIATED MOUNTAIN VALLEY. LIMESTONE PARENT
MATERIAL, LOAM SOIL. ASSOCIATED SPECIES: ARTEMISIA TRIPARTITA, FESTUCA
IDAHOENSIS, A. SPICATUM, CHRYSOTHAMNUS NAUSEOSUS, CAREX FILIFOLIA,
ANTENNARIA MICROPHYLLA.

Land owner/manager:

BLM: BUTTE DISTRICT, DILLON RESOURCE AREA

Comments:

SOME EVIDENCE OF CATTLE DISTURBANCE; SOME INFLORESCENCE PREDATION
NOTED.

Information source: LESICA, PETER. DIVISION OF BIOLOGICAL SCIENCES,
UNIVERSITY OF MONTANA, MISSOULA, MT 59812.

Specimens: LESICA, P. (6129). 1993.

MONTANA NATURAL HERITAGE PROGRAM
Element Occurrence Record

Scientific Name: ASTRAGALUS TERMINALIS
Common Name: RAILHEAD MILKVETCH

Global rank: G3G4 Forest Service status:
State rank: S2 Federal Status:

Element occurrence code: PDFAB0F8U0.008
Element occurrence type:

Survey site name: LIMEKILN CANYON
EO rank: A
EO rank comments: NO EVIDENCE OF DISTURBANCE.

County: BEAVERHEAD

USGS quadrangle: GARFIELD CANYON

Township: Range: Section: TRS comments:
011S 011W 01 NW4SE4

Precision: S
Survey date: 1993-06-08 Elevation: 6240 -
First observation: 1993-06-08 Slope/aspect: 25% / NE
Last observation: 1993-06-08 Size (acres): 3

Location:
FROM I-15 TAKE RED ROCK EXIT AND GO NORTH ON WEST SIDE OF HIGHWAY FOR
2.5 MILES. GO LEFT FOR 0.4 MILE, THEN LEFT AND FOLLOW ROAD FOR 2
MILES. TAKE TWO-TRACK ON RIGHT UP TO LIMEKILN CANYON.

Element occurrence data:
500-1000 PLANTS, 40% FLOWERING, 60% IN BUD.

General site description:
DRY, OPEN MID TO LOWER SLOPE, UNGLACIATED UPLANDS. LIMESTONE PARENT
MATERIAL, SILTY SOIL. ASSOCIATED SPECIES: FESTUCA IDAHOENSIS,
AGROPYRON SPICATUM, CHRYSOTHAMNUS NAUSEOSUS, PHLOX HOODII, CASTILLEJA
PALLESCENS, LESQUERELLA ALPINA.

Land owner/manager:
BLM: BUTTE DISTRICT, DILLON RESOURCE AREA

Comments:

Information source: LESICA, PETER. DIVISION OF BIOLOGICAL SCIENCES,
UNIVERSITY OF MONTANA, MISSOULA, MT 59812.

Specimens: LESICA, P. (5991). 1993. MONTU.

MONTANA NATURAL HERITAGE PROGRAM
Element Occurrence Record

Scientific Name: CAREX PARRYANA SSP. IDAHOA
Common Name: IDAHO SEDGE

Global rank: G2Q Forest Service status: SENSITIVE
State rank: S2 Federal Status: 3C

Element occurrence code: PMCYP036E0.003
Element occurrence type:

Survey site name: LOWER POISON LAKE
EO rank:
EO rank comments:

County: BEAVERHEAD

USGS quadrangle: DEER CANYON

Township: Range: Section: TRS comments:
011S 011W 26 SW4

Precision: S
Survey date: 1984-08-26 Elevation: 8200 -
First observation: 1984 Slope/aspect:
Last observation: 1984-08-26 Size (acres): 0

Location:
TENDON MOUNTAINS, WEST END OF LOWER POISON LAKE, CA. 10 MILES SOUTH OF
CLARK CANYON RESERVOIR.

Element occurrence data:
COMMON.

General site description:
FEN, WITH CAREX AQUATILIS AND C. SIMULATA.

Land owner/manager:
STATE LAND - UNDESIGNATED

Comments:

Information source: LESICA, PETER. DIVISION OF BIOLOGICAL SCIENCES,
UNIVERSITY OF MONTANA, MISSOULA, MT 59812.

Specimens: LESICA, P. (3288). 1984. SPECIMEN #89087. MONTU.

MONTANA NATURAL HERITAGE PROGRAM
Element Occurrence Record

Scientific Name: CAREX PARRYANA SSP. IDAHOA
Common Name: IDAHO SEDGE

Global rank: G2Q Forest Service status: SENSITIVE
State rank: S2 Federal Status: 3C

Element occurrence code: PMCYP036E0.005
Element occurrence type:

Survey site name: MORRISON LAKE WETLANDS
EO rank: B
EO rank comments: PROBABLY A FAIRLY LARGE POPULATION.

County: BEAVERHEAD

USGS quadrangle: MORRISON LAKE

Township: Range: Section: TRS comments:
014S 012W 23 NE4SW4

Precision: S
Survey date: 1990-07-30 Elevation: 8200 -
First observation: 1990 Slope/aspect: 0-3% / LEVEL
Last observation: 1990-07-30 Size (acres): 1

Location:

TAKE DELL EXIT OFF I-15 SOUTH OF DILLON. PROCEED SOUTH ON FRONTAGE ROAD TO BIG SHEEP CREEK ROAD (#257), AND FOLLOW THIS ROAD CA. 30 MILES TO MORRISON LAKE ROAD. PROCEED TO HEAD OF INDIAN CREEK; WETLANDS ARE SOUTHEAST OF LAKE.

Element occurrence data:

51-100 PLANTS IN FRUIT; MAY BE MORE COMMON THAN SURVEY INDICATED.

General site description:

POTENTILLA FRUTICOSA/JUNCUS BALTICUS COMMUNITY. ASSOCIATED SPECIES: ASTER OCCIDENTALIS, THALICTRUM ALPINUM, MUHLENBERGIA RICHARDSONIS, SENEIO FOETIDUS, CAREX SCIRPOIDEA, C. PRAEGRACILIS.

Land owner/manager:

BEAVERHEAD NATIONAL FOREST, DILLON RANGER DISTRICT

Comments:

ROADS AND GRAZING IN AREA. COMPLETE PLANT SPECIES LIST AND MANAGEMENT RECOMMENDATIONS CONTAINED IN A REPORT BY P. LESICA TO THE BEAVERHEAD NATIONAL FOREST (1990), ON FILE AT MTNHP.

Information source: LESICA, PETER. DIVISION OF BIOLOGICAL SCIENCES, UNIVERSITY OF MONTANA, MISSOULA, MT 59812.

Specimens: LESICA, P. (4979). 1990. MONTU.

MONTANA NATURAL HERITAGE PROGRAM
Element Occurrence Record

Scientific Name: CAREX PARRYANA SSP. IDAHOA
Common Name: IDAHO SEDGE

Global rank: G2Q Forest Service status: SENSITIVE
State rank: S2 Federal Status: 3C

Element occurrence code: PMCYP036E0.009
Element occurrence type:

Survey site name: MEADOW CREEK
EO rank: D-B
EO rank comments: WESTERN SUBPOPULATION IS SMALL AND HEAVILY-GRAZED;
EASTERN SUBPOPULATION IS RELATIVELY LARGE WITH
SOME GRAZING.

County: BEAVERHEAD

USGS quadrangle: CABOOSE CANYON

Township: Range: Section: TRS comments:
015S 010W 08 NW4; 9 W2

Precision: S
Survey date: 1993-07-10 Elevation: 6840 - 6880
First observation: 1993-07-10 Slope/aspect: LEVEL
Last observation: 1993-07-10 Size (acres): 12

Location:
FROM DELL, TAKE BIG SHEEP CREEK ROAD TO MEADOW CREEK ROAD, THEN TAKE
MEADOW CREEK ROAD 1 MILE WEST (WESTERN SUBPOPULATION). EASTERN
SUBPOPULATION IS LOCATED NEAR CROSSING OF DEADMAN ROAD AND NICHOLIA
CREEK.

Element occurrence data:
2 SUBPOPULATIONS. WESTERN: 50 PLANTS, IMMATURE FRUIT. EASTERN: 200-500
PLANTS, IMMATURE FRUIT.

General site description:
OPEN, MOIST FLOODPLAIN BOTTOM, CALCAREOUS PARENT MATERIAL, SILTY SOIL.
ASSOCIATED SPECIES: JUNCUS BALTICUS, CAREX PRAEGRACILIS, DESCHAMPSIA
CESPITOSA, ASTER OCCIDENTALIS, POTENTILLA GRACILIS, CREPIS RUNCINATA.

Land owner/manager:
PRIVATELY OWNED LAND (INDIVIDUAL OR CORPORATE)
BLM: BUTTE DISTRICT, DILLON RESOURCE AREA

Comments:

Information source: LESICA, PETER. DIVISION OF BIOLOGICAL SCIENCES,
UNIVERSITY OF MONTANA, MISSOULA, MT 59812.

MONTANA NATURAL HERITAGE PROGRAM
Element Occurrence Record

Scientific Name: CAREX PARRYANA SSP. IDAHOA
Common Name: IDAHO SEDGE

Global rank: G2Q Forest Service status: SENSITIVE
State rank: S2 Federal Status: 3C

Element occurrence code: PMCYP036E0.010
Element occurrence type:

Survey site name: MUDDY CREEK
EO rank:
EO rank comments:

County: BEAVERHEAD

USGS quadrangle: DIXON MOUNTAIN

Township: Range: Section: TRS comments:
013S 010W 07 NW4

Precision: S
Survey date: Elevation: 6960 -
First observation: 1993-07-09 Slope/aspect: LEVEL
Last observation: 1993-07-09 Size (acres): 1

Location:
FROM DELL, TAKE BIG SHEEP CREEK ROAD TO MUDDY CREEK, AND CONTINUE ON
MUDDY CREEK ROAD TO WILSON CREEK ROAD. CONTINUE CA. 3 MILES ON WILSON
CREEK ROAD.

Element occurrence data:
100-500 PLANTS, IMMATURE FRUIT.

General site description:
MOIST, OPEN FLOODPLAIN BOTTOM. SHALE PARENT MATERIAL, SILTY SOIL.
ASSOCIATED SPECIES: JUNCUS BALTICUS, DESCHAMPSIA CESPITOSA, CAREX
PRAEGRACILIS, CREPIS RUNCINATA, VALERIANA EDULE, POTENTILLA ANSERINA.

Land owner/manager:
PRIVATELY OWNED LAND (INDIVIDUAL OR CORPORATE)
BLM: BUTTE DISTRICT, DILLON RESOURCE AREA

Comments:
SOME DISTURBANCE FROM CATTLE.

Information source: LESICA, PETER. DIVISION OF BIOLOGICAL SCIENCES,
UNIVERSITY OF MONTANA, MISSOULA, MT 59812.

Specimens:

MONTANA NATURAL HERITAGE PROGRAM
Element Occurrence Record

Scientific Name: CAREX PARRYANA SSP. IDAHOA
Common Name: IDAHO SEDGE

Global rank: G2Q Forest Service status: SENSITIVE
State rank: S2 Federal Status: 3C

Element occurrence code: PMCYP036E0.011
Element occurrence type:

Survey site name: SOURDOUGH CREEK
EO rank:
EO rank comments:

County: BEAVERHEAD

USGS quadrangle: GRAPHITE MOUNTAIN

Township: Range: Section: TRS comments:
012S 010W 31 SW4SW4

Precision: S
Survey date: Elevation: 7160 -
First observation: 1993-07-09 Slope/aspect: LEVEL
Last observation: 1993-07-09 Size (acres): 1

Location:

FROM DELL, TAKE BIG SHEEP CREEK ROAD TO MUDDY CREEK AND GO NORTH TO
WILSON CREEK ROAD. CONTINUE ON MAIN ROAD 0.5 MILE.

Element occurrence data:
CA. 100 PLANTS, IN YOUNG FRUIT.

General site description:

MOIST, OPEN FLOODPLAIN BOTTOM, SHALE PARENT MATERIAL, SILTY SOIL.
ASSOCIATED SPECIES: POTENTILLA FRUTICOSA, JUNCUS BALTICUS, DESCHAMPSIA
CESPITOSA, ANTENNARIA MICROPHYLLA, AGROPYRON CANINUM, CREPIS
RUNCINATA.

Land owner/manager:
BLM: BUTTE DISTRICT, DILLON RESOURCE AREA

Comments:
SOME CATTLE DISTURBANCE.

Information source: LESICA, PETER. DIVISION OF BIOLOGICAL SCIENCES,
UNIVERSITY OF MONTANA, MISSOULA, MT 59812.

Specimens: LESICA, P. (6066). 1993. MONTU.

MONTANA NATURAL HERITAGE PROGRAM
Element Occurrence Record

Scientific Name: DELPHINIUM BICOLOR SSP NOVUM
Common Name: UNDESCRIBED LARKSPUR

Global rank: G3 Forest Service status:
State rank: S3 Federal Status:

Element occurrence code: PDRANNOV01.007
Element occurrence type:

Survey site name: CLARK CANYON RESERVOIR
EO rank: B
EO rank comments: LARGE POPULATION; SUBDIVISION NEARBY.

County: BEAVERHEAD

USGS quadrangle: RED ROCK

Township: Range: Section: TRS comments:
010S 010W 29 SW4; 30 SE4; 31 NE4; 32 NW4

Precision: S
Survey date: 1993-06-08 Elevation: 5640 - 5960
First observation: 1993-06-08 Slope/aspect: 10% / SOUTH
Last observation: 1993-06-08 Size (acres): 300

Location:

FROM I-15 TAKE RED ROCK EXIT AND HEAD NORTH ALONG WEST SIDE OF
INTERSTATE FOR 2.5 MILES. TURN LEFT AND PROCEED FOR 0.4 MILE TO
LIMESTONE HILLS.

Element occurrence data:

1000-10,000 PLANTS, 70% FLOWERING, 30% IN BUD.

General site description:

DRY, OPEN MID- TO UPPER SLOPE, NON-GLACIATED UPLANDS. LIMESTONE PARENT
MATERIAL, SHALLOW GRAVELLY SOIL. ASSOCIATED SPECIES: AGROPYRON
SPICATUM, POA SECUNDA, PENSTEMON ARIDUS, GUTIERREZIA SAROTHRAE,
OPUNTIA POLYACANTHA, ARTEMISIA FRIGIDA.

Land owner/manager:

PRIVATELY OWNED LAND (INDIVIDUAL OR CORPORATE)
BLM: BUTTE DISTRICT, DILLON RESOURCE AREA
CLARK CANYON RESERVOIR

Comments:

LITTLE DISTURBANCE IN AREA. P. LESICA NOTES THAT PLANT IS PROBABLY
COMMON ALL AROUND CLARK CANYON RESERVOIR.

Information source: LESICA, PETER. DIVISION OF BIOLOGICAL SCIENCES,
UNIVERSITY OF MONTANA, MISSOULA, MT 59812.

Specimens: LESICA, P. (5989). 1993. MONTU.

MONTANA NATURAL HERITAGE PROGRAM
Element Occurrence Record

Scientific Name: DELPHINIUM BICOLOR SSP NOVUM
Common Name: UNDESCRIBED LARKSPUR

Global rank: G3 Forest Service status:
State rank: S3 Federal Status:

Element occurrence code: PDRANNOV01.008
Element occurrence type:

Survey site name: LIMEKILN CANYON
EO rank: AB
EO rank comments: MEDIUM-SIZED POPULATION, LOCATED WITHIN WILDERNESS
STUDY AREA.

County: BEAVERHEAD

USGS quadrangle: GARFIELD CANYON

Township: Range: Section: TRS comments:
011S 011W 01 NW4SE4

Precision: S
Survey date: 1993-06-08 Elevation: 6200 - 6360
First observation: 1993-06-08 Slope/aspect: 30% / SOUTHWEST
Last observation: 1993-06-08 Size (acres): 5

Location:
FROM I-15 TAKE RED ROCK EXIT AND GO NORTH ALONG WEST SIDE OF
INTERSTATE FOR 2.5 MILES. GO WEST 0.4 MILE, THEN SOUTH AND EAST FOR
CA. 2 MILES. GO RIGHT AND FOLLOW MAIN TRAIL INTO LIMEKILN CANYON.

Element occurrence data:
CA. 1000 PLANTS, 70% FLOWERING, 30% IN BUD.

General site description:
DRY, OPEN MID- TO UPPER SLOPE, UNGLACIATED HILLS. LIMESTONE PARENT
MATERIAL, SHALLOW GRAVELLY SOIL. ASSOCIATED SPECIES: CERCOCARPUS
LEDIFOLIUS, AGROPYRON SPICATUM, CHRYSOTHAMNUS NAUSEOSUS, POA SECUNDA,
ALLIUM TEXTILE, ARTEMISIA FRIGIDA.

Land owner/manager:
BLM: BUTTE DISTRICT, DILLON RESOURCE AREA

Comments:

Information source: LESICA, PETER. DIVISION OF BIOLOGICAL SCIENCES,
UNIVERSITY OF MONTANA, MISSOULA, MT 59812.

Specimens:

MONTANA NATURAL HERITAGE PROGRAM
Element Occurrence Record

Scientific Name: HALIMOLOBOS VIRGATA
Common Name: TWIGGY HALIMOLOBOS

Global rank: G2G3 Forest Service status:
State rank: S1 Federal Status: 3C

Element occurrence code: PDBRA1A040.003
Element occurrence type:

Survey site name: PILEUP CANYON
EO rank: C
EO rank comments: SMALL POPULATION.

County: BEAVERHEAD

USGS quadrangle: CABOOSE CANYON

Township: Range: Section: TRS comments:
014S 010W 33 NW4NW4

Precision: S
Survey date: 1993-07-13 Elevation: 7520 - 7600
First observation: 1993-07-13 Slope/aspect: 25% / SOUTHWEST
Last observation: 1993-07-13 Size (acres): 5

Location:
FROM DELL, TAKE BIG SHEEP CREEK ROAD TO CABIN CREEK ROAD. CONTINUE CA.
0.75 MILE TO PILEUP CANYON; WALK UP CANYON.

Element occurrence data:
CA. 100 PLANTS, MAINLY FRUITING.

General site description:
DRY, PARTIALLY SHADED UPPER SLOPE, LIMESTONE PARENT MATERIAL, STONY
SOIL. ASSOCIATED SPECIES: CERCOCARPUS LEDIFOLIUS, AGROPYRON SPICATUM,
ARTEMISIA TRIDENTATA, ORYZOPSIS HYMENOIDES, CHRYSOTHAMNUS
VISCIDIFLORUS.

Land owner/manager:
BLM: BUTTE DISTRICT, DILLON RESOURCE AREA

Comments:

Information source: LESICA, PETER. DIVISION OF BIOLOGICAL SCIENCES,
UNIVERSITY OF MONTANA, MISSOULA, MT 59812.

Specimens: LESICA, P. (6108). 1993. MONTU.

MONTANA NATURAL HERITAGE PROGRAM
Element Occurrence Record

Scientific Name: HALIMOLOBOS VIRGATA
Common Name: TWIGGY HALIMOLOBOS

Global rank: G2G3 Forest Service status:
State rank: S1 Federal Status: 3C

Element occurrence code: PDBRA1A040.004
Element occurrence type:

Survey site name: LIMEKILN CANYON
EO rank: B
EO rank comments:

County: BEAVERHEAD

USGS quadrangle: RED ROCK

Township: Range: Section: TRS comments:
010S 010W 32 SE4SE4; 33 NW4SW4SW4

Precision: S
Survey date: 1993-06-08 Elevation: 5640 -
First observation: 1993-06-08 Slope/aspect: LEVEL
Last observation: 1993-06-08 Size (acres): 4

Location:

TAKE RED ROCK EXIT OFF I-15 AND GO NORTH ON WEST SIDE OF HIGHWAY FOR 2.5 MILES. GO WEST 0.4 MILE, THEN LEFT AND FOLLOW ROAD FOR CA. 2 MILES. TAKE TWO-TRACK ON RIGHT AND FOLLOW TO BOTTOM OF DRAW.

Element occurrence data:
100-500 PLANTS, MAINLY IN FRUIT.

General site description:

OPEN TERRACE BOTTOM, MOIST IN SPRING. LIMESTONE PARENT MATERIAL, SILTY SOIL. ASSOCIATED SPECIES: ARTEMISIA TRIDENTATA, AGROPYRON SMITHII, CHRYSOTHAMNUS VISCIDIFLORUS, ARABIS HOLBOELII.

Land owner/manager:

BLM: BUTTE DISTRICT, DILLON RESOURCE AREA
PRIVATELY OWNED LAND (INDIVIDUAL OR CORPORATE)

Comments:

DISTURBANCE BY LIVESTOCK USE AND WEEDS.

Information source: LESICA, PETER. DIVISION OF BIOLOGICAL SCIENCES,
UNIVERSITY OF MONTANA, MISSOULA, MT 59812.

Specimens: LESICA, P. (5987). 1993. MONTU.

MONTANA NATURAL HERITAGE PROGRAM
Element Occurrence Record

Scientific Name: HAPLOPAPPUS MACRONEMA VAR LINEARIS
Common Name: LINEAR-LEAVED DISCOID GOLDENWEED

Global rank: G4T? Forest Service status:
State rank: S2 Federal Status:

Element occurrence code: PDAST4F0U3.003
Element occurrence type:

Survey site name: NICHOLIA CREEK
EO rank: B
EO rank comments: LARGE POPULATION, HABITAT DEGRADED BY GRAZING.

County: BEAVERHEAD

USGS quadrangle: CABOOSE CANYON

Township: Range: Section: TRS comments:
015S 010W 16 SW4

Precision: S
Survey date: 1993-07-26 Elevation: 6960 -
First observation: 1993-07-26 Slope/aspect: LEVEL
Last observation: 1993-07-26 Size (acres): 20

Location:
FROM MONIDA, GO EAST CA. 3.5 MILES ON ROAD TO RED ROCK LAKE. GO NORTH
ON TWO-TRACK 0.25 MILE PAST GATE.

Element occurrence data:
500+ PLANTS, EARLY FLOWER BUD.

General site description:
OPEN, MOIST LOWER SLOPE GLACIAL VALLEY. CALCAREOUS PARENT MATERIAL,
SILTY SOIL. ASSOCIATED SPECIES: ARTEMISIA TRIPARTITA, FESTUCA
IDAHOENSIS, POA PRATENSIS, JUNCUS BALTICUS, POA NEVADENSIS, IRIS
MISSOURIENSIS, ANTENNARIA MICROPHYLLA.

Land owner/manager:
BLM: BUTTE DISTRICT, DILLON RESOURCE AREA

Comments:
DISTURBANCE BY CATTLE AND TRAILS.

Information source: LESICA, PETER. DIVISION OF BIOLOGICAL SCIENCES,
UNIVERSITY OF MONTANA, MISSOULA, MT 59812.

Specimens:

MONTANA NATURAL HERITAGE PROGRAM
Element Occurrence Record

Scientific Name: HUTCHINSIA PROCUMBENS
Common Name: HUTCHINSIA

Global rank: G5 Forest Service status:
State rank: S1 Federal Status:

Element occurrence code: PDBRA2Z010.001
Element occurrence type:

Survey site name: UPPER BIG SHEEP CANYON
EO rank:
EO rank comments:

County: BEAVERHEAD

USGS quadrangle: CABOOSE CANYON

Township: Range: Section: TRS comments:
015S 010W 10

Precision:	M	
Survey date:		Elevation: 6855 -
First observation:	1986	Slope/aspect:
Last observation:	1986-06-13	Size (acres):

Location:
TENDRY MOUNTAINS, NORTH SIDE OF UPPER BIG SHEEP CREEK CANYON, 20 KM SW
OF LIMA.

Element occurrence data:
LOCALLY COMMON.

General site description:
BENEATH SAGEBRUSH ON A STEEP, WEST-FACING, LIMESTONE TALUS SLOPE.

Land owner/manager:
BLM: BUTTE DISTRICT, DILLON RESOURCE AREA
PRIVATELY OWNED LAND (INDIVIDUAL OR CORPORATE)

Comments:
1989-06-26: AREA SEARCHED BRIEFLY; POPULATION NOT RELOCATED.

Information source: LESICA, PETER. DIVISION OF BIOLOGICAL SCIENCES,
UNIVERSITY OF MONTANA, MISSOULA, MT 59812.

Specimens: LESICA, P. (3834). 1986. MONTU. VER. R. ROLLINS, GH.

MONTANA NATURAL HERITAGE PROGRAM
Element Occurrence Record

Scientific Name: LOMATIUM ATTENUATUM
Common Name: TAPER-TIP DESERT-PARSLEY

Global rank: G3 Forest Service status:
State rank: S1 Federal Status: C2

Element occurrence code: PDAPI1B240.001
Element occurrence type:

Survey site name: DEER CANYON
EO rank: B
EO rank comments: MAY BE SMALL POPULATION.

County: BEAVERHEAD

USGS quadrangle: DEER CANYON

Township: Range: Section: TRS comments:
011S 011W 20 SE4; 21 SW4

Precision: S
Survey date: 1993-07-27 Elevation: 7200 - 7600
First observation: 1993-07-27 Slope/aspect: 20% / WEST
Last observation: 1993-07-27 Size (acres): 10

Location:
GO WEST FROM CLARK CANYON RESERVOIR TO MEDICINE LODGE ROAD. GO SOUTH
CA. 11 MILES TO JOHNSON GULCH ROAD, THEN EAST CA. 2 MILES.

Element occurrence data:
CA. 200 PLANTS, MATURE FRUIT.

General site description:
OPEN TO PARTIAL SHADE, DRY UPPEXSLOPE. LIMESTONE PARENT MATERIAL,
SANDY SOIL. ASSOCIATED SPECIES: CERCOCARPUS LEDIFOLIUS, AGROPYRON
SPICATUM, ARTEMISIA TRIDENTATA, PENSTEMON ARIDUS, ORYZOPSIS
HYMENOIDES.

Land owner/manager:
BLM: BUTTE DISTRICT, DILLON RESOURCE AREA

Comments:
ENTIRE AREA OF SUITABLE HABITAT NOT SURVEYED.

Information source: LESICA, PETER. DIVISION OF BIOLOGICAL SCIENCES,
UNIVERSITY OF MONTANA, MISSOULA, MT 59812.

Specimens: LESICA, P. (6127). 1993. MONTU.

MONTANA NATURAL HERITAGE PROGRAM
Element Occurrence Record

Scientific Name: LOMATIUM ATTENUATUM
Common Name: TAPER-TIP DESERT-PARSLEY

Global rank: G3 Forest Service status:
State rank: S1 Federal Status: C2

Element occurrence code: PDAP11B240.002
Element occurrence type:

Survey site name: LIMEKILN CANYON
EO rank: A
EO rank comments: MAY BE ADDITIONAL UNMAPPED SUBPOPULATIONS.
County: BEAVERHEAD

USGS quadrangle: GARFIELD CANYON
RED ROCK

Township:	Range:	Section:	TRS comments:
011S	011W	01	CENTER; 02 SE4
011S	010W	06	NW4

Precision:	S	
Survey date:	1993-07-11	Elevation: 6200 - 7040
First observation:	1993-07-11	Slope/aspect: 20-35% / S - W
Last observation:	1993-07-11	Size (acres): 20

Location:
FROM RED ROCK GO SOUTH ON FRONTAGE ROAD, THEN WEST AND NORTH ON COUNTY ROAD. TAKE LIMEKILN CANYON ROAD INTO CANYON.

Element occurrence data:
500-2000 PLANTS WITH AT LEAST 5 SUBPOPULATIONS. MATURE FRUIT.

General site description:
DRY, OPEN TO PARTIAL SHADE, NON-GLACIATED MOUNTAIN LOWERSLOPE.
LIMESTONE PARENT MATERIAL, SANDY SOIL. ASSOCIATED SPECIES: PSEUDOTSUGA
MENZIESII, CERCOCARPUS LEDIFOLIUS, BERBERIS REPENS, AGROPYRON
SPICATUM.

Land owner/manager:
BLM: BUTTE DISTRICT, DILLON RESOURCE AREA

Comments:
ONLY KNOWN POPULATION IN MONTANA.

Information source: LESICA, PETER. DIVISION OF BIOLOGICAL SCIENCES,
UNIVERSITY OF MONTANA, MISSOULA, MT 59812.

Specimens: LESICA, P. (5990, 6078, 6081). 1993.

MONTANA NATURAL HERITAGE PROGRAM
Element Occurrence Record

Scientific Name: PENSTEMON LEMHIENSIS

Common Name: LEMHI BEARDTONGUE

Global rank: G3 Forest Service status: SENSITIVE

State rank: S2 Federal Status: C2

Element occurrence code: PDSCR1L3N0.008

Element occurrence type:

Survey site name: JOHNSON GULCH

EO rank:

EO rank comments:

County: BEAVERHEAD

USGS quadrangle: DEER CANYON

Township: Range: Section: TRS comments:

011S 011W 18 SE4

Precision: M

Survey date: 1984-07-06 Elevation: 6500 -

First observation: 1984 Slope/aspect:

Last observation: 1984-07-06 Size (acres): 0

Location:

NORTH SIDE OF JOHNSON GULCH, ALONG THE ROAD CA. 10 MI. SE. OF GRANT.

Element occurrence data:

ONE PLANT (SPECIMEN IS ONE TOPSNATCHED STEM).

General site description:

SILTY SOIL OF A BENCH; WITH ARTEMISIA TRIDENTATA AND AGROPYRON
SPICATUM.

Land owner/manager:

BLM: BUTTE DISTRICT, DILLON RESOURCE AREA

Comments:

Information source: LESICA, PETER. DIVISION OF BIOLOGICAL SCIENCES,
UNIVERSITY OF MONTANA, MISSOULA, MT 59812.

Specimens: LESICA, P. (3110). 1984. SPECIMEN #06215. MONTU.

MONTANA NATURAL HERITAGE PROGRAM
Element Occurrence Record

Scientific Name: PENSTEMON LEMHIENSIS
Common Name: LEMHI BEARDTONGUE

Global rank: G3 Forest Service status: SENSITIVE
State rank: S2 Federal Status: C2

Element occurrence code: PDSCR1L3N0.022
Element occurrence type:

Survey site name: MEDICINE LODGE CREEK
EO rank:
EO rank comments:

County: BEAVERHEAD

USGS quadrangle: TEPEE MOUNTAIN

Township: Range: Section: TRS comments:
013S 012W 03 SE4NE4, NE4SE4

Precision: S
Survey date: 1987- - Elevation: 6970 -
First observation: 1987 Slope/aspect:
Last observation: 1987- - Size (acres): 20

Location:
MEDICINE LODGE CREEK DRAINAGE, 0.15 AIR MILES WNW OF CONFLUENCE OF
MEDICINE LODGE AND HILDRETH CREEKS, CA. 19 AIR MILES SOUTH OF GRANT.

Element occurrence data:
UNKNOWN; POPULATION REPORTED TO BE LARGE BY J. CHRISTENSEN.

General site description:
UNKNOWN; SPECIES OFTEN OCCURS IN SAGEBRUSH/BUNCHGRASS HABITATS AT
HIGHER ELEVATIONS.

Land owner/manager:
PRIVATELY OWNED LAND (INDIVIDUAL OR CORPORATE)

Comments:
SITE REPORTED BY J. CHRISTENSEN, BEAVERHEAD NATIONAL FOREST;
IDENTIFICATION UNCERTAIN - DURING SURVEYS IN 1989, ONLY P. RADICOSUS
WAS FOUND IN THE AREA (SCHASSBERGER).

Information source: CHRISTENSEN, JIM. BEAVERHEAD NATIONAL FOREST,
DILLON RANGER DISTRICT, 420 BARRETT STREET,
DILLON, MT 59725-3572. PHONE: 406/683-3959.

Specimens:

MONTANA NATURAL HERITAGE PROGRAM
Element Occurrence Record

Scientific Name: PHACELIA INCANA
Common Name: HOARY PHACELIA

Global rank: G3 Forest Service status:
State rank: S1 Federal Status:

Element occurrence code: PDHYD0C270.001
Element occurrence type:

Survey site name: JOHNSON GULCH
EO rank:
EO rank comments:

County: BEAVERHEAD

USGS quadrangle: DEER CANYON

Township: Range: Section: TRS comments:
011S 011W 17 SE4

Precision: M
Survey date: 1984-07-06 Elevation: 7085 -
First observation: 1984 Slope/aspect:
Last observation: 1984-07-06 Size (acres): 0

Location:
TENDRY MOUNTAINS, ABOVE JOHNSON GULCH 16 KM SE OF GRANT.

Element occurrence data:
COMMON.

General site description:
EAST-FACING LIMESTONE SCREE SLOPE, WITH MIMULUS SUKSDORFII.

Land owner/manager:
BLM: BUTTE DISTRICT, DILLON RESOURCE AREA

Comments:
SPECIMEN VERIFIED BY A. CRONQUIST, NY.

Information source: LESICA, PETER. DIVISION OF BIOLOGICAL SCIENCES,
UNIVERSITY OF MONTANA, MISSOULA, MT 59812.

Specimens: LESICA, P. (93105). 1984. MONTU. NY.

MONTANA NATURAL HERITAGE PROGRAM
Element Occurrence Record

Scientific Name: PHACELIA INCANA
Common Name: HOARY PHACELIA

Global rank: G3 Forest Service status:
State rank: S1 Federal Status:

Element occurrence code: PDHYD0C270.002
Element occurrence type:

Survey site name: UPPER BIG SHEEP CANYON
EO rank: B
EO rank comments: EXCELLENT CONDITION HABITAT.

County: BEAVERHEAD

USGS quadrangle: CABOOSE CANYON

Township: Range: Section: TRS comments:
015S 010W 10 N2

Precision: M
Survey date: 1986-06-13 Elevation: 6800 -
First observation: 1986 Slope/aspect: 40 % / SOUTH
Last observation: 1989-06-26 Size (acres): 0

Location:
TENDON MOUNTAINS, NORTH SIDE OF UPPER BIG SHEEP CREEK CANYON.

Element occurrence data:
COMMON, 101-1000 INDIVIDUALS (13 JUNE 1986).

General site description:
BENEATH SCATTERED SAGEBRUSH ON STEEP LIMESTONE TALUS SLOPE; WITH
ARTEMISIA TRIDENTATA, MIMULUS SUKSDORFII, CRYPTANTHA WATSONII,
DESCURAINIA SP.

Land owner/manager:
BLM: BUTTE DISTRICT, DILLON RESOURCE AREA

Comments:

Information source: BOTANIST, MONTANA NATURAL HERITAGE PROGRAM, 1515
EAST SIXTH AVENUE, HELENA, MT 59620-1800.

Specimens: LESICA, P. DIVISION OF BIOLOGICAL SCIENCES, UNIVERSITY
OF
LESICA, P. (3833). 1986. SPECIMEN #104272. MONTU.

MONTANA NATURAL HERITAGE PROGRAM
Element Occurrence Record

Scientific Name: PHACELIA INCANA
Common Name: HOARY PHACELIA

Global rank: G3 Forest Service status:
State rank: S1 Federal Status:

Element occurrence code: PDHYD0C270.003
Element occurrence type:

Survey site name: BELL CANYON
EO rank: C
EO rank comments: ANNUALS ARE PROBABLY EPHEMERAL, AT LEAST WHERE
POPULATIONS ARE SMALL AS THIS ONE IS.

County: BEAVERHEAD
USGS quadrangle: KIDD

Township: Range: Section: TRS comments:
011S 010W 18 SW4SE4

Precision: S
Survey date: 1993-06-22 Elevation: 6280 -
First observation: 1993-06-22 Slope/aspect: 45% / SOUTH
Last observation: 1993-06-22 Size (acres): 1

Location:
TAKE RED ROCK EXIT OFF I-15. FROM RAMP, GO SOUTH ON ROAD PARALLEL TO
INTERSTATE; AFTER CA. 1 MILE TAKE RIGHT TURN WEST UP BELL CANYON CA. 2
MILES. PLANTS ARE ON SCREE ACROSS FROM FIRST TIMBER.

Element occurrence data:
CA. 50 PLANTS, 2 SUBPOPULATIONS. 50% FLOWERING, 50% VEGETATIVE. NO
FRUIT SEEN.

General site description:
OPEN, DRY TO SEASONALLY MOIST LOWERSLOPE ROCKSLIDE. LIMESTONE PARENT
MATERIAL, CLAY-LIKE SOIL. ASSOCIATED SPECIES: CHRYSOTHAMNUS
VISCIDIFLORUS, CERCOCARPUS LEDIFOLIUS, ARTEMISIA TRIDENTATA (ON
ADJACENT SLOPES), MIMULUS SUKSDORFII, COLLINSIA PARVIFLORA, PHACELIA
HETEROPHYLLA, PHACELIA LINEARIS, DESCURAINIA RICHARDSONII, MENTZELIA
ALBICAULIS, CHENOPODIUM SP., CRYPTANTHA SP.

Land owner/manager:
BLM: BUTTE DISTRICT, DILLON RESOURCE AREA

Comments:
AREA GRAZED BUT TALUS IS UNTOUCHED. HABITAT IS VERY DIFFICULT TO
SURVEY. OTHER SCREE SLOPES IN CANYON WERE SURVEYED BUT NO MORE PLANTS
WERE FOUND.

Information source: VANDERHORST, J. 1993. [MTNHP FIELD SURVEYS IN THE
TENDRY MOUNTAINS FOR THE BUREAU OF LAND
MANAGEMENT.]

Specimens: VANDERHORST, J. (4970). 1993. MONT.

MONTANA NATURAL HERITAGE PROGRAM
Element Occurrence Record

Scientific Name: PHACELIA INCANA
Common Name: HOARY PHACELIA

Global rank: G3 Forest Service status:
State rank: S1 Federal Status:

Element occurrence code: PDHYD0C270.004
Element occurrence type:

Survey site name: PILEUP CANYON
EO rank: A-B

EO rank comments: WESTERN SUBPOPULATION IS LARGE, HABITAT PRISTINE;
EASTERN SUBPOPULATION IS SMALLER.

County: BEAVERHEAD

USGS quadrangle: CABOOSE CANYON

Township: Range: Section: TRS comments:
014S 010W 33 NW4, 32 NE4

Precision: S
Survey date: 1993-07-13 Elevation: 7240 - 7800
First observation: 1993-07-13 Slope/aspect: 25% / SW
Last observation: 1993-07-13 Size (acres): 60

Location:

FROM DELL, TAKE BIG SHEEP CREEK ROAD TO CABIN CREEK ROAD. FOR EASTERN SUBPOPULATION, TAKE CABIN CREEK ROAD CA. 0.75 MILE TO PILEUP CANYON AND WALK UP CANYON. FOR WESTERN SUBPOPULATION, GO CA. 2 MILES ON CABIN CREEK ROAD TO UNNAMED GULCH AND WALK UP GULCH.

Element occurrence data:

2 SUBPOPULATIONS: EASTERN: 200-1000 PLANTS, FLOWERING AND FRUITING.
WESTERN: 5000-10000 PLANTS, FLOWERING AND FRUITING.

General site description:

DRY, PARTIALLY-SHADED UPPER SLOPE. LIMESTONE PARENT MATERIAL, STONY SOIL. ASSOCIATED SPECIES: CERCOCARPUS LEDIFOLIUS, AGROPYRON SPICATUM, PETROPHYTUM CAESPITOSUM, ORYZOPSIS HYMENOIDES, PENSTEMON ARIDUS.

Land owner/manager:

BLM: BUTTE DISTRICT, DILLON RESOURCE AREA

Comments:

Information source: LESICA, PETER. DIVISION OF BIOLOGICAL SCIENCES,
UNIVERSITY OF MONTANA, MISSOULA, MT 59812.

Specimens: LESICA, P. (6072). 1993. MONTU.

MONTANA NATURAL HERITAGE PROGRAM
Element Occurrence Record

Scientific Name: PHACELIA INCANA
Common Name: HOARY PHACELIA

Global rank: G3 Forest Service status:
State rank: S1 Federal Status:

Element occurrence code: PDHYD0C270.005
Element occurrence type:

Survey site name: LIMEKILN CANYON
EO rank: B
EO rank comments: SMALL POPULATION.

County: BEAVERHEAD

USGS quadrangle: RED ROCK

Township: Range: Section: TRS comments:
011S 010W 06 SE4

Precision: S
Survey date: 1993-06-08 Elevation: 6100 -
First observation: 1993-06-08 Slope/aspect: 30% / SOUTH
Last observation: 1993-06-08 Size (acres): 2

Location:

TAKE RED ROCK EXIT OFF I-15 AND GO NORTH ON WEST SIDE OF HIGHWAY FOR 2.5 MILES. GO WEST 0.4 MILE, THEN LEFT AND FOLLOW ROAD FOR CA. 2 MILES. TAKE TWO-TRACK ON RIGHT CA. 1.2 MILES TO HILLS.

Element occurrence data:
100-500 PLANTS, FLOWERING.

General site description:

OPEN, DRY MIDSLOPE UPLANDS. LIMESTONE PARENT MATERIAL, GRAVELLY SOIL.
ASSOCIATED SPECIES: CERCOCARPUS LEDIFOLIUS, AGROPYRON SPICATUM,
ORYZOPSIS HYMENOIDES, ERIOGONUM MICROTHECUM.

Land owner/manager:

BLM: BUTTE DISTRICT, DILLON RESOURCE AREA

Comments:

SOME FLOWERS EATEN.

Information source: LESICA, PETER. DIVISION OF BIOLOGICAL SCIENCES,
UNIVERSITY OF MONTANA, MISSOULA, MT 59812.

Specimens: LESICA, P. (5985). 1993. MONTU.

MONTANA NATURAL HERITAGE PROGRAM
Element Occurrence Record

Scientific Name: SPHAEROMERIA ARGENTEA
Common Name: CHICKEN SAGE

Global rank: G? Forest Service status:
State rank: S1 Federal Status:

Element occurrence code: PDAST8S010.001
Element occurrence type:

Survey site name: RED BUTTE
EO rank:
EO rank comments:

County: BEAVERHEAD

USGS quadrangle: DELL

Township: Range: Section: TRS comments:
013S 009W 03

Precision:	M	Elevation:	6420 -
Survey date:		Slope/aspect:	
First observation:	1984-06-03	Size (acres):	
Last observation:	1984-06-03		

Location:
RED BUTTE, NORTH OF DELL.

Element occurrence data:
SEVERAL SMALL COLONIES.

General site description:
UPPER WEST-FACING SLOPE AND NEAR CREST OF NORTH-SOUTH TRENDING
RIDGELINE.

Land owner/manager:
PRIVATELY OWNED LAND (INDIVIDUAL OR CORPORATE)

Comments:
SPECIMEN LABEL READS SW4 OF SECTION 3; RIDGELINE IS LOCATED IN SE4 OF
SECTION 3.

Information source: LACKSCHEWITZ, KLAUS. DIVISION OF BIOLOGICAL
SCIENCES, UNIVERSITY OF MONTANA, MISSOULA, MT
59812. 406/243-5222.

Specimens: LACKSCHEWITZ, K. H. (10719) AND J. PIERCE. 1984.
SPECIMEN #26937. MONTU.

MONTANA NATURAL HERITAGE PROGRAM
Element Occurrence Record

Scientific Name: SPHAEROMERIA ARGENTEA

Common Name: CHICKEN SAGE

Global rank: G? Forest Service status:

State rank: S1 Federal Status:

Element occurrence code: PDAST8S010.003

Element occurrence type:

Survey site name: NICHOLIA CREEK

EO rank: C

EO rank comments: SMALL POPULATION.

County: BEAVERHEAD

USGS quadrangle: CABOOSE CANYON

Township: Range: Section: TRS comments:

015S 010W 16 SW4

Precision: S

Survey date: 1993-07-12

Elevation: 6960 -

First observation: 1993-07-12

Slope/aspect: LEVEL

Last observation: 1993-07-12

Size (acres): 1

Location:

FROM DELL TAKE BIG SHEEP CREEK ROAD TO NICHOLIA CREEK ROAD THEN GO SOUTH 0.2 MILE. TAKE DEADMAN ROAD SOUTH CA. 1.4 MILE TO OLD CABIN AND FOLLOW TRAIL WEST TO SECOND STREAM.

Element occurrence data:

CA. 100 PLANTS, FLOWERING.

General site description:

OPEN, MOIST TERRACE BOTTOM, LIMESTONE PARENT MATERIAL, CLAY SOIL.

ASSOCIATED SPECIES: ARTEMISIA ARBUSCULA, SARCOBATUS VERMICULATUS, POA NEVADENSIS, ATRIPLEX GARDNERI, AGROPYRON SMITHII, HAPLOPAPPUS UNIFLORUS.

Land owner/manager:

STATE LAND - UNDESIGNATED

Comments:

EVIDENCE OF CATTLE IN AREA.

Information source: LESICA, PETER. DIVISION OF BIOLOGICAL SCIENCES, UNIVERSITY OF MONTANA, MISSOULA, MT 59812.

Specimens: LESICA, P. (6097). 1993. MONTU.

MONTANA NATURAL HERITAGE PROGRAM
Element Occurrence Record

Scientific Name: SPHAEROMERIA CAPITATA
Common Name: ROCK-TANSY

Global rank: G3 Forest Service status:
State rank: S2S3 Federal Status:

Element occurrence code: PDAST8S030.004
Element occurrence type:

Survey site name: CLARK CANYON RESERVOIR
EO rank: B
EO rank comments: DOMINANT ON ROCK PAVEMENT.

County: BEAVERHEAD

USGS quadrangle: RED ROCK

Township: Range: Section: TRS comments:
010S 010W 31 NE4NE4

Precision: S
Survey date: 1993-06-11 Elevation: 6000 -
First observation: 1993-06-11 Slope/aspect: LEVEL
Last observation: 1993-06-11 Size (acres): 5

Location:

TAKE RED ROCK EXIT OFF I-15 AND GO NORTH ON GRAVEL ROAD TO CLARK CANYON RESERVOIR. CA. 1.5 MILES PAST RED ROCK FISHING ACCESS TURN LEFT (SOUTH) ON JEEP TRAIL. KEEP LEFT ON TRAIL AND CONTINUE CA. 1 MILE TO SADDLE. POPULATION IS ON HILLTOPS ABOVE SADDLE.

Element occurrence data:
100+ PLANTS, ALL IN BUD.

General site description:

DRY, OPEN CREST OF SEDIMENTARY FOOTHILLS. LIMESTONE PARENT MATERIAL. ASSOCIATED SPECIES: PETROPHYTON CAESPITOSUM, SPHAEROMERIA CAPITATA, HAPLOPAPPUS ACAULIS, ERIGERON COMPOSITUS, DELPHINIUM SP., KOELERIA MACRANTHA, SENECEO CANUS, ERYSIMUM ASPERUM.

Land owner/manager:
BLM: BUTTE DISTRICT, DILLON RESOURCE AREA

Comments:

SUBDIVISION BELOW SITE, BUT PLANT COMMUNITY RELATIVELY UNDISTURBED. COMPLETE SURVEY OF ELEMENT NOT CONDUCTED.

Information source: VANDERHORST, J. 1993. [MTNHP FIELD SURVEYS IN THE TENDON MOUNTAINS FOR THE BUREAU OF LAND MANAGEMENT.]

Specimens: VANDERHORST, J. (4952). 1993. MONT.

MONTANA NATURAL HERITAGE PROGRAM
Element Occurrence Record

Scientific Name: TARAXACUM ERIOPHORUM
Common Name: ROCKY MOUNTAIN DANDELION

Global rank: G4 Forest Service status:
State rank: S1 Federal Status:

Element occurrence code: PDAST930G0.002
Element occurrence type:

Survey site name: BIG SHEEP CREEK
EO rank:
EO rank comments:

County: BEAVERHEAD

USGS quadrangle: CABOOSE CANYON

Township: Range: Section: TRS comments:
015S 010W 09 NE4

Precision: M
Survey date: Elevation: 6920 -
First observation: 1984 Slope/aspect: GENTLE / NE TO NW
Last observation: 1984-06-01 Size (acres): 0

Location:
SOUTHWEST END OF BIG SHEEP CREEK ROAD, NEAR ROAD TO HARKNESS RANCHES
(CA. 14 AIR MI. SOUTHWEST OF DELL).

Element occurrence data:
EXTENSIVE COLONY.

General site description:
ON GENTLE NORTHEAST TO NORTHWEST SLOPE, IN OPEN RANGELAND, WITH
LUPINUS SP., ACHILLEA SP. AND T. LAEVIGATUM.

Land owner/manager:
PRIVATELY OWNED LAND (INDIVIDUAL OR CORPORATE)
BLM: BUTTE DISTRICT, DILLON RESOURCE AREA

Comments:
NONE.

Information source: LACKSCHEWITZ, KLAUS. DIVISION OF BIOLOGICAL
SCIENCES, UNIVERSITY OF MONTANA, MISSOULA, MT
59812. 406/243-5222.

Specimens: LACKSCHEWITZ, K. (10699) AND J. PIERCE. 1984. SPECIMEN
#28349. MONTU.

MONTANA NATURAL HERITAGE PROGRAM
Element Occurrence Record

Scientific Name: TARAXACUM ERIOPHORUM
Common Name: ROCKY MOUNTAIN DANDELION

Global rank: G4 Forest Service status:
State rank: S1 Federal Status:

Element occurrence code: PDAST930G0.004
Element occurrence type:

Survey site name: PILEUP CANYON
EO rank: C-D
EO rank comments: SIGNIFICANT CATTLE IMPACTS AT SITE; EXOTICS.

County: BEAVERHEAD

USGS quadrangle: CABOOSE CANYON

Township: Range: Section: TRS comments:
014S 010W 33 W2

Precision: S
Survey date: 1993-06-12 Elevation: 7080 - 7400
First observation: 1993-06-12 Slope/aspect: LEVEL
Last observation: 1993-07-13 Size (acres): 2

Location:
FROM DELL, FOLLOW BIG SHEEP CREEK ROAD CA. 15 MILES TO PILEUP GULCH,
THEN TAKE DIRT ROAD UP CANYON TO ITS END. PLANTS ARE CA. 0.5 MILE
FURTHER UP IN BOTTOM OF CANYON ON MAIN LIVESTOCK TRAIL.

Element occurrence data:
2 SUBPOPULATIONS. NORTHERN: CA. 50 PLANTS, MOST DISPERSING FRUIT;
SOUTHERN: 28 PLANTS, 95% FRUITING, 5% VEGETATIVE. SOME HEADS DEHISCED.

General site description:
PARTIAL SHADE TO OPEN MOIST CANYON BOTTOM FLOODPLAIN. ALLUVIUM PARENT
MATERIAL, FINE CLAY-SILT SOIL. ASSOCIATED SPECIES: ARTEMISIA
TRIDENTATA VAR. TRIDENTATA, TARAXICUM LAEVIGATUM, POA SP., ELYMUS
CINEREUS, ACHILLEA MILLEFOLIUM, MERTENSIA OBLONGIFOLIA, ANTENNARIA
MICROPHYLLA, AGOSERIS GLAUCA.

Land owner/manager:
BLM: BUTTE DISTRICT, DILLON RESOURCE AREA

Comments:
WEEDS AND CATTLE DROPPINGS AT SITE--MANY PLANTS WITH BROWSED HEADS.
LACKSCHEWITZ LOCATED AN "EXTENSIVE" POPULATION NEARBY IN SECTION 9 BUT
THIS WAS NOT RELOCATED ALTHOUGH A SEARCH WAS MADE.

Information source: LESICA, PETER. DIVISION OF BIOLOGICAL SCIENCES,
UNIVERSITY OF MONTANA, MISSOULA, MT 59812.

Specimens: VANDERHORST, J. (4939). 1993. MONT.
LESICA, P. (6101). 1993.

MONTANA NATURAL HERITAGE PROGRAM
Element Occurrence Record

Scientific Name: THALICTRUM ALPINUM
Common Name: ALPINE MEADOWRUE

Global rank: G5 Forest Service status: SENSITIVE
State rank: S1 Federal Status:

Element occurrence code: PDRANOM010.003
Element occurrence type:

Survey site name: MORRISON LAKE WETLANDS
EO rank: B
EO rank comments: FEW EXOTICS; REMOTE, HOWEVER AREA IS GRAZED AND
MORRISON LAKE IS A RECREATION AREA.

County: BEAVERHEAD

USGS quadrangle: MORRISON LAKE

Township: Range: Section: TRS comments:
014S 012W 23 NE4SW4, NE4SE4

Precision: S
Survey date: 1990-07-30 Elevation: 8200 -
First observation: 1990 Slope/aspect: 0-3% / LEVEL
Last observation: 1990-07-30 Size (acres): 1

Location:
TAKE DELL EXIT OFF I-15 SOUTH OF DILLON. PROCEED SOUTH ON FRONTAGE
ROAD TO BIG SHEEP CREEK ROAD (#257), AND FOLLOW THIS ROAD CA. 30 MILES
TO MORRISON LAKE ROAD. PROCEED TO HEAD OF INDIAN CREEK; WETLANDS ARE
SOUTHEAST OF LAKE.

Element occurrence data:
EXCELLENT OCCURRENCE, 10,000+ PLANTS, IMMATURE FRUIT; MANY RAMETS HAD
FLOWERED.

General site description:
POTENTILLA FRUTICOSA/JUNCUS BALTICUS COMMUNITY. ASSOCIATED SPECIES:
SALIX BRACHYCARPA, DESCHAMPSIA CESPITOSA, SENECIO FOETIDUS, POTENTILLA
SPP., TRIFOLIUM LONGIPES, DODECATHEON PULCHELLUM.

Land owner/manager:
BEAVERHEAD NATIONAL FOREST, DILLON RANGER DISTRICT

Comments:
COMPLETE PLANT SPECIES LIST AND MANAGEMENT RECOMMENDATIONS CONTAINED
IN A REPORT BY P. LESICA TO THE BEAVERHEAD NATIONAL FOREST (1990), ON
FILE AT MTNHP.

Information source: LESICA, PETER. DIVISION OF BIOLOGICAL SCIENCES,
UNIVERSITY OF MONTANA, MISSOULA, MT 59812.

Specimens: LESICA, P. (4975). 1990. MONTU.

MONTANA NATURAL HERITAGE PROGRAM
Element Occurrence Record

Scientific Name: THALICTRUM ALPINUM

Common Name: ALPINE MEADOWRUE

Global rank: G5 Forest Service status: SENSITIVE

State rank: S1 Federal Status:

Element occurrence code: PDRANOM010.004

Element occurrence type:

Survey site name: SIMPSON/TEX CREEKS

EO rank: B

EO rank comments: MODERATE-SIZED POPULATION; DEGRADED HABITAT.

County: BEAVERHEAD

USGS quadrangle: ISLAND BUTTE

Township: Range: Section: TRS comments:

014S 011W 36 E2

Precision: S

Survey date: 1993-07-06

Elevation: 6960 -

First observation: 1993-07-06

Slope/aspect: LEVEL

Last observation: 1993-07-06

Size (acres): 2

Location:

FROM DELL, TAKE BIG SHEEP CREEK ROAD TO CABIN CREEK ROAD AND CONTINUE
ON IT CA. 3.5 MILES.

Element occurrence data:

NUMBER OF PLANTS IMPOSSIBLE TO ESTIMATE. MATURE FRUIT.

General site description:

OPEN, MOIST, BROAD ALLUVIAL VALLEY BOTTOM. LIMESTONE PARENT MATERIAL,
SILTY CLAY SOIL. ASSOCIATED SPECIES: POTENTILLA FRUTICOSA, JUNCUS
BALTICUS, MUHLENBERGIA RICHARDSONIS, IRIS MISSOURIENSIS, TARAXACUM
OFFICINALE, ANTENNARIA MICROPHYLLA.

Land owner/manager:

BLM: BUTTE DISTRICT, DILLON RESOURCE AREA

Comments:

DISTURBANCE BY INCREASERS AND EXOTICS.

Information source: LESICA, PETER. DIVISION OF BIOLOGICAL SCIENCES,
UNIVERSITY OF MONTANA, MISSOULA, MT 59812.

Specimens: LESICA, P. (6121). 1993. MONTU.

MONTANA NATURAL HERITAGE PROGRAM
Element Occurrence Record

Scientific Name: THELYPODIUM SAGITTATUM SSP SAGITTATUM
Common Name: SLENDER THELYPODY

Global rank: G3G4T? Forest Service status:
State rank: S2 Federal Status:

Element occurrence code: PDBRA2N0E2.004
Element occurrence type:

Survey site name: TRAIL HOLLOW EXCLOSURE
EO rank: B
EO rank comments: 28 YEAR EXCLOSURE, BUT ANNUAL WEEDS PRESENT.

County: BEAVERHEAD

USGS quadrangle: DIXON MOUNTAIN

Township: Range: Section: TRS comments:
013S 010W 32 SW4NE4

Precision: S
Survey date: 1993-07-01 Elevation: 6600 -
First observation: 1988-07-18 Slope/aspect: LEVEL
Last observation: 1993-07-01 Size (acres): 1

Location:
FOLLOW BIG SHEEP CREEK ROAD SOUTHWEST FROM DELL TO MUDDY CREEK ROAD
AND GO NORTH CA. 3 MILES TO TRAIL HOLLOW. TURN LEFT (SOUTH) AND GO CA.
0.125 MILE TO MUDDY CREEK. EXCLOSURE IS EAST OF ROAD ON CREEK; PLANTS
ON NORTH SIDE OF CREEK.

Element occurrence data:
50 PLANTS IN EXCLOSURE, 90% FRUITING, 10% FLOWERING AND FRUITING.
MATURE SILIQUES ON ALL PLANTS.

General site description:
28-YEAR EXCLOSURE IN HEAVILY-GRAZED DRAINAGE. OPEN, DRY BOTTOMLANDS,
ALLUVIAL PARENT MATERIAL, FINE, DRY CLAY SOIL. ASSOCIATED SPECIES:
ARTEMISIA TRIDENTATA, A. FRIGIDA, POA SP., ELYMUS LANCEOLATUS, THLASPI
ARVENSE (ABUNDANT).

Land owner/manager:
BLM: BUTTE DISTRICT, DILLON RESOURCE AREA

Comments:
SPECIES OBSERVED IN AREA BY LACKSCHEWITZ, ET AL. IN 1988. EXCLOSURE
SURVEYED IN 1993; PLANTS SEEN OUTSIDE OF EXCLOSURE NOT SURVEYED.

Information source: VANDERHORST, J. 1993. [MTNHP FIELD SURVEYS IN THE
TENDON MOUNTAINS FOR THE BUREAU OF LAND
MANAGEMENT.]

Specimens: VANDERHORST, J. (5004). 1993. MONT.
LACKSCHEWITZ, K. (11538) ET AL. 1988. SPECIMEN #109534.
MONTU.

MONTANA NATURAL HERITAGE PROGRAM
Element Occurrence Record

Scientific Name: THELYPODIUM SAGITTATUM SSP SAGITTATUM
Common Name: SLENDER THELYPODY

Global rank: G3G4T? Forest Service status:
State rank: S2 Federal Status:

Element occurrence code: PDBRA2N0E2.010
Element occurrence type:

Survey site name: NICHOLIA CREEK
EO rank: B
EO rank comments: SMALL POPULATION.

County: BEAVERHEAD

USGS quadrangle: CABOOSE CANYON

Township: Range: Section: TRS comments:
015S 010W 09 SW4

Precision: S
Survey date: 1993-07-12 Elevation: 6840 -
First observation: 1993-07-12 Slope/aspect: LEVEL
Last observation: 1993-07-12 Size (acres): 2

Location:

FROM DELL, TAKE BIG SHEEP CREEK ROAD TO NICHOLIA CREEK ROAD, THEN GO
SOUTH 0.2 MILE. TAKE DEADMAN ROAD, CROSS CREEK, AND PARK NEAR OLD
CABIN.

Element occurrence data:

200-500 PLANTS, MOSTLY FRUITING, SOME FLOWERING.

General site description:

OPEN, MOIST FLOODPLAIN BOTTOM. LIMESTONE PARENT MATERIAL, SILTY SOIL.
ASSOCIATED SPECIES: CHRYSOTHAMNUS NAUSEOSUS, POA NEVADENSIS, TARAXACUM
OFFICINALE, HAPLOPAPPUS UNIFLORUS, AGROPYRON SMITHII.

Land owner/manager:

BLM: BUTTE DISTRICT, DILLON RESOURCE AREA

Comments:

EVIDENCE OF CATTLE IN AREA.

Information source: LESICA, PETER. DIVISION OF BIOLOGICAL SCIENCES,
UNIVERSITY OF MONTANA, MISSOULA, MT 59812.

Specimens: LESICA, P. (6089). 1993. MONTU.

MONTANA NATURAL HERITAGE PROGRAM
Element Occurrence Record

Scientific Name: THELYPODIUM SAGITTATUM SSP SAGITTATUM
Common Name: SLENDER THELYPODY

Global rank: G3G4T? Forest Service status:
State rank: S2 Federal Status:

Element occurrence code: PDBRA2N0E2.012
Element occurrence type:

Survey site name: TEX CREEK
EO rank: B
EO rank comments: SMALL POPULATION.

County: BEAVERHEAD

USGS quadrangle: ISLAND BUTTE

Township: Range: Section: TRS comments:
014S 011W 36 SE4

Precision: S
Survey date: 1993-07-26 Elevation: 6960 -
First observation: 1993-07-26 Slope/aspect: LEVEL
Last observation: 1993-07-26 Size (acres): 20

Location:
FROM DELL, TAKE BIG SHEEP CREEK ROAD TO CABIN CREEK ROAD AND CONTINUE
ON CABIN CREEK ROAD CA. 3.5 MILES.

Element occurrence data:
100-500 PLANTS, MOSTLY FRUITING.

General site description:
MOIST, OPEN ALLUVIAL VALLEY BOTTOM. LIMESTONE PARENT MATERIAL, SILTY
CLAY SOIL. ASSOCIATED SPECIES: JUNCUS BALTICUS, POA NEVADENSIS, CAREX
PRAEGRACILIS, ANTENNARIA MICROPHYLLA, HAPLOPAPPUS UNIFLORUS.

Land owner/manager:
BLM: BUTTE DISTRICT, DILLON RESOURCE AREA

Comments:
EVIDENCE OF CATTLE.

Information source: LESICA, PETER. DIVISION OF BIOLOGICAL SCIENCES,
UNIVERSITY OF MONTANA, MISSOULA, MT 59812.

Specimens:

MONTANA NATURAL HERITAGE PROGRAM
Element Occurrence Record

Scientific Name: THLASPI PARVIFLORUM
Common Name: SMALL-FLOWERED PENNYCRESS

Global rank: G3 Forest Service status: SENSITIVE
State rank: S2 Federal Status:

Element occurrence code: PDBRA2P050.009
Element occurrence type:

Survey site name: NICHOLIA CREEK
EO rank: B
EO rank comments: LIKELY A LARGE POPULATION.

County: BEAVERHEAD

USGS quadrangle: CABOOSE CANYON

Township: Range: Section: TRS comments:
015S 010W 16 W2; 17 NW4SE4

Precision: S
Survey date: 1993-07-12 Elevation: 6880 - 7000
First observation: 1993-07-12 Slope/aspect: LEVEL
Last observation: 1993-07-12 Size (acres): 10

Location:

FROM DELL TAKE BIG SHEEP CREEK ROAD TO NICHOLIA CREEK ROAD; GO SOUTH
0.2 MILE TO DEADMAN ROAD. PROCEED ON DEADMAN ROAD FOR CA. 0.8 MILE.

Element occurrence data:

AT LEAST 4 SUBPOPULATIONS. OVER 300 PLANTS, DISPERSING FRUIT.

General site description:

MOIST, OPEN TERRACE BOTTOM, LIMESTONE PARENT MATERIAL, LOAM SOIL.
ASSOCIATED SPECIES: ARTEMISIA CANA, JUNCUS BALTICUS, POA NEVADENSIS,
PENSTEMON PROCERUS, POLYGONUM BISTORTOIDES, TARAXACUM OFFICINALE,
ANTENNARIA MICROPHYLLA.

Land owner/manager:

STATE LAND - UNDESIGNATED
BLM: BUTTE DISTRICT, DILLON RESOURCE AREA

Comments:

PLANT WAS DIFFICULT TO LOCATE AT TIME OF YEAR SURVEY WAS
CONDUCTED--DIFFICULT TO ESTIMATE POPULATION SIZE. WEEDS AND CATTLE
DISTURBANCE.

Information source: LESICA, PETER. DIVISION OF BIOLOGICAL SCIENCES,
UNIVERSITY OF MONTANA, MISSOULA, MT 59812.

Specimens: LESICA, P. (6094). 1993. MONTU.

APPENDIX E. Photographic slides

1. *Agastache cusickii* habitat, upper Big Sheep Creek
2. *Arenaria kingii*, closeup of flowers
3. *A. kingii*, plant and associates
4. habitat of 2 & 3, south of Clark Canyon Reservoir
(T10S R10W S31)
5. *Astragalus argophyllus*
6. habitat of 5, confluence of Nicholia and Big Sheep Creeks
(T15S R10W S4)
7. *Delphinium bicolor* ssp. novum
8. habitat of 7, south of Bell Canyon (T11S R10W S20)
9. *Eriogonum ovalifolium* var. *nevadense*
10. habitat of 9, south of Clark Canyon Reservoir (T10S R10W
S30)
11. *E. ovalifolium* south of Bell Canyon (T11S R10W S21)
12. *Mimulus suksdorfii*
13. *Pediocactus simpsonii*
14. habitat of 13, south of Clark Canyon Reservoir (T10S R10W
S30)
15. *Phacelia incana*
16. habitat of 12 and 15, Bell Canyon (T11S R10W S18)
17. *Taraxacum eriophorum*
18. habitat of 17, Pileup Canyon (T14 S R10W S33 SW1/4)
19. *Thelypodium sagittatum*
20. habitat of 19, lower exclosure, Muddy Creek (T13S R10W
S32, 33)

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