

FIELD INVESTIGATIONS OF FOUR ASTRAGALI,
ALL REGION 4 SENSITIVE SPECIES,
ON THE SALMON NATIONAL FOREST,
WITH NOTES ON TWO OTHERS.

by

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ABSTRACT

Field investigations of four Astragali (milkvetches) were carried on the Salmon National Forest by the Idaho Department of Fish and Game's Natural Heritage Program. The investigations were a cooperative Challenge Cost-share project between the Department and the Salmon NF.

All four milkvetches are endemic to the lower elevation valleys of east-central Idaho and adjacent Montana and are on the Intermountain Region's Sensitive Plant Species List.

Data gathered during this investigation reveal that three of the four milkvetches probably do not occur on the Salmon NF. Astragalus amnis-amissi (Lost River milkvetch) is not known to occur within 40 miles of suitable habitat on the Salmon NF. Known populations and suitable habitat for two others, A. amblytropis (Challis milkvetch) and A. aquilonius (Lemhi milkvetch), occur lower in elevation than the National Forest boundary. It is recommended that these three milkvetches be taken off the Sensitive Species List of the Salmon NF.

Astragalus scaphoides (Bitterroot milkvetch) was found to be plentiful in a wide range of habitat conditions on the Forest in the Lemhi Valley and along the Salmon River between North Fork and Shoup. Distribution, abundance, habitat, and population ecology data indicate that it is relatively common with no threats to population viability. It is recommended that Bitterroot milkvetch be taken off the Sensitive Species List for the Salmon and Challis NFs.

Two other rare milkvetches were encountered during these investigations, Astragalus beckwithii var. sulcatus (Beckwith's milkvetch) and A. gilviflorus (plains milkvetch). Beckwith's milkvetch is a narrow endemic to the Salmon area, but is sufficiently common there not to be of conservation concern to the Salmon NF. Plains milkvetch, however, is a Regional Sensitive Species, known previously from the Targhee NF area. Preliminary data suggest that it is very rare on the Salmon NF and should be considered a Sensitive Species there.

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INTRODUCTION

The National Forest Management Act and Forest Service policy require that Forest Service land be managed to maintain populations of all existing native animal and plant species at or above the minimum viable population level. A minimum viable population consists of the number of individuals, adequately distributed throughout their range, necessary to perpetuate the existence of the species in natural, genetically stable, self-sustaining populations.

The Forest Service, along with other Federal and State agencies, has recognized the need for special planning considerations in order to protect the flora and fauna on the lands in public ownership. Species recognized by the Forest Service as needing such considerations are those that (1) are designated under the Endangered Species Act as endangered or threatened, (2) are under consideration for such designation, or (3) appear on a regional Forest Service sensitive species list.

Four Astragali (milkvetches), occurring at low elevations in the valleys of east-central Idaho, are on the Intermountain Region Sensitive Species List for the Salmon NF (USDA Forest Service 1988). Field investigations of these four milkvetches were conducted on the Salmon NF by the Idaho Department of Fish and Game's Natural Heritage Program through the Cooperative Challenge Cost-share Program.

The primary objectives of this investigation were as follows:

- 1) Survey known populations of the four Astragali and search potential habitats for new populations on the Salmon NF.
- 2) Characterize habitat conditions for known populations on the Salmon NF.
- 3) Assess population trends and threats to existing populations and make management recommendations to the forest based on these assessments.

RESULTS

During late May 1989, I surveyed suitable-appearing habitats for the four Sensitive Astragali on the lower elevations of the Salmon NF around the Lemhi Valley, between Salmon and Leadore, and in the Salmon River canyon, between Ellis and Shoup. Over 30 areas, mostly tributary valleys of the Salmon River canyon and Lemhi Valley, were searched during this period (Appendix 3).

After a thorough search, I found no populations of Astragalus amblytropis, A. amnis-amissi, and A. aquilonius on the Salmon NF, largely due to the fact that suitable habitat of these relatively substrate-specific species did not occur on the Forest. Astragalus scaphoides was found to occur on the Salmon NF in three places in the Lemhi Valley, two of which were very large populations, and ten large populations in the Salmon River valley. Following is a detailed discussion of each species, including information on its taxonomy and identification, range and habitat, conservation status, and recommendations concerning its status to the Regional Forester and Salmon NF.

In addition, I encountered two other rare Astragali during the survey, A. gilviflorus and A. beckwithii var. sulcatus. This is the first record of Astragalus gilviflorus, a Region 4 Sensitive Species, for Lemhi County and the Salmon NF. A brief discussion for each species can be found at the end of the report.

Astragalus amblytropis Barneby

CURRENT STATUS USFS Region 4 Sensitive Species
(Challis and Salmon NFs)
USFWS - None
Idaho Native Plant Society - Sensitive
Heritage Rank - G3 S3

TAXONOMY

Family: Fabaceae [Leguminosae (Pea)]

Common Name: Challis milkvetch

Citation: American Midland Naturalist 41:501. 1949.

Technical Description: Grayish-strigillose perennial with a deep taproot and branched crown; stems several, prostrate to ascending, usually partially buried in talus and therefore rhizome-like at the base, 1-3 dm long; leaves 2-5 cm long, stipules deltoid, 1-2 mm long, purplish, the lower ones connate; leaflets (7) 9-13, oblong-ovate, usually emarginate, 5-10 mm long; racemes 3- to 11-flowered, the peduncles much shorter than the leaves; pedicels 0.5-2.5 mm long; calyx finely whitish-strigillose, about 1/3 the length of the corolla, the linear teeth subequal to the tube; corolla 6-8 mm long, ochroleucous to yellowish, usually tinged with purple, the wings rather narrow, about equaling the much broader, very conspicuous keel; pod sessile, inflated, membranous, ellipsoid-ovoid, 2-3.5 cm long, abruptly contracted to a short, acute, beaklike tip, completely 2-celled by the intrusion of the lower suture, broadly oval in section, with both sutures somewhat sulcate, strigillose, not mottled (Hitchcock 1961).

Nontechnical Description: Small, herbaceous perennial with a deep taproot and pinnately compound, grayish leaves. Stems generally reddish and prostrate, flowers pale yellow to cream, pods inflated, 2-celled, not red-mottled, but with numerous, very short, appressed hairs (Henderson et al. 1979). See Appendix 1 for line drawing of Challis milkvetch.

Distinguishing Features and Similar Species: The Challis milkvetch is a delicate milkvetch of marked and singular individuality, recognizable at a glance by its repeatedly and divaricately branching stems, neat silvery, foliage, small flowers with petals of nearly equal length, and bladderly, bilocular pods. The plants fruit prolifically, and the inflated pods, at first pale green suffused with purple on the side turned toward the sun, then straw-colored and somewhat lustrous when ripe, are enormous in proportion to the leaves and flowers (Barneby 1964). It is similar in flower and fruit to Astragalus platytropis, but always caulescent (elongate stems) and with larger leaflets and an unmottled pod (Hitchcock 1961). For a discussion on its similarity to the closely related Astragalus amnis-amissi, see the Distinguishing Features and Similar Species section of that species.

DISTRIBUTION

Range: Challis milkvetch is endemic to the vicinity of Challis, for a

short distance up and down the Salmon River. More specifically, populations are known from about the mouth of Little Boulder Creek on the East Fork Salmon River, downstream on the East Fork and then main Salmon River to the mouth of McKim Creek, a linear distance of about 50 miles. It is also known from several sites south of Challis on the west slope of the Pahsimeroi Mountains. Elevations of known populations range from 4600 to about 7000 feet, with most occurring between 5500 to 6500 feet.

Results of my field inventory in 1989, indicate that Challis milkvetch comes close, but probably does not occur on the Salmon NF. As discussed in the next section, it appears to be closely associated with lacustrine volcanic ash deposits in the Challis region, the upper elevation of which is several hundred vertical feet below the Salmon NF boundary in the McKim Creek and Allison Creek drainages of the northern Lemhi Range. I found no suitable-appearing habitat downstream of McKim Creek in the Salmon River canyon. See Appendix 2 for an overview of the distribution of Challis milkvetch in Idaho, and a map of populations along the Salmon River near McKim Creek.

Habitat and Associated Species: Challis milkvetch is generally associated with salt desert shrub communities, and occasionally with the Artemisia tridentata ssp. wyomingensis/Agropyron spicatum habitat type. It is nearly always found on unstable, volcanic ash deposits that are often subject to rapid erosion. Associated species include Atriplex confertifolia, Cryptantha interrupta, Hymenopappus filifolius var. idahoensis, Enceliopsis nudicaulis, Oxytropis besseyi var. salmonensis, Thelypodium repandum, and Elymus ambiguous var. salmonis (Henderson et al. 1979).

Henderson et al. (1979) noted that they observed the highest density of individuals on the steepest and most unstable slopes in their study area.

CONSERVATION STATUS

Conservation Status - Idaho: In his treatment of the species as part of the Idaho rare plant project of the Idaho Natural Areas Council, Henderson (1981a) recommended that it be placed on the Federal Watch List. Rare plant inventories on the Challis NF, by botanists from the University of Idaho Herbarium between 1979 and 1983 (Henderson et al. 1979; Henderson 1983) formed the basis for his recommendation. Challis milkvetch was placed on the Region 4 Sensitive Species List based on this recommendation (USDA Forest Service 1988).

Challis milkvetch is currently considered a Sensitive species for Idaho by the Idaho Native Plant Society (Idaho Native Plant Society 1989). The Sensitive category of the Idaho Native Plant Society list refers to taxa with "small populations or localized distributions within Idaho that presently do not meet the criteria for classification as Priority 1 or 2, but whose populations and habitats may be jeopardized if current land use practices continue".

The Idaho Natural Heritage Program currently ranks Challis milkvetch as G3 S3 (G3 = either very rare and local throughout its range or found locally in a restricted range or because of other factors making it

vulnerable to extinction, S3 = since it is endemic to Idaho, the State (S) rank is the same as the Global (G) rank).

Conservation Status - Elsewhere: Challis milkvetch is endemic to Idaho.

Ownership: Challis milkvetch is known to occur on both federal and private ownerships. The Challis Resource Area, Salmon District BLM manages a majority of the known Challis milkvetch populations, with the Challis NF also managing a few. No populations are known from the Salmon NF.

Threats: Since Challis milkvetch is not known to occur on the Salmon NF, this section does not apply. See Henderson (1983) general recommendations on this species.

Management Implications: This section also does not apply to the Salmon NF, since no populations are known there. See Henderson (1983) general recommendations on this species. An ongoing research project on the population ecology of Challis milkvetch is being conducted by Bruce Rittenhouse of Idaho State University.

ASSESSMENT AND RECOMMENDATIONS

Summary: Results of my field investigation in 1989, failed to locate any populations of Challis milkvetch on the Salmon NF. It is closely associated with volcanic ash deposits in the Challis region. This habitat comes close to, but has its upper limit several hundred vertical feet below the lower boundary of the Salmon NF in the McKim Creek and Allison Creek drainages of the northern Lemhi Range.

Recommendation to the Regional Forester: Distribution data collected by myself, personnel of the Salmon District BLM, and botanists from the University of Idaho and Idaho State University, indicate that Challis milkvetch does not occur on the Salmon NF. I recommend that it be taken off the Sensitive Species List for that Forest. It does, however, occur on the Challis NF, and should remain on the Sensitive Species List for that Forest.

Recommendation to Salmon National Forest: In light of data gathered during this and other investigations, Challis milkvetch should be taken off the Sensitive Species List for the Salmon NF.

Astragalus amnis-amissi Barneby

CURRENT STATUS USFS Region 4 Sensitive Species
(Challis and Salmon NFs)
USFWS - 3C
Idaho Native Plant Society - Sensitive
Heritage Rank - G3 S3

TAXONOMY

Family: Fabaceae [Leguminosae (Pea)]

Common Name: Lost River milkvetch

Citation: Univ. Wash. Publ. Biol. 17:219. 1961.

Technical Description: Perennial, with a taproot and superficial root crown or shortly forking caudex, thinly strigillose with subappressed, basifixed hairs, the herbage green, the leaflets nearly glabrous to moderately pubescent above; stems weakly ascending, 1-2.5 dm long, simple, foliferous from near or below the middle; stipules 1.5-5 mm long, the small lower ones papery, the rest herbaceous, strongly amplexicaul-decurrent but free; leaves (3) 4-9.5 cm long, with (7) 9-13 broadly ovate-oblong to oblong-elliptic, retuse or emarginate, thin-textured leaflets 3-15 (18) mm long; peduncles slender, (2) 3-8 cm long, divaricate or recurved in fruit; racemes loosely 5- to 12-flowered, the flowers ultimately spreading or declined, the axis 1-3 cm long in fruit; calyx 4-6 mm long, black- or partly white-strigillose, the campanulate tube 2-3 mm long; the teeth subulate or lance-subulate, 1.8-3 mm long; keel only 0.5-1 mm shorter than the banner, the broadly half-oblong-obovate blades 5.3-6.5 mm long, abruptly incurved through a right angle distally, appearing truncate; pod ascending or loosely spreading, humistrate, sessile, subsymmetrically ellipsoid, moderately inflated, about 15-17 mm long, 7-8 mm in diameter, a little obcompressed, shallowly sulcate ventrally, the thin, green or purplish, strigillose valves becoming papery, inflexed as a partial septum about 1.5 mm wide; ovules 16-20 (Hitchcock 1961).

Nontechnical Description: Erect, small, herbaceous perennial with a taproot; the compound leaves with 7-13 leaflets, each 3-15 mm long, elliptic to broadly ovate, medium to dark semiglossy green and generally with an apical notch; flowers small, spreading, white faintly marked with purple; pods inflated, green to purplish, spreading, with closely appressed short hairs (Henderson et al. 1979). See Appendix 1 for line drawing of Lost River milkvetch.

Distinguishing Features and Similar Species: The lost River milkvetch is closely related to the Challis milkvetch (*Astragalus amblytropis*), but the essentially simple stems arising from a superficial root-crown and caudex, the slightly larger flowers, and especially the smaller, semibilocular, relatively few-ovulate pod provide significant differences (Barneby 1964).

DISTRIBUTION

Range: Lost River milkvetch was once thought to be a very rare species, known for many years only from the type locality in Pass Creek Gorge, in the southern Lost River Range (Henderson 1977). Later investigations by botanists of the University of Idaho Herbarium, disclosed numerous populations, occurring within a very narrow range: canyons on either side of the Lost River Range, south of about Pass Creek Gorge, lower slopes of Hawley Mountain, and a few canyons of the extreme southwestern Lemhi Range, Custer and Butte counties (Henderson et al. 1979; Henderson 1983). Elevations range from about 5500 feet in the canyons of the southern Lemhi Range, to about 7000 feet in the Lost River Range.

Results of my field inventory in 1989, indicate that Lost River milkvetch probably does not occur on the Salmon NF. As discussed in the next section, it appears to be restricted to carbonate cliff-faces in lower canyons of the southern Lost River and Lemhi ranges. The closest similar habitat on the Salmon NF, around Hawley Creek and Railroad Canyon in the Beaverhead Range, is approximately 40 miles from the Hawley Mountain populations and 55 miles from the populations in the southern Lemhi Range. See Appendix 2 for an overview of the distribution of Lost River milkvetch in Idaho.

Habitat and Associated Species: Lost River milkvetch occurs on ledges, in cracks and other similar sites on near-vertical limestone cliffs, and in talus at the immediate base of cliffs, often in partial shade. Associated species in these habitats include Elymus cinereus, Erigeron caespitosus, Cercocarpus ledifolius, Draba oreibata, D. hitchcockii, Acer glabrum, Pseudotsuga menziesii, and Agropyron spicatum (Henderson et al. 1979).

CONSERVATION STATUS

Conservation Status - Idaho: Lost River milkvetch was once thought to be a very rare species, known for many years only from the type locality. It was included in the original Federal Register list of plants proposed for endangered status under the Endangered Species Act in 1976. Henderson (1977) recommended that it be retained as a proposed endangered plant, since little was known of its distribution and potential threats. He later (Henderson 1981b) recommended that it be placed on the Federal Watch List. Rare plant inventories on the Challis NF, by botanists from the University of Idaho Herbarium between 1979 and 1983 (Henderson et al. 1979; Henderson 1983) formed the basis for his recommendation. Challis milkvetch was placed on the Region 4 Sensitive Species List based on this recommendation (USDA Forest Service 1988).

Lost River milkvetch is currently considered a Sensitive species for Idaho by the Idaho Native Plant Society (Idaho Native Plant Society 1989). The Sensitive category of the Idaho Native Plant Society list refers to taxa with "small populations or localized distributions within Idaho that presently do not meet the criteria for classification as Priority 1 or 2, but whose populations and habitats may be jeopardized if current land use practices continue".

The Idaho Natural Heritage Program currently ranks Lost River milkvetch as G3 S3 (G3 = either very rare and local throughout its range or found locally in a restricted range or because of other factors making it

vulnerable to extinction, S3 = since it is endemic to Idaho, the State (S) rank is the same as the Global (G) rank).

Conservation Status - Elsewhere: Lost River milkvetch is endemic to Idaho.

Ownership: Lost River milkvetch is known to occur only on public lands. The Challis NF manages a majority of the populations, with the Challis Resource Area, Salmon District BLM, and the Big Butte Resource Area, Idaho Falls District BLM, each managing a couple. No populations are known from the Salmon NF.

Threats: Since Lost River milkvetch is not known to occur on the Salmon NF, this section does not apply. See Henderson (1983) general recommendations on this species.

Management Implications: This section also does not apply to the Salmon NF, since no populations are known there. See Henderson's (1983) general recommendations on this species.

ASSESSMENT AND RECOMMENDATIONS

Summary: Results of my field investigation in 1989, failed to locate any populations of Lost River milkvetch on the Salmon NF. It appears restricted to vertical, limestone cliff-faces in the southern Lost River and Lemhi ranges. The closest similar habitat on the Salmon NF, in the central Beaverhead Range, is between 40 and 50 miles from the nearest known populations.

Recommendation to the Regional Forester: Distribution data collected by myself and botanists from the University of Idaho, indicate that Lost River milkvetch does not occur on the Salmon NF. I recommend that it be taken off the Sensitive Species List for that Forest. It does, however, occur on the Challis NF, and should remain on the Sensitive Species List for that Forest.

Recommendation to the Salmon National Forest: In light of data gathered during this and other investigations, Lost River milkvetch should be taken off the Sensitive Species List for the Salmon NF.

Astragalus aquilonius (Barneby) Barneby

CURRENT STATUS USFS Region 4 Sensitive Species
(Challis and Salmon NFs)
USFWS - None
Idaho Native Plant Society - Sensitive
Heritage Rank - G3 S3

TAXONOMY

Family: Fabaceae [Leguminosae (Pea)]

Common Name: Lemhi milkvetch

Synonym: Astragalus wootoni var. aquilonius

Citation: Mem. New York Bot. Garden 13: 875. 1964

Technical Description: Strigillose to villous, short-lived, greenish perennial with a branched crown from a taproot and numerous usually decumbent based or trailing stems about 1.5 dm long; stipules 1-4 mm long, ovate to lanceolate, not connate; leaves 4-10 cm long, with 9-23 oblong to oblanceolate, rounded to retuse leaflets 5-16 mm long; racemes loosely 4- to 15-flowered; peduncles mostly shorter than the leaves; flowers spreading, about 1 cm long, greenish-white, the keel often purplish-tipped; pedicels slender, shorter to slightly longer than the tube; pod sessile, inflated, membranous, ellipsoid, not mottled, glabrous to puberulent, 3-4 cm long, 1-celled, the lower suture slightly sulcate but not intruded (Hitchcock 1961).

Nontechnical Description: Taprooted, herbaceous, short-lived perennial with numerous trailing stems; the compound leaves with 9-23 leaflets, each 5-16 mm long, oblong to oblanceolate; flowers about 1 cm long, greenish-white, the keel often purplish tipped; pods sessile, inflated, green and not mottled, 1-celled, and glabrous to minutely hairy. See Appendix 1 for line drawing of Lemhi milkvetch.

Distinguishing Features and Similar Species: Lemhi milkvetch is the only species with bladderly, unilocular fruits known to occur in east-central Idaho. It is likely confused with Challis milkvetch (Astragalus amblytropis), with which it is partially sympatric, because of the similarity of habit and greatly swollen pod. Challis milkvetch differs, however, by having a 2-chambered fruit (Barneby 1964).

DISTRIBUTION

Range: Lemhi milkvetch is endemic to east-central Idaho, where it is known from the lower slopes of the Salmon River valley and East Fork Salmon River, from near Ellis to the vicinity of Clayton, the southern end of the Lemhi Range, the Lemhi River valley around Lemhi, and scattered locations in the Pahsimeroi and Lost River valleys (Henderson et al. 1979; Henderson 1983).

Although the type collection was made by Hitchcock and Muhlick in the Lemhi River valley, and hence the common name Lemhi milkvetch, its center of distribution is in the Challis area from the west slope of the Pahsimeroi Mountains, up the main Salmon River to Clayton and up the East Fork Salmon River to Herd Creek. Only three location records are

known for Lemhi milkvetch in the Lemhi Valley:

1. Type location, four miles south of Lemhi, which has never been relocated since it was collected in 1944.
2. 1984 collection by Peter Lesica from lower Reese Creek, about eight miles southeast of Lemhi. Lesica indicated that it was uncommon in 1984. I was unable to locate this population in 1989.
3. 1986 collection by Lesica from lower Yearian Creek, about three miles east of Lemhi. Lesica indicated it was rare at this site in 1986. I was unable to locate this population in 1989.

These three sites are from four to eight miles and over 1000 feet below the Salmon NF boundary in the Beaverhead Mountains and Lemhi Range. In this area, the Forest is largely confined to the highest part of the two ranges bordering the Lemhi Valley, with geologic substrates substantially different than those underlying known populations; I observed no suitable-appearing habitat on the Salmon NF in the entire Lemhi Valley. See Appendix 2 for an overview of the distribution of Lemhi milkvetch in Idaho and the Lemhi Valley.

Habitat and Associated Species: Lemhi milkvetch is generally found on unstable, steep banks, dry, sandy washes and gullies within shrub-steppe vegetation dominated by Artemisia tridentata ssp. wyomingensis, Agropyron spicatum, Atriplex confertifolia, Sitanion hystrix, Poa secunda, and Elymus ambiguous var. salmonis. Along the Salmon River canyon, it is often found with Astragalus amblytropis, Oxytropis besseyi var. salmonensis, and Penstemon nitidus var. polyphyllus (Henderson 1983).

Habitat descriptions of the three Lemhi Valley sites were noted as "limestone shale," "heavy soil an lower south-facing slope," and "on moist irrigation ditch."

CONSERVATION STATUS

Conservation Status - Idaho: Lemhi milkvetch was first recognized to be of possible conservation concern by Henderson et al. (1979) when they began the rare plant surveys on the Challis NF in 1978. As part of the Idaho rare plant project of the Idaho Natural Areas Council, Henderson (1981c) recommended a Federal Watch List status for Lemhi milkvetch, due to its rarity and habitat specificity. Lemhi milkvetch was placed on the Region 4 Sensitive Species List based on this recommendation (USDA Forest Service 1988).

Lemhi milkvetch is currently considered a Sensitive species for Idaho by the Idaho Native Plant Society (Idaho Native Plant Society 1989). The Sensitive category of the Idaho Native Plant Society list refers to taxa with "small populations or localized distributions within Idaho that presently do not meet the criteria for classification as Priority 1 or 2, but whose populations and habitats may be jeopardized if current land use practices continue".

The Idaho Natural Heritage Program currently ranks Lemhi milkvetch as G3 S3 (G3 = either very rare and local throughout its range or found

locally in a restricted range or because of other factors making it vulnerable to extinction, S3 = since it is endemic to Idaho, the State (S) rank is the same as the Global (G) rank).

Conservation Status - Elsewhere: Lemhi milkvetch is endemic to Idaho.

Ownership: Lemhi milkvetch is known to occur on both federal and private ownerships. The Challis Resource Area of the Salmon District BLM, manages a majority of known Lemhi milkvetch populations, with the Challis NF, Lemhi Resource Area, Salmon District BLM, and Big Butte Resource Area, Idaho Falls District BLM, also managing a few. No populations are known from the Salmon NF.

Threats: Since Lemhi milkvetch is not known to occur on the Salmon NF, this section does not apply. See Henderson (1983) for general recommendations on this species.

Management Implications: This section also does not apply to the Salmon NF, since no populations are known there. See Henderson (1983) for general recommendations on this species.

ASSESSMENT AND RECOMMENDATIONS

Summary: Results of my field investigation in 1989, and previous surveys by agency and university botanists failed to locate any populations of Lemhi milkvetch populations on the Salmon NF. In the Lemhi Valley, it apparently occurs on substrates of clay or shale in the center of the valley. No habitats similar to this occur on the Salmon NF in the Lemhi Valley.

Recommendation to the Regional Forester: Distribution data collected by myself and botanists from the BLM and University of Idaho, indicate that Lemhi milkvetch does not occur on the Salmon NF. I recommend that it be taken off the Sensitive Species List for that Forest. It does, however, occur on the Challis NF, and should remain on the Sensitive Species List for that Forest.

Recommendation to the Salmon National Forest: In light of data gathered during this and other investigations, Lemhi milkvetch should be taken off the Sensitive Species List for the Salmon NF.

Astragalus scaphoides M.E. Jones

CURRENT STATUS USFS Region 4 Sensitive Species
(Challis and Salmon NFs)
USFWS - None
Idaho Native Plant Society - Sensitive
Heritage Rank - G3 S3

TAXONOMY

Family: Fabaceae [Leguminosae (Pea)]

Common Name: Bitterroot milkvetch

Citation: Contributions to Western Botany 8:9. 1898.

Technical Description: 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 mm 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 (Hitchcock 1961).

Nontechnical Description: Bitterroot milkvetch is a fairly robust perennial forb about 1-2 feet high. The leaves are pinnate, clustered at the base and scattered along the stem, and 4-8 inches long. The flowers are light yellow, about an inch long, and fairly showy. They are borne in tight clusters of 15-30 on stalks 2-4 inches long originating in the axil of the upper leaves. The flowers are spreading or slightly nodding, and as they mature the cluster opens up. The fruits are almost cylindric, sharply pointed, and about an inch long. They are held erect and away from the stem, resembling a candelabra. Their color is light green, often with a reddish cast. Most plants bloom in June and mature fruit in the latter part of July (Lesica 1984).

Distinguishing Features and Similar Species: Bitterroot milkvetch is a handsome plant, notable for its large, decidedly inflated but by no means bladderly, dorsiventrally compressed pods which are held erect at a distance from the raceme-axis on long, slender but rigid, incurved-ascending stipes (Barneby 1964). The only milkvetch sympatric with Bitterroot milkvetch that closely resembles it is Astragalus atropubescens, which differs by being a less robust plant, with a relatively slender form. The flowers are similar in color but much smaller, as are the pods, which also differ by being much more tightly ascending on the raceme at maturity. See Appendix 1 for line drawings comparing the two species.

DISTRIBUTION

Range: Bitterroot milkvetch is endemic to the valleys of Lemhi and Custer counties Idaho and adjacent Beaverhead County, Montana. See Lesica (1984) for an overview of the distribution of Bitterroot milkvetch in Montana.

In Idaho, Bitterroot milkvetch has four centers of distribution:

(1) Lemhi Valley - Over 40 populations are known in the lower elevations of the Lemhi Valley, from Coal Mine Gulch Spring (about ten miles southeast of Salmon and three miles northeast of Baker) to the Salmon NF boundary on Big Eightmile Creek (about seven miles west of Leadore). Most of the known populations are concentrated on the old Lemhi Indian Reservation land between Tendoy and Lemhi.

Three populations are known to occur on the Salmon NF in the Lemhi Valley:

(a) A large population spans the FS - BLM boundary on Hayden Creek, between Rye Grass Creek and Bear Valley Creek, about five miles southwest of Lemhi. Over 10,000 individuals comprised this population, which covers a large area. Suitable habitat does not extend any farther upstream on the Forest up Hayden or Bear Valley creeks.

(b) A small population occurs at the Forest boundary on Big Eightmile Creek, west of Leadore. Only three individuals were seen in the population. None were observed on adjacent BLM or private land. The sagebrush-grass habitat was in good ecological condition. Suitable habitat farther up Big Eightmile was searched to no avail. This population is at the southern and upper elevational limits of the known distribution of the species.

(c) A large population occurs immediately above the Forest boundary on Agency Creek, east of Tendoy. Many hundreds of individuals were seen between the valley bottom and the ridgeline, several hundred feet above. The population appeared densest in moderately grazed habitats, lowest on heavily grazed sites and in areas that weren't grazed.

(2) Salmon River valley between North Fork and Shoup - Ten, extensive populations are known from the lower slopes adjacent to the Salmon River, between Sage Creek (about eight miles downstream from North Fork) to Shoup. The known populations are all on the north (road) side of the river. More populations will probably be found in suitable habitat on the largely inaccessible, south side.

Most of these populations occur on the Salmon NF, with a few being on private inholdings along the river.

(3) Morgan Creek, Salmon River Mountains - One small population is known from the Morgan Creek drainage, about 13 miles north of

Challis. It occurs on BLM land, but is less than one mile below the Challis NF boundary. I observed less than 50 individuals in 1989, but a more thorough search of the slopes above may reveal a larger population.

(4) Morgan Creek, Lemhi Range - An historical collection site is located somewhere along Morgan Creek, about four miles north of May, in the Pahsimeroi Valley. Location information from the 1915 collection is ambiguous, and it is not clear if it was collected on the Challis NF or on private land below the boundary. This site has not been relocated.

See Appendix 2 for a maps depicting an overview of the distribution of Bitterroot milkvetch in Idaho in general, and Salmon NF populations in particular.

Habitat and Associated Species: In Idaho, Bitterroot milkvetch occurs on two types of habitats. The Lemhi Valley and Morgan Creek, Salmon River Mountains, populations occur in shrub-steppe vegetation dominated by Artemisia tridentata ssp. wyomingensis or Artemisia tripartita. Common associates include Agropyron spicatum, Festuca idahoensis, Oryzopsis hymenoides, Bromus tectorum, Chrysothamnus nauseosus, Lithospermum ruderales, Balsamorhiza sagittatus, Astragalus purshii, Phlox longifolia, and Aster scopulorum. Slopes ranged from gentle to steep with aspects predominantly to the south.

The Salmon River populations occur predominantly in Pinus ponderosa/Agropyron spicatum woodlands on gently sloping river terraces to moderately steep lower slopes. Other habitats in which populations were observed included Pseudotsuga menziesii/Agropyron spicatum woodlands, moderately to highly degraded pastures on private ranches, and even highly disturbed situations near the helispot at the Indianola Guard Station. All populations appeared vigorous, and usually extensive.

CONSERVATION STATUS

Conservation Status - Idaho: In his evaluation of Bitterroot milkvetch for the Idaho rare plant project of the Idaho Natural Areas Council, Henderson (1981d) recommended that it be placed on the Federal Watch List for Idaho, due its narrow distribution and lack of information regarding abundance and threats. Lesica (1984) evaluated the conservation status of Bitterroot milkvetch for the U.S. Fish and Wildlife Service and recommended a Category 2 Candidate status, based on rarity and potential threats. Subsequent BLM-funded studies in Idaho, revealed that it was more common and populations were more stable than previously thought (Lesica n.d.; Lesica and Elliott 1987a; 1987b; 1988). Bitterroot milkvetch is on the Region 4 Sensitive Species List for the Salmon and Challis NFs (USDA Forest Service 1988).

Bitterroot milkvetch is currently considered a Sensitive species for Idaho by the Idaho Native Plant Society (Idaho Native Plant Society 1989). The Sensitive category of the Idaho Native Plant Society list refers to taxa with "small populations or localized distributions within Idaho that presently do not meet the criteria for classification as Priority 1 or 2, but whose populations and habitats may be jeopardized

if current land use practices continue".

The Idaho Natural Heritage Program currently ranks Bitterroot milkvetch as G3 S3 (G3 = either very rare and local throughout its range or found locally in a restricted range or because of other factors making it vulnerable to extinction, S3 = since it is endemic to Idaho, the State (S) rank is the same as the Global (G) rank).

Conservation Status - Elsewhere:

MONTANA - The Montana Natural Heritage Program ranks Bitterroot milkvetch as G3 S1 ((G3 = either very rare and local throughout its range or found locally in a restricted range or because of other factors making it vulnerable to extinction, S1 = critically imperiled because of extreme rarity or because some factor of its biology making it especially vulnerable to extinction in Montana). Lesica et al. (1984) recommended at status of threatened for the Montana populations.

Ownership: Lemhi milkvetch is known to occur on both federal and private ownerships. The Lemhi Resource Area, Salmon District BLM, manages a majority of known Lemhi milkvetch populations, with the Salmon NF and Challis Resource Area, Salmon District BLM, also managing a few. It is presently not known to occur on the Challis NF.

Threats: Lesica and Elliott (1989) conducted a three year monitoring study of Bitterroot milkvetch on BLM land in the Lemhi Valley. They concluded that populations did not appear to be declining in vigor or reproductive potential due to losses of fecundity from predation. Their study indicted that fluctuations in reproductive output from year to year coincided with climatic fluctuations. They did note that its limited distribution made it susceptible to population reductions due to inappropriate management and habitat destruction.

The Morgan Creek population north of Challis, the Lemhi Valley populations, and a couple of the populations along the Salmon River on private land are grazed by domestic livestock. All land of the Salmon NF in the Salmon River canyon containing Bitterroot milkvetch populations is closed to domestic grazing (from Sage Creek downriver). Heavy grazing has obvious deleterious consequences on vegetation in general and Bitterroot milkvetch in particular; it can occur in habitats where cattle congregate. Moderate amounts of grazing did not appear to affect the vigor of many populations I visited in 1989; they were large and all age classes were represented in the population. Lesica and Elliott (1989) did find that, aside from habitat destruction, livestock grazing in early summer, when the plant is flowering, presents a threat to population vigor.

Management Implications: Current management of Salmon NF lands containing Bitterroot milkvetch appears compatible with the long-term population and species viability.

ASSESSMENT AND RECOMMENDATIONS

Summary: Results of my field investigation in 1989, and previous surveys and monitoring studies by the BLM, indicate that Bitterroot milkvetch is stable and abundant in Idaho. Little habitat-disturbing activity is

taking place in the extensive populations along the Salmon River. It is widespread and abundant in the central Lemhi Valley, where intensive livestock grazing has taken place for more than a century. Locally, high stocking levels may be affecting small populations.

Recommendation to the Regional Forester: Distribution, abundance, habitat, and population ecology data collected by myself and the BLM, indicate that Bitterroot milkvetch is abundant and stable in Idaho. It does not appear to meet criteria necessary for inclusion on the Regional Foresters Sensitive Plant Species List. I recommend that it be taken off the Sensitive Species List for Region 4.

Recommendation to the Salmon National Forest: In light of data gathered during this and other investigations, Bitterroot milkvetch should be taken off the Sensitive Species List for Region 4.

NOTES ON TWO OTHER ASTRAGALI ON THE SALMON NF

During my field investigations for the four Sensitive Astragali on the Salmon NF in May 1989, I encountered two additional rare species worthy of mention.

Astragalus beckwithii T. & G. var. sulcatus Barneby
(Beckwith's milkvetch)

This variety of Beckwith's milkvetch is endemic to low elevation slopes along the Salmon River and tributaries, from just downstream of North Fork, upstream to about Ellis. The conservation status of this taxon was brought to my attention by Caryl Elzinga, Salmon District BLM Botanist, at the 1989 Rare Plant Meeting. At that time it was placed in the Review category of the Idaho Native Plant Society's Rare Plant List for Idaho (Idaho Native Plant Society 1989).

Field surveys by myself and Elzinga in 1989, revealed that Beckwith's milkvetch is relatively common within the narrow range described above. It occurs on steep slopes in the Artemisia tridentata var. wyomingensis/Agropyron spicatum habitat type, where plant cover is low and the substrate exhibits considerable downslope movement. Most known populations occur on BLM or private land. A couple populations below North Fork and one population in lower McKim Creek are on the Salmon NF. Populations appear stable and no threats to population or species viability were apparent in 1989. While it is another interesting Astragali endemic to the Salmon region, it does not qualify for inclusion on the regional Sensitive Species List. Due to its narrow distribution, however, I recommend that it remain on Idaho Native Plant Society's List, but changed from the Review to Monitor category.

Astragalus gilviflorus Sheld. (Plains milkvetch)

Plains milkvetch widespread east of the Continental Divide on the Great Plains. Its first location in Idaho, however, was only recently reported from the northern boundary of the INEL (Goodrich et al. 1982). Another population was recently discovered near Henrys Lake, and it was added to the Regional Sensitive Species List for the Targhee NF (USDA Forest Service 1988).

In searching limestone cliff faces for Astragalus amnis-amissi in canyons of the Beaverhead Mountains east of Leadore, I discovered two populations of plains milkvetch. I found an extensive population on limestone outcrops near the mouth of Railroad Canyon, beginning just inside the Salmon NF boundary, and extending upcanyon about 1.5 miles. Further searches of the Railroad Canyon area are needed to better ascertain the full extent of the population. One plant was seen on a limestone outcrop at the mouth of Hawley Creek canyon. This plant occurred on BLM land. Limestone does not appear to extend onto the Forest here, and no plants were seen on the quartzite substrates above the Salmon NF boundary. More thorough searches are also needed in Hawley Creek.

Plains milkvetch should be added to the Sensitive Species List for the Salmon NF, and a status inventory should be conducted as soon as practicable.

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Appendix 1

Line drawings of rare Astragali
on or near the Salmon National Forest.
(from Hitchcock 1961)

1. Astragalus amblytropis
2. Astragalus amnis-amissi
3. Astragalus aquilonius
4. Astragalus scaphoides and A. atropubescens

Appendix 2

Locations of rare Astragali
on or near the Salmon National Forest.

- Map 1. Astragalus amblytropis - overview of distribution (from Henderson 1983).
- Map 2. Astragalus amblytropis - populations near McKim Creek and Allison Creek. Portions of 1962 Allison Creek and 1963 Hat Creek 7.5' quadrangles)
- Map 3. Astragalus amnis-amissi - overview of distribution (from Henderson 1983).
- Map 4. Astragalus aquilonius - overview of distribution (from Henderson 1983).
- Map 5. Astragalus aquilonius - overview of distribution in Lemhi Valley. Portion of 1956 Lemhi 15' quadrangle.
- Map 6. Astragalus scaphoides - overview of distribution in Idaho (base map from Henderson 1983).
- Map 7. Astragalus scaphoides - Agency Creek population. Portion of 1965 Lemhi Pass 7.5' quadrangle.
- Map 8. Astragalus scaphoides - Big Eightmile Creek population. Portion of 1956 Patterson 15' quadrangle.
- Map 9. Astragalus scaphoides - Hayden Creek population. Portion of Lemhi SW 7.5' orthophoto quadrangle.
- Map 10. Astragalus scaphoides - Salmon River canyon; population at Sage Creek. Portion of Ulysses Mtn NE 7.5' orthophoto quadrangle.
- Map 11. Astragalus scaphoides - Salmon River canyon; seven populations observed between Indianola Guard Station and Little Spring Creek. Portion of Ulysses Mtn NW 7.5' orthophoto quadrangle.
- Map 12. Astragalus scaphoides - Salmon River canyon; two populations observed between Spring Creek and Shoup. Portion of Ulysses Mtn NW 7.5' orthophoto quadrangle.

APPENDIX 3

List of areas searched for rare Astragali
on or near the Salmon National Forest in 1989.

Salmon River canyon between Ellis and Carmen

- | | |
|-------------------------|-------------------|
| 1. McKim Creek | 9. Williams Creek |
| 2. Milepost 290, Hwy 93 | 10. Perreau Creek |
| 3. Poison Creek | 11. Spring Creek |
| 4. Iron Creek | 12. Chipps Creek |
| 5. Warm Springs Creek | 13. Jesse Creek |
| 6. Tvelevemile Creek | 14. Moore Creek |
| 7. Tenmile Creek | 15. Deviar Creek |
| 8. Williams Lake Creek | 16. Wallace Creek |

Lemhi Valley between Salmon and Leadore

- | | |
|-----------------------|-------------------------|
| 1. Withington Creek | 9. Big Eightmile Creek* |
| 2. Haynes Creek | 10. Jakes Canyon |
| 3. Kadletz Creek | 11. Railroad Canyon |
| 4. Price Creek | 12. Yearian Creek* |
| 5. Warm Springs Creek | 13. Agency Creek |
| 6. Bear Valley Creek | 14. Sandy Creek |
| 7. Hayden Creek | 15. Hawley Creek |
| 8. Mill Creek | 16. Reese Creek |

* Denotes sites where Astragalus scaphoides populations were found on the Salmon NF.

Salmon River canyon between North Fork and Pine Creek

1. Slopes along Forest Road 30, along the Salmon River, between North Fork and Pine Creek.
2. Sage Creek
3. Indian Creek
4. Squaw Creek
5. Spring Creek
6. Pine Creek

APPENDIX 4

Slides of rare Astragali on or near the Salmon National Forest
and their habitats.

1. Astragalus amblytropis - close-up of plant; note reddish, inflated fruits and prostrate stems, with grayish leaves.
2. Astragalus aquilonius - close-up of plant; note greenish, inflated, unmottled pod.
3. Astragalus scaphoides - close-up of inflorescence; note the light yellow, slightly nodding flowers, and erect pods on relatively long stipes.
4. Astragalus scaphoides - habitat in Agency Creek; Artemisia tridentata ssp. wyomingensis/Agropyron spicatum habitat type.
5. Astragalus scaphoides - habitat in the Salmon River canyon; Pinus ponderosa/Agropyron spicatum habitat type.