A FIELD INVESTIGATION OF PARK MILKVETCH (*ASTRAGALUS LEPTALEUS*) IN IDAHO

by

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October 1991

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Cooperative Challenge Cost-share Project:
Salmon District BLM
Challis National Forest
Idaho Department of Fish and Game

Purchase Order Nos. ID-040-RQ-0513 (BLM)
40-02S2-0-1278 (CNF)

ABSTRACT

Astragalus leptaleus (park milkvetch) occurs in several disjunct areas in the Rocky Mountains, from Colorado to Montana and Idaho. Because of its rarity in Idaho, park milkvetch is on the Intermountain Region Sensitive Species List for the Challis NF and the Idaho BLM Sensitive Species List. No systematic survey had been conducted for park milkvetch in Idaho, prior to 1991. The Idaho Department of Fish and Game's Conservation Data Center[1] (CDC), through the Cooperative Challenge Cost-share Program with the Challis NF and Salmon BLM, undertook such an investigation in east-central Idaho, during July, August and September, 1991.

As result of our survey, fourteen extant occurrences of park milkvetch are now known from Idaho. We were unable to relocate two historically-known populations. These occur mostly on public land administered by the Challis and Targhee NFs and the Salmon BLM. Only two sites are known from private lands. The populations are spread across east-central Idaho in Custer and Lemhi counties. Cattle graze a majority of the sites, sometimes very heavily, but the long-term effects of this disturbance on population viability needs further study. Road building in the valley bottoms has had a direct, although localized, impact on park milkvetch habitat.

We recommend that park milkvetch remain on the Forest Service's Intermountain Region and the Idaho BLM Sensitive Species Lists. We also recommend that the Forest Service and BLM initiate a monitoring program to study the long-term effects of heavy cattle grazing on park milkvetch population viability.

[1] Formerly the Idaho Natural Heritage Program.

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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.

It is the policy of the Bureau of Land Management to conserve threatened and endangered species and the ecosystems they depend upon primarily by prescribing management for conservation of lands these species inhabit. The primary goals of the Threatened and Endangered Species Program are inventory, monitoring, plan preparation, and plan implementation to insure the maintenance and recovery of these species. It is also BLM policy of carry out management for the conservation of state-listed species assisting the states in achieving their management objectives for those species.

The Forest Service and Bureau of Land Management, along with other Federal and State agencies, has recognized the need for special planning considerations in order to protect the flora and fauna on lands in public ownership. Species recognized by these two agencies 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 or state BLM sensitive species list.

Astragalus leptaleus (park milkvetch) occurs in several disjunct areas in the Rocky Mountains, from Colorado, where it is the most abundant, to western Wyoming, western Montana, and east-central Idaho. Because of its rarity in Idaho, park milkvetch is on the Intermountain Region Sensitive Species List for the Challis NF (Spahr *et al*. 1991) and the Idaho BLM Sensitive Species List (Moseley and Groves 1990). No systematic survey had been conducted for park milkvetch in Idaho, prior to 1991. This field investigation was conducted in eastern Idaho by the Idaho Department of Fish and Game's Conservation Data Center[1] (CDC) through the Cooperative Challenge Cost-share Program with the Challis NF and Salmon BLM.

The primary objectives of this investigation were as follows:

1) Survey known Idaho populations of park milkvetch and search potential habitats for new populations.

2) Characterize habitat conditions for known populations.

3) Assess population trends, if possible, and threats to existing populations and make management recommendations to the Challis NF and Salmon BLM based on these assessments.

[1]Formerly the Idaho Natural Heritage Program.

RESULTS

During July 1991, I surveyed suitable-appearing habitats for park milkvetch on the Challis NF and Salmon BLM land in the Big Lost River and East Fork Salmon River drainages of Custer County. In addition, Targhee NF and Salmon and Idaho Falls BLM lands in Clark and Lemhi counties, were surveyed by CDC botanists in conjunction with another project during August and September.

Prior to 1991, eight park milkvetch occurrences were known from Big Lost River and Road Creek (East Fork Salmon River) drainages in Custer County. During our surveys we relocated six of the eight old occurrences and found eight new sites. We also extended the known range of park milkvetch in Idaho, east to the Birch Creek and Lemhi valleys in Lemhi County.

Following is a detailed discussion of park milkvetch in Idaho, including information on its taxonomy and identification, range and habitat, conservation status, and recommendations to the Forest Service and BLM concerning its status in Idaho.

Astragalus leptaleus Gray

CURRENT STATUS USFS Region 4 - Sensitive Species (Challis NF)
Idaho BLM - Sensitive
USFWS - None
Idaho Native Plant Society - Priority 1
Conservation Data Center Rank - G4 S1

TAXONOMY

Family: Fabaceae (Leguminosae) [Bean]

Common Name: Park milkvetch

Citation: Proc. Am. Acad. 6:220. 1884

Technical Description: Weak, delicate, diffuse, with a slender taproot and widely branching subterranean caudex, thinly strigulose with fine, appressed hairs up to 0.2-0.5 mm long, the stems and herbage bright green, the leaflets glabrous above, the inflorescence commonly nigrescent; stems loosely tufted, in old plants very numerous and entangled, 5-20 (30) cm long, arising singly or few together from buds on the slender, buried caudex-branches, branched at the first emersed, usually congested nodes, floriferous upward from near or from well below the middle; stipules 2-5 mm long, thinly herbaceous or submembranous, usually several-nerved, the lowest becoming papery in age, all glabrous dorsally, fully amplexicaul and connate, the lowest into a short bidentate sheath, the upper ones longer, united through half their length or less, sometimes only at very base, with lanceolate free blades; leaves 2.5-10 cm long, petioled but the uppermost shortly so, with subfiliform rachis and (9) 15-23 (27) narrowly elliptic or lanceolate and subacute, or (in the lower leaves) often ovate and obtuse, thin-textured leaflets 3-15 mm long; peduncles filiform, ascending, 2-5.5 cm long, shorter than the leaf; racemes loosely 1-5 (commonly 2- or 3-) -flowered, the flowers ascending at anthesis, declined thereafter, the axis up to 1 cm long in fruit; bracts membranous, lanceolate or lance-ovate, 1.3-3.3 mm long; pedicels at anthesis straight, 1.2-2.1 mm long, in fruit arched outward, 1.4-2.5 mm long; bracteoles 0-2, minute when present; calyx 4-5.7 mm long, densely to quite thinly black- or rarely white-strigulose, the somewhat oblique disc 0.3-1 mm deep, the campanulate tube 2.7-3.4 mm long, 1.9-2.4 mm in diameter, the subulate or lance-subulate teeth 1.1-2.5 mm long; petals white, the keel-tip maculate with dull bluish-purple; banner recurved through 45°, ovate-cuneate, notched, 8.5-11.8 mm long, 4.8-7.2 mm wide; wings 7.2-9.5 mm long, the claws 2.7-3.8 mm, the obliquely obovate, oblong-oblanceolate or -elliptic, obtuse or emarginate blades 4.9-6.5 mm long, 1.8-2.9 mm wide; keel 6-7.3 mm long, the claws 2.8-3.9 mm, the obliquely half-obovate blades 3.2-3.9 mm long, 1.8-2.3 mm wide, incurved through 85-120° to the bluntly deltoid apex; anthers 0.3-0.5 mm long; pod pendulous, obscurely stipitate or subsessile, the stipe not over 1.5 mm long, often reduced to a narrow neck, the body oblong-, lance-, or subclavate-elliptic in dorsiventral view, 8-14 mm long, 2.5-4 mm in diameter, slightly decurved, shortly subulate- or cuspidate-beaked, obcompressed and bluntly trigonous, with obtuse lateral angles and low-convex lateral faces, keeled ventrally by the prominent, convexly arched suture, flattened or shallowly and openly sulcate dorsally, the thin, green, sparsely black- or white-strigulose valves becoming stramineous and papery, not inflexed; ovules 6-10; seeds brown, smooth, lustrous, 1.8-2.1 mm long (Barneby 1964).

Nontechnical Description: Delicate perennial from a deeply buried taproot and creeping underground caudex. Stems 5-20 cm long, bearing flowers from near or well below the middle; flowers white, tip of the keel purplish. Leaflets 15-27, bright green, thinly hairy, mostly lanceolate and acute. Pod 8-14 mm long, oblong-ellipsoid, somewhat obcompressed, with thin, black and white hairs (Caicco and Henderson 1981).

Distinguishing Features and Similar Species: Park milkvetch has a delicate habit, has bright green leaflets, has only two or sometimes three white flowers at the middle of the stem, and most distinguishing, has slightly obcompressed, one-celled pods that are not visibly stipitate. The stipe, if present, is concealed by the calyx. In our area, park milkvetch is most similar to *Astragalus alpinus*, but at least three other milkvetches and an *Oxytropis* also occur in the riparian communities of the region that could be confusing. The following key, modified from Hitchcock (1961), will help distinguish park milkvetch from similar-looking riparian legumes of east-central Idaho:

A. Keel of the corolla abruptly narrowed to a beaklike point; plants without leafy stems .... *Oxytropis deflexa*

A. Keel of the corolla not abruptly beaked; plants with leafy stems.

B. Terminal leaflet is confluent (continuous) with the rachis; plants robust with prostrate stems from a taproot; flowers white; calyx red ..... *Astragalus diversifolius*

B. All leaflets jointed to the rachis, including the terminal one.

C. Banner (measured along the curvature of the midvein) over 15 mm long; flowers purple, strongly erect, crowded into ovoid heads; stems arising from a buried rootcrown ..... *A. agrestis*

C. Banner not over 15 mm long; flowers not strongly erect or crowded into ovoid heads.

D. Keel petals 2.5-6 mm long; herbage dark green; flower deep purple; pods pendulous ..... *A. eucosmus*

D. Keel petals over 6 mm long.

E. Stipe of the pod 1.4-3.5 mm long, the valves inflexed as a narrow but evident septum 0.2-0.7 mm wide; racemes (5) 7-23-flowered, occurring at the ends of the stems and usually exceeding the leaves; petals lavender..... *A. alpinus*

E. Stipe of the pod not over 1.5 mm long, often obscure and reduced to a narrow stipe-like neck, the valves not inflexed; racemes mostly 2-3, rarely 5-flowered, occurring at about the middle of the stem, the leaves far surpassing the raceme; petals white, with purple keel tip ..... *A. leptaleus*

See Appendix 1 for a line drawing of park milkvetch.

DISTRIBUTION

Range: Park milkvetch is endemic to the Rocky Mountains, where it occurs sporadically and apparently never in abundance. It is most widespread in Colorado, with several disjunct stations north in the Rockies to western Wyoming, east-central Idaho, western Montana, and reportedly from Alberta (Hitchcock 1961; Barneby 1964; Isley 1985). At least three collections of park milkvetch were made in Idaho during the 1940's, all were along the Big Lost River, between Mackey and Chilly. Steve Caicco "rediscovered" the species in 1981, along the North Fork Big Lost River, as part of an evaluation of rare plants on the Lost River Ranger District, Challis NF (Caicco and Henderson 1981; Caicco *et al.* 1983). In 1988, Caryl Elzinga extended the known Idaho range of park milkvetch to the East Fork Salmon River drainage, with the discovery of three populations along Road Creek.

Results of our survey in 1991, increased the number of known populations in the Big Lost and East Fork Salmon drainages, plus we extended the known distribution in the state 50 miles to the east, with the discovery of populations along Birch Creek and along Texas Creek, in the Lemhi Valley. As of the 1991 field season, park milkvetch is known from 14 extant sites in Idaho. We were unable to relocate two historical sites. It is locally abundant, but the areal extent of the extant populations generally range from a few square feet to about three acres. The Lower Wildhorse Creek (009) population is an exception, however, covering approximately 50 acres.

Below is a short summary of each occurrence. Appendix 2 contains detailed element occurrence records from the CDC data base for the 16 park milkvetch occurrences in Idaho. It should be noted that, because park milkvetch has a highly branched caudex (underground stem) and occurs in relatively dense clones or patches, it is difficult to count the number of plants in a population. Therefore, the estimates in Appendix 2 are gross, and areal extent of the population is a better indication of viability. See Appendix 3 for the mapped locations of known park milkvetch populations in Idaho, and Appendix 4 for a list of locations searched, some unsuccessfully.

NORTH FORK BIG LOST RIVER 001[1] - Big Lost River drainage. Probably hundreds of plants scattered over about 75 yd^2. First discovered in 1981. Little change observed in 1991. Challis NF.

THOUSAND SPRINGS CREEK CONFLUENCE 002 - Big Lost River drainage. Moderately-sized population of hundreds of plants spread over about three acres. May be the site of historical Christ collection, rediscovered by Caicco in 1982. No change seen in 1991. Private land.

WHISKEY SPRINGS 003 - Big Lost River drainage. Two very small populations on less than 0.5 acre total. First discovered in 1991. Salmon BLM land.

[1]The three-digit numbers following the occurrence name refers to the occurrence record number in the Conservation Center data base.

BEAR CREEK 004 - East Fork Salmon River drainage. Large population on about three acres. Community in poor ecological condition. Discovered in 1988. No change observed in 1991. State and Salmon BLM land.

ROAD CREEK EXCLOSURE 005 - East Fork Salmon River drainage. Small, localized population within riparian exclosure. Discovered in 1988; no change observed in 1991. Salmon BLM land.

ROAD CREEK 006 - East Fork Salmon River drainage. Small localized population in heavily grazed riparian community. Discovered in 1988. Population expanded somewhat in 1991. Salmon BLM land.

CEDAR CREEK BAR 007 - Big Lost River drainage. Historical (1940's) site based on Christ and Ripley and Barneby collections. Unable to locate in 1991. Largely on fenced and posted private land.

KANE CREEK 008 - Big Lost River drainage. Based on a Henderson collection from 1982. Location narrative from collection label fits site very well, but only found *Astragalus alpinus* and *A. eucosmus* in 1991, not park milkvetch. Challis NF.

LOWER WILDHORSE CREEK 009 - Big Lost River drainage. Very large, extensive population that is locally dense. By far the largest known in Idaho. Discovered in 1982. Considerably expanded in 1991 survey. Challis NF.

TWIN BRIDGES CREEK 010 - Big Lost River drainage. Moderately-sized population, although upstream meadows not checked because of posted private land; may be larger. Discovered in 1991. Salmon BLM and probably private land.

EAST FORK BIG LOST RIVER 011 - Big Lost River drainage. Only one plant discovered in 1991. Challis NF.

UPPER WILDHORSE CREEK 012 - Big Lost River drainage. Moderately-sized population on about two acres. Discovered in 1991. Challis NF.

LAKE CREEK 013 - East Fork Salmon River drainage. Small population in a small area. Discovered in 1991. Salmon BLM land.

HORSE BASIN CREEK 014 - East Fork Salmon River drainage. Moderately large population on 2+ acres in the Anderson Ranch Riparian Pasture. Discovered in 1991. Salmon BLM land.

BIRCH CREEK FEN 015 - Birch Creek Valley. Several small, but dense, populations. Discovered in 1991. Targhee NF.

TEXAS CREEK 016 - Lemhi Valley. Small population on a few square feet. Discovered in 1991. Private land.

Our 1991 survey for park milkvetch was relatively thorough in the Big Lost River drainage and parts of the East Fork Salmon River drainage. In the upper Birch Creek and Lemhi valleys it was opportunistic, however, being associated with another project. A more thorough search of the upper Lemhi Valley may reveal additional populations, although the suitable habitat in this area is mostly on private land. Little suitable habitat remains to be searched in the upper Birch Creek Valley. Another promising area to search in the East Fork Salmon River drainage is upper Herd Creek above the Herd Creek Road, which is mostly Challis NF. Because we did not know of the Lemhi County populations during July, when a bulk of this investigation took place, no concerted effort was made to search the Pahsimeroi and Little Lost River valleys. Parts of Mahogany Creek (Pahsimeroi Valley) and Summit Creek and Dry Creek (Little Lost River Valley) were subsequently searched. These two major valley systems present further opportunity to search for park milkvetch populations.

Habitat and Associated Species: The habitat of park milkvetch is best characterized as being the mesic ecotone between saturated riparian communities and dry, upland sagebrush-steppe. This can occur in at least two settings (1) the tops and sides of hummocks and (2) the dry fringe of Geyer's willow/bluegrass or graminoid-dominated communities. The substrate is loamy, mineral soil that, in August, was dry at the surface, but somewhat moist just below the surface. Soil of the hummocky sites was generally white and alkaline-looking. All sites were more or less flat and open, although park milkvetch sometimes occurs in the partial shade of Geyer's willow and occasionally Booth's willow.

Except for Geyer's willow (*Salix geyeriana*) and Booth's willow (*S. boothii*), most associated species are low growing. The most common/plentiful associates include *Poa pratensis, Juncus balticus*, and *Sisyrinchium idahoense*. Others include *Oxytropis deflexa, Astragalus eucosmus, A. agrestis, A. alpinus, A. diversifolius, Hordeum brachyantherum, Trifolium longipes, Zizia aptera, Antennaria anaphaloides, A. microphylla, Glaux maritima, Haplopappus uniflorus, Senecio debilis, Phlox kelseyi, Ranunculus cymbalarioides, Iris missouriensis, Trichlochin maritimum, Deschampsia cespitosa, Salix brachycarpa, Polygonum viviparum, Potentilla fruticosa, Thalictrum alpinum, Pedicularis groenlandica, Betula glandulosa*, and *Hesperochiron pumilus*.

Several rare plant species occur in the same meadow systems with park milkvetch. At Whiskey Springs 003, *Astragalus diversifolius* and *Phlox kelseyi* are sympatric with park milkvetch. These two species also occur at the Birch Creek Fen 015, along with *Salix candida, Primula alcalina*, and *Lomatogonium rotatum*. The Texas Creek 016 fen has *Salix candida, Carex livida, Primula alcalina*, and *Lomatogonium rotatum*, in addition to park milkvetch.

CONSERVATION STATUS

Conservation Status - Idaho: Park milkvetch was overlooked initially as being of conservation concern in Idaho. It was Caicco's 1981 "rediscovery" of the species in Idaho, as part of the Challis NF rare plant study, that first focused conservation attention on the species. At that time it was recommended for State Threatened status (Caicco and Henderson 1981; Henderson and Caicco 1983).

Park milkvetch is on the Forest Service's Intermountain Region Sensitive Species list for the Challis NF (Spahr *et al.* 1991). It is also on the Idaho BLM Sensitive Species List (Moseley and Groves 1990).

The Idaho Native Plant Society has placed park milkvetch in their Priority 1 category of Idaho rare plants (Idaho Native Plant Society 1991). The Priority 1 category of the Idaho Native Plant Society list refers to taxa in danger of becoming extinct or extirpated in Idaho in the foreseeable future if identifiable factors contributing to their decline continue to operate (Moseley and Groves 1990).

The Idaho Natural Heritage Program currently ranks park milkvetch as G4 S1 [G4 = park milkvetch is apparently secure globally, though it may be quite rare in parts of its range, especially at the periphery; S1 = critically imperiled in Idaho because of extreme rarity or because of some factor of its biology making it especially vulnerable to extirpation (Moseley and Groves 1990)].

Conservation Status - Elsewhere: Although park milkvetch occurs in Wyoming, Colorado, and possibly Alberta, it is of conservation concern only in Montana and Idaho.

MONTANA: Lesica and Shelly (1991) have summarized the conservation status of park milkvetch in Montana. It is considered Sensitive there, that is, it is a taxon that is known from a limited number of populations in Montana, or that occurs principally in restricted habitats considered vulnerable to man-caused disturbances. These taxa may have a restricted range in Montana, or they may be sparsely distributed over a larger area. Plants designated as Sensitive may possibly become threatened or endangered in the state if impacts to known populations occur. The Montana Natural Heritage Program ranks park milkvetch as S1 in Montana (same definition as Idaho). The only collections of park milkvetch within the last 70 years are from Beaverhead County.

Ownership: Of the 14 occurrences of park milkvetch known to be extant in Idaho, most are on public land administered by the Forest Service or BLM. Following is a breakdown of the ownership/management responsibility for the extant occurrences:

4 - Challis NF (001, 009, 011, 012)
1 - Targhee NF (015)
7 - Salmon BLM (003, 004, 005, 006, 010, 013, 014)
2 - Private (002, 016)

Threats: Following is a summary of anthropogenic disturbances to the habitat of the 14 extant occurrences of park milkvetch in Idaho:

NORTH FORK BIG LOST RIVER 001 - Sheep trail through area on way to and from high country pastures. Habitat is grazed by cattle periodically, although this pasture is occasionally rested. Forest Service Road 128 traverses the habitat, as do several "informal" roads through the meadow, and may have impacted population.

THOUSAND SPRINGS CREEK CONFLUENCE 002 - Infrequently grazed by cattle; generally good site quality.

WHISKEY SPRINGS 003 - Very heavily grazed by cattle (annually?). Nearby cabins (in ruins) indicate that this has probably been the case for many years. Small population with very few

flowers or fruits seen.

BEAR CREEK 004 - Very heavily grazed by cattle (annually?). Plants are very closely cropped; may be reason for lack of flowers in 1991.

ROAD CREEK EXCLOSURE 005 - Good site quality, although small population, within exclosure.

ROAD CREEK 006 - Small population that is very heavily and constantly grazed by cattle. Plants are closely cropped and very few flowers seen in 1991. The Walker Way and other informal roads traverse the occurrence.

LOWER WILDHORSE CREEK 009 - Heavily grazed by cattle, almost annually. Very dense and vigorous population.

TWIN BRIDGES CREEK 010 - Moderately grazed by cattle; vigorous, but small population.

EAST FORK BIG LOST RIVER 011 - Grazed by cattle.

UPPER WILDHORSE CREEK 012 - Some grazing by cattle has occurred in the past, but appears to have been missed in the last couple of years.

LAKE CREEK 013 - Grazed by cattle. Herd Creek Road traverses meadow and may have impacted this population.

HORSE BASIN CREEK 014 - Light cattle grazing occurs in this "special riparian pasture".

BIRCH CREEK FEN 015 - Lightly grazed by horses in the winter. Some trampling of stream banks by fishermen.

TEXAS CREEK 016 - Very heavily grazed by cattle annually.

Most sites are grazed by cattle to some degree. Two occurrences along Road Creek (004 and 005) appear to be grazed the heaviest, followed by the Lower Wildhorse 009 and Whiskey Springs 003 occurrences. Very little flower and fruit production was seen at the two Road Creek occurrences in 1991, possibly resulting from very heavy and constant cattle grazing. The riparian zone is very narrow at these two sites and the adjacent upland vegetation is very xeric. In contrast, the dense and vigorous Lower Wildhorse occurrence, while being heavily grazed, occurs in a very wide riparian zone surrounding by relatively mesic sagebrush-steppe communities. It appeared to me that cattle disperse widely throughout the valley bottom, as compared to Road Creek where the cattle were concentrated in the narrow riparian corridor. The long-term affects of livestock grazing on these populations is unknown, however, research on another rare *Astragalus* (Sugden 1985) found that livestock grazing may have considerable long-term effects on population viability. Undoubtedly, these practices have been taking place for may years.

Road building is another threat to park milkvetch populations. Several roads have undoubtedly impacted populations in the past, but the full extent of this is unknown because the habitat is already destroyed. Road building represents a direct threat to a population, in contrast to cattle grazing with its more subtle,

indirect effects.

I was unable to locate two occurrences in 1991, the Cedar Creek Bar 007 and Kane Creek 008 sites. The Cedar Creek Bar site is based on two 1940's collections that have somewhat vague directions, but appear both to have been near where the road across Barton Flats crosses the Big Lost River. Both sides of the road in this area are fenced and posted. I searched only near the road, unsuccessfully, but much suitable habitat occurs on private land in the vicinity, and it is possible that this occurrence is still extant. The Kane Creek site was very frustrating. The location narrative from the Henderson's collection label is precise and fits the site very well. I thoroughly checked the site several times over the course of two weeks, but found only *Astragalus alpinus* and *A. eucosmus*, not park milkvetch.

Management Implications: The direct impacts of road building, or other similar types of habitat destruction, can easily be prevented by conducting ground clearances for park milkvetch during the early planning stages of the project. If cattle grazing is having an impact on population viability, the effects would be more subtle and is observable only over the long-term. Selected populations of park milkvetch should be monitored to determine population trends and assess long-term viability as part allotment management planning.

ASSESSMENT AND RECOMMENDATIONS

Summary: Fourteen extant occurrences of park milkvetch are now known from Idaho. These occur mostly on public land administered by the Challis and Targhee NFs and the Salmon BLM. Only two sites are known from private lands. The populations are spread across east-central Idaho in Custer and Lemhi counties. Cattle graze a majority of the sites, sometimes very heavily, but the long-term effects of this disturbance on population viability needs further study. Road building in the valley bottoms has had a direct, although localized, impact on park milkvetch habitat.

Recommendations to the Regional Forester: Based on data discussed in this report, park milkvetch still meets Sensitive Species criteria and should remain on the Regional List for the Challis NF, and should be added to the Targhee NF. The rationale for this recommendation lies in the fact that it is rare throughout the northern portion of its range and occurs in isolated, generally small populations, all of which have some level of anthropogenic disturbances impacting them.

Recommendations to the Challis National Forest: Park milkvetch populations should be monitored to determine the long-term effects of cattle grazing on viability. The Lower Wildhorse Creek (009) and North Fork Big Lost River (001) are ideal sites for monitoring. Further inventory for park milkvetch populations should be conducted in the Herd Creek drainage and in the larger valleys along the east slope of the Lost River Range and west slope of the Lemhi Range (those with perennial flows).

Recommendations to the Targhee National Forest: Little suitable park milkvetch habitat occurs on that portion of the Targhee NF in the Birch Creek Valley. The Birch Creek Fen, near Kaufman Guard Station, may be the only place. The Idaho Conservation Data Center and the Targhee NF will cooperatively prepare a management plan for the Birch Creek Fen in 1991. The plan will address management of all rare plant species and wetland communities in the fen, including park milkvetch. Populations of park milkvetch in Montana, however, occur very close to the Idaho border in the Monida Pass area. It is, therefore, highly possible that it occurs on the Targhee NF in the Centennial Mountains.

Recommendations to the Bureau of Land Management: Park milkvetch should remain on the Idaho BLM Sensitive Species List. The Salmon District should consider monitoring selected populations to determine the long-term effects of cattle grazing on viability. The three populations along Road Creek (004, 005, and 006) and the Whiskey Springs (003) population would be ideal, especially since the Road Creek Exclosure 005 population is currently protected from grazing. Further inventory for park milkvetch populations should be conducted in the Little Lost River and Pahsimeroi valleys.

Other Recommendations: The Idaho Conservation Data Center has revised its state rank for park milkvetch from S1 to S2 (imperiled in Idaho because of rarity or because of other factors demonstrably making it very vulnerable to extirpation). At the Idaho Rare Plant Conference in 1992, the CDC will recommend that the Idaho Native Plant Society move park milkvetch from the Priority 1 to the Sensitive category of the Idaho rare plant list.

PLEASE NOTE: Land managers and field personnel of the Forest Service and BLM should be informed of the occurrence of this species in their area. Possible sightings of this plant should be documented by specimens (if the size of the population warrants collecting), and should be sent to the University of Idaho Herbarium (Department of Biological Sciences, University of Idaho, Moscow 83843, 208/885-6798) for verification of their identity. When sending specimens for identification, always include detailed location, habitat, and pertinent morphological information. In the case of park milkvetch try and include both flowers and fruits. Confirmed sightings of this species should be reported to the Idaho Conservation Data Center for entry into their permanent data base on sensitive species.

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Appendix 1

Line drawings of *Astragalus leptaleus* (from Hitchcock 1961).

Appendix 2

Element occurrence records for
Astragalus leptaleus in Idaho.
NOT INCLUDED IN CDC HOME PAGE VERSION OF THIS REPORT

Appendix 3

Locations of *Astragalus leptaleus* in Idaho.

Map 1. Overview of park milkvetch distribution in Idaho.

Map 2. North Fork Big Lost River 001 occurrence. Portion of 1967 Herd Peak 7.5' quadrangle.

Map 3. Thousand Springs Creek Confluence 002 and Whiskey Springs 003 occurrences. Portion of 1967 Elkhorn Creek 7.5' quadrangle.

Map 4. Bear Creek 004, Road Creek 006, and Horse Basin Creek 014 occurrences. Portion of 1967 The Paint Pot 7.5' quadrangle.

Map 5. Road Creek Exclosure 005 occurrence. Portion of 1967 Horse Basin 7.5' quadrangle.

Map 6. Cedar Creek Bar 007 occurrence. Portion of 1960 Copper Basin 15' quadrangle.

Map 7. Kane Creek 008 occurrence. Portion of 1967 Phi Kappa Mtn. 7.5' quadrangle.

Map 8. Lower Wildhorse Creek 009, East Fork Big Lost River 011, and Upper Wildhorse Creek 012 occurrences. Portions of 1967 Harry Canyon and Standhope Peak 7.5' quadrangles.

Map 9. Twin Bridges Creek 010 occurrence. Portion of 1967 Harry Canyon 7.5' quadrangle.

Map 10. Lake Creek 013 occurrence. Portion of 1967 Herd Lake 7.5' quadrangle.

Map 11. Birch Creek Fen 015 occurrence. Portion of 1969 Blue Dome 7.5' quadrangle.

Map 12. Texas Creek 016 occurrence. Portion of 1987 Purcell Spring 7.5' quadrangle, provisional edition.

Appendix 4

List of areas searched for
Astragalus leptaleus in 1991.

UPPER BIG LOST RIVER DRAINAGE (Challis NF)

East Fork
The Swamps (head of East Fork)
Corral Creek
lower Lake Creek
Muldoon Canyon
Star Hope Creek
Bear Canyon
Ramey Creek
Bellas Canyon
Broad Canyon
Road Creek
Wildhorse Creek
Kane Creek
Summit Creek
North Fork

LOWER BIG LOST RIVER DRAINAGE (BLM and private)

Big Lost River
Twin Bridges Creek
Lake Creek
Burnt Creek
Thousand Springs Creek

EAST FORK SALMON RIVER (BLM and private)

Lake Creek
lower Herd Creek
Road Creek
Horse Basin Creek
Spar Canyon

Appendix 5

Slides of *Astragalus leptaleus*
and its habitat in Idaho.

1. Close-up of flowers; note two flowers with white petals and purple tip of keel petal.

2. Close-up of fruits; note lack of obvious stipe at base of fruit.

3. Close-up of whole plant; note the few-flowered racemes originating near middle of stem.

4. Close-up of habitat at Lower Wildhorse Creek (009); plant occurs on the sides and summit of this hummock. Antennaria microphylla dominates the top of the hummock; darker green plant is park milkvetch.

5. Habitat at Road Creek (006). Mesic ecotone between saturated communities (right) and xeric upland (left).

6. Habitat at Thousand Springs Creek Confluence (002); plant occurs in graminoid-dominated community in foreground. Geyer's willow/Kentucky bluegrass community behind.