

**MONITORING *ASTRAGALUS ANSERINUS* (GOOSE CREEK MILKVETCH)
AND *PENSTEMON IDAHOENSIS* (IDAHO PENSTEMON)
IN THE GOOSE CREEK DRAINAGE, IDAHO
2001 RESULTS**

by

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ABSTRACT

Goose Creek milkvetch (*Astragalus anserinus*) and Idaho penstemon (*Penstemon idahoensis*) are two rare plant species endemic to the Goose Creek drainage in southern Cassia County, Idaho, and adjacent parts of Utah and Nevada. They are both restricted to sparsely vegetated edaphic exposures of Salt Lake Formation sediments. Both species are on the Idaho Bureau of Land Management Sensitive plant list. In June 2000, baseline habitat monitoring information was collected for both species at a series of permanently marked photo-monitoring stations. The stations were established at three of the seven known Goose Creek milkvetch and eight of the twelve known Idaho penstemon occurrences in Idaho. In addition to the photographic record, the monitoring protocol consisted of collecting quantitative plant community habitat data and updating conservation information for each occurrence. Wildfires in 1999 and 2000 burned large portions of the Goose Creek basin, with fire perimeters encompassing several occurrences of Goose Creek milkvetch and Idaho penstemon. As a result, 2001 presented a good opportunity to resample the monitoring stations and help document the initial response of these two species and their habitats to wildfire. Towards this end, the Bureau of Land Management's Upper Snake River District and the Idaho Department of Fish and Game's Conservation Data Center entered into a Challenge Cost-share agreement to revisit and repeat the photo-monitoring, vegetation sampling, and occurrence update procedures. Our objective was to collect a second consecutive year of monitoring data to study the effects of wildfire on the conservation of Goose Creek milkvetch and Idaho penstemon, and their habitats. This report outlines the monitoring methodology, summarizes the 2001 monitoring results, and discusses the results in the context of wildfire and other conservation concerns.

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INTRODUCTION

In 2000, the Idaho Conservation Data Center (CDC) established permanently marked photo-monitor points at selected occurrences for six rare plant species considered high priority conservation concerns in Idaho (Mancuso 2001). In addition to the photographic record, the monitoring protocol consisted of updating conservation information and collecting quantitative plant community habitat data. Goose Creek milkvetch (*Astragalus anserinus*) and Idaho penstemon (*Penstemon idahoensis*) were included in this monitoring project to (1) acquire occurrence-specific size, habitat condition, and threat information that needed to be updated; and (2) acquire baseline information needed to monitor and assess habitat changes and trends. This information was needed to assess current conservation status and management concerns in an accurate and comprehensive fashion. Towards this end, monitoring stations were established at selected Goose Creek milkvetch and Idaho penstemon occurrences located on public lands in the Goose Creek drainage in southern Cassia County. Both species are on the Idaho Bureau of Land Management (BLM) Sensitive plant list.

Part of the Goose Creek drainage burned in 1999. After monitoring was completed in 2000, wildfires again burned large segments of the drainage, with the fire perimeter encompassing several occurrences of Goose Creek milkvetch and Idaho penstemon. As a result, 2001 presented a good opportunity to resample the monitoring stations and help document the initial response of these two species and their habitats to wildfire. Responding to wildfire can be one of the most difficult responsibilities facing land managers, especially when special resource values such as Sensitive species are involved and at risk. In 2001, the BLM's Upper Snake River District and the Idaho Department of Fish and Game's CDC entered into a Challenge Cost-share agreement to revisit and repeat the photo-monitoring, vegetation sampling, and occurrence update procedures. Our objective was to collect a second consecutive year of monitoring data and provide insight regarding wildfire and the conservation of Goose Creek milkvetch and Idaho penstemon.

Goose Creek milkvetch

Goose Creek milkvetch is a low, tufted perennial forb with small pink-purple flowers and curved, brownish-red fruit pods. It is a narrow endemic of the Goose Creek drainage near where Idaho, Utah, and Nevada share a common border, south of Oakley, Idaho. Seven of the approximately 20 known rangewide occurrences are located in Idaho. The others occur in nearby portions of the adjoining two states. In Idaho, occurrences range in size from less than ten to perhaps several hundred plants. Nearly all occurrences visited in 2000 and 2001 have substantially fewer plants than estimates made in the late 1980s and early 1990s (Mancuso and Moseley 1991a). Goose Creek milkvetch is restricted to relatively sparsely vegetated outcrops and openings within sagebrush or juniper habitats. The dry, sandy, light-colored tuffaceous sediments supporting Goose Creek milkvetch belong to the regional Salt Lake Formation geology. Conservation concerns for Goose Creek milkvetch are focused on the apparent sharp decline in the number of plants over the past decade and possible habitat degradation problems related to recent wildfires and ongoing livestock use impacts.

Idaho penstemon

Idaho penstemon is a short, erect, perennial forb with glandular herbage and a showy display of bluish flowers. It also has a narrow distribution restricted to the Goose Creek basin. Fewer than 15 occurrences are known, one in Utah, the remainder in Idaho. Occurrences range in size from less than 100 to over 1,000 individuals. Population estimates for Idaho penstemon have not declined over the past decade, as most occurrences currently have numbers comparable to, or slightly higher than estimates made in the early 1990s (Mancuso and Moseley 1991b). Like Goose Creek milkvetch, Idaho penstemon is also confined to sparsely vegetated edaphic exposures of Salt Lake Formation sediments. The light-colored, often rocky and steep outcrops

tend to have a hard and fine texture, with bedrock near the surface. Erosional properties of the outcrops are different than the deep, sandy textured substrate typical for Goose Creek milkvetch. As a result, the two species may occur in close proximity to one another, but only rarely are they found growing directly together.

METHODS

In June 2000, baseline habitat monitoring information was collected for Goose Creek milkvetch and Idaho penstemon at a series of permanently marked monitoring stations in the Goose Creek drainage, Cassia County, Idaho (Mancuso 2001). The stations were established at three of the seven known Goose Creek milkvetch and eight of the twelve known Idaho penstemon occurrences in the state. Locations for the monitoring stations were originally chosen after completing a reconnaissance survey of most or all of a given occurrence area. In most cases, they were subjectively located in habitat representative of the occurrence. For three Idaho penstemon occurrences (001, 002, 005), however, monitoring sites were chosen to overlap the location of research transects established several years ago by Brian Cheney. Brian was a graduate student at Brigham Young University studying the demography and other life history attributes of Idaho penstemon. All the monitoring stations were marked using red-painted rebar stakes hammered into the ground.

A second year of monitoring information was collected between June 18 and 21, 2001. Occurrences included in the monitoring program are listed in Table 1. All but one of the 11 monitoring plots established in 2000 were resampled in 2001. The exception was the Goose Creek milkvetch occurrence at Coal Banks Creek (004). The original plot at this occurrence was abandoned in favor of a new, nearby, more representative location. The location of each monitoring station was mapped on a USGS topographic quadrangle (Appendix 1). In addition, an associated location form was completed with directions and a sketch of landmarks and bearings to help relocate the monitoring stations in the future (Appendix 2). The location form has the GPS coordinates for each monitoring station. They were obtained using a navigation grade (Garmin 12XL) unit. The monitoring protocol consists of two main components – collecting quantitative plant community data and taking a series of photo-point photographs. In addition, conservation information gets updated for each occurrence.

Plant community data

Plant community habitat data were collected using a 1/10th acre circular plot and methods outlined in Bourgeron et al. (1992). The rebar stake permanently marking the location of the monitoring station serves as the center of each plot. Plant community information is based on ocular estimates of cover class values for all vascular plant species occurring in the plot. Changes in the species list and associated cover class values from one sampling period to the next are used to monitor changes in the plant community. Because this method has an acceptable accuracy standard of +/- one cover class, an increase or decrease of two or more cover classes is required to be indicative of a measurable change. For each plot, an Ocular Plant Species Data form listing the estimated percent cover for every plant species in the plot was completed. Cover class estimates were also made for several ground cover categories, including soil, gravel, rock, wood, litter, moss/lichen, and basal vegetation. Cover classes used for this monitoring program are:

1 = <1%	30 = 25 - 34.9%	70 = 65 - 74.9%
3 = 1 - 4.9%	40 = 35 - 44.9%	80 = 75 - 84.9%
10 = 5 - 14.9%	50 = 45 - 54.9%	90 = 85 - 94.9%
20 = 15 - 24.9%	60 = 55 - 64.9%	98 = 95 - 100%

Table 1. List of occurrences monitored in 2000 and 2001.

Species	EOR	Name of occurrence	Land ownership
<i>Astragalus anserinus</i>	001	Lower Beaverdam Creek	BLM
<i>Astragalus anserinus</i>	004	Coal Banks Creek	BLM
<i>Astragalus anserinus</i>	006	Goose Creek, Idaho/Utah border	BLM
<i>Penstemon idahoensis</i>	001	Whitley Ranch Gulch	BLM
<i>Penstemon idahoensis</i>	002	Beaverdam Creek	BLM
<i>Penstemon idahoensis</i>	004	Right Hand Fork Beaverdam Creek	Sawtooth NF
<i>Penstemon idahoensis</i>	005	Orangeburg Spring	Sawtooth NF
<i>Penstemon idahoensis</i>	006	North of Worthington Mine	Sawtooth NF
<i>Penstemon idahoensis</i>	007	Nearly Nevada – Almost Utah	Idaho State land
<i>Penstemon idahoensis</i>	008	Lower Beaverdam Creek	BLM
<i>Penstemon idahoensis</i>	010	Border Gulch	BLM

Photo-points

Photo-points were originally established in 2000 at each occurrence included in the project. The rebar stake permanently marking the location of the monitoring station also serves as the reference point for taking the photo point photographs. A minimum of eight photographs were taken at each photo point – 0°, 45°, 90°, 135°, 180°, 225°, 270°, and 315°. A declination of 17° was used for these compass bearings. The array of photos provides a panoramic view of the surrounding landscape and general habitat characteristics. Additional photographs were taken when needed to show specific habitat, threat, or other occurrence details. In 2000, color slides were taken using a SLR camera, ASA 100 slide film, and wide angle (28°) lens. In 2001, color prints were taken instead. Photographs were provided to the BLM as part of this report. Copies are on file at the CDC office in Boise.

Occurrence updates

Updated occurrence information was collected by walking most or all of the occurrence area. Plant abundance numbers were estimated or counted. Habitat conditions were evaluated paying special attention to any fire disturbance impacts or other potential threat factors such as weed invasion and livestock use.

RESULTS

Four rare plant occurrences are located within the 1999 or 2000 wildfire perimeters. However, only two of the occurrences are included in the monitoring program at the present time - the Idaho penstemon occurrence at Whitley Ranch Gulch (001) and the Goose Creek milkvetch occurrence at Coal Banks Creek (004).

Plant community data

Plant community data for 2000 and 2001 at the Goose Creek milkvetch occurrences are compared and summarized in Table 2. Similar information for Idaho penstemon is provided in Table 3. Plant community data sheets for 2000 are provided in Appendix 3, while Appendix 4 has copies of the 2001 sheets. The three Goose Creek milkvetch plots contain a total of 47 vascular plant species compared to 66 species tallied at the eight Idaho penstemon plots. Greater forb diversity accounts for the higher Idaho penstemon plot tally.

For both Goose Creek milkvetch and Idaho penstemon, most plots have between three to five shrub, three to six graminoid, and nine to fourteen forb species. Only two species, Wyoming big sagebrush (*Artemisia tridentata* ssp. *wyomingensis*) and cushion buckwheat (*Eriogonum*

ovalifolium), had 100% constancy for the Goose Creek milkvetch plots. For Idaho penstemon plots, only Utah juniper (*Juniperus osteosperma*), bitterbrush (*Purshia tridentata*), bluebunch wheatgrass (*Agropyron spicatum*), and Indian ricegrass (*Oryzopsis hymenoides*) had 100% constancy. Cushion buckwheat had the highest constancy among the forbs at 90%. Although many species occurred in plots for both Goose Creek milkvetch and Idaho penstemon, several were restricted to, or much more common in plots for one compared to the other. Examples include needle-and-thread grass (*Stipa comata*) and pale evening-primrose (*Oenothera pallida*) for Goose Creek milkvetch sites; and turpentine cymopterus (*Cymopterus terebinthinus*), varying buckwheat (*Eriogonum brevicaulum* var. *laxifolium*), blue flax (*Linum perenne*), and basin butterweed (*Senecio multilobatus*) for Idaho penstemon plots. The total cover class value by life form (tree, shrub, graminoid, or forb) was usually 10% or less, and bare soil and gravel always dominated the ground cover. These features highlight the relatively sparse vegetation and open habitat characterizing most Goose Creek milkvetch and Idaho penstemon occurrences.

Table 2. Plant cover and constancy values for Goose Creek milkvetch monitoring plots. Plant cover values are explained in the text. Constancy values are: 10=<15%; 20=15-25%; 30=26-35%; 40=36-45%; 50=46-55%; 60=56-65%; 70=66-75%; 80=76-85%; 90=86-95%; 100=>95%.

Species	Plot Identification Code						Constancy	
	ASAN-1		ASAN-4		ASAN-6			
	00	01	00	01	00	01	00	01
TREES								
<i>Juniperus osteosperma</i>			10	1			30	30
SHRUBS								
<i>Artemisia tridentata wyomingensis</i>	3	3	3	10	3	3	100	100
<i>Chrysothamnus nauseosus</i>			1				0	30
<i>Chrysothamnus viscidiflorus</i>	3	3		1		1	30	100
<i>Eriogonum microthecum</i>			1				30	0
<i>Leptodactylon pungens</i>	1	1	1	1		1	70	100
<i>Purshia tridentata</i>			10		1	3	70	30
<i>Tetradymia canescens</i>			1				30	0
GRAMINOIDS								
<i>Agropyron cristatum*</i>	3	3		10			30	70
<i>Agropyron spicatum</i>	10		1				70	0
<i>Agropyron</i> sp.*		1		1	1	1	30	100
<i>Bromus tectorum*</i>	1	1			1	3	70	70
<i>Elymus cinereus</i>			1		1		70	0
<i>Oryzopsis hymenoides</i>	1	1	1		10	10	100	70
<i>Poa nevadensis</i>			1	1			30	30
<i>Poa secunda</i>				3			0	30
<i>Stipa comata</i>	10	10	1	20			70	70
<i>Vulpia</i> sp.				1			0	30
FORBS								
<i>Allium acuminatum</i>				1			0	30
<i>Alyssum desertorum*</i>	1	1	1	1			70	70
<i>Arabis</i> spp.			1	1			30	30
<i>Astragalus anserinus</i>	1	1	1	1	1	1	100	100
<i>Astragalus lentiginosus</i>			1				30	0
<i>Camelina microptera*</i>						1	0	30
<i>Chaenactis douglasii</i>	1	1		1	1	1	70	100

	ASAN-1		ASAN-4		ASAN-6		Constancy	
	00	01	00	01	00	01	00	01
<i>Chenopodium fremontii</i>	1						30	0
<i>Commandra umbellata</i>			1				30	0
<i>Cryptantha circumscissa</i>				1			0	30
<i>Cryptantha spiculifera</i>	1	1			1	1	70	70
<i>Delphinium</i> spp.	1			1			30	30
<i>Eriogonum ovalifolium</i>	1	1	1	1	1	1	100	100
<i>Eriogonum</i> spp. (annual)	1		1				30	0
<i>Gayophytum ramosissimum</i>			1	1			30	30
<i>Gila aggregata</i>		1	1				30	30
<i>Gilia congesta</i>	1	1			1	1	70	70
<i>Lupinus argenteus</i>				3			0	30
<i>Lupinus lepidus</i>	1	1	1		1	1	100	70
<i>Lygodesmia grandiflora</i>			1				30	0
<i>Lygodesmia spinosa</i>	1	1	1		1	1	100	70
<i>Macaeranthera canescens</i>		1		1			0	70
<i>Mentzelia albicaulis</i>	1				1	1	70	30
<i>Oenothera caespitosa</i>					1	1	30	30
<i>Oenothera pallida</i>	1	1				1	30	70
<i>Opuntia polyacantha</i>			1	1			30	30
<i>Phacelia hastata</i>					1		30	0
<i>Phlox hoodii</i>	1	1					30	30
<i>Tragopogon dubius*</i>				1			0	30
Total tree cover			10	1				
Total shrub cover	10	10	10	10	3	10		
Total graminoid cover	20	10	3	30	10	10		
Total forb cover	1	3	1	3	3	3		
Soil	70	80	50	70	50	70		
Gravel	20	20	50	10	50	30		
Rock	1	1	1	1	1	1		
Wood	1	1	1	3	1	1		
Litter	1	3	1	1	1	1		
Bryophyte/lichen	0	1	0	20	0	1		
Basal vegetation	10	3	3	10	3	3		

* = introduced species

Table 3. Plant cover and constancy values for Idaho penstemon monitoring plots. Plant cover values are explained in the text. Constancy values are explained in Table 2.

Species	Plot Identification Code																Constancy	
	PEID-1		PEID-2		PEID-4		PEID-5		PEID-6		PEID-7		PEID-8		PEID-10		00	01
	00	01	00	01	00	01	00	01	00	01	00	01	00	01	00	01	00	01
TREES																		
<i>Juniperus osteosperma</i>	10	10	3	3	3	3	20	20	10	10	20	20	10	10	1	1	100	100
SHRUBS																		
<i>Amelanchier utahensis</i>					1	1											10	10
<i>Artemisia nova</i>	3	3											1	1			20	20
<i>Artemisia tridentata wyo.</i>			3	3	3	3	1	1	3	3	1	1	1	1	1	1	90	90
<i>Berberis repens</i>					1	1											10	10
<i>Chrysothamnus nauseosus</i>					1	1									1	1	20	20
<i>Chrysothamnus viscidiflorus</i>	1		1	1	1	1	1	1	1	3	1	1	1	1			90	70
<i>Eriogonum microthecum</i>							1	1									10	10
<i>Eurotia lanata</i>													1				10	0
<i>Gutierrezia sarothrae</i>	1	1												1			10	20
<i>Leptodactylon pungens</i>							1	1	1	1							20	20
<i>Purshia tridentata</i>	1	1	10	3	10	10	3	3	3	3	1	1	3	3	1	1	100	100
<i>Rosa woodsii</i>					1	1											10	10
<i>Symphoricarpos oreophilus</i>					3	3											10	10
GRAMONIODS																		
<i>Agropyron cristatum*</i>	1	1					1		3	3	1	1	1	1	1	1	70	60
<i>Agropyron spicatum</i>	1	1	1	3	3	3	3	3	1	1	3	3	1	1	1	1	100	100
<i>Bromus tectorum*</i>		1			1	1			1		1		1				10	60
<i>Elymus cinereus</i>													1				10	0
<i>Oryzopsis hymenoides</i>	3	3	1	3	1	1	1	1	1	1	1	1	3	3	1	1	100	100
<i>Poa nevadensis</i>	3	3	1	1	1	3	1	1	1	1	1	1	1	1			90	90
<i>Poa secunda</i>	1	1	1	1		1		1		1		1	1	1			40	90
<i>Stipa comata</i>									1	1							10	10
<i>Stipa lettermanii</i>					1	1											10	10
FORBS																		
<i>Alyssum desertorum*</i>	1	1	1														20	10
<i>Arabis</i> spp.	1								1								10	10
<i>Astragalus anserinus</i>				1													0	10
<i>Astragalus calycosus</i>													1				0	10
<i>Camelina microptera*</i>	1												1				10	10
<i>Caulanthus crassicaulis</i>	1	1				1											10	20
<i>Chaenactis douglasii</i>					1	1		1		1							10	40
<i>Chenopodium fremontii</i>					1												10	0
<i>Chenopodium leptophyllum</i>	1																10	0
<i>Cirsium utahense</i>	1	1			1	1									1	1	40	40
<i>Commandra umbellata</i>	1	1			1	1			1	1	1	1					50	50
<i>Crepis acuminata</i>													1				0	10
<i>Cryptantha spiculifera</i>	1	1	1				1	1	1	1			1	1			60	50
<i>Cryptantha</i> sp. (annual)					1	1											10	10
<i>Cymopterus terebinthinus</i>	3	3	3	3			1	1			1	3			1	1	60	60
<i>Descurainia richardsonii</i>	1	1	1														20	10

	PEID-1		PEID-2		PEID-4		PEID-5		PEID-6		PEID-7		PEID-8		PEID-10		Constancy	
	00	01	00	01	00	01	00	01	00	01	00	01	00	01	00	01	00	01
<i>Epilobium brachycarpum</i>				1		1											0	20
<i>Eriogonum brevicaule lax.</i>	1	1	1	1											3	3	40	40
<i>Eriogonum ovalifolium</i>	1	1	1	1	1	1	1	1	1	1	1	1	1	1			90	90
<i>Eriogonum sp. (annual)</i>	1								1								20	0
<i>Eriogonum umbellatum</i>							1	1	1								20	10
<i>Eriophyllum lanatum</i>	1	1									1	1			1	1	40	40
<i>Erysimum sp.</i>	1	1		1		1											10	40
<i>Gayophytum diffusum (?)</i>									1								10	0
<i>Gila aggregata</i>					1	1											10	10
<i>Gilia congesta</i>	1	1										1	1		1		20	40
<i>Linum perenne</i>	1	1	1	1	1	1	1	1			1	1			1	1	70	70
<i>Lupinus lepidus</i>	1	1					1		1	1					1	1	50	40
<i>Lygodesmia spinosa</i>			1	1									1	1			20	20
<i>Machaeranthera canescens</i>								1									0	10
<i>Mentzelia albicaulis</i>					1	1							1				20	10
<i>Oenothera caespitosa</i>	1	1	1	1								1	1	1	1		50	50
<i>Opuntia polyacantha</i>		1							1	1							10	20
<i>Penstemon humilis</i>						1		1									0	20
<i>Penstemon idahoensis</i>	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	100	100
<i>Phacelia hastata</i>					1	1					1	1			1		40	20
<i>Phlox hoodii</i>	1	1	1	1	1		1	1	1	1			1	1			70	60
<i>Physaria geyeri</i>	1					1			1							1	20	20
<i>Polygonum sawatchense</i>					1	1					1						20	10
<i>Senecio canus</i>	1	1			1	1									1	1	40	40
<i>Senecio multilobatus</i>				1	1	1	1	1			1	1		1			50	60
<i>Taraxacum officinale*</i>			1	1											1	1	20	20
<i>Tragopogon dubius*</i>	1	1	1	1							1		1		1		20	60
Total tree cover	10	10	3	3	3	3	20	20	10	10	20	20	10	10	1	1		
Total shrub cover	3	3	10	10	10	10	3	3	10	10	1	1	10	3	1	1		
Total graminoid cover	10	10	10	10	10	10	3	3	10	10	3	3	3	3	1	3		
Total forb cover	3	3	3	3	3	3	1	3	1	1	3	3	1	1	3	3		
Soil	NA	80	50	60	50	50	50	50	80	80	80	80	90	90	50	50		
Gravel	NA	20	50	40	40	50	30	30	3	3	20	10	10	3	50	50		
Rock	NA	1	1	1	3	3	10	10	1	1	1	1			3	3		
Wood	NA	1	1	1	1	1	1	1	3	3	1	3	1	1	1	1		
Litter	NA	3	1	1	3	3	10	10	10	10	3	3	3	3	1	1		
Bryophyte/lichen	NA	0	0	1	0	0	0	0	1	10	0	0	0	1	0	0		
Basal vegetation	NA	3	10	10	10	10	3	3	3	3	3	3	3	3	3	3		

* = introduced species

Overall, vegetation plot data between the two years match very closely. However, a number of differences between the two-year dataset are discussed for each occurrence.

Goose Creek milkvetch

Lower Beaverdam Creek (001): (a) Total graminoid cover was less in 2001 compared to the previous year. This difference was due to the absence of bluebunch wheatgrass (*Agropyron spicatum*) in 2001. It is unclear why so much more bluebunch wheatgrass was present one year, but not the next. This was the only monitoring station where a graminoid species had such a large cover class difference between the two years. (b) A trace amount of what I identified as a bluebunch cultivar (*Agropyron* spp.) was recorded in 2001, but not 2000. I may have recorded the cultivar as bluebunch wheatgrass in 2000.

Coal Banks Creek (004): A comparison of the two year dataset is not possible for this occurrence because the original location was abandoned in favor of a new, nearby, monitoring station in 2001. The original station was located on a steep upper slope, while the new one is situated on a low terrace less than 100 m away alongside Coal Banks Creek. The new station supports a Wyoming big sagebrush/needle-and-thread grass community type. It has much higher graminoid cover and a slightly different forb component than the original site.

Goose Creek, Idaho/Utah border (006): (a) The slight increase recorded for bitterbrush in 2001 was due to correcting a mistake made in 2000, when I inadvertently did not count a few individuals located near the edge of the plot. (b) In 2000, I must have simply missed seeing or forgot to record the trace cover (<1% cover) of green rabbitbrush (*Chrysothamnus viscidiflorus*) and prickly phlox (*Leptodactylon pungens*) noted in 2001. (c) There was a slight increase in cheatgrass (*Bromus tectorum*) recorded in 2001.

Idaho penstemon

Whitley Ranch Gulch (001): (a) No cheatgrass was recorded in 2000, but a trace amount (cover class 1) was present in 2001. (b) A few forb species present in trace amounts in 2000 were not observed in 2001.

Beaverdam Creek (002): One or two Goose Creek milkvetch plants occurred in the vegetation plot in 2001. The previous year it was noted nearby, but not within the plot.

Right Hand Fork Beaverdam Creek (004): (a) This was one of three Idaho penstemon occurrences having trace cover of Sandberg's bluegrass (*Poa secunda*) in 2001, but not in 2000. Orangeburg Spring (005) and North of Worthington Mine (006) were the other two occurrences having this difference. I suspect plants did not have inflorescences last year and were simply missed or confused with Nevada bluegrass (*Poa nevadensis*). (b) Several perennial forb species with trace cover in 2001 were not recorded the previous year.

Orangeburg Spring (005): Crested wheatgrass (*Agropyron cristatum*) was recorded in 2000, but not 2001. This species is hard to differentiate from some of the other bunchgrasses without inflorescences.

North of Worthington Mine (006): Cheatgrass was absent in 2000, but present in trace amounts in 2001.

Nearly Nevada-Almost Utah (007): Two weedy species, cheatgrass and salsify (*Tragopogon dubius*) were absent in 2000, but present in trace amounts in 2001.

Lower Beaverdam Creek (008): (a) Two weedy species, cheatgrass and salsify, were absent in 2000, but present in trace amounts in 2001. (b) Several perennial forb species with trace cover in 2001 were not recorded the previous year.

Border Gulch 010: Salsify was absent in 2000, but present in trace amounts in 2001.

Photo-points

Photo-point photographs provide a visual, time-lapse record of the vegetation and other habitat conditions at each monitoring station. Photos from 2001 were labeled, organized in a binder, and given to the BLM as part of this report. A duplicate set of photographs and the negatives are on file at the CDC office in Boise. Most of the 2001 photos look more or less identical to the baseline photo-monitor photos taken in 2000. The exception is at Coal Banks Creek (004) occurrence for Goose Creek milkvetch. The area around this occurrence burned in 2000 and the 2001 photo set shows this difference to the surrounding landscape. Photos for this occurrence also differ because the location of the plot moved.

Occurrence updates

Occurrence records were updated based on observations made in 2001. The records contain detailed location, plant abundance, habitat, ownership, threat, and other conservation information. The updated records are in Appendix 5. Although the monitoring protocol is not designed to provide precise plant abundance information, part of the update process involves estimating the number of Goose Creek milkvetch or Idaho penstemon plants at an occurrence. The 2000 and 2001 estimates are provided in Table 4. Another aspect of the update process is to document and assess threat factors at each occurrence. This information is important for conservation planning and management purposes. Four of the most serious existing or potential threats facing Goose Creek milkvetch and Idaho penstemon habitat are wildfire, noxious weeds, livestock disturbance, and off-road-vehicle (ORV) use. These threats are discussed below.

Table 4. Two years of plant abundance information for Goose Creek milkvetch and Idaho penstemon.

Species	EOR	Number of plants		Comments
		2000	2001	
<i>Astragalus anserinus</i>	001	12	1	thorough search both years
<i>Astragalus anserinus</i>	004	9	41	thorough search both years
<i>Astragalus anserinus</i>	006	29	47	total estimate of 100-200 for both years
<i>Penstemon idahoensis</i>	001	ca 1000	ca 1000	less thorough search in 2001
<i>Penstemon idahoensis</i>	002	1000-2000	no estimate made	minimal search in 2001
<i>Penstemon idahoensis</i>	004	ca 60	88	thorough search both years
<i>Penstemon idahoensis</i>	005	500-1000	no estimate made	minimal search in 2001
<i>Penstemon idahoensis</i>	006	400-500	ca 400	less thorough search in 2001
<i>Penstemon idahoensis</i>	007	ca 500	ca 200	less thorough search in 2001
<i>Penstemon idahoensis</i>	008	ca 325	100+	incomplete search in 2001
<i>Penstemon idahoensis</i>	010	1000+	300+	incomplete search in 2001

Wildfire

Large wildfires burned portions of the Goose Creek drainage in both 1999 and 2000. The relatively sparse vegetation characterizing most Goose Creek milkvetch and Idaho penstemon occurrences would have trouble carrying a fire. Although individual plants may be destroyed, it is hard to imagine fire alone could extirpate any occurrences. Nonetheless, wildfire is a

conservation concern because fire-fighting activities, post-fire weed invasion, post-fire rehabilitation efforts, and other fire-related disturbances have the potential to adversely impact Goose Creek milkvetch and Idaho penstemon habitat. The majority of Goose Creek milkvetch and Idaho penstemon occurrences in Idaho are located outside the 1999 and 2000 fire perimeters. However, four occur within, and one close to the recent wildfires.

Goose Creek milkvetch (Horseshoe Spring 002): This occurrence is located within approximately 0.3 mile of the 2000 burn edge. It appears that cheatgrass abundance may have increased substantially on the burned hillsides upslope above the occurrence. A large cheatgrass seed rain into the occurrence area is possible.

Goose Creek milkvetch (Coal Banks Creek 004): This occurrence is surrounded by areas that burned during the 2000 wildfire. The fire reached within a few feet of the occurrence perimeter in places, but the occurrence did not burn. Cheatgrass abundance appears to have increased in some places in the surrounding landscape.

Idaho penstemon (Whitley Ranch Gulch 001): The 1999 Goose Creek fire burned up to the upper slope of this occurrence. A few Idaho penstemon plants along the margin may have been killed, but the great majority of the occurrence did not burn. A few ATV tracks near and within the occurrence may be related to fire-fighting activities.

Idaho penstemon (East of Coal Banks Spring 011): This occurrence is within the 2000 wildfire perimeter, but was not visited in 2001. An attempt to relocate this occurrence in 2000 failed, and its status is unknown. There is presently no monitoring transect at this occurrence.

Idaho penstemon (Cold Springs 012): The lower segment of this occurrence and the juniper woodland above it burned in the 2000 wildfire. The upper half of the occurrence area escaped the fire. Sediment from burned areas upslope was depositing in several places within the occurrence. I was unable to find any Idaho penstemon at this occurrence in 2001. There is presently no monitoring transect at this occurrence.

Noxious weeds

No noxious weed species have been observed at any of the monitoring transects. Leafy spurge (*Euphorbia esula*) is probably the most abundant and widespread noxious weed in the Goose Creek drainage. It is capable of invading a number of different habitats in the area, including the ash/tuff outcrops supporting Goose Creek milkvetch and Idaho penstemon. I have observed another noxious weed species, black henbane (*Hyoscyamus niger*), near, but not on the edaphic exposures supporting the two rare plant species. It remains unclear if black henbane is capable of establishing on these harsh ash/tuff sites. Halogeton (*Halogeton glomerata*) is capable, and although not on the Idaho noxious weed list, its invasive properties may pose conservation concerns for Goose Creek milkvetch and Idaho penstemon in the future. Table 5 summarizes weed invasion concerns by occurrence.

Livestock

Livestock grazing is the predominant land use throughout the range of Goose Creek milkvetch and Idaho penstemon. Effects of grazing on Goose Creek milkvetch and Idaho penstemon are largely indirect, mainly habitat trampling and trailing. These disturbances tend to be greater at Goose Creek milkvetch versus Idaho penstemon occurrences. Lower Beaverdam Creek (008) is the only Idaho penstemon occurrence where I observed more than minimal livestock disturbance the past two years. In contrast, I observed relatively heavy livestock use at four Goose Creek milkvetch occurrences (001, 004, 006, 007) during the 2000 season. These occurrences had little or no livestock disturbance sign during my monitoring visits in 2001, however. I am unsure if this lack of livestock use in 2001 was due to a regular rotational grazing

Table 5. Presence/absence of weed species at Goose Creek milkvetch and Idaho penstemon occurrences.

	Leafy spurge		Black henbane	Halogeton	
	In occurrence	Near occurrence	Near occurrence	In occurrence	Near occurrence
Goose Creek milkvetch					
Lower Beaverdam Creek (001)		X		X	
Horseshoe Spring (002)					
Beaverdam Creek (003)		X			
Coal Banks Creek (004)	X				
Goose Creek Cliff Bands (005)	X				
Idaho/Utah Border (006)	X				
Border Gulch (007)	X				
Idaho penstemon					
Whitley Ranch Gulch (001)	X				
Beaverdam Creek (002)		X			
Devine Canyon (003)	X				
Right Hand Fork Beaverdam Creek (004)					
Orangeburg Spring (005)					
North of Worthington Mine (006)					
Nearly Nevada/Almost Utah (007)					
Lower Beaverdam Creek (008)		X			X
Goose Creek Cliff Bands (009)		X			
Border Gulch (010)	X				
East of Coal Banks Spring (011)					
Cold Springs (012)			X		

practice, or part of a special exclusion related to the 2000 wildfires. Livestock disturbances are usually much more evident in the surrounding sagebrush-bunchgrass habitat than the sparsely vegetated ash outcrops supporting Goose Creek milkvetch and Idaho penstemon.

Off-road-vehicles

I observed ORV tracks at two Idaho penstemon occurrences in both 2000 and 2001. The few tracks observed at the Whitley Gulch Ranch occurrence (001) may be related to 1999 fire-fighting activities in the general area. Tracks at the Lower Beaverdam Creek occurrence (008) were likely associated with recreational activities. ORV tracks are easy to see on the open outcrops and likely persist for many years. Habitat degradation problems can be expected if ORV use begins, continues, or intensifies at any Idaho penstemon or Goose Creek milkvetch occurrence.

DISCUSSION

Plant community data

In 2001, cheatgrass was tallied at trace amounts in four Idaho penstemon plots (001, 006, 007, 008) where it was absent last year. It was also slightly more common at one Goose Creek milkvetch occurrence (006) in 2001, than in 2000. Cheatgrass is not a competitive threat to Idaho penstemon, nor a fire threat to its habitat at such a low abundance level. Future monitoring will determine if cheatgrass is beginning to invade these sites, or if a low level persists and fluctuates slightly depending on seasonal environmental conditions. Also in 2001, a trace cover of salsify was tallied in three Idaho penstemon plots (007, 008, 010) and one Goose Creek milkvetch (006) plot that did not have this non-native forb the previous year. Salsify is widespread in the Goose Creek drainage and at low abundance levels does not pose a threat to

either rare plant species. It could become a concern if it increases substantially in abundance at an occurrence.

Several perennial forb species were tallied in a plot for either 2000 or 2001, but not both years. It is impossible to know if the plants were dormant one year, or if I just missed seeing them. It is not unusual to have forb species represented by only one or a few individual plants within a plot, making them easy to miss, especially if small and not in flower. Hoary chaenactis (*Chaenactis douglasii*), wallflower (*Erysimum* spp.), lowly penstemon, (*Penstemon humilis*), and Geyer's twinpod (*Physaria geyeri*) were the only forbs having this presence/absence discrepancy in more than one plot between the two years. There were also a few cases where perennial grass species were tallied one year, but not the other. Several bunchgrasses in the study area are hard to distinguish without inflorescences, which were absent from many plants during both years, probably due to dry conditions. The minor discrepancies caused by missing or confusing the identity of a few grass plants were insufficient to adversely affect interpretation of the monitoring results.

In summary, a comparison of the 2000 versus 2001 plant community data indicated the vegetation did not change to any measurable degree for any occurrence. The Goose Creek milkvetch occurrence at Coal Banks Creek (004) turned out to be the only occurrence in the monitoring program within the 2000 wildfire perimeter. Comparison of the two-year dataset for this occurrence was not possible because the location of the monitoring plot was moved. I did revisit the original monitoring station for this occurrence. Although located on the edge of the fire, the plot zone and associated vegetation looked unchanged except for the lack of Goose Creek milkvetch. At this point in time, there is no evidence the wildfires of 2000 and 2001 have adversely affected occurrences of Goose Creek milkvetch and Idaho penstemon. Future monitoring will be required to see if this trend continues past the initial year or two following a fire. My observations suggest the relatively sparse and open vegetation characterizing most occurrences may serve to protect them from a hot, all-consuming fire. The spot burning that could take place within an occurrence could potentially destroy or injure a few individual rare plants, but most would probably survive. The limited amount of fire disturbance that most occurrences would suffer may also serve to limit weed invasion, which can be a serious problem in habitats that burn more completely.

Photo-points

The monitoring photographs substantiate results from the plant community sampling. Namely, vegetation and habitat conditions did not appreciably change for any occurrence between 2000 and 2001. An exception is the burned vegetation around the Goose Creek milkvetch Coal Banks Creek (004) area.

Occurrence update

Estimates and plant counts suggest that the number of plants at an occurrence can fluctuate from one year to the next for Goose Creek milkvetch and perhaps also for Idaho penstemon. A more rigorous population monitoring design than simply walking around an occurrence and counting plants would be needed to substantiate this casual observation.

Photo-points and vegetation plot sampling are relatively easy and quick monitoring tools. Photographs and plant community data should be collected a minimum of every five years. Monitoring should occur sooner and more regularly after large disturbances such as wildfire or intensive livestock use. Ideally, occurrences should be visited and habitat condition and threat information updated on a biannual basis. Proactive conservation management of both Goose Creek milkvetch and Idaho penstemon will require this more regularly scheduled status documentation.

One short-coming of the monitoring program is its failure to collect quantitative demographic information. A more intensive monitoring design will be needed if land managers want to obtain accurate plant number or other demographic trend information. After visiting most occurrences for two consecutive years I feel obtaining this additional information is warranted, especially for Goose Creek milkvetch occurrences.

Several occurrences of Goose Creek milkvetch and Idaho penstemon are not currently included in the monitoring program. They are discussed in the context of possibly adding them.

Goose Creek milkvetch

Horseshoe Spring (002): This occurrence was visited in 2001, but not in 2000. The eastern end of the occurrence (located below an impressive vertical exposure of white-colored tuff) is probably the most conducive to setting up a monitoring station. I did not establish one in 2001 because it was unclear to me whether this occurrence is located on BLM or private land.

Beaverdam Creek (003): This occurrence is comprised of a series of small outcrops or openings in the sagebrush vegetation. None had more than a few plants in 2000. Livestock disturbance was prevalent throughout the occurrence in 2000, and many plants appeared to be in poor condition. A small portion of this occurrence is monitored as part of the Idaho penstemon Beaverdam Creek (002) monitoring station. Additional monitoring could be accomplished by choosing another outcrop for the photo-monitoring and plant community protocols and revisiting the others to comprehensively update occurrence size, habitat condition, and threat information.

Goose Creek Cliff Bands (005): This occurrence is located largely on private land. The portions on public land are difficult to access without crossing private land. Monitoring this occurrence seems impractical because of the land ownership.

Border Gulch (007): This occurrence may be partly extirpated. One new cluster of plants was discovered in 2000. Although very small, this new site could be added to the monitoring program if deemed necessary.

Idaho penstemon

Devine Canyon (003): This occurrence is located on private land alongside the Goose Creek Road. A photo-monitor station could be established along the road to monitor the occurrence.

Goose Creek Cliff Bands (009): This occurrence is located largely on private land. The portions on public land are difficult to access without crossing private land. Monitoring this occurrence seems impractical because of the land ownership.

East of Coal Banks Spring (011): This occurrence has not been relocated in recent years. It will probably be necessary for people more familiar with this occurrence to help relocate it and establish a monitoring station. This occurrence is located within the perimeter of the 2000 Goose Creek wildfire and should be added to the monitoring program if possible.

Cold Springs (012): This occurrence reportedly has a small number of Idaho penstemon plants, but I was unable to find any in 2001. Because no plants were found, I did not establish a monitoring station as planned. It will be necessary for people more familiar with this occurrence to help relocate the plants prior to establishing a monitoring station. Part of this occurrence burned in the 2000 Goose Creek wildfire and it should be monitored if possible.

Originally, I was under the impression that a majority of Goose Creek milkvetch and Idaho penstemon occurrences were located within the perimeter of the 2000 Goose Creek wildfire. As it turns out, only three occurrences were within the perimeter, and only one of these had a

monitoring plot. As a result, a relatively limited amount of post-fire information was collected in relation to the 2000 wildfire. This can be improved upon by establishing additional monitoring sites for the Idaho penstemon occurrences at Cold Springs (012) and East of Coal Banks Spring (011). Establishment of these monitoring stations will require the assistance of the BLM, as I have not been able to relocate these occurrences on my own. Monitoring information collected in 2000 and 2001 provides a valuable baseline for interpreting future monitoring results. The information is also valuable for assessing current conservation concerns and for proactive conservation management.

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Appendix 1

Map locations for *Astragalus anserinus* and *Penstemon idahoensis* monitoring stations.

Appendix 2

Photo point monitoring forms for *Astragalus anserinus* and *Penstemon idahoensis*.

Appendix 3

Ocular Plant Species Data Forms for 2000.

Appendix 4

Ocular Plant Species Data Forms for 2001.

Appendix 5

Element Occurrence Records for *Astragalus anserinus* and *Penstemon idahoensis*.

GOOSE CREEK MILKVETCH

Occurrence Number: 001

Survey Site Name: LOWER BEAVERDAM CREEK

County: Cassia

USGS quadrangle: BLUE HILL

Latitude: 420008N Longitude: 1135927W

TOWNRANGE:	SECTION:	MERIDIAN:	TRSNOTE:
016S021E	28	BO	SE4SE4
016S021E	33	BO	N2SE4NE4

Location: Just N of Beaverdam Creek, 0.5 mile N of the Idaho/Utah border and ca 1 mile west of Goose Creek Road.

Survey Date: 2000-06-29 First Observed: 1988 Last Observed: 2001-06-20

EORANK: D

EORANK Comments: Occurrence is small with few plants; part of it is disturbed; only a portion is not on private land.

Population Data: 1988: No data. Collected by Ann DeBolt, Boise District BLM. 1991: Only 1 plant seen; 1 plant also seen on N edge of road from ranch into upper Beaverdam Creek. Observation by Bob Moseley, Idaho CDC. 2000: 12 genets counted and less than 50 estimated for the portion of occurrence on BLM land in section 28 SE4SE4. Plants ca 35% reproductive, 60% vegetative, and 5% juveniles. Plants most common in upper slope position; most appeared "stressed" (drought stress?), as did much of the sagebrush in the general area. Portion of occurrence in nearby section 33 NE4 on private land looked more or less undisturbed viewed from across the fence; unknown number of plants in this area. Observation by Michael Mancuso, Idaho CDC. 2001: Only 1 large, vegetative genet; no plants found in places where they were observed in 2000. Observation by M. Mancuso, Idaho CDC.

Habitat Description: S to SW exposures, 15-25% slope. At the base and on lower slopes of cliffs, and mid- to lower slope positions. Open *Juniperus osteosperma* with *Oryzopsis hymenoides*, *Stipa comata*, *Chrysothamnus viscidiflorus*, and *Cryptantha spiculifera*; or open *Artemisia tridentata*/*Stipa comata* community with *Leptodactylon pungens*, *Agropyron spicatum*, and *C. viscidiflorus*. High bare ground cover; sandy, light-gray-colored tuffaceous sediments; rocky in places. Sagebrush/ bunchgrass vegetation on surrounding ridgetops and flat bottoms.

Minimum Elevation: 5040 feet Maximum Elevation: 5080 feet Size: 2 ACRES

Ownership Comments: Private land and Upper Snake River Districts BLM, Burley FO.

Comments: Photomonitor station established by the Idaho CDC in 2000 (UTM zone 12T 0252250 East 4654702 North GPS coordinates). Monitoring station resampled in 2001.

Protection Comments: 2000: Livestock graze adjacent areas pretty heavily, but slopes with *A. anserinus* seem to receive only light use. *Euphorbia esula* and *Halogeton glomerata* established, although presently not abundant, on slopes below *A. anserinus* in section 28. *Bromus tectorum* and *Agropyron cristatum* occur with the milkvetch. No off-road tracks seen, but occurrence located in close proximity to a main dirt road. 2001: No recent livestock use within occurrence, although evidence on nearby flats. Occurrence looks more or less identical to 2000; no new threats or disturbances.

Management Comments:

Specimens: Ann DeBolt 979 (BLM, NY).

GOOSE CREEK MILKVETCH Occurrence Number: 002

Survey Site Name: HORSESHOE SPRING

County: Cassia

USGS quadrangle: BLUE HILL

Latitude: 420104N Longitude: 1135909W

TOWNRANGE:	SECTION:	MERIDIAN:	TRSNOTE:
016S021E	27	BO	N2
016S021E	28	BO	NE4NE4

Location: About 2 miles N of the ID/UT border, ca 0.5 mile W of Goose Creek, near Horseshoe Spring.

Survey Date: 1991-06-20 First Observed: 1989 Last Observed: 2001-06-20

EORANK: C

EORANK Comments: Originally given an "A" rank in 1991, but changed to "C" based on 2001 visit. Habitat intact, but small number of plants at very low density.

Population Data: 1989: Ca 1000 individuals in flower and fruit; good overall site quality. Observation by Ann DeBolt, Boise District BLM. 1991: Ca 200 individuals in 4 populations; very low density; all age classes represented, also numerous dead individuals; largest population is in juniper just SW of Horseshoe Spring - other populations consist of scattered individuals. Area surveyed by Bob Moseley, Idaho CDC. 2000: Occurrence not directly visited, but it appears intact, unburned, as viewed from near the Goose Creek Road. Observation by Michael Mancuso Idaho CDC. 2001: Western subpopulation occupies ca 0.1 acre outcrop with 4 genets; large subpopulation area just SW of Horseshoe Spring with 10 genets, various sizes, most with fruits. Observation by M. Mancuso, Idaho CDC.

Habitat Description: Sparsely vegetated, sandy, tuffaceous sediments. SW to W-facing aspects, gentle to moderately steep slopes. Associated with *Juniperus osteosperma*, *Purshia tridentata*, *Chrysothamnus viscidiflorus*, *Stipa comata*, *Oryzopsis hymenoides*.

Minimum Elevation: 4940 feet Maximum Elevation: 5200 feet Size: 5 ACRES

Ownership Comments: Upper Snake River Districts BLM, Burley FO, and private land.

Comments: 2001: Based on fencelines in area, it was unclear how much, if any of occurrence located on BLM land. GPS coordinates (UTM 12T) for western subpopulation = E 0252394 N 4655872; eastern end of occurrence = E 0252683 N4655880.

Protection Comments: 2001: Unburned, but edge of 2000 wildfire within 0.3 mile of northern end of occurrence. No leafy spurge observed; scattered, low cover of cheatgrass. Limited amount of cattle trampling disturbance in places.

Management Comments:

Specimens: Ann DeBolt 1197 (herbarium unknown).

GOOSE CREEK MILKVETCH Occurrence Number: 003

Survey Site Name: BEAVERDAM CREEK

County: Cassia

USGS quadrangle: IBEX PEAK

Latitude: 420050N Longitude: 1140100W

TOWNRANGE:	SECTION:	MERIDIAN:	TRSNOTE:
016S021E	28	BO	center SW4SW4
016S021E	29	BO	SW4NE4, SE4NW4NE4, NW4NW4SE4
016S021E	33	BO	NW4NE4NW4

Location: Lower Beaverdam Creek, about 2.5 miles west of Goose Creek and about 1.5 miles north of the ID/UT border.

Survey Date: 2000-06-27 First Observed: 1985 Last Observed: 2000-06-27

EORANK: C

EORANK Comments: Formerly given an "A" rank, but changed to "C" after 2000 surveys. The number of plants seems to be declining and portions of habitat impacted by livestock grazing.

Population Data: 1985: No data. Collected by Rosentreter and Atwood. 1991: 7 widely scattered clusters over a very large area of potential habitat; the cluster range in size from 3 to 150 individuals for a total of ca 325 plants; plants are mostly in fruit. Observation by Michael Mancuso, Idaho CDC. 2000: comprised of nine small tuff outcrops scattered over about 1.3 miles. Outcrops vary in size from less than 1 to over 2 acres in size. A total of 28 plants counted and less than 100 plants estimated for occurrence; 90% non-reproductive, 10% reproductive. The largest number of plants found at any one outcrop was 10, most had less than 5 plants, and two outcrops had no plants. Majority of plants appeared to be of marginal to poor vigor (drought stress?). Observation by Michael Mancuso, Idaho CDC, Cleve Davis, BLM, and Miriam Austin, Red Willow Research. 2001: Occurrence area habitat looked similar to 2000; no attempt made to survey for *Astragalus* plants. Observation by M. Mancuso, Idaho CDC.

Habitat Description: Series of light-colored, sparsely-vegetated, fine-textured tuffaceous outcrops. Various aspects, but predominately SW to W; flat to 15 degree slope. One group of plants is in a depauperate community of *Artemisia tridentata* and *Chrysothamnus viscidiflorus*; 2 groups are in a community of very scattered *Juniperus osteosperma* with *Oryzopsis hymenoides*, *Gilia congesta*, *Eriogonum ovalifolium*, *Purshia tridentata*, *Chaenactis douglasii*, *Penstemon idahoensis*; other groups are in open *Artemisia tridentata* communities; all have high bare ground cover.

Minimum Elevation: 5020 feet Maximum Elevation: 5160 feet Size: 7 ACRES

Ownership Comments: Upper Snake River Districts BLM, Burley FO.

Comments: Part of occurrence located in close proximity to the photomonitor station for *Penstemon idahoensis* 002.

Protection Comments: 2000: Livestock grazing more intensive within surrounding sagebrush/ bunchgrass habitats than the tuff outcrops; nonetheless, trampling disturbances are common in several of the outcrops. Noxious weeds presently not a problem on the outcrops although *Euphorbia esula* is known from general area. *Bromus tectorum* is common at easternmost outcrop.

Management Comments:

Specimens: D. Atwood and R. Rosentreter 11161 (BRY).

GOOSE CREEK MILKVETCH Occurrence Number: 004

Survey Site Name: COAL BANKS CREEK

County: Cassia

USGS quadrangle: BLUE HILL

Latitude: 420248N Longitude: 1135722W

TOWNRANGE: SECTION: MERIDIAN: TRSNOTE:
016S021E 14 BO NE4

Location: About 0.8 mi W of Goose Creek Road on Coal Banks Creek Road, N side of drainage.

Survey Date: 2000-06-27 First Observed: 1989 Last Observed: 2001-06-21

EORANK: C

EORANK Comments: Plenty of available habitat, but few plants with an apparent decline.

Population Data: 1989: 1001-10,000 plants, 85% mature, in flower and mostly in fruit. Observation by Duane Atwood. 1991: Ca 30 plants seen in very low density on slope in flower and fruit. Observation by Bob Moseley, Idaho CDC. 2000: 9 plants in one upper to mid-slope area; another 15 widely scattered plants along the creek terrace bottoms and very lower slopes. 90% vegetative, 10% reproductive. Plants do not look vigorous (drought stress?). Pretty thorough survey of occurrence area. Observations by Michael Mancuso, Idaho CDC; Cleve Davis, BLM; and Miriam Austin, Red Willow Research. 2001: 37 genets on terrace between road and creek; only 4 additional genets found during thorough search of rest of occurrence area. Several size classes; 80% with fruits; 1 dead (?) plant. Observation by M. Mancuso, Idaho CDC.

Habitat Description: Upper to lower slope and creek terrace bottoms. S, SW, and W aspect; flat to 20-45 degree slopes. Dry, white to brownish tuffaceous sands. Some juniper, but mostly open sagebrush community; associated with *Artemisia tridentata*, *Stipa comata*, *Agropyron spicatum*, *Chrysothamnus* spp., *Eriogonum ovalifolium*.

Minimum Elevation: 4920 feet Maximum Elevation: 5040 feet Size: 2 ACRES

Ownership Comments: Upper Snake River Districts BLM, Burley FO.

Comments: Photomonitor station established by Idaho CDC in 2000 (GPS coordinates, UTM zone 12T, E 0255145 N 4659133). New monitoring station established and sampled in 2001. GPS coordinates E 0255167 N 4659026).

Protection Comments: 1991: bottom seeded with crested wheatgrass; slope eroding; some cattle trampling. 2000: Area used by cattle in 1999, and in 2000, in general area since early May. Livestock use has led to terracing and widespread soil disturbance within occurrence area. Trampling around plants observed along lower slope/bottoms. *Euphorbia esula* present at low density in general area. 2001: Surrounded by areas that burned in 2000 wildfire, but occurrence itself did not burn, although fire within 10 feet of occurrence perimeter in places. No recent cattle use, but area obviously grazed in past - many sagebrush shrubs with broken branches.

Management Comments:

Specimens: D. Atwood 15645 (BRY).

GOOSE CREEK MILKVETCH Occurrence Number: 005

Survey Site Name: GOOSE CREEK CLIFF BANDS

County: Cassia

USGS quadrangle: BLUE HILL

Latitude: 420144N Longitude: 1135828W

TOWNRANGE:	SECTION:	MERIDIAN:	TRSNOTE:
016S021E	22	BO	NE4, SE4
016S021E	23	BO	NE4NE4

Location: W side of Goose Creek, near the confluence of Goose Creek and Birch Creek.

Survey Date: 1991-06-20 First Observed: 1991-06-20 Last Observed: 991-06-20

EORANK: AB

EORANK Comments:

Population Data: 1991: Unknown number of plants, mostly in fruit; good age class distribution; plants are widely scattered across face on slopes above and below lower cliff band. Area surveyed by Bob Moseley, Idaho CDC. 2000: Not directly visited, but good general views of occurrence can be made from the Goose Creek Road. Habitat appeared intact and similar to 1991 description. Observation by Michael Mancuso, Idaho CDC.

Habitat Description: Dry; lower to upper slope; S, SE, and SW aspects; 0-35% slope; open light; open community with scattered *Juniperus osteosperma*; gray sandy outcrops of tuffaceous sediments; associated with *Cymopterus terebinthinus*, *Gilia capitata*, and *Oryzopsis hymenoides*.

Minimum Elevation: 5000 feet Maximum Elevation: 5280 feet Size: 7 ACRES

Ownership Comments: Private land and Upper Snake River Districts BLM, Burley FO.

Comments:

Protection Comments: 1991: There is a cattle trail on the slope between the cliff bands; there has been some impact to the *Astragalus anserinus* population. 2000: There is also a cattle trail network at the southernmost subpopulation. A room-sized patch of *Euphorbia esula* occurs along the lower slopes of the southernmost subpopulation of *A. anserinus*; there may also be some around the spring area ca 0.3 mile further north.

Management Comments: 1991: This fragile slope and community should be off limits to cattle. 2000: A fenceline that ascends to the lower cliff band has kept livestock use much lower at the northern versus the southernmost subpopulation.

Specimens:

GOOSE CREEK MILKVETCH Occurrence Number: 006

Survey Site Name: GOOSE CREEK, IDAHO/UTAH BORDER

County: Cassia

USGS quadrangle: POLE CREEK

Latitude: 415948N Longitude: 1135948W

TOWNRANGE: SECTION: MERIDIAN: TRSNOTE:
016S021E 33 BO SE4

Location: About 0.4 mile west of Goose Creek and 0.3 mile north of the Idaho/Utah border.

Survey Date: 2000-06-29 First Observed: 1991-06-20 Last Observed: 2001-06-20

EORANK: C

EORANK Comments: Originally given a "B" rank. Changed to "C" rank in 2000 due to small number of plants and high level of habitat disturbance.

Population Data: 1991: 300-400 normal genets, 20% in flower, 80% in immature fruit; good age structure; very low density. Observation by Bob Moseley, Idaho CDC. 2000: two subpopulations within 0.1 mile of each other occurring in parallel gully slopes. 29 plants counted at the northern, and 3 plants at the southern subpopulation; 25% reproductive, 65% vegetative; 10% juveniles. Thorough survey, but plants hard to see; an estimated 100-200 plants maximum. Observation by Michael Mancuso, Idaho CDC. 2001: 37 genets along top and upper slope positions; 10 genets elsewhere on slope; majority of occurrence slope not searched; 25% reproductive, 75% vegetative. Observation by M. Mancuso, Idaho CDC.

Habitat Description: Dry; bottom to upper slope; S aspect; 3-35% slope; high bare ground/gravel/ rock cover (>90%); sandy, light-gray sediments; loose on the steep slopes. Open community of *Artemisia tridentata* ssp. *wyomingensis*/*Stipa comata*; associated with *Agropyron spicatum*, *Cryptantha spiculifera*, *Gilia capitata*, *Purshia tridentata*, *Chrysothamnus viscidiflorus*, *Lupinus lepidus*, and *Lygodesmia spinosa*.

Minimum Elevation: 5000 feet Maximum Elevation: Size: 3 ACRES

Ownership Comments: Upper Snake River Districts BLM, Burley FO.

Comments: Photomonitoring station established by Idaho CDC in 2000 (UTM zone 12T 0251872 East 4653628 North, GPS coordinates). Monitoring station resampled in 2001.

Protection Comments: 1991: There is evidence of cattle trampling throughout population. Threatened by continued cattle grazing. 2000: High level of surface disturbance by cattle traversing the steep and erosive slope at the northern subpopulation; this despite the fact there is very little forage along the slope. *A. anserinus* occurs in both trampled and untrampled areas, but there are more plants where trampling is less severe. Much less livestock evidence at the southern subpopulation. *Bromus tectorum* is scattered throughout occurrence at low density; no *Euphorbia esula* observed. 2001: No recent livestock use. The network of cattle trails criss-crossing slope much less prominent in 2001 compared to 2000. The steep, erosive slopes may be able to "self-heal" to a degree during periods of rest from livestock use. Leafy spurge spotty in draw bottom at base of occurrence. No new disturbances.

Management Comments: 1991: Population should be monitored. 2000: Livestock use/trailing should be reduced if conservation of *A. anserinus* is important objective at this site. Leafy spurge should be controlled in draw bottom at base of occurrence.

Specimens:

GOOSE CREEK MILKVETCH Occurrence Number: 007

Survey Site Name: BORDER GULCH

County: Cassia

USGS quadrangle: POLE CREEK BLUE HILL

Latitude: 415947N Longitude: 1135837W

TOWNRANGE: SECTION: MERIDIAN: TRSNOTE:
016S021E 34 BO SE4, NW4SE4NE4

Location: About 0.3 mile N of the Idaho/Utah border and 0.3 mile SE of the Goose Creek road.

Survey Date: 2000-06-30 First Observed: 1991-06-18 Last Observed: 2000-06-30

EORANK: D

EORANK Comments: Apparently very few plants; and *A. anserinus* may be extirpated from part of occurrence.

Population Data: 1991: 7 mature genets in 2 subpopulations - 4 in the northern and 3 in the southern subpopulation; plants are 30% in flower, 70% in immature fruit. Observation by Bob Moseley, Idaho CDC. 2000: Despite a thorough survey, no plants found in the general area originally reported. Possible that the two small subpopulations have been extirpated. One new small subpopulation discovered about 0.25 mile north of original report; 5 plants, 2 being reproductive; plants look healthy. Observation by Michael Mancuso, Idaho CDC.

Habitat Description: Dry; upper slope; S aspect; 15-35% slope; open light; open *Artemisia tridentata* ssp. *wyomingensis* slope; sparsely vegetated buff-colored tuffaceous deposits of the Salt Lake Formation; associated with *Stipa comata*, *Chrysothamnus nauseosus*, and *Astragalus calycosus*. The new site discovered in 2000 is a gently sloping ridgecrest; NW aspect. *Artemisia tridentata wyomingensis*/*Agropyron spicatum* community with *Tetradymia canescens*.

Minimum Elevation: 5000 feet Maximum Elevation: 5040 feet Size: 100 SQ YD

Ownership Comments: Upper Snake River Districts BLM, Burley FO, and private land.

Comments:

Protection Comments: 1991: The site has been beat to smithereens by cow feet! 2000: *Euphorbia esula* well established along gulch bottom; lower density on the outcrops of potential *A. anserinus* habitat. Livestock traverse at least portions of most of the outcrops in the occurrence area - recent use appears to range from light to moderate. The new group of plants discovered in 2000 are within a few meters of a fenceline (on BLM side of fence) that cattle trail along. Cattle and horses graze the general area. There are also some ATV tracks on the ridgeline near the plants, but no direct impacts observed.

Management Comments: 2000: Control of *Euphorbia esula* is needed in the area originally reported for *A. anserinus*.

IDAHO PENSTEMON Occurrence Number: 001

Survey Site Name: WHITLEY RANCH GULCH

County: Cassia

USGS quadrangle: BLUE HILL

Latitude: 420017N Longitude: 1135802W

TOWNRANGE:	SECTION:	MERIDIAN:	TRSNOTE:
016S021E	26	BO	SW4SW4
016S021E	35	BO	NW4NW4

Location: 17 air mi SW of Oakley, 1 mi N of the Idaho/Utah line, on N side of Goose Creek drainage, E of Whitley Ranch.

Survey Date: 2000-06-26 First Observed: 1982 Last Observed: 2001-06-18

EORANK: A

EORANK Comments: Relatively undisturbed, vigorous population.

Population Data: 1982: No data. Collected by D. Atwood and S. Goodrich. 1991: Ca 1000 plants, very few in flower, some in bud, but most appeared vegetative; various age classes appeared representative. Area surveyed by Bob Moseley, Idaho CDC. 1999: General occurrence area burned in the Goose Creek fire; no information on impacts to *Penstemon idahoensis*. Fire perimeter maps sent to CDC by Miriam Austin, a consultant from Oakley. 2000: Ca 1000 genets, 10% reproductive, 90% vegetative. Plants most common along mid- to upper slope positions; but overall occur at low density and missing from some portions of the outcrop area. Observation by Michael Mancuso, Idaho CDC. 2001: Ca same number of plants as in 2000; ca 10% reproductive, most with only a few flowers/plant; ca 90% vegetative, most rosettes small in size. Observation by M. Mancuso, Idaho CDC.

Habitat Description: South-facing, moderately steep slope with scattered juniper trees, sparse herbaceous layer, and scattered individual or small clumps of *Artemisia nova*. High bare ground cover (>90%) mixed with various size and color stones; the light-colored tuff sediments have a "lumpy" microtopography in many places. Associated species include *Juniperus osteosperma*, *Artemisia nova*, *Poa nevadensis*, *Oryzopsis hymenoides*, *Cymopterus terebinthinus*, *Lupinus lepidus*, *Oenothera caespitosa*, *Eriophyllum lanatum*, *Eriogonum brevicaulis*, and *Physaria geyeri*.

Minimum Elevation: 5000 feet Maximum Elevation: 5080 feet Size: 5 ACRES

Ownership Comments: Upper Snake River Districts BLM, Burley FO.

Comments: Photomonitor station established in 2000 (Map Datum NAD 27 Central; UTM zone 12T; 0254261 East 4654349 North, GPS coordinates). Monitoring station resampled in 2001.

Protection Comments: 1991: Leafy spurge is well established in drainage bottom below population; few are established within population and should be monitored. 2000: The 1999 Goose Creek fire burned to the upper slope edge of occurrence, but did not burn within the occurrence. A few plants occur along the margin of the burn. *Euphorbia esula* occurs in small scattered clusters in the burn zone along the upper edge of occurrence. A few plants are sympatric with *P. idahoensis* in at least one spot along the upper slope. Hoof prints and cowpies are scattered through the occurrence, but overall livestock use appears minimal, probably due to the relatively steep and unstable slope and sparse forage. Greater use evident above and below the occurrence. A few ATV tracks along the ridge above the occurrence, plus one set of tracks (last year, fire fighting?) cutting up a part of the slope with the *Penstemon*. 2001: Leafy spurge more abundant along lower sections of occurrence slope compared to 2000, but still less than in early 1990s. Scattered small patches of leafy spurge throughout occurrence area. No evidence of recent cattle use within occurrence area. Occurrence area looks the same as in 2000; no new threats observed.

Management Comments: 2000: The amount of leafy spurge in the general area looks to be reduced from 1991 levels. Regular, spot application to control this weed should continue.

Specimens: D. Atwood and S. Goodrich 8958 (BRY -- holotype); label says "Shoe Spring".

IDAHO PENSTEMON Occurrence Number: 002

Survey Site Name: BEAVERDAM CREEK

County: Cassia

USGS quadrangle: IBEX PEAK

Latitude: 420035N Longitude: 1140030W

TOWNRANGE:	SECTION:	MERIDIAN:	TRSNOTE:
016S021E	28	BO	SW4
016S021E	29	BO	NE4SE4SE4, SE4NE4SE4
016S021E	33	BO	NW4NE4NW4

Location: Outcrops north of Beaverdam Creek; ca 1.5 mi W of Goose Creek and 1 mi N of the Utah state line.

Survey Date: 2000-06-27 First Observed: 1985-06-10 Last Observed: 2001-06-20

EORANK: A

EORANK Comments: Large population, most of it relatively undisturbed.

Population Data: 1985: Collected by Atwood and Rosentreter. 1991: Estimated 500 plants, widely scattered, usually in small clusters, over a large area of suitable-appearing habitat; approximately 50% in flower and bud, the rest in leaf; all size classes are present. Area surveyed by Michael Mancuso and Bob Moseley, Idaho CDC. 1996: Area surveyed by Jim Tharp, BLM, locating additional scattered populations. Total of ca 650 genets, 40% vegetative and 60% in flower. Population age class structure estimated as 5% seedlings, 10% immature, 75% mature, and 10% senescent. Population vigor assessed as fair to good. 2000: 1000-2000 genets, less than 5% reproductive, some juveniles. The large subpopulation below Point 5260 extends for about 0.25 mile, from upper to lower slopes; widely scattered clusters of plants of varying number and density; large segments of slope without *Penstemon*. The subpopulation NNE of Point 5260 was not visited, but looks intact when viewed from a distance. Observations by Michael Mancuso, Idaho CDC. 2001: Only a small area in close proximity to photomonitor plot surveyed - 35 genets counted. Observation by M. Mancuso, Idaho CDC.

Habitat Description: White tuffaceous outcrops; near ridge top orange-colored substrate as well. Open, sparsely vegetated SE- and SW-facing aspects; slopes average ca 25 degree, although more gentle or steep in some areas. Open *Juniperus osteosperma* with varying amounts and regularity of *Purshia tridentata* and *Artemisia tridentata wyomingensis*, with *Agropyron spicatum*, *Oryzopsis hymenoides*, *Gilia congesta*, *Cymopterus terebinthinus*, *Chaenactis douglasii*, *Eriogonum ovalifolium*, and *Penstemon humilis*. *Astragalus anserinus* co-occurs in at least one area. The *Penstemon* seems to be most common where the tuff erodes into small, platy pieces over bedrock and associated vegetation is very sparse or absent.

Minimum Elevation: 5000 feet Maximum Elevation: 5260 feet Size: 15 ACRES

Ownership Comments: Upper Snake River Districts BLM, Burley FO.

Comments: Photomonitor station established in 2000. GPS coordinates for station are UTM 11T, E 0747657 N 4655036. Monitor station resampled in 2001.

Protection Comments: 1991: Cattle use a portion of the area, but probably do not pose a threat to a majority of the plants. Leafy spurge is beginning to invade area, although none was seen in areas where *Penstemon idahoensis* was found. 1996: Leafy spurge occupies ca 400 sq ft of habitat, but poses a non-imminent threat. The infestation should be treated within the next two years. 2000: Cattle prints are widespread, but not abundant except along edges of tuff outcrop. The outcrops probably visited by a relatively small number of adventuresome individuals rather than a large number of cattle. Overall livestock impacts are light within occurrence. 2001: No recent livestock use observed around monitor station area. No leafy spurge observed in area, but BLM was spraying for this weed along Beaverdam

Creek and sagebrush hills south of creek. Occurrence area looks the same as in 2000; no new disturbances.

Management Comments: 2000: None are present, and it's recommended that salt or water stations continue to be kept away occurrence area.

Specimens: D. Atwood and R. Rosentreter 11163 (BRY). There are over 100 acres of potential habitat in the immediate area.

IDAHO PENSTEMON Occurrence Number: 003

Survey Site Name: DEVINE CANYON

County: Cassia

USGS quadrangle: BLUE HILL

Latitude: 420255N Longitude: 1135632W

TOWNRANGE: SECTION: MERIDIAN: TRSNOTE:
016S021E 2 BO SE4SW4

Location: Along Goose Creek Road, ca 15.6 mi S of Oakley and about 5 miles N of the Idaho/Utah border; 0.5 mi SW of Blue Hill, near Devine Canyon.

Survey Date: 2000-06-30 First Observed: 1982 Last Observed: 2000-06-30

EORANK: B

EORANK Comments:

Population Data: 1982: No data. Collected by Atwood and Rosentreter. 1989: Ca 200 normal & vigorous genets, 30% in bud, 70% in flower, all age classes appeared to be represented in population. Area surveyed by Bob Moseley, Idaho CDC. 1991: No change, except no plants in flower. Observation by Moseley. 2000: Ca 250 genets, 65% reproductive, 25% vegetative, 5% seedlings, and 5% senescent. A cluster of several dead plants alongside the road may have been killed by herbicide application. Overall, plants look vigorous, including some very large individuals. Observation by Michael Mancuso, Idaho CDC during a cursory visit.

Habitat Description: Dry-mesic to dry site; upper, mid, and lower slope; N and NW aspects; 15% to vertical slopes; open light; *Artemisia tridentata* ssp. *wyomingensis*/*Festuca idahoensis* community; lacustrine ash deposits; associated with *Rosa woodsii*, *Ribes aureum*, *Gilia congesta*, *Chrysothamnus viscidiflorus*, and *Euphorbia esula*.

Minimum Elevation: 4900 feet Maximum Elevation: Size: 1 ACRE

Ownership Comments: Private land.

Comments: Little or no additional potential habitat in vicinity of occurrence.

Protection Comments: Threats: road widening, leafy spurge control. 1991: County has sprayed roadside, but *Penstemon* does not appear to be affected. 2000: Unknown if several dead plants close to road were killed by herbicide application, but this is a good possibility. A few stray leafy spurge plants observed on the slope and the roadway. Area did not burn in 1999 Goose Creek fires.

Management Comments: May be in county right-of-way. They should be contacted and care should be taken during weed control spraying in the population area.

Specimens: R. K. Moseley 1437 (ID).
D. Atwood and S. Goodrich 8954 (BRY).

IDAHO PENSTEMON Occurrence Number: 004

Survey Site Name: RIGHT HAND FORK BEAVERDAM CREEK

County: Cassia

USGS quadrangle: IBEX PEAK

Latitude: 420353N Longitude: 1140434W

TOWNRANGE: SECTION: MERIDIAN: TRSNOTE:
016S020E 02 BO SW4NE4

Location: Upper Right Hand Fork Beaverdam Creek, about 2.25 air miles S of Ibex Peak.

Survey Date: 2000-06-28 First Observed: 1989 Last Observed: 2001-06-19

EORANK: C

EORANK Comments: Small site with relatively few plants, although it is more or less undisturbed.

Population Data: 1989: 101-1000 plants in flower, 25% first year, 75% mature. 1991: Ca 25 plants in leaf. Observation by Michael Mancuso, Idaho CDC. 2000: Counted 60, but perhaps as many as 100 genets; 15% reproductive, 65% vegetative, 20% juveniles. Observation by Michael Mancuso, Idaho CDC. 2001: 88 genets counted; 5% reproductive, the rest vegetative rosettes; some plants look "stressed" (drought stress?). Observation by M. Mancuso, Idaho CDC

Habitat Description: SW aspect; 20-30 degree slope; mid-slope position; dry; open light. Small, light gray tuffaceous outcrop of Salt Lake Formation sediments; fine-textured to gravel and small rock size fragments; high bare ground cover. A few scattered *Juniperus osteosperma* along fringe of outcrop; associates include *Purshia tridentata*, *Artemisia tridentata*, *Amelanchier utahensis*, *Symphoricarpos oreophilus*, *Agropyron spicatum*, *Stipa lettermanii*, *Senecio canus*, *Senecio multilobatus*, *Eriogonum microthecum*, and *Commandra umbellata*. None of the other outcrops in the area seem to have the *Penstemon*. A tall, blue-flowered *Penstemon* sp. was growing in the area - much larger and not scabrous, so there were no problems with identification.

Minimum Elevation: 5720 feet Maximum Elevation: Size: 0.25 ACRE

Ownership Comments: Sawtooth NF, Twin Falls RD.

Comments: Photomonitor station established in 2000 (at UTM zone 11T 0741864 East 4660939 North, GPS coordinates). Monitor station resampled in 2001.

Protection Comments: 1991: Light livestock grazing in the area. 2000: Cattle graze the general area every other year. Although heavy use nearby along creek, a fenceline protects the outcrop with *Penstemon*. Cattle use on outcrop is minimal as only a few old cowpies were observed. In the past, a wildfire burned to within ca 0.3 mile to SW and W of occurrence. Occurrence located close to a block of private inholding land. 2001: No new threats or disturbances observed.

Management Comments: 2000: Maintenance of fenceline near outcrop is important - livestock use on and around the outcrop would otherwise be much greater.

Specimens: D. Atwood 15647 (BRY).

IDAHO PENSTEMON Occurrence Number: 005

Survey Site Name: ORANGEBURG SPRING

County: Cassia

USGS quadrangle: IBEX PEAK

Latitude: 420035N Longitude: 1140430W

TOWNRANGE: SECTION: MERIDIAN: TRSNOTE:
016S020E 26 BO NW4NE4

Location: Ca 0.3 mi NW of Orangeburg Spring, the north side of NE Creek, ca 1 mile north of the Nevada state line.

Survey Date: 2000-06-28 First Observed: 1989 Last Observed: 2001-06-19

EORANK: A

EORANK Comments: Originally given a "B" rank in 1991, but changed to "A" in 2000. Quite a few plants and minimal disturbance in most of occurrence.

Population Data: 1989: 11-50 plants in leaf, bud, and flower; 75% mature, 25% immature. 1991: Ca 300 plants, approximately 20% are in flower or bud, the remainder are in leaf; all size classes present. Observation by Bob Moseley and Michael Mancuso, Idaho CDC. 2000: Estimated 500-1000 genets; ca 10% reproductive, 85% vegetative, 5% juveniles, 1% senescent. Plants occur in a band along the lower slope for ca 0.2 mile. No *P. idahoensis* observed to the SE along a contiguous part of the tuffaceous exposure where the substrate appears to be deeper and less stony. Observation by Michael Mancuso, Idaho CDC. 2001: plants locally common in area where monitoring station located, but no estimate of plant numbers made. Observation by M. Mancuso, Idaho CDC.

Habitat Description: Apparently restricted to the steep (average 25 degrees) SW-facing lower slope between the more gentle sagebrush bench below and the juniper forest above. High bare ground cover, with lots of soil microtopography. *P. idahoensis* occurs where bedrock close to surface and the tuff has eroded to angular, platy to blocky, gravel to rock size material. Open *Juniperus osteosperma* with scattered shrubs such as *Purshia tridentata*, *Artemisia tridentata wyomingensis*, and *Chrysothamnus* spp.; low bunchgrass cover is primarily *Agropyron spicatum*; associated forbs include *Cymopterus terebinthinus*, *Eriogonum ovalifolium*, and *Linum perenne*. *Penstemon humilis* is in the area, but not directly sympatric with *P. idahoensis*.

Minimum Elevation: 5280 feet Maximum Elevation: 5360 feet Size: 2 ACRES

Ownership Comments: Sawtooth NF, Twin Falls RD.

Comments: Photomonitoring station established in 2000 (at UTM zone 11T 0742194 East 465911 North, GPS coordinates). Monitoring station resampled in 2001.

Protection Comments: 1991: Light livestock grazing in the area. 2000: Cattle use widespread and prevalent in nearby sagebrush bottoms, but light through occurrence; however in a few places there is evidence cattle occasionally traverse across the steep, loose slope causing some erosion. Some crested wheatgrass occurs in the population, but no weed problems observed. No evidence of recent wildfire in area. 2001: No evidence of recent livestock use; no leafy spurge seen. Area looks the same as in 2000; no new disturbances or threats.

Management Comments: 2000: Recommend keeping salt, water or other enticements for livestock away from occurrence area.

Specimens: D. Atwood 15649 (BRY).

IDAHO PENSTEMON Occurrence Number: 006

Survey Site Name: NORTH OF WORTHINGTON MINE

County: Cassia

USGS quadrangle: IBEX PEAK

Latitude: 420102N Longitude: 1140440W

TOWNRANGE: SECTION: MERIDIAN: TRSNOTE:
016S020E 23 BO NW4SE4

Location: Along and near jeep trail, 0.4 mile due N of Worthington Mine, ca 1.5 miles N of the Nevada state line. Access is via an unimproved spur road.

Survey Date: 2000-06-28 First Observed: 1991-06-19 Last Observed: 2001-06-19

EORANK: B

EORANK Comments: Occurrence is small in size, but has some dense groupings of plants, and disturbance not excessive.

Population Data: 1991: 250-300 normal genets, 40% in leaf, 60% in bud; plants are 40% immature, 60% mature. Evidence of cattle herbivory on several plants. Area surveyed by Bob Moseley and Michael Mancuso, Idaho CDC. 2000: An estimated 400-500 genets; 20% reproductive, 75% vegetative; 5% juveniles, and 1% senescent. All size classes, including some large individuals. Plants dense over some of the small outcrops. Occurrence is comprised of a series of small tuffaceous outcrops in a narrow band about 100 m long. Observations by Michael Mancuso, Idaho CDC. 2001: Ca same number of plants as in 2000; 25% reproductive, 75% vegetative rosettes. Observation by Michael Mancuso, Idaho CDC.

Habitat Description: Dry; upper slope; E, S, SE, and SW exposures; 8-15% slope; *P. idahoensis* occurs in series of small openings within the surrounding *Juniperus osteosperma* woodland matrix containing a mix of shrubs such as *Artemisia tridentata*, *Purshia tridentata*, and *Chrysothamnus* spp. The openings have relatively sparse vegetation and high bare ground cover; associates include *Commandra umbellata*, *Leptodactylon pungens*, *Oryzopsis hymenoides*, *Agropyron spicatum*, *Lupinus lepidus*, *Opuntia polyacantha*, and *Penstemon humilis*.

Minimum Elevation: 5360 feet Maximum Elevation: 5400 feet Size: 0.5 ACRE

Ownership Comments: Sawtooth NF, Twin Falls RD.

Comments: Photomonitor station established in 2000 (at UTM zone 11T 0741920 East 4655638 North, GPS coordinates). Former Survey Site Name for occurrence was "Water Trough". Monitor station resampled in 2001.

Protection Comments: 1991: Cattle trail and grazing evident in population - several plants were eaten. Water trough and trail are close to population. 2000: A jeep trail bisects occurrence, but no off-road use observed. Crested wheatgrass well established in general area, some growing with *P. idahoensis*; no noxious weeds seen at occurrence Livestock graze within occurrence; light use so far this year, still associated trampling and general soil disturbance can and do occur. 2001: No off-trail motorized tracks observed; livestock sign restricted to jeep trail corridor during visit; no leafy spurge or other noxious weeds. Occurrence area looks the same as in 2000; no new disturbances or threats.

Management Comments: 1991: Need to determine impacts of cattle; population needs to be monitored. 2000: Should receive regular monitor visits. Improvements or enlargement of jeep rail could destroy part of occurrence.

Specimens:

IDAHO PENSTEMON Occurrence Number: 007

Survey Site Name: NEARLY NEVADA - ALMOST UTAH

County: Cassia

USGS quadrangle: IBEX PEAK

Latitude: 415952N Longitude: 1140347W

TOWNRANGE: SECTION: MERIDIAN: TRSNOTE:
016S020E 36 BO NE4NW4

Location: Ca 0.3 mile N of the Idaho/Nevada border, ca 0.7 mile S of Orangeburg Spring.

Survey Date: 2000-06-28 First Observed: 1991-06-19 Last Observed: 2001-06-19

EORANK: A

EORANK Comments: Minimal disturbance; relatively large number of plants.

Population Data: 1991: Ca 150 vigorous plants in flower; 20% of the plants are immature, 80% are mature. Area surveyed by Bob Moseley and Michael Mancuso, Idaho CDC. 2000: Ca 500 genets; 75% reproductive, 20% vegetative, 2% juveniles, and 3% senescent; relatively high density of plants; all size classes. Observation by Michael Mancuso, Idaho CDC. 2001: Ca 200 genets, but many plants small and easy to miss if not with flowers; ca 20% reproductive, 80% vegetative rosettes. Observation by M. Mancuso, Idaho CDC.

Habitat Description: Dry upper slope; SW aspect; 8-20% slope. Light gray, sandy to stony tuffaceous sediments with bedrock close to surface; high bare ground cover and sparse herb cover. *Juniperus osteosperma* woodland with scattered *Purshia tridentata*; *Artemisia tridentata* more common on nearby portions of slope; other associates include *Cymopterus terebinthinus*, *Commandra umbellata*, *Phacelia hastata*, and *Agropyron spicatum*. Open light to partial shade of junipers.

Minimum Elevation: 5280 feet Maximum Elevation: Size: 1 ACRE

Ownership Comments: State land.

Comments: Photomonitor station established in 2000 (at UTM zone 11T, 0743129 East 4653507 North, GPS coordinates). Monitor station resampled in 2001.

Protection Comments: 1991: Heavy cattle grazing in the area but does not appear to be a threat. 2000: Minimal evidence of disturbance - a few cowpies and cattle and wildlife tracks. Cattle trail along the nearby fenceline and the sagebrush flats east of occurrence are grazed hard. A trace of crested wheatgrass occurs with the *Penstemon*, but apparently not a problem at this time; no other weed species observed within occurrence. 2001: Some bunchgrass clumps grazed, but apparently by deer (deer prints present); no sign of recent cattle use; no noxious weeds observed. Occurrence area looks the same as in 2000; no new disturbances or threats.

Management Comments: 2000: Some of the juniper in area looks to be very old and may qualify as "old-growth". Occurrence should be monitored at least periodically.

Specimens:

IDAHO PENSTEMON Occurrence Number: 008

Survey Site Name: LOWER BEAVERDAM CREEK

County: Cassia

USGS quadrangle: BLUE HILL

Latitude: 420029N Longitude: 1135934W

TOWNRANGE: SECTION: MERIDIAN: TRSNOTE:
016S021E 28 BO SE4SE4

Location: North of lower Beaverdam Creek, ca 1 mile N of the Utah border, and ca 1 mile W of the Goose Creek road.

Survey Date: 2000-06-29 First Observed: 1991-06-20 Last Observed: 2001-06-20

EORANK: B

EORANK Comments:

Population Data: 1991: 150 normal genets, 50% in bud, 50% in flower; plants are 20% immature, 80% mature. Population is in a narrow band just below ridgeline. Area surveyed by Bob Moseley, Idaho CDC. 1996: Area surveyed by Jim Tharp, BLM, locating two small additional sites and noting that the original site is larger than described in 1991. Total number of genets ca 303, 40% vegetative and 60% in flower. Population age class structure estimated as 5% seedlings, 10% immature, 70% mature, and 15% senescent. Population vigor ranges from fair to good. 2000: Total of ca 325 genets; ca 300 at the northern subpopulation, 25 at the small southernmost subpopulation, one other reported small area not visited; 35% reproductive, 65% vegetative. Observations by Michael Mancuso, Idaho CDC. 2001: Ca 100 genets observed during a cursory, incomplete survey of occurrence area; 25% reproductive, 75% vegetative, including many small size plants. Observation by M. Mancuso, Idaho CDC.

Habitat Description: Dry lower to upper slopes; open light to partial shade of junipers; 15-35% slope. Northern subpopulation is a SW-facing bowl with aspects ranging from NW around to SE. Some plants along rim occur in atypical habitat with grasses and in shade of junipers. Plants are most common in narrow band of gray, sandy and stony sediments along rim and upper slope of bowl. Open *Juniperus osteosperma* community; associated with *Artemisia tridentata* ssp. *wyomingensis*, *Purshia tridentata*, *Oryzopsis hymenoides*, *Poa secunda*, *Cryptantha spiculifera*, and *Oenothera caespitosa*. The small southernmost subpopulation occurs along a very sparsely vegetated mid to lower slope with scattered *Eriogonum brevicaulle* and *Agropyron spicatum*. Habitat is discontinuous between subpopulations.

Minimum Elevation: 5000 feet Maximum Elevation: 5080 feet Size: 2 ACRES

Ownership Comments: Upper Snake River Districts BLM, Burley FO.

Comments: Photomonitor station established in 2000 (GPS coordinates 0252089 East 4654888 North, UTM zone 11T). Monitor station resampled in 2001.

Protection Comments: 1991: Cattle grazing occurs on the ridge above and in valley bottom below, but does not appear to impact population. 1996: Cattle trampling may be keeping the east slope site from reaching its potential. 2000: Off-road ATV or motorcycle treads observed in the two subpopulation visited in 2000. A potential conservation problem if this use persists or increases. Livestock use near the occurrence can be heavy, and is likely impacting portions of the occurrence along the rim of the bowl-like subpopulation. Several weedy annual species established within occurrence; leafy spurge and halogeton occur in close proximity. 2001: Cattle trailing and trampling disturbance widespread and locally common within occurrence. No leafy spurge within occurrence, but a small patch observed ca 100 m SW of photomonitor stake on ridgeline leading to occurrence. General occurrence area looks the same as in 2000; no new threats.

Management Comments: 2000: Should control leafy spurge and halogeton along nearby road while infestation is manageable. Keep water and salt away from occurrence. Monitor ORV use in area.

Specimens:

IDAHO PENSTEMON Occurrence Number: 009

Survey Site Name: GOOSE CREEK CLIFF BANDS

County: Cassia

USGS quadrangle: BLUE HILL

Latitude: 420144N Longitude: 1135828W

TOWNRANGE:	SECTION:	MERIDIAN:	TRSNOTE:
016S021E	14	BO	NE4SE4SW4
016S021E	22	BO	NE4
016S021E	23	BO	NW4NW4

Location: West side of Goose Creek, near the confluence of Goose Creek and Birch Creek. On slopes between cliff bands on W side of Goose Creek bottoms between Coal Banks Creek and Beaverdam Creek.

Survey Date: 1991-06-20 First Observed: 1991-06-20 Last Observed: 1991-06-20

EORANK: AB

EORANK Comments: Excellent population, but less than excellent site condition and defensibility.

Population Data: 1991: Ca 500 normal genets, 20% in bud, 80% in flower; plants are 10% immature, 80% mature; occurs very locally along slope, largely on the upper edge of the lower cliff band. Area surveyed by Bob Moseley, Idaho CDC. 2000: Occurrence area appears intact; not directly visited, but viewed from Goose Creek Road. Observation by Michael Mancuso, Idaho CDC.

Habitat Description: Dry mid-slope; S, SE, and SW exposures; 0-15% slope; open light; gray sandy outcrops of tuffaceous sediments; largely unvegetated bedrock surfaces; some scattered *Juniperus osteosperma*; associated with *Cymopterus terebinthinus*, *Gilia capitata*, and *Oryzopsis hymenoides*.

Minimum Elevation: 5000 feet Maximum Elevation: 5280 feet Size: 5 AC

Ownership Comments: Private land and Upper Snake River Districts BLM, Burley FO.

Comments:

Protection Comments: 1991: There is a cow trail on the slope between cliff bands, although there doesn't appear to have much impact on the *Penstemon*. 2000: A few clumps of leafy spurge spotted within or close to the occurrence.

Management Comments: 1991: This fragile slope and associated *Juniperus osteosperma* community should be off limits to cattle. *Astragalus anserinus* known from same general area.

Specimens:

IDAHO PENSTEMON Occurrence Number: 010

Survey Site Name: BORDER GULCH

County: Cassia

USGS quadrangle: POLE CREEK BLUE HILL

Latitude: 415957N Longitude: 1135822W

TOWNRANGE: SECTION: MERIDIAN: TRSNOTE:
016S021E 34 BO E2

Location: About 0.5 mile N of Idaho/Utah border, E of Goose Creek in the lower Pole Creek area.

Survey Date: 2000-06-27 First Observed: 1991-06-18 Last Observed: 2001-06-18

EORANK: A

EORANK Comments: Large population and good condition habitat in most places.

Population Data: 1991: 500-1000 individuals scattered over an outcrop of white tuffaceous material that extends for ca 0.2 mile; plants are 50% in leaf, 25% in bud, 25% in flower. Observation by Michael Mancuso and Bob Moseley, Idaho CDC. 2000: Two subpopulations, the northern one discovered in 2000 and thoroughly surveyed. It has an estimated 1000 genets; mix of size classes; more plants vegetative than reproductive. cursory survey of the southern subpopulation; only 50-100 plants observed. Observations by Michael Mancuso, Idaho CDC. 2001: Ca 200 reproductive and 100 vegetative genets observed during incomplete survey of northern subpopulation. Plants occur from upper to very bottom of slope; a few plants in the gully bottom itself. Southern subpopulation intact, but plants not counted or estimated. Observation by M. Mancuso, Idaho CDC.

Habitat Description: Steep (8-35 degrees), SW-facing upper to lower gully slopes. Sparsely vegetated exposures of firm, sandy to stony, light gray-colored tuffaceous sediments; bedrock relatively close to surface. Bare ground/gravel/rock cover is >90%. Very widely scattered *Juniperus osteosperma*, *Artemisia tridentata*, and *Purshia tridentata*; *Agropyron spicatum* the most common grass, occasional *Oryzopsis hymenoides* and *Agropyron cristatum*; associated forbs include *Cymopterus terebinthinus*, *Eriogonum brevicaulis*, *Lupinus lepidus*, and *Chaenactis douglasii*. Leafy spurge is widely scattered, with some dense clumps along gully bottoms.

Minimum Elevation: 5000 feet Maximum Elevation: 5040 feet Size: 5 ACRES

Ownership Comments: Upper Snake River Districts BLM, Burley FO.

Comments: Photomonitor station established at northern subpopulation in 2000 (GPS coordinates 0253826 East 4654064 North UTM zone 12T). Monitor station resampled in 2001.

Protection Comments: 1991: There are cattle in the area, but use is light where the *Penstemon* is located. Threatened by invasion of leafy spurge and spraying for spurge. 2000: Livestock use of steep, sparse slopes is minimal, but common on adjacent rolling hills with sagebrush and crested wheatgrass. Leafy spurge established within occurrence, presently not abundant; most dense near draw bottoms; and widespread in the general area. A few ATV tracks along very upper slope of the northern subpopulation - likely from weed control personnel. 2001: Control efforts in 2000 knocked back the leafy spurge in the NE corner of the northern subpopulation, but leafy spurge plants persisting. Scattered small clusters of leafy spurge within northern subpopulation, including the gully bottom. Occurrence area looks unchanged from 2000; no new threats observed.

Management Comments: 2000: Continued and thorough control of leafy spurge is needed, especially along draw bottoms and lower slopes; will require spot spraying as the *Penstemon* co-occurs with leafy spurge in number of places.

Specimens: Michael Mancuso 536 (ID).

IDAHO PENSTEMON Occurrence Number: 011

Survey Site Name: EAST OF COAL BANKS SPRING

County: Cassia

USGS quadrangle: BLUE HILL

Latitude: 420423N Longitude: 1135736W

TOWNRANGE: SECTION: MERIDIAN: TRSNOTE:
015S021E 35 BO NW4SW4SE4

Location: Ca 1.9 air miles NW of Blue Hill, ca 1.3 air miles E of Coal Banks Spring, and ca 2.2 air miles N of Sand Spring; W of Goose Creek.

Survey Date: First Observed: 1994-03-31 Last Observed: 1994-03-31

EORANK: B-C

EORANK Comments: Overall site quality rated as good to fair.

Population Data: 1994: 9 vegetative genets. Population age class structure is 10% immature and 90% mature. Plants don't appear stressed. Immediate vicinity thoroughly surveyed by Jim Tharp, Burley BLM. 2000: Occurrence area relocated, but no plants found. Observation by Miriam Austin, Red Willow Consulting.

Habitat Description: Dry, steep, unstable 55% south-facing slope. Whitish tuffaceous soil. Associates include *Juniperus osteosperma*, *Oryzopsis hymenoides*, and a few *Salsola kali* nearby.

Minimum Elevation: 5640 feet Maximum Elevation: Size: 100 SQ FT

Ownership Comments: Upper Snake River Districts BLM, Burley FO; adjacent to state land.

Comments:

Protection Comments: Livestock grazing occurs in the general area, but is not apparent at the site. 2001: Occurrence located within perimeter of the 2000 Goose Creek wildfire.

Management Comments:

Specimens:

IDAHO PENSTEMON Occurrence Number: 012

Survey Site Name: COLD SPRINGS

County: Cassia

USGS quadrangle: BLUE HILL

Latitude: 420557N Longitude: 1135507W

TOWNRANGE: SECTION: MERIDIAN: TRSNOTE:
015S022E 19 BO SW4SW4SE4

Location: East of where Cold Creek crosses the Goose Creek Road.

Survey Date: First Observed: 1998-11-05 Last Observed: 1998-11-05

EORANK:

EORANK Comments:

Population Data: 1998: 7 actual genets; 2 vegetative, 5 in fruit; 2 immature, 5 mature; population area 50 ft. X 50 ft.; population vigor good; cursory survey by Brian J. Cheney (BYU graduate student) and Jim Tharp (BLM, Burley). 2001: No plants found during a thorough search by M. Mancuso, Idaho CDC. *Penstemon humilis* and *P. deustus* were observed in the occurrence area.

Habitat Description: White Salt Lake formation on ash outcrop; southwest aspect; erosive slopes in an *Artemisia nova/Oryzopsis hymenoides* community with scattered junipers.

Minimum Elevation: 5065 feet Maximum Elevation: Size: 250 SQ FT

Ownership Comments: Upper Snake River Districts BLM, Burley FO.

Comments: Overall site quality assessed as excellent.

Protection Comments: Cattle graze in area but do not pose an imminent threat. 2001: Lower portion of ash outcrop hillside burned in 2000 wildfire; upper half unburned; juniper woodland above outcrop also burned. Scattered old cowpies, but slope apparently not used much by livestock. *Hyoscyamus niger* (henbane) established and increasing in burn area in the Cold Creek area; it occurs in gulch below outcrop, but none observed directly within occurrence.

Management Comments:

Specimens: