

**FIELD INVESTIGATION FOR *LEPIDIUM PAPILLIFERUM* (SLICKSPOT PEPPERGRASS)
ON SELECTED IDAHO BLM LANDS IN SOUTHWESTERN IDAHO**

by

Michael Mancuso, Shelley Cooke, and Cyndi Coulter
Conservation Data Center

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Idaho Department of Fish and Game
Natural Resource Policy Bureau
600 South Walnut, P.O. Box 25
Boise, Idaho 83707



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Lower Snake River District BLM
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ABSTRACT

Slickspot peppergrass (*Lepidium papilliferum*) is an annual or biennial forb endemic to southwestern Idaho. Much of its original sagebrush-steppe habitat has been destroyed or seriously degraded over the past century. The documented downward conservation trend for slickspot peppergrass has made it a high priority for Idaho Bureau of Land Management (BLM) resource managers for many years. This conservation concern was highlighted in July 2002, when the U.S. Fish and Wildlife Service proposed to list slickspot peppergrass as Endangered under the Endangered Species Act. Field inventories by the BLM and other agencies have been conducted throughout segments of the range of slickspot peppergrass. However, a number of areas known or suspected to contain suitable habitat have not been searched, including on BLM land. In 2002, the BLM and Idaho Conservation Data Center entered into a Challenge Cost-share agreement to conduct a systematic field investigation to assess the occurrence and distribution of slickspot peppergrass in three separate areas along the western Snake River Plain. The field investigation targeted areas south of New Plymouth, northwest of Mountain Home, and north of Glenns Ferry. During the course of our field surveys we discovered three new slickspot peppergrass occurrences in the New Plymouth area and expanded the extent of three previously known occurrences near Glenns Ferry. Burned habitat supporting early seral vegetation dominated the landscape in surveys areas south of New Plymouth and northwest of Mountain Home. In contrast, sagebrush vegetation characterized a majority of the Glenns Ferry survey area.

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INTRODUCTION

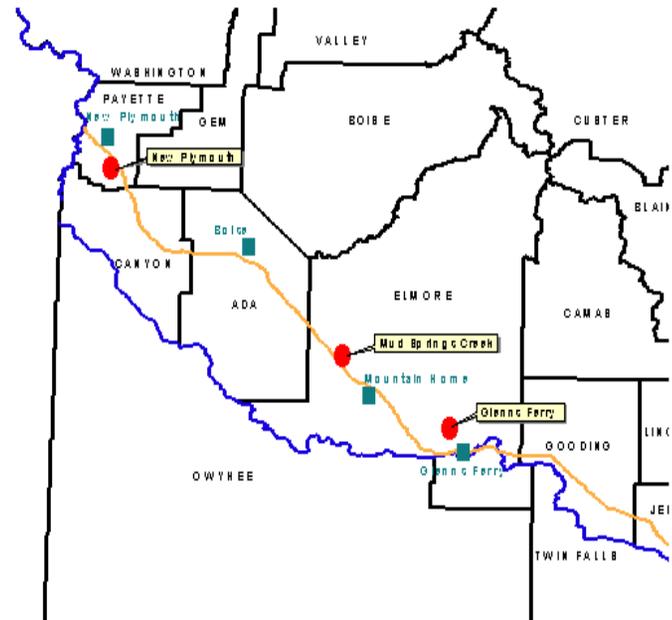
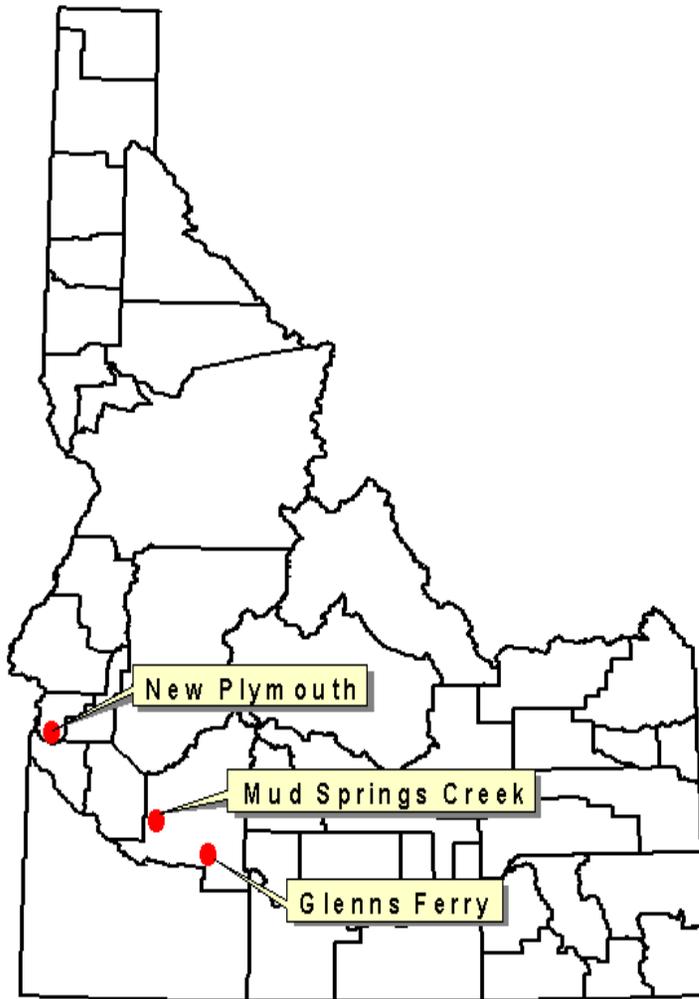
Slickspot peppergrass (*Lepidium papilliferum*) is an annual or biennial forb endemic to southwestern Idaho. Much of its original sagebrush-steppe habitat has been lost to agricultural and urban development. In addition, an ever-increasing amount has been converted to annual grassland or seeded grassland vegetation as a result of wildfires or associated rehabilitation programs (Knick and Rotenberry 1997). The largely impoverished ecological condition of much of the remaining sagebrush-steppe in the western Snake River Plain is due to over a century of intensive use, especially disturbances associated with livestock grazing. A direct consequence of this habitat loss and degradation has been the outright loss or reduction in size of many slickspot peppergrass populations. This downward conservation trend resulted in the addition of slickspot peppergrass to the federal Endangered Species Act Candidate list in 1999 (U.S. Fish and Wildlife Service 1999), and the subsequent proposal for it to be listed as Endangered in 2002 (U.S. Fish and Wildlife Service 2002). Population, life history, habitat, distribution, and other information concerning slickspot peppergrass has been discussed and summarized in previous publications (e.g., Moseley 1994; Fisher et al. 1996; Quinney 1998; U.S. Fish and Wildlife Service 2002).

Rangewide, the majority of known slickspot peppergrass occurrences are located on lands administered by the Bureau of Land Management (BLM). Many areas containing additional unsurveyed habitat are also BLM land. Because of this ownership pattern, the BLM has played a leading role in slickspot peppergrass management; and this species is a priority conservation concern for the agency. Even though the BLM has made a concerted effort to conduct or sponsor field surveys in recent years, gaps remain in documenting whether or not slickspot peppergrass occurs in several geographic areas. Development of a comprehensive conservation plan requires the rangewide distribution of slickspot peppergrass be documented as fully as possible. To further conservation efforts on behalf of slickspot peppergrass, the BLM's Lower Snake River District and the Idaho Department of Fish and Game's Conservation Data Center (CDC) entered into a Challenge Cost-share agreement in 2002, to conduct a systematic field investigation for slickspot peppergrass in three southwestern Idaho areas.

METHODS

Areas targeted for inventory were identified by the BLM prior to initiation of our field investigation. Three separate areas were targeted, including south of New Plymouth, northwest of Mountain Home, and north of Glens Ferry (Figure 1). For purposes of this report, these areas are referred to as New Plymouth, Mud Springs Creek, and Glens Ferry, respectively. All of the survey areas were located along the western Snake River Plain in southwestern Idaho. The survey areas were selected because they had not been previously searched, were located relatively close to known slickspot peppergrass populations, and were known or suspected to contain suitable habitat for this species.

Field work was conducted between June 3 and July 3, 2002. Roads, powerlines, and other map features or land ownership boundaries were used to delineate each



Idaho Conservation Data Center
Idaho Department of Fish and Game
 P.O. Box 25
 Boise, ID 83707
 Office (208) 334-3402, Fax (208) 334-2114
www.state.id.us/fishgame/info/cd/cdc.htm

2002 *Lepidium papilliferum* Survey Areas

-  Snake River
-  Towns
-  Interstate 84
-  Counties
-  Study Areas

40 0 40 Miles



December-16-2002

survey area into a series of polygons to help facilitate field surveys. We documented our survey routes as polygons on USGS topographic map quadrangles. These polygons formed the basis for our survey acreage estimates. Polygons were systematically searched using a meandering transect method. Most polygons were surveyed by three or four people, although in some cases two, five, or six people participated. Field personnel walked parallel, equidistant transects, approximately 100 m apart within a given polygon. The transect's start and end points were typically conveniently located along roads, powerlines, or fencelines. Transects followed an azimuth that connected the start and end points, usually along the long axis of the polygon. Each person surveyed a separate transect line, but was usually within sight of at least one other crew member. Azimuths provided a rough guide for each transect. It was common to deviate off the azimuth to search slickspot openings within one's field of view. For this reason, transect routes often had a meandering component.

We collected information concerning the general vegetation and the distribution, abundance, and condition of slickspot microsites, including levels of livestock disturbance and weed invasion for each survey area, whether or not slickspot peppergrass was found. This information was then summarized on a field form for each polygon. Additional data were collected if slickspot peppergrass was found, including location, size, abundance, habitat, and threat information. Coordinates were obtained for new slickspot peppergrass locations using navigation grade GPS units. Coordinates were not taken for every occupied slickspot. Instead, coordinates represent the location of a single occupied slickspot within the general occurrence area. A rare plant observation form was completed for all slickspot peppergrass occurrences discovered or updated during our field inventory.

RESULTS

During the field investigation we discovered three new slickspot peppergrass occurrences in the New Plymouth study area and expanded the extent of three previously known occurrences near Glenns Ferry. We did not find any slickspot peppergrass in the Mud Springs Creek study area. We surveyed a total of approximately 9,150 acres during our field investigation. Approximately 2,870 acres (31%) of this total was in the New Plymouth area, 2,205 acres (24%) in the Mud Springs Creek area, and 4,075 acres (45%) in the Glenns Ferry area. Survey areas were mapped as polygons (Appendix 1). Surveys were conducted in unburned big sagebrush (*Artemisia tridentata*) habitat and in areas that had very little or no sagebrush due to past wildfires. Burned, early seral habitat dominated the New Plymouth and Mud Spring Creek target areas, while sagebrush vegetation occurred over the majority of the Glenns Ferry target area. Roughly 90+% of the New Plymouth, 80% of the Mud Spring Creek, and 35% of the Glenns Ferry target areas had burned in the past and were dominated by weedy herbaceous or seeded vegetation.

A great majority of the New Plymouth survey area supported a weedy herbaceous plant community characterized by tumbled mustard (*Sisymbrium altissimum*) intermixed with varying amounts of crested wheatgrass (*Agropyron cristatum*), as well as Sandberg's bluegrass (*Poa secunda*), and occasionally small amounts of other native bunchgrasses. The Sandberg's bluegrass had relatively high cover in places, but most plants had a pedestal appearance. The majority of Sandberg's bluegrass plants had a pedestal form in the Mud Springs Creek and Glenns Ferry survey areas as well. Weed species such as bur buttercup (*Ranunculus testiculatus*), clasping peppergrass (*Lepidium perfoliatum*),

and cheatgrass (*Bromus tectorum*) tended to be widespread and locally common. Sagebrush was limited to widely scattered individuals, small clusters, or a few small unburned stands. The survey area was hilly and had sandy soils in most places. Slickspots tended to be concentrated along ridgecrest and associated upper slope contours, and rare or absent in other topographic positions. Evidence of cattle use was ubiquitous throughout the survey area.

A majority of the Mud Springs Creek survey area was also dominated by herbaceous vegetation with only a few remnant stands of unburned sagebrush. Early seral vegetation was typically dominated by cheatgrass, joined by medusahead rye (*Taeniatherum caput-medusae*) in some places, and varying abundance of crested wheatgrass and native bunchgrass species, mostly Sandberg's bluegrass. Bur buttercup tended to be common, but other weedy forbs were generally more spotty in their distribution. Sagebrush stands or patches within mosaic burn areas had Sandberg's bluegrass in the understory, but cheatgrass often co-occurred in high cover. The survey area was a mix of gently undulating and more or less flat topography with a patchy to locally common distribution of slickspots in most places. Evidence of cattle use was ubiquitous throughout the survey area.

The Glenns Ferry survey area contained large stands of unburned sagebrush and a few large blocks of burned habitat. Sagebrush vegetation typically had either a cheatgrass- or depauperate Sandberg's bluegrass-dominated understory. Bur buttercup was typically much more widespread and abundant than any native forb species. Interseeded crested wheatgrass was present in most sagebrush areas. Burned areas had herbaceous vegetation dominated by crested wheatgrass, variable Sandberg's bluegrass cover, and spotty, but in places abundant cheatgrass and/or bur buttercup cover. Sagebrush regeneration tended to be spotty within the burns. The survey area had flat to gently sloping topography in most places and wide variability in the abundance and distribution of slickspot microsites. All areas had signs of past cattle grazing, but evidence of recent use was absent from many places.

Occurrence descriptions

Summary descriptions for the updated and new slickspot peppergrass occurrences are referenced by their Occurrence name and associated CDC data base identifier number. Location, abundance, habitat, and threat information are detailed in the Element Occurrence Records for each occurrence (Appendix 2). All occurrences have been mapped (Appendix 3).

Bennett Road (008) - This occurrence is located approximately five miles north-northeast of Hammett. Surveys in 2002 expanded the southeastern perimeter of this previously known occurrence by approximately 140 acres. This addition was located east of Bennett Road (T5S R 9E sec 7 and 8) in unburned sagebrush habitat having an understory characterized by Sandberg's bluegrass, interseeded crested wheatgrass, minimal cheatgrass, and low native forb diversity and cover.

Over 2,500 slickspot peppergrass plants were counted in over 50 occupied slickspot microsites. Clusters of occupied slickspots were scattered throughout the new occurrence area, but many suitable-looking slickspots did not have slickspot peppergrass. Approximately 70% of the plants observed were rosettes and 30% flowering individuals. Abundance varied from less than 5 to greater than 200 slickspot

peppergrass plants/slickspot, with the majority having between 25 and 100 individuals. The great majority of flowering plants were small annuals. Most rosettes were also small, but some larger diameter individuals were also observed. Slickspots were common throughout much of the new occurrence area, and most appeared to be in relatively good condition.

Most slickspots had some evidence of livestock disturbance and low levels of weed invasion. Wildfire, increased weed establishment, and livestock grazing are the main existing or potential disturbances to slickspot peppergrass and its habitat at this site.

Alkali Creek (026) - This occurrence is located about four miles northwest of Glenns Ferry. Surveys in 2002 expanded the extent of this previously know occurrence by nearly 400 acres, in the area north of the junction of Bennett and Bennett Mountain roads (T5SR9E sec 10, 11, 14, and 15). The survey area was located in unburned sagebrush habitat having an understory characterized by Sandberg's bluegrass, interseeded crested wheatgrass, minimal cheatgrass, locally common and widespread bur buttercup, and low native forb diversity and cover.

Over 5,000 slickspot peppergrass plants were tallied on over 100 slickspot microsites scattered throughout the survey area. Approximately 65% of the plants observed were flowering and 35% rosettes. The majority of slickspots had less than 100 individuals. Slickspots were common throughout the survey area, and most appeared to be in good condition.

No recent livestock sign was observed, but most slickspots had some old evidence of cattle disturbance and minimal to no weed invasion. Wildfire, increased weed establishment, and livestock grazing are the main existing or potential disturbances to slickspot peppergrass and its habitat at this site.

Glenns Ferry Northwest (058) – This occurrence is located roughly three miles northwest of Glenns Ferry. Surveys in 2002 expanded the extent of this previously know occurrence, by approximately 300 acres, east of the junction of Bennett and Bennett Mountain roads (T5S R 9E sec 13, 14, and 24). The survey area was located in unburned sagebrush habitat having an understory characterized by Sandberg's bluegrass, low cover of other bunchgrasses, high cover of cheatgrass in most places, bur buttercup, and low native forb diversity and cover.

Several thousand slickspot peppergrass plants were tallied on over 100 slickspot microsites scattered throughout the survey area. Slickspots had a patchy distribution overall, and clusters of occupied slickspots were scattered throughout the survey area. The majority of slickspots had less than 100 slickspot peppergrass plants. Approximately 60% of the plants observed were flowering and 40% rosettes.

No recent livestock sign was observed, but most slickspots had some old evidence of cattle disturbance and low levels of weed invasion. Wildfire, increased weed establishment, and livestock grazing are the main existing or potential disturbances to slickspot peppergrass and its habitat at this site.

South of New Plymouth/I-84 (068) – This occurrence was discovered in 2002. It is located approximately six miles south of New Plymouth, near Interstate 84, between the New Plymouth and Black Canyon interchanges (T6NR4W sec 3). The occurrence area

burned in the past and was dominated by weedy herbaceous species and intermixed crested wheatgrass and native bunchgrasses, most notably, Sandberg's bluegrass. Sagebrush has been eliminated from the occurrence area.

The occurrence is comprised of two subpopulations in close proximity to each other. The northern subpopulation contained over 2,000 slickspot peppergrass genets in over 20 slickspot microsites. The other subpopulation had a few hundred plants on 5-10 slickspots. Plants were represented by various size classes, including a number of very large individuals. Approximately 70% of the plants were reproductive and 30% rosettes. Slickspots were concentrated along ridgecrest and associated upper slope positions.

Cattle grazing and related ground disturbance activity was common throughout the occurrence area. All slickspots had at least some level of cattle disturbance, including severe impacts in some instances. What appeared to be cattle feeding stations were located along a ridge located approximately 0.2 mile west of the occurrence.

East of Ashlock Gulch (069) - This occurrence was discovered in 2002. It is located approximately six miles south of New Plymouth and 1.5 miles west of Interstate 84 (T6NR4W sec 4 and 9). The occurrence area burned in the past and was dominated by weedy herbaceous species, along with intermixed crested wheatgrass and native bunchgrasses. Sagebrush has been largely eliminated from the occurrence area.

The occurrence is comprised of three small, separate subpopulations. The northern subpopulation contained approximately 50 slickspot peppergrass genets in three slickspot microsites. Approximately 50% of the plants were reproductive and 50% rosettes. The other two subpopulations had one only reproductive individual each.

Cattle grazing and related ground disturbance activity was common throughout the occurrence area. All slickspots had at least some level of cattle disturbance. What appeared to be cattle feeding stations were located within 25 m of the northern and southern subpopulations. A livestock water trough was located roughly 0.3 mile south of the southern subpopulation as well.

West of Graveyard Gulch (070) - This occurrence was discovered in 2002. It is located approximately six miles south-southeast of New Plymouth, between Highway 30 and Graveyard Gulch (T6NR4W sec 1). The occurrence area was located within a stand of fairly intact sagebrush-steppe, although the surrounding landscape was burned and very weedy.

The occurrence contained approximately 100 genets in three slickspots scattered over about one acre. Approximately 50% of the plants were reproductive and 50% rosettes. Minimal livestock sign was observed within the sagebrush stand and slickspots were mostly undisturbed and free of weeds. However, cattle-related disturbances and garbage dumping were common in nearby areas.

Survey area descriptions

Each survey area consisted of multiple polygons representing areas we directly searched for slickspot peppergrass. Each polygon was mapped (see Appendix 1) and numbered (e.g., Polygon 1). Legal descriptions and acreages for all polygons are listed in Table 1. General vegetation and slickspot microsite information is summarized for

each polygon in the descriptions below. The slickspot microsite descriptions include weed and cattle disturbance information for each polygon that are summarized in Table 2.

Average weed invasion and livestock (cattle) disturbance levels are based on the following categories:

Slickspot weed density - average number of weedy plants/slickspot: no weeds; <10 plants/sq. ft.; 10-25 plants/sq.ft.; >25 plants/sq.ft.

Livestock disturbance sign – average number of livestock prints and or scats/ slickspot: no livestock sign; 1-10; >10.

Livestock trampling – average percentage of the slickspot surface trampled by livestock: <1%; 1-10%; 10-50%; >50%.

New Plymouth area – this survey area was located approximately six miles south of the town of New Plymouth in Payette County. Areas both east and west of Interstate 84 were surveyed.

Polygon 1 Vegetation - area has burned in the past, with only a few widely scattered individual or small islands or sagebrush remaining. Weedy herbaceous/*Poa secunda* ct. with tumbled mustard being the dominant forb, although bur buttercup and clasping peppergrass were also common. Cheatgrass was widespread, but generally occurred at low cover. Great Basin wild rye (*Elymus cinereus*) was also widespread, but other native bunchgrasses such as bluebunch wheatgrass (*Agropyron spicatum*), Thurber's needlegrass (*Stipa thurberiana*), and *Stipa comata* (needle-and-thread grass) were largely restricted to scattered hillside patches. Three noxious weed species occurred within the polygon – diffuse knapweed (*Centaurea diffusa*), rush skeletonweed (*Chondrilla juncea*), and Scotch thistle (*Onopordum acanthium*). Evidence of cattle-related ground disturbance was widespread and common. Evidence of badger activity was also common. Hilly topography and sandy soils characterized most of the polygon. Slickspots - patchy along ridgetops, but rare on hillsides or bottoms. Slickspots averaged 1-10 livestock tracks/slickspot, but was substantially higher in some places. Livestock trampling averaged 10-50% of the slickspot surface. Weed density averaged 10-25 plants/sq.ft. for most slickspots. Slickspot peppergrass - three small scattered subpopulations.

Polygon 2 Vegetation - area has burned in the past, with only a few widely scattered individual or small islands or sagebrush remaining. Weedy herbaceous/*Poa secunda* ct., with tumbled mustard being the dominant forb. Cheatgrass and crested wheatgrass were both widespread, but generally had low cover. Evidence of cattle-related ground disturbance was widespread and common. Evidence of badger activity was also common. Hilly topography and sandy soils characterized most of the polygon. Slickspots - concentrated and often locally common along ridgetops, but rare or absent on hillsides and bottoms. Slickspots averaged >10 livestock tracks/slickspot (some had less), and livestock trampling 10-50%, to often >50% of the slickspot surface. Weed density averaged 10-25 plants/sq.ft. in the slickspots. Slickspot peppergrass - two subpopulations.

Polygon 3 Vegetation - area has burned in the past, with only a few widely scattered individual or small islands of sagebrush. The remaining sagebrush patches were very disturbed by badger activity. Weedy herbaceous/*Poa secunda* ct., with the weed component dominated by tumbled mustard and joined by bur buttercup, clasping peppergrass, and cheatgrass. Large segments of the polygon area had some crested wheatgrass and scattered patches of native bunchgrasses. Evidence of cattle-related ground disturbance was widespread and very heavy in places. Evidence of badger activity was also common. Hilly topography and sandy-loess soils characterized most of the polygon.

Slickspots - patchy to common along ridgetops, but rare or absent on hillsides and bottoms. Slickspots averaged >10 livestock tracks/slickspot, and livestock trampling 10-50% of the slickspot surface, although many had >50%, and in quite a few cases appeared to be destroyed. Weed density in slickspots averaged 10-25 plants/sq.ft. Some were filled with tumbled mustard.

Slickspot peppergrass - none.

Polygon 4 Vegetation - most of area has burned in the past, with a few widely scattered patches of remnant sagebrush. Weedy herbaceous/*Poa secunda* ct., with the weed component dominated by tumbled mustard. Cheatgrass, bur buttercup, clasping peppergrass, and crested wheatgrass were also all widespread and locally prominent. Scattered patches of native bunchgrasses were observed near the northern edge of the polygon. Evidence of cattle-related ground disturbance was widespread and common. Badger activity was also common. Hilly topography with sandy or clayey soils characterized the polygon.

Slickspots - rare to patchy. Slickspots averaged >10 livestock tracks/slickspot, and livestock trampling 10-50% of the slickspot surface. Weed density averaged 10-25 plants/sq.ft. in the slickspots.

Slickspot peppergrass - none.

Polygon 5 Vegetation - area has burned in the past, with a few scattered, small islands of remnant sagebrush. Weedy herbaceous/*Poa secunda* ct., with tumbled mustard being the dominant herbaceous species. Bur buttercup was common, but cheatgrass rare or absent in many places. Crested wheatgrass and prostrate Kochia (*Kochia prostrata*) have been seeded into the area. Scattered patches of native bunchgrasses were observed. Cattle-related ground disturbance was widespread, but not as pervasive as most other portions of the survey area. Hilly topography with sandy soils characterized the polygon in most places.

Slickspots - common along ridgecrest and very upper slope contours, but varying from patchy to absent elsewhere. All slickspots had cattle or horse disturbance sign, with slickspots averaging 1-10 livestock tracks/slickspot, and livestock trampling 1-10% of the slickspot surface. Weed density in the slickspots averaged <10 plants/sq.ft. A few off-road vehicle tracks were observed through slickspot microsites.

Slickspot peppergrass - none.

Polygon 6 Vegetation - area burned in the past, with scattered individual or small patches of remnant sagebrush and/or rabbitbrush. Weedy herbaceous/*Poa secunda* ct. with tumbled mustard being the dominant herbaceous species. Other widespread species included bur buttercup, cheatgrass, clasping peppergrass, Great Basin wild rye, and variable crested wheatgrass cover. Cattle-related ground disturbance was common and widespread and the area was characterized by hilly topography and sandy soils in most places.

Slickspots - patchy, but uncommon overall. Slickspots averaged 1-10 tracks/slickspot, and livestock trampling 1-10% or sometimes higher of the slickspot surface. Weed density in the slickspots averaged 10-25 plants/sq.ft.

Slickspot peppergrass - none.

Polygon 7 Vegetation - majority of area burned or had a mosaic burn pattern. Burned segments were weedy herbaceous/*Poa secunda* ct., with tumbled mustard, bur buttercup, and cheatgrass being the dominant weedy species, and crested wheatgrass and medusahead rye scattered throughout the polygon. Diffuse knapweed was also present in places. Weedy species also dominated the herb layer within the interspersed islands and small stands of sagebrush. Contrary to elsewhere in the polygon, vegetation around the new slickspot peppergrass occurrence supported fairly intact *Artemisia tridentata*/*Poa secunda* ct. Cattle-related ground disturbance was common and widespread, and hilly topography with sandy soils characterized the polygon in most places.

Slickspots - patchy, but uncommon overall. Slickspots averaged >10 tracks/ slickspot in the burned areas, but tracks were absent from slickspots in the sagebrush stand where slickspot peppergrass was found. Livestock trampling averaged 10-50% of the slickspot surface in most areas. Slickspot weed density averaged 10-25 plants/sq.ft., but was reduced to <10 plants/sq.ft. in the sagebrush habitat having slickspot peppergrass.

Slickspot peppergrass - one small population area.

Polygon 8 Vegetation - burn, mosaic burn area dominated by a weedy herbaceous/*Poa secunda* ct. Islands or small stands/stringers of sagebrush were interspersed within the polygon. In general, the vegetation was characterized by abundant tumbled mustard, a mix of native and other weedy forbs, Sandberg's bluegrass, some cheatgrass, and variable amounts of crested wheatgrass. Rush skeletonweed and Scotch thistle occurred in this polygon, and the area appeared to have a heavy grazing history. A gravel pit, communications tower, and extensive dumping were other local disturbances. Badger activity was also widespread. The area contained hilly topography with sandy to occasionally clayey soils.

Slickspots - rare to patchy. Slickspots averaged 1-10 tracks/slickspot, and livestock trampling 1-10% of the slickspot surface in most cases. Slickspot weed density averaged 10-25 plants/sq.ft.

Slickspot peppergrass - none.

Mud Springs Creek area – this survey area was located north of Interstate 84, approximately 10 miles northwest of Mountain Home, near Cleft, an old railroad stop. The area consisted of burned, mosaic burn, and unburned sagebrush habitat. Most of the areas searched were surrounded by private land.

Polygon 9 Vegetation - the majority of this polygon was burned habitat supporting a mix of crested wheatgrass, cheatgrass, and Sandberg's bluegrass. Tumbled mustard, and to a lesser extent, bur buttercup formed locally dense patches. Sagebrush was limited to scattered individuals or small clumps, except for a relatively large unburned area in the northwestern corner of section 11 having an *Artemisia tridentata*/*Bromus tectorum*-*Poa secunda* plant community.

Slickspots - common in the northeastern corner of section 10 and adjacent northwestern corner of section 11. Slickspots decreased dramatically further westward in section 10, and became patchy further southward in section 11. Slickspots averaged 1-10 livestock

tracks/slickspot, and livestock trampling 1-10% of the slickspot surface. Slickspot weed density averaged 10-25 plants/sq.ft.

Slickspot peppergrass - none.

Polygon 10 Vegetation - the majority of this polygon had a mosaic burn pattern, with more sagebrush in the southern portion, and more burn in the northern. Unburned segments supported an *Artemisia tridentata/Bromus tectorum-Poa secunda* ct., with much higher cheatgrass compared to Sandberg's bluegrass cover. Mosaic burn sagebrush patches contained increased amounts of weedy species. Burned areas were weedy with increased tumbled mustard, cheatgrass, and medusahead rye cover. Tumbled mustard and bur buttercup formed dense patches in places throughout the polygon.

Slickspots - common in the southern half of the polygon, but uncommon further northward, and eventually disappearing towards the northern edge of the polygon. Slickspots averaged 1-10 livestock tracks/slickspot, and livestock trampling 1-10% of the slickspot surface. Slickspot weed density averaged 10-25 plants/sq.ft.

Slickspot peppergrass - none.

Polygon 11 Vegetation - relatively recently burned area with minimal sagebrush survival. The weedy herbaceous vegetation was dominated by cheatgrass, medusahead rye, tumbled mustard, and clasping peppergrass, with intermixed crested wheatgrass and locally dense patches of bur buttercup. Sandberg's bluegrass and squirreltail (*Sitanion hystrix*) were widespread, but clearly subordinate.

Slickspots - common to patchy. Slickspots averaged 1-10 livestock tracks/slickspot, and livestock trampling 1-10% of the slickspot surface. Slickspot weed density averaged 10-25 plants/sq.ft.

Slickspot peppergrass - none.

Polygon 12 Vegetation - unburned sagebrush vegetation with an understory dominated by weedy herbaceous species, including cheatgrass, tumbled mustard, bur buttercup, and clasping peppergrass. Sandberg's bluegrass was widespread, but relatively uncommon, and Thurber's needlegrass occurred in scattered patches. The area appeared to be quite heavily grazed in the recent past.

Slickspots - patchy to locally common. Slickspots averaged 1-10 livestock tracks/slickspot, and livestock trampling 1-10% of the slickspot surface. Slickspot weed density averaged 10-25 plants/sq.ft.

Slickspot peppergrass - none.

Polygon 13 Vegetation - area burned and was seeded with crested wheatgrass. Cheatgrass, medusahead rye, and bur buttercup all occurred at high cover. Sandberg's bluegrass was widespread, but heavily grazed.

Slickspots - mostly patchy, occasionally locally common or rare. Slickspots averaged 1-10 livestock tracks/slickspot, although this range was higher in several places. Livestock trampling averaged 10-50% of the slickspot surface. Slickspot weed density averaged <10 plants/sq.ft., ranging to 10-25 plants/sq.ft. in some places.

Slickspot peppergrass - none.

Polygon 14 Vegetation - this polygon contains both burned and unburned habitat. An *Artemisia tridentata/Poa secunda* ct. with a notable weedy understory component dominated the unburned vegetation in section 6 north of Martha Avenue. A majority of the polygon was burned and seeded with crested wheatgrass. Weedy herbaceous

species dominated the vegetation, although Sandberg's bluegrass was also widespread. Portions of the polygon just south of Martha Avenue in the northern part of section 7 burned in a mosaic pattern. In this area, patches of sagebrush with a weedy understory were intermixed with weedy herbaceous vegetation dominated by cheatgrass and tumbled mustard. Large portions of the polygon area appeared to be heavily grazed. Badger disturbance was prevalent.

Slickspots - common to patchy in the unburned segment, but mostly patchy to rare in areas further south. Slickspots averaged 1-10 livestock tracks/slickspot, to more in places, and livestock trampling 10-50% of the slickspot surface, except in sagebrush areas where trampling averaged <10%. Slickspot weed density averaged <10 plants/sq.ft.

Slickspot peppergrass - none.

Polygon 15 Vegetation - burned and seeded with crested wheatgrass. Cheatgrass and medusahead rye were common in most areas. Sandberg's bluegrass, and to a lesser extent Great Basin wildrye were also widespread and common in places. Stones and small boulders were common on the surface.

Slickspots - patchy to rare distribution. Slickspots averaged 1-10 livestock tracks/slickspot, to more in places, and livestock trampling 10-50% of the slickspot surface. Slickspot weed density averaged <10 plants/sq.ft.

Slickspot peppergrass - none.

Glenns Ferry area – this survey area was located north and northwest of the town of Glenns Ferry. The inventory area extended westward from Little Canyon Creek to the Cold Springs Creek/Ryegrass Creek area. It extended north-south for approximately eight miles. This area contained the vast majority of sagebrush habitat we encountered during the course of this project.

Polygon 16 Vegetation - *Artemisia tridentata/Poa secunda* ct. with interseeded crested wheatgrass, trace cover of cheatgrass, and low native forb diversity and cover. Bur buttercup was widespread and common in places, as were badger and other digging disturbances.

Slickspots - common throughout most of polygon, although some areas with few if any microsites. Slickspots became rare near the private property fence line marking the eastern perimeter of the polygon. Slickspots were variable in size, including many large multi-lobed complexes. Slickspots averaged 1-10 livestock tracks/ slickspot, and livestock trampling 1-10% of the slickspot surface. Most slickspots had weed density averaging <10 plants/sq.ft., but some were more or less free of weeds.

Slickspot peppergrass - scattered throughout polygon; an addition to the previously known Bennett Road occurrence (008).

Polygon 17 Vegetation - *Artemisia tridentata/Bromus tectorum-Poa secunda* ct., with patches of rabbitbrush. Bur buttercup and clasping peppergrass were widespread, but native forb diversity and cover was minimal. The Sandberg's bluegrass was grazed to nubs.

Slickspots - absent from survey area.

Slickspot peppergrass - none.

Polygon 18 Vegetation - *Artemisia tridentata/Poa secunda* ct. with generally low cover of Sandberg's bluegrass and cheatgrass abundance varying from trace to moderate

levels, but less than 10% cover in most places. Native forbs were uncommon and usually with no more than trace coverage.

Slickspots - rare overall, consisting of widely scattered individual or clusters of two or three slickspots. Most slickspots were small in size and did not look quite "right" for slickspot peppergrass. Slickspots averaged 1-10 livestock tracks/slickspot, and livestock trampling <1% of the slickspot surface. Most slickspot had weed densities averaging <10 plants/sq.ft., but some were more or less weed-free.

Slickspot peppergrass - none.

Polygon 19 Vegetation - mix of *Artemisia tridentata/Poa secunda-Bromus tectorum* and *Artemisia tridentata/Bromus tectorum* cts. Native forbs were uncommon and usually with no more than trace coverage.

Slickspots - rare overall; absent from some portions of polygon, but with occasional local patches of 2-5 slickspots, especially along upper slopes of undulating topography. Slickspots averaged 1-10 livestock tracks/slickspot, and livestock trampling 1-10% of the slickspot surface. Most slickspot had weed densities averaging <10 plants/sq.ft., but some were more or less weed-free.

Slickspot peppergrass - none.

Polygon 20 Vegetation - burned and seeded in the past with high cover of bur buttercup beneath the crested wheatgrass in most places. Sandberg's bluegrass and squirreltail cover varied from trace to low, while for cheatgrass it varied from low to very high. A little sagebrush appeared to be re-establishing in places and *Artemisia tridentata/Bromus tectorum* ct. persisted in a couple of small unburned patches.

Slickspots - rare to uncommon, with widely scattered individual or small slickspot clusters. Slickspots averaged 1-10 livestock tracks/slickspot, to more in places, and livestock trampling 10-50% of the slickspot surface. Some slickspots had numerous livestock tracks and were nearly completely trampled. Slickspots weed density averaged <10 plants/sq.ft in most cases.

Slickspot peppergrass - none.

Polygon 21 Vegetation - burned and seeded in past with an *Agropyron cristatum-Poa secunda* ct. Cheatgrass tended to be spotty, but bur buttercup was widespread and often abundant. Sagebrush appeared to be re-establishing in a few places.

Slickspots - patchy distribution, locally common, but areas with sparse or no slickspots. Slickspots averaged 1-10 livestock tracks/slickspot, but was considerably higher in some cases. All slickspots showed some level of cattle trampling, which averaged 1-10% of the slickspot surface, but >50% was not rare, and in a few cases exceeded 90%. Weed density for most slickspots averaged <10 plants/sq.ft., but varied from no weeds to much higher densities.

Slickspot peppergrass - none.

Polygon 22 Vegetation - this polygon contained a mix of unburned, burned, mosaic burn, seeded, and unseeded vegetation. This mix included *Artemisia tridentata/Poa secunda*, *Artemisia tridentata/Agropyron cristatum-Poa secunda*, *Agropyron cristatum*, and annual grassland community types.

Slickspots - rare to patchy, generally widely scattered and grouped together. Slickspots tended to be more common closer to Bennett Road and in the southern part of the polygon. Slickspots averaged 1-10 livestock tracks/slickspot, and livestock trampling 1-10% of the slickspot surface. Slickspot weed density averaged <10 plants/sq.ft.

Slickspot peppergrass - none.

Polygon 23 Vegetation - *Artemisia tridentata/Poa secunda* ct. with trace to low cover by other native bunchgrasses such as squirreltail and Thurber's needlegrass, and a widespread and locally common cheatgrass component. This survey area was relatively forb-rich, and long-leaved phlox (*Phlox longifolia*) was especially common.

Slickspots - rare overall, with scattered clusters of a few small- to large-sized slickspots. Slickspots averaged 1-10 livestock tracks/slickspot, but many prints could not be definitely assigned to cattle. Livestock trampling averaged 1-10% of the slickspot surface. Slickspot weed density averaged <10 plants/sq.ft.

Slickspot peppergrass - none.

Polygon 24 Vegetation - *Artemisia tridentata/Bromus tectorum* ct. with nearly a complete carpet of associated bur buttercup in most places. Low cover of native bunchgrasses and low native forb diversity and cover.

Slickspots - patchy distribution. Slickspots averaged 1-10 livestock tracks/slickspot, although it was higher in places. Livestock trampling averaged 1-10%, but exceeded 50% in parts of section 11. Weed density averaged <10 plants/sq.ft. Some slickspots were nearly weed-free, but in a number of instances the slickspots were difficult to identify because they were so completely covered by weeds.

Slickspot peppergrass - none.

Polygon 25 Vegetation - *Artemisia tridentata/Poa secunda* ct. with interseeded crested wheatgrass and widespread bur buttercup. Cheatgrass was present in only trace amounts in most areas.

Slickspots - very common in some places, but patchy in others. Slickspots averaged 1-10 livestock tracks/slickspot, and livestock trampling <1% of the slickspot surface. Weed density averaged <10 plants/sq.ft. Overall, most slickspots appeared in good condition.

Slickspot peppergrass - scattered throughout polygon; an addition to the previously known Alkali Creek occurrence (026).

Polygon 26 Vegetation - *Artemisia tridentata/Bromus tectorum* ct. with varying amounts of Sandberg's bluegrass and plenty of bur buttercup.

Slickspots - common, with some large complexes close to Bennett Road, but decreasing in abundance further east, and absent near the rim overlooking Morrow Reservoir. Slickspots averaged 1-10 livestock tracks/slickspot, and livestock trampling 1-10% of the slickspot surface. Weed density averaged 10-25 plants/sq.ft.

Slickspot peppergrass - none.

Polygon 27 Vegetation - *Artemisia tridentata/Poa secunda* and *Artemisia tridentata/Poa secunda-Bromus tectorum* cts. Native bunchgrasses such as Thurber's needlegrass and needle-and-thread grass, as well as crested wheatgrass, occurred in places, but usually at low cover. Soils were sandy in some areas.

Slickspots - a patchy and sporadic distribution. The southern portion of the polygon had the highest concentration of slickspots, but they were rare or absent in some segments. Slickspots averaged 1-10 livestock tracks/slickspot, and livestock trampling 1-10% of the slickspot surface. Trampling was worse in some slickspots and approached nearly 50%. Weed density averaged <10 plants/sq.ft. in the slickspots.

Slickspot peppergrass - scattered throughout polygon; an addition to the previously known Glenns Ferry Northwest occurrence (058).

Polygon 28 Vegetation - *Artemisia tridentata*-*Chrysothamnus* spp/*Poa secunda*-*Bromus tectorum* ct. Long-leaved phlox and needle-and-thread grass were both fairly widespread. Sandy soils dominated the polygon area, often with a rocky basalt surface.
Slickspots - none observed.
Slickspot peppergrass - none.

Polygon 29 Vegetation - *Artemisia tridentata*-*Chrysothamnus* spp/*Poa secunda*-*Bromus tectorum* ct. with fairly widespread needle-and-thread grass. Sandy soils dominated the polygon area.
Slickspots - none observed.
Slickspot peppergrass - none.

Table 1. Size and legal descriptions for *Lepidium papilliferum* survey polygons.

Polygon #	Size (acres)	USGS 7.5' quadrangle	Legal description
New Plymouth			
1	685	New Plymouth; Parma SE	T6N R4W sec 4, 9, 10
2	235	New Plymouth	T6N R4W sec 3, 4
3	805	New Plymouth; Parma SE	T6N R4W sec 10, 11, 14, 15
4	145	New Plymouth	T6N R4W sec 2, 3
5	340	New Plymouth; Parma SE	T6N R4W sec 2, 3, 10, 11
6	170	New Plymouth	T6N R4W sec 2
7	365	New Plymouth; Parma SE	T6N R4W sec 1, 12
8	125	New Plymouth	T6N R4W sec 1; T7N R4W sec 36
Mud Springs Cr.			
9	390	Mayfield SE	T2S R5E sec 10, 11
10	330	Mayfield SE	T2S R5E sec 1, 2; T1S R4W sec 35
11	520	Mayfield SE	T2S R5E sec 12, 13, 14
12	90	Mayfield SE	T2S R5E sec 12, 13
13	380	Mayfield SE; Crater Rings	T2S R5E sec 13
14	455	Mayfield SE	T2S R6E sec 6, 7, 18
15	35	Mayfield SE; Crater Rings	T2S R5E sec 18
Glenns Ferry			
16	155	Hot Springs Creek Res.; Hammett	T5S R9E sec 7, 8
17	70	Hot Springs Creek Res.	T4S R9E sec 7
18	135	Hot Springs Creek Res.	T4S R9E sec 17, 18
19	225	Hot Springs Creek Res.	T4S R9E sec 19, 20
20	585	Hot Springs Creek Res.	T4S R9E sec 17, 18, 20
21	615	Morrow Reservoir	T4S R9E sec 23, 25, 26, 36
22	945	Morrow Reservoir	T4S R9E sec 26, 27, 35, 36
23	285	Morrow Reservoir	T4S R9E sec 25, 30, 31, 36
24	185	Morrow Reservoir	T5S R9E sec 1, 2, 11
25	400	Morrow Reservoir; Glenns Ferry	T5S R9E sec 10, 11, 14, 15
26	50	Morrow Reservoir; Glenns Ferry	T5S R9E sec 11
27	360	Glenns Ferry	T5S R9E sec 13, 14, 24
28	25	Morrow Reservoir	T5S R9E sec 12
29	40	Morrow Reservoir; Glenns Ferry	T5S R9E sec 12

Table 2. Summary of fire history and polygon slickspot microsite disturbance information.

Polygon #	Fire history	Avg. # of livestock track or scat/slickspot	Avg. % of slickspot surface trampled by livestock	Avg. slickspot weed density (plants/sq.ft.)
New Plymouth				
1	burned	1-10	10-50	10-25
2	burned	>10	10-50	10-25
3	burned	>10	10-50	10-25
4	burned	>10	10-50	10-25
5	burned	1-10	1-10	<10
6	burned	1-10	1-10	10-25
7	burned	>10	10-50	10-25
8	burned	1-10	1-10	10-25
Mud Springs Cr.				
9	burn/unburn	1-10	1-10	10-25
10	mosaic bun	1-10	1-10	10-25
11	burn	1-10	1-10	10-25
12	unburned	1-10	1-10	10-25
13	burned	1-10	10-50	<10
14	burn/unburn	1-10	10-50	<10
15	burned	1-10	10-50	<10
Glenns Ferry				
16	unburned	1-10	1-10	<10
17	unburned	no slickspots	no slickspots	no slickspots
18	unburned	1-10	<1	<10
19	unburned	1-10	1-10	<10
20	burned	1-10	1-10	<10
21	burned	1-10	1-10	<10
22	burn/unburn	1-10	1-10	<10
23	unburned	1-10	1-10	<10
24	unburned	1-10	1-10	<10
25	unburned	1-10	<1	<10
26	unburned	1-10	1-10	10-25
27	unburned	1-10	1-10	<10
28	unburned	no slickspots	no slickspots	no slickspots
29	unburned	no slickspots	no slickspots	no slickspots

DISCUSSION

The degree of annual slickspot peppergrass germination and survival seems to be related to seasonal precipitation patterns (Meyer et al. 2002). Timing, as well as total precipitation, are both likely important determinants for annual cohort survival rates. Precipitation totals for 2002 were below normal for the January through June time period at stations in Parma, Mountain Home, and Glenns Ferry (Western Regional Climate Center 2002). Table 3 summarizes precipitation totals for these weather stations, the closest to the three surveys areas included in our 2002 field inventory. Precipitation for the three survey areas may have been different from nearby weather stations due to the localized and hit-and-miss nature of many storms in southwestern Idaho. Regardless, it

is probably safe to say that total precipitation for this six-month period was below average at each of the three survey areas.

Based on observations by ourselves and others, it seemed to be a “good” year for slickspot peppergrass in the Glenns Ferry area. Most of the flowering plants we observed were relatively small or average in size and assumed to be annuals. It was also a “good” year to observe slickspot peppergrass in the New Plymouth area. The majority of reproductive plants were relatively large and assumed to be the biennial life form. Only a handful of diminutive plants were found during a pre-survey reconnaissance trip to known slickspot peppergrass occurrences near Ditto Creek, just west of the Mud Springs Creek survey area. This suggested it may have been a “poor” year to look for slickspot peppergrass in the Mud Springs Creek area. It would be worthwhile to revisit selected portions of the Mud Springs Creek survey area in the future to validate or refute the absence of slickspot peppergrass.

In some ways it seemed remarkable that we found slickspot peppergrass within the New Plymouth survey area in light of the prevailing habitat conditions. Most of the landscape was degraded by wildfire, weed invasion, and high levels of trampling and other cattle-related disturbances. Nearly all slickspot microsites at the South of New Plymouth/I-84 (068) and East of Ashlock Gulch (069) occurrences were highly disturbed from cattle trampling and/or badger activity. The ability of slickspot peppergrass to persist under these conditions points to a degree of resiliency by both the plant and its slickspot microsite habitat, at least in some areas.

The New Plymouth area represents the known western edge of slickspot peppergrass’s range. The area is a mix of private and BLM ownership with livestock grazing being the primary land use. Much of the landscape has burned over the years and is now dominated by weedy herbaceous vegetation. Although soils are sandy over large portions of the area, slickspot microsites do occur in places and can even be locally common along some ridge complexes. Additional surveys in the New Plymouth area are recommended to more fully identify the abundance and distribution of slickspot peppergrass in the western portion of its range. In addition, the new occurrences discovered in 2002 are good candidates for monitoring, especially in light of livestock management activities in the area.

The Glenns Ferry area apparently represents the northeastern edge of the range of slickspot peppergrass. Some of the largest known occurrences for this species are found in the area. These occurrences occupy some of the largest sagebrush stands left north of the Snake River in southwestern Idaho. Although the native bunchgrass and forb components of these stands tend to be depauperate, they are still relatively structurally complex and have important conservation value. Management priorities, actions, and monitoring to protect these sagebrush stands would benefit the regional conservation of slickspot peppergrass.

Table 3. Precipitation totals for selected weather stations in southwestern Idaho.

Month	Parma		Mountain Home		Glenns Ferry	
	2002	Average	2002	Average	2002	Average
January	0.55	1.32	0.27	1.34	0.95	1.46
February	0.24	0.94	0.02	0.87	0.21	0.99
March	0.62	0.96	0.71	1.06	0.97	0.88
April	0.88	0.88	0.95	0.83	0.45	0.68
May	0.09	0.88	0.03	0.87	0.07	0.82
June	0.05	0.83	0.24	0.74	0.00	0.69
Total	2.43	5.94	2.22	5.71	2.65	5.52
% of avg.	41%		39%		48%	

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- Western Regional Climate Center. 2002. Western Regional Climate Center web page available at <http://www.wrcc.dri.edu>.

Appendix 1

Map locations for *Lepidium papilliferum* survey area polygons.

Appendix 2.

Element Occurrence Records for new and updated *Lepidium papilliferum* occurrences.

SLICK SPOT PEPPERGRASS

Occurrence Number: 008

Survey Site Name: BENNETT ROAD

County: Elmore

USGS quadrangle: HAMMETT; HOT SPRINGS CREEK RES.

Latitude: 430044N Longitude: 1152541W

TOWNRANGE:	SECTION:	MERIDIAN:	TRSNOTE:
005S009E	19	BO	NW4NE4
005S008E	13	BO	SE4SE4SE4
005S009E	06,07	BO	
004S009E	31	BO	S2
005S008E	01	BO	SE4NE4
005S009E	05	BO	SW4SW4
005S009E	08	BO	SW4
005S009E	18	BO	NW4NE4, NE4SW4
005S008E	24	BO	NE4NE4

Location:

From Hammett take Bennett Road north. The occurrence extends from about 3 to 6.5 miles NE of Hammett on both sides of the road.

First Observed: 1940-06-08

Last Observed: 2002-06-03

EORANK: B

EORANK Comments:

Changed from C to B in 2002 based on expanded extent of occurrence. Originally given an "A rank" in 1994. One of the most extensive populations known. Site quality ranges from good to poor. The occurrence is comprised of areas with intact sagebrush-steppe habitat (mainly east of Bennett Road), and former habitat that has burned, been reseeded, and is now dominated by weedy species (mainly west of road). Many plants observed in both burned and unburned areas some years.

Population Data:

1940: Scattered distribution. 1980: 10 or more small groups of plants. 1993: Ca 100 flowering plants seen in three playas along a 2-mile stretch east of the road. The area was not thoroughly surveyed and more plants likely exist. Observation by Bob Moseley, Idaho CDC. 1994: Tens of thousands of genets in flower. Ca 90% of the population consists of mature plants, 10% immature. Population vigor assessed as good. Population extends outside of area surveyed. Observations by Joe Duft, Boise, on 5/94 and Julie Kaltenecker and John Doremus, Boise District BLM, on 2/94. 1997: Plants observed in low numbers on scattered slickspots in burned and unburned areas during a cursory visit by Michael Mancuso, Idaho CDC. 1998: Several thousand genets observed, with more plants in unburned than burned areas. Observations by Michael Mancuso and Chris Murphy, Idaho CDC, on 6/12. 2000: Estimated 1537-1567 individuals, 70% vegetative, 10% flowering, 20% in fruit occurring over one square mile. Percent of slick

spots occupied = 1-10%. Thorough survey of a portion of the occurrence by Kendra Moseley on 6/9. 2002: Surveys expanded known extent of occurrence. More than 2500 plants observed; ca 70% rosettes, 30% flowering. Slickspot size varied, many large multi-lobed, others smaller in size. Quite a few plants occurred near, but outside the slickspots. *Lepidium* abundance varied from < 5 to over 200 plants per slickspot; the majority having between 25-100 plants. Most plants seemed short-statured. Most rosettes ca 2 cm in diameter but relatively large rosettes not uncommon (ca 4 cm). Thorough survey within portion of occurrence (sections 7, 8) by IDCDC staff.

Habitat Description:

Flat to gently rolling plain. Sandy loess to clayey soils over volcanics. 1998: east of Bennett Road is largely sagebrush-steppe habitat that has been interplanted with *Agropyron cristatum*. Weeds have a relatively low density. West of the road is former sagebrush-steppe habitat that has burned. It was reseeded, probably in the 1980's. This area is now dominated by *Agropyron cristatum* and weedy annuals such as *Sisymbrium altissimum*, *Ranunculus testiculatus*, and some *Bromus tectorum*, *Lepidium perfoliatum*, and *Epilobium paniculatum*. Widely scattered *Artemisia tridentata wyomingensis* occurs throughout the burn area. Slickspots are fairly common. Many disturbed from one degree or another.

Minimum Elevation: 3050 feet Maximum Elevation: 3160 feet Size: 900 AC

Land Owner/Manager:

LOWER SNAKE RIVER DISTRICT
FOUR RIVERS FIELD OFFICE
SNAKE RIVER BIRDS OF PREY NATIONAL CONSERVATION AREA

Ownership Comments:

Lower Snake River District BLM, Four Rivers FO, and private land.

Comments:

2000: BLM recorded GPS coordinates and assessed the site quality as poor. 2002: GPS Coordinates on file with IDCDC.

Protection Comments:

Portion of occurrence west of Bennett Road has burned and then was seeded to crested wheatgrass. Wildfire remains a serious threat to entire occurrence. Site appears to be grazed at moderate levels by livestock, including horses. 2000: Light to moderate grazing. Less than 50% of the slickspots were trampled by livestock. Average density of annual weeds = 10-25/sq. ft. 2002: Light to moderate grazing. On average, less than 10% of the slickspot surfaces appeared trampled, with 1-10 tracks/scat per slickspot. Exotic annuals were present on most slickspots with the average density being < 10 plants/sq.ft.

Management Comments:

This occurrence is part of a rangewide monitoring program for *Lepidium papilliferum*. Monitoring is based on a Habitat Integrity Index developed for this species and its habitat. Baseline sampling was conducted in 1998. HII monitoring was also conducted in 1999, 2000 and 2001.

Specimens: E. H. Keller s.n. (IDS) - determined by R. Rollins; Grimes et al. 1611 (CIC).

SLICK SPOT PEPPERGRASS

Occurrence Number: 026

Survey Site Name: ALKALI CREEK

County: Elmore

USGS quadrangle: HAMMETT; GLENN'S FERRY; MORROW RESERVOIR;
HOT SPRINGS CREEK RES.

Latitude: 425947N Longitude: 1152150W

TOWNRANGE:	SECTION:	MERIDIAN:	TRSNOTE:
005S009E	14	BO	NW4
005S009E	16	BO	NE4NE4NE4
005S009E	10	BO	SE4, W2W2SW4
005S009E	08	BO	SE4NE4SE4
005S009E	09	BO	S2, SW4SW4NW4
005S009E	11	BO	SW4
005S009E	15	BO	N2, Center N2E2

Location:

About 5 air miles NW of Glenn's Ferry, from the vicinity of the junction of Bennett Road and Bennett Mountain Road, extending northwest for about 1.5 miles to west of Alkali Creek, and north to transmission lines.

First Observed: 2000-06-05

Last Observed: 2002-06-13

EORANK: A

EORANK Comments:

Portions of occurrence in relatively good ecological condition and little disturbance. Other portions are more weedy and/or disturbed.

Population Data:

2000 (BLM): Estimated 560 individuals, 65% vegetative, 35% in flower. Thorough search by BLM (Ann DeBolt, Heather Swartz, Valerie Geertson, and Kendra Moseley).
2000 (IDCDC): Estimated 2250-2350 individuals, mix of rosettes and flowering plants. Almost all plants very small in size. Slickspots widespread, locally common. Less than 10% of the slickspots in the survey area were occupied by *Lepidium*. In Section 10 there were 3 small groupings with 1 to about 10 slickspots each, and 1 to about 200 *Lepidium* plants/slickspot. In Section 9, northern grouping with 300-400 plants in 7 slickspots; the southern group with ca 200 plants in ca 10 slickspots. Thorough survey by Michael Mancuso IDCDC and Cleve Davis, BLM, on 6/5; and by Mancuso 6/6. 2002: Expansion of population due to additional surveys in Sections 10, 11, 14 and 15. An estimated 5,000+ genets observed; 35% rosettes, 65% flowering; >10% of the slickspots observed contained *Lepidium*; Thorough survey by Cyndi Coulter, Shelley Cooke, Ben Stewart, and Carol Prentice, IDCDC.

Habitat Description:

2000 (BLM): Vegetation dominated by *Artemisia tridentata wyomingensis*/*Poa secunda*. Some soil crusts. *Bromus tectorum* 10-20% cover. Other associated

species include *Sitanion hystrix*, *Chrysothamnus nauseosus*, *Lepidium perfoliatum*, *Allium acuminatum*, and *Epilobium paniculatum*. Many large slickspots in area. Survey area recently burned. 2000 (IDCDC): Vegetation is mostly *Artemisia tridentata wyomingensis*/*Poa secunda*; mixed with *A. t. tridentata* near Alkali Creek. *Bromus tectorum* rare in most places, but *Ranunculus testiculatus* common north of Bennett Road. Microbiotic crust cover is high in places. Section 10 is nearly all unburned habitat; Section 9 is unburned in southern parts, but mosaic burn or burned in northern part. 2002: *Artemisia tridentata wyomingensis*/*Poa secunda* with high cover of *Ranunculus testiculatus* in places. Low cover of *Bromus tectorum*. High crust cover. Area is unburned, but there is interseeded *Agropyron cristatum*. Gently sloping to flat aspect. Slickspots were patchy to common.

Minimum Elevation: 3100 feet Maximum Elevation: 3170 feet Size: 440 AC

Land Owner/Manager:
JARBIDGE FIELD OFFICE
FOUR RIVERS FIELD OFFICE

Ownership Comments:
Lower Snake River District BLM, Four Rivers FO.

Comments:
BLM recorded GPS readings and assessed the overall site quality as fair. 2002: GPS coordinates on file with IDCDC. Overall site quality assessed as good.

Protection Comments:
BLM: Light to moderate livestock use; <50% trampling of slickspot surfaces. The irrigation ditch that runs through occurrence is used as a watering site. Density of annual weeds on slickspots = 10-25 plants/sq ft. Mancuso (IDCDC): Blair Trail Reservoir ditch bisects part of the occurrence; also old (discontinued?) small stock pond located north of the Chevron Pumping Station grouping. Livestock use varies; much less south of Bennett Road. Livestock disturbance of slickspots also varies - most <1% trampled south of Bennett Road, but a few up to 50% trampled north of road. 2002: Low to moderate cattle use with 1-10 tracks/slickspot and <1% of the slickspot surfaces appearing trampled. Exotic species density on slickspots is < 10 plants/sq.ft. the most common being *Ranunculus testiculatus*, *Lepidium perfoliatum*, and Halogeton.

Management Comments:

Specimens:

SLICK SPOT PEPPERGRASS

Occurrence Number: 058

Survey Site Name: GLENN'S FERRY NORTHWEST

County: Elmore

USGS quadrangle: GLENN'S FERRY

Latitude: 425907N Longitude: 1152049W

TOWNRANGE:	SECTION:	MERIDIAN:	TRSNOTE:
005S009E	13	BO	SW4
005S009E	14	BO	S2N2, SE4, N2SW4
005S009E	23	BO	NE4NE4
005S009E	24	BO	N2NW4

Location:

Approximately 3 air miles NW of Glens Ferry and just E of Bennett Road. The population extends for about 1 mile east and SE of the junction of Bennett Road and Bennett Mountain Road with scattered plants throughout the area.

First Observed: 1994-05-02

Last Observed: 2002-06-12

EORANK: A

EORANK Comments:

Changed to from B to A in 2002 because occurrence found to be more extensive than previously known. Originally given a "D rank" in 1994. Relatively large population in an area of variable habitat quality. Located in an area of extensive sagebrush-steppe that is mostly BLM land.

Population Data:

1994: Ca 70 genets, 10% vegetative, 90% in flower. Population age class structure is 10% seedlings and 90% mature. Numerous natric sites, but only three contained *Lepidium*. Population observed on a cursory visit by Ann DeBolt, Boise District BLM. 1997: No plants observed during a cursory visit by Michael Mancuso, CDC. 1998: Slickspots uncommon in general area, but are locally common on gentle slopes where *Lepidium* occurs. At least 150 plants counted, but less than 10 slickspots contained *Lepidium*. Some nearby areas further surveyed, but only a fraction of the extensive sagebrush habitat in area. Observations by Michael Mancuso and Chris Murphy, Idaho CDC, on 5/2. 2000: Estimated 733-759 individuals, 524-550 vegetative, 132 in flower, 77 in fruit. Percent of slickspots in the surveyed area occupied by LEPA = 1-10%. Thorough survey by Ann DeBolt and Kendra Moseley, BLM. 2002: New searching led to a large expansion of occurrence. Thousands of genets observed throughout the area; ca 50% rosettes, 50% flowering. Slickspots very sporadic in the southern portion of occurrence where >10% of the slickspots had *Lepidium*. Some *Lepidium* occurred outside the slickspots. Fairly thorough survey by Cyndi Coulter, Shelley Cooke, Carol Prentice, and Ben Stewart, IDCDC.

Habitat Description:

Large expanse of *Artemisia tridentata wyomingensis*/*Poa secunda* community in gently rolling terrain. Habitat quality ranges from good to poor. *Bromus tectorum* is common and in some places abundant. Slickspots are sporadic, being common in some areas, but rare or absent from others. Bunchgrasses besides *Poa secunda* are relatively uncommon. Microbiotic crusts are well developed in places. Soil is silty loess. 2000: Slickspots abundant in area; some soil crusts. Associated species include *Artemisia tridentata wyomingensis*, *Chrysothamnus nauseosus*, *Bromus tectorum*, *Sitanion hystrix*, *Elymus cinereus*, *Poa secunda*, and *Stipa* spp. 2002: Slickspots mostly patchy but rare in some places.

Minimum Elevation: 2960 feet Maximum Elevation: 3030 feet Size: 325 AC

Land Owner/Manager:

LOWER SNAKE RIVER DISTRICT
FOUR RIVERS FIELD OFFICE

Ownership Comments:

Lower Snake River District BLM, Four Rivers FO.

Comments:

Unsurveyed potential habitat exists in the NE4 of section 23, the NW4 of section 24, and much of section 14. 2000: BLM recorded GPS readings and assessed the site quality as poor. 2002: GPS readings taken and are on file with the Idaho Conservation Data Center.

Protection Comments:

Grazing is the principle land use. Appeared to be pretty light during the spring of 1998. Fire is a threat. Gas pipeline and powerline pass close to population. The old Oregon Trail passes by the population, but this section of the trail probably does not see much visitation. 2000: Heavy livestock use of the area; 50% trampling of slickspots. Average density of annual weeds <10 plants/sq ft. 2002: No recent grazing in the area; average of 1-10 tracks/slickspot and < 10% of the slickspot surfaces appeared trampled. Exotics are present on the slickspots, mostly < 10 plants/sq.ft.; most common ones are *Ranunculus testiculatus*, *Bromus tectorum* and *Lepidium perfoliatum*.

Management Comments:

This occurrence is part of a rangewide monitoring program for *Lepidium papilliferum*. Monitoring is based on a Habitat Integrity Index developed for this species and its habitat. Baseline sampling was conducted in 1998. Additional sampling took place in 1999, 2000, and 2001.

Specimens:

SLICK SPOT PEPPERGRASS

Occurrence Number: 068

Survey Site Name: SOUTH OF NEW PLYMOUTH/I-84

County: Payette

USGS quadrangle: NEW PLYMOUTH

Latitude: 435303N Longitude: 1164807W

TOWNRANGE:	SECTION:	MERIDIAN:	TRSNOTE:
006N004W	03	BO	SW4

Location:

Take I-84 to the Black Canyon Exit, turn right and follow road past service station, to BLM office. Turn right and go through the gate and follow road around to the right that parallels the highway (road is not on the map). The main road curves and heads west soon after you see a small shed (well house) on the left. Do not head west on the main road. Instead, follow the 2-track that parallels the interstate.

First Observed: 2002-06-27

Last Observed: 2002-06-27

EORANK: C

EORANK Comments:

Large number of plants but habitat is highly degraded, dominated by exotic species, and heavily grazed.

Population Data:

2002: Two subpopulations consisting of several thousand genets; 30% rosettes, 40% flowering, 30% fruiting; population area ca 5 acres. *Lepidium papilliferum* abundant on ridgeline, but absent from slopes and bottoms. Some plants were growing out of badger holes and in and around cow pies. Population vigor assessed as good. Fairly thorough survey by Cyndi Coulter, Shelley Cooke, Luana McCauley, and Ben Stewart, IDCDC.

Habitat Description:

Sisymbrium altissimum/*Poa secunda* is the primary community type. The area has many exotic species including some *Bromus tectorum* and *Lepidium perfoliatum*. The area has burned in the past and is very hilly. Slickspots are concentrated on ridges.

Minimum Elevation: 2500 feet Maximum Elevation: 2600 feet Size: 5 AC

Land Owner/Manager:

LONG-BILLED CURLEW HABITAT ACEC

Ownership Comments:

Lower Snake River District BLM, Four Rivers FO.

Comments:

Overall site quality is poor. GPS coordinates on file with IDCDC.

Protection Comments:

Area is extremely weedy and heavily grazed. Most slickspots have > 10 livestock tracks/scat per slickspot, with > 50% of the surfaces being trampled. There appears to be cattle feeding stations located on a ridge ca 0.2 mile west of occurrence. Weed density is about 10-25 plants/sq. ft. in the slickspots.

Management Comments:

Specimens:

SLICK SPOT PEPPERGRASS

Occurrence Number: 069

Survey Site Name: EAST OF ASHLOCK GULCH

County: Payette

USGS quadrangle: PARMA SE; NEW PLYMOUTH

Latitude: 435301N Longitude: 1164948W

TOWNRANGE:	SECTION:	MERIDIAN:	TRSNOTE:
006N004W	09	BO	NW4NW4NE4, NE4NE4SW4
006N004W	04	BO	SW4SW4

Location:

Take I-84 to the Black Canyon Exit, turn right and follow road past service station, to BLM office. Turn right and go through the gate and follow road around to the right that parallels the highway (road is not on the map). The main road curves and heads west soon after you see a small shed (well house) on the left. Follow the main road for about 1.5 miles and take a two-track road (not on map) heading north up drainage. Part of the occurrence is located on separate ridges west of the road. To reach the other larger subpopulation, continue on this road and park before section line fence. From here continue northward over a low pass into a drainage which forks near the NW corner of Section 9; cross fence into Section 4, ascend hills to the NNW, follow a long ridgeline; plants occur in slickspots along the top of the ridge.

First Observed: 2002-06-25

Last Observed: 2002-06-25

EORANK: D

EORANK Comments:

Very small population within very degraded habitat dominated by exotic plant species.

Population Data:

2002: Three subpopulations, the northernmost with 3 occupied slickspots (one slickspot with six flowering plants, one with 3 flowering plants, and one with 12 flowering plants and ca 25 rosettes). The other two subpopulations had one occupied slickspot each (with one flowering plant each). 40 to 50 estimated genets for entire population. Population area totals about 1 acre. Plant vigor ranges from fair to good. Fairly thorough survey by Cyndi Coulter, Luana McCauley, Ben Stewart and Shelley Cooke, IDCDC.

Habitat Description:

Heavy grazing and fire events are readily apparent. Weedy annuals dominate, with a few native grasses mostly on or adjacent to ridgetops. *Lepidium* occurs on ridgelines in sandy soil. Weedy herbaceous community type. Associated species include *Sisymbrium altissimum*, *Poa secunda*, *Mentzelia albicaulis*, *Ambrosia acanthicarpa*, *Elymus cinereus*, *Sitanion hystrix*, *Agropyron cristatum* and *Bromus tectorum*. Many badger holes and ant hills in the area. Overall habitat is poor.

Minimum Elevation: 2500 feet Maximum Elevation: 2620 feet Size: 1 AC

Land Owner/Manager:
LOWER SNAKE RIVER DISTRICT
FOUR RIVERS FIELD OFFICE

Ownership Comments:
Lower Snake River District BLM, Four Rivers FO.

Comments:
Overall site quality is poor. GPS coordinates on file at IDCDC.

Protection Comments:
What appeared to be cattle feeding stations were located within 25m of the northern and southern subpopulations. A livestock water trough was located ca 0.3 miles S of the southern subpopulation. Heavy grazing occurs in general area. Habitat is degraded by the invasion of exotic/noxious weeds: *Ranunculus testiculatus*, *Chondrilla juncea*, *Centaurea diffusa*, *Bromus tectorum* and others. Slickspots averaged 1-10 livestock tracks/slickspot, and livestock trampling 10-50% of the slickspot surface. Weed density averaged 10-25 plants/sq.ft. in slickspots. Overall, site and landscape context is poor.

Management Comments:

Specimens:

SLICK SPOT PEPPERGRASS

Occurrence Number: 070

Survey Site Name: WEST OF GRAVEYARD GULCH

County: Payette

USGS quadrangle: NEW PLYMOUTH

Latitude: 435332N Longitude: 1164605W

TOWNRANGE:	SECTION:	MERIDIAN:	TRSNOTE:
006N004W	01	BO	SE4NW4NW4

Location:

Take I-84 W, to Black Canyon Exit, turn L and drive to intersection with Hwy. 30. Turn right, follow highway for ca 1.5 miles (you will pass the gravel pit road) to the canal road on right. Take this road and follow for about 0.5 mile to first big switchback heading back south (a drainage crosses the road here). Park near here and head due south for less than 1/4 mile. Occurrence located on ridge spur.

First Observed: 2002-06-28

Last Observed: 2002-06-28

EORANK: C

EORANK Comments:

Small population and immediate habitat relatively intact, but surrounding area is in very poor ecological condition.

Population Data:

2002: 100 estimated genets; 50% rosettes, 50% flowering or in seed. The size of the population area is 1+ acres. Plant vigor is good to fair. There is more potential habitat in the area that was not surveyed. Fairly thorough survey by Shelley Cooke, IDCDC.

Habitat Description:

Fairly intact sagebrush stand with native grass component. Low abundance of invasive species in immediate area, although a lot of the surrounding area is very weedy and heavily grazed. Slickspots in excellent condition with no cattle sign or invasives inside the slickspots. Area is rolling hills, plants found on ridge top; 0-5% slope; somewhat sandy soil, especially in bottom areas, but not quite as sandy on ridges. Community type is *Artemisia tridentata*/*Poa secunda*. Associated species include *Artemisia tridentata wyomingensis*, *Artemisia tridentata tridentata*, *Stipa comata*, *Poa secunda*, *Vulpia* sp., and *Sitanion hystrix*. Some exotics include minimal amounts of *Bromus tectorum*, *Sisymbrium altissimum*, and *Ranunculus testiculatus* encroaching from adjacent burned areas.

Minimum Elevation: 2520 feet Maximum Elevation: feet Size: 1 + AC

Land Owner/Manager:
LOWER SNAKE RIVER DISTRICT
FOUR RIVERS FIELD OFFICE
LONG-BILLED CURLEW HABITAT ACEC

Ownership Comments:
Lower Snake River District BLM, Four Rivers FO.

Comments:
Overall site quality within population is good, but surrounding area is poor. GPS coordinates on file with IDCDC.

Protection Comments:
Fire is a threat to the immediate area. Most of the area surrounding the occurrence seems to be burned with a high amount of invasives such as *Bromus tectorum*, *Sisymbrium altissimum*, and *Ranunculus testiculatus*. Only a few stands of sagebrush remain and this is one of them. Also, a lot of this area seems to be used as a dumping ground, with trash and garbage everywhere. Grazing could also be a threat as surrounding area seems to be highly impacted by livestock.

Management Comments:

Specimens:

Appendix 3.

Map locations for new *Lepidium papilliferum* occurrences in the New Plymouth area and updated occurrences in the Glens Ferry area.