

**FIELD INVESTIGATION FOR SLICKSPOT PEPPERGRASS (*LEPIDIUM PAPILLIFERUM*)
ON BLM LANDS IN SOUTHEASTERN ADA COUNTY, IDAHO**

by

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Challenge Cost-Share Project
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ABSTRACT

Slickspot peppergrass (*Lepidium papilliferum*) is an annual or biennial forb endemic to southwestern Idaho. Conservation concern for this species was highlighted in July 2002, when the U.S. Fish and Wildlife Service proposed it for listing as Endangered under the Endangered Species Act. In 2003, the Bureau of Land Management's (BLM) Lower Snake River District contracted the Idaho Department of Fish and Game Idaho Conservation Data Center to conduct a systematic field investigation for slickspot peppergrass in southeastern Ada County south of Boise. The field investigation was conducted to help fill in gaps concerning the species' abundance and extent on BLM land and assist resource managers with ongoing conservation efforts. Burned habitat supporting various stages of early- and mid-seral plant communities dominated the study area landscape. A total of approximately 3,880 acres were thoroughly searched during the field investigation. One new slickspot peppergrass occurrence comprised of seven subpopulations was discovered approximately five miles west of Indian Creek Reservoir. A total of approximately 4,100 plants were tallied at the new occurrence. The number of plants at each subpopulation ranged from <10 to approximately 1,800. Another occurrence located approximately two and one-half miles southwest of Indian Creek Reservoir and previously thought to be extirpated was found to be extant. This occurrence consisted of two occupied slickspot microsites, each with a single slickspot peppergrass plant.

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INTRODUCTION

Slickspot peppergrass (*Lepidium papilliferum*) is an annual or biennial forb endemic to southwestern Idaho. Rangewide, large segments of its original sagebrush-steppe habitat have been lost to agricultural and urban development, or converted to annual and seeded grassland vegetation as a result of wildfires. In addition, all of the regional sagebrush-steppe that remains is in degraded ecological condition; or vulnerable to future wildfires, weed invasion, and other threats. Serious conservation concern for slickspot peppergrass led to its addition to the federal Endangered Species Act Candidate list in 1999 (U.S. Fish and Wildlife Service 1999). It was subsequently proposed to be listed as Endangered in July, 2002 (U.S. Fish and Wildlife Service 2002).

Slickspot peppergrass is a priority conservation species for the Bureau of Land Management (BLM). Rangewide, the majority of known occurrences are located on lands administered by the BLM. Many areas containing additional unsurveyed habitat are also BLM land. The BLM has made a dedicated effort to conduct or sponsor field surveys in recent years to more fully document the distribution, abundance, and overall conservation status of slickspot peppergrass on lands they manage (e.g., Mancuso 2000; Mancuso et al. 2002; Popovitch 2001). Nonetheless, gaps remain in documenting whether or not slickspot peppergrass occurs in several geographic areas within its known range. To further conservation efforts on behalf of slickspot peppergrass, the BLM's Lower Snake River District and the Idaho Department of Fish and Game Idaho Conservation Data Center (IDCDC) entered into a Challenge Cost-share agreement in 2003, to conduct a systematic field investigation for this species on BLM property south of Boise.

STUDY AREA

The field investigation targeted a block of BLM land located north-northwest of Orchard, approximately 12 miles south of Boise, Idaho, in southeastern Ada County (Figure 1). This area was targeted for three reasons: (1) because potential slickspot peppergrass habitat was known or suspected to occur throughout much of the area; (2) because the area had never been systematically surveyed for slickspot peppergrass in the past; and (3) because slickspot peppergrass was known from a few miles to the south on the Orchard Training Area.

The study area extends over an area approximately six miles long, by seven miles wide, and covers roughly 31,000 acres (Appendix 1). The study area extends from the Kuna-Mora Road along its northern edge, southward to the Union Pacific railroad tracks between Owyhee and Orchard. BLM land near the old Owyhee townsite forms the western edge, and Interstate 84 the eastern boundary of the study area. Two useful reference points within the study area are Blacks Creek Reservoir and Indian Creek Reservoir. The former is located along the northern edge and the latter near the southeastern corner of the study area. Indian Creek is the main drainage within the study area. Elevation ranges from 3,000 feet along its western edge to 3,400 feet at its eastern end. Approximately 20,000 acres within the perimeter of the study area is BLM land. Ownership for the remaining acreage is Idaho Department of Lands and to a lesser extent private property. State and private lands were not searched as part of our field investigation.



Figure 1. Location of slickspot peppergrass field survey area.

METHODS

Roads, powerlines, and other map features or land ownership boundaries were used to delineate a series of survey routes within the study area to help facilitate the field investigation. We documented our survey routes as polygons on USGS 7.5' topographic map quadrangles (Appendix 2). These polygons formed the basis for our survey acreage estimates. Legal descriptions for each of our 11 survey polygons are listed in Table 1. Transect start and end points were typically conveniently located along roads, powerlines, fencelines, or drainage bottoms. Polygons were systematically searched by two-to-four field personnel walking parallel, equidistant transects, approximately 150 feet apart. Pre-determined azimuths provided a rough directional guide for each transect. It was common to deviate off the azimuth to search slickspot openings within one's field of view and to then return to the transect bearing. For this reason, transect routes usually had a meandering course.

We collected general information about the vegetation; as well as the distribution, abundance, and condition of slickspot microsites for each transect whether or not slickspot peppergrass was found in the area. Weed invasion and livestock disturbance levels in slickspot microsites were estimated using the following categories:

Slickspot weed density (average number of weed plants/slickspot): 0, <10 weed plants/sq. ft., 10-25 weed plants/sq.ft., >25 weed plants/sq.ft.

Slickspot livestock trampling (average percentage of the slickspot surface trampled by livestock): <1%, 1-10%, 11-50%, >50%.

This information was summarized on a field form for each survey polygon. If slickspot peppergrass was found, location, size, abundance, habitat, and threat information was also collected. Coordinates were obtained for new slickspot peppergrass locations using navigation grade GPS units. Coordinates were not taken for every occupied slickspot. In most cases, coordinates were taken at one occupied slickspot in an area supporting a series of slickspots having slickspot peppergrass. A standard IDCDC rare plant observation form was completed for slickspot peppergrass occurrences discovered or updated during our field inventory. We conducted our field investigation between May 21 and June 12, 2003.

Table 1. Slickspot peppergrass survey polygon information.

Polygon #	Size (acres)	USGS 7.5' quadrangle	Legal description
1	549	Owyhee	T1N R2E sec 1,12, 13
2	257	Owyhee	T1N R3E sec 7, 18
3	265	Owyhee	T1N R2E sec 13, 24
4	264	Indian Creek Reservoir	T1N R3E sec 11, 13, 14
5	443	Indian Creek Reservoir	T1N R3E sec 9, 10, 15
6	176	Indian Creek Reservoir	T1N R4E sec 19, 30
7	171	Indian Creek Reservoir	T1N R4E sec 19, 30
8	499	Indian Creek Reservoir; Orchard	T1N R4E sec 30, 31
9	379	Orchard	T1S R3E sec 1, 2
10	540	Indian Creek Reservoir; Orchard	T1N R3E sec 33 T1S R3E sec 4, 9
11	339	Owyhee; Christmas Mountain	T1N R 3E sec 29, 30, 31, 32

RESULTS

We surveyed a total of approximately 3,880 acres. Our 11 survey routes ranged in size from approximately 170 to 550 acres. Burned habitat supporting various early- or mid-seral plant communities dominated BLM property across the study area landscape. Unburned, remnant sagebrush (*Artemisia tridentata*) stands were fragmented and limited in extent on BLM property. We discovered one new slickspot peppergrass occurrence comprised of seven subpopulations in the southwestern portion of the study area. We also found slickspot peppergrass to be extant at an occurrence in the southeastern portion of the study area that was previously thought to be extirpated. The location of both occurrences has been mapped (Appendix 3). Location, population, habitat, threat, and other conservation information is contained in IDCDC Element Occurrence Records for each occurrence (Appendix 4). Information for each occurrence is summarized below.

Southwest of Indian Creek Reservoir (054)

This occurrence was originally based on a slickspot peppergrass collection made in 1980 from along the Pan-Alberta pipeline approximately four miles north-northwest of Orchard. The collection did not include any information regarding the extent or abundance of slickspot

peppergrass. Bob Moseley (former IDCDC biologist) failed to relocate the species during a 1994 visit to the original occurrence area. He reported many suitable appearing slickspot microsites, but that the area recently burned and was dominated by weedy vegetation. Based on these findings he declared the occurrence extirpated (Idaho Conservation Data Center 2003). Nearly a decade later, the occurrence area was revisited again during our field investigation.

We also failed to find slickspot peppergrass along or near the pipeline even though slickspot microsites are common in the general area. However, we did discover two slickspots with slickspot peppergrass located approximately 0.4 mile further south. The occupied slickspots are separated by approximately 0.1 mile, and each contained a single flowering slickspot peppergrass plant in 2003. Slickspots are common in this area too, but no additional slickspot peppergrass was found. Shrubs, mainly rabbitbrush (*Chrysothamnus* spp.), but also a few sagebrush are re-establishing in many portions of the previously burned occurrence landscape. The herbaceous vegetation surrounding the occurrence is strongly dominated by cheatgrass (*Bromus tectorum*) and both slickspot microsites had low cover (<10 weed plants/sq.ft.) of this weedy annual. Both occupied slickspots also had a few (1-10) old cattle prints. A livestock water pond (dry at time of survey) is located approximately 0.2 mile west of the occurrence. Badger and anthill activity were the only other ground disturbances noted in the area.

Southwest of Leone (072)

This newly discovered occurrence is comprised of seven subpopulations scattered over an area approximately two miles wide by two and one-half miles long. It is located about three miles west of the Southwest of Indian Creek occurrence. Two of the subpopulations consists of a single occupied slickspot. The others vary in size up to approximately 25 acres and combine to cover approximately 75 acres. However, slickspot peppergrass occupies only a small fraction of this aerial extent, much less than one acre overall. Many suitable-appearing slickspots in the occurrence area were unoccupied. A total of approximately 4,100 slickspot peppergrass plants was tallied for the seven subpopulations in 2003. The number of plants at each subpopulation ranged from <10 to approximately 1,800.

Most subpopulations occur in areas that have burned at least once during the past few decades. A rabbitbrush/Sandberg's bluegrass-cheatgrass (*Chrysothamnus* spp./*Poa secunda*-*Bromus tectorum*) c.t. dominates most of the occurrence area. Cheatgrass cover varies from very high to sparse. Islands of unburned sagebrush occur in several places. Slickspot peppergrass is almost completely restricted to areas that were not drill seeded with crested wheatgrass (*Agropyron cristatum*) during past post-fire rehabilitation efforts. Most occupied slickspots in all subpopulations had <10 weed plants/sq.ft. Most also had some level of cattle trampling disturbance, although the amount varied between and within subpopulations.

SURVEY POLYGON DESCRIPTIONS

General information concerning the location, vegetation, slickspot microsite abundance, and slickspot weed and cattle disturbance levels for each survey polygon is summarized below.

Polygon 1 - Located approximately one and one-half miles west and southwest of Blacks Creek Reservoir, extending south from the East Kuna-Mora Road. A gas pipeline forms the southern edge of the polygon.

Description – This area has gently rolling terrain dissected by wide, shallow draws and associated low ridges. Nearly all of the landscape has burned in the past.

Vegetation – Wide swaths of burned, annual grassland vegetation with dense cheatgrass cover dominates the survey polygon. Medusahead (*Taeniatherum caput-medusae*) is also common in

many places. Scattered shrub islands dominated by rabbitbrush with lesser amounts of sagebrush occur within this burn matrix. Sandberg's bluegrass is the most widespread and common native bunchgrass throughout the polygon. Squirreltail (*Sitanion hystrix*) is the only other bunchgrass occurring with any regularity. The forb component is strongly dominated by exotic annual species such as bur buttercup (*Ranunculus testiculatus*) and clasping peppergrass (*Lepidium perfoliatum*). Microbiotic crust cover varies from high to sparse.

Slickspots – Slickspots are widespread with a patchy distribution. They are locally common in some places, but sparse or absent in others and vary in size from small, individual microsites to multi-lobed complexes. Slickspots are more common in shrub islands compared to areas of annual grassland vegetation. Most had 10-25 weed plants/sq.ft.

Livestock – Cattle evidence was present in the polygon area in 2003, but little if any appeared to be from recent use. Slickspots averaged 1-10% of their surface area disturbed by cattle trampling.

Slickspot peppergrass – None.

Polygon 2 - Located approximately two miles south of Blacks Creek Reservoir, north of the gas pipeline and south of North Indian Creek. A two-track road forms the western edge of the survey polygon.

Description – This area has gently rolling terrain dissected by a few small draws and has burned in the past.

Vegetation – The vegetation is a mix of rabbitbrush/cheatgrass and Wyoming sagebrush-rabbitbrush/cheatgrass plant communities with inclusions of annual grassland. Variable amounts of Sandberg's bluegrass and little fescue (*Festuca microstachys*) co-occur in the understory. The Sandberg's bluegrass is often at least as abundant as cheatgrass in places where sagebrush is the dominant shrub. A relatively well developed microbiotic crust layer is present in some of the shrub-dominated areas.

Slickspots – Overall, slickspots are widespread, consisting of widely scattered individuals and clusters. They are locally common in some places, but sparse or absent in others and vary in size from small, individual microsites to multi-lobed complexes. Mammal digging activity is prevalent near many of the slickspots. Slickspot microsite weed density varies, but the majority have 10-25 weed plants/sq.ft.

Livestock – The majority (estimated 80%) of slickspots had 1-10% of their surface area disturbed by cattle trampling. The remaining slickspots were split between having higher levels of cattle disturbance and no trampling evidence.

Slickspot peppergrass – None.

Polygon 3 – Located between North Indian and Indian creeks, approximately two and one-half miles south of Blacks Creek Reservoir. A gas pipeline forms the northern edge of the polygon, which also has a powerline and associated access road running through it.

Description – This area has gently rolling or sloping terrain dissected by a few small draws and has burned in the past.

Vegetation – Most of the survey polygon burned in an older fire and supports a rabbitbrush/cheatgrass community type. Intermixed shrubless patches dominated by high cheatgrass and medusahead cover indicate portions of the polygon have burned again in more recent years. Sagebrush is spotty and rare overall. Variable amounts of Sandberg's bluegrass and little fescue occur in the rabbitbrush understory. Squirreltail is widespread, but never common. Other bunchgrasses such as Thurber's needlegrass (*Stipa thurberiana*) and needle-and-thread grass (*Stipa comata*) are rare. Native forbs are less common than tumbled mustard (*Sisymbrium altissimum*) and other weedy annual forbs. Trace cover of rush skeletonweed (*Chondrilla juncea*) occurs in the vicinity of the gas pipeline.

Slickspots – Overall, slickspots are a regular and common part of the landscape north of the powerline, but more spotty south of this point to Indian Creek. Rocky inclusions are usually devoid of slickspots. Slickspot microsites vary in size from small to large. Slickspot weed density varies but the majority have 10-25 weed plants/sq.ft. Weed density tends to be highest in areas lacking shrub cover. Clasping peppergrass is the main slickspot weed.

Livestock – Relatively light, recent cattle use was observed throughout most of the survey polygon. Most slickspots had 1-10% of their surface area disturbed by cattle trampling. This ranged up to approximately 30% in some slickspots.

Slickspot peppergrass – None.

Polygon 4 - Located approximately two miles south of the Blacks Creek exit on I-84, roughly four miles northwest of Indian Creek Reservoir.

Description – This area has rolling terrain with low hills and ridges and intervening flats. Nearly all of the polygon area has burned in the past.

Vegetation – Vegetation for most of the polygon is a mix of native bunchgrasses, cheatgrass, and medusahead. Rabbitbrush is widespread and forms locally dominant patches, and small remnant sagebrush patches occur in the vicinity of a low ridge in the southwestern part of the survey polygon. Sandberg's bluegrass is the most common and widespread native bunchgrass, but squirreltail is also relatively common in places. Bluebunch wheatgrass (*Agropyron spicatum*) occurs on hill positions and basin wild rye (*Elymus cinereus*) in the flats. Cheatgrass and medusahead are most abundant in the flats and swales. Native forbs, especially death camas (*Zigadenus venenosus*) and annual willowherb (*Epilobium brachycarpum*) are common in areas with bunchgrasses. Both rush skeletonweed and hoary whitetop (*Cardaria draba*) are present in some areas, but always with low cover.

Slickspots – Slickspots have a patchy distribution, but are locally common in places, especially along hill and ridge shoulders. Many slickspots have indistinct borders. Cheatgrass and clasping peppergrass are the most abundant slickspot weeds. Most slickspots have 10-25 weed plants/sq.ft.

Livestock – The level of cattle disturbance in the area appears to be related to the distance to a stock pond in North Indian Creek (section 14). Heavier cattle disturbance occurs closer to the water source. Cattle use appears to be minimal further west near the railroad tracks, where bunchgrass density is notably greater. Many slickspots had some level of livestock trampling disturbance. Cattle trampling averaged 11-50% of the slickspot surface in slickspots closest to the water source.

Slickspot peppergrass – None.

Polygon 5 – Located approximately three miles northwest of Indian Creek Reservoir, just west of the truck weigh station along Interstate 84.

Description – This area has low rolling hills with hummock and swale microtopography. The entire polygon area has burned in the past. The northern portion of the polygon has burned multiple times, including relatively recently.

Vegetation – An annual grassland community having a mix of cheatgrass, medusahead, and bulbous bluegrass (*Poa bulbosa*) dominates the northern portion of the polygon. Only patchy rabbitbrush and rarely a few sagebrush occur in this area. Southern and eastern sections of the polygon support a rabbitbrush/Sandberg's bluegrass community with much less cheatgrass. Native bunchgrasses such as squirreltail, Thurber's needlegrass, bluebunch wheatgrass, and basin wild rye are scattered, but locally common in places. Hooker's balsamorhiza (*Balsamorhiza hookeri*) is profuse in shallow, rocky soil areas. A few other native forbs such as death camas are also relatively common. Exotic annual forbs are widespread but tend to have low cover. Rush skeletonweed and hoary whitetop occur in several places at low cover.

Slickspots – Slickspots are common throughout most of the survey polygon. They typically occur in swales between low hummocks and vary in size and distinctness. The degree of slickspot weed density varies, but most have either 10-25 weed plants/sq.ft. or >25 weed plants/sq.ft. Clasping peppergrass and bur buttercup are the most common slickspot weeds. Hoary whitetop occurs in at least one slickspot.

Livestock – Cattle were present in the area during the time of the survey and all slickspots had some level of trampling disturbance. In many cases, cattle trampling impacted 11-50% or >50% of the slickspot surface.

Slickspot peppergrass – None.

Polygon 6 – Located just northwest of Indian Creek Reservoir and south of Interstate 84.

Description – This area has flat to gently sloping terrain with areas of mound and swale microtopography. It has burned in the past.

Vegetation – The vegetation in this polygon is characterized by cheatgrass-dominated annual grassland with scattered patches or larger islands of open to relatively dense rabbitbrush. The rabbitbrush patches have a cheatgrass-Sandberg's bluegrass understory in most places. Native bunchgrasses such as squirreltail and Thurber's needlegrass are spotty and never common. Clasping peppergrass is abundant throughout much of the polygon, while native forbs such as Hooker's balsamroot, common yarrow (*Achillea millefolium*), tapertip onion (*Allium acuminatum*), and curvepod milkvetch (*Astragalus curvicaupus*) have a patchy, scattered distribution. Rush skeletonweed is widely distributed but uncommon.

Slickspots – Most of the polygon has widely scattered individual or clusters of slickspot microsites. They are locally common in some limited areas but absent or very sparse from others. Clasping peppergrass is the primary slickspot weed, often with >25 weed plants/sq.ft.

Livestock – Old cowpies were observed throughout the polygon in approximately 30% of the slickspot microsites. Most of these had 1-10% of their surface area disturbed by trampling.

Slickspot peppergrass – None.

Polygon 7 – Located just west of Indian Creek Reservoir, north of Indian Creek.

Description – The area has gently rolling-to-sloping topography and portions have burned multiple times in the recent past.

Vegetation – Annual grassland vegetation dominated by high cheatgrass cover characterizes the entire landscape. Young sagebrush or rabbitbrush shrubs are rare and native bunchgrasses largely absent from the area. Clasping peppergrass along with storksbill (*Erodium cicutarium*), bur buttercup, and medusahead are common intermixed with the cheatgrass. Scattered rush skeleton weed plants occur at trace cover.

Slickspots – Slickspots are patchy and uncommon overall. Most of them are completely covered with clasping peppergrass (>25 weed plants/sq.ft.), making it very difficult to even see the slickspot surface.

Livestock – Current cattle use in the area appeared to be light, but the thick cheatgrass and weed cover made it difficult to see the ground surface and signs of cattle use. The majority of slickspots appeared to be free of cattle evidence, but some had 1-10% of their surface trampled.

Slickspot peppergrass – None. The likelihood is low slickspot peppergrass will be found in this area in the future.

Polygon 8 – Located just west and southwest of Indian Creek Reservoir, south of Indian Creek.

Description – This area has gentle rolling terrain with low hills, ridges, and swales dissected by small draws. The northern portion of the polygon has a mix of unburned, mosaic-burn, and older burn vegetation that gives way to a largely old burn landscape further south.

Vegetation – The older burn habitat is dominated by a rabbitbrush/Sandberg's bluegrass-cheatgrass plant community in most places. Seeded crested wheatgrass is also an important

understory species in some areas. The density of rabbitbrush varies, and in places more or less disappears to be replaced by annual grassland, or Sandberg's bluegrass-annual grassland vegetation. Unburned inclusions supported an open Wyoming sagebrush/Sandberg's bluegrass community with varying amounts of cheatgrass. Squirreltail is widespread throughout the polygon but occurs at low cover. Remnant patches of Thurber's needlegrass, bluebunch wheatgrass, and basin wild rye occur in several places. Patches of hoary whitetop are present in some of the swales, while rush skeletonweed is widespread but never abundant.

Slickspots – Slickspots are patchy and uncommon overall, with widely scattered individuals or clusters of a few slickspots often on hillside shoulders. Slickspots tend to be in good condition with distinct boundaries and <10 weed plants/sq.ft. in unburned areas. Slickspots in burned areas often have 10-25 weed plants/sq.ft. A relatively large number of slickspots in this survey area did not look "right" for slickspot peppergrass.

Livestock – Old cowpies were scattered throughout the survey polygon. South of the section 30/31 fenceline, only a few slickspot microsites had old cowpies or what appeared to be old cattle trampling divots. No recent livestock use was observed in this area. Cattle sign was more prevalent north of the fenceline where a minority of slickspots had 1-10% of their surface impacted by trampling.

Slickspot peppergrass – None.

Polygon 9 – Located a little over one mile southwest of Indian Creek Reservoir and four miles north of Orchard. A gas pipeline bisects the polygon northwest to southeast. One powerline cut through the western quarter of the polygon, and another runs along its northern perimeter.

Description – This area has flat to undulating or gently sloping terrain dissected by a series of small draws, and one larger intermittent drainage along the eastern edge of the polygon. The great majority of the polygon area has burned in the past.

Vegetation – Burned portions of the polygon support a mosaic of re-establishing shrub stands and annual grassland vegetation. Shrub patches contain a mix of rabbitbrush and some sagebrush with cheatgrass dominating the understory in most places. Sandberg's bluegrass is widespread but subordinate to cheatgrass in most areas. Other bunchgrasses tend to be spotty, although they may be locally common in places. One of these, a large wild rye (*Elymus siberica?*), may be a seeded cultivar and not the native basin wild rye. Bur buttercup is widespread and often abundant, while native forbs usually occur in only trace amounts. Rush skeletonweed is widespread but never common. The condition of the vegetation is more degraded in the very western portion of the survey polygon. The increase in habitat degradation may be associated with two stockponds (both dry in 2003) and powerline access trail/roads in the area.

Slickspots – Overall, slickspots are widespread, being common in some areas, but sparse or absent in others. Slickspots are most dense in the central and south-central portions of the polygon. Some relatively large slickspot complexes occur in these two areas. All slickspot microsites have some level of weed invasion. The majority have <10 weed plants/sq.ft., the others 10-25 weed plants/sq.ft. Claspings peppergrass and cheatgrass are the primary slickspot weeds in the area.

Livestock – Old cowpies were scattered throughout the survey polygon. The great majority of slickspots had at least a few old cattle prints or droppings. Most had 1-10% of their surface disturbed by cattle.

Slickspot peppergrass – In 1980, slickspot peppergrass was collected in the vicinity of the gas pipeline near the center of this polygon. No slickspot peppergrass was found along the pipeline in 2003, even though many suitable-appearing slickspots were observed in the area. However, two slickspots containing slickspot peppergrass were discovered approximately 0.4 mile south of the pipeline site. They comprise the extant portion of the Southwest of Indian Creek Reservoir (054) occurrence.

Polygon 10 – Located approximately six miles south-southeast of Blacks Creek Reservoir and south of Indian Creek. A powerline and associated access road pass through the polygon.

Description – This area has gently rolling or sloping terrain dissected by several small draws and a few low ridges. Most of the polygon area has burned in the past.

Vegetation – Most of the survey polygon north of Bisuka Point Ridge supports a rabbitbrush community having a variable mix of Sandberg's bluegrass, cheatgrass, and crested wheatgrass in the understory. Cheatgrass strongly dominates the understory of this recovering old burn in some places, but in other areas it is either co-dominant or subordinate to Sandberg's bluegrass. Crested wheatgrass is absent from some areas but widespread overall. Its occurrence in straight lines indicates past drill seeding in places. Patches of remnant unburned Wyoming sagebrush occur in the northern part of the polygon. These patches have a mix of Sandberg's bluegrass and cheatgrass in the understory. Native forbs are rare throughout the survey polygon. Annual grassland vegetation characterized by high cheatgrass cover dominates the landscape south from Bisuka Point Ridge. Only a few widely scattered rabbitbrush or sagebrush shrubs occur in this area. The soil becomes more sandy near the very southern part of the polygon with the presence of needle-and-thread grass. Microbiotic crust cover tends to be high in areas with minimal cheatgrass cover but sparse or absent in annual grassland areas.

Slickspots – Slickspots are widespread, locally common, and more or less a regular part of the landscape. Some slickspots have lines of weeds or Sandberg's bluegrass that appear related to past drill seeding efforts. In the northern part of the survey polygon, most slickspots have <10 weed plants/sq.ft., while many in the southern part have >25 weed plants/sq.ft. Slickspot microsites in the central part of the polygon typically have 10-25 weed plants/sq.ft. Claspings peppergrass is the primary slickspot weed.

Livestock – Cattle signs, some relatively recent, some obviously old, was present throughout the polygon. The northern portion of the survey polygon had a lower percentage of slickspots disturbed by cattle compared to further south. Most slickspots had 1-10% of their surface disturbed by cattle prints, although an estimated 20% of microsites had higher disturbance levels in the southern part of polygon.

Slickspot peppergrass – Three new subpopulations of slickspot peppergrass were discovered within the polygon. They comprise part of the Southwest of Leone (072) occurrence.

Polygon 11 – Located approximately five miles south of Blacks Creek Reservoir and south of Indian Creek. This area is about six miles west of Indian Creek Reservoir. The railroad tracks between Owyhee and Orchard run along the southern part of the polygon.

Description – This area has gently rolling terrain with long, low ridges and benches above dissected minor drainage bottoms. Much of the polygon area has burned in the past.

Vegetation – Most areas recovering from past wildfire events support rabbitbrush communities having a mix of Sandberg's bluegrass, cheatgrass, and crested wheatgrass in the understory. Cheatgrass strongly dominates the understory in many places, but in other areas was either co-dominant or subordinate to Sandberg's bluegrass. Other native bunchgrasses are widely dispersed and occasionally common in places. Native forbs are uncommon in most places, but weedy annuals such as bur buttercup and claspings peppergrass are widespread and locally abundant. Some sections of formerly burned habitat have few or no shrubs and contain annual grassland vegetation dominated by cheatgrass. Sagebrush dominates patches of unburned habitat. Evidence of crested wheatgrass drill seeding occurs over approximately 25% of the polygon area.

Slickspots – Slickspots are patchy but widespread and relatively common overall. They vary in size and include some large, multi-lobed complexes. The majority of slickspots occupied by slickspot peppergrass are positioned along low ridges and benches adjacent to the drainage bottoms. The majority of slickspot microsites have <10 weed plants/sq.ft.

Livestock – Recent cattle use within the polygon area appeared to be light to moderate. Several dikes in the area are used to hold water for livestock and have associated trails and loafing sites. The nearest watering point was located approximately 200 m from slickspot peppergrass. Slickspot peppergrass – Four new subpopulations of slickspot peppergrass were discovered within the polygon. They comprise part of the Southwest of Leone (072) occurrence.

DISCUSSION

The newly discovered slickspot peppergrass occurrence at Southwest of Leone (072) and updated occurrence at Southwest of Indian Creek Reservoir (054) are both located near the center of the species' known range on the western Snake River Plain. The two occurrences are located ca. two and one-half miles from one another, and between several previously documented occurrences in the general Orchard area. The Southwest of Leone occurrence is comprised of seven subpopulations. The southernmost of these is located a little more than one mile northeast of the one of the subpopulations (Emerald City Wash subpopulation) comprising the large Orchard Training Area (027) occurrence. It is also located ca. two and one-half miles east of the much smaller Northern Orchard Training Area (067) occurrence. Several additional occurrences within the Idaho National Guard's Orchard Training Area are found further south. Greater gaps in the distribution of slickspot peppergrass occur to the north. The Southwest of Leone occurrence is ca. seven miles southeast of the Pleasant Valley North (022) occurrence and ca. 11 miles south of the Boise Air Terminal (064) occurrence. To the east, the Simco Road (015) occurrence is located a little over five miles from the occurrence at Southwest of Indian Creek Reservoir.

As stated above, the southern subpopulation of the Southwest of Leone occurrence and the northern subpopulation of the Orchard Training Area occurrence are separated by only a little more than one mile. It would be worth surveying south of the railroad tracks and north of the Orchard Training Area boundary, between the two occurrences, to document whether slickspot peppergrass is distributed more continuously in the general area. Discoveries made in 2003 also suggests it may be useful to survey for slickspot peppergrass on State and private lands south and southwest of the Southwest of Indian Creek Reservoir occurrence. The large block of State land in the middle of our study area undoubtedly contains potential slickspot peppergrass habitat. Future field investigations will help determine if occurrences in the general area extend onto State land and are more extensive than found in 2003.

Most of the areas we surveyed in 2003 have slickspot microsites that appear superficially suitable for slickspot peppergrass. However, our survey results found slickspot peppergrass absent from most areas we searched. I believe 2003 was a favorable year to survey for slickspot peppergrass in the general Orchard area. The absence of this species from most of the places we searched was probably not an artifact of seasonal climatic conditions. Rather than resurvey areas we searched in 2003, I recommend future slickspot peppergrass field surveys in southeastern Ada County give priority to areas we did not visit.

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Appendix 1

Slickspot peppergrass survey area.

Appendix 2

Slickspot peppergrass survey route polygons.

Appendix 3

Map locations for slickspot peppergrass at the Southwest of Indian Creek and Southwest of Leone occurrences.

Appendix 4

Element Occurrence Records for slickspot peppergrass at the Southwest of Indian Creek and Southwest of Leone occurrences.