

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



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ABSTRACT

Slickspot peppergrass (*Lepidium papilliferum*) is an annual or biennial forb endemic to southwestern Idaho. It has been a high priority conservation concern for the Idaho Bureau of Land Management (BLM) for many years. In 2004, the Idaho Conservation Data Center conducted a systematic field investigation for slickspot peppergrass on BLM property in two areas south of Boise, Idaho. A total of approximately 1,370 ha (3,384 ac) were inventoried during the survey. We discovered four new slickspot peppergrass subpopulations. One of these subpopulations represents an extension to a previously documented slickspot peppergrass occurrence near Initial Point. It consisted of a single occupied slickspot with one slickspot peppergrass plant. The three other new subpopulations represent extensions to the previously known Southwest of Leone occurrence. Fewer than 100 slickspot peppergrass plants were observed at two of the new subpopulations, but the third supported nearly 1000 individuals. This report summarizes the results of our field investigation, including habitat and other descriptive information for each of our survey areas.

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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 converted to agricultural and urban development, or annual and seeded grassland vegetation as a result of wildfires. Remaining stands of its sagebrush-steppe habitat are fragmented, often in degraded ecological condition, and vulnerable to future wildfires, weed invasion, and other threats.

Slickspot peppergrass has been a high priority conservation concern for the Bureau of Land Management (BLM) for many years. Conservation concern for this species was highlighted in 2002, when the U.S. Fish and Wildlife Service (USFWS) proposed slickspot peppergrass be listed as Endangered under the Endangered Species Act (U.S. Fish and Wildlife Service 2002). Adoption of a collaborative Candidate Conservation Agreement (CCA) for slickspot peppergrass in 2004 (Candidate Conservation Agreement 2003) enabled the USFWS to remove slickspot peppergrass from the Proposed Endangered category. The Idaho BLM is one of the primary partners for the CCA, and most slickspot peppergrass populations outside the Boise Foothills portion of the species' range occur on BLM property.

Over the years, the BLM has made a dedicated effort to conduct or sponsor field surveys to more fully document the distribution, abundance, and overall conservation status of slickspot peppergrass on lands they manage (e.g., Mancuso 2000, Popovitch 2001, Mancuso et al. 2002, Mancuso 2003). Nonetheless, gaps remain in documenting whether or not slickspot peppergrass occurs in several geographic areas within its known range. One of the conservation measures identified in the 2004 CCA is for the BLM to continue to conduct slickspot peppergrass field surveys on lands they manage. To help meet this commitment, the Boise District BLM and the Idaho Department of Fish and Game's Idaho Conservation Data Center (IDCDC) entered into a Challenge Cost-share agreement in 2004, to conduct a systematic field investigation for slickspot peppergrass on BLM property south of Boise. This report outlines the results of our investigation.

STUDY AREA

The field investigation targeted blocks of BLM property located northwest of Orchard, approximately 12 miles south-southeast of Boise, and also south of Mora, approximately 13 miles south-southwest of Boise (Figure 1). Both areas are located in Ada County, approximately 10 air miles apart. The two areas had not been systematically surveyed in the past and were known or suspected to contain potential slickspot peppergrass habitat. In addition, these areas were targeted because of their location within a few miles of previously documented slickspot peppergrass occurrences. State and private lands occur adjacent to both survey areas, but were not searched as part of our field investigation. Potential slickspot peppergrass habitat does occur on these other lands.

METHODS

Roads, powerlines, and other map features or land ownership boundaries were used to delineate a series of survey routes within each target area to help facilitate the field investigation. We documented our survey routes as polygons on USGS 7.5' topographic map quadrangles (Appendix 1). These polygons formed the basis for our survey acreage estimates.

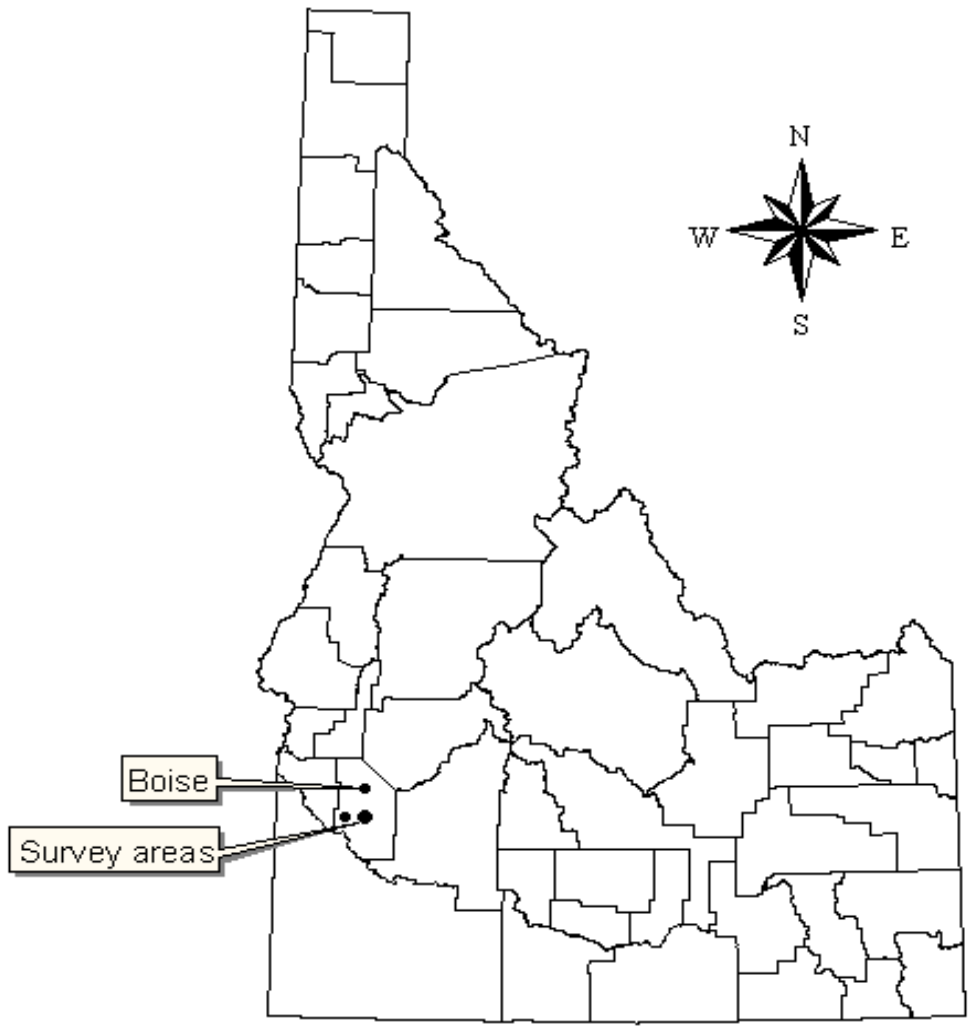


Figure 1. Location of slickspot peppergrass field survey areas in southwestern Idaho, 2004.

Legal descriptions for each of the 13 survey polygons are listed in Table 1. Transect start and end points were typically located along roads, powerlines, fencelines, or some other convenient landscape feature. Polygons were systematically searched by one to four field personnel walking parallel, roughly equidistant transects, either 25 m (82 ft) or 50 m (164 ft) apart. It is usually impractical to seek and check every slickspot microsite when surveying large tracts of land. Walking transects separated by a set distance has proven to be an efficient way to cover a lot of ground and sample many slickspots. Pre-determined azimuths provided a directional guide for each transect. It was common to deviate off the azimuth to search slickspot openings within a person's field of view and to then return to the transect bearing. For this reason transect routes had a meandering course.

We stopped at each slickspot encountered along our transects to look for slickspot peppergrass. GPS coordinates were obtained using a navigation grade unit to document the location of most

Table 1. Slickspot peppergrass survey polygon size and location information.

| Polygon # | Size (acres) | USGS 7.5' quadrangle | Legal description |
|------------------|---------------------|---------------------------------|--------------------------------------|
| 1 | 535 | Mora | T1N R1E sec 20, 29, 32 |
| 2 | 280 | Mora | T1N R1E sec 21, 28 |
| 3 | 331 | Mora | T1N R1E sec 22 |
| 4 | 426 | Owyhee | T1N R2E sec 24, 25 T1N R3E sec 30 |
| 5 | 47 | Owyhee, Christmas Mountain | T1N R2E sec 35 |
| 6 | 141 | Indian Creek Reservoir, Orchard | T1N R3E sec 33, 34 |
| 7 | 171 | Indian Creek Reservoir, Orchard | T1N R3E sec 34 |
| 8 | 298 | Indian Creek Reservoir; Orchard | T1N R3E sec 34 |
| 9 | 128 | Orchard | T1S R3E sec 2 |
| 10 | 377 | Orchard | T1S R3E sec 3, 4 |
| 11 | 420 | Orchard | T1S R 3E sec 5, 8 |
| 12 | 94 | Orchard | T1S R3E sec 8 |
| 13 | 137 | Orchard, Christmas Mountain | T1S R3E sec 8 |

slickspots occupied by slickspot peppergrass. Coordinates were not consistently recorded at occupied slickspots occurring within approximately 25 m (82 ft) of a slickspot that had already received a GPS reading. A standard IDCDC rare plant observation form was completed for each area where slickspot peppergrass was found. This form details location, size, abundance, habitat, threat, and other conservation information for the area supporting slickspot peppergrass.

Slickspot size, livestock prints, off-road vehicle (ORV) tracks, and weed density information was recorded at a subset of slickspot microsites we encountered for all survey polygons except one (polygon # 5). This was done whether or not the slickspot contained slickspot peppergrass plants. For most polygons this information was recorded at either every third or every fifth slickspot. The weed density information was not collected by certain personnel to conserve time. Information collected at the slickspots enabled us to objectively assess livestock use, ORV use, and weed density conditions in each polygon area.

* Slickspot size was estimated based on the length and width of the microsite and recorded as one of three size classes:
Small (<4 m²); Medium (4 – 20 m²); Large (>20 m²)

* Trampling disturbance was recorded by separately estimating the number of livestock prints and the number of animal tracks of uncertain origin (tracks not distinct enough to positively assign to livestock, or assigned to wildlife) in each slickspot. Tallies for the separate estimates were assigned to one of four abundance classes:
0; 1 –10; 11 – 25; >25

* The number of livestock prints exposing the sub-surface clay layer within each slickspot was also assigned to one of four abundance classes:
0; 1 –10; 11 – 25; >25

* ORV disturbance was recorded as present or absent within the slickspot. Tire tread marks in the slickspot were considered a positive indicator of ORV disturbance.

* Weed density was estimated as an average for the entire slickspot and assigned to one of four abundance classes:

0; <10 plants/ft²; 10-25 plants/ ft²; >25 plants/ ft²

RESULTS

We surveyed a total of approximately 1,370 ha (3,384 ac) between May 17 and July 9, 2004. Our 13 survey polygons ranged in size from approximately 19 ha (47 ac) to 217 ha (535 ac). A total of approximately 2,980 slickspot microsites were searched during the survey. Of these, 24 (0.8%) were occupied by slickspot peppergrass. Slickspot peppergrass, slickspot size, livestock print, ORV, and weed density information was recorded at 781 (approximately 27%) of the nearly 3,000 slickspots we looked at.

Burned habitat supporting various early- or mid-seral plant communities dominated the landscape in both the Mora and the northwest of Orchard survey areas. Unburned, remnant big sagebrush (*Artemisia tridentata*) stands were fragmented and limited in extent on BLM property, especially in the survey area south of Mora. We discovered a total of four new slickspot peppergrass subpopulations. The subpopulation discovered south of Mora represents an eastward extension of the previously documented Initial Point (Element Occurrence 19) occurrence. The three subpopulations located northwest of Orchard represent extensions of the Southwest of Leone (Element Occurrence 72) occurrence discovered during a survey in 2003 (Mancuso 2003). The mapped location of each new subpopulation is in Appendix 2. Maps showing the entire Initial Point and Southwest of Leone occurrences are included in Appendix 3. Location, population, habitat, threat, and other conservation information collected in 2004 was added to the IDCDC Element Occurrence Records for each occurrence. Copies of these records are in Appendix 4. Nomenclature for plant names used in this report follows Hitchcock and Cronquist (1973).

Lepidium papilliferum

A total of approximately 1,028 slickspot peppergrass, occupying 24 slickspot microsites, were found at the four subpopulations. The subpopulation discovered east of Initial Point had only one occupied slickspot. Two subpopulations representing extensions to the Southwest of Leone occurrence each had three occupied slickspots. The third new subpopulation at this occurrence had 17 occupied slickspots. Most plants (89%) observed during the survey were concentrated in this relatively large subpopulation. Approximately 52% of the plants tallied in 2004 were reproductive. Most reproductive individuals were <10 cm tall and appeared to be annuals. Non-reproductive basal rosettes varied in size from approximately 1 cm (0.4 in) to 5 cm (2 in) in diameter, with most individuals towards the smaller end of the this range. The number of slickspot peppergrass individuals/slickspot varied from 1 to >200, but most had <50 plants. A precise slickspot peppergrass tally was made at some of the 24 occupied slickspots, but at others an estimate of the number of plants was made using one of five abundance classes: <10, 10-50, 51-100, 101-500, >500. Where a precise count was lacking, the abundance class midpoint (5, 25, 75, or 300) was used to estimate the number of slickspot peppergrass plants in a given slickspot. Table 2 summarizes slickspot peppergrass abundance information tallied during the survey. Abundance information summarized for each of the 13 survey polygons is included in Appendix 5.

Table 2. Slickspot peppergrass abundance information. Percentages are in parentheses.

| Approximate # of slickspot peppergrass plants | | | # slickspot peppergrass plants/slickspot by abundance class | | | | |
|---|----------|----------|---|---------|--------|---------|------|
| Total | Repro. | Rosette | <10 | 10-50 | 51-100 | 101-500 | >500 |
| 1,028 | 535 (52) | 493 (48) | 7 (29) | 12 (50) | 3 (13) | 2 (8) | 0 |

Slickspot size

The majority (60%) of the 781 slickspots sampled during the survey were classified as medium size. Slickspot peppergrass was found to occur in microsites in all three size classes. Slickspots were widespread in all of our survey polygon areas, although they tended to display a patchy distribution, being locally common in some areas, but sparse or absent in others. Slickspots tended to be common in areas where slickspot peppergrass was found. Table 3 provides a summary of slickspot size information collected during our field survey. Appendix 5 includes slickspot size information for each of the individual survey polygons.

Table 3. Slickspot size information. Percentages are in parentheses. Slickspot size classes are explained in the text.

| # of slickspots | | | | # of slickspots with slickspot peppergrass | | | |
|-----------------|----------|----------|----------|--|--------|---------|--------|
| Total | Small | Medium | Large | Total | Small | Medium | Large |
| 781 | 147 (19) | 469 (60) | 164 (21) | 24 | 6 (25) | 12 (50) | 6 (25) |

Livestock prints

We did not observe slickspots with sheep or horse prints during the survey. Hoof prints that could definitely be assigned to cattle were present in the majority (56%) of all slickspots sampled. The percentage of slickspots with cattle prints was substantially higher in surveys areas located northwest of Orchard compared to south of Mora. The ten survey polygons northwest of Orchard had cattle prints in 84% of the slickspots sampled, compared to 27% in the three survey polygons located south of Mora. Prints that may have been caused by cattle, but lacked sufficient detail or clarity to be certain of their origin were also recorded in the majority (62%) of slickspots. It was not unusual to encounter slickspots with both cattle prints and prints of uncertain origin. Slightly less than half (45%) of all the slickspots sampled had cattle prints impressed deep enough to expose the underlying clay layer. Most of the affected slickspots had their clay layer exposed by 1 – 10 cattle prints.

Cattle prints were present in 12 of the 24 (50%) slickspots containing slickspot peppergrass, and exposed the clay layer in 10 of these slickspots. Two additional occupied slickspots had prints that could not definitely be assigned to cattle. With one exception, the number of cattle prints in occupied slickspots was in the 1 – 10 abundance class. Table 4 summarizes cattle hoof print information tallied during our survey. A summary of this information for each of the survey polygons is included in Appendix 5.

Off-road vehicles

No evidence of ORV use was observed in the areas we surveyed. Four (<1%) of the sampled slickspots that occurred adjacent to dirt roads did have tire tread marks. None of the slickspots

occupied by slickspot peppergrass had ORV-related disturbances. Furrow lines associated with past drill seeding activity was noted in one of the survey polygons south of Mora, and in at least four polygons located northwest of Orchard. Slickspot peppergrass did not occur in areas where old drill seeding disturbance was evident.

Table 4. Slickspot information for cattle prints and animal prints of uncertain origin. Percentages are in parentheses; N =781 for all slickspots sampled, and N = 24 for slickspots with slickspot peppergrass. Disturbance classes are explained in the text.

| | # of slickspots | Disturbance class | | | |
|--|-----------------|-------------------|-------------|------------|-----------|
| | | 0 | 1-10 | 11-25 | >25 |
| Slickspots with cattle prints | 435 (56) | 346 (44) | 328 (42) | 81 (10) | 26 (3) |
| Slickspots with cattle prints exposing clay layer | 349 (45) | 427 (55) | 283 (36) | 51 (7) | 15 (2) |
| Slickspots with prints of uncertain origin | 482 (62) | 299 (38) | 428 (55) | 46 (6) | 8 (1) |
| Slickspots with cattle prints and slickspot peppergrass | 12 (50) | 12 (50) | 11 (46) | 1 (4) | 0 |
| Slickspots with cattle prints exposing clay layer and slickspot peppergrass | 10 (42) | 14 (58) | 10 (42) | 0 | 0 |
| Slickspots with prints of uncertain origin and slickspot peppergrass | 10 (42) | 14 (58) | 9 (38) | 1 (4) | 0 |

Weeds

Weed density information was collected at 571 slickspots. Nearly all of them (99%) had weeds, including those occupied by slickspot peppergrass. Two-thirds (67%) of the slickspots had a density class of 1 – 10 weed plants/ft². Most (82%) slickspots with slickspot peppergrass also scored a density class of 1 – 10 weed plants/ft². Claspig peppergrass (*Lepidium perfoliatum*) was the most common slickspot weed in most cases. Tumbleweed (*Salsola kali*) was also common in places, while bur buttercup (*Ranunculus testiculatus*) and cheatgrass (*Bromus tectorum*) tended to occur in low density when present. Table 5 summarizes weed density data collected during our survey. Appendix 5 includes weed density information for the individual survey polygons.

Table 5. Slickspot weed density information. Percentages are in parentheses; N =571 slickspots sampled. Disturbance classes are explained in the text.

| | # of slickspots | Weed density class | | | |
|--|-----------------|--------------------|-------------|-------------|-----------|
| | | 0 | 1-10 | 11-25 | >25 |
| Slickspots with weeds | 568 (99) | 3 (1) | 382 (67) | 173 (30) | 13 (2) |
| Slickspots with weeds and slickspot peppergrass | 17 (100) | 0 | 14 (82) | 3 (18) | 0 |

SURVEY POLYGON DESCRIPTIONS

General location, disturbance, vegetation, slickspot distribution, and slickspot peppergrass abundance information is summarized below for each of our 13 survey polygon areas.

Polygon 1 – Located approximately four miles south of Mora, west of South Cloverdale Road. The area had flat to gently sloping topography with a few low, scattered rock outcrops.

Disturbances - Over 95% of the survey area burned in the past. Drill seeding lines were evident in portions of the southern half of the polygon. Holes and soil piles related to ground squirrel and badger activity were common throughout the polygon. Older prints and feces were more common than recent cattle sign.

Vegetation – Nearly all of the polygon supported post-fire, annual grassland vegetation dominated by cheatgrass or a cheatgrass-Sandberg's bluegrass (*Poa secunda*) mix. Weed species such as tumbleweed, tumbledustard (*Sisymbrium altissimum*), and bur buttercup were the most common forbs. Perennial native forbs were rare. Prostrate kochia (*Kochia prostrata*) was common, and crested wheatgrass (*Agropyron cristatum*) uncommon in the seeded areas. A relatively large big sagebrush stand occurred along the northern edge of the polygon. The southern half of the survey polygon contained only a few scattered small sagebrush islands <0.08 ha (<0.2 ac) in size. Sagebrush patches had their understory dominated by cheatgrass and/or bur buttercup in nearly all cases. Some also had tumbleweed skeletons piled up within them.

Slickspots – Scattered individual or small clusters of slickspots were widespread throughout the survey area. They were never abundant, but also never absent from a large area. The main slickspot weeds were clasping pepperweed, tumbleweed, and to a lesser extent bur buttercup. Prostrate kochia occurred in slickspots in seeded areas. Many of the slickspots appeared outwardly suitable for slickspot peppergrass, although microsite integrity was compromised by weeds and livestock trampling disturbances in some cases. Microbiotic crust cover was relatively high in many slickspots.

Slickspot peppergrass – One slickspot, with one slickspot peppergrass plant was found near the southern end of the survey area, and represented an eastward extension to the previously documented Initial Point (Element Occurrence 19) occurrence. Unsurveyed, similar-looking annual grassland-dominated habitat was observed in areas to the south and west.

Polygon 2 – Located approximately four miles south of Mora, immediately west of South Cloverdale Road. Flat to gently sloping topography covered the survey area.

Disturbances – The entire survey area burned in the past. Ground squirrel and badger activity were evident in most places. Old cattle feces was also seen throughout the polygon. The age and condition of tracks prevented us from positively identifying many of them, however, most were probably old cattle prints. Some illegal dumping has taken place along the dirt roads in the area.

Vegetation – The majority of the polygon was dominated by a Sandberg's bluegrass community type. Cover of this native bunchgrass averaged 15 – 30% in most places. Cheatgrass was sparse or absent except in scattered dense patches up to approximately 0.2 ha (0.5 acre) in size, but usually only half this large. Small tumbleweed plants were common and native perennial forbs nearly absent from the area. Patches of green rabbitbrush (*Chrysothamnus viscidiflorus*) were interspersed within the grassland vegetation in the northern part of the survey polygon, and to a lesser extent in the southern part. Dead shrubs were abundant in some of these rabbitbrush patches. Except for a few stray individuals, big sagebrush was absent. High microbiotic crust cover characterized much of the area, commonly exceeding 70% ground cover.

Slickspots – Overall, slickspots were widespread but spotty, with scattered individual, or more commonly, small clusters of several microsites in close proximity to one another. Several relatively large gaps without slickspots occurred within the polygon. Microbiotic crust cover was high in the majority of slickspots, except in the very southern part of the survey polygon. This area also has the highest density of slickspots. Tumbleweed and an unknown forb (represented by a small basal rosette) were the main slickspot weeds.

Slickspot peppergrass – None.

Polygon 3 – Located approximately four miles south of Mora, just east of South Cloverdale Road. Topography within the survey area varied from flat to gently sloping.

Disturbances – Most of survey area burned in the past. Cattle had obviously grazed the area in the past, but no evidence of recent use was observed. The landscape was pot-marked by ground squirrel and badger holes. Garbage dumping was observed in a few places.

Vegetation – The polygon was largely a mix of green rabbitbrush/Sandberg's bluegrass and green rabbitbrush/cheatgrass-Sandberg's bluegrass community types. Shrub cover varied throughout this mix, and an estimated 80% of the green rabbitbrush plants were dead. The cause of the die-off was not clear. Openings with few or no shrubs and dominated by Sandberg's bluegrass and/or cheatgrass were interspersed throughout the polygon. Native forbs were present in only trace amounts. Areas disturbed by ground squirrel and badger activity, and the eastern portion of the survey area, had high bur buttercup cover. Microbiotic crust cover was high in areas dominated by Sandberg's bluegrass, especially if shrub cover was minimal.

Slickspots – Slickspots were generally sparse in distribution, but varied from being locally common in a few places, to absent or rare in others. Many slickspots had a gravelly surface and appeared outwardly suitable for slickspot peppergrass. Some slickspots had high microbiotic crust cover, while others had little or no crust.

Slickspot peppergrass – None.

Polygon 4 - Located approximately two miles southeast of Owyhee, south of Indian Creek. The survey area had flat, to gently sloping, or undulating terrain, with a series of low ridges and intervening swales.

Disturbances – Most of survey area burned in the past. Cattle were present during the time of our survey and fresh sign was frequently observed. Ground squirrel and badger holes were also widespread.

Vegetation – The vegetation was dominated by a mosaic of annual grassland and green rabbitbrush/cheatgrass community types. In many places the majority of green rabbitbrush shrubs were dead. The rabbitbrush communities also often had an intermixed big sagebrush component. Several big sagebrush-dominated islands occurred in the eastern portion of the survey area. These tended to have an understory dominated by Sandberg's bluegrass with little cheatgrass. Bottlebrush squirreltail (*Sitanion hystrix*) was a widespread native bunchgrass, but had low abundance. Native forbs occurred in only trace amounts and were largely missing from annual grassland patches.

Slickspots – Overall, slickspots were a regular part of the survey area landscape. They varied from being locally common, to gaps with few or no microsites, especially in the eastern end of the survey area. Very few large slickspot complexes were observed.

Slickspot peppergrass – Two small subpopulations of slickspot peppergrass were discovered within the polygon.

Polygon 5 – Located approximately three miles south of Owyhee, just north of the Orchard Training Area boundary.

Disturbances – Livestock grazing is the primary land use in the area. Cattle were present in the general vicinity during the time of our survey. Ground squirrel and badger holes were fairly common in the survey area.

Vegetation – This survey area encompassed the northern edge of a large, unburned big sagebrush stand that extends to the south within the Orchard Training Area. It was characterized by a big sagebrush/cheatgrass-Sandberg's bluegrass plant community. The ratio of the two understory grasses varied within the survey area. Some portions were strongly dominated by cheatgrass, but other sections had more, or roughly equal amounts of Sandberg's bluegrass. Native forbs were sparse. Post-wildfire, early seral annual grassland vegetation extended north of the survey area for a long distance.

Slickspots – Slickspots displayed a spotty distribution in this survey area, with widely spaced individuals or clusters of several microsites in close proximity to each other. Slickspots tended to be weedy, most with a density of 11-25 weeds/ft². Clasping pepperweed was the most abundant slickspot weed, along with lesser amounts of cheatgrass and bur buttercup. Cattle prints were present in the majority of slickspots.

Slickspot peppergrass – None.

Polygon 6 – Located approximately five miles northwest of Orchard, south of Indian Creek. The survey area was characterized by gently rolling and sloping terrain dissected by several small, dry drainage bottoms.

Disturbances – A mosaic burn passed through the survey polygon area sometime in the past. Evidence of old drill seeding was observed in the southern part of the polygon. Cattle sign was observed in most areas.

Vegetation – Past fires in the area have given rise to a mosaic pattern of unburned, burned, and partially burned patches. The vegetation was dominated by either, or both, green rabbitbrush and big sagebrush communities, or patches of annual grassland. Canopy cover varied from very open to >20% within the shrub patches. The herbaceous understory usually supported a mix of cheatgrass and native bunchgrasses, predominately Sandberg's bluegrass, but also bottlebrush squirreltail, Thurber's needlegrass (*Stipa thurberiana*), bluebunch wheatgrass (*Agropyron spicatum*), and in the southern part of the polygon, seeded crested wheatgrass. The annual weedy grass, medusahead rye (*Elymus caput-medusae*) was locally common in places as well. Native forb abundance and diversity was low. Microbiotic crust cover varied from high to low within the survey polygon.

Slickspots – Slickspots were widespread, but spotty, and varied from being locally common to absent in certain areas. They typically occurred in scattered clusters of multiple microsites in close proximity to each other. Clasping pepperweed was the predominant weed.

Slickspot peppergrass – One new subpopulation representing a westward extension to the previously documented Southwest of Leone (Element Occurrence 72) occurrence was discovered within this survey polygon. This is part of the same subpopulation discovered in survey polygon #7. No slickspot peppergrass was found in sections of the polygon where old, faint drill seed lines were encountered.

Polygon 7 – Located approximately five miles northwest of Orchard, immediately east of polygon #6. The polygon area had flat to gently rolling and shallowly dissected topography.

Disturbances – A mosaic burn passed through the survey polygon area sometime in the past. Old drill seeding lines were observed in portions of the polygon. Cattle were present in the general area during the time of our survey.

Vegetation – The vegetation was similar to that found in adjacent polygon #6 except the vegetation mosaic included larger annual grassland patches, and patches of a mostly shrubless mixed bunchgrass community type. This mixed bunchgrass community type was comprised primarily of Sandberg's bluegrass and bottlebrush squirreltail, with sparse to roughly equal

amounts of cheatgrass. Medusahead rye was abundant in the annual grassland inclusion located between the powerline access road and Indian Creek, in the northern segment of the survey polygon.

Slickspots – Slickspots were widespread and a regular component of the polygon landscape, although a few limited areas had few if any microsites. Deep hoof prints in many slickspots were indicative of cattle being the area during a period of wet soil conditions. Several slickspots had >25% of their surface disturbed by hoof prints exposing the underlying clay layer.

Slickspot peppergrass – One new subpopulation representing an eastward extension of the previously documented Southwest of Leone (Element Occurrence 72) occurrence was discovered within this survey polygon. This is part of the same subpopulation discovered in survey polygon #6. No slickspot peppergrass was found in sections of the polygon containing old, faint drill seed lines.

Polygon 8 – Located approximately four miles northwest of Orchard, immediately east of polygon #7. Terrain in the area varied from flat, to gently sloping or rolling.

Disturbances – Most of the survey polygon area burned in the past and evidence of cattle grazing was widespread.

Vegetation – The vegetation consisted of a mosaic of green rabbitbrush, native bunchgrass, and a few inclusions of annual grassland community types. Shrub cover in the green rabbitbrush/Sandberg's bluegrass and green rabbitbrush/cheatgrass-Sandberg's bluegrass type was <10% in most places. Native bunchgrass patches were dominated by Sandberg's bluegrass, with varying amounts of squirreltail, and low cover of Thurber's needlegrass and basin wild rye (*Elymus cinereus*). Cheatgrass cover tended to be low, but was locally dense in places. Medusahead rye was spotty, but locally abundant in a few places. Needle-and-thread grass (*Stipa comata*) dominated a few sandy area inclusions. Big sagebrush was restricted to scattered individuals and a few small patches. Native forbs were sparse overall. Rush skeletonweed (*Chondrilla juncea*) was widespread, but no large, dense colonies of this noxious weed were observed.

Slickspots - Slickspots were common in most of the survey polygon, although a few limited areas had few if any microsites. Many of the slickspots were large in size and appeared outwardly suitable for slickspot peppergrass.

Slickspot peppergrass – None.

Polygon 9 – Located approximately four miles northwest of Orchard, immediately southeast of polygon #8. The topography varied from flat, to gently sloping and undulating.

Disturbances – Vegetation patterns indicated a past burn within the survey polygon. Cattle were present during the time of our survey, with hoof prints and feces observed throughout the area.

Vegetation – Vegetation within the survey polygon area was dominated by a green rabbitbrush/cheatgrass-Sandberg's bluegrass plant community. Green rabbitbrush density varied, with areas supporting only a few scattered shrubs usually having relatively high cheatgrass cover. Big sagebrush was restricted to a few widely dispersed individuals. Bottlebrush squirreltail, Thurber's needlegrass, and lesser amounts of basin wild rye were intermixed with the primary grass species. Claspings peppergrass and tumbled mustard were the most common forbs, with scattered individuals of rush skeletonweed also occurring in the area. Native forbs were sparse.

Slickspots – Slickspots were widely scattered, being locally common in some areas, but absent or sparse in others. Slickspots appeared to be most concentrated in low ridgetop and adjacent upper slope positions. The main slickspot weed was claspings peppergrass, along with lesser amounts of tumbleweed and cheatgrass. A large majority of slickspots had evidence of cattle disturbance. Many of the microsites had color and other characteristics that did not quite look right for slickspot peppergrass.

Slickspot peppergrass – None.

Polygon 10 – Located approximately four miles northwest of Orchard, immediately south of polygons #6, #7, and #8. Most of the area had flat or gently sloping topography.

Disturbances – Portions of the survey polygon area burned in the past, including sections displaying an older mosaic burn pattern. Old drill seeding lines were observed in segments of the polygon. Evidence of cattle disturbance was slightly more pronounced in the eastern half of the polygon.

Vegetation – The eastern segment of the polygon supported a green rabbitbrush community, while most of the western segment contained a big sagebrush-green rabbitbrush mix. Sandberg's bluegrass and crested wheatgrass dominated the understory in both sections. The crested wheatgrass was obviously drill-planted in many places, but may have been non-mechanically seeded in others. Cheatgrass cover was low in most of the polygon, but varied from locally dense patches, to being largely absent. Bottlebrush squirreltail was the only other bunchgrass that consistently co-occurred. Hooker's balsamroot (*Balsamorhiza hookeri*) was locally common, but other native forbs tended to be sparse. Rush skeletonweed was scattered throughout much of the area at low density. Microbiotic crust cover varied from high to sparse.

Slickspots – Slickspots were uncommon overall, usually occurring in patchily distributed clusters of fewer than ten microsites. Some areas had only widely scattered individual or no slickspots. The great majority of slickspots had evidence of cattle disturbance, with many of the hoof prints made under wet soil conditions. Old drill seeding furrow lines were evident in many slickspots, especially in the western portion of the polygon. Many of the large, multi-lobed slickspot complexes, or their remnants, looked outwardly suitable for slickspot peppergrass.

Slickspot peppergrass – None.

Polygon 11 – Located approximately five miles northwest of Orchard, near the northeastern boundary of the OTA. The area was flat or gently sloping.

Disturbances – A mosaic burn occurred in the polygon area sometime in the past. Evidence of drill-seeding was observed in approximately one-third of the polygon area. Cattle use was evident throughout most of the survey area.

Vegetation – The vegetation was a mosaic of shrub-dominated communities containing green rabbitbrush, big sagebrush, or a combination of the two species; annual grassland communities dominated by cheatgrass; and grassland communities having Sandberg's bluegrass with roughly equal or higher cover than cheatgrass. Shrub community understories were dominated by Sandberg's bluegrass and/or cheatgrass. Crested wheatgrass was common in some places, but establishment of this seeded species appeared to be spotty overall. Native forbs were uncommon in the survey area, as was rush skeletonweed.

Slickspots – Slickspot distribution was patchy within the survey area. Cattle prints were present in the large majority of slickspots, and covered >10% of the microsite surface in some cases.

Slickspot peppergrass – None.

Polygon 12 – Located approximately five miles northwest of Orchard, near the northeastern boundary of the OTA, immediately south of polygon #11. This area had gently undulating topography.

Disturbances – The survey area was mostly unburned, but had inclusions of mosaic burn or other disturbed habitat. Cattle use was evident the general area.

Vegetation – Big sagebrush/Sandberg's bluegrass vegetation covered most of the polygon area. Green rabbitbrush with varying amounts of big sagebrush and an understory dominated or co-dominated by cheatgrass characterized inclusions of old burn habitat. Bottlebrush squirreltail and Thurber's needlegrass were more common in areas with big sagebrush than in the old burn patches. A few small patches of annual grassland vegetation were also encountered within the polygon.

Slickspots – Slickspot were spotty, with widely scattered individuals or clusters of multiple microsites. Cattle prints were present in the majority of slickspots. Many of the slickspots looked outwardly suitable for slickspot peppergrass.

Slickspot peppergrass – None.

Polygon 13 – Located approximately five miles northwest of Orchard, partially abutting the northeastern boundary of the OTA, and immediately south of polygon #12. This area had gently undulating topography dissected by an ephemeral drainage.

Disturbances – A small, approximately 0.6 ha (1.5 ac) patch along the access road was the only burned habitat in the survey area. Cattle use was evident in the general area.

Vegetation – Big sagebrush/Sandberg's bluegrass vegetation covered most of the polygon area. Bottlebrush squirreltail, Thurber's needlegrass, and annual fescue (*Vulpia* spp.) were all widespread, but only the latter species was abundant. In some places the big sagebrush understory was dominated by cheatgrass, but this species was absent or rare in much of the polygon. Bur buttercup was the most common forb in the area.

Slickspots – Slickspots were spotty, with widely scattered individual or clusters of multiple slickspots. Cattle prints were present in the majority of slickspots. Most slickspots had only trace weed cover and some had high microbial crust cover. Many looked outwardly suitable for slickspot peppergrass.

Slickspot peppergrass – None.

DISCUSSION

The four new subpopulations of slickspot peppergrass discovered during our 2004 field survey all represent additions to previously known occurrences. The new subpopulation added to the Initial Point occurrence (Element Occurrence 19), south of Mora, is located slightly less than 1.6 km (1 mi) east of a previously documented subpopulation. The new subpopulation consisted of a single occupied slickspot with one reproductive slickspot peppergrass plant in 2004. It occurred in an area dominated by annual grassland vegetation.

The three subpopulations added to the Southwest of Leone occurrence (Element Occurrence 72), west of Indian Creek Reservoir, are all located within 1.6 km (1 mi) of previously documented slickspot peppergrass subpopulations. The furthest west new subpopulation had approximately 32 plants in three slickspots in an area dominated by annual grassland vegetation. Another new subpopulation had approximately 64 plants in three slickspots scattered over roughly 0.1 ha (0.3 ac) within a green rabbitbrush/cheatgrass plant community. The largest new subpopulation consisted of 17 occupied slickspots and nearly 1000 plants scattered over approximately 8 ha (20 ac) in 2004. This subpopulation is located east of previously documented subpopulations and occurs in an area having a mosaic of open to relatively dense shrub patches and intermixed annual grassland vegetation.

The degree of annual slickspot peppergrass germination and survival seems to be related to seasonal precipitation patterns (Meyer et al. 2002). Based on reports from slickspot peppergrass occurrences throughout the western Snake River Plain, 2004 was a favorable year to conduct surveys for this species. I feel no new, large slickspot peppergrass populations were overlooked in the areas we searched in 2004. I would rate most of the areas we searched in 2004 to be low priority for future re-survey for slickspot peppergrass. Survey polygons #8, 10, and 13 contained the highest concentration of slickspots that appeared outwardly suitable for slickspot peppergrass and would probably benefit the most from any future re-surveys.

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