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Fish and Wildlife Service
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JUL 0 6 2012

Memorandum

To: Manager, Four Rivers Field Office, Bureau of Land Management, Boise, Idaho

From: State Supervisor, Idaho Fish and Wildlife Office, Fish and Wildlife Service, Boise, Idaho

Ruth Hold for Brian Kelly

Subject: Mountain Home Subunit Allotment #00813—Elmore County, Idaho—Biological and Conference Opinion
In Reply Refer To: 01EIFW00-2012-F-0183 Internal Use: CONS-100b

Enclosed is the Fish and Wildlife Service's (Service) combined Biological and Conference Opinion (Opinion) for livestock grazing activities on the Bureau of Land Management's (Bureau) Mountain Home Subunit Allotment in Elmore County, Idaho. In a letter dated April 6, 2012, and received by the Service on April 9, the Bureau requested reinitiation of formal consultation on the determination, under section 7 of the Endangered Species Act of 1973, as amended (Act), that the proposed project is likely to adversely affect *Lepidium papilliferum* (slickspot peppergrass) and its proposed critical habitat.

The enclosed Opinion is based primarily on our review of the ongoing action, as described in your Assessment dated April 6, 2012, and the anticipated effects of the action on listed species and proposed critical habitat, and was prepared in accordance with section 7 of the Act. Our Opinion concludes that the proposed project will not jeopardize the survival and recovery of slickspot peppergrass, and will not destroy or adversely modify proposed critical habitat for this species. A complete record of this consultation is on file at this office.

The Bureau may ask the Service to confirm the conclusion of this Conference Opinion should proposed critical habitat for slickspot peppergrass become designated in the action area in the future (and prior to the conclusion of the 2-year term of the eleven individual livestock grazing permits associated with the ongoing action). This request must be in writing. If the Service reviews the ongoing action and finds that there have been no significant changes that could warrant a reanalysis of effects, the Service may confirm the Conference Opinion as our Biological Opinion, and no further section 7 consultation will be necessary.

Thank you for your continued interest in the conservation of threatened and endangered species. Please contact Barbara Chaney at (208) 378-5259 if you have questions concerning this Opinion.

Attachment

cc: Bureau, ISO, Boise (Rosentreter, Hoefer)
Bureau, Boise (Knapton, Steiger)
Ark Properties
Charles and Rebecca Lyons
Calvin Ireland
Estate of Roy Ireland, Steve and Jake Ireland
Preston Lord (R. Foster)
Preston Lord (C. Hunt)
John McGrew
Charles Olsen
Steve and Helen Percy
J.R. Simplot Company

BIOLOGICAL AND CONFERENCE OPINION
FOR THE
Mountain Home Subunit Allotment #00813

01EIFW00-2012-F-0183

FISH AND WILDLIFE SERVICE
IDAHO FISH AND WILDLIFE OFFICE
BOISE, IDAHO

Supervisor Russell R. Holder for Brian T. Kelly

Date JUL 0 6 2012

Table of Contents

List of Tables

List of Figures

1. BACKGROUND AND INFORMAL CONSULTATION

1.1 Introduction

The Fish and Wildlife Service (Service) has prepared this Biological and Conference Opinion (Opinion) of the effects of livestock grazing activities within the Mountain Home Subunit Allotment #00813 (Allotment) on *Lepidium papilliferum* (slickspot peppergrass) and its proposed critical habitat. In a letter dated April 6, 2012, and received on April 9, the Bureau of Land Management (Bureau) requested reinitiation of formal consultation with the Service under section 7 of the Endangered Species Act (Act) of 1973, as amended, for livestock grazing activities in the Allotment. This Allotment was originally evaluated in 2010 as an ongoing action (14420-2010-F-0025) in a batched consultation; it is being evaluated at this time as a single action. The Bureau determined that the action is likely to adversely affect slickspot peppergrass and proposed critical habitat for this species (USBLM 2012, pp. 37). As described in this Opinion, and based on the Biological Assessment (Assessment, Bureau 2012, entire) developed by the Bureau and other information, the Service has concluded that the action, as described, is not likely to jeopardize the continued existence of slickspot peppergrass, and will not destroy or adversely modify proposed critical habitat for the species.

1.2 Consultation History

The Service previously provided a biological opinion to the Bureau addressing the effects of ongoing livestock grazing in 27 allotments, including the Mountain Home Subunit Allotment, on slickspot peppergrass. While livestock grazing in the action area is ongoing, our January 2010 opinion did not address proposed critical habitat for the species because at the time none was identified in the action area. Subsequently, on May 10, 2011, we published a proposal to designate critical habitat for the species in the Federal Register, a portion of which included the Mountain Home Subunit Allotment. Under 50 CFR §402.16, action agencies are required to reinitiate consultation if newly designated critical habitat may be affected by their projects and if the agency maintains discretionary control of the project. The Bureau has included analyses on the potential effects of livestock grazing in the Allotment on proposed critical habitat in their Assessment in anticipation of final critical habitat designation in the future. The Bureau has properly requested reinitiation of consultation for this Allotment to address both changes in the environmental baseline associated with increased survey effort for the species and its habitat as well as to address proposed critical habitat.

The Service has maintained open communication with the Bureau regarding the ongoing livestock grazing in the Allotment since July of 2008. During that time, the Service provided technical assistance to the Bureau through the section 7 streamlining process with the Boise District Level 1 Team. The consultation history for this proposed permit renewal is as follows. Refer to the Bureau's Assessment (USBLM 2012, entire) and the original opinion (USFWS 2010, entire) for a more detailed consultation history prior to reinitiation.

November 30, 2009	The Service completed formal consultation for the Jarbidge Resource Management Plan (RMP), the Kuna Management Framework Plan (MFP), the Cascade RMP, and the Snake River Birds of Prey National Conservation Area RMP on the effects of land use plan programs on slickspot peppergrass (14420-2010-F-0019).
December 7, 2009	The Service's decision to list slickspot peppergrass as threatened became effective.
January 28, 2010	The Service provided the Bureau and its applicants with a final biological opinion for 27 ongoing livestock grazing actions that contain slickspot peppergrass element occurrences (EOs) (14420-2010-F-0025), including the Mountain Home Subunit Allotment.
March 4, 2010	The Bureau and the Service discussed strategies for completing section 7 consultation on effects of permit renewal for the Mountain Home Subunit Allotment on slickspot peppergrass at the March Boise District Level 1 Team meeting.
March 18, 2010	The Boise Level 1 Team requested input from the Boise District Level 2 Team regarding strategies for completing Section 7 consultation on the effects of permit renewal for the Mountain Home Subunit Allotment.
March 25, 2010	The Service's Boise District Level 2 Team representative provided input regarding the need for section 7 consultation on effects of permit renewal for the Mountain Home Subunit Allotment.
April 1, 2010	The Bureau entered into an agreement with one livestock grazing permittee to specify inventory and consultation timelines and conservation measures to implement if habitat is found within their area of use (Pasture 3).
June 21, 2010	The Mountain Home Subunit Allotment was removed from consideration within an initial biological assessment due to the necessity to consult on an Allotment basis rather than a pasture or permit basis. The Bureau determined that consultation on all permits within the Allotment would occur after field inventory is completed by the fall of 2010.
November 22, 2010	The Bureau initiated development of a biological assessment for the ongoing grazing authorizations within the Mountain Home Subunit Allotment with acquired inventory information.
December 13, 2010	The Level 1 Team discussed the action and information used in the development of the draft Assessment.
December 29, 2010	The Bureau delivered the draft Assessment for Level 1 Team review.
January 11, 2011	Level 1 Team review identified the need to execute consultation on the action as a reinitiation of the 2009 Ongoing Action Assessment due to the presence of additional occupied and slickspot peppergrass habitat

	within the action area. At the time, it was recommended that the Assessment include conference on effects of the ongoing action on proposed critical habitat, which was anticipated to be published by the Service in the Federal Register in late January/mid-February 2011.
May 10, 2011	Proposed critical habitat for slickspot peppergrass was published in the Federal Register.
December 29, 2011	The Bureau provided the Boise Level 1 Team with an updated draft Assessment for review and comment.
February 3, 2012	The Service provided the Bureau with review comments on the draft updated Assessment.
April 6, 2012	The Bureau submitted the final Assessment to the Service with a request to initiate formal consultation.
June 1, 2012	The Service provided the Bureau with the draft Opinion for review and comment, which the Bureau subsequently forwarded to applicants for review and comment.
June 22, 2012	The Bureau provided the Service with Bureau and applicant comments on the draft Opinion, which were incorporated into the final Opinion, as appropriate

2. BIOLOGICAL OPINION

2.1 Description of the Action

This section describes the Federal action, including any measures that may avoid, minimize, or mitigate adverse effects to listed species or critical habitat, and the extent of the geographic area affected by the action (i.e., the action area). The term "action" is defined in the implementing regulations for section 7 as "all activities or programs of any kind authorized, funded, or carried out, in whole or in part, by Federal agencies in the United States or upon the high seas." The term "action area" is defined in the regulations as "all areas to be affected directly or indirectly by the Federal action and not merely the immediate area involved in the action."

2.1.1 Action Area

The Mountain Home Subunit Allotment is located in T1S, R8E; T2S, R6E/7E/8E; T3S, 6E/7E/8E; and T4S, R7E/8E. The Allotment, which permits grazing by cattle only, is divided into 47 pastures and gathering paddocks (area ranging from 0.8 acres to over 16,900 acres), and consists of a mixture of public, state, and private lands totaling approximately 98,900 acres. State and private lands within the boundary of the Allotment are not included as part of the Federal action addressed within this Opinion, although activities on nonfederal lands are considered within the cumulative effects analyses of this Opinion.

There are 35,902 acres of Bureau-administered habitat for slickspot peppergrass within the Allotment. Of this acreage, 4,374 acres are classified as occupied habitat (defined as slickspot peppergrass EOs plus the surrounding 0.5 mile pollinator buffer, see Appendix A) within the Allotment (see Figure 1). The Allotment contains slickspot peppergrass Element Occurrences (EOs) 29, 51, and 62 within slickspot peppergrass Management Area (MA) 9. In 2010, Bureau surveys documented approximately 4,500 individual slickspots within the Allotment. The survey also resulted in the identification of approximately 1,434 additional occupied public land acres within the Edgemead Seeding (#7) and Olson (#16) Pastures through the location of previously undocumented, occupied slickspots. Soils located within Pastures 1 and 2 (Upper Immigrant and Bennett Creek Pastures) do not support slickspot habitat for the species.

2.1.2 Description of the Action

10-Year Permit and Annual Authorization, Terms and Conditions, and Management Guidelines

The Allotment is grazed in common by nine permittees with a total of eleven Bureau-issued livestock grazing permits. Each permittee has differing turnout and removal dates associated with their individual permits. The grazing permits allocate a total of 9,151 Animal Unit Months (AUMs) for spring and fall/winter use. Current grazing management consists of 5,899 AUMs of spring grazing, from April 1 to June 30, although most livestock are removed from the Allotment by June 15. In addition, a total of 3,252 fall AUMs are allocated on the Allotment from November 1 to December 31.

The action includes proposed actions associated with the renewal of seven livestock grazing permits that expire in 2014, with four livestock grazing permits representing ongoing livestock

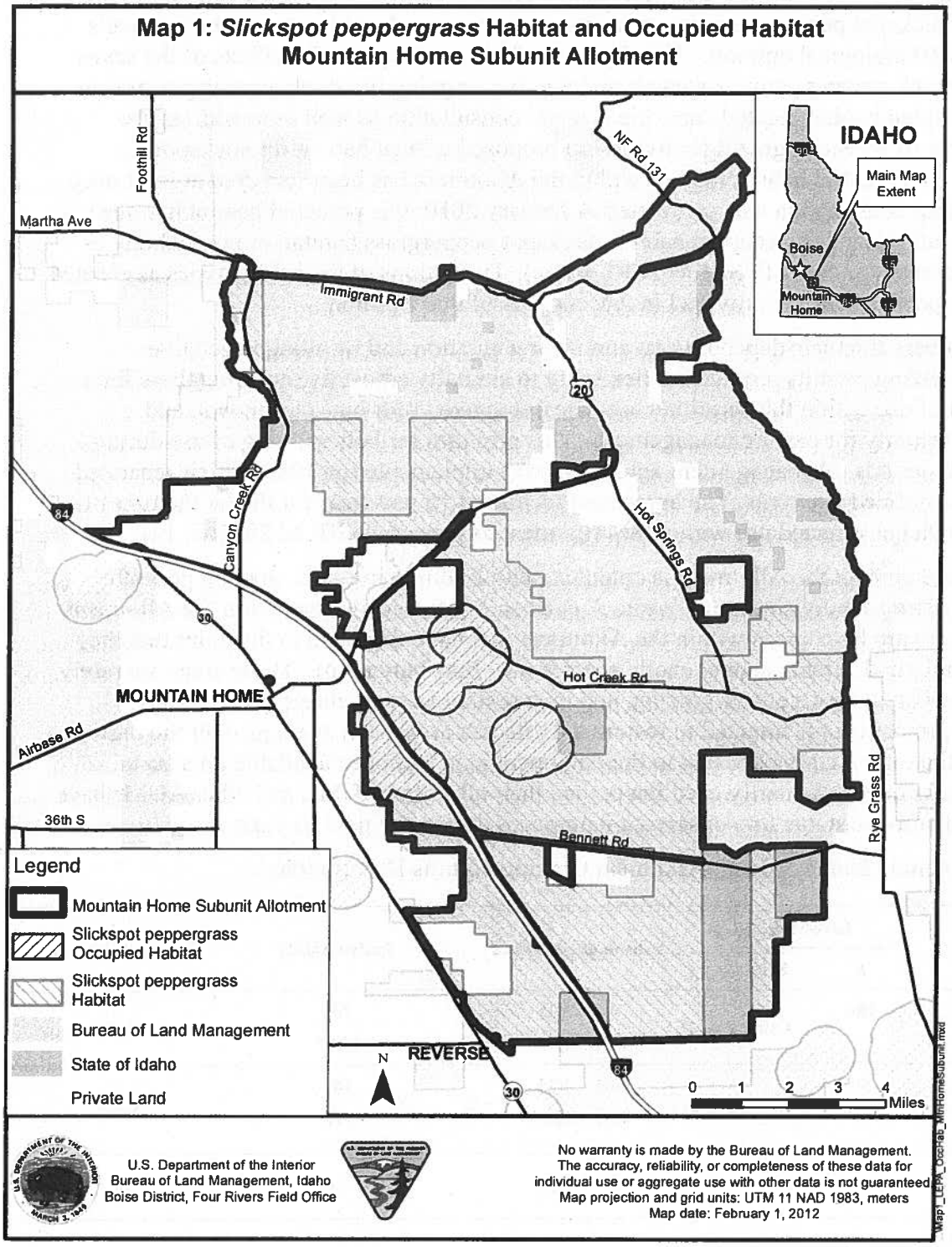

Figure 1. Map of Mountain Home Subunit Allotment boundary showing land ownership patterns. Both occupied habitat and slickspot peppergrass habitat are also illustrated.

grazing actions. The effects of the eleven livestock grazing permits associated with the Allotment on slickspot peppergrass and its habitat were previously addressed in the Service's January 25, 2010 biological opinion. This Opinion addresses the potential effects of the seven proposed livestock grazing permit renewals and the four ongoing livestock grazing permits on additional occupied habitat located since the original consultation as well as to address the potential effects of livestock grazing activities on proposed critical habitat for slickspot peppergrass. All potential habitat located within the Allotment has been surveyed at least once since the original consultation was completed in January 2010; this potential habitat has been subsequently categorized as occupied habitat, slickspot peppergrass habitat, or non-habitat, as described in Bureau guidance (USBLM 2010, entire). Definitions of the habitat types associated with slickspot peppergrass are provided in Appendix A of this Opinion.

Livestock numbers fluctuate depending on annual precipitation and resulting vegetative production. Grazing permits provide for flexibility to annually adjust livestock numbers for a shorter period of use within the permitted use dates, staggered turn-outs or removal, and increased opportunity for pasture management. This provides for better timing of use during critical growth periods. A management agreement was implemented in 1989, which separated permittees into defined use areas. The agreement identified 15 use areas for the (at the time) 12 permittees which has directed use within the Allotment to present (USBLM 2012, p. 12).

Grazing management on the Allotment is complex, with multiple livestock grazing permittees and up to 47 pasture subdivisions and livestock exclosures of varying size within the Allotment boundary. There are large areas within the Allotment that have degraded to the point that they now support only undesirable annual exotic species (i.e., burr buttercup). These areas are rarely used or not used at all for livestock grazing, and may remain as such unless a large scale rehabilitation project is implemented to restore the affected areas. On average, over the past several years the total AUMs allocated to the Allotment have not been available on a sustainable basis. Permittees have voluntarily used fewer than their allocated AUMs, and other AUMs have been placed in non-use status for conservation purposes during the past 10 years.

Table 1. Mountain Home Subunit Allotment Grazing Permits Descriptions.

Permittee	Livestock		Season of Use Dates	Active AUMs	Suspended AUMs
	#	Kind			
Permit #1100148, Ark Properties	280 512	Cattle	4/1 – 5/15 11/1 – 12/31	700 1,027	None
Permit #1100046, Charles and Rebecca Lyons	59 59	Cattle	4/1 – 6/15 11/1 – 12/31	147 118	None
Permit #1101684, Calvin Ireland	20	Cattle	4/1 – 6/12	48	None
Permit #1104102, Estate of Roy Ireland, Steve and Jake Ireland	204	Cattle	4/1 – 6/15	510	None

Permit #1101644, Preston Lord (R. Foster)*	65 70	Cattle	4/1 – 6/15 11/1 – 12/31	162 140	None
Permit #1101641, Preston Lord (C. Hunt)	72 98 71	Cattle	4/1 – 6/15 4/1 – 6/16 10/16 – 12/15	160 248 127	None
Permit #1100148, Preston Lord (C. Hunt)	150	Cattle	10/15 – 12/14	301	None
Permit #1101655, John McGrew	171 85	Cattle	4/1 – 6/15 11/1 – 12/15	406 120	None
Permit #1101647, Charles Olsen	160 42	Cattle	4/1 – 5/31 11/1 – 11/30	321 41	None
Permit #1101626, Steve and Helen Percy	160 199	Cattle	4/1 – 6/15 11/16 – 12/31	400 301	None
Permit #1104215, J.R. Simplot Co.	984 537	Cattle	4/1 – 6/30 11/1 – 12/31	2,944 1,077	None

* While permit use dates identify spring season of use for Permit #1101644, all use occurs in the fall and winter periods, as allowed by the 1989 Agreement and permit term and condition.

Thirteen pastures within the Allotment contain habitat for slickspot peppergrass. Many of these pastures are subdivided and may be used by multiple livestock permittees (see Table 2 and Table 5).

Recently discovered, additional occupied habitat associated with EO 29 and the habitat previously known to be occupied associated with EO 29 in Pasture 16 (Olsen Pasture) is grazed by Charles Olsen from April 1 to May 31 and from November 1 to November 30. As no other permittees are authorized to graze this area (see Table 2), conservation measures identified for Mr. Olson's permit are universally applied within Pasture 16 (see Table 6).

Recently discovered occupied habitat and previously known occupied habitat associated with EOs 29, 51, and 62 in Pastures 6 (Rock Lake Pasture) and 7 (Edgemead Seeding Pasture) is grazed by J.R. Simplot Co. from April 1 to June 30 and from November 1 to December 31. As no other permittees are authorized to graze these areas (see Table 2), conservation measures identified for the J.R. Simplot Co. permits are universally applied within Pastures 6 and 7 (see Table 6). Locations of Allotment pastures in relation to habitat for slickspot peppergrass is shown in Figure 2 of this Opinion (see p. 22).

Table 2. Detailed Description of Pastures with Occupied Habitat and Slickspot Peppergrass Habitat.

Permit Number/ Name/ Expiration Date	Season of Use Dates	Suspended AUMs	LEPA Habitat Type	
			Slickspot Peppergrass Habitat (Pasture #s and Habitat Acres)	**Occupied Habitat (Pasture #s and Acres)**
Permit #1101647 Charles Olsen* Exp. 8/31/2014	4/1-5/31 11/1-11/30	None	Pasture 16/Olson/3,064 ac.	Pasture 16/Olson/1,020 ac.
			Pasture 17/South Bennett/645 ac.	Unknown
			Pasture 18/Olson/Small Arms II/ 1338 ac.	Unknown
Permit #1104215 J.R. Simplot Co.* Exp. 8/31/2014	4/1-6/30 11/1-12/31	None	Pasture 6/Rock Lake/5,563 ac.	Pasture 6/Rock Lake/1,317 ac.
			Pasture 6A/Teapot/758 ac.	Unknown
			Pasture 7/Edgemead Seeding/6,302 ac.	Pasture 7/Edgemead Seeding/2,166 ac.
			Pasture 8/North Hot Creek Seeding/2,967 ac.	Pasture 8/ North Hot Creek Seeding /156 ac.
			Pasture 9/ South Hot Creek Seeding /2,930 ac.	Unknown
			Pasture 10/Ross Road Seeding/2,270 ac.	Unknown
			Pasture 12/Smith Field/115 ac.	Unknown
			Pasture 14/East Hammett/1,074 ac.	Unknown
			Pasture 15/Hammett Seeding/6,353 ac.	Unknown
Permit #1100148, Ark Properties* Exp. 9/30/2019 (Leased to Skip Owen)	4/1 – 5/15 11/1 – 12/31	None	Pasture 8/North Hot Creek Seeding/2,967 ac.	Pasture 8/North Hot Creek Seeding/156 ac.
			Pasture 9/South Hot Creek Seeding/2,930 ac.	Unknown
			Pasture 10/Ross Road Seeding/2,270 ac.	Unknown
Permit #1100046, Charles and Rebecca Lyons Exp. 8/31/2014	4/1 – 6/15 11/1 – 12/31	None	Pasture 6A/Teapot/758 ac.	Unknown
Permit #1101684, Calvin Ireland Exp. 2/28/2014	4/1 – 6/12	None	Pasture 3/East Canyon Creek/5,320 ac.	Unknown

Table 2. Detailed Description of Pastures with Occupied Habitat and Slickspot Peppergrass Habitat.

Permit Number/ Name/ Expiration Date	Season of Use Dates	Suspended AUMs	LEPA Habitat Type	
			Slickspot Peppergrass Habitat (Pasture #s and Habitat Acres)	Occupied Habitat (Pasture #s and Acres)
Permit #1104102, Estate of Roy Ireland, Steve and Jake Ireland*[1] Exp. 2/28/2014	4/1 – 6/15	None	Pasture 3/East Canyon Creek/5,320 ac.	Unknown
Permit #1101644, Preston Lord* (R. Foster) Exp. 8/31/2014	4/1 – 6/15 11/1 – 12/31	None	Pasture 6/Rock Lake/5,563 ac.	Pasture 6/Rock Lake/1,317 ac.
Permit #1101641, Preston Lord (C. Hunt) Exp. 2/28/2015	4/1 – 6/15 4/1 – 6/16 10/16 – 12/15	None	Pasture 3/East Canyon Creek/5,320 ac.	Unknown
Permit #1100148, Preston Lord[1] (C. Hunt) Exp. 2/28/2022	10/15 – 12/14	None		
Permit #1101655, John McGrew Exp. 2/28/2017	4/1 – 6/15 11/1 – 12/15	None	Pasture 3/East Canyon Creek/5,320 ac.	Unknown
Permit #1101626, Steve and Helen Percy Exp. 8/31/2014	4/1 – 6/15 11/16 – 12/31	None	Pasture 6A/Teapot/758 ac.	Unknown

* Indicates that the permit has specific terms and conditions or an agreement in place to ensure conservation of the species and its habitat.

[1] Indicates that the permit is to be (or has recently been) renewed with the same terms and conditions as the expiring permit.

Terms and Conditions

The terms and conditions listed in Table 3 below are common to all grazing authorizations in the Boise District with few exceptions. Where additional terms and conditions have been added specific to certain pastures or for slickspot peppergrass conservation, these are indicated by the individual livestock grazing permit descriptions on pages 14-16.

Table 3. Terms and Conditions for Grazing Authorizations in the Mountain Home Subunit Allotment[1].

1	The allotment listed on this grazing permit is subject to the requirements of 43 CFR 4180, *Fundamentals of Rangeland Health and Guidelines for Grazing Administration*. This permit shall be modified (if necessary) to meet these requirements upon completion of a Standard and Guidelines Assessment and determination as scheduled by the authorized officer.
2	Pursuant to 43 CFR 10.4(b), you must notify the Bureau Field Manager, by telephone with written confirmation, immediately upon the discovery of human remains, funerary objects, sacred objects, or objects of cultural patrimony on federal lands. Pursuant to 43 CFR 10.4 (c), you must immediately stop any ongoing activities connected with such discovery and make a reasonable effort to protect the discovered remains or objects.
3	As provided in the Code of Federal Regulations (CFR 4130.6-2D), you are hereby required to submit a certified Actual Use Report within 15 days after completion of your annual grazing use. Failure to comply could result in the cancellation of your permit in whole or part.
4	Salt and/or supplements shall not be placed within one quarter (1/4) mile of springs, streams, meadows, aspen stands, playas or water developments.
5	Changes to the scheduled use require prior approval.
6	Trailing activities must be coordinated with the Bureau prior to initiation. A trailing permit or similar authorization may be required prior to crossing public lands.
7	Livestock exclosures located within your grazing allotment are closed to all domestic grazing use. It is your responsibility to keep the fences in good repair where maintenance has been assigned to you. Permittees who willingly cause and willingly allow their livestock to graze in exclosures closed to grazing will be charged with trespass.
8	Range improvements must be maintained in accordance with the cooperative agreements and range improvement permits in which you are a signatory or assignee.
9	All appropriate documentation regarding state and/or private leased lands, private lands offered for exchange-of-use, and livestock control agreements must be approved by the authorized officer prior to allowing livestock to graze on public lands.

Management Guidelines

The additional management guidelines listed below are applicable to all allotments in the Boise District that are within slickspot peppergrass management areas (LEPA-MAs). These management guidelines were identified as conservation measures within the 2003 Candidate Conservation Agreement (CCA) between the State of Idaho, the Bureau, and livestock grazing interests. These management guidelines complement the terms and conditions for the Allotment listed above.

[1] The wording on each individual permit may not be exactly the same as listed here; however, the intent is the same.

Table 4. Management Guidelines for Grazing Authorizations in the Boise District.

1	Permittees will supplement federal and state agency surveys and monitoring by surveying their allotments for slickspots and plants, including existing occurrences, during their normal course of business.
2	Permittees will report survey information to the CDC[2] for the purposes of aiding monitoring efforts and contributing to the CCA adaptive management strategy.
3	Supplement placement shall be considered in the annual slickspot peppergrass tour with the BLM range specialist and other appropriate resource specialists, based on the experience in the previous year's grazing season. Terms and Conditions with a permit will be adjusted to reflect the distance necessary for supplements from existing EOs and slickspots; however, requirements for maximum distance from water may be waived for a compelling reason involving minimizing impact on a slickspot or the plant. If the aforementioned is not possible, then existing sites will be examined by the Bureau and the permittee to determine the best available location.
4	If soils are likely to become saturated, permittee will also relocate livestock away from the vicinity of existing EOs by moving livestock to one of three alternative sites (two of the alternative sites are fenced).
5	Permittee will request modification of time of use for fall and winter grazing only.

Specific Terms and Conditions for individual grazing permits

J.R. Simplot Co. Permit #1104215

The general Boise District terms and conditions described in Table 3 above apply here. Grazing decisions were amended in 2004 for permitted use within occupied habitat, in compliance with the Candidate Conservation Agreement (CCA) (State of Idaho *et al.* 2003, entire). Additional terms and conditions specific to this permit include the following:

- Livestock grazing within the Mountain Home Subunit Allotment will be in accordance with this final decision dated Sep. 10, 2004.
- Grazing use in the Mountain Home Subunit shall be in accordance with the 1989 agreement[3].
- A minimum 4 inch stubble height will be left on herbaceous grasses/grass-like plants within the riparian vegetation along Rattlesnake Creek (Pasture 6) in the Mountain Home Subunit Allotment #0813 at the end of the growing season. This requirement is identified in the wildlife-aquatic objective 1.2 of the 1983 Bruneau-Kuna Management Framework Plan (MFP).
- Livestock numbers may vary annually within the period of use as long as AUMs are not exceeded.
- Turn-out is subject to Boise District range readiness criteria.

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[2] The Idaho Conservation Data Center (CDC) is now known as the Idaho Natural Heritage Program (INHP).

[3] This Term and Condition refers to the management agreement between the Bureau and the 12 livestock permittees (at the time) using the Allotment implemented in 1989. This agreement separated the 12 permittees into 15 defined use areas, and has directed use within the Allotment to present.

- Salt and/or supplements shall not be placed within one quarter (0.25) mile from any springs, streams, meadows, aspen stands, playas, special status plant populations, or water developments.

- The Land Use Plan allowable use level for riparian and upland vegetation is 50 percent of the current year's growth. Livestock should be removed from the use area, pasture or allotment when this utilization has been reached.

- Permittee will not trail livestock through EOs within the management area when soils are saturated.

- Permittee shall place salt/supplement to minimize trampling of slickspot peppergrass and of slickspots respectively. Supplements will be placed at least 0.5 mile, and preferably 0.75 mile, if practicable, from occurrences. Supplements that are attractants should be placed so that cattle will not trail through an EO to the supplement or a water source. Attractants should be placed so that cattle are drawn away from the area of the EO.

Charles Olsen Permit #1101647

The general Boise District terms and conditions listed above apply here. Grazing decisions were amended in 2004 for permitted use within occupied habitat, in compliance with the CCA. Additional terms and conditions specific to this permit include the following:

- Livestock grazing within the Mountain Home Subunit Allotment will be in accordance with this Final Decision dated 9-10-04.
- Grazing use in the Mountain Home Subunit Allotment shall be in accordance with the 1989 Agreement (Davison/Fisher).
- Livestock numbers may vary annually providing the use period and AUMs by season are not exceeded.
- Salt and/or mineral blocks shall not be placed on public lands within one quarter mile (0.25 mile) of springs, streams, meadows, riparian habitats, aspen stands, playas, special status plant populations, or water developments.
- Turnout is subject to Boise District Range Readiness criteria.
- The Land Use Plan allowable use level for riparian and upland vegetation is 50 percent of the current year's growth. Livestock should be removed from the use are, pasture or allotment when this utilization has been reached.
- Permittee will not trail livestock through EOs within the management area when soils are saturated.
- Permittee shall place salt/supplement to minimize trampling of slickspot peppergrass and of slickspots, respectively. Supplements will be placed at least 0.5 mile, preferably 0.75 mile, if practicable, from occurrences. Supplements that are attractants should be placed so that cattle will not trail through an EO to the supplement or a water source. Attractants should be placed so that cattle are drawn away from the area of the EO.

Estate of Roy Ireland, Steve and Jake Ireland Permit #1104102

The general Boise District terms and conditions listed above apply here. Additional terms and conditions specific to this permit include the following:

- All grazing will be in accordance with the 1989 Mountain Home Subunit Allotment Users Agreement. Grazing use shall be in Pasture 3. Livestock numbers may vary on an annual basis; providing the period-of-use and total permitted use are not exceeded.
- Turnout is subject to the Lower Snake River District (LSRD)[4] Range Readiness Criteria.
- Salt and supplement shall not be placed within one quarter (0.25) mile of springs, streams, meadows, aspen stands, playas or water developments.
- You are required to coordinate trailing activities with the Bureau prior to initiation. A trailing permit or similar authorization may be required prior to crossing public lands.
- The Land Use Plan allowable use level for riparian and upland vegetation is 50 percent of the current year's growth. Livestock should be removed from the use area, pasture or allotment when this utilization has been reached.

In addition to the permit terms and conditions, the previous permit holder entered into an agreement (adopted by the heirs and current permit holders) to protect habitat for slickspot peppergrass. The agreement was initially approved on April 9, 2010, was approved by the new permit holders on March 8th, 2011, and will expire on February 28, 2015, upon full processing of the permit under 43 CFR 4100, or a determination that no suitable habitat occurs within the action area, whichever comes first. This agreement included the following conservation measures:

- As part of range readiness assessments, delay livestock turnout into areas known to support suitable habitat when soils are saturated.
- When soils become saturated during the grazing season within slickspot peppergrass habitat, use herding and mineral/supplement/water placement to avoid livestock use of the area.
- Minimize gathering of livestock in slickspot peppergrass habitat.
- Avoid impacts to habitat from herd movements through deferred pastures.
- Supplements will be placed so that livestock are drawn away from any EOs[5] and avoid trailing through EOs en route to the supplement or water course.

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[4] That portion of the Bureau's Lower Snake River District that encompasses the Mountain Home Subunit Allotment has been renamed and is currently known as the Boise District.

[5] No EOs are currently located within Pasture 3. Due to the presence of numerous slickspot microsites, it is possible that an EO may be discovered within Pasture 3 in the future.

- Existing water troughs (to include troughs that are tied into pipelines, as well as both permanent and moveable troughs to which water is delivered throughout the grazing season) will be moved at least 0.5 mile from EOs. Where troughs cannot be moved (for example, because of topographical constraints, additional disturbance, or impacts to sensitive species), management will be adjusted to mitigate the impacts during the periods of critical concern for slickspot peppergrass (such as when soils are saturated and subject to trampling impacts). Management adjustments could include shutting the water off seasonally or other appropriate measures.

Other permittees that also use Pasture 3 (as indicated in Table 2) are not bound by the terms of the April 9, 2011 agreement or other similar agreements or specific terms and conditions for conservation of the species (with the exception of general terms and conditions that do have conservation value, such as range readiness criteria). As part of fully processing livestock grazing permits (permit renewal consistent with the Idaho Standards for Rangeland Health and the Guidelines for Livestock Grazing Management), all permits within the Allotment will have applicable terms and conditions applied to renewed term permits (10 year permits from the time of issuance). It is anticipated that the permits will be renewed in 2014, based upon the current permit renewal schedule.

Conservation Measures from the 2009 Conservation Agreement

All Bureau-administered actions, including livestock grazing permits associated with the Allotment, implement conservation measures for slickspot peppergrass as described within the 2009 CA between the Bureau and the Service. Land use plan level conservation measures from the CA that area applicable to the Allotment are shown in Table 5 below. Compliance with applicable CA conservation measures and their associated implementation actions will be evaluated for all individual livestock grazing permits during permit renewal, which is scheduled for 2014.

Table 5. Conservation Agreement (CA) Conservation Measures Applicable to Livestock Grazing Activities within the Mountain Home Subunit Allotment.

See Appendix C for a full description of the Conservation Measures and associated Implementation Actions. Analyses within this Opinion included the Implementation Actions listed in Appendix C as components of the conservation measures below.

LUP Programs Evaluated	Conservation Measures	Applicable to Livestock Grazing Activities
Special Status Animal and Plant Management Note: Common to All Programs	**1)** In cooperation with Idaho Department of Fish and Game (IDFG), Idaho Conservation Data Center (IDCDC), Service, IDARNG, the USAF, and others:	
	a) Develop and use survey protocols consistent with the Service Rare Plant Survey Guidelines to conduct Stage 1, 2, and 3 surveys (see Figure III.C.1 for the general survey process).	X
	b) Cooperate to refine slickspot peppergrass potential habitat maps (Stage 1 survey, Figure III.C.1), and to identify and map slickspot peppergrass occurrences (Stage 2 survey, Figure III.C.1).	X

Table 5. Conservation Agreement (CA) Conservation Measures Applicable to Livestock Grazing Activities within the Mountain Home Subunit Allotment.

See Appendix C for a full description of the Conservation Measures and associated Implementation Actions. Analyses within this Opinion included the Implementation Actions listed in Appendix C as components of the conservation measures below.

LUP Programs Evaluated	Conservation Measures	Applicable to Livestock Grazing Activities
	c) Cooperate in regular monitoring of slickspot peppergrass population trends and land health conditions on Bureau lands, and follow current monitoring protocols. Land health conditions include forb diversity to support pollinators and habitat for slickspot peppergrass.	X
	d) Participate in research essential to conservation of the species.	X
	e) Continue to support seed banks in a long-term seed storage facility.	
	f) Support the establishment and maintenance of new populations in slickspot peppergrass habitat. The goal of these activities is to maintain or enhance viable populations.	
	2) Ensure that ongoing Federal actions support or do not preclude species conservation in slickspot peppergrass habitat.	X
	3) Ensure that new Federal actions support or do not preclude species conservation in slickspot peppergrass habitat.	X
	4) Implement adaptive management as needed to achieve conservation objectives.	X
	5) Support programs to conserve and enhance slickspot peppergrass on non-Federal lands.	
	6) Include language in all land use authorizations to require rehabilitation of slickspot peppergrass habitat in case of trespass or permit violations, if damage occurs.	X
Upland Vegetation Management: Rangelands (includes weed management)	**1)** Apply relevant conservation measures from the **Special Status Animal and Plant Management** program section at the beginning of this table. [6]	X
	2) Although non-chemical methods will be the preferred approach in occupied habitat, when appropriate, projects involving the application of pesticides (including herbicides, fungicides, and other related chemicals) in slickspot peppergrass habitat and potential habitat that may affect the species will be analyzed at the project level and designed such that pesticide applications will support conservation and minimize risks of exposure.	X

[6] This conservation measure is included within each of the land use plan programs that follow, but is shown only once in this table to reduce repetition.

Table 5. Conservation Agreement (CA) Conservation Measures Applicable to Livestock Grazing Activities within the Mountain Home Subunit Allotment.

See Appendix C for a full description of the Conservation Measures and associated Implementation Actions. Analyses within this Opinion included the Implementation Actions listed in Appendix C as components of the conservation measures below.

LUP Programs Evaluated	Conservation Measures	Applicable to Livestock Grazing Activities
	3) Where needed and feasible, coordinate with adjacent land owners and local governments regarding control of noxious and invasive plants in upland areas through cooperative weed management programs. One of BLM's priorities within the cooperative weed management program is the protection of special status plants on BLM lands.	X
	4) The Bureau will promote diversity, richness, and health of native plant communities to support pollinators and habitat for slickspot peppergrass.	X
Wildlife and Wildlife Habitat Management	**2)** Manage facilities installed for wildlife to promote maintenance of slickspot peppergrass habitat.	
	3) Restore wildlife habitat while promoting slickspot peppergrass conservation.	
Livestock Grazing Management: Permits and Leases	**2)** Manage livestock grazing and trailing to conserve suitable habitat conditions for slickspot peppergrass while implementing rangeland health standards and guidelines (S&Gs). Apply the **Implementation of Annual Grazing Adaptive Management Implementation Flowchart (Figure III.C.2)**, located at the end of this conservation measures table, to adjust livestock use as appropriate.	X
	3) As part of adaptive management, the Bureau will conduct scheduled compliance inspections in pastures with occupied habitat as part of Bureau range use supervision to minimize impacts.	X
	4) Provide adequate rest from livestock use for areas treated after major disturbances in slickspot peppergrass habitat. Major disturbances include fire, fire rehabilitation, or other soil-disturbing occurrences.	X
	5) The Bureau will work cooperatively with the livestock permittees to promote slickspot peppergrass conservation.	X
Livestock Grazing Management: Livestock Management Facilities	**2)** Manage livestock facilities to promote slickspot peppergrass conservation while implementing rangeland health S&Gs.	X
Wild Horse Management	**2)** If the range of wild horses and slickspot peppergrass occupied habitat overlaps now or in the future, protect these areas from wild horses by including applicable conservation measures in herd management plans.	
Recreation Management	**2)** Developed facilities (paved campgrounds, vault toilets, interpretive kiosks, etc.): Manage existing and new recreation facilities to promote conservation of species habitat.	

Table 5. Conservation Agreement (CA) Conservation Measures Applicable to Livestock Grazing Activities within the Mountain Home Subunit Allotment.

See Appendix C for a full description of the Conservation Measures and associated Implementation Actions. Analyses within this Opinion included the Implementation Actions listed in Appendix C as components of the conservation measures below.

LUP Programs Evaluated	Conservation Measures	Applicable to Livestock Grazing Activities
	3) Dispersed use areas (informal areas, including camping areas and tie-up areas for pack animals): Manage dispersed use sites to promote conservation of species habitat. This includes limiting disturbances to the species resulting from human uses.	
	4) Commercial and noncommercial recreation permits, including hunting guides and outfitter camps: issue commercial and noncommercial recreation permits to promote conservation of slickspot peppergrass habitat. This includes management of physical facilities (such as camps), as well as disturbances to slickspot peppergrass habitat resulting from human uses.	
Recreation Management: Travel Management	**2)** Manage roads, OHV routes and areas, as well as non-motorized trails, to promote species habitat conservation. This includes management of roads and trails, as well as ground disturbance resulting from human uses.	
	3) Perform compliance checks on OHV closures to protect occupied habitat, identify problems as soon as possible, and take immediate corrective measures.	
Special Designation Area Management	**2)** Explore the potential for new designations that would enhance species conservation.	X
Fire Management: Fire Suppression	**2)** Fire suppression efforts will be conducted, as possible, to protect slickspot peppergrass habitat. Place a high priority on protecting slickspot peppergrass habitat.	
	3) As needed, coordinate with appropriate agency personnel regarding fire suppression activities in or adjacent to slickspot peppergrass habitat.	
Fire Management: Emergency Stabilization and Rehabilitation	**2)** Implement Emergency Stabilization and Rehabilitation (ES&R) activities to consider slickspot peppergrass in and adjacent to slickspot peppergrass habitat rehabilitation.	X
	3) Fire rehabilitation projects involving the application of pesticides in slickspot peppergrass habitat will be analyzed and implemented in accordance with the approach described in the **Upland Vegetation Management: Rangelands (includes weed management)** program section.	
Fire Management: Wildland Fire Use	**1)** Wildland fire use projects will not be allowed in slickspot peppergrass habitat.	
Fire Management: Prescribed Fire	**2)** Prescribed fire projects will be designed to conserve and enhance slickspot peppergrass habitat.	

Table 5. Conservation Agreement (CA) Conservation Measures Applicable to Livestock Grazing Activities within the Mountain Home Subunit Allotment.

See Appendix C for a full description of the Conservation Measures and associated Implementation Actions. Analyses within this Opinion included the Implementation Actions listed in Appendix C as components of the conservation measures below.

LUP Programs Evaluated	Conservation Measures	Applicable to Livestock Grazing Activities
Fire Management: Non-Fire Fuels Management	**2)** Implement projects involving the application of pesticides in accordance with the approach described in the **Upland Vegetation Management: Rangelands (includes weed management)** program section.	
	3) Fuels management projects conducted in slickspot peppergrass habitat should have long-term benefits to slickspot peppergrass.	
Fire Management: Community Assistance	**2)** Follow all measures included throughout the Fire Management program sections.	
Lands and Realty Management: Land Tenure Adjustment (land sale, exchanges, withdrawals, etc.)	**2)** Where feasible and funding is available, acquire through land exchange or purchase private lands that contain slickspot peppergrass habitat.	
	3) Retain occupied slickspot peppergrass habitat in Federal ownership unless such a transfer would result in a net benefit to the species.	
Lands and Realty Management: Land Use Permits and Leases	**2)** Issue new land use permits and leases and review existing permits and leases at renewal to conserve species habitat. This includes management of physical facilities, as well as ground disturbance resulting from human uses.	
Lands and Realty Management: Rights-of-Way	**2)** Issue new rights-of-way and review existing rights-of-way at renewal to conserve species habitat. This includes management of physical facilities, as well as disturbances to the species resulting from human uses.	
Mineral Management: Locatable Minerals	**2)** Approve plans of operations or allow notice level operations so as not to preclude species habitat conservation. This includes management of physical facilities, as well as disturbances to the species resulting from human uses.	
Mineral Management: Saleable and Leasable Minerals	**2)** Approve development of saleable or leasable minerals so as not to preclude species habitat conservation. This includes management of physical facilities, as well as disturbances to the species resulting from human uses.	

Livestock Management Infrastructure

Numerous range developments, such as boundary fences, pasture and fire rehabilitation fences, and water developments, are located on public land within the Allotment (see Figure 2).

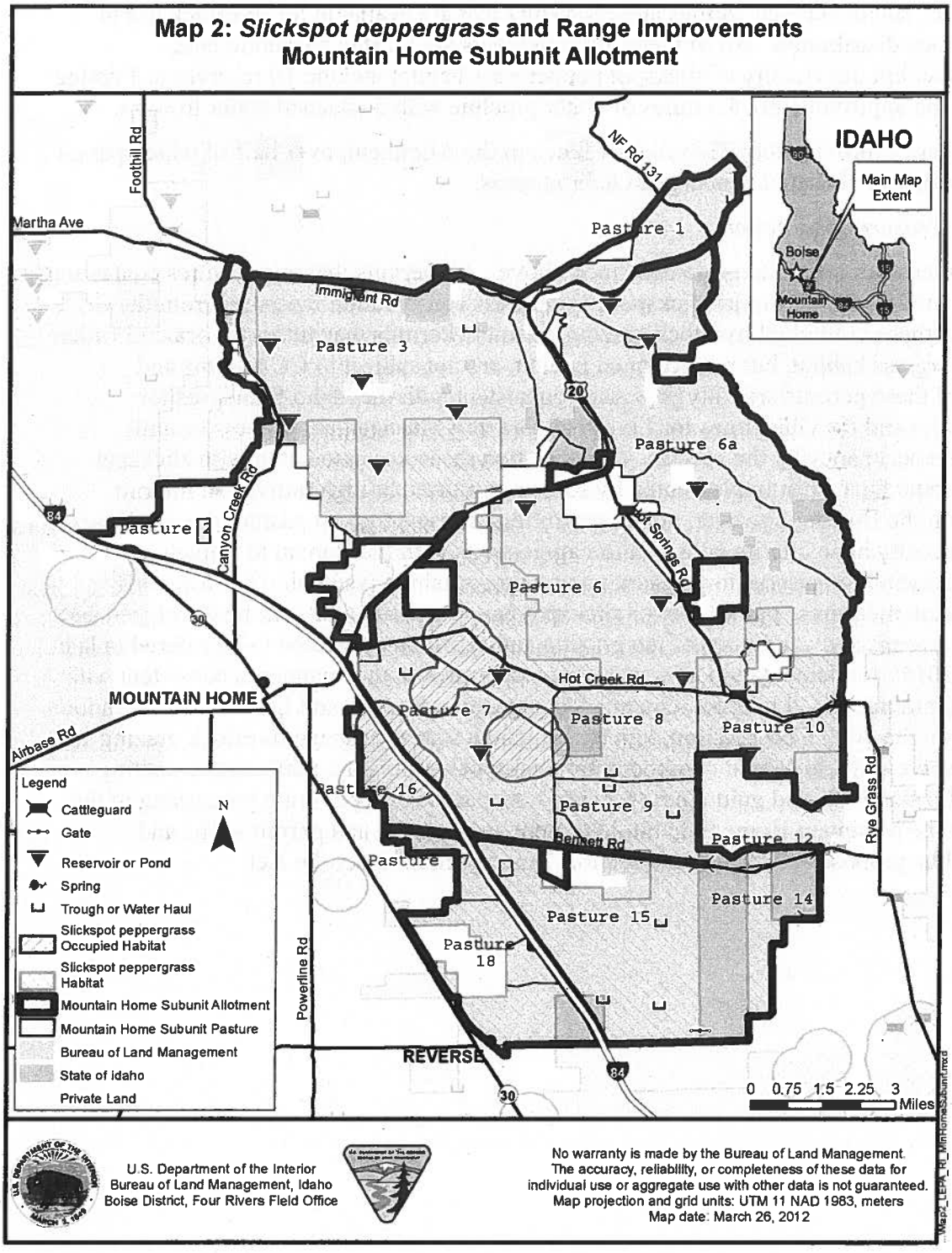

Figure 2. Map showing range infrastructure in the Mountain Home Subunit Allotment.

Water Developments: Surface water is limited on the Allotment; thus, most livestock water and salt/supplement must be hauled in by truck to portable water troughs. There are some well and pipeline systems, and developed springs and reservoirs that are available for livestock use to facilitate livestock distribution. All of these improvements are located on public land. Developments within the vicinity of slickspot peppergrass habitat include 10 reservoirs, 1 spring development, and approximately 4.5 miles of water pipeline with 5 attached water troughs.

Fences: There are approximately 236 miles of fence in the Allotment, over half of which passes through the expansive slickspot peppergrass habitat areas.

Conservation Measures and Actions

Conservation measures and actions are described above. All permits that use pastures containing EOs currently implement additional slickspot peppergrass conservation measures from the CCA associated with these individual livestock grazing permits. Permits that authorize grazing within slickspot peppergrass habitat, but not occupied habitat, are not subject to CCA terms and conditions until these permits are fully processed consistent with the Idaho Standards for Rangeland Health and the Guidelines for Livestock Grazing Management process or until surveys indicate occupancy by the species. Conservation measures associated with slickspot peppergrass habitat have been implemented by some permittees through individual interim agreements with the Bureau; however, not all permittees that use a given pasture during the same time period currently have interim conservation agreements with the Bureau to implement additional conservation measures for slickspot peppergrass habitat (see Table 6, Pastures 3 and 6a). Conservation measures appropriate for slickspot peppergrass habitat will be developed and implemented as terms and conditions of the grazing authorizations expected to be offered in late 2013 or early 2014. Implementation of conservation measures in this manner is consistent with Land Use Program Section "Livestock Grazing Management: Permits and Leases" conservation measure #2 from the 2009 Conservation Agreement which states "Manage livestock grazing and trailing to conserve suitable habitat conditions for slickspot peppergrass while implementing rangeland health standards and guidelines (S&Gs)." As part of the upcoming processing of the permits within the Mountain Home Subunit Allotment, grazing use and permit terms and conditions will be proposed and subject to section 7 consultation under the Act.

Table 6. Overview of Slickspot Peppergrass Conservation Measures Implemented within the Mountain Home Subunit Allotment by Pasture and Livestock Grazing Permit.

Pasture Number and Name	Permit Number	Grazing Dates (AUMs)	Habitat Type (Acreage)	Boise District Grazing Guidelines (Table 4)	CA Grazing Cons. Measures (Table 5)	Allotment Terms and Conditions (Table 3)	LEPA Terms and Conditions for Individual Permits (see descriptions by permit on pp. 14-16)
Pasture 3 – East Canyon Creek	#1101684	4/1-6/12 (48)		X	X	X	
	#1104102	4/1-6/15 (510)		X	X	X	X
	#1101644	4/1-6/15 (162) 11/1-12/31 (140)		X	X	X	X
	#1101641	4/1-6/15 (160) 4/1-6/16 (248) 10/16-12/15 (127)	SSPG (5,320 ac)	X	X	X	
	#1100148	10/15-12/14 (301)		X	X	X	
	#1101655	4/1-6/15 (406) 11/1-12/15 (120)		X	X	X	

Pasture 6 –Rock Lake	#1104215	4/1-6/30 (2,944*) 11/1-12/31 (1,077)	EO 51/OCC (1,317 ac) SSPG (5,563 ac)	X	X	X	X
	#1101644	10/16 – 12/31		X	X	X	X
Pasture 6a – Teapot	#1104215	4/1-6/15 (see Pasture 6) 11/1-12/31 (see Pasture 6)		X	X	X	X
	#1100046	4/1-6/30 (147) 11/1-12/31 (118)	SSPG (758 ac)	X	X	X	
	#1101626	4/1-6/15 (400) 11/16-12/31 (301)		X	X	X	
Pasture 7 – Edgemead Seeding	#1104215	4/1-6/30 (see Pasture 6) 11/1-12/31 (see Pasture 6)	EOs 51 & 62 /OCC (2,166 ac) SSPG (6,302 ac)	X	X	X	X

Pasture 8 – North Hot Creek Seeding	#1104215	4/1-6/30 (see Pasture 6) 11/1-12/31 (see Pasture 6)	OCC (156 ac) SSPG (2,967 ac)	X	X	X	
	#1100148	4/1-5/15 (700*) 11/1-12/31 (1,027*)		X	X	X	
Pasture 9 – South Hot Creek Seeding	#1104215	4/1-6/30 (see Pasture 6) 11/1-12/31 (see Pasture 6)	SSPG (2,930 ac)	X	X	X	X
	#1100148	4/1-5/15 (see Pasture 8) 11/1-12/31 (see Pasture 8)		X	X	X	

Pasture 10 – Ross Road Seeding	#1104215 #1100148	4/1-6/30 (see Pasture 6) 11/1-12/31 (see Pasture 6) 4/1-5/15 (see Pasture 8) 11/1-12/31 (see Pasture 8)	SSPG (2,270 ac)	X X	X X	X X	X
Pasture 12 – Smith Field	#1104215	4/1-6/30 (see Pasture 6) 11/1-12/31 (see Pasture 6)	SSPG (115 ac)	X	X	X	X
Pasture 14 – East Hammett	#1104215	4/1-6/30 (see Pasture 6) 11/1-12/31 (see Pasture 6)	SSPG (1,074 ac)	X	X	X	X
Pasture 15 – Hammett Seeding	#1104215	4/1-6/30 (see Pasture 6) 11/1-12/31 (see Pasture 6)	SSPG (6,353 ac)	X	X	X	X
Pasture 16 - Olson	#1101647	4/1-5/31 (321*) 11/1-11/30 (41*)	EO 29 /OCC (1,020 ac) SSPG (3,064 ac)	X	X	X	X

Pasture 17 - South Bennett	#1101647	4/1-5/31 (see Pasture 16) 11/1-11/30 (see Pasture 16)	SSPG (645 ac)	X	X	X	X
Pasture 18 – Olson/Small Arms II	#1101647	4/1-5/31 (see Pasture 16) 11/1-11/30 (see Pasture 16)	SSPG (1,338 ac)	X	X	X	X

* AUMs shown are used within multiple pastures.

EO = Pasture contains an Element Occurrence either wholly or in part.

OCC = Pasture contains that portion of Occupied Habitat composed of the 0.5 mile pollinator buffer surrounding an Element Occurrence.

SSPG = Pasture contains Slickspot Peppergrass Habitat.

2.2 Analytical Framework for the Jeopardy and Adverse Modification Determinations

2.2.1 Jeopardy Determination

In accordance with policy and regulation, the jeopardy analysis in this Opinion relies on four components:

1. The *Status of the Species*, which evaluates slickspot peppergrass rangewide condition, the factors responsible for that condition, and its survival and recovery needs.
2. The *Environmental Baseline*, which evaluates the condition of slickspot peppergrass in the action area, the factors responsible for that condition, and the relationship of the action area to the survival and recovery of slickspot peppergrass.
3. The *Effects of the Action*, which determines the direct and indirect impacts of the proposed Federal action and the effects of any interrelated or interdependent activities on slickspot peppergrass.
4. *Cumulative Effects*, which evaluates the effects of future, non-Federal activities in the action area on slickspot peppergrass.

In accordance with policy and regulation, the jeopardy determination is made by evaluating the effects of the Federal action in the context of slickspot peppergrass current status, taking into account any cumulative effects, to determine if implementation of the action is likely to cause an appreciable reduction in the likelihood of both the survival and recovery of slickspot peppergrass in the wild.

The jeopardy analysis in this Opinion places an emphasis on consideration of the rangewide survival and recovery needs of slickspot peppergrass and the role of the action area in the survival and recovery of slickspot peppergrass as the context for evaluating the significance of the effects of the proposed Federal action, taken together with cumulative effects, for purposes of making the jeopardy determination.

2.2.2 Adverse Modification Determination

This Opinion does not rely on the regulatory definition of "destruction or adverse modification" of critical habitat at 50 CFR 402.02. Instead, we have relied upon the statutory provisions of the Act to complete the following analysis with respect to proposed critical habitat.

In accordance with policy and regulation, the adverse modification analysis in this Opinion relies on four components:

1. The *Status of Critical Habitat*, which evaluates the rangewide condition of critical habitat for slickspot peppergrass in terms of primary constituent elements (PCEs), the factors responsible for that condition, and the intended recovery function of the critical habitat overall.
2. The *Environmental Baseline*, which evaluates the condition of the critical habitat in the action area, the factors responsible for that condition, and the recovery role of the critical habitat in the action area.

3. The *Effects of the Action*, which determines the direct and indirect impacts of the proposed Federal action and the effects of any interrelated or interdependent activities on the PCEs and how that will influence the recovery role of affected critical habitat units.
4. *Cumulative Effects*, which evaluates the effects of future, non-Federal activities in the action area on the PCEs and how that will influence the recovery role of affected critical habitat units.

For purposes of the adverse modification determination, the effects of the Federal action on slickspot peppergrass critical habitat are evaluated in the context of the rangewide condition of the critical habitat, taking into account any cumulative effects, to determine if the critical habitat rangewide would remain functional (or would retain the current ability for the PCEs to be functionally established in areas of currently unsuitable but capable habitat) to serve its intended recovery role for slickspot peppergrass.

The analysis in this Opinion places an emphasis on using the intended rangewide recovery function of slickspot peppergrass critical habitat and the role of the action area relative to that intended function as the context for evaluating the significance of the effects of the Federal action, taken together with cumulative effects, for purposes of making the adverse modification determination.

2.3 Status of the Species and Critical Habitat

This section presents information about the regulatory, biological and ecological status of slickspot peppergrass and its proposed critical habitat that provides context for evaluating the significance of probable effects caused by the action.

2.3.1 Slickspot Peppergrass

2.3.1.1 Listing Status

Effective December 7, 2009, slickspot peppergrass was listed as threatened under the Act (74 FR 52014–52064, October 8, 2009, p. 52014).

2.3.1.2 Species Description

Slickspot peppergrass is an intricately branched, tap-rooted plant, averaging 2 to 8 inches (in.) high, but occasionally reaching up to 16 in. high. Leaves and stems are covered with fine, soft hairs, and the leaves are divided into linear segments. Flowers are numerous, 0.11 to 0.15 in. in diameter, white, and four-petalled. Fruits (siliques) are 0.10 to 0.15 in. across, round in outline, flattened, and two-seeded (Moseley 1994, pp. 3, 4; Holmgren *et al.* 2005, p. 260). The species is monocarpic (it flowers once and then dies) and displays two different life history strategies—an annual form and a biennial form. The annual form reproduces by flowering and setting seed in its first year and dies within one growing season. The biennial life form initiates growth in the first year as a vegetative rosette but does not flower and produce seed until the second growing season. Biennial rosettes must survive generally dry summer conditions, and consequently many of the biennial rosettes die before flowering and producing seed. The number of prior-year rosettes is positively correlated with the number of reproductive plants present the following year (ICDC 2008, p. 9; Unnasch 2008, p. 14; Sullivan and Nations 2009, p. 44). The proportion of

annuals versus biennials in a population can vary greatly (Meyer *et al.* 2005, p. 15), but in general, annuals appear to outnumber biennials (Moseley 1994, p. 12).

2.3.1.3 Life History

Seed Production

Depending on an individual plant's vigor, the effectiveness of its pollination, and whether it is functioning as an annual or a biennial, each slickspot peppergrass plant produces varying numbers of seeds (Quinney 1998, pp. 15, 17). Biennial plants normally produce many more seeds than annual plants (Meyer *et al.* 2005, p. 15). Average seed output for annual plants at the OTA was 125 seeds per plant in 1993 and 46 seeds per plant in 1994. In contrast, seed production of biennials at this site in 1993 and 1994 averaged 787 and 105 seeds per plant, respectively (Meyer *et al.* 2005, p. 16). Based on data collected from a 4-year demography study on the OTA, survivorship of the annual form of slickspot peppergrass was demonstrated to be higher than survivorship of biennials (Meyer *et al.* 2005, p. 16). Meyer *et al.* (2005, p. 21) hypothesize that the reproductive strategy of slickspot peppergrass is a plastic response, meaning that larger plants will flower and produce seed in their first season, whereas smaller plants that stand less chance of successfully setting seed in their first season will delay reproduction until the following year. Thus, the biennial life form is maintained, despite the higher risk of mortality.

Like many short-lived plants growing in arid environments, above-ground numbers of slickspot peppergrass individuals can fluctuate widely from year to year, depending on seasonal precipitation patterns (Mancuso and Moseley 1998, p. 1; Meyer *et al.* 2005, pp. 4, 12, 15; Palazzo *et al.* 2005, p. 9; Menke and Kaye 2006a, p. 8; Menke and Kaye 2006b, pp. 10, 11; Sullivan and Nations 2009, p. 44). Mancuso and Moseley (1998, p. 1) note that sites with thousands of above-ground plants one year may have none the next, and vice versa. Above-ground plants represent only a portion of the population; the seed bank (a reserve of dormant seeds generally found in the soil) contributes the other portion and in many years, constitutes the majority of the population (Mancuso and Moseley 1998, p. 1). Seed banks are adaptations for survival in a "risky environment" because they buffer a species from stochastic (random) impacts, such as lack of soil moisture (Baskin and Baskin 2001, p. 160).

Seed Viability and Germination

The seeds of slickspot peppergrass are found primarily within the slickspot microsites where the plants are found (Meyer and Allen 2005, pp. 5–6). Slickspots, also known as mini-playas or natric (high sodium content) sites, are visually distinct openings in the sagebrush-steppe created by unusual soil conditions characterized by significantly greater sodium and clay content relative to the surrounding area (Moseley 1994, p. 7). The vast majority of slickspot peppergrass seeds in slickspots have been located near the soil surface, with lower numbers of seeds located in deeper soils (Meyer *et al.* 2005, p. 19; Palazzo *et al.* 2005, p. 3). Slickspot peppergrass seeds have been found in slickspots even if no above-ground plants are present (Meyer *et al.* 2005, p. 22; Palazzo *et al.* 2005, p. 10). When above-ground plants are present, flowering usually occurs in late April and May, fruit set occurs in June, and the seeds are released in late June or early July. Seeds produced in a given year are dormant for at least a year before any germination takes place. Following this year of dormancy, approximately 6 percent of the initially viable seeds produced in a given year germinate annually (Meyer *et al.* 2005, pp. 17–18). When

combined with an average annual 3 percent loss of seed viability, approximately 9 percent of the original seed cohort per year is lost after the first year. Thus, after 12 years, all seeds in a given cohort will likely have either died or germinated, resulting in a maximum estimated longevity of 12 years for seeds in the seed bank (Meyer *et al.* 2005, p. 18).

Billinge and Robertson (2008, pp. 1005–1006) report that both small and large slickspot peppergrass populations share similar spatial structure, and that spatial structuring within its unique microsite slickspot habitats suggests that both pollen dispersal and seed dispersal are low for this species and occur over short distances (Robertson *et al.* 2006a, p. 3; Billinge and Robertson 2008, pp. 1005–1006). Dispersal and seed dormancy modeling of desert annual plants predicts that plants with long-range dispersal will have few dormancy mechanisms and quick germination (Venable and Lawlor 1980, p. 272). Contrary to this prediction, however, slickspot peppergrass has delayed germination (Meyer *et al.* 2005, pp. 17–18), and, therefore, according to the model, may not disperse long distances. The primary seed dispersal mechanism for slickspot peppergrass is not known (Robertson and Ulappa 2004, p. 1708), although viable seeds have been found outside of slickspots, indicating that some seed dispersal is occurring beyond slickspot habitat (Palazzo *et al.* 2005, p. 10). Additionally, beginning in mid-July, entire dried-up biennial plants and some larger annual plants have been observed to break off at the base and are blown by the wind (Stillman, pers. obs., as reported in Robertson *et al.* 2006b, p. 44). This tumbleweed-like action may have historically resulted in occasional long-distance seed dispersal (Robertson *et al.* 2006b, p. 44). Ants are not considered a likely disperser despite harvesting an average of 32 percent of fruits across six sites (Robertson and White 2007, p. 11).

Slickspot peppergrass seeds located near the soil surface show higher rates of germination and viability (Meyer and Allen 2005, pp. 6–8; Palazzo *et al.* 2005, p. 10) and the greatest seedling emergence success rate (Meyer and Allen 2005, pp. 6–8). Viable seeds were more abundant and had greater germination rates from the upper 2 in. of soil (Palazzo *et al.* 2005, pp. 8, 10), while Meyer and Allen (2005, pp. 6–8) observed the upper 0.08 in. as optimal for germination. Deep burial of slickspot peppergrass seeds (average depths greater than 5.5 in.) can entomb viable seeds and may preserve them beyond the 12-year period previously assumed as the maximum period of viability for slickspot peppergrass seeds (Meyer and Allen 2005, pp. 6, 9). However, seeds buried at such depth, even if they remain viable, are unlikely to regain the surface for successful germination. The effects of environmental factors, such as wildfire, on slickspot peppergrass seed dormancy and viability are unknown although slickspot peppergrass abundance is reduced in burned areas.

Pollination

Slickspot peppergrass is primarily an outcrossing species requiring pollen from separate plants for more successful fruit production and has a low seed set in the absence of insect pollinators (Robertson 2003, p. 5; Robertson and Klemash 2003, p. 339; Robertson and Ulappa 2004, p. 1707; Billinge and Robertson 2008, pp. 1005–1006). Slickspot peppergrass is able to self-pollinate, with a selfing rate (rate of self-pollination) of 12 to 18 percent (Billinge 2006, p. 40; Robertson *et al.* 2006a, p. 40). In pollination experiments where researchers moved pollen from one plant to another, fruit production was higher when pollen from distant sources was used (4 to 12.4 miles (mi)) between patches of plants) than when pollen from plants within the same patch was used (246 to 330 feet (ft)) between plants within the same patch) (Robertson and Ulappa 2004, p. 1705; Robertson *et al.* 2006a, p. 3).

Fruits produced from fertilized flowers reach full size approximately two weeks after pollination (Robertson and Ulappa 2004, p. 1706). Each fruit typically bears two seeds that drop to the ground when the fruit dehisces (splits open) in midsummer (Billinge and Robertson 2008, p. 1003).

Known slickspot peppergrass insect pollinators include several families of bees (Hymenoptera), including Apidae, Halictidae, Sphecidae, and Vespidae; beetles (Coleoptera), including Dermestidae, Meloidae, and Melyridae; flies (Diptera), including Bombyliidae, Syrphidae, and Tachinidae; and others (Robertson and Klemash 2003, p. 336; Robertson *et al.* 2006b, p. 6). In slickspot peppergrass insect pollinator studies conducted at three study sites, seed set was not limited by the number of pollinators at any study site (Robertson *et al.* 2004, p. 14). Studies have shown a strong positive correlation between insect diversity and the number of slickspot peppergrass plants flowering at a site (Robertson and Hannon 2003, p. 8). Measuring fruit set per visit revealed considerable variability in the effectiveness of pollination by different types of insects, ranging from 0 percent in dermestid beetles to 85 percent in honeybees (*Apis mellifera*) (Robertson *et al.* 2006b, p. 15).

Population Dynamics

Due to its occupancy of patchily distributed slickspots, the habitat of slickspot peppergrass is somewhat naturally fragmented. However, large-scale fragmentation can pose problems for slickspot peppergrass by creating barriers in the landscape that prevent effective genetic exchange between populations. Seed dispersal for slickspot peppergrass likely occurs only over very short distances; thus, pollinators and pollen dispersal are the primary means for reproductive and genetic exchange between slickspot peppergrass sites (Robertson and Ulappa 2004, pp. 1705, 1708; Stillman *et al.* 2005, pp. 1, 6–8).

Research indicates that seeds generated by the pollen of nearby plants have reduced viability, and that slickspot peppergrass seed viability increases as the distance to the contributing pollination source increases (Robertson and Ulappa 2004, pp. 1705, 1708). The ability to exchange pollen with distant populations is therefore an advantage for slickspot peppergrass. Barriers or too much distance between slickspots and pollinating insect habitats can reduce the effective range of insects important to slickspot peppergrass pollination (Robertson *et al.* 2004, pp. 2–4). Barriers can include agricultural fields, urban development, and large areas of annual and perennial grass monocultures that do not support diversity and suitable floral resources such as nectar or edible pollen for pollinators. Slickspot peppergrass habitats separated by distances greater than the effective range of available pollinating insects (about 0.6 mi. as described in Colket and Robertson *in litt.* 2006, p. 1) are at a genetic disadvantage and may become vulnerable to the effects of loss of genetic diversity (Stillman *et al.* 2005, pp. 1, 6–8) and a reduction in seed production (Robertson *et al.* 2004, p. 1705). A genetic analysis of slickspot peppergrass suggested that populations in the Snake River Plain and Owyhee Plateau "may have reduced genetic diversity" (Larson *et al.* 2006, p. 1).[7]

Many of the remaining occurrences of slickspot peppergrass, particularly in the Snake River Plain near urban centers, are restricted to small, remnant patches of suitable sagebrush-steppe

[7] The Boise Foothills were not analyzed separately in this study.

habitat. When last surveyed, 31 of the 80 EOs (39 percent) each had fewer than 50 plants (Colket *et al.* 2006, Tables 1–13). Many of these small, remnant EOs exist within habitat that is degraded. Small slickspot peppergrass populations have likely persisted due to their long-lived seed bank, but the potential risk of depleting each population's seed bank with no new genetic input makes the persistence of these small populations uncertain. Providing suitable nesting and foraging habitats for the species' insect pollinators is important for maintaining slickspot peppergrass genetic diversity. Small populations are vulnerable to relatively minor environmental disturbances such as wildfire, herbicide drift, and nonnative plant invasions (Given 1994, pp. 66–67) and are subject to the loss of genetic diversity from genetic drift and inbreeding (Ellstrand and Elam 1993, pp. 217–237). Populations with lowered genetic diversity are more prone to extirpation (Barrett and Kohn 1991, pp. 4, 28). Smaller populations generally have lower genetic diversity, and lower genetic diversity may lead to even smaller populations by decreasing the species' ability to adapt, thereby increasing the probability of population extinction (Newman and Pilson 1997, p. 360).

Fragmentation (either by development or wildfires) has occurred in 62 of 79 EOs (15 of 16 on the Boise Foothills, 35 of 42 on the Snake River Plain, and 12 of 21 on the Owyhee Plateau), and within 0.31 mi in 78 of the 79 EOs (all except one on the Owyhee Plateau) (Cole 2009, threats table).[8] Additionally, several development projects are planned within slickspot peppergrass occupied range that would contribute to further large-scale fragmentation of its habitat, potentially resulting in decreased viability of populations through decreased seed production, reduced genetic diversity, and increased inherent vulnerability of small populations to extirpation.

2.3.1.4 Status and Distribution

The range of slickspot peppergrass is restricted to the volcanic plains of southwest Idaho, occurring primarily in the Snake River Plain and its adjacent northern foothills, with a single disjunct population on the Owyhee Plateau (Figure 3). The plant occurs at elevations ranging from approximately 2,200 to 5,400 ft in Ada, Canyon, Gem, Elmore, Payette, and Owyhee Counties (Moseley 1994, pp. 3–9). Based on differences in topography, soil, and relative abundance, we have divided the extant slickspot peppergrass populations into three physiographic regions: the Boise Foothills, the Snake River Plain, and the Owyhee Plateau. The nature and severity of factors affecting the species also vary between the three physiographic regions for the purposes of analysis. For example, urban and rural development, agriculture, and infrastructure development has been substantial in the sagebrush-steppe habitat of the Boise Foothills and the Snake River Plain regions, while very little of these types of development have occurred within the Owyhee Plateau region.

As of February 2009, there were 80 extant EOs in the three physiographic regions that collectively comprise approximately 15,801 ac of total area broadly occupied by slickspot peppergrass (Cole 2009, threats table). The area actually occupied by slickspot peppergrass is a small fraction of the total acreage since slickspots occupy only a small percentage of the

[8] Habitat information is known for 79 of the 80 extant EOs; habitat information is not known for 1 EO on the Snake River Plain.

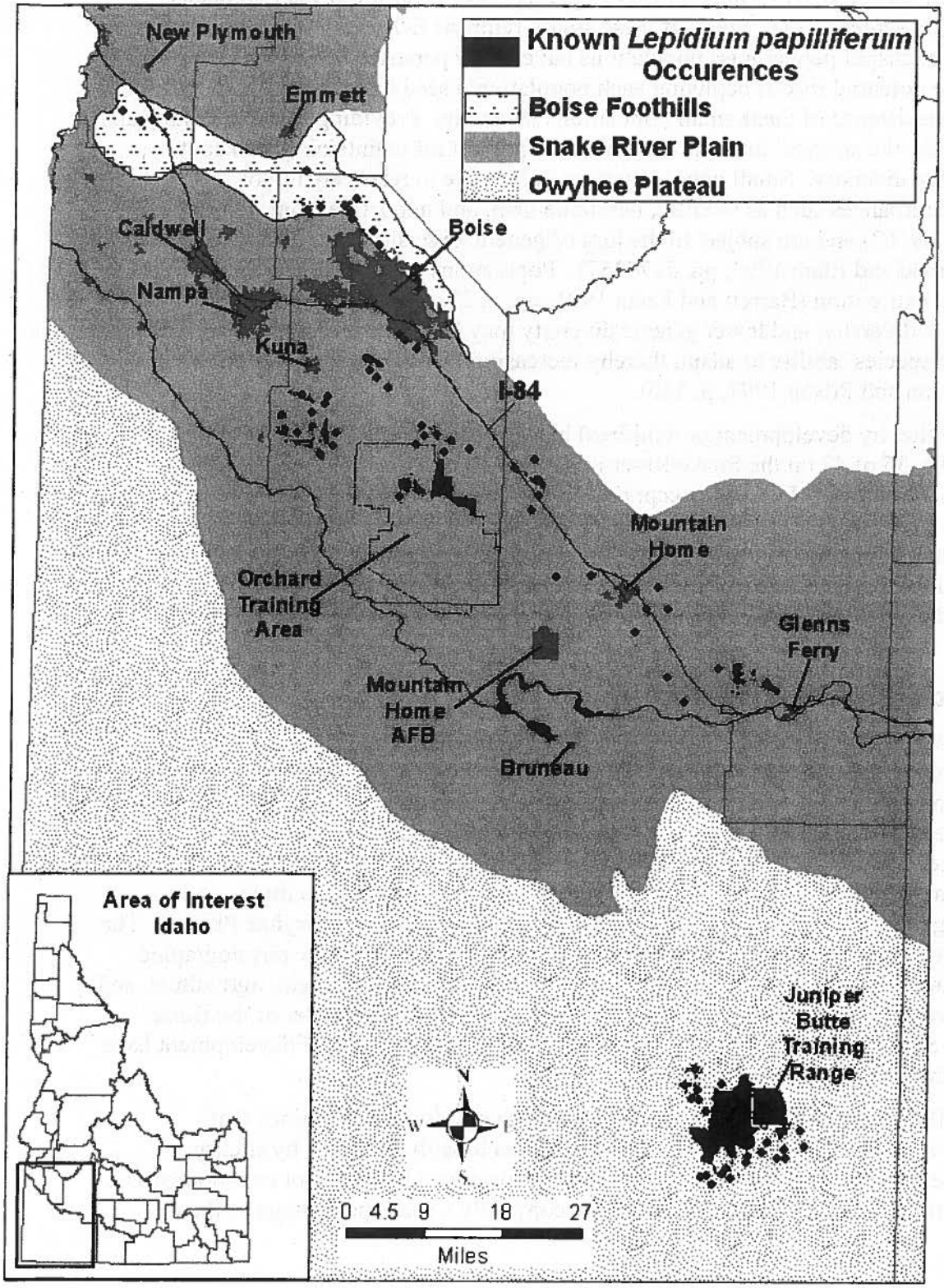

Figure 3. The range of slickspot peppergrass (*Lepidium papilliferum*) in southwest Idaho, showing its distribution in the Snake River Plain, Boise Foothills, and Owyhee Plateau.

landscape, and slickspot peppergrass occupies only a fraction of those slickspots (see U.S. Air Force 2002 , p. 9). Table 7 presents distribution, land ownership and management information for all slickspot peppergrass EOs, in total and by region. The majority of slickspot peppergrass sites are located on Federal lands, most of which are administered by the Bureau.

Habitat Characteristics

The biological soil crust, also known as a microbiotic crust or cryptogamic crust, is one component of quality habitat for slickspot peppergrass. Such crusts are commonly found in semiarid and arid ecosystems and are formed by living organisms, primarily bryophytes, lichens, algae, and cyanobacteria, that bind together surface soil particles (Moseley 1994, p. 9; Johnston 1997, p. 4). Microbiotic crusts play an important role in stabilizing the soil and preventing erosion, increasing the availability of nitrogen and other nutrients in the soil and regulating water infiltration and evaporation levels (Johnston 1997, pp. 8–10). In addition, an intact crust appears to aid in preventing the establishment of invasive plants (Brooks and

Pyke 2001, p. 4 and references therein; Serpe *et al.* 2006, pp. 174, 176). These crusts are sensitive to disturbances that disrupt crust integrity, such as compression due to livestock trampling or off highway vehicle (OHV) use and are subject to damage by fire; recovery from disturbance is possible but occurs very slowly (Johnston 1997, pp. 10–11).

Slickspot peppergrass occurs in slickspot habitat microsites scattered within the greater semiarid sagebrush-steppe ecosystem of southwestern Idaho. On a broad scale, the Snake River Plains and the Owyhee Plateau physiographic regions are volcanic in nature and underlain by Tertiary basalt or rhyolite; the adjacent Boise Foothill sites are underlain by Pliocene/Quaternary lacustrine deposits (Moseley 1994, p. 8). Slickspots are visually distinct openings characterized by natric soils and distinct clay layers; they tend to be highly reflective and relatively light in color, making them easy to detect on the landscape (Fisher *et al.* 1996, p. 3). Slickspots are distinguished from the surrounding sagebrush matrix as having the following characteristics: microsites where water pools when rain falls (Fisher *et al.* 1996, pp. 2, 4); sparse native vegetation, distinct soil layers with a columnar or prismatic structure, higher alkalinity and clay content, and natric properties (Fisher *et al.* 1996, pp. 15–16; Meyer and Allen 2005, pp. 3–5, 8; Palazzo *et al.* 2008, p. 378); and reduced levels of organic matter and nutrients due to lower biomass production (Meyer and Quinney 1993, pp. 3, 6; Fisher *et al.* 1996, p. 4). Fisher *et al.* (1996, p. 11) describe slickspots as having a "smooth, panlike surface" that is structureless and slowly permeable when wet, moderately hard and cracked when dry. Although the low permeability of slickspots appears to help hold moisture (Moseley 1994, p. 8), once the thin crust dries out, slickspot peppergrass seedling survival depends on its ability to extend its taproot into the argillic horizon (soil layer with high clay content) to extract moisture from the deeper natric zone (Fisher *et al.* 1996, p. 13).

How long slickspots take to form is unknown, but is hypothesized to take several thousands of years (Nettleton and Peterson 1983, p. 193; Seronko 2006, *in litt.* p. 2). Climate conditions that allowed slickspot formation in southwestern Idaho are thought to have occurred during a wetter Pleistocene period. Holocene additions of wind-carried salts (often loess deposits) produced the natric soils characteristic of slickspots (Nettleton and Peterson 1983, p. 191; Seronko 2006, *in litt.*, p. 2). Several hundred years may be necessary to alter or lose slickspots through natural climate change or severe natural erosion (Seronko 2006, *in litt.* p. 2). However, some researchers hypothesize that new slickspots are no longer being created given current climatic

Table 7. Distribution and landownership of slickspot peppergrass Element Occurrences (EOs) by physiographic region (Cole 2009, threats table; Sullivan and Nations 2009, p. 77). All areas are estimates and may not total exactly due to rounding.

	Slickspot Peppergrass EOs		Federal		State		Private		Total	
	Number	Percent (%)	Acres	Percent (%)	Acres	Percent (%)	Acres	Percent	Acres	Percent (%)
Snake River Plain	43	54.0	12,754	98.0	55	0.5	164	1.5	12,980	82.0
Boise Foothills	16	20.0	89	48.0	0	0.0	96	52.0	185	1.2
Owyhee Plateau	21	26.0	2,636	99.7	7 ac	0.3	0	0.0	2,643	16.8
All Extant EOs	**80**	**100.0**	**15,479**	**98.0**	**62 ac**	**0.4**	**260**	**1.6**	**15,801**	**100.0**

conditions (Nettleton and Peterson 1983, pp. 166, 191, 206). As slickspots in southwest Idaho appear to have formed during the Pleistocene and current climate conditions may not allow for the formation of new slickspots, the loss of slickspot microsites appears to be permanent.

Some slickspots subjected to past light disturbance may be capable of reforming (Seronko 2006, *in litt.* p.2). However, disturbances that alter the physical properties of the soil layers, such as deep disturbance and the addition of organic matter, may lead to the destruction and permanent loss of slickspots. For example, deep soil tilling and adding organic matter and gypsum have been recommended for eliminating slickspots from agricultural lands in Idaho (Peterson 1919, p. 11; Rasmussen *et al.* 1972, p. 142). Slickspot soils are especially susceptible to mechanical disturbances when wet (Rengasamy *et al.* 1984, p. 63; Seronko 2004, *in litt.* pp. 1–2). Such disturbances disrupt the soil layers important to slickspot peppergrass seed germination and seedling growth and alter hydrological function. Meyer and Allen (2005, p. 9) suggest that if sufficient time passes following the disturbance of slickspot soil layers, the slickspot soil layers may regain their pre-disturbance configuration yet not support the species. Thus, while the slickspot appears to have regained its former character, some essential component required to sustain the life history requirements of slickspot peppergrass has apparently been lost, or the active seed bank is no longer present.

Most slickspots are between 10 and 20 square feet (ft^2) in size although some are as large as 109 ft^2 (Mancuso *et al.* 1998, p. 1). Slickspots cover a relatively small cumulative area within the larger sagebrush-steppe matrix, and only a small percentage of slickspots are known to be occupied by slickspot peppergrass.

Slickspot peppergrass has infrequently been documented outside of slickspots on disturbed soils, such as along graded roadsides and badger mounds. These are rare observations and the vast majority of plants documented over the past 19 years of surveys and monitoring for the species were within slickspot microsite habitats (USFWS 2006b, p. 20). For example, in 2002, a complete census of an 11,070-ac area recorded approximately 56,500 slickspots (U.S. Air Force 2003 *in litt.*, p. 15), of which approximately 2,450 (about 4.0 percent) were occupied by slickspot peppergrass plants (Bashore, pers. comm. 2003, p. 1). Of the approximately 11,300 slickspot peppergrass plants documented during the survey effort, only 11 plants (less than 1 percent) were documented outside of slickspots (U.S. Air Force 2002, summary attachment).

Not all potential slickspot peppergrass habitats in southwest Idaho have been surveyed, and additional slickspot peppergrass sites may be found outside of areas known to be occupied. Recent modeling was completed to develop a high-quality, predictive-distribution model of slickspot peppergrass to identify potential habitat (Colket 2008, p. 1). The Assessment defines potential habitat as areas within the known range of slickspot peppergrass that have certain general soil and elevation characteristics that indicate the potential for the area to support slickspot peppergrass although the presence of slickspots or the plant is unknown (USBLM 2009, p. B–2). Although surveys were conducted in 2008 in some areas identified as previously unsurveyed habitat with potential to contain the species, these surveys did not result in any new locations of the species (Colket 2008, pp. 4–6). Slickspot peppergrass has also been surveyed for in eastern Oregon, but the species has never been found there (Findley 2003 *in litt.*, p. 1). We have no historical records indicating that slickspot peppergrass has ever been found anywhere outside of its present range in southwestern Idaho.

The Idaho Natural Heritage Program (INHP) uses an EO ranking system for assessing the status of slickspot peppergrass. This system ranks slickspot peppergrass occurrences based on measures of habitat quality and species abundance. EO ranks are useful for assessing estimated viability or probability of persistence and helping prioritize conservation planning or actions (NatureServe 2002). The ranks are defined as follows (Colket *et al.* 2006, pp. 3–4):

- A-Rank—
  - SIZE: Greater than1,000 detectable genets.
  - CONDITION: Native plant community is intact with trace introduced plant species cover. Slickspots have zero or trace introduced weed cover and/or livestock disturbance. Zero or few minor anthropogenic disturbances are present. EO is unburned.
  - LANDSCAPE CONTEXT: Surrounding landscape less than 0.6 mi away has not been fragmented by agricultural lands, residential or commercial development, introduced annual grasslands, or drill seeding projects.
- B-Rank—
  - SIZE: 400–999 detectable genets.
  - CONDITION: Native plant community is intact with low introduced plant species cover. Slickspots have low introduced weed cover and/or livestock disturbance. Zero or few minor anthropogenic disturbances present. EO is predominantly unburned.
  - LANDSCAPE CONTEXT: Surrounding landscape less than 0.6 mi away is minimally to partially fragmented by agricultural lands, residential or commercial development, introduced annual grasslands, or drill seeding projects.
- C-Rank—
  - SIZE: 50–399 detectable genets.
  - CONDITION: Native plant community is partially intact with low-to-moderate introduced plant species cover. Slickspots have low-to-moderate introduced weed cover and/or livestock disturbance. Few or several minimally to moderately severe anthropogenic disturbances are evident. EO has partially burned. Portions of EO may have been drill seeded, but slickspots are largely intact.
  - LANDSCAPE CONTEXT: Surrounding landscape less than 0.6 mi away is partially to predominantly fragmented by agricultural lands, residential or commercial development, introduced annual grasslands, or drill seeding projects.
- D-Rank—
  - SIZE: 1–49 detectable genets.
  - CONDITION: Few components of the native plant community remain and introduced plant species cover is high. Slickspots have high introduced weed cover and/or livestock disturbance. Few or several moderately severe anthropogenic disturbances are evident. EO has been predominantly to completely burned. Portions of EO may have been drill seeded, and slickspot soils have been altered by drill seeding.
  - LANDSCAPE CONTEXT: Surrounding landscape less than 0.6 mi away is moderately to completely fragmented by agricultural lands, residential or commercial development, introduced annual grasslands, or drill seeding projects.

- E-Rank (Extant)—
  - EO has been verified extant, but population size, condition, and landscape context have not been assessed.
- F-Rank (Failed to find)—
  - EO has been surveyed by experienced individuals who failed to find any slickspot peppergrass individuals, despite searching under conditions appropriate for the element at a location where it was previously recorded. Only one visit is required for this rank designation, but the survey should cover the entire extent of the EO. The F-rank was first standardized by NatureServe (2002) and not implemented for slickspot peppergrass before 2006.
- H-Rank (Historical)[9]—
  - An EO that has not been observed since 1970. These are historical EOs indicating where slickspot peppergrass was reported, often based on older herbarium records. Locations associated with these herbarium records are typically geographically vague and may be simply indicated by the name of a town.
- X-Rank (Extirpated)—
  - EO has been extirpated. Extirpation is based on: 1) agricultural conversion, commercial or residential development, or other documented habitat destruction where slickspot peppergrass has been previously recorded, or 2) when an EO has consistently received an F-rank five times within a 12-year time period.
- X?-Rank (Probably Extirpated)—
  - EO has probably been extirpated. The "?" qualifier is used with the most appropriate rank (i.e. X?) if there is incomplete information on the EO size, condition, and/or landscape context factors.

As of February 2009, the INHP has ranked 80 extant EO records for slickspot peppergrass based on habitat quality and abundance (Cole 2009, threats table). No A-ranked EOs for slickspot peppergrass exist. The most common rangewide EO ranks for slickspot peppergrass are C and D. EO ranks also vary by physiographic region. A little more than one-half of the extant EO area in the Boise Foothills region is C-ranked. Approximately three-quarters of the total EO area in the Snake River Plain is B-ranked. The majority of B-ranked EO acreage rangewide occurs on the IDANG's OTA. The majority of the total EO area in the Owyhee Plateau physiographic region is also B-ranked. In addition, nine EOs are ranked as X or X?, and seven EOs are ranked as H.

[9] No G-Rank exists in the INHP EO ranking system for slickspot peppergrass.

Population Trends

Extreme variability in annual plant counts makes detecting significant population trends in slickspot peppergrass difficult. However, the best scientific and commercial evidence available collected over the past 18 years from the rough census areas on the OTA shows a significant downward density trend in the abundance of slickspot peppergrass plants during the past two decades (74 FR 52025, October 8, 2009). Furthermore, we believe it is reasonable to infer that this negative trend may be similar or possibly even greater rangewide in areas outside the high-quality habitat of the OTA, and this trend appears to be independent of any precipitation trend.

Uncertainties associated with both the data and the model, used by Sullivan and Nations (2009) in their analysis of slickspot peppergrass density and abundance on the OTA over time; preclude our ability to project future population trends for slickspot peppergrass. These uncertainties include, but are not limited to, great annual variability in plant numbers; the confounding influence of the long-lived seed bank; complications associated with annual variability in both precipitation and temperature; and inconsistent results between the special-use plots and the rough census areas on the OTA (see Sullivan and Nations 2009, pp. 28–33 for an explanation of these two OTA survey methodologies). The evaluation by Sullivan and Nations (2009, pp. 1–278) was based on a simple model of slickspot peppergrass abundance or density as a linear function of time and intended only to discern whether there was any general population trend (74 FR 52025, October 8, 2009). The authors acknowledge that the dynamics are complicated, and note their model is not intended to describe (nor explain) the details of the temporal pattern of abundance or density of slickspot peppergrass (Sullivan and Nations 2009, p. 38). In addition, we do not have any models for slickspot peppergrass based on multivariate analyses, which would simultaneously consider additional variables such as precipitation to potentially allow for the prediction of abundance or density of slickspot peppergrass over time based on projected conditions. As stated in our listing rule, although the available descriptive model is helpful for interpreting the population information available to date and indicates that slickspot peppergrass has likely been trending downward for all of the reasons outlined above, it would be inappropriate to rely on this model to predict any future population trajectory for slickspot peppergrass (74 FR 52025, October 8, 2009).

2.3.1.5 Previous Consultations and Conservation Efforts

The Service has completed several consultations under section 7 of the Act for programs and individual actions located in the vicinity of the ongoing livestock grazing within the Allotment. Some of these were completed as letters of concurrence/conference reports (Normal Fire Emergency Stabilization and Rehabilitation Plan, Noxious Weed Management Plan) as they were determined to be unlikely to adversely affect listed/proposed species, including slickspot peppergrass. Following listing of the species in 2009, conference reports for slickspot peppergrass were converted to letters of concurrence, at the request of the Bureau, to ensure continued compliance under section 7 of the Act. The Service has also completed formal consultations with the Bureau on the Kuna MFP, which provides management direction for the Allotment area. For actions that are underway, standing concurrences and consultations will remain in effect as long as the actions are carried out as proposed and no new information surfaces to indicate the species will be affected in unanticipated ways.

As described above, the Service and Bureau have entered into a CA committing to implement conservation measures for slickspot peppergrass to avoid or minimize effects associated with implementing Bureau actions planned under the standards and guidelines of their LUPs (USBLM and USFWS 2009, entire). The conservation measures and associated implementation actions for ongoing Bureau LUP programs provide overall guidance for avoiding or minimizing direct and indirect effects to the habitat of slickspot peppergrass and restoring and maintaining that habitat. Conservation measures and implementation actions for slickspot peppergrass include conducting species inventories on Bureau lands, exchanging location information with agency partners, completing site-specific section 7 consultation on both ongoing and new actions, and avoiding or minimizing potential adverse impacts of site-specific projects covered under LUP programs. Site-specific implementation and effectiveness monitoring, including annual reporting requirements, will also be completed to track progress toward achieving conservation objectives. All conservation measures in the CA will be implemented until such time that new LUPs or amendments are approved with completed consultations and signed Records of Decision. The CA provides goals for inventories of slickspot peppergrass as well as direction for completing section 7 consultations on all ongoing and proposed activities on Bureau lands that may affect this species. The 2009 CA between the Bureau and the Service is presented in its entirety in Appendix C of this Opinion.

As described above, the Bureau is also implementing conservation measures defined in the CCA signed between the State of Idaho, the Bureau, the Idaho Army National Guard (IDARNG), and nongovernmental cooperators (private landowners who also hold livestock grazing permits on Bureau lands) (State of Idaho *et al.* 2003, entire and 2006, entire). The majority of the individual conservation efforts being implemented for slickspot peppergrass that are applicable to individual projects are contained in the CCA, which was originally drafted in 2003 and updated in 2006. The CCA represents an important milestone in the cooperative conservation of slickspot peppergrass given its rangewide scope and coordinated management across lands managed by Federal agencies and the State of Idaho. The CCA includes rangewide efforts that are intended to address the need to maintain and enhance slickspot peppergrass habitat; reduce intensity, frequency, and size of natural- and human-caused wildfires; minimize loss of habitat associated with wildfire-suppression activities; reduce the potential of nonnative plant species invasion from wildfire; minimize habitat loss associated with rehabilitation and restoration techniques; minimize the establishment of invasive nonnative species; minimize habitat loss or degradation from OHV use; mitigate the negative effects of military training and other associated activities on the Orchard Training Area (OTA)[10], an Idaho Army National Guard training area on Bureau land; and minimize the impact of ground disturbances caused by livestock penetrating trampling when soils are saturated (State of Idaho *et al.* 2006, p. 3). Penetrating trampling is defined by the CCA as breaking through the restrictive layer (i.e., the middle layer of slickspot soil that supports slickspot peppergrass, as described by Meyer and Allen 2005, p. 3) under the silt surface area of a slickspot during saturated conditions (State of Idaho *et al.* 2006, p. 9).

[10] The Orchard Training Area has recently been renamed and is currently known as the Orchard Regional Combat Training Center (ORCTC).

As a signatory of the CCA (State of Idaho *et al.* 2003, 2006), the Bureau is the primary land management agency responsible for implementing conservation actions for slickspot peppergrass on their lands. Implementing the conservation measures in the CCA represents a major commitment on behalf of the Bureau, which has management authority for the majority of the range where slickspot peppergrass occurs (i.e., 87 percent of the total Element Occurrence [EO] area [13,470 ac] and partial-to-entire management authority for 69 of the 80 extant EOs comprising the current population of this species occur on Bureau lands). The Bureau also has the lead for implementing CCA-derived conservation measures that were appropriate for LUP-level programs that were included in the August 22, 2006 CA between the Service and the Bureau to avoid or minimize the adverse impacts of implementing Bureau LUPs to slickspot peppergrass (USBLM and USFWS 2006, entire).

Although the majority of the conservation measures identified in the CCA have been implemented to date, relatively few of these measures have been determined at this time to be measurably effective for conserving slickspot peppergrass. For example, many of the implemented measures include conducting surveys, monitoring, or providing for public outreach and education, which have limited direct or long-term conservation benefits to the species. With the exception of several conservation efforts implemented at the OTA that have been successful in controlling wildfire effects on slickspot peppergrass habitats, many of the remaining conservation efforts and adaptive management provisions identified in the CCA have not been implemented over a long enough period of time to demonstrate their effectiveness in reducing threats to the species. Furthermore, the conservation measures identified in the CCA are concentrated on slickspot peppergrass EOs. While this focus is helpful, effectively controlling the most significant threats to slickspot peppergrass (wildfire and invasive nonnative plant species) requires efforts that extend well beyond the boundaries of the EOs since these threats are naturally expansive and occur throughout the Great Basin. We recognize the conservation efforts identified in the CCA have a conservational benefit for slickspot peppergrass, but rangewide their effectiveness in reducing or eliminating the most significant threats to the species has not been demonstrated at this time.

Conservation measures identified for slickspot peppergrass are either specific measures designed to reduce impacts to the species and its habitat at the local level, or general measures designed to improve the ecological condition of native sagebrush-steppe vegetation at a landscape scale, inclusive of areas supporting slickspot peppergrass. Specific measures include management actions such as varying the timing or season of livestock grazing or trailing and moving water or supplements away from EOs. General measures include management actions designed to maintain or increase native forb and grass cover, protect sagebrush through fire protection or suppression, and restore degraded habitats to improve connectivity between sites. General conservation measures and implementation actions within the CA include direction to prioritize slickspot peppergrass EOs for fire protection and weed control across the range of the species. For example, the CA indicates that fire suppression efforts will be conducted, as possible, to protect slickspot peppergrass habitat; protecting slickspot peppergrass habitat will be a high priority. The Bureau will also promote diversity, richness, and health of native plant communities to support pollinators and habitat for slickspot peppergrass, including conducting weed control activities compatible with slickspot peppergrass conservation. The Service expects the Bureau's continued implementation of these general conservation measures will reduce

effects from wildfire and nonnative invasive plants across the range of the species, including within the Allotment.

2.3.1.6 Conservation Needs

Although recovery planning has not been completed for slickspot peppergrass, the Service anticipates that providing for its survival and recovery will entail reducing the threats that are the basis for its being listed: habitat loss, degradation, and fragmentation primarily caused by increased fire frequencies and the invasion of exotic plants; lack of sufficient gene flow between populations; and reduced viability of seed banks. The Service anticipates that the following factors will be important for survival and recovery of the species:

- Protection, restoration, and maintenance of suitable habitat conditions for all life stages of slickspot peppergrass;
- Reduction and mitigation of negative effects caused by increased fire frequencies and invasive nonnative plants on slickspot peppergrass;
- Establishment of vegetation management goals and objectives that are compatible with slickspot peppergrass recovery;
- Identification of what is necessary to conserve genetic diversity and gene flow among populations of slickspot peppergrass; and monitoring to ensure that this diversity and gene flow are being maintained;
- Implementation of an adaptive management based research and monitoring program that uses feedback from implemented, site-specific recovery tasks to implement and evaluate slickspot peppergrass recovery activities;
- Use of all available conservation programs and regulations to protect and conserve slickspot peppergrass and sagebrush-steppe habitats, including slickspot microsites; and
- Development of a management area-based recovery program that relies on adaptive management to implement and revise, as appropriate, recovery actions for slickspot peppergrass.

Slickspot peppergrass survival and recovery depends on maintaining and enhancing Wyoming big sagebrush–steppe habitat and the slickspot microsites located within this ecosystem in southwestern Idaho. The long-term conservation of slickspot peppergrass is dependent upon the maintenance or improvement of ecological function of the higher quality (C- through A-ranked) EOs rangewide, including maintaining or improving connectivity within and between EOs, which may involve the maintenance or enhancement of currently lower ranked EOs (D- through F-ranked) as necessary to facilitate pollinator activity; the maintenance of genetic diversity; and limiting the establishment of invasive nonnative plant species.

Key to maintaining quality habitat includes preserving existing Wyoming big sagebrush stands by avoiding or minimizing adverse effects of wildfire and invasive nonnative plants, such as *Bromus tectorum* (cheatgrass) and *Taeniatherum caput-medusae* (medusahead). The Service has identified the modified wildfire regime in the Great Basin and subsequent proliferation of invasive nonnative plants as the primary threats to slickspot peppergrass. Adequate resources should be made available to reduce the wildfire risk in remaining sagebrush stands, and efforts to maintain and restore native shrubs, grasses, forbs, and biological soil crust should be identified as a priority in areas that have burned in or nearby slickspot peppergrass population strongholds. Plant species that may invade slickspots and compete with slickspot peppergrass should be

avoided for use in emergency stabilization and rehabilitation or habitat restoration seedings in areas that support slickspot peppergrass. Native forb cover should be maintained or restored to levels that would encourage diverse insect pollinators available for slickspot peppergrass seed production. Activities that could cause direct plant mortality should be minimized. Ground disturbance that could cause decreased suitability of microsites to support slickspot peppergrass should be avoided or minimized. When soils are saturated, ground disturbing activities should be minimized to reduce the likelihood of directly affecting plants and burying seeds too deep to successfully germinate and emerge. Conservation measures should be implemented to mitigate the effect of actions that create conditions conducive to invasive nonnative plants within and adjacent to slickspot habitat.

Secondary threats, such as commercial and residential development, seed predation by Owyhee harvester ants (*Pogonomyrmex salinus*), habitat fragmentation and isolation, and climate change, were identified in the Federal Register notice for listing of slickspot peppergrass as factors that could impact slickspot peppergrass throughout a significant portion of its range. Other factors, including livestock grazing, fire rehabilitation activities, military training, and recreational use, were discussed as not having significant impacts that would lead to slickspot peppergrass becoming endangered in the foreseeable future. However, both secondary threats and these other factors have been identified as aggravating degraded habitat conditions caused by the modified wildfire regime and associated invasion of nonnative plants. While not identified as rangewide issues, secondary threats and other factors may adversely affect individual slickspot peppergrass plants at the physiographic regional or local level. In areas containing high-quality sagebrush-steppe habitats, conservation measures should be implemented to avoid or minimize the impacts of habitat loss on slickspot peppergrass. Actions that could degrade slickspots to the point that they can no longer provide the essential functions to support slickspot peppergrass should be avoided as losing habitat represents a permanent loss for the species. Using pesticides near EOs should also be minimized to avoid impacts to individual slickspot peppergrass plants or insect pollinators.

Slickspot peppergrass survival and recovery depends on maintaining and enhancing Wyoming big sagebrush–steppe habitat and the slickspot microsites located within this ecosystem in southwestern Idaho. The long-term conservation of slickspot peppergrass is dependent upon the maintenance or improvement of ecological function of the higher quality (C- through A-ranked) EOs rangewide, including maintaining or improving connectivity within and between EOs, which may involve the maintenance or enhancement of currently lower ranked EOs (D- through F-ranked) as necessary to facilitate pollinator activity; the maintenance of genetic diversity; and limiting the establishment of invasive nonnative plant species.

For purposes of this jeopardy analysis, the maintenance or improvement of medium-to-high conservation value EOs (i.e., those currently ranked C through B by INHP, and including any EOs that may be A-ranked in the future) will be an important component of the rangewide conservation strategy for slickspot peppergrass. We anticipate the enhancement of higher-quality EOs will effectively offset the relatively low contribution made by the lower-ranked EOs of lesser conservation value to the species. In general, small populations of slickspot peppergrass in degraded and fragmented habitat are at high risk of extirpation and are unlikely to significantly contribute to the conservation of the species.

The anticipated beneficial and adverse effects of livestock grazing actions associated with the Allotment form the basis for our determination as to whether this action is expected to maintain, reduce, or improve the current conservation value of the affected area for slickspot peppergrass over the duration of the permitted action (about 2 more years). Conservation measures designed to reduce wildfire threats and competition from invasive nonnative plants are expected to be especially important for the survival and recovery of slickspot peppergrass.

Effects of Climate Change on Slickspot Peppergrass Survival and Recovery Needs

Warmer temperature regimes associated with global climate change represent another potentially significant risk factor for slickspot peppergrass. Researchers confirmed "experimentally in an intact ecosystem that elevated carbon dioxide may enhance the invasive success of *Bromus* spp. in arid ecosystems," and suggest that this enhanced success will then expose these areas to accelerated fire cycles (Smith *et al.* 2000, p. 81). Chambers and Pellant (2008, p. 32) also suggest that higher carbon dioxide levels are likely increasing cheatgrass fuel loads due to increased productivity, with a resulting increase in fire frequency and extent. Based on the best available information, we therefore expect continuing production of atmospheric carbon dioxide at or above current levels, as predicted, to increase the threat posed to slickspot peppergrass by cheatgrass and from more frequent, expansive, and severe wildfires (Smith et al. 1987, p. 143; Smith et al. 2000, p. 81; Brown et al. 2004, p. 384; Neilson et al. 2005, pp. 150, 156; Chambers and Pellant 2008, pp. 31-32). Thus, under current climate-change projections, we anticipate

- future climatic conditions will favor further invasion by cheatgrass;
- fire frequency is likely to continue to increase; and
- the extent and severity of fires may also increase.

Current projections for the Pacific Northwest region are that precipitation will increase in the winter but decrease in the summer months (Karl et al. 2009, p. 135). The survivorship of slickspot peppergrass rosettes to flower the following spring is favored by greater summer precipitation (Meyer et al. 2005, p. 15; CH2MHill 2007, p. 14; Sullivan and Nations 2009, pp. 33, 41), and increased winter precipitation appears to decrease survivorship (Meyer et al. 2005, pp. 15-16; Sullivan and Nations 2009, pp. 39, 43-44). As the projected rainfall pattern under climate change would follow the opposite pattern, this alteration in seasonal precipitation could result in decreased survivorship of slickspot peppergrass. Alterations in precipitation patterns, however, are more uncertain than predicted changes in temperature for the Great Basin region (Neilson et al. 2005, p. 153).

The consequences of climate change, if current projections are realized, are therefore likely to exacerbate the existing primary threats—modified wildfire regime and invasive nonnative plants, particularly cheatgrass—to slickspot peppergrass conservation. Because the Intergovernmental Panel on Climate Change (IPCC) projects changes to the global climate system in the twenty-first century will likely be greater than those observed in the twentieth century (IPCC 2007, p. 45), we anticipate that these effects will continue and likely increase into the future. Due to the uncertainty associated with climate change projections, we did not consider climate change in and of itself to represent a significant rangewide threat to slickspot peppergrass in our listing decision. However, we acknowledge that climate change will likely play a potentially important supporting role in intensifying the most significant current threats to the species in the

foreseeable future. The severity and scope of the primary threats of changing wildfire regime and invasive nonnative plants to slickspot peppergrass are likely to be magnified, depending on the realized outcome of climate change. Habitat conservation and restoration efforts are likely to be further complicated by these climatic changes. Additional conservation measures may be needed to mitigate the effects of habitat degradation that are aggravated by climate change. For a more detailed discussion of climate change and slickspot peppergrass, refer to the final listing rule (74 FR 52014, October 8, 2009).

2.3.2 Slickspot Peppergrass Proposed Critical Habitat

2.3.2.1 Legal Status

Critical habitat was proposed for slickspot peppergrass on May 10, 2011. We anticipate that the final designation of critical habitat for slickspot peppergrass will occur no later than September 2012 following review of public comments received on both our May 2011 proposal and the draft economic analysis of critical habitat designation.

2.3.2.2 Conservation Role and Description of Proposed Critical Habitat

The conservation role of slickspot peppergrass critical habitat is to support the various life history needs and provide for the conservation of the species (76 FR 27190). Four Critical Habitat Units (CHUs) encompassing 57,756 acres in Ada, Elmore, Payette, and Owyhee counties have been identified as being important to the survival and recovery of slickspot peppergrass. All CHUs currently proposed as critical habitat are located within the geographical area occupied by slickspot peppergrass at the time of listing, and are currently occupied by the species. These units proposed as critical habitat contain the physical and biological features essential to the conservation of slickspot peppergrass.

Primary constituent elements (PCEs) include physical and biological features of designated or proposed critical habitat essential to the conservation of the species, including, but not limited to: (1) space for individual and population growth, and for normal behavior; (2) food, water, air, light, minerals, or other nutritional or physiological requirements; (3) cover or shelter; (4) sites for breeding, reproduction, rearing of offspring, germination, or seed dispersal; and (5) habitats that are protected from disturbance or are representative of the historic geographic and ecological distributions of a species [Act §3(5)(A)(i), 50 CFR §424.12(b)]. In determining which areas to propose as critical habitat, the Service considered the physical and biological features that are essential to the conservation of slickspot peppergrass and that may require special management considerations or protection. These features are the PCEs laid out in the appropriate quantity and spatial arrangement for conservation of the species. The PCEs of slickspot peppergrass proposed critical habitat are:

PCE 1. Ecologically-functional microsites or "slickspots" that are characterized by:

- A high sodium and clay content, and a three-layer soil horizonation sequence, which allows for successful seed germination, seedling growth, and maintenance of the seed bank. The surface horizon consists of a thin, silty, vesicular, pored (small cavity) layer that forms a physical crust (the silt layer). The subsoil horizon is a restrictive clay layer

with an abruptic (referring to an abrupt change in texture) boundary with the surface layer, that is natric or natric-like in properties (a type of argillic (clay-based) horizon with distinct structural and chemical features) (the restrictive layer). The second argillic subsoil layer (that is less distinct than the upper argillic horizon) retains moisture through part of the year (the moist clay layer); and

- Sparse vegetation with low to moderate introduced invasive nonnative plant species cover.

PCE 2. Relatively-intact native Wyoming big sagebrush (*Artemisia tridentata* ssp. *wyomingensis*) vegetation assemblages, represented by native bunchgrasses, shrubs, and forbs, within 250 m (820 ft) of slickspot peppergrass element occurrences to protect slickspots and slickspot peppergrass from disturbance from wildfire, slow the invasion of slickspots by nonnative species and native harvester ants, and provide the habitats needed by slickspot peppergrass' pollinators.

PCE 3. A diversity of native plants whose blooming times overlap to provide pollinator species with sufficient flowers for foraging throughout the seasons and to provide nesting and egg-laying sites; appropriate nesting materials; and sheltered, undisturbed places for hibernation and overwintering of pollinator species. In order for genetic exchange of slickspot peppergrass to occur, pollinators must be able to move freely between slickspots. Alternative pollen and nectar sources (other plant species within the surrounding sagebrush vegetation) are needed to support pollinators during times when slickspot peppergrass is not flowering, when distances between slickspots are large, and in years when slickspot peppergrass is not a prolific flowerer.

PCE 4. Sufficient pollinators for successful fruit and seed production, particularly pollinator species of the sphecid and vespid wasp families, species of the bombyliid and tachnid fly families, honeybees, and halictid bee species, most of which are solitary insects that nest outside of slickspots in the surrounding sagebrush-steppe vegetation, both in the ground and within the vegetation.

The space for individual and population growth is provided by PCEs 1, 2, and 3; the need for food, water, air, light, minerals, or other physiological requirements is provided by PCEs 1 and 2; the need for cover and shelter is met by PCEs 1 and 2; sites for reproduction, germination, and seed dispersal are provided by PCEs 1, 2, 3, and 4; and habitat free from disturbance is met by PCE 2 (76 FR 27191).

Activities that cause adverse effects to critical habitat are evaluated to determine if they are likely to "destroy or adversely modify" critical habitat by no longer serving the intended conservation role for the species or retaining those PCEs that relate to the ability of the area to at least periodically support the species. Activities that may destroy or adversely modify critical habitat are those that alter the PCEs to such an extent that the conservation value of critical habitat is appreciatively reduced. The Service's evaluation must be conducted at the scale of the entire critical habitat area designated, unless otherwise stated in the final critical habitat rule (USFWS and NMFS 1998, pp. 4-39). Thus, proposed critical habitat for slickspot peppergrass is evaluated at the scale of the entire area proposed for designation, which includes the four CHUs described above. All four CHUs contain features or areas essential to the conservation of slickspot peppergrass. Therefore, if a proposed or ongoing action would alter the physical or biological features of proposed critical habitat to the extent that appreciably reduces the

conservation function of one or more critical habitat units for slickspot peppergrass, a finding of adverse modification for the entire proposed critical habitat area may be warranted.

2.3.2.3 Current Rangewide Condition of Slickspot Peppergrass Proposed Critical Habitat

The condition of slickspot peppergrass proposed critical habitat varies across its range from poor to good. While some areas contain intact sagebrush steppe habitat, other areas have been fragmented by wildfires and both unseeded and seeded invasive nonnative plants such as cheatgrass and *Agropyron cristatum* (crested wheatgrass). The modified wildfire regime and spread of invasive nonnative plants continues to degrade slickspot microsites and associated sagebrush steppe habitat across the range of slickspot peppergrass (76 FR 27186).

Many factors have impacted slickspot peppergrass and its habitat, and continue to do so. Among the factors that contribute to degraded PCEs, those which appear to be particularly significant and have resulted in degraded habitat conditions within areas proposed for critical habitat designation are as follows:

- **Current Wildfire Regime (i.e., increasing frequency, size, and duration).** The result of this altered wildfire regime has been the conversion of vast areas of the former sagebrush-steppe ecosystem to nonnative annual grasslands (USGS 1999, *in litt.*, pp. 1–9), resulting in loss reduction in cover of sagebrush, native grasses, and native forbs available for insect pollinator foraging and/or shelter. Frequent wildfires can also promote soil erosion and sedimentation (Bunting et al. 2003, p. 82) in arid environments such as the sagebrush-steppe ecosystem. Increased sedimentation can result in a silt layer that is too thick for optimal slickspot peppergrass germination (Meyer and Allen 2005, pp. 6–7). The altered wildfire regime is one of the primary causes of reduced quality of PCEs 1, 2, 3, and 4 of proposed critical habitat for slickspot peppergrass.

- **Invasive Nonnative Plant Species.** Invasive, nonnative plants can alter various attributes of ecosystems including geomorphology, wildfire regime, hydrology, microclimate, nutrient cycle, and productivity (for a summary see Dukes and Mooney 2003, entire). Additionally, these invasive nonnative plants can negatively affect native plants, including rare plants like slickspot peppergrass, through competitive exclusion, niche displacement, hybridization, and competition for pollinators; examples of these negative effects are widespread among different taxa, locations, and ecosystems (D'Antonio and Vitousek 1992, pp. 63–87; Olson 1999, p. 5; Mooney and Cleland 2001, p. 1). Recent analyses have revealed a significant, negative association between the presence of weedy species and the abundance or density of slickspot peppergrass, to the point that the species peppergrass may be excluded from slickspots (Sullivan and Nations 2009, pp. 109–112). Although the specific mechanisms are not well understood, some of these plants, such as *Agropyrum cristatum* (crested wheatgrass) and cheatgrass, are strong competitors in this arid environment for such limited resources as moisture, which tends to be concentrated in slickspots (Pyke and Archer 1991, p. 4; Moseley 1994, p. 8; Lesica and DeLuca 1998, p. 4), at least in the subsurface soils (Fisher et al. 1996, pp. 13–16). Invasive nonnative plants are one of the primary causes of reduced quality of PCEs 1, 2, 3, and 4 of proposed critical habitat for slickspot peppergrass.

- **Habitat Loss and Fragmentation due to Agricultural and Urban Development.** Residential and agricultural development can affect slickspot peppergrass and slickspot habitat through habitat conversion, increased nonnative plant invasions, increased off road vehicle use, increased wildfire, changes to insect populations, and increased fragmentation. Utility lines such as power and gas lines, as well as roads, also fragment slickspot peppergrass occupied areas and act as corridors for nonnative plant invasions. Habitat fragmentation and loss due to development has resulted in localized reduced quality of PCEs 1, 2, 3, and 4 of proposed critical habitat for slickspot peppergrass.

- **Livestock Grazing.** Livestock trampling of water-saturated slickspot soils that breaks through the restrictive layer (referred to as "penetrating trampling" (State of Idaho et al. 2006, p. 9)) has the potential to alter the soil structure and the functionality of slickspots (Rengasamy et al. 1984, p. 63; Seronko 2004, *in litt.*). Penetrating trampling that occurs when slickspots are wet also has the potential to affect the seed bank for slickspot peppergrass by pushing the seeds below a depth where they can germinate (i.e., below 3 cm (1.5 in.)) (Meyer and Allen 2005, pp. 9–10; Meyer et al. 2006, pp. 891, 901–902). Livestock grazing may also locally reduce native forb cover available for insect pollinators. In contrast, with careful management, livestock grazing may be used as a tool to select for certain native species, or even to control cheatgrass (Frost and Launchbaugh 2003, p. 43). Therefore, livestock grazing may result in localized reductions in the quality of PCEs 1, 2, 3, and 4; current livestock management (including continued implementation of conservation measures to avoid or minimize impacts) is not considered to pose a significant threat to proposed critical habitat of slickspot peppergrass.

Other factors that may result in localized reduced quality of proposed critical habitat PCEs include rangeland revegetation projects, wildfire management practices, and recreational use.

Effects of Climate Change on Proposed Critical Habitat for Slickspot Peppergrass

Similar to potential effects of climate change on the species, we also recognize that climate change may cause changes in slickspot peppergrass proposed critical habitat. As previously described, under projected future temperature conditions, the cover of sagebrush in the Great Basin region is anticipated to be dramatically reduced (Neilson et al. 2005, p. 154). Warmer temperatures and greater concentrations of atmospheric carbon dioxide create conditions favorable to cheatgrass, and perpetuate the positive feedback cycle between annual grasses and fire frequency that poses a significant threat to the sagebrush habitat (Chambers and Pellant 2008, p. 32; Karl et al. 2009, p. 83) where slickspot peppergrass occurs.

The direct, long-term impact from climate change to the critical habitat of slickspot peppergrass is yet to be determined. As discussed above, we anticipate that future climatic conditions will favor further invasion by cheatgrass, that fire frequency will continue to increase, and that the extent and severity of fires may increase as well, further changing the species composition of southwest Idaho's sagebrush-steppe habitat. Over a period of decades, climate change may directly threaten the integrity of the essential physical or biological features described in PCEs 1, 2, 3, and 4. Climate change may exacerbate habitat degradation impacts both physically (i.e.,

degradation or loss of slickspot microsites) and biologically (i.e., reduction of insect pollinators due to habitat degradation as well as increased competition with invasive nonnative plants). Protecting slickspot peppergrass strongholds and remaining intact sagebrush steppe habitat from the effects of the modified wildfire regime and associated spread of invasive nonnative plants as well as ensuring connectivity among populations are important considerations in addressing the potential impacts of climate change.

2.3.2.4 Previous Conference on the Effects of Actions on Proposed Critical Habitat

Formal conference on the effects of ongoing or proposed actions on slickspot peppergrass proposed critical habitat is limited to the proposed Northwest Ada County Rights-of-Way for the M3 Development (14420-2011-F-0148) and emergency conference on effects of 2011 wildfire suppression actions on the Bureau's Boise District (01EIFW00-2012-EF-0073). As described in section 2.3.1.5 above, section 7 consultation has occurred on the effects of multiple actions and plans on the species itself. It is anticipated that section 7 conference or consultation, as appropriate, will be completed regarding the potential effects of additional ongoing and new actions on proposed and designated critical habitat for slickspot peppergrass. Section 7 conference and consultation are expected to include some actions that may degrade the environmental baseline over the short-term in many cases. However, existing conservation measures are intended to minimize habitat degradation for the species; these conservation measures also are expected to minimize short-term impacts to PCEs of slickspot peppergrass critical habitat.

2.4 Environmental Baseline of the Action Area

This section assesses the effects of past and ongoing human and natural factors that have led to the current status of the species, its habitat and ecosystem in the action area. Also included in the environmental baseline are the anticipated impacts of all proposed Federal projects in the action area that have already undergone section 7 consultations, and the impacts of state and private actions which are contemporaneous with this consultation. The Assessment determined the environmental baseline conditions of the action area using HIP monitoring data from EO 76 and EO 52 (Colket 2009, entire; Kinter et al. 2010, entire; Kinter et al. 2011, entire) as well as data collected from Bureau pre-project surveys of the Allotment. The Bureau also used *A Framework to Assist in Making Endangered Species Act Determinations of Effect for Slickspot Peppergrass (Lepidium papilliferum)* (Framework) (USFWS 2006a) to develop a description of baseline conditions for the species and its habitat in the action area and changes in conditions for the species as well as for PCEs of proposed critical habitat resulting from the action. The Framework is described further within the Overview of the Effects of the Action Analysis section of this Opinion (see p. 62).

2.4.1 Slickspot Peppergrass

2.4.1.1 Status of the Species in the Action Area

Three EOs are known to be located within the boundaries of the Mountain Home Subunit Allotment ongoing action area (EOs 29, 51, and 62). The Allotment contains all of EO 29 (approximately 105 acres), EO 51 (about 4 acres), and EO 62 (about 6 acres). The Allotment is located within the Snake River Plain physiographic region, and contains the majority of slickspot peppergrass MA 9C. EO 29 exhibited plant numbers ranging from 161–360 plants in 2004 to 1,466 individual plants observed in 2009 over the 7 years of HIP monitoring data available (Colket 2009, p. 32; Kinter *et al.* 2010, Appendix H; Kinter *et al.* 2011, Appendix H). Transect 51A in EO 51 exhibited plant numbers ranging from 2 plants observed in 2007 to 860 individual plants observed in 2005 over the 7 years of HIP monitoring data available, with numbers in transect 51B ranging from 3 plants observed in 2010 to 60 plants observed in 2005 (Colket 2009, p. 32; Kinter *et al.* 2010, Appendix H; Kinter *et al.* 2011, Appendix H). EO 62 exhibited plant numbers ranging from 0 plants observed in 2007 to 297 individual plants observed in 2005 over the 6 years of HIP monitoring data available (Colket 2009, p. 32; Kinter *et al.* 2010, Appendix H; Kinter *et al.* 2011, Appendix H). Plant numbers appear to be increasing at EO 29, with highest plant numbers being observed in 2009 and 2010 (1,466 and 1,414 plants, respectively). In contrast, plant numbers appear to be decreasing at HIP transect 51B for EO 51 and at EO 62. The highest plant numbers in HIP transect 51B were observed in 2005 (60 plants), and all other years had 25 or less plants, with the lowest plant numbers observed in 2010 (3 plants). The highest plant numbers in HIP transect 62 in 6 years of HIP monitoring were observed in 2005 (297 plants), and all other years had less than 20 plants, with the lowest plant numbers observed in 2007 (0 plants). No obvious trends are apparent in plant numbers at HIP transect 51A for EO 51 over the 7 years of monitoring, and it is likely that these variations in plant numbers in some years are due to environmental factors such as spring precipitation levels. The highest plant numbers in HIP transect 51A were observed in 2005 (860 plants), with the lowest plant numbers observed in 2007 (2 plants). Plant numbers rebounded in 2008 (315 plants), although not to the high numbers observed in 2005 (Colket 2009, p. 32). Plant numbers gradually decreased in 2009 (91 plants) and 2010 (45 plants). The INHP has classified EOs 29 and 62 as C-ranked and EO 51 as BC-ranked, which is intermediate between the B- and C-ranked EOs.

The 2,910 ac of Bureau-administered occupied and surrounding habitat in the Allotment (Table 8) consists predominantly of Wyoming big sagebrush with large inclusions of exotic annuals (e.g., cheatgrass) and smaller inclusions of green rabbitbrush and perennial bunchgrasses. In a previous biological opinion (Service tracking number 14420-2010-F-0025; USFWS 2010, entire), we determined that the ongoing grazing authorizations within the 2,910 acres of occupied habitat known in the Allotment at the time of the consultation are not likely to jeopardize the continued existence of slickspot peppergrass rangewide. A total of 4,374 acres of occupied habitat are analyzed in this Opinion (see Table 8), which includes 1,464 additional acres of occupied habitat beyond the 2,910 acres of occupied habitat considered in the original 2010

Table 8. Habitat Acreages for Slickspot Peppergrass Within the Mountain Home Subunit Allotment.

	Habitat Acres within Action Area[1]				
Habitat Type	**Bureau**	**BOR**	**Private**	**State**	**Total**
Slickspot Peppergrass Habitat	35,902	0	Unknown	Unknown	35,902
Occupied Habitat	4,374	0	Unknown	118	4,492
Proposed Critical Habitat*	1,061	0	0	0	1,061
Total Habitat Acres for Slickspot Peppergrass within the Allotment					**40,394**
Non-habitat	39,157	36	Unknown	Unknown	39,193
Total Allotment Acres[2]	**79,433**	**36**	**12,175**	**7,258**	**98,902**

[1] If amount of habitat type is unknown, this is indicated using "Unknown".
[2] The total acres do not sum due to rounding and unknown habitat acreages on State and privately owned lands.

*Proposed critical habitat is included entirely within the occupied habitat acreage; therefore, proposed critical habitat acreage is not included in the Total Habitat Acres for Slickspot Peppergrass to avoid double counting.

consultation. This additional acreage is the result of recent surveys of the Allotment that identified both slickspot peppergrass habitat and additional occupied slickspots, including their surrounding half-mile pollinator buffer areas.

Satellite data indicate the vegetation conditions for current or future opportunities for slickspot peppergrass conservation in this Allotment are as follows:

- Occupied Habitat, Proposed Critical Habitat, and Slickspot Peppergrass Habitat:
    - Approximately 43 percent of the acreage in the Allotment capable of supporting shrub-steppe habitat currently supports native shrub cover.
    - Approximately 57 percent of the acreage in the Allotment is dominated by exotic species with minimal or no native shrub component.

In addition, surveys for slickspot peppergrass and slickspot microsite habitats have identified approximately 4,500 slickspots within the Allotment, varying from 1 to 174 slickspots per section (640 acres, see Figure 4). However, based on current vegetation types and distribution in the Allotment, there appear to be limited opportunities for recovery and enhancement of the species despite the number of slickspot microsites identified in the area.

Approximately 35,902 acres of the Bureau lands located in this Allotment are categorized as habitat that contains slickspot microsites. Occupied habitat is known to exist within the Allotment (See BO 14420-2010-F-0025, USFWS 2010, p. 133), comprising approximately 4,374 of the total public land acreage (2,910 acres of these 4,373 acres of Bureau lands were previously identified in the Bureau's 2009 Assessment, p. IV-192).

2.4.1.2 Factors Affecting the Species in the Action Area

Threats to slickspot peppergrass identified in the Assessment for the Allotment include wildfire, invasive nonnative plants, fire rehabilitation activities, herbicide and pesticide use, and livestock use. Herbivory by insects is also identified as an emerging issue for the species. These threats are described below.

2.4.1.3 Overview of Threats to Slickspot Peppergrass

Several threat factors are contributing to the destruction, modification, or curtailment of slickspot peppergrass habitat across the range of the species, including within the Allotment. The sagebrush-steppe habitat of the Great Basin where slickspot peppergrass occurs is becoming increasingly degraded due to the impacts of multiple threats, including increased fire frequency and the subsequent invasion of nonnative annual grasses, such as cheatgrass. Effects of the modified wildfire regime and the invasive nonnative plants were identified as the primary threats identified in the Service's decision to list slickspot peppergrass as threatened. Cheatgrass can impact slickspot peppergrass directly through competition but also indirectly by providing continuous fine fuels that contribute to the increased frequency and extent of wildfires. Frequent wildfires have numerous negative consequences in the sagebrush-steppe system, which is adapted to much longer fire-return intervals, ultimately resulting in the conversion of the sagebrush community to nonnative annual grasslands with associated losses of native species diversity and natural ecological function. Because the modified wildfire regime and invasion of cheatgrass create a positive feedback loop, independently separating the effects of each of these threats is difficult. For a more detailed description of the effects of wildfire and invasive nonnative plants on slickspot peppergrass, see the Service's listing decision.

Climate change is expected to exacerbate this feedback loop between the primary threats of invasive nonnative plants (e.g., cheatgrass) and changes in wildfire regime. As there is some degree of uncertainty regarding the potential effects of climate change on slickspot peppergrass specifically, climate change in and of itself was not considered a significant factor in the Service's determination to list slickspot peppergrass as a threatened species. However, the Service recognizes that the severity and scope of the primary threats to slickspot peppergrass of frequent wildfire and invasion by nonnative plants such as cheatgrass are likely to magnify, depending on the realized outcome of climate change within the foreseeable future; thus, we consider climate change as playing a potentially important supporting role in intensifying the primary threats to the species.

Secondary threats of residential and commercial development and the emerging threat of seed predation by Owyhee harvester ants (*Pogonomyrmex salinus*); and other factors including livestock use, wildfire management activities, post-fire stabilization and restoration activities, and military training; also may affect slickspot peppergrass. These factors may result in effects that may occur both directly through the damage or mortality to individual plants and loss of slickspot microsites and indirectly through habitat fragmentation and isolation. The loss of slickspot microsites is a permanent loss of habitat for slickspot peppergrass since the species is specialized to occupy these unique microsite habitats that were formed in the Pleistocene; once lost, slickspot microsites likely cannot be re-created on the landscape. For a detailed discussion

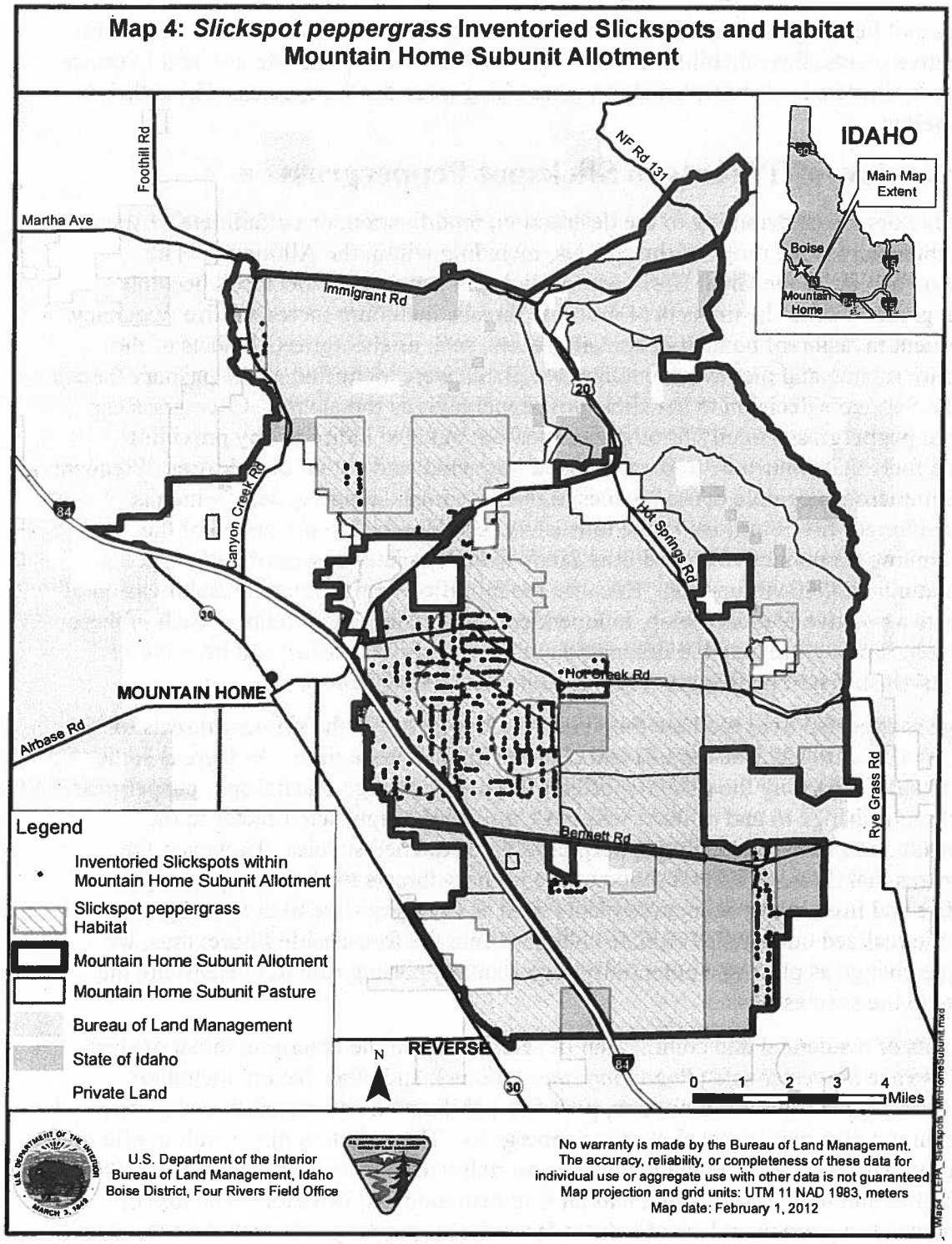

Figure 4. Slickspot microsites located during inventory of the Mountain Home Subunit Allotment.

of these factors, refer to the final listing rule for slickspot peppergrass (74 FR 52014, October 8, 2009).

All of these threats have long been recognized as contributing to the ongoing degradation of the sagebrush-steppe ecosystem of southwestern Idaho. However, the Service has only recently received independent evaluations of the direct relationship between the more significant threats and indicators of population viability, specifically for slickspot peppergrass. New evidence suggests a significant negative association between both cheatgrass cover and wildfire and the abundance of slickspot peppergrass, such that the species appears to be in decline across its range with adverse impacts continuing and likely increasing into the foreseeable future (Sullivan and Nations 2009, pp. 109–112, 114–118, 137). Past and ongoing factors that may affect slickspot peppergrass within the Allotment as described within the Bureau's Assessment include wildfire, invasive nonnative plants, fire rehabilitation activities, herbicide use, and livestock use. Herbivory by insects is also identified as an emerging issue in the Allotment.

The Service acknowledges that gaps exist in available information on slickspot peppergrass. These gaps create uncertainty; however, the best information available was used for developing this Opinion. Science may reduce but can never completely estimate nor eliminate the uncertainty regarding future events (USBLM 2000, p. 3, 5). As stated in the Endangered Species Consultation Handbook, "Where significant data gaps exist there are two options: (1) if the action agency concurs, extend the due date of the biological opinion until sufficient information is developed for a more complete analysis; or (2) develop the biological opinion with the available information giving the benefit of the doubt to the species" (USFWS and NMFS 1998, p. 1-6). Conducting research studies on the effects of various management actions to gather missing effects data on a plant with a seed bank cohort that is viable for up to 12 years would likely delay this consultation for many years. Consultation timelines under the Act do not allow for such a delay; thus, for purposes of completing this consultation, the Service has provided the benefit of the doubt to slickspot peppergrass with respect to data gaps regarding the effects of ongoing livestock activities within the Allotment considered in this Opinion.

Soils and Slickspot Microsites in the Allotment

The Assessment (USBLM 2012, p. 20) states that "Soil series present in the area include the following: Chilcott silt loam, 0 to 4 percent slopes; Colthorp-Minveno stony silt loams, 0 to 8 percent slopes; Colthorp-Kunaton complex, 0 to 8 percent slopes; Chilcott very stony silty clay loam, 0 to 12 percent slopes; Colthorp-Rock outcrop complex, 4 to 20 percent slopes; Lanktree-Chilcott loams, 0 to 12 percent slopes. Erosion potential from both wind and water varies from slight to moderate on these shallow to moderately deep, well-drained soils".

As described above, surveys for slickspot peppergrass and slickspot microsite habitats have documented approximately 4,500 slickspots within the Allotment, with slickspot density varying from 1 to 174 slickspots per section (approximate density of 0.002 slickspots per acre to 0.27 slickspots per acre).

Vegetation Condition in the Allotment

The Assessment states that the occupied and surrounding habitat in the Allotment consists predominantly of Wyoming big sagebrush with large inclusions of exotic annuals (cheatgrass) and smaller inclusions of green rabbitbrush and perennial bunchgrasses (USBLM 2012, p. 20).

The majority of the habitat within the Allotment burned in the 1980s. Smaller segments of habitat burned in the 1990s and 2000s with the most recent fire occurring in 2008 (Knudsen Fire, 2,492 acres). The occupied habitat associated with EOs 29, 51, and 62 was most heavily impacted by wildfires in the 1950s and 1980s. Despite the burn history, some isolated areas support shrub cover and larger areas support successful nonnative perennial grass seedings (see Figure 5).

Approximately 950 acres within the Allotment have burned 5 or more times between 1957 and 2009. Approximately 4,000 acres have burned more than 4 times over the same period, and approximately 25,000 acres have burned 2 or more times between 1957 and 2009. Between 1990 and 2009, approximately 35,000 acres have burned within the Allotment.

As described above, cheatgrass is the dominant plant in the understory throughout the majority of the action area. Cheatgrass, often a dominant nonnative annual grass in the understory of slickspot peppergrass habitat, can impact slickspot peppergrass via direct loss (e.g. plant competition) as well as indirect population declines from habitat loss (e.g. modification of the sagebrush-steppe ecosystem and/or increased wildfire return interval). In addition, HIP monitoring data show levels of invasive nonnative plants in slickspots within EOs 29, 51, and 62 ranging from less than1 to about 29 percent cover (EO 29 = 4–29 percent; transect 51A of EO 51 = 1–4 percent; transect 51B of EO 51 = 1–6 percent; and EO 62 = 2–8 percent). Invasive and noxious weed invasions can also reduce the quality of slickspot peppergrass habitat. In 2001, an infestation (1–5 ac) of *Onopordum acanthium* (Scotch thistle) was observed in occupied habitat associated with EO 51. An infestation (1 ac) of *Centaurea diffusa* (diffuse knapweed) was observed approximately 1.5 mi west of EO 51 in 2002. Additionally, an infestation of *Chondrilla juncea* (rush skeletonweed) (0.1–1.0 ac) was observed approximately 3.0 mi north of EO 51 in 2002. Rush skeletonweed has been documented at less than 1 percent cover within slickspots on HIP transects located in both the Boise Foothills and the Snake River Plain physiographic regions (Colket 2009, pp. 37—49). During the inventory conducted in the field season of 2010, weeds such as scotch thistle and rush skeletonweed were observed within numerous areas within the Allotment. Rush skeletonweed has continued to spread throughout the Snake River Plain over the last few years and the likelihood that it may spread further within the Mountain Home Subunit Allotment in the future is high.

HIP monitoring data also indicate that percent native forb cover is low in EOs 29, 51, and 62 (0.1 percent to about 5 percent in the 2 years of available HIP monitoring data,, with half of the years having less than 1 percent cover). Diversity and cover of native forbs are important factors that can affect the availability of insect pollinators required for successful reproduction of slickspot peppergrass.

HIP monitoring data show percent cover of biological soil crust in the vicinity of transects within EOs 29, 51, and 62 ranging from about 7 percent to about 64 percent cover (EO 29 = 24–64 percent; transect 51A of EO 51 = 36–61 percent; transect 51B of EO 51 = 29–64 percent; and EO 62 = 7–52 percent). Areas dominated by invasive nonnative annual plants (such as cheatgrass) are typically characterized by low biological soil crust cover (Belnap *et al.* 2001, p. 47). As much of the Allotment is dominated by exotic annuals, including cheatgrass, biological soil crust cover is likely lower in the recently burned areas than in HIP monitoring transects for EOs 29, 51, and 62, which are located in remnant sagebrush patches. In addition, Owyhee

harvester ants, which are an active and efficient slickspot peppergrass seed predator (White and Robertson 2009, p. 511), may occur in burned areas within the Allotment.

EO quality within the Mountain Home Subunit Allotment #00813 is categorized as moderate to high, although overall habitat quality for slickspot peppergrass throughout the Allotment is categorized as low to moderate due to low shrub cover, a reduced incidence of native understory plants in remnant sagebrush stands, and the presence of invasive and noxious weeds across the Allotment.

Replacement of shrub cover in the Allotment is expected to be slow, particularly since much of the vegetation in the burned portion of the Allotment is currently dominated by cheatgrass, which increases the risk of future wildfires. Assuming no additional fires occur in the action area, recovery of Wyoming big sagebrush shrub cover in the burned portions of the Allotment may take 50 to 120 years (Baker 2006, p. 181).

Habitat Fragmentation and Isolation of Small Populations

Slickspot peppergrass habitat fragmentation levels within the Allotment are determined by shrub cover, which is an indicator of fire occurrence within the past 15 to 25 years. The Allotment is dominated by cheatgrass with pockets of sagebrush and is highly fragmented due to past wildfires. The modified wildfire regime and invasive nonnative plants are described above as primary threats to slickspot peppergrass. Isolated pockets of remnant shrub communities in the Allotment exhibit moderate levels of native perennial grass and forb diversity. As described above, the majority of the habitat within the Allotment burned in the 1980s. The occupied and surrounding habitat in this Allotment consists predominantly of Wyoming big sagebrush with large inclusions of exotic annuals (cheatgrass) and smaller inclusions of green rabbitbrush and perennial bunchgrasses. In contrast, about 43 percent of the Allotment area contains native shrub habitat, with about 57 percent of the Allotment area dominated by invasive nonnative annual plants (e.g., cheatgrass) with minimal or no native shrub component.

Due to its occupancy of patchily distributed slickspots, the habitat of slickspot peppergrass is somewhat naturally fragmented. Fragmentation at a larger scale, however, can pose problems for slickspot peppergrass by creating barriers in the landscape that prevent effective genetic exchange between populations. Seed dispersal for slickspot peppergrass likely occurs only over very short distances; thus, pollinators and pollen dispersal are the primary means for reproductive and genetic exchange between slickspot peppergrass sites (Robertson and Ulappa 2004, pp. 1705, 1708; Stillman *et al.* 2005, pp. 1, 6-8). Research indicates that seeds generated by the pollination of nearby plants have reduced viability, and that slickspot peppergrass seed viability increases as the distance to the contributing pollination source increases (Robertson and Ulappa 2004, pp. 1705, 1708). The ability to exchange pollen with distant populations is therefore an advantage for slickspot peppergrass. Barriers or too much distance between slickspots and pollinating insect habitats can reduce the effective range of insects important to slickspot peppergrass pollination (Robertson *et al.* 2004, pp. 2-4). Barriers can include agricultural fields, urban development, and large areas of annual and perennial grass monocultures that do not support diverse and suitable floral resources such as nectar or edible pollen for pollinators. Slickspot peppergrass habitats separated by distances greater than the effective range of available pollinating insects (estimated at about 0.6 mi. as described in Colket and Robertson 2006, *in litt.* p. 1) are at a genetic disadvantage, and may become vulnerable to

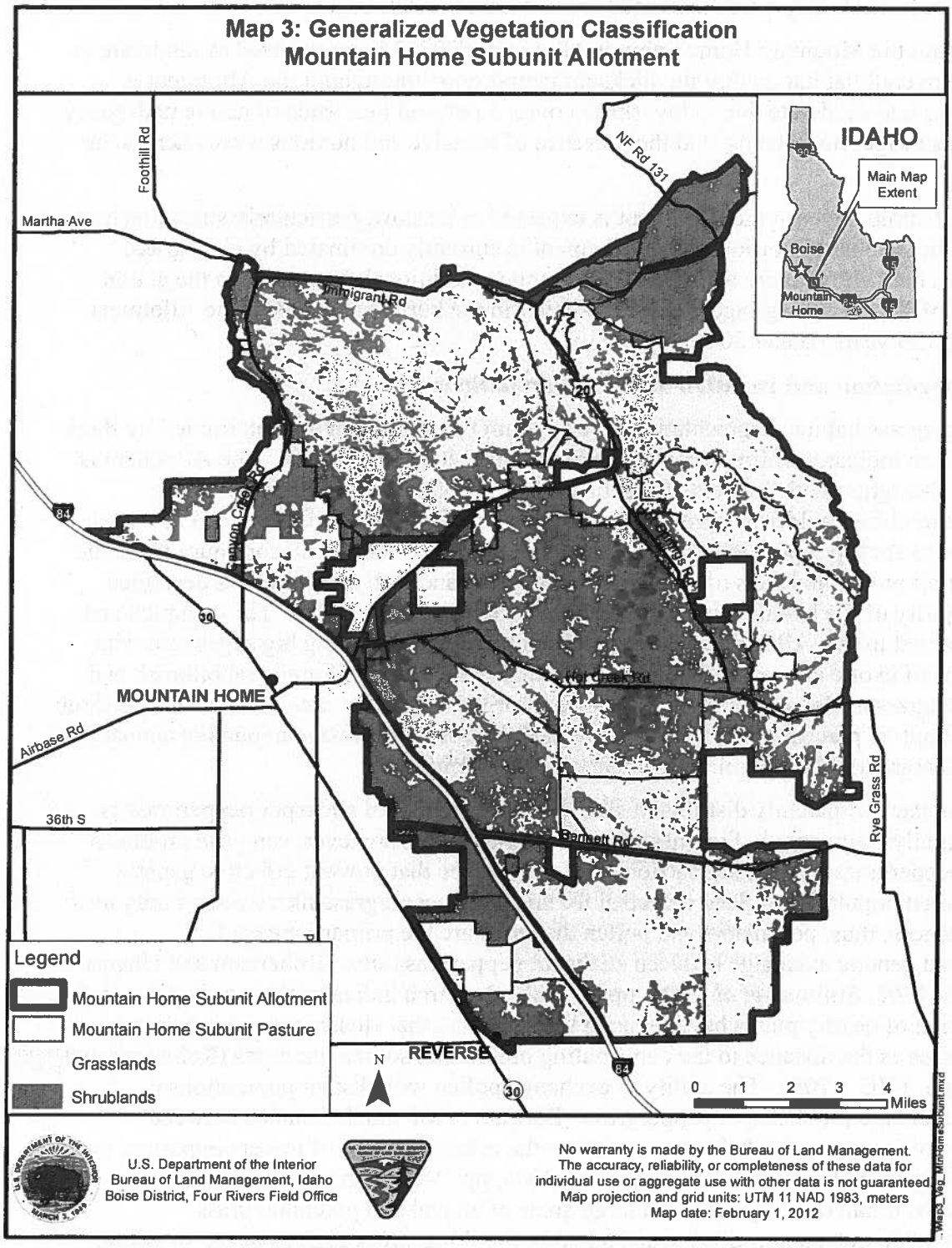

Figure 5. Generalized Vegetation Classification for the Mountain Home Subunit Allotment.

the effects of loss of genetic diversity (Stillman *et al.* 2005, pp. 1, 6-8) and a reduction in seed production (Robertson *et al.* 2004, p. 1705). A genetic analysis of slickspot peppergrass suggested that populations in the Snake River Plain and the Owyhee Plateau[11] "may have reduced genetic diversity" (Larson *et al.* 2006, p. 17).

Many of the remaining occurrences of slickspot peppergrass, particularly in the Snake River Plain near urban centers, are restricted to small, remnant patches of suitable sagebrush-steppe habitat. When last surveyed, 31 EOs (37 percent) had fewer than 50 plants during years of average or greater than average rainfall (Colket *et al.* 2006, Tables 1–13). Many of these small remnant EOs exist within habitat that is degraded by the factors identified above. Small slickspot peppergrass populations have likely persisted due to their long-lived seed bank, but the potential risk of depletion of each population's seed bank with no new genetic input makes the persistence of these small populations uncertain. Providing suitable habitats and foraging habitats for the species' insect pollinators are important for maintaining slickspot peppergrass genetic diversity. Small populations are vulnerable to relatively minor environmental disturbances such as wildfire, herbicide drift, and nonnative plant invasions (Given 1994, pp. 66-67), and are subject to the loss of genetic diversity from genetic drift and inbreeding (Ellstrand and Elam 1993, pp. 217-237). Populations with lowered genetic diversity are more prone to local extinction (Barrett and Kohn 1991, pp. 4, 28). Smaller populations generally have lower genetic diversity, and lower genetic diversity may in turn lead to even smaller populations by decreasing the species' ability to adapt, thereby increasing the probability of population extinction (Newman and Pilson 1997, p. 360).

Even though slickspot peppergrass occurs in naturally patchy microsite habitats, the increasing degree of fragmentation produced by wildfires and development may result in the separation of populations beyond the distance that its insect pollinators are capable of traveling. Genetic exchange in slickspot peppergrass is achieved through either seed dispersal or insect-mediated pollination, and plants that receive pollen from more distant sources demonstrate greater reproductive success in terms of seed production. As all indications are that seeds are dispersed over only a very small distance and insect pollinators are also limited in their dispersal capabilities, habitat fragmentation and isolation of populations poses a threat to slickspot peppergrass in terms of decreased reproductive success (lower seed set), reduced genetic variability, and greater local extinction risk. For these reasons, we consider habitat fragmentation resulting from wildfires and development to pose a moderate degree of threat to slickspot peppergrass. We consider the threat of habitat fragmentation to be significant, but not as severe as the threats posed by the modified wildfire regime and invasive nonnative plant species. The threat of habitat fragmentation and isolation of small populations is pervasive throughout the range of slickspot peppergrass.

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[11] Note that in this study, there were no separate analyses of data from populations within the Boise Foothills physiographic region.

2.4.2 Slickspot Peppergrass Critical Habitat

2.4.2.1 Status of Slickspot Peppergrass Proposed Critical Habitat in the Action Area

The Allotment contains 1,061 acres located within slickspot peppergrass proposed critical habitat Subunit 3c (Figure 6), which makes up about 1 percent of the approximately 98,900 acres of the total Allotment area. All proposed critical habitat within the Allotment occurs on public land. The 1,061 acres of proposed critical habitat located within the Allotment represent about 19 percent of the total acreage of Subunit 3c (5,583 acres), about 11 percent of the 9,879 acres of proposed critical habitat within Critical Habitat Unit 3 (Elmore County), and about 2 percent of the proposed critical habitat acreage for slickspot peppergrass rangewide (57,756 acres).

Proposed critical habitat occurs within three Allotment pastures: Pasture 6 (Rock Lake), Pasture 7 (Edgemead Seeding), and Pasture 16 (Olson Pasture) (Figure 6). Approximately 113 of the 1,061 acres of proposed critical habitat in the Allotment are occupied by slickspot peppergrass. The total area of unoccupied slickspots within the Allotment is unknown. As described in the Status of Slickspot Peppergrass section above, inventory transects, which represent an incomplete census of slickspot microsites present, documented well over 4,653 individual identified slickspots (PCE 1) within the Allotment (see Figure 4 above).

Proposed critical habitat in the Allotment is associated with C-ranked EOs 29 and 62 and BC-ranked EO 51. As described in the Status of Slickspot Peppergrass section above, habitat in the vicinity of these EOs has been impacted by past wildfires and associated spread of invasive nonnative plants, including cheatgrass. The lowered habitat quality in the area may affect the ability of the action area to support slickspot peppergrass in areas outside of the EOs and proposed critical habitat.

2.4.2.2 Factors Affecting Slickspot Peppergrass Proposed Critical Habitat in the Action Area

Of the four PCEs identified for slickspot peppergrass proposed critical habitat (i.e., functional slickspot microsites, intact big sagebrush habitat, presence of insect pollinators, and habitat requirements for insect pollinators), all occur to some degree within the Allotment. Ongoing threats to PCEs of proposed critical habitat in the Allotment include wildfire, invasive nonnative plants, fire rehabilitation activities, herbicide and pesticide use, livestock use, and herbivory by insects. These same factors affecting the PCEs of proposed critical habitat have been previously described in detail for the species in section 2.4.1.2 above. The primary threats of modified wildfire regime and invasive nonnative plants have significantly impacted the functionality of PCEs of proposed critical habitat within the action area, and may continue to impact critical habitat PCEs in the future.

The entire acreage of the proposed critical habitat located within the Allotment is encompassed by occupied habitat for the species (EOs and the 0.5 mile pollinator buffer surrounding the EOs). Data used to determine condition of slickspots and habitat parameters within proposed critical habitat included HIP monitoring data for EOs 29, 51, and 62 (Colket 2009, entire; Kinter *et al.* 2010, Appendix H; Kinter *et al.* 2011, Appendix H) and data from Bureau slickspot peppergrass

inventories conducted within the Allotment area. Overall, PCE quality within the Allotment is rated as low to moderate (Table 9). The Assessment rated ecologically functional slickspots

Table 9. Current Condition of Primary Constituent Elements for Slickspot Peppergrass Proposed Critical Habitat within the Mountain Home Subunit Allotment.

PCE[1]	Corresponding Pathway Indicators[2]	Current Quality Ranking of Pathway Indicators[3]	Quality Ranking of PCE (H, M, L)
1	A-1	M	M - H
	A-2	M – H	
	A-3	M - H	
2	B-1	M – H	L - M
	B-2	L	
	B-3	L – M	
	B-4	M	
	B-5	L	
3	B-3	L – M	L
	B-5	L	
4	B-1	M – H	L - M
	B-2	L	
	B-3	L – M	
	B-5	L	
Summary of Overall Status of PCE Baseline within the Action Area			L - M

[1] PCE 1 = Ecologically functional slickspots; PCE 2 = relatively intact native Wyoming big sagebrush vegetation; PCE 3 = a diversity of native plants; PCE 4 = sufficient pollinators for successful fruit and seed production.

[2] Framework Pathway Indicators are described in Appendix B of this Opinion.

[3] L = low quality, M = moderate quality, H = high quality

(PCE 1) as moderate to high quality for slickspot peppergrass. The Assessment rated intact sagebrush steppe habitat (PCE 2) as well as the presence of habitat components required by insect pollinators such as a diversity of native forbs and reproductive nesting sites (PCE 4) as being in low to moderate quality condition. The Assessment rated the presence of insect pollinators (PCE 3) as low quality due to the low cover of native forbs and the predominance of invasive nonnative plants such as cheatgrass throughout the Allotment.

Generally, the proposed critical habitat supports functional slickspot microsites within a mosaic of shrub-dominated and annual invasive grassland sites (see Figure 5 above and Figure 6 below). The area lacks expected composition and cover of native grasses and forbs, but current composition continues to support pollinators within the community. General condition of the slickspots and habitat surrounding occupied slickspots is also described in the "Status of the Species in the Action Area" section above.

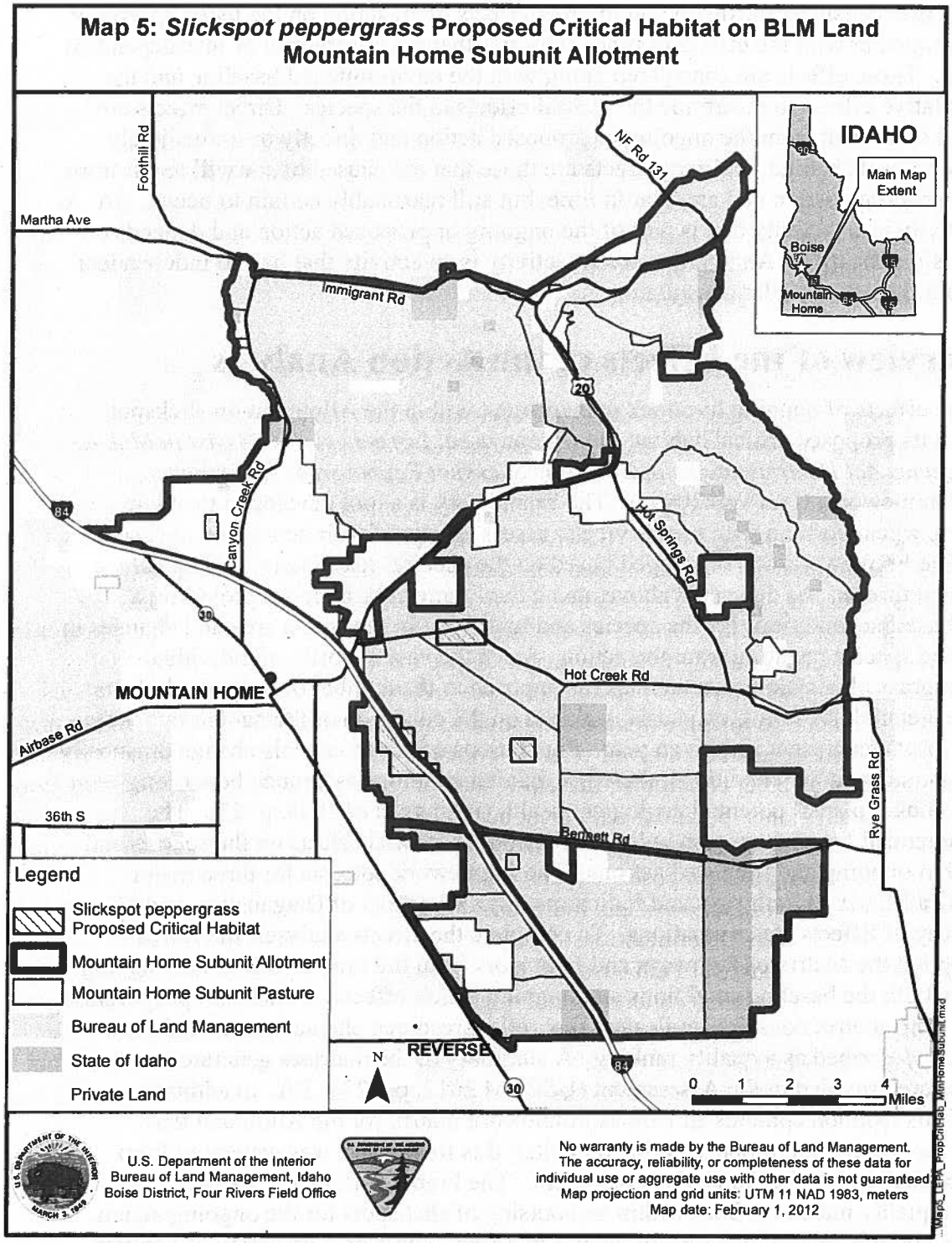

Figure 6. Proposed Critical Habitat for Slickspot Peppergrass Located within the Mountain Home Subunit Allotment.

2.5 Effects of the Action

Effects of the action considers the direct and indirect effects of an action on the listed species or critical habitat, together with the effects of other activities that are interrelated or interdependent with that action. These effects are considered along with the environmental baseline and the predicted cumulative effects to determine the overall effects to the species. Direct effects are defined as those that result from the ongoing or proposed action and directly or immediately impact the species or its habitat. Indirect effects are those that are caused by, or will result from, the ongoing or proposed action and are later in time, but still reasonably certain to occur. An interrelated activity is an activity that is part of the ongoing or proposed action and depends on the action for its justification. An interdependent activity is an activity that has no independent utility apart from the action under consultation.

2.5.1 Overview of the Effects of the Action Analysis

In analyzing the effects of ongoing livestock management within the Allotment on slickspot peppergrass and its proposed critical habitat, the Bureau used *A Framework to Assist in Making Endangered Species Act Determinations of Effect for Slickspot Peppergrass (Lepidium papilliferum)* (Framework) (USFWS 2006a). The Framework is a tool developed to assist Federal agencies when working with the Service to assess effects of their actions on slickspot peppergrass. The Framework was developed based on the species' life history, ecological requirements, and threats. As described above, using the Framework includes providing a description of baseline conditions for the species and its habitat in the action area and changes in conditions for the species resulting from the action. Since the vast majority of individual slickspot peppergrass plants are desert annuals (as opposed to the number of individual plants that exhibit the biennial life form), emphasis is placed on the condition of the habitat rather than on the number of plants present in a given year. Populations of desert annuals change drastically in response to annual weather conditions; therefore, habitat condition is a much better long-term measure of the annual plants' potential ecological health (Elzinga *et al.* 1998, p. 55). The Framework is intended for analyzing an individual action's potential effects on the species and may be applied to ongoing and proposed actions. The Framework consists for three major components: (1) a Matrix of Pathways and Indicators, (2) a Checklist of Diagnostics, and (3) a Dichotomous Key of Effects Determinations. To complete the effects analyses, the Bureau consistently applied the Matrix of Pathways and Indicators from the Framework to the ongoing action to review both the baseline conditions and ongoing action effects on slickspot peppergrass and its habitat. This matrix considers indicators that reflect resource characteristics and their condition that are described as a quality ranking. A summary of the matrices generated by this analysis process are provided in the Assessment (USBLM 2012, pp. 23 – 29). In addition, Appendix C of this Opinion contains an Effects Framework matrix for the Allotment that addresses both the species and proposed critical habitat; this framework was generated from information included within the Bureau's Assessment. The Framework matrix categorizes a series of habitat quality indicators both within and outside of slickspots for the ongoing action. High, moderate, and low quality rankings of habitat represent points on a gradation of habitats rather than absolute thresholds for habitat quality. And while habitat quality may be categorized as low for a particular habitat quality indicator, in a given year slickspot peppergrass plant

abundance at that location may be high due to other environmental variables, such as precipitation.

Slickspot peppergrass survival and recovery is dependent on maintaining and enhancing Wyoming big sagebrush-steppe habitat and slickspot microsites located within this ecosystem in southern Idaho. The long-term conservation of slickspot peppergrass is dependent upon the maintenance or improvement of ecological function of the higher quality (C- through A-ranked) EOs rangewide, including maintaining or improving the connectivity within and between EOs which may involve the maintenance or enhancement of currently lower ranked EOs (D- through F-ranked). Maintaining the ecological function of higher quality habitat for slickspot peppergrass is necessary to facilitate insect pollinator activity, maintain genetic diversity, and limit the establishment of invasive nonnative plant species. As described in the "Conservation Needs" section above (section 2.3.1.4), the Service used the State of Idaho's INHP EO rankings to characterize the conservation value of each action area considered in this document. These INHP criteria address population size of the EO, habitat condition within the EO, and the landscape condition of the area surrounding the EO.

The Allotment contains EOs that are BC- and C-ranked. When multiple EOs of varying INHP ranks are located within an action area, the conservation value of the action area is categorized based on the highest ranked EO located within the area. For the purpose of analyses presented in this Opinion, the action area for the Allotment was ranked as having a moderate to high conservation value for slickspot peppergrass. Once the conservation value of habitat in an action area is identified, effects of the action are examined to determine whether the action was expected to increase, maintain, or decrease the current conservation value of the action area over time. These analyses are then used to make our jeopardy determination for the species as well as our adverse modification determination for proposed critical habitat.

The indicators and quality rankings used to determine the effects of livestock grazing activities within the Allotment on slickspot peppergrass and proposed critical habitat are based on best available science. We acknowledge that information gaps and disagreement exist with respect to the available information on slickspot peppergrass. As noted earlier, the Service has provided the benefit of the doubt to slickspot peppergrass and its proposed critical habitat regarding the potential effects of the action considered in this Opinion. Therefore, if there is a reasonable possibility that an adverse impact could occur to a single slickspot peppergrass plant (including seeds) or any loss or degradation of PCEs for proposed critical habitat associated with the Allotment, our analysis will reflect that adverse effects are expected.

Livestock management within the Allotment is described as having "localized effects" on slickspot peppergrass. Localized effects are those that are anticipated to occur within a relatively small area in relation to slickspot peppergrass habitat located within the action area. Because livestock are often patchy in their distribution and the intensity of effects varies across the action area, it is not expected that potential impacts caused by livestock use would occur at the same level of intensity or on every portion of habitat within the action area. Localized effects are not expected to impact slickspot peppergrass to the extent that the conservation value of an action area to the species is likely substantively reduced over the term of the action.

2.5.2 Slickspot Peppergrass

2.5.2.1 Direct and Indirect Effects of the Action

Livestock use has the potential to result in both positive and negative effects on slickspot peppergrass and its habitat. Impacts vary with stocking rate and season of use. Potential positive effects that livestock grazing may have on slickspot peppergrass include herbivory of invasive nonnative plants and the associated lower risk of wildfire through the reduction of fine fuels and native plant competition in the understory (Pellant 1996, p. 6). The potential negative effects of livestock grazing activities on slickspot peppergrass and its habitat include herbivory, trampling damage or mortality of individual plants, reduction of native forb cover, destruction or disturbance of slickspot microsites, soil compaction, impacts to insect pollinators, increases in invasive nonnative plants, and localized trampling that moves some seeds too far from the soil surface for subsequent successful seedling emergence. Ground disturbance within slickspot microsites or injury to or mortality of individual slickspot peppergrass plants may also occur due to operating motorized vehicles off road to accomplish grazing permit related tasks. However, analyses of the best available information indicate that impacts from livestock grazing activities tend to be localized and are probably not a threat to the population rangewide (USFWS 2010, pp. 41-45).

Direct Loss or Damage

Herbivory of Slickspot Peppergrass by Livestock

Herbivory on slickspot peppergrass plants by large ungulates, whether wild or domestic, does not appear to pose a threat to slickspot peppergrass. Domestic cattle are not known to feed upon slickspot peppergrass, and domestic sheep have been observed pulling plants from the ground and spitting them out (Quinney and Weaver 1998, pers. comm.). Herbivory of slickspot peppergrass plants by cattle is not anticipated to occur on the Allotment, and therefore will have no effect on the species.

Livestock Trampling

Trampling by livestock may have a potentially detrimental effect on slickspot peppergrass; however, these effects appear to be seasonal (most detrimental when soils are wet in the spring) and localized in nature. Livestock trampling may result in direct damage or mortality of individual slickspot peppergrass plants, and the mechanical disturbance may damage slickspot microsite soil layers, altering slickspot function and creating conditions conducive to the invasion of weedy nonnative plants. Livestock grazing can result in plants being crushed, severed, or bruised by hoofs (Vallentine 2001, p.155). Laylock and Harniss (1972, as described in Vallentine 2001, p. 155) found that because forbs were succulent and easily broken, forbs suffered disproportional livestock trampling losses when compared to grasses. To date, HIP monitoring data indicate that trampling damage to individual slickspot peppergrass plants appears to be localized, and while occasional damage or mortality of individual above-ground plants is likely to occur, it is probably not of much consequence to the species as a whole rangewide, because studies and modeling of the slickspot peppergrass life cycle indicate that the persistence of the plant is largely dependent on the proliferation of the seed bank (Palazzo *et al.* 2005, pp. 2–4, 8–9; Meyer et al. 2006, p. 900). However, if trampling results in the mortality of

individual plants prior to seed set, that will have a localized negative impact on the persistence of the seed bank itself by reducing the number of seeds entering the seed bank.

Livestock trampling can also disrupt the soil layers of slickspots, altering slickspot function (Seronko 2004, *in litt.*; Colket 2005, p. 34; Meyer *et al.* 2005, pp. 21-22). Trampling when slickspots are dry can lead to mechanical damage to biological soil crust in slickspots, potentially resulting in the invasion of nonnative plants and altering the hydrologic function of slickspots. In water-saturated slickspot soils, trampling by livestock can break through the restrictive clay layer; this is referred to as penetrating trampling (State of Idaho *et al.* 2006, p. 9). Trampling that alters the soil structure and the functionality of slickspots (Rengasamy *et al.* 1984, p. 63; Seronko 2004, *in litt.*) likely impacts the suitability of these microsites for slickspot peppergrass. Trampling can also negatively affect the seed bank by pushing seeds too deeply into the soil for subsequent successful germination and emergence. Meyer and Allen (2005, pp. 6-8) found that seed emergence success decreased with increasing depth in the soil, from a mean of 54 percent emergence success at the shallowest planting depth of 0.1 in. to a mean emergence success of 5 percent at 1.2 in. planting depth. HIP monitoring documented the average depth of the slickspot crust layer to be approximately 0.3 in. below the slickspot surface (Colket 2006, Appendix G, p.1). Slickspot peppergrass plants that die before emerging from the soil surface would not contribute seeds to the seed bank. Therefore, biologically significant impacts to slickspot peppergrass may occur when livestock hoof prints within slickspot microsites attain a depth greater than 1 in. In addition, some of the slickspot peppergrass pollinators are ground-dwelling insects that may be negatively impacted by livestock trampling (Sugden 1985, pp. 300, 309). Livestock trampling may result in localized adverse impacts to individual insect pollinators that nest within the soil, including those that nest within slickspot microsites.

While we acknowledge that livestock use may have negative impacts on individual slickspots, statistical analyses of monitoring data available at this time have not demonstrated a significant correlation between livestock use and the abundance of slickspot peppergrass on a rangewide basis. In a statistical analysis of Habitat Integrity Index (HII) data from 1998 to 2001, recent livestock use did not appear to have any effect on slickspot peppergrass, slickspot attributes, and plant community attributes (Menke and Kaye 2006a, p. iii). The evidence from this study is not strong, however, as the analysis of grazing impacts were limited to areas that had already been burned and had likely been previously grazed (Menke and Kaye 2006a, pp. 18-19). These researchers recommended additional analysis to confirm their findings (Menke and Kaye 2006a, p. iii). Later statistical analyses using additional years of rangewide HIP data, based on 4 years (2005–2008) and 5 years (2004–2008) of livestock use, also showed no significant relationships between slickspot peppergrass abundance and penetrating livestock hoof prints in slickspots (Salo 2009, p. 1; Sullivan and Nations 2009, p. 122), or between slickspot peppergrass abundance and total livestock-print cover or livestock-feces cover in slickspots (Sullivan and Nations 2009, p. 122). Sullivan and Nations (2009, p. 136) found only a single year (2007) where a consistent negative relationship existed between slickspot peppergrass abundance and each of the measures of livestock presence within slickspots (e.g., total livestock print percent cover, penetrating livestock print percent cover, and livestock feces percent cover), and this relationship only occurred within the Owyhee Plateau physiographic region. Statistical analyses of slickspot peppergrass data from 3 years of surveys on the Owyhee Plateau (2000–2002) showed that sites with low levels of livestock trampling exhibited greater numbers of slickspot

peppergrass plants (averaging twice the total number of plants) than sites with high levels of trampling, although these results were statistically significant for only the year 2000. A significant positive relationship was also found between slickspot peppergrass abundance and distance to water and salt stations for use by livestock with total plant abundance increasing with increasing distance away from the water or salt sources (Popovich 2009, pp. 27–28). However, like the Menke and Kaye (2006a) study, these three analyses of grazing impacts on slickspot peppergrass were limited to areas that had been previously grazed, making potential effects difficult to detect. For a more detailed discussion on the effects of livestock trampling on slickspot peppergrass, see our 2009 listing decision and the 2010 ongoing livestock grazing biological opinion (USFWS 2010, entire).

The Service is aware of three incidents where localized livestock trampling events have been suggested as the likely cause of reduced slickspot peppergrass numbers at sites where the plants were formerly abundant, while reduced plant numbers were not observed at similar adjacent sites within the same year (Robertson 2003, p. 8; Meyer *et al.* 2005, p.22; Colket 2006, pp. 10-11). In one case, slickspot peppergrass plant numbers were reduced from thousands of plants annually observed prior to the livestock trampling event to 0 to 10 plants observed each year (Meyer *et al.* 2005, p. 22). In a second case, a pollinator research study site near Glenns Ferry was no longer used after a 575 percent reduction in slickspot peppergrass numbers following a livestock trampling event between 2002 and 2003 (Robertson 2003, p. 8). Trampling has been suggested as the likely cause of the ensuing population reductions in these two incidents, but as these were observational reports, it is not known whether other factors may have also acted on these populations. The third incident occurred in 2005 at a HIP monitoring transect in EO 68, in MA 1 of the Boise Foothills physiographic region. In 2005, penetrating livestock hoof prints were observed in 3 of 10 slickspots on the transect to a depth of 3 in., but not to the extent that the livestock penetrating-trampling trigger was tripped (the penetrating trampling "trigger" refers to a 10 percent cover threshold for penetrating trampling set in the CCA). In the years following this event, slickspot peppergrass numbers at this transect were substantially reduced, going from 631 to 1,277 plants observed in 2004 to a total of 9 plants observed in 2005 and 3 plants observed in 2006. Similar reductions in plant abundance were not observed in other HIP transects in CCA MA 1 in 2005 and 2006 (Colket 2009, p. 31), indicating that environmental factors shared by these sites were likely not responsible for the observed declines (Colket 2006, pp. 10–11). In 2007 and 2008, slickspot peppergrass numbers in this transect appeared to be slowly increasing (167 plants documented in 2007 and 224 plants documented in 2008), but had not reached the levels observed in 2004 prior to the trampling incident (Colket 2009, p. 31). In 2009, plant numbers continued to increase (326 plants documented in 2009 (Kinter *et al.* 2010, Appendix H); and in 2010, the 2,813 plants observed on the HIP transect (Kinter *et al.* 2011, Appendix H) more than doubled the number of plants observed in 2004. It is unknown how reducing the number of seeds that replenish the seed bank associated with these localized reductions in plant numbers during 2005 and 2006 may affect the longer term status of slickspot peppergrass at this site. While slickspot peppergrass numbers appear to have recovered at the site in the Boise Foothills (Kinter *et al.* 2011, Appendix H), the site at the OTA has shown no apparent recovery over time (Meyer *et al.* 2005, p.22; Meyer 2009, *in litt.* p. 1). The status of the third site at Glenns Ferry is unknown, as it has not been revisited since the trampling event.

Livestock are typically not evenly distributed across a pasture, and areas with localized trampling impacts are areas where livestock congregate near or within EOs, particularly when soils are saturated. Soils are more likely to be wet in spring (March through June) due to climatic patterns in southwestern Idaho. If grazing is conducted during the slickspot peppergrass growing season when soils are saturated, then there is potential for trampling damage to slickspot microsites and the slickspot peppergrass seed bank. However, supplemental salt and watering sites can alter livestock distribution, and depending on location, can increase or decrease trampling of slickspots. Livestock typically gather near water troughs and salting areas, or along fence lines, particularly in corners, resulting in localized trampling impacts. Cattle congregate around trough locations, causing disturbance to the localized area, which decreases as the distance from the trough increases. Slickspot microsites located in close proximity to troughs have a greater risk of trampling damage, which may result in deep burial of slickspot peppergrass seeds, and higher risk of mechanical hoof damage to individual slickspot peppergrass plants, especially when plants are actively growing and flowering in May and June. As previously described, conservation measures for slickspot peppergrass are designed specifically to prevent or minimize the impacts to the species from localized livestock trampling, particularly during the seasons when slickspot soils are wet and most susceptible to damage.

Livestock are present annually during spring within slickspot peppergrass occupied habitat located in Pastures 6, 7, and 16 of the Allotment. Slickspot peppergrass occupied habitat associated with EO 29 in Pasture 16 is grazed from April 1 to May 31 (321 AUMs) and November 1 to November 30 (41 AUMs) annually. Occupied habitat associated with EOs 29, 51, and 62 in Pastures 6 and 7 is permitted to be annually grazed from April 1 to June 30 (2,944 AUMs) and November 1 to December 31 (1,077 AUMs). Annual spring grazing is expected to have localized effects on slickspot peppergrass and its habitat. Current Bureau conservation measures and grazing management standards, such as no herding of cattle through EOs during periods when soils are saturated, are designed to minimize trampling impacts to slickspot microsites and to the seed bank.

HIP monitoring data show percent cover of total livestock prints observed within slickspots in EOs 29, 51, and 62 to be extremely low, ranging from about 0 percent to about 6 percent cover over the 7 years of HIP monitoring (EO 29 = 0 percent for all years; transect 51A of EO 51 = 0–0.1 percent; transect 51B of EO 51 = 0–6.2 percent; and EO 62 = 0–2.3 percent). Similarly, HIP monitoring data show percent cover of penetrating livestock prints observed in EOs 29, 51, and 62 to also be very low, ranging from about 0 percent to about 6 percent cover over the 7 years of HIP monitoring (EO 29 = 0 percent for all years; transect 51A of EO 51 = 0–0.1 percent; transect 51B of EO 51 = 0–5.7 percent; and EO 62 = 0–1.3 percent). Only one transect in one year (transect 51B in 2005) had penetrating hoof print cover greater than 2 percent, and the majority of years had 0 percent penetrating hoof print cover. The penetrating trampling trigger (e.g., greater than or equal to 10 percent penetrating trampling cover) has never been tripped in the 7 years of HIP monitoring at EOs 29, 51, and 62. Low cover levels of livestock feces (0–0.4 percent cover) were also documented in slickspots within the HIP transects in the Allotment over 6 to 7 years of HIP monitoring.

The percent cover of livestock prints observed and recorded during HIP monitoring may represent a small proportion of soil disturbance that occurred during periods of livestock use, making even a small percent of slickspot microsite area documented with livestock hoof prints

biologically meaningful. Since HIP monitoring is only conducted annually, precipitation events may "silt in" penetrating hoof prints or obliterate livestock hoof prints prior to monitoring (Young 2007, pp. 16 and 39; Popovich 2002, pp. 11 and 20–21), reducing or eliminating evidence of potential trampling impacts to slickspot habitats. Depending on the timing of precipitation events, evidence of livestock hoof prints since the previous year of monitoring may be difficult to detect, making the determinations of effect associated with livestock use challenging.

Conservation measures will reduce potential livestock-related impacts to slickspot peppergrass in this Allotment; however, localized direct effects from livestock trampling on individual slickspot peppergrass plants, the seed bank, and slickspot microsites may occur. Spring livestock grazing that occurs annually in EOs 29, 51, and 62 from April through June has the potential to trample individual annual and biennial slickspot peppergrass plants that are actively growing and flowering and may also impact biological soil crusts through trampling. Livestock grazing when soils are wet increases the potential for penetrating livestock trampling, which can impair existing plants and seed beds, change the slickspot soil structure, and introduce invasive plants and noxious weeds. Potential trampling-related effects are not expected to occur throughout all occupied habitat located within the Allotment. As extremely low levels of livestock hoof prints have been documented in slickspots within the Allotment, direct effects related to livestock trampling to individual slickspot peppergrass plants, the seed bank, slickspot microsites, or biological soil crusts are expected to be minimal. However, some localized adverse effects associated with livestock trampling may occur.

In addition, while the effects of soil compaction on slickspot peppergrass by livestock use were not discussed in our final listing rule, the Assessment and the Service's 2006 *Draft Best Available Biological Information on Slickspot Peppergrass (Lepidium papilliferum)* (Service 2006b, pp. 74–75; Bureau 2009, p. II–39) indicate that soil disturbance by vehicle tracks or animal trampling may directly impact the seed bank by crusting and compaction of soils, which can cause seed entrapment and hinder seedling emergence (Chambers and MacMahon 1994, p. 270 and 279–280; Seronko 2004, *in litt.* pp. 1–2). Both seed incorporation into the seed bank and seedling emergence have been demonstrated as being lower on compacted than on non-compacted soils as compaction reduces soil pore space and increases soil rigidity (Sheldon 1974, p. 63). The effects of soil compaction through soil disturbance, including disturbance by localized livestock trampling, may impact the viability of the slickspot peppergrass seed bank, which constitutes the majority of the plant population. Additionally, livestock trampling may potentially reduce ground dwelling insect pollinators and cause a decline in pollinator populations (Shepherd *et al.* 2003, p. 73; Sugden 1985, pp. 300, 309).

Reduced Invasive Nonnative Plant Cover and Wildfire through Livestock Herbivory

Grazing has been documented to reduce invasive nonnative plant cover; these invasive nonnative plants may invade slickspot microsites to compete with slickspot peppergrass. Therefore, carefully managed grazing in areas containing invasive nonnative plants may benefit slickspot peppergrass. For example, Air Force monitoring documented significantly lower *Thinopyrum intermedium* (intermediate wheatgrass) cover in both slickspot microsites and in the surrounding vegetation community in pastures where livestock grazing occurred. In contrast, intermediate wheatgrass cover increased over time inside a livestock exclosure; this increased intermediate

wheatgrass cover may have contributed to the gradual reduced number of slickspot peppergrass plants observed on the exclosure monitoring transects over time (CH2MHill 2009, p. 17).

Livestock grazing may also benefit slickspot peppergrass through reducing the frequency and severity of fire impacts on the species. Modified wildfire regime and invasive nonnative plants have been identified as the primary threats to slickspot peppergrass. Reduced fire frequency may in turn reduce the expansion and spread of annual nonnative invasive grass species such as cheatgrass. Annual livestock grazing removes fine fuels, which may reduce the risk of fire frequency and spread. The potential benefit of livestock use in reducing wildfire effects through a reduction of fine fuels has generated discussion in recent years (e.g., Pellant 1996, entire; Loeser *et al.* 2007, entire). The introduction of cattle, sheep, and horses to the Great Basin in the 1860s quickly created large ranching operations and grazing pressure. Heavy livestock grazing removed fine fuels and resulted in a substantial reduction in the number of fires and acres burned. Only 44 fires, burning a total of 11,000 ac, were reported from 1880 to 1912 in Great Basin rangelands (Miller and Narayanan 2008, p. 9). The number of livestock in Great Basin and sagebrush ecosystems has dropped rapidly since the passage of the Taylor Grazing Act of 1934 (43 USC 315; http://www.blm.gov/wy/st/en/field_offices/Casper/range/taylor.1.html, accessed June 1, 2012, as cited in Launchbaugh *et al.* 2008, p. 2). Livestock numbers in Idaho decreased in the 1950s primarily from the loss of large sheep operations. Livestock numbers have fluctuated at or below this decreased amount through the remainder of the twentieth century, with a steady conversion from sheep to cattle. In the last decade, a substantial decrease in authorized use of livestock grazing on Bureau lands in Idaho has been recorded (Launchbaugh *et al.* 2008, p. 2).

With careful management, livestock grazing may potentially be used as a tool to control cheatgrass (Frost and Launchbaugh 2003, p. 43) or, at a minimum, retard the rate of invasion (Loeser *et al.* 2007, p. 95). Targeted grazing of cheatgrass-dominated sites has been suggested as a first step in breaking the cheatgrass–fire cycle via removal of fire disturbance. However, caution must be used in applying this level of biomass removal in a community that retains some native or desirable plant species, and use of this grazing treatment should therefore be limited to degraded rangeland with little or no native perennial plant cover (Diamond *et al.* 2009, pp. 949–950). Although the spread of cheatgrass has been strongly linked with high-impact grazing, some evidence indicates that grazing at more moderate levels may potentially inhibit cheatgrass colonization (Loeser *et al.* 2007, pp. 94–95). The researchers note, however, that experimental study over a longer time period is needed to verify this tentative conclusion. In addition, fall grazing was shown to reduce fuel loading of cheatgrass dominated range sites in Nevada (Schmelzer 2009, entire). Others, however, have suggested that given the variability in the timing of cheatgrass germination and development, and its ability to spread vegetatively, effective control of cheatgrass through livestock grazing may be a challenge (Hempy-Mayer and Pyke 2008, p. 121; Mayer 2004, p. 32). One recent study demonstrated that livestock grazing on cheatgrass can increase the amount of cheatgrass seed set for the following year (Clements *et al.* 2008, p. 1). While it is difficult to discern the relative importance of grazing, climate, and wildfire in contributing to nonnative plant abundance (D'Antonio *et al.* 1999, as described in Zouhar *et al.* 2008, pp. 23–24), areas with a history of livestock grazing often support a wide variety of nonnative species, especially in areas where nonnatives have been introduced to increase the forage value of rangelands or pastures (Zouhar *et al.* 2008, pp. 23–24).

Following investigations of the 2007 Murphy Wildland Fire Complex, fire-modeling efforts revealed that grazing in grassland vegetation can reduce the surface rate of spread and fire-line intensity to a greater extent than grazing in shrubland vegetation (Launchbaugh *et al.* 2008, pp. 1–2). However, under extreme fire conditions (i.e., low fuel moisture, high temperatures, and gusty winds), grazing applied at moderate levels has limited or negligible effects on fire behavior. When weather and fuel-moisture conditions are less extreme, grazing may reduce the rate of spread and intensity of fires, allowing for patchy burns with low levels of fuel consumption (Launchbaugh *et al.* 2008, pp. 1–2).

Some research also indicates that grazed areas have a reduced likelihood of wildfire ignitions, likely by reducing the availability of fine fuels (Romero-Calcerrada *et al.* 2008, p. 351). However, "fire behavior in sagebrush vegetation types is driven by sagebrush cover and height, with the herbaceous component on which livestock focus their grazing, playing a lesser role" (Launchbaugh *et al.* 2008, p. 30). "Grazing as a fuels management technique would be most effective on uniform grasslands and becomes less effective as the amount and size of the shrub component in the plant community increases" (Launchbaugh *et al.* 2008, p.31), which may limit the utility of livestock grazing as an effective wildfire control technique within sagebrush-steppe habitats containing slickspot peppergrass. In addition, using livestock grazing to reduce fine fuel levels at a landscape scale may conflict with other land management goals. Launchbaugh *et al.* (2008, p. 32) state that "changes in grazing management aimed at managing fuel loads are not appropriate for homogeneous application across large landscapes and multiple management units. Such application of grazing across entire landscapes at rates necessary to reduce fuel loads and affect fire behavior, especially under extreme conditions, could have negative effects on livestock production and habitat goals." Targeted grazing to accomplish fuel objectives holds promise but requires detailed planning that includes clearly defined goals for fuel modification and appropriate monitoring to assess effectiveness (Launchbaugh *et al.* 2008, p. 32). It is unknown if targeted grazing or landscape-level intensive grazing to reduce fuel loads would be compatible with slickspot peppergrass recovery since the degree to which livestock grazing influences fuel loads and fire spread in slickspot peppergrass habitat is currently unknown.

Modified wildfire regime and invasive nonnative plants have been identified as the primary threats to slickspot peppergrass. Annual livestock grazing removes fine fuels, which may reduce the risk of fire frequency and spread. Reduced fire frequency may subsequently reduce the expansion and spread of annual nonnative invasive grass species such as cheatgrass. However, data are currently lacking to document the potential benefit to the species associated with livestock-related reduced fuel loads based on current livestock grazing regimes; therefore, potential benefits of livestock grazing with regards to reduced fuel loads in the Allotment are not quantifiable at this time. The potential fuel-reduction benefits of livestock grazing within in the Allotment are not addressed further in this Opinion, but will be considered in future biological opinions as more research as well as site-specific information becomes available.

Livestock-Related Reduction in Native Vegetation Cover

Livestock herbivory may have negative effects on native forb cover as native forbs may be consumed during the growth and flowering period, especially with spring livestock grazing that occurs in the Allotment. Slickspot peppergrass depends on insect pollinators for its reproduction (Robertson and Ulappa 2004, p. 1707) and survival. Livestock grazing of native forbs has the

potential to reduce pollinating insect populations that are critical to slickspot peppergrass reproduction and survival by reducing their pollen and nectar food source. Livestock grazing may reduce native forb cover or preclude the recovery of historic forb cover levels (Kimball and Schiffman 2003, pp. 1687–1688). Native perennial and annual forbs may be consumed during the growth and flowering period, especially with spring livestock grazing (Kimball and Schiffman 2003, p. 1683). Lack of forbs in occupied slickspot peppergrass habitat can constitute a barrier that reduces the effective range of insects important to slickspot peppergrass pollination (Robertson *et al.* 2004, p. 2–4). A lack of insect pollinators has the potential to impact seed production for renewal of the slickspot peppergrass seed bank.

Barriers to insect pollinators can include large areas of degraded sagebrush steppe habitat that do not support sufficient forb diversity necessary for insect pollinators to be available for slickspot peppergrass pollination. If livestock grazing occurs during April through June when many annual and perennial forbs actively grow and flower in southwestern Idaho, livestock consumption of forbs may affect forb vigor and seed production, potentially reducing the present and future forb cover in the vicinity of slickspot peppergrass habitat. In addition, removal of native plants in the vicinity of slickspot peppergrass EOs through livestock grazing and trampling may result in lowered densities and diversity of insects required for pollination and successful reproduction of slickspot peppergrass, resulting in some localized adverse impacts on slickspot peppergrass related to loss of insect pollinator habitat.

Annual livestock grazing in EOs 29, 51, and 62 from April through June has the potential to impact native forbs, which are an important habitat component for slickspot peppergrass. Continual spring grazing during the critical growth period for native grasses and forbs affects plant vigor and overall health. Over time, without rest or deferment scheduled into the grazing management rotations, range condition can decline. Continuation of annual spring grazing during the active growing period for native plants in EO 29, EO 51, and EO 62 is expected to limit the potential for recovery of remaining native forbs within the Allotment, which may affect the abundance of slickspot peppergrass insect pollinators in the area. Effects associated with livestock grazing have been reduced by implementing conservation measures in the Allotment, including placing salt and supplements at least 0.5 mi from EOs and avoiding livestock trailing through EOs when soils are saturated as well as adherence to range readiness criteria. In addition, grazing standards and guides for the Allotment are designed to improve native plant cover in the action area. However, localized adverse effects from spring livestock herbivory of native forbs and trampling of individual slickspot peppergrass plants, the seed bank, slickspot microsites, and native forbs are reasonably certain to occur.

Mechanical Damage to Vegetation

"Additional mechanical effects of foraging on woody plants include intentional or inadvertent breaking off of limbs and bark wounding by horning, rubbing, feeding, or hooves" (Vallentine 2001, p. 156). While not addressed in the Service's listing rule, livestock may also have a negative impact on shrub distribution due to breaking of shrubs by bedding in or rubbing on them or by reaching through shrubs to access forage. Damage to existing shrubs has been observed near areas of livestock congregation, such as near watering sites and mineral supplement areas, and may be amplified in sites that already exhibit limited shrub cover (USBLM 2009, p. II-40). Shrub damage by livestock is more likely in pastures that have limited

shrub stands since livestock congregate around shrubs when the weather is windy and to rub on. The loss of shrub cover may impact slickspot peppergrass by allowing more wind to the soil surface and drying the areas out. Shrubs also act as snow fences and help catch and retain winter moisture (Rosentreter and Jorgensen 1986, p. 3). Although the specific function of shrubs in relation to slickspot peppergrass habitat parameters is not discussed in our final listing rule, the Service acknowledges that shrubs are important components of slickspot peppergrass habitat. Increased numbers of slickspot peppergrass plants observed in 2008 were largely based on substantial increases at 6 of 80 HIP transects, with 66 percent of all slickspot peppergrass plants counted in 2008 found at these 6 transects (Colket 2009, p. 26). The plant community where these 6 transects are located has not been burned, is dominated by native sagebrush, and represents some of the highest-quality habitat remaining for the species. In addition, an analysis of 5 years of HIP monitoring data indicated that slickspot peppergrass "abundance was lower within those slickspot (sic) that had previously burned" (Sullivan and Nations 2009, p. 137). HIP monitoring identifies burned areas within the range of slickspot peppergrass by their lack of Wyoming big sagebrush shrub cover. It is unknown if this relationship between slickspot peppergrass abundance and fire is the result of the lack of shrubs in burned areas, physical or chemical changes to habitat parameters as the result of burning, or a combination of both.

The vast majority of impacts to shrub cover within the range of slickspot peppergrass are related to wildfire, with additional shrub cover loss associated with development. In contrast, the effects of livestock use on shrub cover reduction are typically localized, and primarily occur in areas of livestock concentration such as near water or salt/supplement sites. Effects of livestock use on shrub cover are expected to be most impacting to slickspot peppergrass in EO areas where shrub cover has already been reduced by other factors. Livestock grazing activities are expected to maintain current shrub cover levels in the Allotment, although some adverse effects to shrubs may occur in localized areas around livestock salting and watering areas as well as in areas with reduced shrub cover due to past wildfires.

Livestock-Related Spread of Invasive Nonnative Plants

Livestock use has been suggested as a contributing factor to the spread of both native and invasive nonnative plant species (e.g., Young *et al.* 1972, pp. 194–201; Hobbs and Huenneke 1992, p. 329; Frost and Launchbaugh 2003, pp. 43–45; Loeser *et al.* 2007, p. 95). The spread of cheatgrass across portions of the Snake River Plain has been attributed to several causes, including the past practice of intensive livestock use in the late 1800s (Mack 1981, pp. 145–165). A small number of case studies from western North America suggest that grazing plays an important role in the decrease of native perennial grasses and an increase in dominance by nonnative annual species; however, invasion by nonnative grasses has been found to occur both with and without grazing in some areas. Today, nonnative annual plants such as cheatgrass are so widespread that they have been documented spreading into areas not impacted by disturbance (Piemeisel 1951, p. 71; Tisdale *et al.* 1965, pp. 349-351; Stohlgren *et al.* 1999, p. 45); therefore, the absence of livestock use no longer protects the landscape from invasive nonnative weeds (Frost and Launchbaugh 2003, p. 44), at least with respect to cheatgrass.

Analysis of 3 years of HII data, from 1999 through 2001, showed no effect of livestock grazing on slickspot perimeter integrity (described as "loss of slickspot perimeter distinctness" in Mancuso *et al.* 1998, p. 7), weedy species density, perennial forb or grass establishment, or

organic debris accumulation in slickspots (Menke and Kaye 2006a, p. 10). Cumulative livestock sign (an indicator of livestock presence) had a significant negative correlation with exotic grass dominance around slickspots (Menke and Kaye 2006a, p. 11) and with the frequency of slickspots with dense weedy annuals in 2001 (Menke and Kaye 2006a, p. 10). The analysis of grazing effects was limited since the HII data were observational only (i.e., no controlled experiments were performed); all areas were likely grazed at some point in the past; and grazing effects could only be observed in previously burned habitats (Menke and Kaye 2006a, p. 18). In addition, there was no significant difference in cover of exotic plant species in slickspots between grazed and ungrazed areas in the 2004 HIP data set, although biological soil crust cover was significantly lower in grazed transects (Menke and Kaye 2006b, p. 19). Biological soil crusts are important to the sagebrush-steppe ecosystem and slickspots where slickspot peppergrass occurs; they stabilize and protect soil surfaces from wind and water erosion, retain soil moisture, discourage annual weed growth, and fix atmospheric nitrogen (Eldridge and Greene 1994 as cited in Belnap *et al.* 2001, p. 4).

In addition, Young (2007, p. 19) did not find a significant change in the density of cheatgrass, bur buttercup (*Ceratocephala testiculata*), and clasping pepperweed (*Lepidium perfoliatum*) following the application of a short-duration, annual trampling treatment over a 2-year period on the Owyhee Plateau physiographic region. However, similar to Menke and Kaye (2006a, 2006b), this study represents a short-term data set that likely is not capable of reflecting any potential long-term effects to slickspot peppergrass habitat.

Indirect impacts to slickspot peppergrass and its habitat could occur from the introduction and spread of invasive nonnative plants, including noxious weeds, related to livestock grazing activities. Livestock grazing activities can contribute to the spread of invasive nonnative plants by (1) reducing native plant biomass and competition within the plant community; (2) disrupting the soil surface, particularly during saturated soil conditions, and creating disturbed areas open to introduction of nonnative plants; and (3) physically transporting seeds externally or in feces. For example, nonnative invasive plants could become introduced during grazing or trampling when soils are exposed, and during the long-term use of roadways, where invasive and noxious weeds could be brought in on and spread by vehicles. Invasive plants could also spread naturally to disturbed soils from surrounding areas. Invasive plants could adversely affect the quality of suitable habitat for slickspot peppergrass and could lead to competition for resources. With the spread of annual invasive plant species, there will be more fine fuels and a greater risk of fire, which could threaten the population of slickspot peppergrass. The conversion of sagebrush-steppe into annual grasslands, which could result from a shortened fire regime interval, would further degrade the quality of habitat for slickspot peppergrass and its pollinators, which is known to have lowered abundance in burned areas.

Diffuse knapweed, rush skeletonweed, and Scotch thistle—all Idaho noxious weeds—have been documented near EO 51 and can be dispersed by grazing cattle within and adjacent to EOs in the Allotment. As cattle may spread nonnative plant propagules from previously grazed areas (in some cases outside of Idaho), effects associated with livestock-related introduction of invasive nonnative plants into slickspot microsites and habitat surrounding EOs are reasonably likely to occur. Therefore, some localized adverse effects associated with increased invasive nonnative plant cover are expected to occur in the action area as a result of proposed and ongoing livestock grazing activities in the Allotment.

Summary of Effects

The Allotment contains BC-ranked EO 51 (about 4 acres), and C-ranked EOs 29 and 62 (about 105 acres and about 4 acres, respectively); and has a medium to high conservation value for slickspot peppergrass within the action area as well as rangewide. Trampling by livestock could result in localized damage to or mortality of individual slickspot peppergrass plants or localized impacts to the seed bank within individual slickspots. In addition, livestock trampling may also result in localized damage or loss of native plants and insect pollinators. As the Allotment supports annual spring and fall grazing, some trampling impacts and localized degradation of habitat conditions are expected to occur with continued implementation of this action. However, current habitat conditions are likely to be maintained over the majority of the action area because extremely low levels of livestock trampling and feces percent cover have been documented in the Allotment over the 7 years of HIP monitoring available in this Allotment; thus, it is expected that livestock trampling impacts will be limited to isolated areas with livestock concentrations during periods of saturated soils conditions or when individual plants are flowering.

Indirect impacts to slickspot peppergrass and its habitat could occur from the introduction and spread of invasive nonnative plants, including noxious weeds, related to livestock grazing activities. As described above, invasive nonnative plants have been identified as one of the primary threats to slickspot peppergrass. Introduction or spread of invasive nonnative plants facilitated by livestock use may directly displace slickspot peppergrass plants or native plants required for food or shelter by insect pollinators. As cattle may spread nonnative plant propagules from previously grazed areas (in some cases outside of Idaho), effects associated with livestock-related introduction of invasive nonnative plants into slickspot microsites and habitat surrounding EOs are reasonably likely to occur. Therefore, some localized adverse effects associated with increased invasive nonnative plant cover are expected to occur in the action area as a result of livestock grazing activities in the Allotment.

Conservation measures implemented within the Allotment are likely to reduce but not eliminate localized effects from livestock grazing activities that could adversely affect slickspot peppergrass and its habitat. These conservation measures include no trailing of livestock through EOs when soils are saturated, placement of supplements and water to draw livestock away from EOs, the continuation of weed treatments within the Allotment while avoiding adverse impacts to slickspot peppergrass, adherence to range readiness criteria, and implementing compliance inspections that may trigger an adaptive management response with appropriate changes in livestock grazing activities to minimize impacts to slickspot peppergrass. For these reasons, the action is compatible with maintaining a medium to high slickspot peppergrass conservation value for the Allotment and its associated slickspot peppergrass occupied habitat over the remaining term of the action (about 2 more years).

2.5.2.2 Effects of Interrelated or Interdependent Actions

No effects from interrelated or interdependent actions are anticipated.

2.5.3 Slickspot Peppergrass Proposed Critical Habitat

2.5.3.1 Direct and Indirect Effects of the Proposed Action

Direct and indirect effects on proposed critical habitat for slickspot peppergrass within the action area would result from livestock grazing activities in the Allotment. Similar to effects to the species, direct and indirect effects could result from ground disturbance, increased establishment and spread of invasive nonnative plants (including noxious weeds), reduction of native grasses and forbs, and reduction in the frequency and intensity of wildfire due to grazing-related reductions in fine fuel loads.

PCE 1 – Ecologically Functional Slickspots

Effects to slickspot microsites (PCE 1) associated with livestock grazing activities in the Allotment are similar to effects to slickspot microsite habitats important to the species, which are discussed in detail above. As previously described, ground disturbance from livestock trampling could result in the localized direct effects on slickspot microsites within proposed critical habitat. Slickspot microsites may be damaged through trampling damage to the slickspot soil structure and function and by the reduction of biological soil crust cover. Indirect impacts to slickspots may occur through increased nonnative invasive plant cover within slickspots associated with livestock transport of propagules and trampling-related soil disturbance allowing the spread of invasive nonnative plants into slickspot microsites. Project design features such as no trailing of livestock through EOs when soils are saturated and placement of supplements and water to draw livestock away from EOs as well as adherence to range readiness criteria will minimize effects of ground disturbance on PCE 1. However, some localized adverse effects to some slickspot microsites associated with livestock grazing activities in the Allotment are expected to occur.

The 1,061 acres of proposed critical habitat located within the Allotment represent about 19 percent of the total acreage of Subunit 3c (5,583), about 11 percent of the 9,879 acres of proposed critical habitat within Critical Habitat Unit 3 (Elmore County), and about 2 percent of the proposed critical habitat acreage for slickspot peppergrass rangewide (57,756 acres). Although the livestock grazing activities in the Allotment will result in some localized adverse effects to slickspot microsites, overall the functionality of PCE 1 of proposed critical habitat in Subunit 3c as well as across the entire area proposed for critical habitat designation will not be reduced by ongoing livestock grazing in the Allotment.

PCE 2 – Relatively Intact Native Wyoming Big Sagebrush

Effects to big sagebrush stands (PCE 2) associated with livestock grazing activities in the Allotment are similar to effects to sagebrush habitat important to the species, which are discussed in detail above. Given the current condition of the habitat in the action area, ongoing livestock grazing activities in the Allotment are expected to result in minimal fragmentation impacts to sagebrush steppe habitat. Livestock may directly damage or kill individual sagebrush plants by trampling, bedding, or rubbing on plants. Livestock grazing activities may indirectly impact intact sagebrush steppe habitat through increased spread of invasive nonnative plants (such as cheatgrass) associated with grazing-related ground disturbance.

Project design features such as no trailing of livestock through EOs when soils are saturated, placement of supplements and water to draw livestock away from EOs, and adherence to range

readiness criteria will reduce the risk of impacts to remnant intact sagebrush steppe habitat in the action area. However, some localized adverse effects to some sagebrush plants associated with livestock grazing activities in the Allotment are expected to occur. Although the livestock grazing activities in the Allotment will result in some localized adverse effects to intact sagebrush steppe habitat that remains in the action area, overall the functionality of PCE 2 of proposed critical habitat in Subunit 3c as well as across the entire area proposed for critical habitat designation will not be reduced by the permitted actions with the Allotment.

PCE 3 – A Diversity of Native Plants for Foraging, Reproduction, and Shelter of Insect Pollinators

Effects to native plant diversity (PCE 3) associated with livestock grazing activities in the Allotment are similar to effects to native plants important to the species, which are discussed in detail above. As previously discussed, livestock grazing may reduce the number of native forbs through direct livestock consumption, mortality or damage of native forbs due to trampling, and the introduction and spread of invasive nonnative plants that directly compete with native forbs. It is expected that ongoing livestock grazing activities within the Allotment will result in some localized adverse effects to habitat parameters important to insect pollinators. Livestock grazing activities could also lead to an increase in invasive nonnative annuals and/or invasive nonnative perennial plants in the action area over time, reducing native forb cover due to competition for resources.

Effects of localized loss of remnant remaining native plants are expected to be minimized through adherence to range readiness criteria as well as through continuation of weed treatments within the Allotment while avoiding adverse impacts to slickspot peppergrass; however, some reduction in native plant diversity is expected to occur associated annual spring grazing in the Allotment. Although permitted activities in the Allotment will result in some localized adverse effects to habitat parameters important to insect pollinators, overall the functionality of PCE 3 of proposed critical habitat in Subunit 3c as well as across the entire area proposed for critical habitat designation will not be reduced by this project.

PCE 4 – Sufficient Pollinators for Successful Fruit and Seed Production

Effects to insect pollinators (PCE 4) associated with livestock grazing activities in the Allotment are similar to effects to insect pollinators for the species, which are discussed in detail above. As described above, diversity and numbers of insect pollinators may be locally impacted through ground disturbance and vegetation removal during livestock grazing activities. Ground disturbance by livestock trampling may result in localized adverse impacts to insect pollinators that nest within the soil, including within slickspot microsites. In addition, cover of remnant native vegetation will be locally reduced by foraging or trampling by livestock, reducing its availability for pollinator foraging or shelter. However, effects of localized reduction of remnant remaining native plant cover is expected to be reduced through adherence to range readiness criteria as well as through continuation of weed treatments within the Allotment while avoiding adverse impacts to slickspot peppergrass. Similarly, effects of livestock trampling on insect pollinators will be minimized through project design features to minimize ground disturbance such as no trailing of livestock through EOs when soils are saturated and placement of supplements and water to draw livestock away from EOs as well as adherence to range readiness criteria. Although ongoing livestock grazing in the Allotment may result in some localized

adverse effects to insect pollinators, overall the functionality of PCE 4 of proposed critical habitat in Subunit 3c as well as across the entire area proposed for critical habitat designation will not be reduced by livestock grazing activities in the Allotment.

2.5.3.2 Effects of Interrelated or Interdependent Actions

There are no interrelated or interdependent actions associated with livestock grazing actions in the Allotment, as described above for the species.

2.6 Cumulative Effects

The implementing regulations for section 7 define cumulative effects to include the effects of future State, tribal, local or private actions that are reasonably certain to occur in the action area considered in this Opinion. Future Federal actions that are unrelated to the action are not considered in this section because they require separate consultation pursuant to section 7 of the Act.

2.6.1 Slickspot Peppergrass Cumulative Effects

Future state, tribal, local or private actions that are reasonably certain to occur in the action area include livestock grazing, recreation, noxious weed control, and development. In general, these activities are associated with potential increases in noxious weed and nonnative plant cover as well as increased risk of wildfire. Effects of these activities on slickspot peppergrass are described in detail in the Environmental Baseline section above.

No EOs are documented on non-Federal lands located within the boundaries of the Allotment. The slickspot peppergrass 0.5 mi occupied habitat pollinator buffer overlapping with non-Federal lands within the boundaries of the Allotment include 118 ac of State land and 0 ac of private land. The presence or absence of slickspot peppergrass on private lands in the vicinity of the Allotment is unknown due to lack of surveys for the plant. However, because only 2 percent (322 ac) of the total EO acreage rangewide occurs on non-Federal lands (Table 7), the Service expects that any cumulative effects occurring within the term of the livestock grazing actions considered herein are not likely to significantly alter habitat conditions for slickspot peppergrass within the EOs affected by Bureau actions.

2.6.2 Slickspot Peppergrass Proposed Critical Habitat Cumulative Effects

Impacts from livestock grazing activities in the Allotment on proposed critical habitat for slickspot peppergrass would add cumulatively to the impacts of future state, tribal, local or private actions that are reasonably certain to occur in the action area. As described above for the species, these actions include livestock grazing, recreation, and development, along with associated increases in noxious weeds and nonnative plants and risk of wildfire. The impacts of these future actions on slickspot peppergrass proposed critical habitat would be the same as that described for slickspot peppergrass habitat above, and therefore are not repeated here.

2.7 Conclusion

2.7.1 Slickspot Peppergrass

The Service has reviewed the current status of slickspot peppergrass, the environmental baseline in the action area, effects of the action, and cumulative effects, and it is our conclusion that the action is not likely to jeopardize the continued existence of slickspot peppergrass.

The Service concludes that direct and indirect effects to slickspot peppergrass will be limited to localized trampling of individual slickspot peppergrass plants and ground disturbance of slickspot microsites located within the Allotment, minimal increases in invasive nonnative plant cover within habitat known to contain slickspot microsites, and potential localized effects to insect pollinator populations due to loss of remnant native vegetation and ground disturbance within the Allotment. The adverse effects of the proposed action on slickspot peppergrass will occur at a localized level. The Service expects that the numbers, distribution, and reproduction of slickspot peppergrass in the action area (which includes EOs 29, 51, and 62 and Management Area 9), and for the species rangewide in southwestern Idaho, will not be significantly changed as a result of this action. As such, we have concluded that the survival and recovery of slickspot peppergrass will not be jeopardized by activities associated with livestock grazing in the Allotment.

The Service reached the no-jeopardy determination on the basis that the aggregate effects of livestock grazing activities in the Allotment, inclusive of applicable conservation measures set forth in the Conservation Agreement (CA) (USBLM and USFWS 2009, entire) and project conservation measures, taken together with cumulative effects, are compatible with maintaining the ecological function of slickspot microsites and EOs in the vicinity of the project within the Snake River Plain physiographic region. As noted in the "Status of the Species" section of this Opinion, the long-term conservation of slickspot peppergrass is likely to depend on the maintenance or improvement of the ecological function of the higher quality (A- through C-ranked) EOs rangewide, including maintaining or improving the connectivity within and between EOs to facilitate pollinator activity, maintain genetic diversity, and minimize the effects of activities that promote the establishment of invasive nonnative plant species.

Limited trampling impacts and continued localized degradation of habitat conditions are expected to occur with continued implementation of this action. The Allotment contains BC-ranked EO 51 (about 4 acres), and C-ranked EOs 29 and 62 (about 105 acres and about 4 acres, respectively); and has a medium to high conservation value for slickspot peppergrass rangewide. Conservation measures implemented within the Allotment are likely to reduce but not eliminate localized effects from livestock grazing activities that could adversely affect slickspot peppergrass and its habitat. However, current habitat conditions are likely to be maintained over the majority of the action area because HIP monitoring has documented very low levels of livestock hoof print cover within slickspots in the Allotment, indicating livestock use in the vicinity of EOs is relatively low; and due to continued implementation of slickspot peppergrass conservation measures. These conservation measures include no trailing of livestock through EOs when soils are saturated, placement of supplements and water to draw livestock away from EOs, the continuation of weed treatments within the Allotment while avoiding adverse impacts

to slickspot peppergrass, adherence to range readiness criteria, and implementing compliance inspections that may trigger an adaptive management response with appropriate changes in livestock grazing activities to minimize impacts to slickspot peppergrass. For these reasons, the action is compatible with maintaining a medium to high slickspot peppergrass conservation value for the Allotment and its associated slickspot peppergrass occupied habitat over the remaining term of the action (about 2 more years).

2.7.2 Slickspot Peppergrass Proposed Critical Habitat

The Service has reviewed the current status of slickspot peppergrass proposed critical habitat, the environmental baseline in the action area, effects of the action, and cumulative effects, and it is our conclusion that the livestock grazing activities in the Allotment are not likely to destroy or adversely modify proposed critical habitat for slickspot peppergrass.

Similar to our conclusion regarding the species as described above, the Service concludes that direct and indirect effects to proposed critical habitat for slickspot peppergrass will be limited to localized ground disturbance of slickspot microsites and some increases in invasive nonnative plant cover within slickspot microsites (PCE 1). There may also be loss of individual native shrubs though mechanical damage, localized reduced cover of native forbs due to annual spring grazing or trampling, localized reduced forb cover due to competition with invasive nonnative plants spread by grazing related-ground disturbance, and localized trampling loss of insect pollinators or their habitats (PCEs 2, 3, and 4). The adverse effects of the proposed action on PCEs will occur at a localized level relative to the rangewide extent of proposed critical habitat for slickspot peppergrass. The Service expects that the function of PCEs within proposed critical habitat in the action area and rangewide in southwestern Idaho will not be significantly changed as a result of livestock grazing activities in the Allotment. Therefore, we have concluded that livestock grazing activities in the Allotment do not appreciably diminish the value of the PCEs of proposed critical habitat for slickspot peppergrass.

The Service reached the no adverse modification determination on the basis that the aggregate effects of the livestock grazing activities in the Allotment, inclusive of applicable conservation measures set forth in the Conservation Agreement (CA) (USBLM and USFWS 2009) and project conservation measures, taken together with cumulative effects, are compatible with maintaining the ecological function of slickspot microsites, remnant sagebrush stands, remnant native plants, and insect pollinators within proposed critical habitat Subunit 3c. As described above, the long-term conservation of slickspot peppergrass is likely to depend on the maintenance or improvement of ecological function of the higher quality (A- through C-ranked) EOs rangewide, including maintaining or improving the connectivity within and between EOs, to facilitate pollinator activity, maintain genetic diversity, and minimize the effects of activities that promote the establishment of invasive nonnative plant species.

Slickspot peppergrass conservation measures being implemented by the Bureau in conjunction with the livestock grazing activities in the Allotment also serve to avoid or minimize impacts to PCEs of proposed critical habitat. Measures include management actions such as such as no trailing of livestock through EOs when soils are saturated, adherence to range readiness criteria, and placement of supplements and water to draw livestock away from EOs will reduce the risk of impacts to slickspot microsites (PCE1), remnant intact sagebrush steppe habitat (PCE 2), native

plants (PCE 3), and insect pollinators (PCE 4) in the action area. These specific measures are intended to reduce the amount or extent of localized impacts, although localized adverse effects to PCEs will not be completely eliminated.

2.8 Incidental Take Statement

Section 9 of the Act and Federal regulations pursuant to section 4(d) of the Act prohibit the take of endangered and threatened species, respectively, without specific exemption. Take is defined as to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture or collect, or to attempt to engage in any such conduct. Harm in the definition of take in the Act means an act which actually kills or injures wildlife. Such act may include significant habitat modification or degradation that results in death or injury to listed species by significantly impairing essential behavioral patterns, including breeding, feeding, or sheltering. Harass is defined by the Service as an intentional or negligent act or omission which creates the likelihood of injury to listed species by annoying it to such an extent as to significantly disrupt normal behavior patterns which include, but are not limited to, breeding, feeding, or sheltering.

Incidental take is defined as take that is incidental to, and not the purpose of, the carrying out of an otherwise lawful activity. Under the terms of section 7(b)(4) and section 7(o)(2), taking that is incidental to and not intended as part of the agency action is not considered to be prohibited taking under the Act provided that such taking is in compliance with the terms and conditions of this Incidental Take Statement.

Because the "take" prohibitions detailed under section 9(a)(1) of the Act do not apply to listed plants, those sections of the Act dealing with incidental "take", Sections 7(b)(4) and 7(0)(2), generally do not apply to listed plants either. Therefore, we are not including an Incidental Take Statement for slickspot peppergrass in this Opinion.

However, section 9(a)(2) of the Act prohibits, among other actions, the removal and reduction to possession of plants listed as endangered or threatened from areas under Federal jurisdiction. The Act prohibits the malicious damage of Federally listed endangered plants on areas under Federal jurisdiction, or the destruction of endangered plants on non-Federal areas in violation of State law or regulations or in the course of any violation of a State criminal trespass law. These protections may apply to slickspot peppergrass as well if State regulations are promulgated.

2.9 Conservation Recommendations

Section 7(a)(1) of the Act directs Federal agencies to utilize their authorities to further the purposes of the Act by carrying out conservation programs for the benefit of endangered and threatened species. Conservation recommendations are discretionary agency activities to minimize or avoid adverse effects of a proposed action on listed species or critical habitat, to help implement recovery programs, or to develop new information on listed species.

The Service recommends that the Bureau implement the following conservation measures:

- Use the conservation measures and associated implementation actions in the 2009 CA as a basis for developing conservation measures for future revised Land Use Plans (LUP) in order to continue recovery of slickspot peppergrass. Given new information resulting from implementation actions identified in the 2009 CA (e.g., completion of surveys) and recent and ongoing research on habitat restoration, insect pollinators, wildfire, and invasive nonnative plants, LUPs may be revised to include more stringent conservation measures and implementation actions as appropriate.
- Encourage all permittees that use Pastures 3 and 6a to voluntarily implement conservation measures for slickspot peppergrass until such time that all applicable permits are updated to include consistent, permit-level slickspot peppergrass conservation measures for all Allotment pastures documented to contain occupied habitat and slickspot peppergrass habitat.
- Continue to implement conservation measures for slickspot peppergrass, regardless of future listing status, to ensure continued species conservation and population expansion over time. The Service's interpretation of the signed 2009 CA is that the conservation measures apply to Bureau actions regardless of the species' status under the Act.
- Continue annual monitoring efforts to ensure that conservation measures are implemented and to assist in determining if these measures are effective in the conservation of the species and report these annual findings to the Service.
- Conduct surveys in cooperation with the Service, Idaho Department of Fish and Game, and other parties to determine slickspot peppergrass locations and densities in potential habitat.
- Encourage research and projects to restore sagebrush-steppe habitat within the range of slickspot peppergrass.
- Actively participate in critical habitat and recovery planning efforts for slickspot peppergrass.
- Continue to participate in the LEPA Technical Team and other cooperative forums for sharing information, developing partnerships, and encouraging research to facilitate the survival and recovery of slickspot peppergrass, including restoration techniques for sagebrush-steppe habitat and methods to reintroduce slickspot peppergrass into areas capable of supporting the species.
- Conduct annual coordination meetings between the Bureau and the Service to address new information; provide perspective regarding the relationship of new information to ongoing actions; use this information, as appropriate, to modify actions or conservation measures via the established adaptive management strategy; and consider whether this

information may modify the analyses in this Opinion and/or the appropriateness of the Service's conclusions.

- Consider establishing conservation reserves for slickspot peppergrass to maintain high quality sagebrush-steppe habitat and for use as research areas.
- Exercise section 7(a)(1) of the Act to maintain or enhance plant communities in a manner compatible with the needs of slickspot peppergrass and its critical habitat, which includes maintaining a functional sagebrush-steppe ecosystem, minimizing ground disturbance in slickspot habitats, and providing native forb cover to maintain or enhance insect pollinator populations.
- Prioritize fire suppression to protect remaining large sagebrush stands within the range of slickspot peppergrass.
- Avoid or minimize ground-disturbing activities within EOs when soils are saturated and/or when slickspot peppergrass is flowering (May–June).
- Consider modifying livestock management within pastures in the Allotment that contain slickspot peppergrass or slickspot microsites to avoid annual spring grazing.
- Avoid pesticide contact with slickspot peppergrass plants or insect pollinators near EOs.
- For upcoming Bureau permit renewals and reissuances and the updated Four Rivers Resource Management Plan effort, cooperate with the Service, the Idaho Department of Fish and Game, permit holders, and other parties to identify strategies for avoiding or minimizing adverse impacts to slickspot peppergrass.
- Continue to encourage the restoration of native sagebrush steppe habitat on Bureau lands for species native to this habitat type, including slickspot peppergrass.
- Conduct annual reporting on herbicide use, fire suppression activities, monitoring results, and any revegetation planned or implemented on Bureau lands in relation to potential impacts to slickspot peppergrass and slickspot microsites as part of annual coordination meetings between the Bureau and the Service.
- Consider use of conservation measures for slickspot peppergrass on Bureau lands that also complement conservation of the other sagebrush steppe habitat obligates, including greater sage-grouse (*Centrocercus urophasianus*), a candidate species, and pygmy rabbit (*Brachylagus idahoensis*), a species of concern.

To remain informed about actions minimizing or avoiding adverse effects or benefiting listed species or their habitats, the Service requests notification of the implementation of any conservation recommendations.

2.10 Reinitiation Notice

This concludes formal consultation on slickspot peppergrass and formal conference on proposed critical habitat for slickspot peppergrass. Because the "take" prohibitions detailed under section 9(a)(1) of the Act do not apply to listed plants, requirements for reinitiation of formal consultation associated with incidental "take" as described below are not applicable to listed plants, including slickspot peppergrass.

As provided in 50 CFR §402.16, reinitiation of formal consultation is required where discretionary Federal agency involvement or control over the action has been maintained (or is authorized by law) and if:

1. The amount or extent of incidental take is exceeded.
2. New information reveals effects of the agency action that may affect listed species or critical habitat in a manner or to an extent not considered in this Opinion.
3. The agency action is subsequently modified in a manner that causes an effect to the listed species or critical habitat that was not considered in this Opinion.
4. A new species is listed or critical habitat designated that may be affected by the action.

In instances where the amount or extent of incidental take is exceeded, any operations causing such take must cease pending reinitiation.

3. LITERATURE CITED

3.1 Published Literature

Baker, W.L. 2006. Fire and Restoration of Sagebrush Ecosystems. Wildlife Society Bulletin. 34(1): 177-185.

Barrett, S.C.H., and J.R. Kohn. 1991. Genetic and evolutionary consequences of small population size in plants: implications for conservation. Pages 3–30 in D.A. Falk and K.E. Holsinger, eds. Genetics and conservation of rare plants. Oxford University Press, New York, NY.

Baskin, C.C., and J.M. Baskin. 2001. Seed ecology, biogeography, and evolution of dormancy and germination. Academic Press, San Diego, CA. pp. 133–164, 399–404, 508–518, 565–570.

Belnap, J., J.H. Kaltenecker, R. Rosentreter, J. Williams, S. Leonard, and D. Eldridge. 2001. Biological soil crusts: Ecology and management. BLM Technical Reference 1730-2. January 2001. 119 pp.

Billinge, S.A. 2006. Reproductive performance as a function of outcrossing distance in *Lepidium papilliferum* (Brassicaceae), a rare plant endemic to southwest Idaho. Master's thesis, Boise State University, Boise, ID. 72 pp.

Billinge, S.A., and I.C. Robertson. 2008. Spatial structure and inbreeding depression in slickspot peppergrass, *Lepidium papilliferum* (Brassicaceae). Botany 86:1002–1008.

Brooks, M.L., and D.A. Pyke. 2001. Invasive plants and fire in the deserts of North America. Pages 1–4 in K.E.M. Galley and T.P. Wildson, eds. Proceedings of the Invasive Species Workshop: the Role of Fire in the Control and Spread of Invasive Species Fire Conference 2000: the First National Congress on Fire Ecology, Prevention, and Management.

Brown, T.J., B.L. Hall, and A.L. Westerling. 2004. The impact of twenty-first century climate change on wildland fire danger in the western United States: An application perspective. Climatic Change 62:365–388.

Bunting, S.C., J.L. Kingery, and M.A. Schroeder. 2003. Assessing the Restoration Potential of Altered Rangeland Ecosystems in the Interior Columbia Basin. Ecological Restoration 21(2):77-86.

CH2MHill. 2009. Slickspot peppergrass (*Lepidium papilliferum*) permanent monitoring plots 2009 Juniper Butte Range. Unpublished report prepared by CH2MHill. October 2009. 18 pp. + appendices.

CH2MHill. 2007. Slickspot peppergrass (*Lepidium papilliferum*) permanent monitoring plots 2007 Juniper Butte Range. Unpublished report prepared by CH2MHill. December 2007. 17 pp. + appendices.

Chambers, J.C., and J.A. MacMahon. 1994. A day in the life of a seed: Movements and fates of seeds and their implications for natural and managed systems. Annual Review of Ecology and Systematics 25:263–292.

Chambers, J.C., and M. Pellant. 2008. Climate change impacts on northwestern and intermountain United States rangelands. Society for Range Management, June 2008:29–33.

Clements, D.D., J.A. Young, and D.N. Harmon. 2008. Cheatgrass response to simulated grazing. Abstract of presentation at the Society for Range Management national meeting. Louisville, Kentucky. Available online at S:\CCHC\Federal Action Agencies\BLM\Idaho State Office\LEPA Ongoing Actions Conference 2009\BA References for BOs\Citations from BLM\Clements_ etal_ 2008_abstract.mht. (last accessed December 23, 2009).

Cole, N.K. 2009. *Lepidium papilliferum* threats table. Update of 2006 table summarizing individual EO information and threats using January 14, 2009 Idaho National Heritage Program data with additional hand written refinements by Barbara Chaney, Idaho Fish and Wildlife Office, U.S. Fish and Wildlife Service, Boise, Idaho. Table compiled by Nancy Cole for the Idaho Fish and Wildlife Office, U.S. Fish and Wildlife Service, Boise, ID. 5 pp.

Colket, B. 2005. 2004 habitat integrity and population monitoring of slickspot peppergrass (*Lepidium papilliferum*). Idaho Conservation Data Center, Idaho Department of Fish and Game, Boise, ID. 40 pp. + appendices.

Colket, B. 2006. 2005 rangewide habitat integrity and population monitoring of slickspot peppergrass (*Lepidium papilliferum*). Idaho Conservation Data Center, Idaho Department of Fish and Game, Boise, ID. 86 pp. + appendices.

Colket, B. 2008. Slickspot peppergrass (*Lepidium papilliferum*) field study and predictive distribution modeling. Idaho Conservation Data Center, Idaho Department of Fish and Game, Boise, ID. 29 pp. + appendices.

Colket, B. 2009. 2004–2008 Rangewide habitat integrity and population monitoring of slickspot peppergrass (*Lepidium papilliferum*). Idaho Conservation Data Center, Idaho Department of Fish and Game, Boise, ID. 30 pp. + appendices.

Colket, B., S. Cooke, and M. Mancuso. 2006. Element occurrence review and update for slickspot peppergrass (*Lepidium papilliferum*) in the Idaho Conservation Data Center BIOTICS database. Unpublished report. Idaho Conservation Data Center, Idaho Department of Fish and Game, Boise, ID. December 2005. 40 pp. + appendices.

D'Antonio, C.M., and P.M. Vitousek. 1992. Biological Invasions by Exotic Grasses, the Grass/Fire Cycle, and Global Change. Annual Review of Ecology and Systematics 23:63-87.Dukes, J.S., and H.A. Mooney. 2003. Disruption of Ecosystem Processes in Western North America by Invasive Species. How Landscapes Change, Human Disturbance and Ecosystem Fragmentation in the Americas Series: Ecological Studies 162:1-62.

Diamond, J.M, C.A. Call, and N. Devoe. 2009. Effects of cattle grazing on fire behavior of cheatgrass-dominated rangeland in the northern Great Basin, USA. International Journal of Wildland Fire. 18:944–950.

Dukes, J.S., and H.A. Mooney. 2003. Disruption of Ecosystem Processes in Western North America by Invasive Species. How Landscapes Change, Human Disturbance and Ecosystem Fragmentation in the Americas Series: Ecological Studies 162:1-62.

Ellstrand, N.C., and D.R. Elam. 1993. Population genetic consequences of small population size: implications for plant conservation. Annual Review of Ecology and Systematics 24:217–242.

Elzinga, C.L., D.W. Salzer, and J.W. Willoughby. 1998. Measuring and monitoring plant populations. Bureau of Land Management Technical Report BLM/RS/ST-98/005+1730. July 1998. 492 pp.

Fisher, H., L. Eslick, and M. Seyfried. 1996. Edaphic factors that characterize the distribution of *Lepidium papilliferum*. April 1996. Technical Bulleting No.96-6, Idaho Bureau of Land Management, Boise, ID. 1–23 pp.

Frost, R.A., and K.L. Launchbaugh. 2003. Prescription Grazing for Rangeland Weed Management. Rangelands 25(6)43-47.

Given, D.R. 1994. Principles and practice of plant conservation. Chapter 2: How plants become threatened or extinct. Timber Press, Inc. Pages 13–36.

Hempy-Mayer, K., and D.A. Pyke. 2008. Defoliation effects on *Bromus tectorum* seed production: Implications for grazing. Rangeland Ecology Management 61:116–123.

Hobbs, R.J., and L.F. Huenneke. 1992. Disturbance, diversity, and invasion: Implications for conservation. Conservation Biology 6(3):324–337.

Holmgren, N.H., P.K. Holmgren, and A. Cronquist. 2005. Intermountain flora, vascular plants of the Intermountain West, U.S.A.: Volume two, part b, subclass Dilleniidae. The New York Botanical Garden. 30 June 2005.

Idaho Conservation Data Center (ICDC). 2008. 2007 rangewide habitat integrity and population monitoring of slickspot peppergrass (*Lepidium papilliferum*). 38 pp. + appendices.

Intergovernmental Panel on Climate Change (IPCC). 2007. Climate change 2007: Synthesis report. November 12–17, 2007, Valencia, Spain. 47 pp.

Johnston, R. 1997. Introduction to microbiotic crusts. USDA Natural Resources Conservation Service, Soil Quality Institute, Grazing Lands Technology Institute. 15 pp.

Karl, T.R., J.M. Melillo, and T.C. Peterson, eds. 2009. Global climate change impacts in the United States. Cambridge University Press, 2009. Available online at www.globalchange.gov/usimpacts (last accessed June 7, 2011)

Kimball, S., and P. M. Schiffman. 2003. Differing effects of cattle grazing on native and alien plants. Conservation Biology 17(6):1681–1693.

Kinter, C.L., L.A. Harloe, K.M. Pekas, and J.J. Miller. 2010. Habitat Integrity and Population Monitoring of *Lepidium papilliferum* (Slickspot Peppergrass): 2009. Idaho Natural

Heritage Program, Idaho Department of Fish and Game, Boise, Idaho. 86 pp. plus appendices.

Kinter, C.L., B.A. Mealor, N.L. Shaw, and A.L. Hind. 2007. Post-fire Invasion Potential of Rush Skeletonweed (*Chondrilla juncea*). Rangeland Ecology and Management 60(4):386-394.

Larson S. R., C. M. Culumber, L. Johnson, and N. J. Chatterton. 2006. Genetic relationships between *Lepidium montanum* and *L. papilliferum* determined by the nuclear ribosomal DNA internal transcribed spacer sequence, chloroplast trnL intron and trnL-F intergenic spacer sequences, and high resolution AFLP genotyping. Received November 13, 2006. Unpublished report prepared by the USDA-ARS Forage and Range Research Laboratory, Utah State University, Logan, UT. 32 pp.

Launchbaugh, K., B. Brammer, M.L. Brooks, S. Bunting, P. Clark, J. Davison, M. Fleming, R. Kay, M. Pellant, D.A. Pyke, and B. Wylie. 2008. Interactions among livestock grazing, vegetation type, and fire behavior in the Murphy Wildland Fire Complex in Idaho and Nevada, July 2007. U.S. Geological Survey Open-File Report 2008-1214. 42 pp.

Lesica, P. and T.H. DeLuca. 1998. Long-term harmful effects of crested wheatgrass on Great Plains grassland ecosystems. Journal of Soil and Water Conservation 51(5):408-409.Mancuso, M., and R. Moseley. 1998. An ecological integrity index to assess and monitor *Lepidium papilliferum* (slickspot peppergrass) habitat in southwestern Idaho. Idaho Conservation Data Center, Idaho Department of Fish and Game. Report prepared for State of Idaho, Military Division Memorandum of Agreement NGB16-97-0001 Task Order - 002. 15 pp. + appendices.

Mack, R.M. 1981. Invasion of *Bromus tectorum* L. into western North America: An ecological chronicle. Agro-Ecosystems 7:145–165.

Mancuso, M., and R. Moseley. 1998. An ecological integrity index to assess and monitor *Lepidium papilliferum* (slickspot peppergrass) habitat in southwestern Idaho. Idaho Conservation Data Center, Idaho Department of Fish and Game. Report prepared for State of Idaho, Military Division Memorandum of Agreement NGB16-97-0001 Task Order - 002. 15 pp. + appendices.

Mancuso, M., C. Murphy, and R. Moseley. 1998. Assessing and monitoring habitat integrity for *Lepidium papilliferum* (slickspot peppergrass) in the sagebrush-steppe of southwestern Idaho. Idaho Department of Fish and Game. Report prepared for State of Idaho, Military Division Task Order No.001-FY-98. 28 pp. + appendices.

Mayer, K. H. 2004. The effects of defoliation on *Bromus tectorum* seed production and growth. Master Thesis. Botany and Plant Pathology Department. Oregon State University. Corvallis, OR. 54 pp.

Menke, C.A., and T.N. Kaye. 2006a. *Lepidium papilliferum* (slickspot peppergrass) habitat integrity index data analysis (1998–2001). Final Report. March 2006. Cooperative project between the Bureau of Land Management, Idaho Department of Fish and Game, and the Institute for Applied Ecology. 22 pp.

Menke, C.A., and T.N. Kaye. 2006b. *Lepidium papilliferum* (slickspot peppergrass) Evaluation of Trends (1998-2004) and Analysis of 2004 Habitat Integrity and Population Monitoring Data. Final Report. June 2006. Cooperative project between the Bureau of Land Management, Idaho Department of Fish and Game, and the Institute for Applied Ecology. 27 pp.

Meyer, S.E., and D. Quinney. 1993. A preliminary report on edaphic characteristics of *Lepidium papilliferum* microsites on the Orchard Training Area, Ada County, Idaho. U.S. Forest Service, Intermountain Research Station, Shrub Sciences Laboratory, Provo, Utah and U.S. Army Idaho Army National Guard, Orchard Training Area, Boise, ID. 7 pp.

Meyer, S.E., and P.S. Allen. 2005. *Lepidium papilliferum* soil and seed bank characterization on the Orchard Training Area. U.S. Forest Service, Intermountain Research Station, Shrub Sciences Laboratory, Provo, Utah. Department of Plant and Animal Science, Brigham Young University, Provo, UT. 10 pp.

Meyer, S.E., D.L. Quinney, and J. Weaver. 2005. A life history study of the Snake River Plains endemic *Lepidium papilliferum* (Brassicaceae). Western North American Naturalist 65(1):11–23.

Meyer, S.E., D. Quinney, and J. Weaver. 2006. A stochastic population model for *Lepidium papilliferum* (Brassicaceae), a rare desert ephemeral with a persistent seed bank. American Journal of Botany 93(6):891-902.

Miller, E., and R. Narayanan, eds. 2008. Great Basin wildfire forum: The search for solutions. Nevada Agricultural Experiment Station, Reno, NV. 44 pp. Available online at http://www.ag.unr.edu/nsrm/publications/wildfireforum.pdf.

Mooney, H.A. and E.E. Cleland. 2001. The Evolutionary Impact of Invasive Species. Archaea PNAS 98(10). 15 pp.

Moseley, R.K. 1994. Report on the conservation status of *Lepidium papilliferum*. Idaho Conservation Data Center, Idaho Department of Fish and Game. Status Survey Report prepared for Idaho Department of Parks and Recreation through Section 6 funding from U.S. Fish and Wildlife Service. Region 1. 35 pp. + appendices.

NatureServe. 2002. NatureServe element occurrence data standard. Available online at http://whiteoak.natureserve.org/eodraft/all.pdf (last accessed January 4, 2007)

Neilson, R.P., J.M. Lenihan, D. Bachelet, and R.J. Drapek. 2005. Climate change implications for sagebrush ecosystems. Transactions of the 70th North American Wildlife and Natural Resources Conference, pp. 145–159.

Nettleton, W.D., and F.F. Peterson. 1983. Aridisols. In: L.P. Wilding, N.E. Smeck, and G.F. Hall, eds. Pedogenesis and soil taxonomy, pp. 165–215. Elsevier Science Publishing Company Inc., New York.

Newman, D., and D. Pilson. 1997. Increased probability of extinction due to decreased genetic effective population size: experimental populations of *Clarkia pulchella*. Evolution 51(2):354–362.

Olson, B.E. 1999. Impacts of Noxious Weeds on Ecologic and Economic Systems. Biology and Management of Noxious Rangeland Weeds. Oregon State University Press, Corvallis, Oregon. 8 pp.

Palazzo, A.J., R.W. Lichvar, T.J. Cary, and T.L. Bashore. 2005. An analysis of the seed bank of *Lepidium papilliferum* (slickspot peppergrass). Unpublished report dated February 23, 2005 submitted to Plant Ecology in March 2005. 22 pp.

Palazzo, A.J., C.E. Clapp, N. Senesi, M.H.B. Hayes, T.J. Cary, J Mao, and T.L. Bashore. 2008. Isolation and characterization of humic acids in Idaho slickspot soils. Soil Science 173(6):375–386.

Pellant, M. 1996. Cheatgrass: The invader that won the West. Unpublished report prepared for the U.S. Forest Service and USDI Bureau of Land Management Interior Columbia Basin Ecosystem Management Project. 22 pp. Available online at http://www.icbemp.gov/html/icbhome.html (last accessed June 7, 2011)

Peterson, P.P. 1919. The "slick spots" of middle western Idaho with suggestions for their elimination. Agricultural Experiment Station. Idaho Station Bulletin No. 114. University of Idaho, Moscow, Idaho. pp. 3–11.

Piemeisel, R.L. 1951. Causes affecting change and rate of change in a vegetation of annuals in Idaho. Ecology 32:53–72.

Popovich, S.J. 2002. 2002 survey for *Lepidium papilliferum* (slickspot peppergrass) in the inside desert, BLM-Jarbidge Resource Area, Owyhee County, Idaho. Final report written for Portage Environmental, Inc. Prepared under Contract NAC010131, Delivery Order DBD020003. 28 pp. + appendices.

Popovich, S.J. 2009. Analysis of *Lepidium papilliferum* abundance on the inside desert 2000–2002. Report prepared for the U.S. Fish and Wildlife Service, Idaho Fish and Wildlife Office, Boise, Idaho. 28 pp. + 260 pp. appendices.

Pyke, D.A. and S. Archer. 1991. Plant-plant Interactions Affecting Plant Establishment and Persistence on Revegetated Rangeland. Journal of Range Management 44(6): 550-557.

Quinney, D. 1998. LEPA (*Lepidium papilliferum*). Natural Resources Group, Environmental Management Office, Idaho Army National Guard. Project funding from Department of Defense Legacy and Idaho Army National Guard. 21 pp. + appendices.

Rasmussen, W.W., D.P. Moore, and L.A. Alban. 1972. Improvement of a solonetzic (slick spot) soil by deep plowing, subsoiling, and amendments. Soil Science Society of America Proceedings 36:137–142.

Rengasamy, P., R.S.B. Greene, and G.W. Ford. 1984. The role of clay fraction in the particle arrangement and stability of soil aggregates - a review. Clay Research 3(2):53–67.

Robertson, I. 2003. Insect pollinator communities of slickspot peppergrass, *Lepidium papilliferum*: Implications for *Lepidium* viability. Unpublished report prepared for the Bureau of Land Management. Boise State University Grant Number: 006G106208 Task Order Number: DAF010016. 17 pp. + figures.

Robertson, I., and L. Hannon. 2003. Insect pollinator communities of slickspot peppergrass, *Lepidium papilliferum*: Implications for Lepidium viability. Unpublished report prepared for the Bureau of Land Management. Boise State University Grant Number: 006G106208 Task Order Number: DAF010016. 20 pp. + figures.

Robertson, I.C., and D.K. Klemash. 2003. Insect-mediated pollination in slickspot peppergrass, *Lepidium papilliferum* L. (Brassicaceae), and its implications for population variability. Department of Biology, Boise State University, Boise, Idaho. Western North American Naturalist 63(3):333–342.

Robertson, I., and A. Ulappa. 2004. Distance between pollen donor and recipient influences fruiting success in slickspot peppergrass, *Lepidium papilliferum*. Canadian Journal of Botany 83:1705–1710.

Robertson, I., and J. White. 2007. Insect-mediated pollination and seed predation in slickspot peppergrass, *Lepidium papilliferum*. Unpublished report prepared for the Idaho Army National Guard. Memorandum of Agreement No. NGBID-07-D-0001, Task Order No. 001-FY-07. 21 pp.

Robertson, I., H. Leavitt, and S. Billinge. 2004. Insect-mediated pollination in slickspot peppergrass, and the impact of competition for pollinators on reproductive success. Unpublished report prepared for the Bureau of Land Management. Agreement No. DAA010200 Task Order Number: DLF040553. 19 pp. + data.

Robertson, I., H. Leavitt, and S. Billinge. 2006a. Importance of insect-mediated pollination and outcrossing on the reproductive performance of slickspot peppergrass, *Lepidium papilliferum*: Report for 2006. Unpublished report prepared for the Bureau of Land Management. Agreement No. DLA060109. 55 pp. + data.

Robertson, I., S. Novak, H. Leavitt, A. Stillman, and J. White. 2006b. Analyses of seed predation, pollination, and population genetics in *Lepidium papilliferum*. Unpublished report prepared for the Idaho Army National Guard. Memorandum of Agreement No. NGB16-01-D-0002, Task Order No. 001-FY-06. 49 pp. + tables and figures.

Romero-Calcerrada, R., C.J. Novillo, J.D.A. Millington, and I. Gomez-Jimenez. 2008. GIS analysis of spatial patterns of human-caused wildfire ignition risk in the SW of Madrid (central Spain). Landscape Ecology 23(3):341-354.

Rosentreter, R., and R. Jorgensen. 1986. Restoring winter game ranges in southern Idaho. Idaho Bureau of Land Management Technical Bulletin 86-3. Idaho Bureau of Land Management, Idaho State Office, Boise, Idaho. pp. 26.

Salo, C. 2009. Relationship between livestock trampling and *Lepidium papilliferum* abundance. Sage Ecosystem Science Corp. February 17, 2009. 15 pp.

Schmelzer, Lee. 2009. Reduced fuel load of key cheatgrass (*Bromus tectorum* L.) dominated range sites by the use of fall grazing. Master's thesis. University of Nevada. Reno, Nevada. May 2009. 116 pp.

Serpe, M.D., J.M. Orm, T. Barkes, and R. Rosentreter. 2006. Germination and seed water status of four grasses on moss-dominated biological soil crusts from arid lands. Plant Ecology 184:163–178.

Shephard, M., S. L. Buchmann, M. Vaughan, and S.H. Black. 2003. Pollinator conservation handbook. Publication of The Xerces Society in association with The Bee Works. Portland, OR. 145 pp.

Smith, S.D., B.R. Strain, and T.D. Sharkey. 1987. Effects of CO2 enrichment on four Great Basin grasses. Functional Ecology 1987(1):139–143.

Smith, S.D., T.E. Huxman, S.F. Zitzer, T.N. Charlet, D.C. Housman, J.S. Coleman, L.K. Fenstermaker, J.R. Seemann, and R.S. Nowak. 2000. Elevated CO2 increases productivity and invasive species success in an arid ecosystem. Nature 408:79–82.

State of Idaho, Bureau of Land Management, Idaho Army National Guard, and Nongovernmental Cooperators. 2003. Candidate conservation agreement for slickspot peppergrass (*Lepidium papilliferum*). 198 pp.

State of Idaho, Bureau of Land Management, Idaho Army National Guard, and Nongovernmental Cooperators. 2006. Candidate conservation agreement for slickspot peppergrass (*Lepidium papilliferum*). 198 pp.

Stillman, A., I. Robertson, and S. Novak. 2005. Population genetics of *Lepidium papilliferum* – excerpted from Robertson, I., S. Novak, H. Leavitt, and A. Stillman. 2005. *Lepidium papilliferum*: Analysis of pollination, herbivory, and genetic structure of populations. Unpublished report on file at State of Idaho, Military Division, Idaho Army National Guard.

Stohlgren, T. J., L. D. Schell, and B.V. Heuvel. 1999. How grazing and soil quality affect native and exotic plant diversity in Rocky Mountain grasslands. Ecological Applications 9:45–64.

Sugden, E. A. 1985. Pollinators of *Astragalus monoensis* Barneby (Fabaceae), new host records, potential impact of sheep grazing. Great Basin Naturalist 299, 300, 309.

Sullivan, J.P., and C.S. Nations. 2009. Analysis of slickspot peppergrass (*Lepidium papilliferum*) populations trends on Orchard Training Area and rangewide implications. Unpublished report prepared for Fish and Wildlife Service, Idaho Fish and Wildlife Office, Boise, ID. January 2009. 148 pp. + appendices.

Tisdale, E.W., M. Hironaka, and M.A. Fosberg. 1965. An area of pristine vegetation in Craters of the Moon National Monument, Idaho. Ecology 46(3):349–352.

U.S. Air Force (Air Force). 2002. Final survey and mapping report for slickspot habitat and slickspot peppergrass at Juniper Butte Range. 16 pp.

U.S. Bureau of Land Management (USBLM). 2000. Bureau of Land Management science strategy. Report dated September 26, 2000. BLM/RS/PL-00/001plus1700. 14 pp. + 2 appendices.

U.S. Bureau of Land Management (USBLM). 2009. Final biological assessment for slickspot peppergrass (*Lepidium papilliferum*): Jarbidge and Four Rivers Field Offices, land use plans and ongoing actions. September 16, 2009. 675 pp. + appendices.

U.S. Bureau of Land Management (USBLM). 2010. Bureau of Land Management Slickspot Peppergrass Inventory and Clearance Standards. Internal Bureau guidance document dated May 13, 2010. 5 pp. + attachments.

U.S. Bureau of Land Management (USBLM). 2012. Final biological assessment for slickspot peppergrass (*Lepidium papilliferum*): Mountain Home Subunit Allotment Livestock Grazing Permit. April 6, 2012. 45 pp. + maps.

U.S. Bureau of Land Management and U.S. Fish and Wildlife Service (USBLM and USFWS). 2009. Conservation agreement for Idaho Bureau of Land Management existing land use plans. Agreement to provide land use plan level conservation measures for slickspot peppergrass for all applicable existing Idaho Bureau of Land Management land use plans signed August 27, 2009. pp. 33.

U.S. Fish and Wildlife Service (USFWS). 2006a. A framework to assist in making Endangered Species Act determinations of effect for slickspot peppergrass, *Lepidium papilliferum*. Snake River Fish and Wildlife Office, Boise, ID. September 14, 2006 version. 66 pp.

U.S. Fish and Wildlife Service (USFWS). 2006b. Draft best available biological information for slickspot peppergrass (*Lepidium papilliferum*). 98 pp. + appendices.

U.S. Fish and Wildlife Service (USFWS). 2010. Biological Opinion on the Effects of Bureau of Land Management Ongoing Livestock Grazing Actions in Idaho on the Slickspot Peppergrass (*Lepidium papilliferum*). 268 pp. + appendices.

U.S. Fish and Wildlife Service and National Marine Fisheries Service (USFWS and NMFS). 1998. Endangered species consultation handbook: Procedures for conducting consultation and conference activities under Section 7 of the Endangered Species Act. U.S. Fish and Wildlife Service and National Marine Fisheries Service.

Unnasch, R.S. 2008. *Lepidium papilliferum* (slickspot peppergrass): Evaluation of trends 2004–2007. Unpublished report prepared for the Idaho Department of Fish and Game, Idaho Conservation Data Center, by Sound Science. 17 pp.

Vallentine, J.F. 2001. Grazing management. Second edition. Academic Press, San Diego, CA. 659 pp.

Venable, D.L., and L. Lawlor. 1980. Delayed germination and dispersal in desert annuals: Escape in space and time. Oecologia 46:272–282.

White, J.P. and I.C. Robertson. 2009. Intense seed predation by harvester ants on a rare mustard. Écoscience 16(4): 508-513.

Young, J. 2007. Effects of livestock trampling on *Lepidium papilliferum*, its habitat, and subsequent hydrology in southwestern Idaho. Master's thesis, University of Idaho, Moscow, ID. May 2007. 41 pp.

Young, J.A., R.A. Evans, and J. Major. 1972. Alien plants in the Great Basin. Journal of Range Management 25:194–201.

Zouhar, K., J.K. Smith, S. Sutherland, and M.L. Brooks. 2008. Wildland fire in ecosystems: Fire and nonnative invasive plants. Gen. Tech. Rep. RMRS-GTR-42-vol. 6. U.S. Department of Agriculture, Forest Service, Rocky Mountain Research Station, Ogden, UT. 355 pp.

3.2 *In Litteris* References

Colket, B., and I. Robertson. 2006, *in litt.* Email communications between Beth Colket, Botanist, Idaho Conservation Data Center, Idaho Department of Fish and Game, Boise, Idaho and Dr. Ian Robertson, Professor, Biology Department, Boise State University, Boise, Idaho regarding use of a 1 km (0.6 mi) separation distance in delineating *Lepidium papilliferum* Element Occurrences. Email dated February 13, 2006.

Findley, J. 2003, *in litt.* Letter from Jean Findley, Botanist, Bureau of Land Management, Vale District Oregon to U.S. Fish and Wildlife Service (May 22, 2003). Subject: Request for documentation of Slickspot peppergrass in Oregon.

Meyer, S. 2009, *in litt.* Email dated March 10, 2009 from Barbara Chaney, Biologist, Idaho Fish and Wildlife Office, U.S. Fish and Wildlife Service, Boise Idaho to Michele Zwartjes, Biologist, Region 1 Office, US Fish and Wildlife Service, Portland, Oregon documenting the continued low abundance of Lepidium papilliferum since the 1995 livestock trampling disturbance at the States site on the Idaho Army National Guard's Orchard Training Area, Idaho.

Seronko, P. 2004, *in litt.* Memo from Paul Seronko, Environmental Protection Specialist, Bureau of Land Management, Boise, Idaho to Mark Steiger, Botanist, Bureau of Land Management, Boise, Idaho. Subject: Formation of slickspots.

Seronko, P. 2006, *in litt.* Email dated February 9, 2006 at 11:19 am from Paul Seronko, Environmental Protection Specialist, Bureau of Land Management, Boise, Idaho to Barbara Chaney, Biologist, U.S. Fish and Wildlife Service, Boise, Idaho. Subject: Re: Slickspot peppergrass.

U.S. Air Force (Air Force). 2003, *in litt.* Comments on the Issues Pertaining to the Proposed Listing of the Slick Spot Peppergrass. 45 pp.

U.S. Geological Service (USGS). 1999, *in litt.* News Release Re: USGS studies wildfire ecology in the Western United States. 9 pp.

3.3 Personal Communications

Bashore, T. 2003. Email documenting telephone conversation between Barbara Heslin, Biologist, Idaho Fish and Wildlife Office, U.S. Fish and Wildlife Service, Boise, Idaho, and Dr. Terry Bashore, U.S. Air Force. Subject: Update on Information Request from Air Force. Dated October 23, 2003.

Quinney, D., and J. Weaver. 1998. Contact Record by Edna Rey-Vizgirdas, Botanist, U.S. Fish and Wildlife Service of conversation with Dana Quinney and Jay Weaver, botanists with the Idaho Army National Guard (April 21, 1998).

4. APPENDICES

APPENDIX A

Definitions of Habitat Categories for Slickspot Peppergrass as described within Bureau of Land Management Biological Assessment (USBLM 2009, p. B-2 and USBLM 2012, pp.7-8)

Potential Habitat –

Areas within the known range of slickspot peppergrass that have certain general soil and elevation characteristics that indicate the potential for the area to support slickspot peppergrass, although the presence of slickspots or the plant is unknown. These areas meet the following criteria:
- Natric and natric-like soils forming "slickspots," and associated soil series, or phases thereof, which support Loamy 7- to 10-inch and 10- to 13-inch Wyoming big sagebrush Ecological Sites (Major Land Resource Areas 11—Snake River Plains, and 25—Owyhee High Plateau) and have a aridic bordering on xeric soil moisture regime; and
- 2,200 to 5,400 feet elevation.

Occupied Habitat –

In the Bureau's 2012 Assessment, the term "occupied habitat" refers to areas where slickspot peppergrass has been documented or identified as an element occurrence (EO) and includes the area generally within 0.5 mile of that occurrence that is important to maintain or improve habitat integrity and pollinator populations necessary for species conservation. For analysis purposes in this BA, a generalized area delineated by a 0.5 mile radius circle was drawn around each EO (this circle may include areas of non-habitat). This area identified as occupied habitat may or may not include additional slickspots or slickspot peppergrass plants beyond the EO. Further refinement of occupied habitat may be accomplished through field surveys considering existing resource conditions as well as specific habitat quality and integrity.

Slickspot Peppergrass Habitat –

Potential habitat areas with Wyoming big sagebrush ecological sites that through Stage 1 surveys have documented slickspot microsites (natric and natric-like soil types) within 2,200 feet and 5,400 feet elevation in Southwest Idaho. Slickspot peppergrass habitat includes areas with slickspots of unknown occupancy and in some cases may be dominated by non-native vegetation such as annual grasses or crested wheatgrass. In addition, to maintain ecological continuity, if there is less than 0.5 mile between areas defined as slickspot peppergrass habitat, then the entire area is considered slickspot peppergrass habitat. Surveyed potential habitat not meeting these criteria will no longer be considered habitat for slickspot peppergrass.

APPENDIX B

Crosswalk between Primary Constituent Elements for slickspot peppergrass proposed critical habitat and Corresponding Pathway Indicators for making effects determinations on the species.

PCE	PCE Description	Corresponding Pathway Indicator
1	Ecologically functional microsites or "slickspots" that are characterized by: (a) a high sodium and clay content and a three-layer soil horizonation and (b) sparse vegetation with low to moderate introduced plant species cover	A-1. Density of nonnative annual and/or nonnative perennial plants established within slickspots A-2. Level of ground disturbance within slickspots A-3. Level of organic debris (litter or feces) and/or soil deposition and accumulation within slickspots
2	Relatively intact native Wyoming big sagebrush vegetation assemblages within 820 feet (250 meters) of slickspots	B-1. Level of ground disturbance within the action area B-2. Condition of native vegetation within the action area - level of habitat fragmentation B-3. Condition of native vegetation within the action area - presence of nonnative annuals and/or nonnative perennial plants B-4. Condition of native vegetation within the action area - percent cover of biological soil crusts B-5. Condition of native vegetation within the action area - percent cover of native forbs
3	A diversity of native plants	B-3. Condition of native vegetation within the action area - presence of nonnative annuals and/or nonnative perennial plants B-5. Condition of native vegetation within the action area - percent cover of native forbs
4	Sufficient pollinators for successful fruit and seed production	B-1. Level of ground disturbance within the action area B-2. Condition of native vegetation within the action area - level of habitat fragmentation B-3. Condition of native vegetation within the action area - presence of nonnative annuals and/or nonnative perennial plants B-5. Condition of native vegetation within the action area - percent cover of native forbs

APPENDIX C

EFFECTS DETERMINATION CHECKLIST FOR SLICKSPOT PEPPERGRASS AND PROPOSED CRITICAL HABITAT

SLICKSPOT PEPPERGRASS PHYSIOGRAPHIC REGION: Snake River Plain

NAME OF PROJECT BEING EVALUATED: Mountain Home Subunit Allotment

PROJECT STATUS AND TYPE: Proposed Renewal of 7 Bureau of Land Management Livestock Grazing Permits and reinitiation of consultation on 4 Bureau of Land Management Ongoing Livestock Grazing Permits for the Mountain Home Subunit Allotment

The Allotment encompasses all of C-ranked EO 29 (about 105 acres), BC-ranked EO 51 (about 4 acres) and C-ranked EO 62 (about 6 acres). HIP transects 029, 051A, and 051B, which are located within the Allotment, have 7 years of available HIP monitoring data. HIP transect 062, which is also located within the Allotment, has 6 years of available HIP monitoring data.

POTENTIAL EFFECTS PATHWAYS:	INDICATORS	BASELINE INDICATOR CONDITIONS		EFFECT OF ACTION ON INDICATOR CONDITION		
		Current Condition Description	Current Quality Ranking (H, M, L)	Description of Potential Effects of the Action on the Baseline within the Action Area	Restore, Maintain or Degrade Habitat	Expected Modification of Baseline ↑ → ↓
A. Slickspot Conditions	A-1. Density of nonnative annual and/or nonnative perennial plants established within slickspots	Levels of invasive nonnative plants in slickspots within EOs 29, 51, and 62 ranging from less than1 to about 29 percent cover (EO 29 = 4–29 percent; transect 51A of EO 51 = 1–4 percent; transect 51B of EO 51 = 1–6 percent; and EO 62 = 2–8 percent).	M	Plants (native and nonnative) can be spread by livestock, and trampling of slickspots through livestock use can modify the soil surface and seed bed to allow for establishment and spread of nonnative plants, particularly in spring (March through June). Plants, including invasive weeds, may be spread into slickspots by seeds passing though livestock rumens and livestock movements. Invasive nonnative annual plants and noxious weeds can outcompete slickspot peppergrass plants within slickspots. The presence of nonnative invasive plant cover within the slickspots (which impacts both the species and PCE 1 of proposed critical habitat) is reasonably likely to continue based on 6-7 years of HIP data. Therefore, livestock-related effects associated with invasive nonnative plants within slickspots are reasonably likely to occur.	D	↓

POTENTIAL EFFECTS PATHWAYS:	INDICATORS	BASELINE INDICATOR CONDITIONS		EFFECT OF ACTION ON INDICATOR CONDITION		
		Current Condition Description	Current Quality Ranking (H, M, L)	Description of Potential Effects of the Action on the Baseline within the Action Area	Restore, Maintain or Degrade Habitat	Expected Modification of Baseline ↑ → ↓
	A-2. Level of ground disturbance within slickspots	Percent cover of total livestock prints observed within slickspots in EOs 29, 51, and 62 to be extremely low, ranging from about 0 percent to about 6 percent cover over the 7 years of HIP monitoring (EO 29 = 0 percent for all years; transect 51A of EO 51 = 0–0.1 percent; transect 51B of EO 51 = 0–6.2 percent; and EO 62 = 0–2.3 percent) over the 6-7 years of HIP monitoring data available. Similarly, percent cover of penetrating livestock prints observed in EOs 29, 51, and 62 to also be very low, ranging from about 0 percent to about 6 percent cover over the 7 years of HIP monitoring (EO 29 = 0 percent for all years; transect 51A of EO 51 = 0–0.1 percent; transect 51B of EO 51 = 0–5.7 percent; and EO 62 = 0–1.3 percent). Only one transect in one year (transect 51B in 2005) had penetrating hoof print cover greater than 2 percent, and the majority of years had 0 percent penetrating hoof print cover. The penetrating trampling trigger (e.g., greater than or equal to 10 percent penetrating trampling cover) has never been tripped in the 6-7 years of HIP monitoring at EOs 29, 51, and 62.	M-H	Livestock grazing may negatively affect intact slickspots through 1) mechanical damage (trampling) especially when soils are saturated. 2) reduction of long term seed availability by pushing seeds below a depth at which they can germinate. 3) damage to soil crusts, both in the slickspots and the surrounding area, which can lead to the spread and continued persistence of invasive annuals and noxious weeds that outcompete slickspot peppergrass within slickspots and other native plant species outside of slickspots. Livestock grazing, when soils are wet, increases the potential for livestock trampling in slickspots, which can impair existing plants and seed beds, change the slickspot soil structure, and introduce invasive and noxious weeds (all of which may impact both the species and PCE 1 of proposed critical habitat). In the spring (March through June), soils are more likely to be wet due to climatic patterns in southwestern Idaho. Because there is annual spring grazing in pastures that contain EOs 29, 51, and 62 and their proposed critical habitat, and HIP monitoring has documented low levels of livestock print cover within slickspots,	M	→

POTENTIAL EFFECTS PATHWAYS:	INDICATORS	BASELINE INDICATOR CONDITIONS		EFFECT OF ACTION ON INDICATOR CONDITION		
		Current Condition Description	Current Quality Ranking (H, M, L)	Description of Potential Effects of the Action on the Baseline within the Action Area	Restore, Maintain or Degrade Habitat	Expected Modification of Baseline ↑ → ↓
				some localized trampling effects in EOs and PCEs of proposed critical habitat may occur, although effects severity and likelihood are expected to be low.		
A. Slickspot Conditions (continued)	A-3. Level of organic debris and/or soil deposition and accumulation within slickspots	HIP monitoring documented low cover levels livestock feces (0–0.4 percent cover) in slickspots in the Allotment (6-7 years of monitoring data).	M-H	Livestock grazing may negatively affect intact slickspots through the introduction of organic debris in the form of feces. Livestock feces can contribute to the spread and continued persistence of invasive nonnative plants, including noxious weeds, by seeds passing though livestock rumens. Invasive nonnative plants can outcompete slickspot peppergrass within slickspots as well as other native plant species outside of slickspots. Cattle feces may also cover individual slickspot peppergrass plants, which may result in plant damage or mortality. However, due to the relatively low levels of livestock feces observed in slickspots, effects to the species as well as PCE 1 of proposed critical habitat from organic debris in slickspots associated with livestock feces cover are anticipated to be minimal.	M	→

POTENTIAL EFFECTS PATHWAYS:	INDICATORS	BASELINE INDICATOR CONDITIONS		EFFECT OF ACTION ON INDICATOR CONDITION		
		Current Condition Description	Current Quality Ranking (H, M, L)	Description of Potential Effects of the Action on the Baseline within the Action Area	Restore, Maintain or Degrade Habitat	Expected Modification of Baseline ↑ → ↓
B. Habitat Characteristics within the Action Area Surrounding Occupied Slickspots	B-1. Level of ground disturbance within the action area	Percent cover of total livestock prints observed within slickspots in EOs 29, 51, and 62 to be extremely low, ranging from about 0 percent to about 6 percent cover over the 6-7 years of HIP monitoring (EO 29 = 0 percent for all years; transect 51A of EO 51 = 0–0.1 percent; transect 51B of EO 51 = 0–6.2 percent; and EO 62 = 0–2.3 percent) over the 7 years of HIP monitoring data available. Similarly, percent cover of penetrating livestock prints observed in EOs 29, 51, and 62 to also be very low, ranging from about 0 percent to about 6 percent cover over the 7 years of HIP monitoring (EO 29 = 0 percent for all years; transect 51A of EO 51 = 0–0.1 percent; transect 51B of EO 51 = 0–5.7 percent; and EO 62 = 0–1.3 percent). Only one transect in one year (transect 51B in 2005) had penetrating hoof print cover greater than 2 percent, and the majority of years had 0 percent penetrating hoof print cover. The penetrating trampling trigger (e.g., greater than or equal to 10 percent penetrating trampling cover) has never been tripped in the 6-7 years of HIP monitoring at EOs 29, 51, and 62.	M-H	Livestock grazing, when soils are wet, increases the potential for penetrating livestock trampling, which can impair existing native grass and forb plants and seed beds, impact insect pollinators, and introduce invasive and noxious weeds. In the spring (March through June), soils are more likely to be wet due to climatic patterns in southwestern Idaho. Low levels of trampling has been observed every year on HIP transects, so low levels of localized trampling effects also likely occurred in the areas outside of this transect. Effects from trampling tend to be cumulative and impacts may still occur even if penetrating trampling has not occurred. Because there is annual spring grazing in pastures which contain EOs, the probability of localized trampling effects to both the species and its habitat as well as to PCEs 2, 3, and 4 of proposed critical habitat within the Allotment may occur. However, the level of soil disturbance observed on HIP transects is expected to maintain current habitat conditions across the Allotment.	M	→

POTENTIAL EFFECTS PATHWAYS:	INDICATORS	BASELINE INDICATOR CONDITIONS		EFFECT OF ACTION ON INDICATOR CONDITION		
		Current Condition Description	Current Quality Ranking (H, M, L)	Description of Potential Effects of the Action on the Baseline within the Action Area	Restore, Maintain or Degrade Habitat	Expected Modification of Baseline ↑ → ↓
	B-2. Condition of native vegetation within the action area - Level of habitat fragmentation	Approximately 43 percent of the Allotment capable of supporting shrub-steppe habitat currently supports native shrub cover. About 57 percent of the Allotment is dominated by exotic species with little or no native shrub component.	L	Livestock may have a negative impact on shrub distribution due to breaking of shrubs by bedding in or rubbing on them as well as by reaching through shrubs to access forage. In addition, sagebrush and associated woody debris may be important habitat features for slickspot peppergrass insect pollinators. Indirect effects may include ground disturbance and increases in invasive nonnative plants which compete with young sagebrush plants for light, moisture, and nutrients. Shrub cover within the Allotment is relatively low (43 percent). While some localized effects to the species and PCEs 2, 3, and 4 of proposed critical habitat are possible due to livestock-related effects to shrub cover, the likelihood and severity of these impacts is low. Livestock grazing activities are expected to maintain current shrub cover levels in the Allotment, although some adverse effects to shrubs may occur in localized areas around livestock salting and watering areas as well as in areas with reduced shrub cover due to past wildfires.	M	→

POTENTIAL EFFECTS PATHWAYS:	INDICATORS	BASELINE INDICATOR CONDITIONS		EFFECT OF ACTION ON INDICATOR CONDITION		
		Current Condition Description	Current Quality Ranking (H, M, L)	Description of Potential Effects of the Action on the Baseline within the Action Area	Restore, Maintain or Degrade Habitat	Expected Modification of Baseline ↑ → ↓
	B-3. Condition of native vegetation within the action area - presence of nonnative annuals and/or nonnative perennial plants	The majority of the habitat within the Allotment burned in the 1980s. Smaller segments of habitat burned in the 1990s and 2000s with the most recent fire occurring in 2008 (Knudsen Fire, 2,492 acres). The occupied habitat associated with EOs 29, 51, and 62 was most heavily impacted by wildfires in the 1950s and 1980s. Despite the burn history, some isolated areas support shrub cover and larger areas support successful nonnative perennial grass seedings. Cheatgrass is the dominant plant in the understory throughout the majority of the action area. Noxious weeds (Scotch thistle, diffuse knapweed, and rush skeletonweed) have been observed within and adjacent to occupied habitat in the Allotment. Current habitat condition is categorized as low to moderate due to low shrub cover, a reduced incidence of native understory plants in remnant sagebrush stands, and the presence of invasive and noxious weeds across the Allotment.	L - M	Livestock grazing reduces the number of native forbs through livestock consumption, direct trampling, and the introduction and spread of non-native invasive plant species. Invasive nonnative plants may be spread by seeds passing though livestock rumens and livestock movements. Reduction in forb cover and vigor may also reduce habitat for insect pollinators. As annual spring grazing occurs in pastures containing EOs and proposed critical habitat, effects to the species and PCEs 2, 3, and 4 of proposed critical habitat are reasonably certain to occur.	D	↓

POTENTIAL EFFECTS PATHWAYS:	INDICATORS	BASELINE INDICATOR CONDITIONS		EFFECT OF ACTION ON INDICATOR CONDITION		
		Current Condition Description	Current Quality Ranking (H, M, L)	Description of Potential Effects of the Action on the Baseline within the Action Area	Restore, Maintain or Degrade Habitat	Expected Modification of Baseline ↑ → ↓
	B-4. Condition of native vegetation within the action area - % cover of biological soil crusts	Percent cover of biological soil crust in the vicinity of HIP transect within EOs 29, 51, and 62 ranging from about 7 percent to about 64 percent cover (EO 29 = 24–64 percent; transect 51A of EO 51 = 36–61 percent; transect 51B of EO 51 = 29–64 percent; and EO 62 = 7–52 percent). In areas dominated by cheatgrass, biological soil crust cover is typically low. As much of the Allotment is dominated by cheatgrass, biological soil crust cover is likely lower in the recently burned, cheatgrass-dominated areas than in the HIP monitoring transects for EOs 29, 51, and 62.	M	Livestock trampling may have negative impacts on biological soil crusts, particularly in spring when studies indicate that trampling in wet conditions has a higher probability of impacting biological soil crusts. Livestock grazing, when soils are wet, increases the potential for penetrating livestock trampling, which can reduce biological soil crust cover. In the spring (March through June), soils are more likely to be wet due to climatic patterns in southwestern Idaho. Because the current grazing permit authorizes annual spring grazing in pastures that contain the species, the probability of livestock trampling effects to biological soil crusts in the Allotment is reasonably likely to occur. Therefore, effects to the species and PCEs 2, 3, and 4 of proposed critical habitat are reasonably certain to occur.	M	→

POTENTIAL EFFECTS PATHWAYS:	INDICATORS	BASELINE INDICATOR CONDITIONS		EFFECT OF ACTION ON INDICATOR CONDITION		
		Current Condition Description	Current Quality Ranking (H, M, L)	Description of Potential Effects of the Action on the Baseline within the Action Area	Restore, Maintain or Degrade Habitat	Expected Modification of Baseline ↑ → ↓
	B-5. Condition of native vegetation within the action area - % cover of native forbs	HIP monitoring data indicate that percent native forb cover is low in EOs 29, 51, and 62 (0.1 percent to about 5 percent in the 2 years of available HIP monitoring data, with half of the years having less than 1 percent cover).	L	Livestock grazing reduces the number of native forbs through livestock consumption, direct trampling, and the introduction and spread of non-native invasive plant species. Reduction in native forb cover and vigor may also reduce habitat for slickspot peppergrass insect pollinators. Spring livestock grazing has the potential for high grazing impacts to native forbs as forbs could be consumed during their active growing period prior to setting seed. As annual spring grazing occurs within occupied and proposed critical habitat in the Allotment, effects to the species and PCEs 2, 3, and 4 of proposed critical habitat are reasonably certain to occur. Therefore, effects are reasonably certain to occur.	D	↓

POTENTIAL EFFECTS PATHWAYS:	INDICATORS	BASELINE INDICATOR CONDITIONS		EFFECT OF ACTION ON INDICATOR CONDITION		
		Current Condition Description	**Current Quality Ranking (H, M, L)**	**Description of Potential Effects of the Action on the Baseline within the Action Area**	**Restore, Maintain or Degrade Habitat**	**Expected Modification of Baseline ↑ → ↓**
SUMMARY		**Summary of Overall Status of Baseline within the Action Area** EO quality within the Mountain Home Subunit Allotment #00813 is categorized as moderate to high. Overall habitat quality for slickspot peppergrass throughout the Allotment is categorized as low to moderate due to low shrub cover, a reduced incidence of native understory plants in remnant sagebrush stands, and the presence of invasive and noxious weeds across the Allotment.	L - M	**Summary of Potential Effects of the Action on the Baseline within the Action Area** Plants, including invasive plants and weeds near EOs, may be spread by livestock activity. In addition, diversity and cover of native grasses and forbs may be reduced due to livestock grazing activity. Because there is spring grazing in the Allotment, there is the probability of livestock spreading weed seeds into EOs and proposed critical habitat. Localized effects to the species and PCEs 1, 2, 3, and 4 of proposed critical habitat from livestock-related spread of invasive nonnative plants are reasonably likely to occur. Localized effects associated with livestock trampling are also reasonably likely to occur. These effects are reduced, but not eliminated, by slickspot peppergrass conservation measures implemented within the Allotment.	**D**	↓

Effects Determination: May Affect, Likely to Adversely Affect slickspot peppergrass and its proposed critical habitat

APPENDIX D

CONSERVATION AGREEMENT

U.S. Bureau of Land Management – Idaho State Office
U.S. Fish and Wildlife Service –
Snake River Fish and Wildlife Office

Idaho Bureau of Land Management Existing Land Use Plans and On-going Actions Affecting Slickspot Peppergrass

I. INTRODUCTION

This Conservation Agreement updates the August 2006 agreement between the Idaho State Office Bureau of Land Management (BLM) and the Snake River Fish and Wildlife Office of the U.S. Fish and Wildlife Service (USFWS) to provide for the conservation of slickspot peppergrass related to existing Idaho BLM land use plans (LUPs) and a subset of ongoing actions. The Conservation Agreement and associated conservation measures guide BLM management actions and serve as a basis for consultation or conference on these LUPs and on-going actions between the BLM and the USFWS regarding slickspot peppergrass, a proposed species for listing under the Endangered Species Act. This update of the Conservation Agreement reflects the Idaho District Court ruling that directs the USFWS to reconsider the USWS slickspot peppergrass status and make a listing determination by October 1, 2009.

Land use plans provide guidance and direction for managing public lands administered by the BLM. They ensure that public land is managed in accordance with the intent of Congress as stated in the Federal Land Policy and Management Act (FLPMA) (43 U.S.C. 1701 et seq.). Resource management planning is used by the BLM to allocate resources and select appropriate uses for public land. There are four LUPs that are addressed under the scope of this Conservation Agreement. The LUPs include the 1983 Kuna Management Framework Plan, 1987 Jarbidge RMP, the 1988 Cascade RMP, and the 2008 Snake River Birds of Prey RMP. At the time these LUPs were prepared, there was no requirement to consult with the USFWS on slickspot peppergrass. Currently land use plan revisions are in progress for the Jarbidge Field Office and Four Rivers Field Office that will update and replace all but the 2008 Snake River Birds of Prey RMP. The BLM and USFWS will consult on these revised LUPs when they are at the appropriate stage of development and depending on the impending listing decision for slickspot peppergrass.

This Conservation Agreement also addresses on-going actions currently authorized by the BLM including livestock gazing, rights-of way activities, and military training.

II. OBJECTIVE AND INTENT

This Conservation Agreement is intended to promote the conservation of slickspot peppergrass, a species proposed for listing which has not yet undergone consultation or conference at the LUP level or for ongoing actions. The conservation measures describe desired recovery and conservation objectives with corresponding implementation actions and will be analyzed in the associated Biological Assessment (BA). These conservation measures replace or create guidance within the LUPs regarding programmatic management direction for slickspot peppergrass. It is the intent of BLM and USFWS that specific conservation measures will be fully implemented and that this Conservation Agreement will remain in effect and binding on both parties until such time as new LUPs or amendments are prepared with completed section 7 compliance as appropriate, and Records of Decision signed. At that time, programmatic management direction for slickspot peppergrass will be included in the new or revised LUP or amendment, and this Conservation Agreement, or portions thereof in the case of programmatic amendments, will no longer apply to the planning area. Additionally, the conservation measures associated with this agreement may be modified based on the current USFWS analysis of new information and assessment of threats being conducted as part of the listing determination process.

While a high priority for BLM, both the BLM and USFWS recognize that funding constraints may affect the ability to implement specific conservation measures as planned. Where funding is lacking, BLM and USFWS will cooperate to set priorities and adjust dates for accomplishment. In addition, minor modifications to conservation measures may be necessary as the conference process progresses. Any modification must be agreed to by the BLM and the USFWS, and shall not materially alter the meaning or intent of a conservation measure as stated at the time of signature of this agreement.

III. PARTIES TO THE CONSERVATION AGREEMENT

U.S. Bureau of Land Management, Idaho; and
U.S. Fish and Wildlife Service, Snake River Fish and Wildlife Office

IV. AUTHORITY FOR CONSERVATION AGREEMENTS

The commitments and actions in this Conservation Agreement are within existing authorities of the signatory agencies. The primary authority for the USFWS and BLM to enter into this Conservation Agreement derives from the Endangered Species Act of 1973, as amended.

The primary purpose of the ESA is to provide a means whereby ecosystems upon which endangered and threatened species depend may be conserved. Section 7(a) directs Federal agencies to utilize their authorities (e.g., FLPMA) in furtherance of the purposes of this Act by carrying out programs for the conservation of endangered species and threatened species. Further, under Section 7(b), each Federal agency is expected to, in consultation and with the assistance of the USFWS, ensure that any action authorized, funded or carried out by the agency is not likely to jeopardize the continued existence of any endangered or threatened species.

Section 3 of the ESA includes the following definition for conservation as is intended under this Conservation Agreement:

> The terms "conserve," "conserving," and "conservation" mean to use and the use of all methods and procedures which are necessary to bring any endangered species or threatened species to the point at which the measures provided pursuant to this Act are no longer necessary. Such methods and procedures include, but are not limited to, all activities associated with scientific resources management such as research, census, law enforcement, habitat acquisition and maintenance, propagation, live trapping, and transplantation, and, in the extraordinary case where population pressures within a given ecosystem cannot be otherwise relieved, may include regulated taking.

Additional authorities for the USFWS derive from the Fish and Wildlife Act of 1956, as amended; and the Fish and Wildlife Coordination Act, as amended.

In addition to the ESA, FLPMA (43 U.S.C. 1701 et. seq) provides the BLM with the authorities required for this Conservation Agreement:

> The public lands be managed in a manner that will protect the quality of scientific, scenic, historical, ecological, environmental, air and atmospheric, water resource, and archeological values; that, where appropriate, will preserve and protect certain public lands in their natural condition; that will provide food and habitat for fish and wildlife and domestic animals; and that will provide for outdoor recreation and human occupancy and use.

BLM Special Status Species Management Manual 6840 provides specific policy guidance as it pertains to the ESA, FLPMA and this Conservation Agreement. For listed species, the policy states the following:

1. Actions authorized by the BLM shall further the conservation and/or recovery of federally listed species and conservation of Bureau sensitive species.

2. The BLM shall retain in Federal ownership those habitats essential for the conservation of any listed species, particularly those that are part of a broader, logical public land ownership management unit. The BLM may dispose of lands providing habitat for listed species, including critical habitat, only following consultation with the FWS or NMFS and upon a determination that such action is consistent with relevant law.

3. Ensure that all actions authorized, funded, or carried out by the BLM are in compliance with the ESA. To accomplish this, the BLM shall:

   a. Evaluate all proposed actions to determine if individuals or populations of listed species or their habitat may be affected.

   b. Initiate consultation with the USFWS, including preparation of biological assessments, as appropriate, for those actions that may affect listed species or their habitats.

Part 3: Monitoring

Conservation measures for slickspot peppergrass include a provision to implement adaptive management as needed to achieve conservation objectives. At the project level, this will be accomplished by conducting site-specific implementation and effectiveness monitoring to track progress toward achieving the conservation measures. BLM and USFWS Level 1 Teams will meet annually to review the implementation and effectiveness monitoring results for projects of concern, determine if current management actions are on a trajectory toward meeting management goals within the established time frames, and modify management actions as needed if progress toward goals is inadequate. Implementation of the programmatic and ongoing actions conservation measures will be monitored through the reporting and monitoring requirements of this Conservation Agreement (Section VII).

VII. CONSERVATION AGREEMENT MONITORING AND REPORTING

The agencies agree to a joint, annual review in October each year to assess progress in implementing this Conservation Agreement. Any recommendations will be presented to the Idaho BLM State Director and USFWS Field Office Supervisor by November of each year. This review could lead to the modification and exceptions discussed in Part VIII below. These modifications or exceptions will be formalized within the scope of this Conservation Agreement.

VIII. AMENDMENTS, EXCEPTIONS, AND DURATION OF AGREEMENT

Exceptions or amendments to this agreement may be jointly agreed to by the signatories on a case-by-case basis, where such changes would better provide for protection and conservation of species, where conflicts must be resolved between species, where priorities need to be adjusted due to funding constraints, or when new, relevant scientific information becomes available. Such exceptions or amendments shall be agreed to by modification. All modifications within the scope of this agreement shall be made by issuance of a modification executed by all parties prior to any changes being performed.

This agreement shall be considered fully executed when all signatories have signed. The agreement shall expire on December 31, 2012, at which time it will be reviewed for renewal or expiration.

IX. QUALIFICATIONS AND CONTACTS

This agreement in no way restricts any of the signatories from participating in similar activities with other public or private agencies, organizations, and individuals. This agreement is neither a fiscal nor a funds obligation document. Any endeavor involving reimbursement or contribution of funds between the parties to this agreement will be handled in accordance with applicable laws, regulations, and procedures including those for government procurement and printing. Such endeavors will be outlined in separate agreements that shall be made in writing by representatives of the parties and shall be independently authorized by appropriate statutory authority. This agreement does not provide such authority. Specifically, this agreement does not

establish authority for noncompetitive award to the cooperator of any contract or other agreement. Any contract or agreement for training or other services must fully comply with all applicable requirements for competition.

The principal contacts for this agreement are:

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Idaho State Office
1387 South Vinnell Way
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208-373-3813

Mark Roberston
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Snake River Fish and Wildlife Office
1387 South Vinnell Way
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208-378-5287

X. SIGNATURES

THOMAS H. DYER
State Director
Bureau of Land Management

Date 8/26/09

JEFFERY L. FOSS
Field Supervisor
U.S Fish and Wildlife Service

Date 8/27/09

Table III.C–1
Slickspot peppergrass (*Lepidium papilliferum*): Conservation Measures and Implementation Actions for the Jarbidge and Four Rivers FOs

LUP Programs Evaluated	Conservation Measures	BLM Implementation Actions	Responsibilities	Timeframes
Special Status Animal and Plant Management Note: Common to All Programs	The conservation measures contained throughout this table implement important elements included in the Candidate Conservation Agreement (CCA) for slickspot peppergrass. The conservation measures reflect BLM's commitment to support species conservation.	The implementation actions reflect BLM's commitment to support species conservation and meet ESA objectives. Actions apply to BLM lands and activities only. Habitat terms used throughout this document are defined in **Appendix B: Definitions**.		
	1) In cooperation with Idaho Department of Fish and Game (IDFG) Conservation Data Center (CDC), U.S. Fish and Wildlife Service (USFWS), Idaho Army National Guard (IDARNG), the U.S. Air Force (USAF), and others:	**1)** Following actions to be completed in cooperation with others:	**1)** As stated below:	**1)** As stated below:
	a) Develop and use survey protocols consistent with the USFWS Rare Plant Survey Guidelines to conduct Stage 1, 2, and 3 surveys (see Figure III.C-1 at the end of this table for the general survey process).	a) Apply current survey methods, and assure that inventories are done at the appropriate time of the year by qualified botanists, or by persons who are under the guidance of botanists. Develop more specific survey protocols with reporting standards for slickspot peppergrass.	a) BLM State Office (SO), BLM Field Office (FO), USFWS, and CDC	a) SO Due Date (DD) for protocol = February 1, 2007
	b) Cooperate to refine slickspot peppergrass potential habitat maps (Stage 1 survey, Figure III.C-1), and to identify and map slickspot peppergrass occurrences (Stage 2 survey, Figure III.C-1).	b) Surveys, mapping, and data management (refer to Figure III.C-1, *Survey Flowchart for Slickspot Peppergrass,* at the end of this table):	b) FO, with CDC and USFWS	b) Standard operating action (SOA)
		i) Cooperate with CDC and USFWS to record, refine, and map all habitat features including potential habitat, slickspot peppergrass habitat, non-habitat, occupied habitat, and element occurrences (EOs), for BLM lands (see Appendix B, *Definitions*). Use current GIS standards for mapping and database management. In cooperation with CDC, maintain a spatial database of species population and habitat information for BLM lands.	*i)* FO	*i)* Update map annually

Table III.C–1
Slickspot peppergrass (*Lepidium papilliferum*): Conservation Measures and Implementation Actions for the Jarbidge and Four Rivers FOs

LUP Programs Evaluated	Conservation Measures	BLM Implementation Actions	Responsibilities	Timeframes
		ii) BLM will continue to conduct Stage 1 and 2 surveys, report survey information to the CDC, and incorporate the information into the adaptive management strategy.	*ii)* FO	*ii)* SOA, annually
		iii) BLM's intent will be to conduct Stage 1 surveys (slickspot survey) for at least 50,000 acres of the potential habitat annually with a goal of completing Stage 1 surveys for all potential habitat within 10 years. BLM will work collaboratively with USFWS to prioritize surveys during the first 5 years to areas that have a high likelihood of species occurrence, or that are needed for BLM project purposes. BLM will also target at least 15,000 acres of Stage 2 surveys (slickspot peppergrass plant surveys) that can be done concurrently with the Stage 1 surveys. The amount of habitat to be surveyed each year will be based on available annual funding. Stage 3 plant surveys will be conducted as necessary and desired.	*iii)* Level 1 Team develops schedule; FO completes Stage 1 surveys	*iii)* Develop schedule for conducting priority Stage 1 surveys by February 1, 2007. Complete all Stage 1 surveys by 2017.
		iv) Prioritize Stage 2 surveys to address slickspot peppergrass habitat with a high likelihood of species occurrence. Surveys should be scheduled to complement other program needs. Coordinate annually with USFWS as Stage 1 surveys are completed to schedule the Stage 2 surveys.	*iv)* Level 1 Team develops schedule; FO completes Stage 2 surveys	*iv)* Develop Stage 2 survey schedules annually, beginning in 2007.
	c) Cooperate in regular monitoring of slickspot peppergrass population trends and land health conditions on BLM lands, and follow current monitoring protocols. Land health conditions include forb diversity to support pollinators and habitat for slickspot peppergrass.	c) Follow the Habitat Integrity and Population (HIP) monitoring protocol or other accepted methodology. BLM will cooperate with others to conduct annual monitoring within all EOs on BLM lands to assess the effectiveness of the conservation measures as part of the adaptive management strategy.	c) FO	c) SOA
		i) Establish permanent ecological reference areas (ERAs) in	*i)* FO, with SO, USFWS, and CDC	*i)* FO DD = 2008

Table III.C–1
Slickspot peppergrass (*Lepidium papilliferum*): Conservation Measures and Implementation Actions for the Jarbidge and Four Rivers FOs

LUP Programs Evaluated	Conservation Measures	BLM Implementation Actions	Responsibilities	Timeframes
		selected EOs to evaluate land health conditions associated with slickspot peppergrass.	*ii)* FO	*ii)* SOA
	d) Participate in research essential to conservation of the species.	*ii)* Use data from the ERAs to assist in completing land health assessments. This information will be used to evaluate permitted management actions and to design restoration projects for slickspot peppergrass.	d) FO and SO, with USFWS (all actions)	d) SOA (all actions)
		d) BLM will participate in research as funding allows. Areas to focus on include, but are not limited to, the following:		
		i) Elimination and control of invasive species.		
		ii) Pollination, forb restoration, and effects of ground disturbance on the species.		
		iii) Determination of specific limiting factors in terms of habitat needs and characteristics.	e) SO, with CDC and USFWS	e) SOA
	e) Continue to support seed banks in a long-term seed storage facility.	*iv)* Population viability analyses.		
	f) Support the establishment and maintenance of new populations in slickspot peppergrass habitat. The goal of these activities is to maintain or enhance viable populations.	e) As needed, provide funding to a suitable repository to support a seed bank.	f) FO and SO, with CDC and USFWS	f) SOA
		f) Reintroduce slickspot peppergrass at selected experimental reintroduction or historic sites as funding allows.		
	2) Ensure that ongoing Federal actions support or do not preclude species conservation in slickspot peppergrass habitat.		**2)** FO (all actions)	**2)** SOA, annual review
		2) Ongoing BLM authorized activities:		

Table III.C–1
Slickspot peppergrass (*Lepidium papilliferum*): Conservation Measures and Implementation Actions for the Jarbidge and Four Rivers FOs

LUP Programs Evaluated	Conservation Measures	BLM Implementation Actions	Responsibilities	Timeframes
	3) Ensure that new Federal actions support or do not preclude species conservation in slickspot peppergrass habitat.	a) Based on the results of annual Stage 1 and 2 surveys, review ongoing activities in slickspot peppergrass habitat. The Level 1 Team will conduct these reviews in a manner consistent with streamlining procedures where local section 7 compliance activities with USFWS (if necessary) have not yet been completed. b) If reviews indicate that direct or indirect negative impacts to the species or its habitat are occurring as a result of ongoing discretionary BLM actions, the activity will be modified to avoid or minimize anticipated negative impacts and, where feasible, promote species conservation. c) Where needed, complete section 7 compliance for ongoing activities that may affect this species and its habitat. Following the annual review of Stage 1 and 2 surveys outlined in **(2)**(a) above, initiate section 7 compliance activities for ongoing actions within 6 months, as appropriate. d) Where slickspot peppergrass habitat exists, BLM will conserve remaining stands of sagebrush and native vegetation in making activity plan and project level decisions. 3) New proposed BLM authorized activities: a) Consistent with streamlining procedures, BLM will require project-level inventories for any project in slickspot peppergrass habitat and in potential habitat during project planning if inventory information is not available or adequate. BLM will use the protocols developed in **(1)**(a).	3) As listed below: a) FO and USFWS b) FO c) FO and USFWS	3) See below: a) SOA b) SOA c) SOA

Table III.C–1
Slickspot peppergrass (*Lepidium papilliferum*): Conservation Measures and Implementation Actions for the Jarbidge and Four Rivers FOs

LUP Programs Evaluated	Conservation Measures	BLM Implementation Actions	Responsibilities	Timeframes
		b) If direct or indirect negative impacts to the species or its habitat are anticipated as a result of new BLM actions, the activity will be modified to avoid or minimize negative impacts and, where feasible, promote species conservation.	d) FO	d) SOA
	4) Implement adaptive management as needed to achieve conservation objectives.	c) Where needed, complete section 7 compliance for new activities that may affect this species and its habitat.	4) FO, with USFWS	4) SOA
	5) Support programs to conserve and enhance slickspot peppergrass on non-Federal lands.	d) Where slickspot peppergrass habitat exists, BLM will conserve remaining stands of sagebrush and native vegetation in making activity plan and project level decisions.	5) FO	5) SOA
	6) Include language in all land use authorizations to require rehabilitation of slickspot peppergrass habitat in case of trespass or permit violations, if damage occurs.	4) Conduct site-specific implementation and effectiveness monitoring of management actions. Adjust management as needed to ensure that management objectives are met. See additional details within other programs.	6) FO	6) SOA
		5) Take advantage of opportunities to support conservation of slickspot peppergrass through easements, cooperative management efforts, and other programs.		
		6) As a part of management authorizations, require rehabilitation to native vegetation in slickspot peppergrass habitat if trespass or permit violation occurs and the habitat is damaged. If ecological site conditions preclude the use of native species, use non-invasive, nonnative plant species for rehabilitation in trespass or permit violation situations.		
Air Resources	None	None	None	None
Soil and Water Resources:	None	None	None	None

Table III.C–1
Slickspot peppergrass (*Lepidium papilliferum*): Conservation Measures and Implementation Actions for the Jarbidge and Four Rivers FOs

LUP Programs Evaluated	Conservation Measures	BLM Implementation Actions	Responsibilities	Timeframes
Riparian/ Wetland Areas (includes weed management)				
Upland Vegetation Management: Rangelands (includes weed management)	**1)** Activities within the **Upland Vegetation Management: Rangelands (includes weed management)** program will implement relevant conservation measures as described in the **Special Status Animal and Plant Management** program section to promote conservation. As a part of promoting conservation, the goals are to promote habitat conservation, to avoid negative impacts, or to minimize impacts if avoidance is not possible. **2)** Although non-chemical methods will be the preferred approach in occupied habitat, when appropriate, projects involving the application of pesticides (including herbicides, fungicides, and other related chemicals) in slickspot peppergrass habitat and potential habitat that may affect the species will be analyzed at the project level and designed such that pesticide applications will support conservation and minimize risks of exposure.	**1)** Apply relevant conservation measures from the **Special Status Animal and Plant Management** program section at the beginning of this table. **2)** Site-specific stipulations will be developed locally using these criteria: a) Evaluate the benefits and risks of vegetation treatment including the following: application methods; pesticides, carriers, and surfactants used; needed treatment buffers; and use of non-chemical weed control (for example, bio-controls, hand pulling). b) Apply appropriate spatial and temporal buffers to avoid species' exposure to harmful chemicals. c) Explore opportunities to eradicate competing nonnative invasive plants in occupied habitat where slickspots are being invaded by such plants. d) Implement appropriate revegetation and weed control measures to reduce the risks of nonnative invasive plant infestations	**1)** SO and FO **2)** FO, with USFWS (all actions)	**1)** SOA **2)** SOA

Table III.C–1
Slickspot peppergrass (*Lepidium papilliferum*): Conservation Measures and Implementation Actions for the Jarbidge and Four Rivers FOs

LUP Programs Evaluated	Conservation Measures	BLM Implementation Actions	Responsibilities	Timeframes
		following ground/soil disturbing actions in slickspot peppergrass habitat. e) BLM will provide USDA APHIS with the location of slickspot peppergrass habitat. Mormon cricket, grasshopper, or other insect control in slickspot peppergrass habitat will only include those methods that minimize impacts to the plant's pollinators.		
	3) Where needed and feasible, coordinate with adjacent land owners and local governments regarding control of invasive plants in upland areas through cooperative weed management programs. One of BLM's priorities within the cooperative weed management program is the protection of special status plants on BLM lands.	3) Take advantage of coordination opportunities as they arise.	3) FO	3) SOA
	4) BLM will promote diversity, richness, and health of native plant communities to support pollinators and habitat for slickspot peppergrass.	4) BLM will focus slickspot peppergrass habitat conservation and restoration efforts in or adjacent to occupied habitat to encourage connectivity among populations through the following measures: a) Where slickspot peppergrass habitat exists, BLM will conserve remaining stands of sagebrush and native vegetation in making activity plan and project level decisions. b) Vegetation treatment projects undertaken in slickspot peppergrass habitat will be compatible with species habitat restoration objectives, as described in item (d) below.	4) FO, with USFWS	4) SOA

Table III.C–1
Slickspot peppergrass (*Lepidium papilliferum*): Conservation Measures and Implementation Actions for the Jarbidge and Four Rivers FOs

LUP Programs Evaluated	Conservation Measures	BLM Implementation Actions	Responsibilities	Timeframes
		c) BLM will select and implement specific projects to restore slickspot peppergrass habitat in degraded areas as funding allows, such as planting shrubs and forbs and controlling weeds, within and adjacent to occupied habitat. Apply methods described in item (d) below. d) When conducting vegetation treatment projects, BLM will use seeding techniques that minimize soil disturbance such as no-till drills and rangeland drills equipped with depth bands, use native plant materials and seed during restoration activities, and select native forbs that benefit slickspot peppergrass insect pollinators.		
Forest and Woodland Management (includes weed management)	None	None	None	None
Wildlife and Wildlife Habitat Management	**1)** Activities within the **Wildlife and Wildlife Habitat Management** program will implement relevant conservation measures as described in the **Special Status Animal and Plant Management** program section to promote conservation. **2)** Manage facilities installed for wildlife to promote maintenance of slickspot peppergrass habitat. **3)** Restore wildlife habitat while promoting	**1)** Apply relevant conservation measures from the **Special Status Animal and Plant Management** program section at the beginning of this table. **2)** For review of ongoing actions, see **Special Status Animal and Plant Management** program section item **(2)**. For new actions, see **Special Status Animal and Plant Management** program section item **(3)**. As appropriate to avoid or minimize negative impacts, modify existing and avoid placement of new wildlife facilities in occupied habitat. **3)** Any restoration efforts for wildlife within slickspot	**1)** SO and FO **2)** FO **3)** FO	**1)** SOA **2)** SOA **3)** SOA

Table III.C–1
Slickspot peppergrass (*Lepidium papilliferum*): Conservation Measures and Implementation Actions for the Jarbidge and Four Rivers FOs

LUP Programs Evaluated	Conservation Measures	BLM Implementation Actions	Responsibilities	Timeframes
	slickspot peppergrass conservation.	peppergrass habitat will be compatible with the species' habitat requirements.		
Fish and Aquatic Habitat Management	None	None	None	None
Livestock Grazing Management: Permits and Leases	**1)** Activities within the **Livestock Grazing Management: Permits And Leases** program will implement relevant conservation measures as described in the **Special Status Animal and Plant Management** program section to promote conservation. **2)** Manage livestock grazing and trailing to conserve suitable habitat conditions for slickspot peppergrass while implementing rangeland health standards and guidelines (S&Gs). Apply the *Implementation of Annual Grazing Adaptive Management* (Figure III.C-2), located at the end of this conservation measures table, to adjust livestock use as appropriate.	**1)** Apply relevant conservation measures from the **Special Status Animal and Plant Management** program section at the beginning of this table. **2)** Permit or lease renewal actions and annual authorizations: a) For review of ongoing actions, see **Special Status Animal and Plant Management** program section item **(2)**. b) Schedule surveys in slickspot peppergrass habitat as needed for S&G assessments associated with permit and lease renewals. Use survey procedures and flowchart (Figure III.C-2, *Implementation of Annual Grazing Adaptive Management*) referenced in **Special Status Animal and Plant Management** program section 1(b). c) For new actions, see **Special Status Animal and Plant Management** program section item **(3)**. d) As part of adaptive management to avoid or minimize negative impacts, modify livestock grazing activities as outlined in Figure III.C-2, *Implementation of Annual Grazing Adaptive Management*, located at the end of this conservation measures table. In addition, the following measures will be implemented, as	**1)** SO and FO **2)** FO (all actions)	**1)** SOA **2)** SOA (all actions)

Table III.C–1
Slickspot peppergrass (*Lepidium papilliferum*): Conservation Measures and Implementation Actions for the Jarbidge and Four Rivers FOs

LUP Programs Evaluated	Conservation Measures	BLM Implementation Actions	Responsibilities	Timeframes
		appropriate: *i)* As part of range readiness assessments, delay livestock turnout when soils are saturated. *ii)* Minimize gathering livestock in EOs. *iii)* Avoid impacts to EOs from herd movement through rested and deferred pastures. *iv)* Trailing permits will not be authorized through EOs. *v)* Sheep grazing permits will be modified to restrict bedding, trailing, or watering herds within 1/2 mile of EOs. *vi)* Supplements will be placed at least 1/2 mile from EOs. Supplements will be placed so that livestock are drawn away from the EO and avoid trailing through the EO en route to the supplement or a water source. Management requirements will be adjusted to maintain an appropriate distance between supplements and existing EOs to avoid impacts. *vii)* No new domestic horse AUMs will be authorized in pastures containing EOs to avoid trampling impacts.		
	3) As part of adaptive management, BLM will conduct scheduled compliance inspections in pastures with occupied habitat as part of BLM range use supervision to minimize impacts.		3) FO	3) SOA

Table III.C–1
Slickspot peppergrass (*Lepidium papilliferum*): Conservation Measures and Implementation Actions for the Jarbidge and Four Rivers FOs

LUP Programs Evaluated	Conservation Measures	BLM Implementation Actions	Responsibilities	Timeframes
		3) BLM, in coordination with the USFWS, will create a schedule to prioritize compliance inspections associated with livestock grazing permits in occupied habitat areas. These compliance inspections are a complement to the HIP monitoring listed under Special Status Animal and Plant Management and where practical the efforts may be combined. BLM staff will conduct inspections as determined by the schedule.	a) FO b) SO and USFWS, with FO input	a) SOA b) DD for developing format: February 1, 2007
		a) BLM range staff will conduct pre-season range readiness checks for soil moisture conditions in allotments with occupied habitat.	c) FO	c) SOA
		b) BLM will conduct post-use monitoring for trampling in slickspots within EOs (could be done in conjunction with utilization compliance checks).	d) FO	d) SOA
	4) Provide adequate rest from livestock use for areas treated after major disturbances in slickspot peppergrass habitat. Major disturbances include fire, fire rehabilitation, or other soil-disturbing occurrences.		**4)** FO	**4)** SOA
	5) BLM will work cooperatively with the livestock permittees to promote slickspot peppergrass conservation.	c) Monitoring results will be documented in a standard format (to be developed by BLM) in the grazing allotment files. Copies will be provided to the USFWS as completed.	**5)** FO	**5)** SOA
		d) Apply Grazing Adaptive Management Implementation Flowchart as outlined in Figure III.C-2, located at the end of this conservation measures table.		
		4) Protect treated areas by using temporary livestock closures or other measures. The length of rest will be determined by achieving certain goals associated with plant establishment outlined in the restoration, fire rehabilitation, or other plan.		

Table III.C–1
Slickspot peppergrass (*Lepidium papilliferum*): Conservation Measures and Implementation Actions for the Jarbidge and Four Rivers FOs

LUP Programs Evaluated	Conservation Measures	BLM Implementation Actions	Responsibilities	Timeframes
		5) BLM will train permittees on slickspot peppergrass habitat and plant recognition. BLM will also work with permittees to use the CDC rare plant observation form to report survey information in a standard format.		
Livestock Grazing Management: Livestock Management Facilities	**1)** Activities within the **Livestock Grazing Management: Livestock Management Facilities** program will implement relevant conservation measures as described in the **Special Status Animal and Plant Management** program section to promote conservation. **2)** Manage livestock facilities to promote slickspot peppergrass conservation while implementing rangeland health S&Gs.	**1)** Apply relevant conservation measures from the **Special Status Animal and Plant Management** program section at the beginning of this table. **2)** For review of ongoing actions, see **Special Status Animal and Plant Management** program section item **(2)**. For new actions, see **Special Status Animal and Plant Management** program section item **(3)**. As appropriate to avoid or minimize negative impacts, modify existing and avoid placement of new livestock facilities in occupied habitat areas. a) Within pastures, place water facilities to support slickspot peppergrass conservation: *i)* Existing water troughs (includes troughs that are tied into pipelines, as well as both permanent and movable troughs to which water is delivered throughout the grazing season) will be moved at least 1/2 mile from EOs, when feasible. Where troughs	**1)** SO and FO **2)** FO (all actions)	**1)** SOA **2)** SOA (all actions)

Table III.C–1
Slickspot peppergrass (*Lepidium papilliferum*): Conservation Measures and Implementation Actions for the Jarbidge and Four Rivers FOs

LUP Programs Evaluated	Conservation Measures	BLM Implementation Actions	Responsibilities	Timeframes
		cannot be moved (for example, because of topographical constraints, additional disturbance, or impacts to sensitive species), management will be adjusted to mitigate the impacts during the periods of critical concern for slickspot peppergrass (such as when soils are saturated and subject to trampling impacts). Management adjustments could include shutting the water off seasonally, changing pasture boundary fences, or other appropriate measures. *ii)* New water troughs (not including existing water troughs moved in **(2)**(a)(*i*), above) will be placed at least 1 mile from EOs. A deviation from this standard may be developed on a case-by-case basis through collaboration with the USFWS. New water troughs will be placed so that cattle are drawn away from the EO and avoid trailing through an EO en route to a water source. *iii)* Temporary water troughs (short-term, emergency, or single-season use) will be located at least 1 mile from EOs. A deviation to this standard may be developed on a case-by-case basis through collaboration with the USFWS. New water troughs will be placed so that cattle are drawn away from the EO and avoid trailing through an EO en route to a water source. b) Placement of new livestock infrastructure will be compatible with slickspot peppergrass habitat conservation. Avoid placement of new fences within EOs.		
Wild Horse Management	**1)** Activities within the **Wild Horse Management** program will implement relevant conservation measures as described	**1)** Apply relevant conservation measures from the **Special Status Animal and Plant Management** program section at the beginning of this table.	**1)** SO and FO	**1)** SOA

Table III.C–1
Slickspot peppergrass (*Lepidium papilliferum*): Conservation Measures and Implementation Actions for the Jarbidge and Four Rivers FOs

LUP Programs Evaluated	Conservation Measures	BLM Implementation Actions	Responsibilities	Timeframes
	in the **Special Status Animal and Plant Management** program section to promote conservation. **2)** If the range of wild horses and slickspot peppergrass occupied habitat overlaps now or in the future, protect these areas from wild horses by including applicable conservation measures in herd management plans.	**2)** Manage wild horse herd size to minimize conflicts with slickspot peppergrass. Limit trampling in occupied habitat by implementing appropriate range management practices, such as fencing and water trough placement.	**2)** FO	**2)** SOA
Recreation Management	**1)** Activities within the **Recreation Management** program will implement relevant conservation measures as described in the **Special Status Animal and Plant Management** program section to promote conservation. **2)** Developed facilities (paved campgrounds, vault toilets, interpretive kiosks, etc.): Manage existing and new recreation facilities to promote conservation of species habitat.	**1)** Apply relevant conservation measures from the **Special Status Animal and Plant Management** program section at the beginning of this table. **2)** Management of existing and new facilities: a) For review of existing facilities, see **Special Status Animal and Plant Management** program section item **(2)**. As appropriate to avoid or minimize negative impacts, modify existing facilities. b) For new facilities, or for expansion of uses at existing facilities, see **Special Status Animal and Plant Management** program section item **(3)**. In addition, avoid development of new recreation facilities or expansion of existing facilities in slickspot peppergrass habitat if negative impacts are anticipated. c) BLM will educate recreationists on special status species and invasive weeds, focusing on occupied and selected habitat areas. BLM will develop and install educational signage at entry points and key recreational points regarding the biology and	**1)** SO and FO **2)** FO (all actions)	**1)** SOA **2)** SOA (all actions)

Table III.C–1
Slickspot peppergrass (*Lepidium papilliferum*): Conservation Measures and Implementation Actions for the Jarbidge and Four Rivers FOs

LUP Programs Evaluated	Conservation Measures	BLM Implementation Actions	Responsibilities	Timeframes
		conservation of this species and other special status species.		
	3) Dispersed use areas (informal areas, including camping areas and tie-up areas for pack animals): Manage dispersed use sites to promote conservation of species habitat. This includes limiting disturbances to the species resulting from human uses.	**3)** For review of ongoing activities, see **Special Status Animal and Plant Management** program section item **(2)**. In addition, minimize human activity in and adjacent to occupied habitat if negative impacts are occurring. Close areas, either seasonally or year-round, as needed to protect the species and its habitat.	**3)** FO	**3)** SOA
	4) Commercial and noncommercial recreation permits, including hunting guides and outfitter camps: issue commercial and noncommercial recreation permits to promote conservation of slickspot peppergrass habitat. This includes management of physical facilities (such as camps), as well as disturbances to slickspot peppergrass habitat resulting from human uses.	**4)** Issuance and review of existing and new permits: a) For review of existing permits, see Special Status Animal and Plant Management program section item **(2)**. If needed, modify existing permits that negatively impact habitat for this species. b) For new permits, see Special **Status Animal and Plant Management** program section item **(3)**. Avoid issuing recreation permits in slickspot peppergrass habitat if negative impacts are expected. In particular, avoid permitting new recreation activities in and adjacent to occupied habitat. If a recreation permit is to be issued, apply stipulations to the permit to support or to not preclude species conservation and educate permit holders about species' biology and needs. c) BLM will not authorize organized recreation activities in slickspot peppergrass habitat if negative impacts are anticipated (for example, OHV races, equestrian events, and other events).	**4)** FO (all actions)	**4)** SOA (all actions)
Recreation Management: Travel Management	**1)** Activities within the **Recreation Management: Travel Management** program will implement relevant conservation measures as described in the	**1)** Apply relevant conservation measures from the **Special Status Animal and Plant Management** program section at the beginning of this table.	**1)** SO and FO	**1)** SOA

Table III.C–1
Slickspot peppergrass (*Lepidium papilliferum*): Conservation Measures and Implementation Actions for the Jarbidge and Four Rivers FOs

LUP Programs Evaluated	Conservation Measures	BLM Implementation Actions	Responsibilities	Timeframes
	Special Status Animal and Plant Management program section to promote conservation. **2)** Manage roads, OHV routes and areas, as well as non-motorized trails, to promote species habitat conservation. This includes management of roads and trails, as well as ground disturbance resulting from human uses. **3)** Perform compliance checks on OHV closures to protect occupied habitat, identify problems as soon as possible, and take immediate corrective measures.	**2)** Review of existing and new roads, OHV routes, and areas and non-motorized trails: a) For existing roads, designated OHV routes and areas, and designated non-motorized trails, see **Special Status Animal and Plant Management** program section item **(2)**. Modify roads and routes in and adjacent to slickspot peppergrass habitat if negative impacts are occurring. Implement restrictions to reduce ground disturbance. Seek opportunities to close and revegetate roads, OHV routes, or non-motorized trails and use areas in and adjacent to habitat if negative impacts are occurring. b) For new roads, OHV routes and areas, and non-motorized trails, see **Special Status Animal and Plant Management** program section item **(3)**. Avoid creating new roads, trails, routes, and areas if negative impacts are expected in and adjacent to slickspot peppergrass habitat. c) Evaluate off-road vehicle use in occupied habitat, and where needed, limit access or close areas to motorized and mechanical vehicles to promote species conservation. **3)** See **Special Status Animal and Plant Management** program section item **(2)**.	**2)** FO and SO (all actions) **3)** FO	**2)** SOA **3)** SOA
Visual Resource	None	None	None	None

Table III.C–1
Slickspot peppergrass (*Lepidium papilliferum*): Conservation Measures and Implementation Actions for the Jarbidge and Four Rivers FOs

LUP Programs Evaluated	Conservation Measures	BLM Implementation Actions	Responsibilities	Timeframes
Management				
Special Designation Area Management	**1)** Activities within the **Special Designation Area Management** program will implement relevant conservation measures as described in the **Special Status Animal and Plant Management** program section to promote conservation. **2)** Explore the potential for new designations that would enhance species conservation.	**1)** Apply relevant conservation measures from the **Special Status Animal and Plant Management** program section at the beginning of this table. **2)** Evaluate establishing ACECs for several stronghold populations of slickspot peppergrass during land use plan amendments or revisions.	**1)** SO and FO **2)** FO	**1)** SOA **2)** SOA
Fire Management: Fire Suppression	**1)** Activities within the **Fire Management: Fire Suppression** program will implement relevant conservation measures as described in the **Special Status Animal and Plant Management** program section to promote conservation. Human life and firefighter safety and property take priority over species protection. **2)** Fire suppression efforts will be conducted, as possible, to protect slickspot peppergrass habitat. Place a high priority on protecting slickspot peppergrass habitat.	**1)** Apply relevant conservation measures from the **Special Status Animal and Plant Management** program section at the beginning of this table. **2)** Fire management activities: a) Fire Management Plans will include Standard Operating Procedures (SOP's) that address conservation of slickspot peppergrass. *i)* BLM will provide adequate fire suppression coverage at all stations to meet management objectives with the intent to suppress 90% of fires to the acreages specified in the fire management plans for slickspot peppergrass. BLM will maintain existing remote fire guard stations easily accessible to occupied habitat (for example, Juniper Butte fire guard station) and explore	**1)** SO and FO **2)** As listed below: a) SO in coordination with Fire Management Office (FMO) and FO	**1)** SOA **2)** See below: a) SO DD = 2007

Table III.C–1
Slickspot peppergrass (*Lepidium papilliferum*): Conservation Measures and Implementation Actions for the Jarbidge and Four Rivers FOs

LUP Programs Evaluated	Conservation Measures	BLM Implementation Actions	Responsibilities	Timeframes
		opportunities to establish additional stations to provide better initial attack and reduced response times for wildfires in slickspot peppergrass habitat		
		ii) Apply minimum impact suppression tactics (MIST) in slickspot peppergrass habitat, as appropriate. Consult with resource advisors to determine where MIST tactics should be applied to avoid or minimize negative impacts.		
		iii) Although MIST are preferred, aggressive fire suppression tactics (e.g., blade lines, back fires, etc. in habitat) may be applied if EOs are threatened.	b) FMO and Incident Commander for fire	b) SOA
	3) As needed, coordinate with appropriate agency personnel regarding fire suppression activities in or adjacent to slickspot peppergrass habitat.	b) Do not locate fire base camps, staging areas, and fueling areas within occupied habitat.	**3)** FMO with support from FO resource advisor	**3)** SOA
		3) Ongoing interagency coordination.		
		a) BLM and cooperators will expand on and continue to provide special status plant and habitat awareness training to fire resource advisors, Incident Commanders, Engine Operators, and Fire Operations Supervisors.		
		b) BLM and cooperators will distribute maps and inform fire crews on locations of the EOs to maximize fire protection and to		

Table III.C–1
Slickspot peppergrass (*Lepidium papilliferum*): Conservation Measures and Implementation Actions for the Jarbidge and Four Rivers FOs

LUP Programs Evaluated	Conservation Measures	BLM Implementation Actions	Responsibilities	Timeframes
		avoid or minimize impacts from fire suppression activities.		
Fire Management: Emergency Stabilization and Rehabilitation	**1)** Activities within the **Fire Management: Emergency Stabilization and Rehabilitation** program will implement relevant conservation measures as described in the **Special Status Animal and Plant Management** program section to promote conservation. **2)** Implement Emergency Stabilization and Rehabilitation (ES&R) activities to consider slickspot peppergrass in and adjacent to slickspot peppergrass habitat rehabilitation.	**1)** Apply relevant conservation measures from the **Special Status Animal and Plant Management** program section at the beginning of this table. **2)** The following measures will be applied: a) All wildfires within slickspot peppergrass habitat will be evaluated for ES&R treatments, regardless of size. b) As needed, protect disturbed and recovering areas using temporary closures or other measures. BLM will continue to rest areas from land use activities to meet ES&R objectives, defined through the ES&R plans. c) BLM will initiate and complete ES&R efforts for slickspot peppergrass, such as planting shrubs and forbs, within slickspot peppergrass habitat. BLM will implement the following measures during fire ES&R efforts: *i)* BLM will use seeding techniques that minimize soil disturbance such as no-till drills and rangeland drills equipped with depth bands when ES&R projects have the potential to impact slickspot peppergrass habitat. *ii)* BLM will use native plant materials and seed during ES&R	**1)** SO and FO **2)** FO (all actions)	**1)** SOA **2)** SOA (all actions)

Table III.C–1
Slickspot peppergrass (*Lepidium papilliferum*): Conservation Measures and Implementation Actions for the Jarbidge and Four Rivers FOs

LUP Programs Evaluated	Conservation Measures	BLM Implementation Actions	Responsibilities	Timeframes
		activities. BLM will include native forbs in seed mixtures that will benefit slickspot peppergrass insect pollinators. *iii)* If native plant materials and seed are not available, non-invasive, nonnative species may be used for stabilization activities in slickspot peppergrass habitat. iv) In areas adjacent to slickspot peppergrass habitat, if natives are not available, non-invasive nonnative species are acceptable for stabilization activities. Potentially invasive nonnative species such as intermediate wheatgrass and prostrate kochia may be used as a last resort for stabilization activities in areas adjacent to slickspot peppergrass habitat provided the benefits of their use are demonstrated to outweigh the risks to slickspot peppergrass and its habitat.		
	3) Fire rehabilitation projects involving the application of pesticides in slickspot peppergrass habitat will be analyzed and implemented in accordance with the approach described in the **Upland Vegetation Management: Rangelands (includes weed management)** program section.	**3)** See **Upland Vegetation Management: Rangelands (includes weed management)** program section.	**3)** SO and FO	**3)** SOA
Fire Management: Wildland Fire Use	**1)** Wildland fire use projects will not be allowed in slickspot peppergrass habitat.	**1)** When developing wildland fire use plans, do not allow wildland fire use in slickspot peppergrass habitat.	**1)** SO and FO	**1)** SOA
Fire Management: Prescribed Fire	**1)** Activities within the **Fire Management: Prescribed Fire** program will implement relevant conservation measures as described in the **Special Status Animal and Plant Management** program section to promote conservation.	**1)** Apply relevant conservation measures from the **Special Status Animal and Plant Management** program section at the beginning of this table.	**1)** SO and FO	**1)** SOA

Table III.C–1
Slickspot peppergrass (*Lepidium papilliferum*): Conservation Measures and Implementation Actions for the Jarbidge and Four Rivers FOs

LUP Programs Evaluated	Conservation Measures	BLM Implementation Actions	Responsibilities	Timeframes
	2) Prescribed fire projects will be designed to conserve and enhance slickspot peppergrass habitat.	**2)** Prescribed fire in slickspot peppergrass habitat will only be used as a tool for assisting with species conservation (for example, a burn in preparation to decrease cheatgrass litter before herbicide application, or to clear fence lines of accumulated windblown weeds).	**2)** FO	**2)** SOA
Fire Management: Non-Fire Fuels Management	**1)** Activities within the **Fire Management: Non-Fire Fuels Management** program will implement relevant conservation measures as described in the **Special Status Animal and Plant Management** program section to promote conservation.	**1)** Apply relevant conservation measures from the **Special Status Animal and Plant Management** program section at the beginning of this table.	**1)** SO and FO	**1)** SOA
	2) Implement projects involving the application of pesticides in accordance with the approach described in the **Upland Vegetation Management: Rangelands (includes weed management)** program section.	**2)** See **Upland Vegetation management: Rangelands (includes weed management)** program section.	**2)** FO	**2)** SOA
	3) Fuels management projects conducted in slickspot peppergrass habitat should have long-term benefits to slickspot peppergrass.	**3)** Avoid fuels management projects in occupied habitat, unless such projects would enhance species conservation or are necessary for hazardous fuels reduction near the urban interface. Implement protection measures to avoid or minimize negative impacts to the species. In slickspot peppergrass habitat, design native seed mixes that emphasize local stock and will promote species conservation. a) Because of potential negative impacts to slickspot peppergrass habitat from linear fuel breaks, which can act as weed dispersal corridors, the following measures will be applied in or adjacent to slickspot peppergrass habitat: *i)* BLM will evaluate the effectiveness of existing fuel breaks	**3)** FO (all actions)	**3)** SOA (all actions)

Table III.C–1
Slickspot peppergrass (*Lepidium papilliferum*): Conservation Measures and Implementation Actions for the Jarbidge and Four Rivers FOs

LUP Programs Evaluated	Conservation Measures	BLM Implementation Actions	Responsibilities	Timeframes
		(location, dry fuel load, and weed composition) in protecting slickspot peppergrass habitat. *ii)* BLM may create and maintain fuel breaks where frequent fires can threaten slickspot peppergrass habitat. New fuel breaks in slickspot peppergrass habitat will be designed to conserve and enhance species habitat. Where appropriate and where objectives will be met, native vegetation should be emphasized in the creation of new fuel breaks. If native vegetation or seed is not available or if objectives would not be met through their use, fuel breaks may include nonnative, non-invasive, species that will not invade slickspots. In areas adjacent to slickspot peppergrass habitat, fuel breaks may include potentially invasive nonnative species such as intermediate wheatgrass and prostrate kochia as a last resort if the benefits of their use are demonstrated to outweigh the risks to slickspot peppergrass and its habitat. Apply conservation measure (2) in the **Fire Management: Emergency Stabilization and Rehabilitation** program section and conservation measure (4) in the **Upland Vegetation Management** program. *iii)* Consider actions to repair or restore fuel breaks so they function as desired. Apply conservation measure (2) in the **Fire Management: Emergency Stabilization and Rehabilitation** program section and conservation measure (4) in the **Upland Vegetation Management** program. b) In addition to the reduction in fuels associated with appropriately managed livestock grazing (see relevant conservation measures from **Livestock Grazing Management** section of this table), BLM may create fuel breaks using techniques such as mowing or targeted grazing to strategically reduce fuel loads where frequent fires can threaten slickspot peppergrass habitat if the benefit of these actions can be demonstrated to outweigh the risks to slickspot peppergrass		

Table III.C–1
Slickspot peppergrass (*Lepidium papilliferum*): Conservation Measures and Implementation Actions for the Jarbidge and Four Rivers FOs

LUP Programs Evaluated	Conservation Measures	BLM Implementation Actions	Responsibilities	Timeframes
		and its habitat.		
Fire Management: Community Assistance	**1)** Activities within the **Fire Management: Community Assistance** program will implement relevant conservation measures as described in the **Special Status Animal and Plant Management** program section to promote conservation.	**1)** Apply relevant conservation measures from the **Special Status Animal and Plant Management** program section at the beginning of this table.	**1)** SO and FO	**1)** SOA
	2) Follow all measures included throughout the Fire Management program sections.	**2)** See actions within Fire Management program sections. Incorporate into community assistance agreements.	**2)** FO	**2)** SOA
Lands and Realty Management: Land Tenure Adjustment (land sale, exchanges, withdrawals, etc.)	**1)** Activities within the **Lands and Realty Management: Land Tenure Adjustment (land sale, exchanges, withdrawals, etc.)** program will implement relevant conservation measures as described in the **Special Status Animal and Plant Management** program section to promote conservation.	**1)** Apply relevant conservation measures from the **Special Status Animal and Plant Management** program section at the beginning of this table.	**1)** SO and FO	**1)** SOA
	2) Where feasible and funding is available, acquire through land exchange or purchase private lands that contain slickspot peppergrass habitat.	**2)** BLM will opportunistically acquire slickspot peppergrass habitat, particularly occupied habitat, in land exchanges and purchases.	**2)** FO	**2)** SOA
	3) Retain occupied slickspot peppergrass habitat in Federal ownership unless such a transfer would result in a net benefit to the species.	**3)** Review each land tenure decision in terms of species habitat. Avoid the loss of occupied habitat from Federal ownership. If property with occupied habitat is being considered for transfer out of Federal ownership, ensure that the action will result in a greater net benefit for this species. BLM will coordinate with USFWS as early as possible to discuss methods to assure that the proposed land tenure adjustment benefits the species.	**3)** FO	**3)** SOA
Lands and	**1)** Activities within the **Lands and Realty**	**1)** Apply relevant conservation measures from the **Special Status**	**1)** SO and FO	**1)** SOA

Table III.C–1
Slickspot peppergrass (*Lepidium papilliferum*): Conservation Measures and Implementation Actions for the Jarbidge and Four Rivers FOs

LUP Programs Evaluated	Conservation Measures	BLM Implementation Actions	Responsibilities	Timeframes
Realty Management: Land Use Permits and Leases	**Management: Land Use Permits and Leases** program will implement relevant conservation measures as described in the Special Status Animal and Plant Management program section to promote conservation.	**Animal and Plant Management** program section at the beginning of this table.		
	2) Issue new land use permits and leases and review existing permits and leases at renewal to conserve species habitat. This includes management of physical facilities, as well as ground disturbance resulting from human uses.	**2)** For new authorizations, as well as those being renewed, see **Special Status Animal and Plant Management** program section item **(3)**. Avoid issuing new authorizations, or renewing existing authorizations, in or adjacent to slickspot peppergrass habitat if negative impacts are expected. If an authorization is to be issued or re-issued in such areas, apply stipulations to the authorization that support species conservation and that avoid or minimize negative impacts. BLM will require control of invasive nonnative or weed species on new, renewing, or amending land use permits and leases in slickspot peppergrass habitat. a) Conduct periodic project compliance inspections during implementation of projects involving soil disturbance. b) BLM will require that new or renewing permit or lease holders establish at least 50% perennial cover after all ground disturbing activities, unless ecological site conditions preclude that level of cover. If a native species component existed prior to the ground disturbance, then the native species component of the perennial cover should be restored.	**2)** FO (all actions)	**2)** SOA (all actions)
Lands and Realty Management: Rights-of-Way	**1)** Activities within the **Lands and Realty Management: Rights-of-Way** program will implement relevant conservation measures as described in the **Special Status Animal and**	**1)** Apply relevant conservation measures from the **Special Status Animal and Plant Management** program section at the beginning of this table.	**1)** SO and FO	**1)** SOA

Table III.C–1
Slickspot peppergrass (*Lepidium papilliferum*): Conservation Measures and Implementation Actions for the Jarbidge and Four Rivers FOs

LUP Programs Evaluated	Conservation Measures	BLM Implementation Actions	Responsibilities	Timeframes
	Plant Management program section to promote conservation. **2)** Issue new rights-of-way and review existing rights-of-way at renewal to conserve species habitat. This includes management of physical facilities, as well as disturbances to the species resulting from human uses.	**2)** For new rights-of-way and renewal of existing rights-of-way, see **Special Status Animal and Plant Management** program section item **(3)** Avoid issuing new rights-of-way, or renewing rights-of-way, in or adjacent to slickspot peppergrass habitat if negative impacts are expected. In slickspot peppergrass habitat, only issue or re-issue rights-of-way with stipulations to avoid negative impacts to the habitat. BLM will require control of invasive nonnative or weed species on new, renewing, or amending right of way authorizations in slickspot peppergrass habitat. a) BLM will require that new or renewing permit or lease holders establish at least 50% perennial cover after all ground disturbing activities, unless ecological site conditions preclude that level of cover. If a native species component existed prior to the ground disturbance, then the native species component of the perennial cover should be restored.	**2)** FO	**2)** SOA
Mineral Management: Locatable Minerals	**1)** Activities within the **Mineral Management: Locatable Minerals** program will implement relevant conservation measures as described in the **Special Status Animal and Plant Management** program section to promote conservation. **2)** Approve plans of operations or allow notice level operations so as not to preclude species habitat conservation. This includes management of physical facilities, as well as disturbances to the species resulting from	**1)** Apply relevant conservation measures from the **Special Status Animal and Plant Management** program section at the beginning of this table. **2)** Approval of plans of operations and notice-level operations: a) For review of existing plans of operation and notice-level operations, see **Special Status Animal and Plant Management** program section item **(2)**. To the extent allowed by law, modify	**1)** SO and FO **2)** FO (all actions)	**1)** SOA **2)** SOA

Table HI.C–1
Slickspot peppergrass (*Lepidium papilliferum*): Conservation Measures and Implementation Actions for the Jarbidge and Four Rivers FOs

LUP Programs Evaluated	Conservation Measures	BLM Implementation Actions	Responsibilities	Timeframes
	human uses.	plans of operation or notice-level operations that may have negative impacts on the species or its habitat. For notice-level operations, notify the operator that modifications to proposed activities will be required to avoid negative impacts. b) For new plans of operation and notice-level operations, see **Special Status Animal and Plant Management** program section item **(3)**. To the extent allowed by law, avoid approving plans of operation or notice-level operations that may have negative impacts on the species or its habitat. For notice-level operations, notify the operator that modifications to proposed activities will be required to avoid negative impacts. If a plan of operations is to be approved in or adjacent to slickspot peppergrass habitat, apply stipulations to support or to not preclude species conservation. A notice will require modification by the operator until BLM determines that it will not result in undue or unnecessary degradation.		
Mineral Management: Saleable and Leasable Minerals	**1)** Activities within the **Mineral Management: Saleable and Leasable Minerals** program will implement relevant conservation measures as described in the **Special Status Animal and Plant Management** program section to promote conservation. **2)** Approve development of saleable or leasable minerals so as not to preclude species habitat conservation. This includes management of physical facilities, as well as disturbances to the species resulting from human uses.	**1)** Apply relevant conservation measures from the **Special Status Animal and Plant Management** program section at the beginning of this table. **2)** Approval of saleable and leasable minerals: a) For review of existing mineral leases, see **Special Status Animal and Plant Management** program section item **(2)**. Modify existing mineral leases if negative impacts are occurring. b) For new sales or leases, see **Special Status Animal and Plant Management** program section item **(3)**. Avoid	**1)** SO and FO **2)** FO	**1)** SOA **2)** SOA

Table III.C–1
Slickspot peppergrass (*Lepidium papilliferum*): Conservation Measures and Implementation Actions for the Jarbidge and Four Rivers FOs

LUP Programs Evaluated	Conservation Measures	BLM Implementation Actions	Responsibilities	Timeframes
		development of saleable or leasable minerals in or adjacent to slickspot peppergrass habitat if negative impacts are expected. If a minerals lease or sale is to be issued in or adjacent to habitat, apply stipulations to support or to not preclude species conservation.		
Cultural Management	1) Activities within the **Cultural Management** program will implement relevant conservation measures as described in the **Special Status Animal and Plant Management** program section to promote conservation.	1) Apply relevant conservation measures from the **Special Status Animal and Plant Management** program section at the beginning of this table.	1) SO and FO	1) SOA
Pleontology	1) Activities within the **Paleontology** program will implement relevant conservation measures as described in the **Special Status Animal and Plant Management** program section to promote conservation.	1) Apply relevant conservation measures from the **Special Status Animal and Plant Management** program section at the beginning of this table.	1) SO and FO	1) SOA