BIOLOGICAL OPINION
FOR THE
LANGLEY GULCH POWER PLANT RIGHTS-OF-WAY

14420-2010-F-0280

May 28, 2010

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

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1. BACKGROUND

1.1 Introduction

The Fish and Wildlife Service (Service) has prepared this Biological Opinion (Opinion) of the effects of the proposed Langley Gulch Power Plant (LGPP) Rights-of-Way (ROWs) on the slickspot peppergrass (*Lepidium papilliferum*). In a letter dated April 7, 2010, the Bureau of Land Management (Bureau) requested formal consultation with the Service under section 7 of the Endangered Species Act (Act) for its proposal to carry out the action. The Bureau determined that the proposed action is likely to adversely affect the slickspot peppergrass. As described in this Opinion, and based on the Biological Assessment (Assessment) developed by the Bureau and other information, the Service has concluded that the action, as proposed, is not likely to jeopardize the continued existence of the slickspot peppergrass.

1.2 Consultation History

July 22, 2009:	The Boise District Level 1 Team was provided a preliminary overview of the proposed Langley Gulch Power Plant ROWs. The Team informed the project proponent that section 7 consultation would be required for this project, and recommended that the 138-kV transmission line alignment was moved to avoid known slickspot peppergrass Element Occurrences (EO).
February 22, 2010:	The Boise District Level 1 Team received a draft Assessment for review and comment on the effects of the proposed Langley Gulch Power Plant ROWs on the slickspot peppergrass.
March 4, 2010:	The Boise District Level 1 Team provided input to project proponent on the draft Assessment for the Langley Gulch Power Plant ROWs. The Team agreed that a “may affect, likely to adversely affect” determination for the slickspot peppergrass was appropriate.
March 16, 2010:	The Boise District Level 1 Team received the updated draft Assessment for the Langley Gulch Power Plant ROWs from the project proponent.
March 19, 2010:	The Service provided final review comments on the draft Assessment for the Langley Gulch Power Plant ROWs to the Bureau to forward to the project proponent.
April 13, 2010:	The Service received a memorandum dated April 7, 2010 transmitting the final Langley Gulch Power Plant ROWs Assessment which requested formal consultation with the Service on effects to the slickspot peppergrass associated with implementing the proposed action.
May 4, 2010:	The Service provided a draft Opinion to the Bureau for their review and comment. The Opinion addressed the effects of the Langley Gulch Power Plant ROWs on the slickspot peppergrass.

May 17, 2010: The Service received comments on the draft Opinion from the Bureau and their applicant. These comments were incorporated, as appropriate, into the final version of this Opinion.

2. BIOLOGICAL OPINION

2.1 Description of the Proposed Action

This section describes the proposed 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."

Idaho Power submitted an application to the Bureau of Land Management (Bureau) on October 13, 2008, for the construction and operation and maintenance (O&M) of a new water pipeline, a new 230 kilovolt (kV) transmission line and the modification of a portion of an existing 230-kV transmission line (Caldwell to Ontario) to serve the LGPP, a power generation facility located on privately-owned lands. While the general proposed locations of the water and transmission lines have not changed, the specific locations have changed based on engineering criteria and environmental issues. The Bureau assigned serial number IDI-36332 to the 230-kV transmission line and serial number IDI-36333 to the water pipeline. Idaho Power has also determined that an additional new 138-kV transmission line is needed and that the existing shield wire on the Caldwell to Ontario line will need to be replaced. Cumulatively, these activities have been identified as the proposed action.

2.1.1 Action Area

The project area includes Bureau land managed by the Four Rivers Field Office within Payette County, Idaho (Figure 1). Each of the proposed transmission lines would start at the LGPP, which is located on non-Federal lands in Sections 33 and 28 of Township 7N, Range 4W of the Boise Meridian. The action area for the project includes all areas that may be affected directly or indirectly by the proposed action and not merely the immediate area involved in the action (50 CFR §402.02). The action area identified for this project includes a 0.25 mile buffer from the centerline of each of the action components (Figure 2).

The overall project consists of the construction and O&M of the following features:

- A new 138-kV transmission line from the LGPP to an existing 138-kV transmission line adjacent to Willis Road.
- A new double-circuit 230-kV transmission line from the LGPP to the existing Caldwell to Ontario 230-kV line.
- Replacement of an existing shield wire on the existing Caldwell to Ontario 230-kV line with a shield wire that contains fiber optic cable to allow for better communication and control of the system.
- Modification of the existing Caldwell to Ontario 230-kV line to allow connection with the proposed 230-kV line.

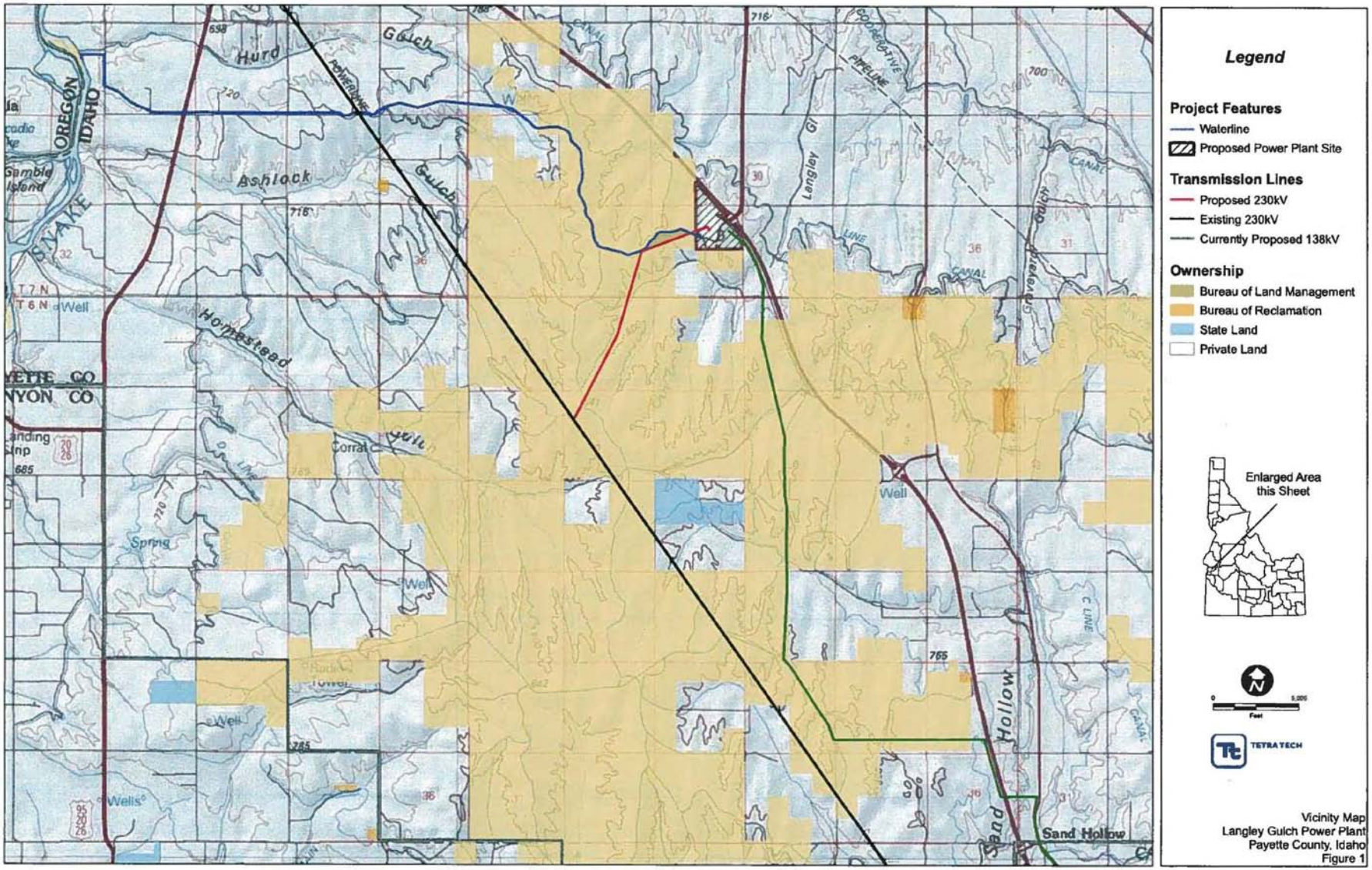

Figure 1. Vicinity Map, Langley Gulch Power Plant

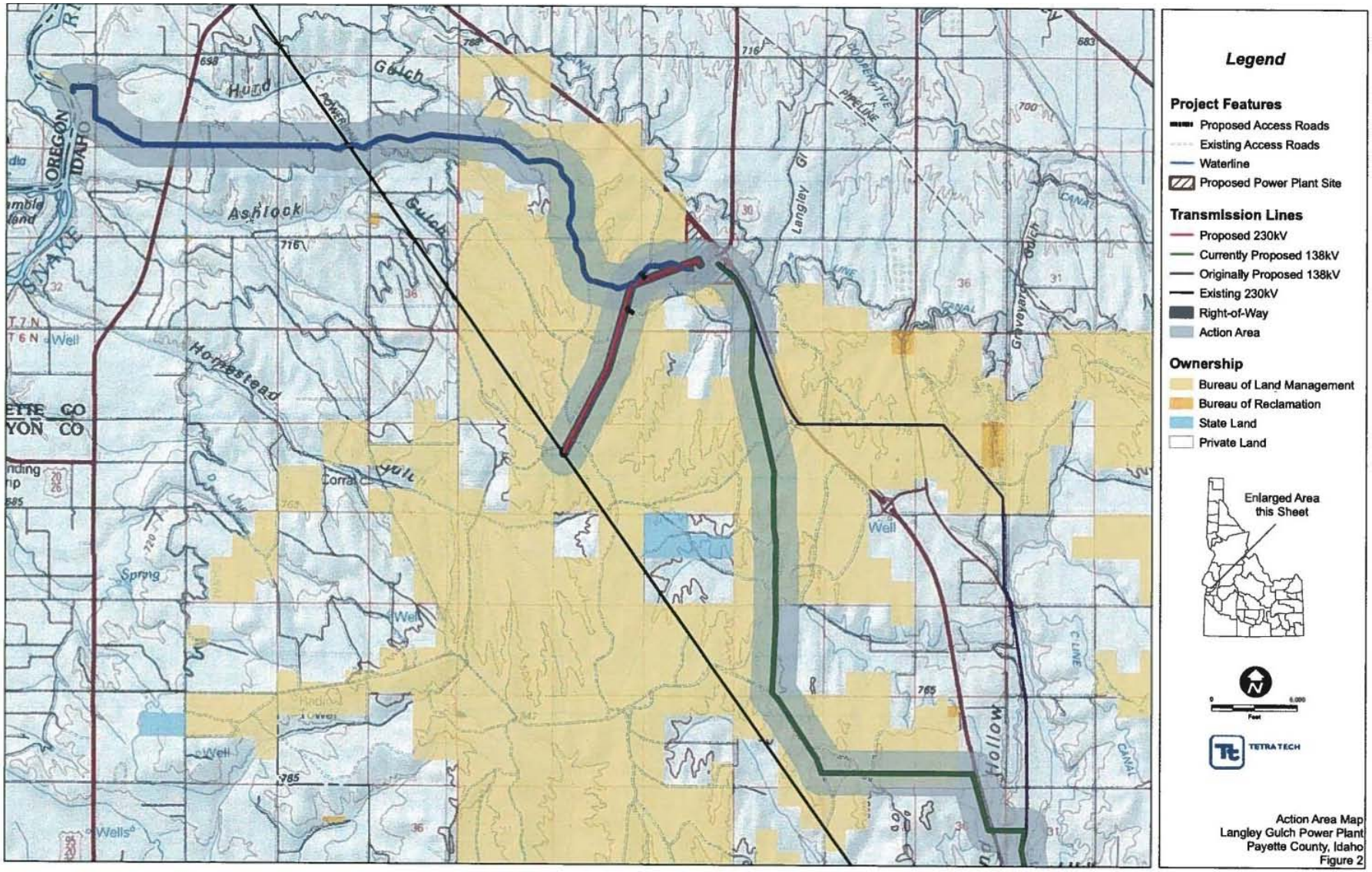

Figure 2. Action Area Map, Langley Gulch Power Plant

- A new water pipeline from the Snake River to the LGPP, including a pump station at the Snake River.
- O&M of existing roads to access project facilities and construction of spur roads to access the proposed 230-kV line. Overland travel will be used for the construction and O&M of the 138-kV line; this will likely result in the creation of a permanent two-track road.

The components of proposed action considered within this Opinion are as follows:

138-kV Transmission Line: A new approximately 16.7 mile, 138-kV transmission line would be constructed from the LGPP to an existing 138-kV line located at the intersection of Old Highway 30 and Willis Road. The transmission line would start on private land in Section 33 of T7N R4W and travel slightly southeast to Section 3 of T6N R4W, where it crosses Bureau lands for approximately 6.3 miles and then makes a hard turn east towards Interstate 84. The remainder of the transmission line works its way in a southeastern direction and would be located on private property or existing public road ROWs, ending at Section 33 in T5N R3W (Figure 2). Overland travel within the proposed ROW will be used for construction and O&M of the 138-kV transmission line; this will likely result in the creation of a new two-track road.

230-kV Transmission Line: The new 230-kV transmission line segment would loop the existing Caldwell to Ontario 230-kV transmission line (located approximately 2.8 miles from the LGPP site) into the LGPP. The proposed double circuit 230-kV transmission line would interconnect with the Caldwell to Ontario 230-kV transmission line in Section 8 of T6N R4W and would occur entirely on Bureau lands. From the existing Caldwell to Ontario 230-kV transmission line, the proposed 230 kV transmission line would travel northeast into Section 5 and would continue traveling in a northeasterly direction into Section 32 of T7N R4W. Once in Section 32, the transmission line would shift to a more easterly direction and would cross into Section 33 before entering the western side of the LGPP site (Figure 2). Idaho Power will use existing roads in the area as much as possible for the construction and O&M of this line. Two 10-foot wide spur roads will be graded from the existing dirt roads to the proposed 230-kV line, totaling approximately 1,000 feet (Figure 3).

Work would be required on the existing Caldwell to Ontario 230-kV line. Work would be conducted in the immediate vicinity of the proposed 230-kV line and will consist of breaking the existing line to loop it into and from the LGPP. Existing structures at the break will need to be replaced.

Water Pipeline: The water pipeline would be approximately 8.8 miles in length, with approximately 3 miles of the pipeline route located on Bureau land. After crossing private land in the eastern portion of Section 30, the pipeline enters Bureau land and continues in an easterly direction for approximately 2,100 feet of Sections 29 and 30. In Section 29, the pipeline turns to the south and follows an existing Bureau road into Section 32 The road and pipeline then turn to the east and cross into Section 33, and then into the LGPP site. The water pipeline follows an existing dirt road for 13,497 feet (2.6 miles, see Figure 2). Existing roads will be used for the construction and O&M of the water pipeline on Bureau land and to the extent possible on private lands.

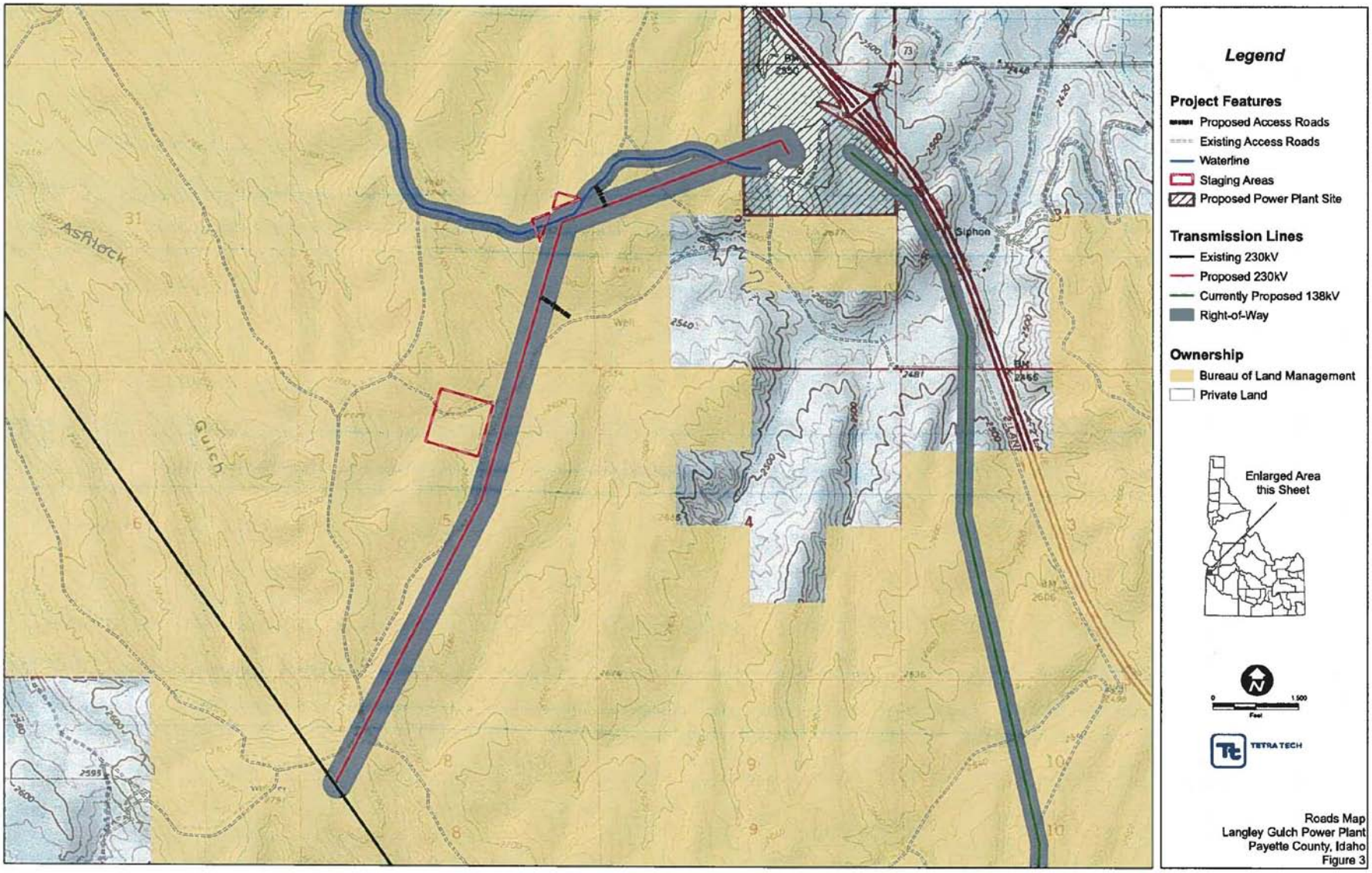

Figure 3. Roads Map, Langley Gulch Power Plant

2.1.2 Proposed Action

The proposed action is for the Bureau to issue the following ROWs to Idaho Power for a term of 30 years, and includes the following components:

- Temporary construction ROW of 300 feet wide by 6.3 miles long for the 138-kV transmission line and 300 feet wide by 3 miles long water line.
- Temporary construction ROW of 500 feet wide by 2.8 miles long for the 230-kV transmission line.
- Temporary ROW for two staging areas on Bureau lands associated with the construction of the proposed 230-kV transmission line.
- Permanent ROW of 150 feet wide by 6.3 miles long for the 138-kV transmission line.
- Permanent ROW of 150 feet wide by 2.8 miles long for the 230-kV transmission line.
- Permanent ROW of 10 feet wide by approximately 0.2 miles long (approximately 1,000 feet) for the spur roads for the 230-kV transmission line.
- Permanent ROW of 30 feet wide by 3 miles long for the water pipeline.

The proposed temporary transmission line ROWs encompass the proposed permanent transmission line ROWs.

The construction and operation and maintenance (O&M) general activities that would result from granting the transmission line ROWs include:

1. Survey and stake the centerline
2. Maintain and repair access and service roads
3. Prepare (i.e., clear and/or grade) work areas as needed
4. Excavate structure holes
5. Assemble and erect transmission line structures
6. Install conductors and ground wire
7. Site reclamation

Idaho Power and/or or contract construction crews will complete construction activities. Idaho Power expects that 12 to 20 crew members will be required. Equipment could include, but is not limited to low drill, bucket trucks, line beds, wire pulling trailer, concrete trucks, crane, crew cab pickups, and flat bed trailers.

Descriptions of the structures to be constructed for this Project are below. Idaho Power will prepare a Plan of Development (POD) that includes additional information on structure type and location, as well as construction details. This will be submitted to the Bureau with the Environmental Assessment (EA).

<u>Transmission Structures</u>

The 138-kV transmission line structures will be single circuit H-frame steel pole structures on Bureau land and uncultivated private lands; these structures range from 60 to 80 feet in height. This transmission line will be built using 230-kV transmission line construction parameters, but would be initially operated at 138-kV. Single steel pole single-circuit structures will be utilized along road ROWs and along cultivated private ground; these structures will range from 95 to 120

feet in height. The steel H-frame structures will be direct buried and the single steel poles will have a single concrete foundation. Approximately 120 to 140 poles will be required for the 6.3 mile transmission line route. Structure types are shown on Figure 4. Work on the 138-kV line is proposed to start in July 2011 and be completed by June 2012; work on the portion that would occur on Bureau-managed lands would be completed by March 1, 2012.

The 230-kV transmission line will be constructed using single pole, galvanized steel double circuit structures, each with drilled pier steel-reinforced concrete foundations. Tangent structures will utilize braced post insulators. Angle and dead-end structures will be designed with tubular steel davit arms and suspension/dead-end insulators. All poles will be grounded using 2/0 AWG stranded copper wire from a 1/2" hex nut on the structure to a 5/8" x 8' copper ground rod embedded into earth at each structure. Structure types are shown on Figure 5.

The north circuit on the 230-kV transmission line and the circuit on the 138-kV transmission line is "Bittern" 45/7 ACSR and the south circuit on the 230-kV line is "Cardinal" 54/7 ACSR. The vertical design clearances are based on the transmission conductor's final sag at the maximum design operating temperature (194°F, final) or at the NESC loaded condition, whichever produces the greater sag. The minimum ground clearance is 27 feet.

Pole heights for the 230-kV transmission line could range from 80 feet to 120 feet, depending on structure type. Span lengths could range from 800 to 1,200 feet and the number of structures could range from 15 to 20, again depending on the structure type used for this 2.8 mile transmission line section. Idaho Power is proposing to start work on the 230-kV line in October 2010 and be completed by March 2011.

Water Pipeline

Water pipeline construction would likely be conducted with two crews; each would use one front end loader and two track-mounted back hoes. The two track hoes will do the trench excavation and backfill and the front end loader will handle the pipe and move excavated soil material. Three or four trucks will also be needed to haul pipe and other materials to the site. Construction of the proposed water pipeline would involve surveying the centerline, removing vegetation as needed, removing and stockpiling topsoil and subsoil, excavating a trench, laying pipe sections along the trench, welding the pipe, lowering the pipe into the trench, backfilling the trench, pressure testing the pipe, replacing and stabilizing topsoil, recontouring, and revegetating. The activities would occur sequentially along the entire length of the pipeline, so a substantial portion of the pipeline trench could remain open for several weeks. Short sections of the trench would be left open overnight. Crews would place temporary covers or fence the open sections at the end of each day. Best Management Practices (BMPs), as described in the storm-water pollution prevention plan (SWPPP), associated with the POD, would be implemented to reduce runoff and soil erosion. Work on the water pipeline is expected to start in summer 2010 and to be completed in 2011.

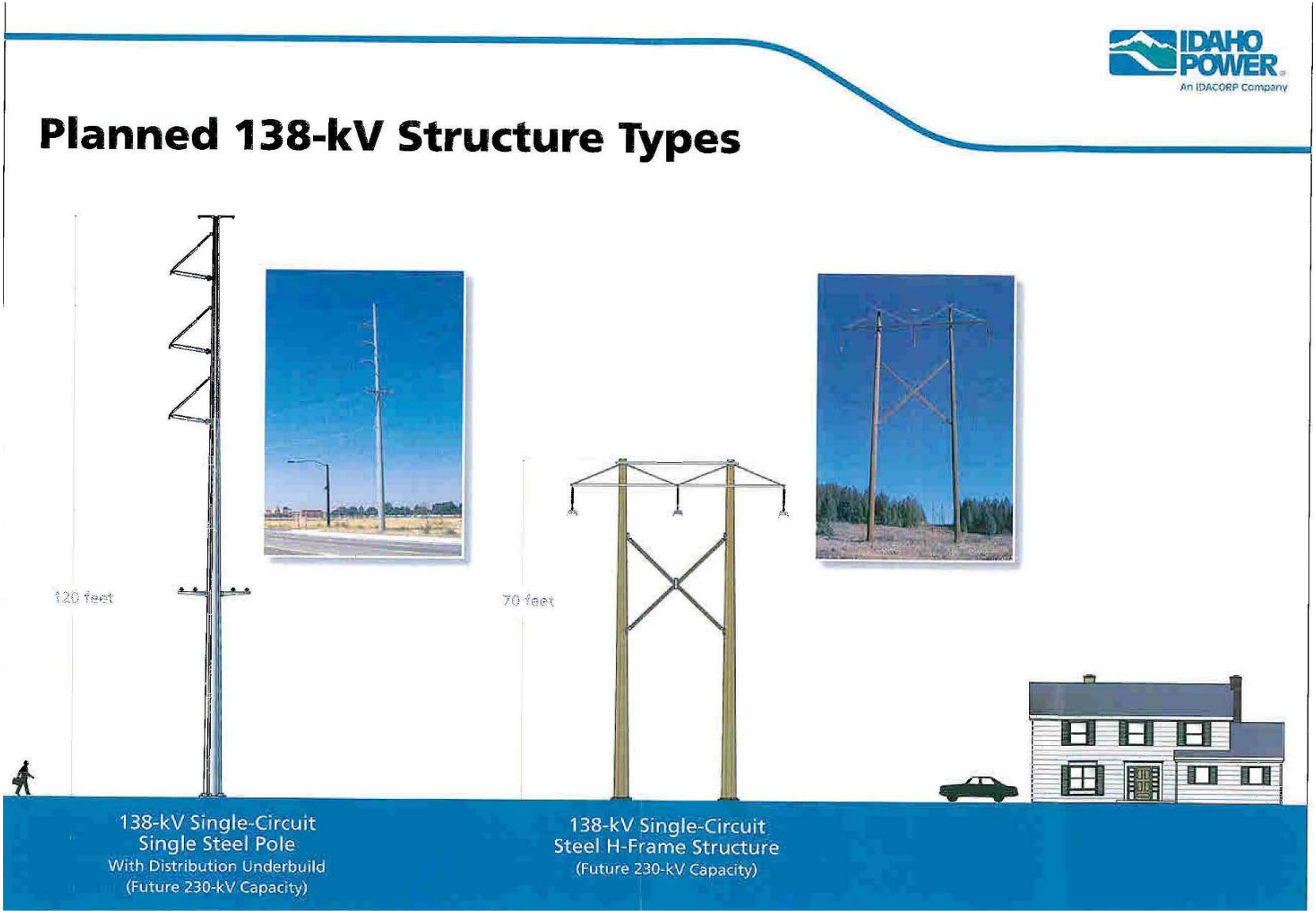

Figure 4. 138-kV Transmission Line Structure Types.

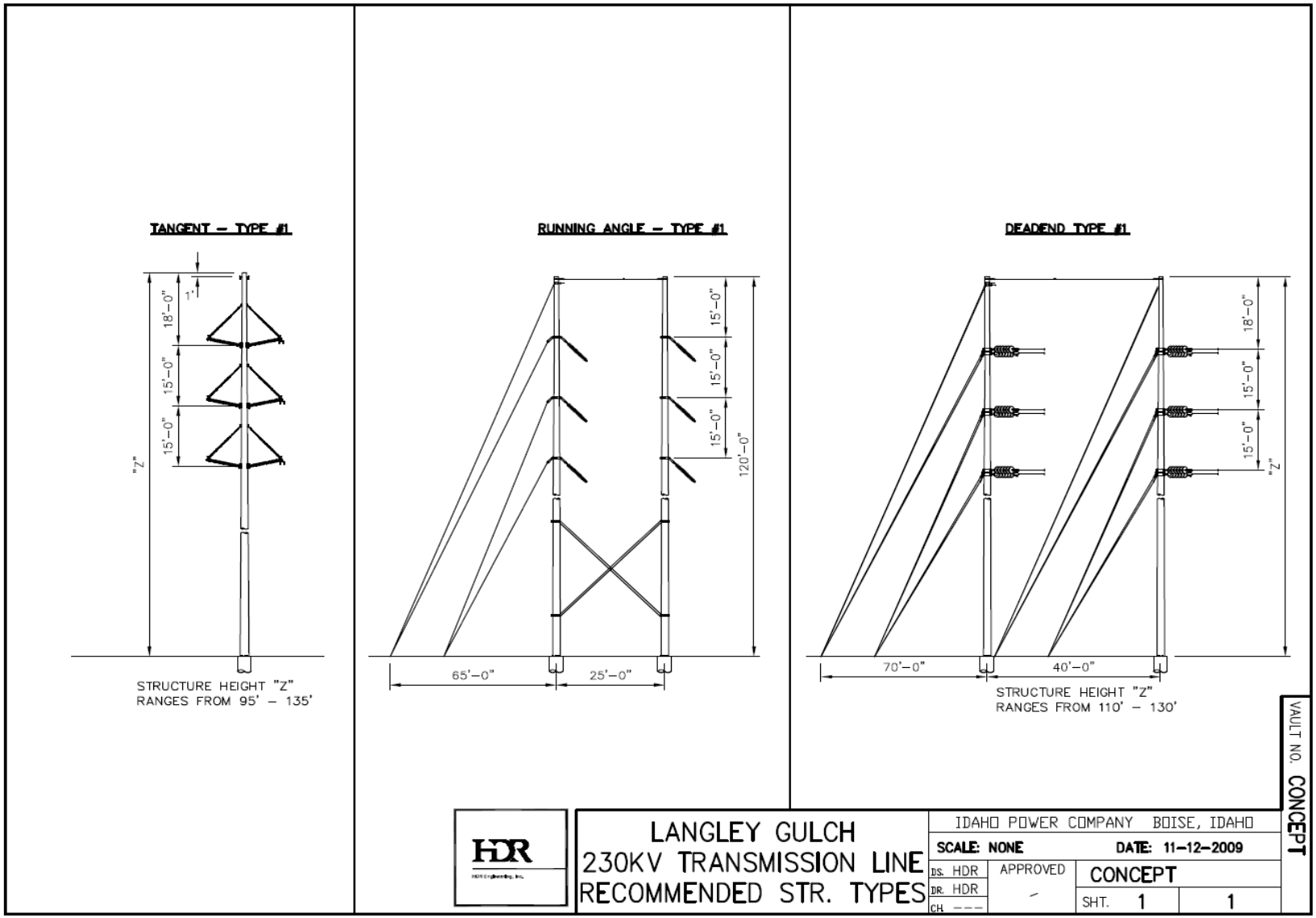

Figure 5. 230-kV Transmission Line Structure Types

Staging Areas

The majority of staging areas will be located on private property. There are two staging areas associated with the new 230-kV line that are proposed on Bureau lands. All other work, laydown areas, etc. will be within the temporary ROW.

O&M Activities and Emergency Situations

Idaho Power performs O&M activities to keep transmission lines operational and in good repair. These activities are either planned (such as, routine patrols, inspections, scheduled maintenance, and scheduled emergency maintenance) or unplanned (such as, emergency maintenance in cases where public safety and property are threatened). Other than routine inspections, the level of maintenance anticipated would be relatively low.

A patrolman using a pickup truck or all-terrain vehicle will conduct a ground patrol twice a year, once in the spring and once in the fall, and will identify transmission line and structure conditions in need of repair. Follow-up maintenance on problems is typically scheduled for the fall (October through November), but it is also dependent upon whether the transmission line needs to be taken out of service to conduct maintenance and when the transmission line can be taken out of service. A detailed climbing or aerial inspection of the structures, conductors, and associated hardware takes place approximately once every 10 years. During a climbing inspection, structural hardware is checked and tightened. Climbing inspections can take place from April through October. Follow-up maintenance to the detailed inspection usually occurs the following fall.

Vegetation management to maintain the required clearances within the ROWs will be minimal due to the lack of tall shrubs or trees in the action area. Idaho Power may clear vegetation within a 10-foot radius of each structure as a measure to reduce possible damage from fire. Following vegetation clearing, licensed applicators will apply herbicides to minimize vegetation regrowth. On Bureau managed lands, Idaho Power will coordinate these activities with the Bureau to ensure that sensitive plant and wildlife resources are not negatively impacted, including the slickspot peppergrass.

Maintenance activities are also conducted on roads associated with the ROWs. Maintenance activities can include grading, repair of eroded areas, and installation of water bars and dips to control erosion and storm water runoff. Roads are not improved beyond what is necessary to ensure safe access and operation of equipment.

Emergency situations are those conditions that may result in imminent or direct threats to public safety or threaten or impair Idaho Power's ability to provide power to its customers. The following examples include actual and potential emergency situations:

- Failure of conductor splices.
- Lightning strikes or wildfires resulting in smoke that causes flashover between the conductors.
- Damage to structures from high winds, ice, or other weather-related conditions.
- Breaking or imminent failure of cross-arms or insulators, which could cause conductor failures.

- Vandalism to structures or conductors from shooting or other destructive activities.

Typically, the same measures Idaho Power implements during routine, planned maintenance activities will also be implemented in emergency situations.

There will also be periodic visual inspections of the water pipeline route (twice a year at the most). Maintenance will be conducted as needed and repairs will occur if water pipe failure occurs. Pigging may also be conducted (once every 5 to 10 years) if build up occurs. The pump house maintenance will depend on the type of water intake Idaho Power selects. If a traditional in-stream water intake is used, the accumulation of algae will be an ongoing maintenance requirement. Maintenance will be minimal if Idaho Power selects a well field option. Regardless of which option is selected, there will be periodic inspections of the pumps and controls in the pump house building.

ENVIRONMENTAL PROTECTION MEASURES

Idaho Power has committed to Environmental Protection Measures (EPMs) as part of the project description. Unless specified otherwise, these EPMs will be implemented on Bureau lands only. EPMs that are relevant to the protection of the slickspot peppergrass include:

- During initial routing and siting, transmission line ROWs, tower locations, staging areas, and new access roads were relocated to avoid direct impacts to previously identified slickspot peppergrass element occurrences (EO) as designated by the Idaho Fish and Game Department's Idaho Natural Heritage Program (INHP), and to avoid or minimize impacts to mapped slickspot peppergrass potential habitat as defined in the Bureau's *Biological Assessment for Slickspot Peppergrass (Lepidium papilliferum): Jarbidge and Four Rivers Field Office , Land Use Plans and Ongoing Actions* (Bureau 2009, p. B-2).
- Slickspot peppergrass EOs and habitat within intact sagebrush communities will be temporarily fenced during construction activities and marked as an avoidance area on both Bureau and private lands (subject to agreement with the land owner). All contractors will be informed of the avoidance area(s) and fencing will be inspected periodically to ensure its integrity. Temporary fencing will be removed following the completion of construction activities.
- Slickspot peppergrass EOs and habitat within intact sagebrush communities near the ROW, but not within work areas, will be protected by marking the edges of the ROW and access roads in the general vicinity to ensure that workers do not leave those areas. Marking will consist of lathe stakes painted blue at the tops and they will be removed following the completion of construction activities.
- Where possible, slickspot peppergrass habitat (i.e., slickspot microsites) outside of sagebrush communities will be avoided by moving a structure location along the proposed centerline within the requested ROWs. Avoidance of all slickspot peppergrass habitat is not possible given its distribution within the area.
- When possible and where slickspots may be impacted by overland travel, this travel will be limited to the late summer or early fall when any slickspot peppergrass seeds that may be contained in the seed bed will be dormant.

- Contract documents will also include the requirement to avoid slickspot peppergrass EOs and habitat within intact sagebrush communities.
- Existing roads used for access will be improved only to the degree that is required to ensure safe operation and movement of equipment on both Bureau and private lands (subject to agreement with the land owner).
- New access roads will be kept to the minimum necessary and overland travel will be used wherever feasible and safe to do so, on both Bureau and private lands (subject to agreement with the land owner).
- Where appropriate, access roads will be maintained to have crossroad drainage in order to minimize the amount of channeling or ditches needed on both Bureau and private lands (subject to agreement with the land owner). Water bars will be installed at all alignment changes (curves), significant grade changes, and as requested by the Authorized Officer. This will result in a decrease in soil erosion, which could impact slickspot microsites.
- All existing access road drainage structures will be maintained or repaired by Idaho Power during construction and future O&M activities, further reducing potential impacts to slickspot microsites from soil erosion, on both Bureau and private lands (subject to agreement with the land owner).
- If necessary, BMPs to address dust from access roads and other areas of ground disturbance within the construction limits will be implemented on both Bureau and private lands (subject to agreement with the land owner). This may include the use of water, vehicle speed limits, gravel, or a combination of these or similar control measures. Reduction in construction dust is expected to avoid or minimize potential impacts to reproduction of individual slickspot peppergrass plants as dust may interfere with insect pollination or seed production of the slickspot peppergrass.
- The SWPPP will include measures to minimize direct and indirect impacts to vegetation from erosion and sedimentation during construction activities on both Bureau and private lands (subject to agreement with the land owner). This EPM is anticipated to minimize potential impacts to the slickspot peppergrass and other sagebrush steppe native plants important to insect pollinators.
- A Spill Prevention, Containment, and Countermeasures Plan will include site-specific implementation of cleanup procedures in the event of soil contamination from spills or leaks of fuels, lubricants, coolants, or solvents. The Plan will help avoid or minimize impacts to native vegetation, including the slickspot peppergrass.
- To decrease the potential for the introduction or spread of undesirable vegetation, which could impact the slickspot peppergrass through direct competition or through altering wildfire frequency and intensity in the vicinity of the proposed action, the following EPMs will be implemented:
    - Personal vehicles, sanitary facilities, and work areas will be confined to areas specified in the POD on both Bureau and private lands (subject to agreement with the land owner).

- The responsible party will clean all equipment that may operate off-road or disturb the ground before beginning construction or O&M activities within a pre-determined project area on both Bureau and private lands (subject to agreement with the land owner). This process will clean tracks and other parts of the equipment that could trap soil and debris and will reduce the potential for introduction or spread of undesirable exotic vegetation. Preferably, the cleaning will occur at an Idaho Power operation center, commercial car wash, or similar facility. Vehicles traveling only on established paved roads are not required to be cleaned.
- Idaho Power will prepare a re-vegetation plan in consultation with the Bureau, if necessary. The plan will specify appropriate re-vegetation timing, techniques, and seed mixes for shrub-dominated as well as nonnative annual grass-dominated areas. Adherence to this plan will also help limit the spread and establishment of undesirable vegetation. Certified, weed-free seed must be used on all areas to be restored. Other construction material, such as fill, shall also be free of undesirable vegetation seeds.

- Idaho Power will regularly inspect the transmission lines for fire hazards on both Bureau and private lands (subject to agreement with the land owner). This EPM will reduce the risk of wildfire ignitions that may impact the slickspot peppergrass. Idaho Power crews and contractors will have the following equipment when working in or around the transmission and water lines on Bureau-managed lands:
    a. All power-driven equipment, except portable fire pumps, shall be equipped with one fire extinguisher having a UL rating of at least 5 BC, and one "D" handled or long handled round point shovel, size "0" or larger. In addition, each motor patrol, truck and passenger-carrying vehicle shall be equipped with a double-bit axe or Pulaski, 3-1/2 pounds or larger.
    b. Each internal combustion engine shall be equipped with a spark arrester meeting either (1) USDA Forest Service Standard 5100-1a, or (2) appropriate Society of Automotive Engineers (SAE) recommended practice J335(b) and J350(a) as now or hereafter amended unless it is:
        i. Equipped with a turbine-driven exhaust supercharger such as the turbocharger. There shall be no exhaust bypass.
        ii. A passenger-carrying vehicle or light truck, or medium truck up to 40,000 GVW, used on roads and equipped with a factory-designed muffler complete with baffles and an exhaust system in good working condition.
        iii. A heavy duty truck, such as a dump or log truck, or other vehicle used for commercial hauling, used only on roads and equipped with a factory designed muffler and with a vertical stack exhaust system extending above the cab.
    c. Exhaust equipment, including spark arresters and mufflers, shall be properly installed and maintained in serviceable condition.
    d. Smoking is not allowed outside of vehicles or construction trailers.

In addition, to comply with the Bureau's 6840 manual direction, the USDI Conservation Agreement (Bureau and Fish and Wildlife Service 2009), and 2006 CCA (State of Idaho et. al 2006) (as amended), the following measures would be employed for any selected overland travel routes and proposed transmission line ROWs:

- A Bureau botanist, ecologist or approved knowledgeable Idaho Power or contract botanist would accompany the construction crews to identify the access and coordinate the actual power pole locations on Bureau lands.
- Full field clearances (inventory) would be conducted during the appropriate 2010 season in the proposed transmission line ROWs and access and spur roads to identify avoidance areas (occupied slickspots).
- Overland crossing of any slickspot peppergrass plants or habitat would be avoided as much as possible as determined by the LEPA Consideration Zone or clearance survey.
- During construction, soil and materials will not be stored on slickspots, and excess soil will not be spread on slickspots.
- Impacts to sagebrush will be minimized to the maximum extent possible.
- Disturbed soils within sagebrush plant communities would be seeded with a Bureau-approved certified weed-free seed mix. Native plants would be used in the seed mix. Forbs should also be included in seed mixes to increase diversity and pollen sources for pollinators. Reseeding will result in at least 50-percent perennial cover after all ground disturbing activities (measured after two growing seasons) unless site-specific conditions preclude this level of cover. Seeding techniques that minimize soil disturbance (e.g., no-till drills and rangeland drills equipped with depth bands) will be used and identified slickspots will be avoided during reseeding efforts.

The Bureau would also include standard stipulations in ROW grants including, but not limited to, the following:

- During surface disturbing construction and maintenance activities, the holder shall ensure that all construction equipment and vehicles are cleaned of all vegetation (stems, leaves, seeds, and all other vegetative parts) prior to entering public lands to minimize the transport and spread of noxious weeds. During surface disturbing construction and maintenance activities, the holder shall ensure that all construction equipment and vehicles are cleaned of all vegetation (stems, leaves, seeds, and all other vegetative parts) prior to leaving public lands in areas that are known by the Bureau's authorized officer to be infested with noxious weeds.
- No construction or maintenance activities shall be performed during periods when the soil is too wet to adequately support construction equipment. If such equipment creates ruts in excess of three (3) inches deep, and the holder must access these types of areas to conduct maintenance, the holder will coordinate with the Bureau prior to any maintenance and the holder will be required to do ground restoration in alignment with Bureau stipulations.

- Except for emergency repairs, the holder shall notify the authorized officer at least ten working days prior to any major repair or replacement activities.
- Use of pesticides shall comply with applicable Federal and State laws. Pesticides shall be used only in accordance with their registered uses and within limitations imposed by the Secretary of the Interior. Prior to the use of pesticides, the holder shall obtain from the authorized officer written approval of a plan showing the type and quantity of material to be used, pest(s) to be controlled, method of application, location of storage and disposal of containers, and any other information deemed necessary by the authorized officer. Emergency use of pesticides shall be approved in writing by the authorized officer prior to such use.
- The holder shall conduct all activities associated with the construction, operation, and termination of the right-of-way within the authorized limits of the right-of-way.
- The holder shall take such measures for prevention and suppression of fire on the grant area and adjacent public lands or public lands used or traversed by the holder in connection with operations as are required by applicable laws and regulations.

2.2 Analytical Framework for the Jeopardy Determinations

2.2.1 Jeopardy Determination

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

1. The *Status of the Species*, which evaluates the 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 the 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 the 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 the slickspot peppergrass.
4. *Cumulative Effects*, which evaluates the effects of future, non-Federal activities in the action area on the slickspot peppergrass.

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

The jeopardy analysis in this Biological Opinion places an emphasis on consideration of the rangewide survival and recovery needs of the slickspot peppergrass and the role of the action area in the survival and recovery of the 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.

2.3 Status of the Species

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

2.3.1 Regulatory Status

Effective December 7, 2009, the slickspot peppergrass was listed as threatened under the Act (74 FR 52014–52064, October 8, 2009). No critical habitat has been designated at this time.

2.3.2 Description of the Species

The slickspot peppergrass is an intricately branched, tap-rooted plant, averaging 2 to 8 inches (in.) high, but occasionally reaching up to 16 in. high. The plant's 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).

2.3.3 Life History

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).

2.3.3.1 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 Idaho Army National Guard's Orchard Training Area (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 the slickspot peppergrass was demonstrated to be higher than survivorship of biennials (Meyer et al. 2005, p. 16). For example, of the 4,065 plants counted in spring 1993, a total of 2,503 survived to fruit as annuals, while only 85 survived to fruit as biennials in spring 1994. Meyer et al. (2005, p. 21) hypothesize that the reproductive strategy of the 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. The biennial life form is thus 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).

2.3.3.2 Seed Viability and Germination

The seeds of the 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, the 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 the 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.

2.3.3.3 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).

2.3.4 Habitat Characteristics

The native, semiarid sagebrush-steppe habitat of southwestern Idaho where slickspot peppergrass is found can be divided into two plant associations, each dominated by the shrub Wyoming big sagebrush (*Artemisia tridentata* spp. *wyomingensis*): Wyoming big sagebrush–Thurber's needlegrass (*Achnatherum thurberianum* [formerly *Stipa thurberiana*]) and Wyoming big sagebrush–bluebunch wheatgrass (*Pseudoroegneria spicata* [also known as *Agropyron spicatum*]) habitat types (Moseley 1994, p. 9). Menke and Kaye (2006a, p. 1) describe high-quality matrix habitat conditions for slickspot peppergrass as sagebrush-steppe habitat in late seral condition, and Fisher et al. (1996, p. 1) note that "habitat with vigorous slickspot peppergrass populations has not been recently burned, is not heavily grazed, has an understory of native bunchgrasses, and a well developed microbiotic soil crust." Moseley (1994, p. 4) suggests that the slickspot peppergrass serves as an indicator species for the health of the sagebrush-steppe ecosystem in the western Snake River Plain.

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 OHV use and are subject to damage by fire; recovery from disturbance is possible, but occurs very slowly (Johnston 1997, pp. 10–11).

The 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 conditions (Nettleton and Peterson 1983, pp. 166, 191, 206). As slickspots in southwest Idaho appear to have formed during the Pleistocene and new slickspots are not being formed, slickspot loss is apparently 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 the 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 the slickspot peppergrass.

The 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 (Fish and Wildlife Service 2006b, p. 20). For example, in 2002, a complete census of an 11,070 acre 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 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. The

Bureau's *Biological Assessment for Slickspot Peppergrass (Lepidium papilliferum): Jarbidge and Four Rivers Field Offices Land Use Plans and Ongoing Actions* defines potential habitat as areas within the known range of the slickspot peppergrass that have certain general soil and elevation characteristics that indicate the potential for the area to support the slickspot peppergrass although the presence of slickspots or the plant is unknown (Bureau 2009, p. B–2). Recent modeling was completed to develop a high-quality, predictive-distribution model of the slickspot peppergrass to identify potential habitat (Colket 2008, p. 1). Although surveys were conducted in 2008 in some areas identified as potential, previously unsurveyed habitat, these surveys did not result in any new locations of the species (Colket 2008, pp. 4–6). The 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 the slickspot peppergrass has ever been found anywhere outside of its present range in southwestern Idaho.

The INHP uses an EO ranking system for assessing the status of the 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 help to 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 the slickspot peppergrass before 2006.

As of February 2009, the INHP has ranked 80 extant EO records for the slickspot peppergrass based on habitat quality and abundance (Cole 2009, pp.15). No A-ranked EOs for the slickspot peppergrass exist. The most common rangewide EO ranks for the 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 IDARNG'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 extirpated or probably extirpated (X-ranked or X?-ranked), and seven EOs are considered historical (Hranked, meaning information is too vague for relocation of the sites).

2.3.5 Survival and Recovery Needs

Although recovery planning has not been completed for the slickspot peppergrass, the Service anticipates that providing for its survival and recovery will entail reducing the threats that are the

basis for its status as a listed species: 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 the survival and recovery of the species:

- Protection, restoration, and maintenance of suitable habitat conditions for all life stages of the slickspot peppergrass.
- Reduction and mitigation of negative effects caused by increased fire frequencies and invasive nonnative plants on the 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 the slickspot peppergrass; and monitor 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 the slickspot peppergrass and sagebrush-steppe habitats, including slickspot microsites.
- Development of a management area-based recovery program that relies on adaptive management to implement and revise, as appropriate, recovery actions for the 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 the slickspot peppergrass is dependent upon the maintenance or improvement of ecological functions of the higher quality (C- through A-ranked) EOs rangewide, including maintaining or improving connectivity within and between EOs. Connectivity improvements may involve maintaining or enhancing currently lower ranked EOs (D- through F-ranked), as necessary, to facilitate pollinator activity; maintain genetic diversity; and limit 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 cheatgrass and medusahead (*Taeniatherum caput-medusae*). The Service has identified the modified wildfire regime in the Great Basin and subsequent proliferation of invasive nonnative plants as the primary threats to the 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 the 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 the 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 and emerging threats, such as commercial and residential development, seed predation, habitat fragmentation and isolation, and climate change, were identified in the Federal Register notice for listing of the slickspot peppergrass as factors that could impact the 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 rangewide significant impacts that would lead to the slickspot peppergrass becoming endangered in the foreseeable future. However, both secondary and emerging 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, these 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 taken to avoid or minimize the impacts of habitat loss on the slickspot peppergrass. Actions that could degrade slickspots to the point that they can no longer provide the essential functions to support the 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. Conservation measures designed to reduce wildfire threats, reduce competition from invasive nonnative plants, and conserve slickspot microsites are expected to be especially important for the survival and recovery of the species rangewide, and are considered in our analysis of this proposed action.

2.3.6 Rangewide Status and Distribution

The slickspot peppergrass range 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 6). 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 acres of total area broadly occupied by the slickspot peppergrass (Cole 2009, threats table). The area actually occupied by the slickspot peppergrass

is a small fraction of the total acreage since slickspots occupy only a small percentage of the landscape, and the slickspot peppergrass occupies only a fraction of those slickspots (see U.S. Air Force 2002, p. 9). Table 1 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.

Table 1. Distribution and landownership of slickspot peppergrass (*Lepidium papilliferum*) 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.

Physiographic Region	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	0.3	0	0.0	2,643	16.8
All Extant EOs	80	100.0	15,479	98.0	62	0.4	260	1.6	15,808	100.0

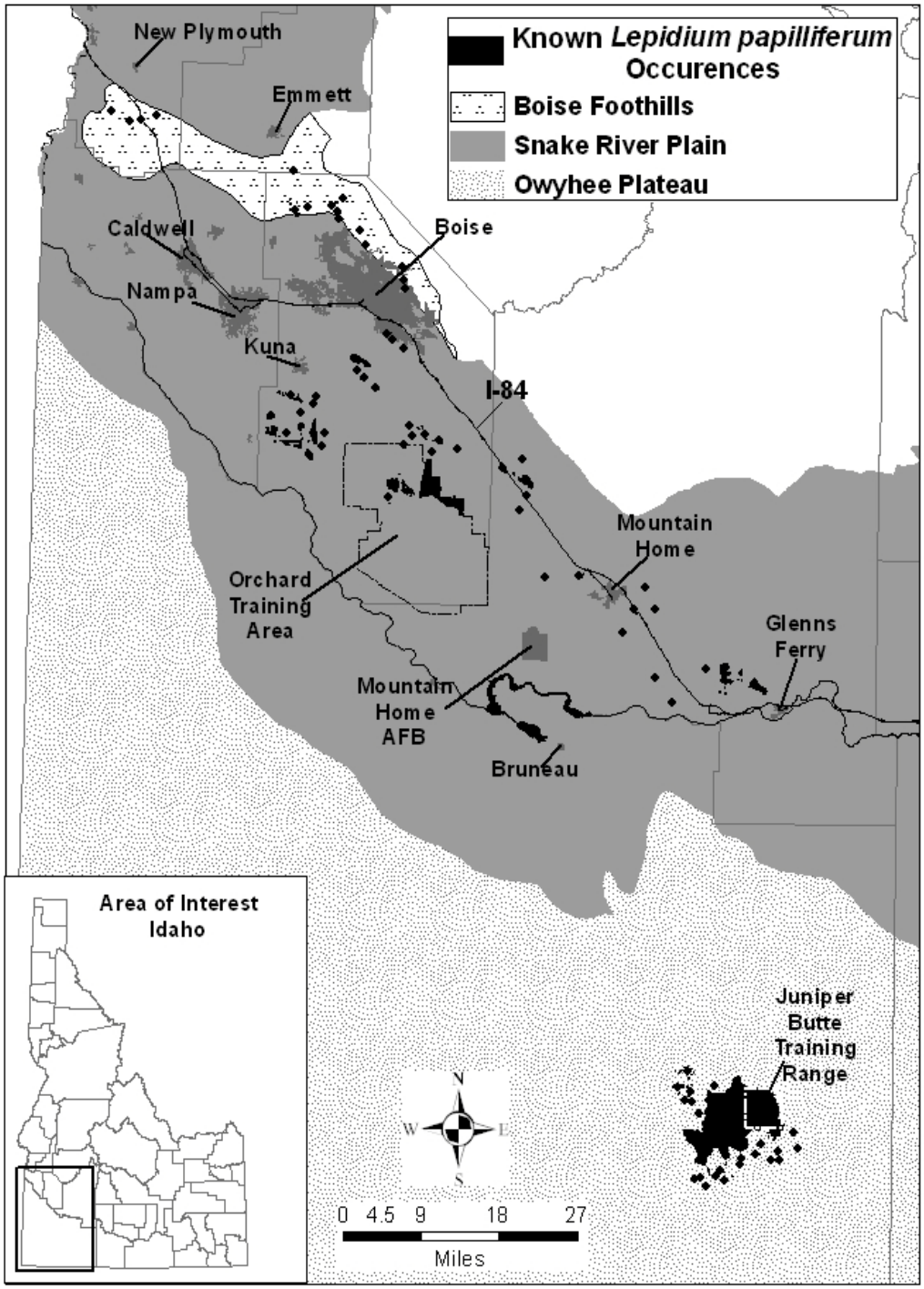

Figure 6. The range of the slickspot peppergrass (*Lepidium papilliferum*) in southwest Idaho, showing its distribution in the Snake River Plain, Boise Foothills, and Owyhee Plateau physiographic regions.

Of the 98 percent of EO area under Federal ownership, the Bureau has management authority on 87 percent of the total EO area (13,470 ac) rangewide and on all or portions of 69 of the 80 extant EOs for the slickspot peppergrass. This represents the majority of the slickspot peppergrass range. The EO rankings (discussed in section 2.3.4 above) for slickspot peppergrass EOs located entirely or partially on Bureau-managed lands are presented in Table 2.

Table 2. Element Occurrences (EOs) entirely or partially on Bureau of Land Management lands by Element Occurrence rank

EO Rank	B	BC[a]	C	D	E	F	Total
Number of Bureau-managed EOs	13	1	27	13	10	5	69
Percentage of Total Bureau-managed EOs (%)	19	2	39	19	15	7	100

[a] Indicates an EO that is an intermediate between B-rank and C-rank (see Colket et al. 2006, p. 5).

As shown in Table 2, the majority (65 percent) of EOs entirely or partially on Bureau-managed land are ranked as C, D, and F. EOs with rankings of C, D, or F are indicative of lower-quality habitat and lower plant abundance. However, a lower EO ranking is not always indicative of the overall conservation value of a particular EO as it may be important for connectivity of the species across its range.

2.3.7 Population Dynamics

Due to its occupancy of patchily distributed slickspots, the habitat of the slickspot peppergrass is somewhat naturally fragmented. However, large-scale fragmentation can pose problems for the slickspot peppergrass by creating barriers in the landscape that prevent effective genetic exchange between populations. Seed dispersal for the 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 the 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 the slickspot

peppergrass suggested that populations in the Snake River Plain and Owyhee Plateau "may have reduced genetic diversity" (Larson et al. 2006, p. 1) [1].

Many of the remaining occurrences of the 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 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).[2] 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.

2.4 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 which have already undergone section 7 consultations, and the impacts of state and private actions which are contemporaneous with the consultations in progress.

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

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

2.4.1 Status of the Slickspot Peppergrass in the Action Area

2.4.1.1 Slickspot Peppergrass Element Occurrences in the Action Area

As part of the CCA, 12 management areas were established to provide an organizational structure that facilitates conservation of the slickspot peppergrass in distinct segments across its range (State of Idaho et. al 2003, pp.21-22). The survey corridor is in a portion of the New Plymouth / Canyon County slickspot peppergrass Management Area. This management area is located on Bureau-managed land south of New Plymouth on either side of I-84, which is the northwest extent of the species range. Most of the area has burned in the past and has developed into grasslands dominated by invasive nonnative annual grass species (cheatgrass and medusahead) with small scattered remnant stands of native shrubs and areas of seeded nonnative perennial grasses. The distribution of slickspots is limited, occurring mainly along ridgelines (State of Idaho et. al 2003, p. 27).

A database search of the Idaho Fish & Wildlife Information System (IFWIS) documented six slickspot peppergrass EOs within three miles of the action area (IFWIS 2009). Two of the slickspot peppergrass occurrences (EO 11 [ID 947]: New Plymouth and EO 13 [ID 3663]: Sand Hollow) were documented on private land. EO 11 is categorized by the INHP as extirpated, and EO 13 is categorized as historical. Historical EOs are often based on older herbarium records; these location records are typically geographically vague and may be simply indicated by the name of a town (Colket et al. 2006, p. 4). The New Plymouth occurrence was last observed in 1910, and the Sand Hollow occurrence was last observed in 1974. INHP surveyed the area in 1993 and was unable to locate these populations. No extant slickspot peppergrass EOs occur within the action area on non-Federal lands.

The other four slickspot peppergrass EOs are located on Bureau-administered land. Three of these four occurrences are more than 0.5 mile from the action area. These three occurrences (EO #69 [ID 9352]: East of Ashlock Gulch, EO 66 [4450]: New Plymouth SW, and EO 70 [ID 9353]: West of Graveyard Gulch) are occurrences with observations of flowering plants documented as recently as 2008 (Colket 2009, p. 31). The INHP has categorized EO 66 as C-ranked, EO 69 as D-ranked, and EO 70 as B-ranked.

The New Plymouth SW occurrence (EO 66) is located within an Idaho Power ROW for the existing 230-kV Caldwell to Ontario transmission line. In 2008, the occurrence was surveyed by INHP botanists and a Bureau livestock grazing permittee. This survey noted a population with good vigor; 6,754 genets were observed on a Habitat Integrity and Population (HIP) monitoring transect. (Genets are a group of individuals growing in a single location or population that propagates clonally.)

The fourth occurrence (EO 68 [ID 6035]: South of New Plymouth/ I-84) is located within the original proposed location of the new 138-kV transmission line ROW. This occurrence has three subpopulations (sub-EO 1, 2, and 3). In 2002, sub-EO 1 and 2 had several thousand genets documented and were described as occurring in a 5-acre area. Some plants were observed growing out of badger holes and in and around cow pies. In 2004, a new subpopulation (sub EO-3) was recorded with 631-1,277 genets along HIP transect 068. However, in 2005, poor population vigor was observed with nine flowering genets in one slickspot along HIP transect

068 by INHP botanists and a Bureau livestock grazing permittee. 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). 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 in slickspot peppergrass plant numbers on HIP transect 068 (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). The INHP has categorized EO 68 as C-ranked. However, the proposed 138-kV transmission line ROW location has been moved to avoid potential impacts to EO 68, and this EO is no longer located within the proposed action area.

2.4.1.2 Field Surveys – 2009

In 2009, two field surveys were conducted in the Action Area. The first field survey was conducted by Idaho Power contractors and focused on looking for the slickspot peppergrass during its growing/flowering season (May/June). The second survey was conducted by another Idaho Power contractor, and focused on locating slickspot microsites along the re-located portion of the ROWs during November and December 2009 and early January 2010. Surveys were conducted on both Bureau and private lands, although not all private lands were surveyed due to access issues and because some of the private lands located within the proposed 138-kV transmission line and the water line ROWs have been previously disturbed by agricultural activities or by their location within an existing road ROW. The likelihood of slickspot peppergrass or slickspot microsites remaining in these previously disturbed private lands is low.

EOs of the slickspot peppergrass were initially located in close proximity of the proposed 138 kV transmission line, which prompted Idaho Power in conjunction with the agencies to relocate the proposed ROW of the 138 kV transmission line further to the west. This resulted in the request to evaluate the habitat (slickspots), in the new proposed ROW for the 138 kV transmission line. The second survey, also done by Idaho Power contractors, was conducted in late November and early December and focused on slickspot peppergrass habitat (slickspot microsites).

<u>Field Surveys – Spring 2009</u>: For the initial field surveys, the potential presence of the slickspot peppergrass was assessed through communications with Bureau botanist Mark Steiger, who provided a map of slickspot peppergrass potential habitat on Bureau lands within the Action Area, and information on extant EO locations from Idaho's INHP. The survey time window was designed to maximize the accurate identification of the slickspot peppergrass. Known occurrences of the slickspot peppergrass were visited and photographed at the start of each field survey to aid in identification and to get a good visual image of its habitat requirements. Areas along the various project components that appeared to have the potential to provide suitable habitat (i.e., contain slickspot microsites) received 100 percent coverage by thoroughly walking the area.

Habitat for the slickspot peppergrass was initially identified using the native shrubland assemblage with an overlay of natric soils such as Elijah and Purdam soil complexes. Slickspot microsite locations were identified in accordance with established survey protocols for the slickspot peppergrass (Mancuso et al. 2002, pp. 1-3) and outlined in Bureau technical bulletin 96-6 Edaphic Factors that Characterize the Distribution of *Lepidium Papilliferum* (Fisher et al. 1996, pp. 3-5). Slickspot microsite locations were mapped with a GPS unit.

Initial field surveys were conducted within the action area on Bureau and private lands on May 12-18 and June 22-24, 2009 by Idaho Power contractors with the consulting firm EDAW. Field surveys consisted of an intuitive controlled pedestrian survey where ecologists traversed the action area and documented vegetation types, potential wetlands and other waters, special status plant species, and noxious weeds. This intuitive controlled survey is based on the Bureau's survey protocol for vascular plants (Whiteaker et al. 1998, p. 2). When ecologists arrived at habitat with a high potential occurrence for the slickspot peppergrass, an intensive visual examination for the species was conducted.

EDAW observed the slickspot peppergrass at a previously known location (EO 68) approximately 200 feet outside of the original proposed 138-kV transmission line ROW (see Appendix B for photos). Twenty plants were observed in a 130 square foot area. All plants appeared healthy and were at peak flowering. Forage kochia dominated the species assemblage on the 138-kV transmission line with some small inclusions of flat surfaces where water pools early in the spring, but these microsite habitats appeared to have more porous substrates and darker soils compared to the observed reference occurrence of the slickspot peppergrass. No slickspot peppergrass plants were observed within the 500-foot survey corridor, but these areas were mapped as slickspot microsite locations.

EDAW ecologists mapped 8.1 acres of slickspot microsite habitat within the 138-kV transmission line survey corridor. An approximately 7.5-acre slickspot area was identified within the proposed 138-kV transmission line ROW survey area that parallels I-84. This area overlaps with the EO 68 known population of slickspot peppergrass. This area is degraded, with evidence of cattle grazing and fire disturbance. Because of this disturbance and the observed abundance of nonnative species, it was difficult to distinguish individual slickspot microsites in this area. A second slickspot microsite area that is approximately 0.6 acres was observed along a ridgeline and is located 300 feet south of the proposed LGPP site within the 138-kV transmission line proposed ROW. Each slickspot microsite had a natric soil component of either Elijah or Purdam soil complexes. No above ground slickspot peppergrass plants were observed in these slickspot microsites.

<u>Field Surveys – Fall 2009</u>: On November 30, 2009, a Tetra Tech botanist contracted by Idaho Power conducted surveys for slickspot peppergrass habitat (slickspot microsites) along the proposed revised route of the 138-kV line. Based on the large number of observed slickspot microsites, it was determined that initial spring/summer field surveys for slickspot peppergrass habitat may have excluded some potential habitat within the survey corridor, so additional slickspot peppergrass habitat surveys were conducted along the proposed 230-kV line ROW and water pipeline ROW on December 10, 2009 and January 6, 2010.

Tetra Tech employed a randomly meandering transect survey approach. The survey corridor consisted of the entire width of the proposed temporary ROWs for the 230-kV transmission line (500 ft), as well as the 138-kV transmission line and the water pipeline (both 300 ft) within Bureau lands. Private lands along the proposed 138-kV transmission line and the water pipeline ROW were not included in this Tetra Tech supplemental survey. Specifically, field teams were surveying for slickspot microsite presence, regardless of slickspot peppergrass occupation of slickspots. Additionally, Tetra Tech made observations of rare plant and noxious weed occurrence, as well as vegetation community characterization and distribution. Tetra Tech's objective with regards to slickspot observation was not to necessarily record each and every slickspot microsite, but to record enough to provide an indication of general density and distribution of slickspots along the project routes. Slickspots and rare plant/noxious weed populations were recorded with a commercial-grade GPS unit.

Results from the fall 2009 surveys identified a large quantity of slickspot microsites within the alternate route of the 138-kV survey corridor, as well as the waterline and 230-kV survey corridors. Over 200 slickspot microsites were identified on Bureau lands within the proposed ROWs. The perimeter of each slickspot microsite was not mapped so acreages are not available. Greater densities of slickspot microsites were observed along ridges and shallow slopes as opposed to drainage bottoms. Slickspot microsite locations seemed independent of vegetation community dominance. Examples of observed slickspots are presented in Appendix B of the Assessment. No observations of the slickspot peppergrass were made, although additional surveys will be conducted prior to construction to attempt to detect the plant during its growing season. The Bureau indicated slickspot microsite occurrence and habitat of greatest concern (i.e. best condition) were those situated within intact and remnant pockets of Wyoming sagebrush. Those slickspot microsite occurrences were exclusive to the 138-kV corridor. Additional pockets and communities of rabbitbrush were also inhabited by dense occurrences of slickspot microsites along the proposed 138-kV and 230-kV transmission lines. The majority of the collective survey corridors were dominated by mixed composition of annual invasive species and occasional native grass species.

Observations of *Onopordum acanthium* (Scotch thistle) and *Acroptilon repens* (Russian knapweed) were made along the water pipeline and the 230-kV corridors. The Scotch thistle occurrences were isolated to just a few locations. The Russian knapweed occurred inconsistently across both corridors and did not appear to be associated with land use, disturbance regime, or vegetation community. Neither weed species was determined to be a threat to the general slickspot habitat, specific slickspot microsites, or slickspot peppergrass EOs in the project area.

2.4.2 Factors Affecting the Species in the Action Area

As described above, the majority of the collective survey corridors for the ROWs are dominated by mixed composition of annual invasive species and occasional native grass species indicating past wildfire and associated invasions by nonnative annual plants in the area. The sagebrush-steppe habitat of the Great Basin where slickspot peppergrass occurs is becoming increasingly degraded due to the impacts of multiple threats, including the invasion of nonnative annual grasses, such as cheatgrass, and increased fire frequency. 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 threat is difficult.

Climate change is expected to exacerbate this feedback loop between cheatgrass and wildfire. Under current climate-change projections, we anticipate that future climatic conditions will favor further invasion by cheatgrass, fire frequency will continue to increase, and the extent and severity of fires may also increase. Precipitation patterns may also be altered as a result of climate change, resulting in potential decreased survivorship of the slickspot peppergrass; although the projections for future precipitation patterns are less certain. The consequences of climate change, if current projections are realized, are likely to exacerbate the existing primary threats to the slickspot peppergrass of frequent wildfire and invasive nonnative plants, particularly cheatgrass. As the IPCC projects changes to the global climate system in the 21st century will likely be greater than those observed in the 20th century (IPCC 2007, p. 45), we anticipate that these effects will continue and likely increase into the foreseeable future. As there is some degree of uncertainty regarding the potential effects of climate change on the slickspot peppergrass specifically, climate change in and of itself was not considered a significant factor in our determination to list the slickspot peppergrass as a threatened species. However, we recognize that the severity and scope of the primary threats to the slickspot peppergrass of frequent wildfire and 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 current threats to the species.

Secondary or emerging threats of residential and commercial development, livestock use, wildfire management activities, post-fire stabilization and restoration activities, and military training also may affect the slickspot peppergrass, both directly through the destruction of populations and loss of slickspot microsites and indirectly through habitat fragmentation and isolation. The loss of slickspots is a permanent loss of habitat for the slickspot peppergrass since the species is specialized to occupy these unique microsite habitats that were formed in the Pleistocene and, once lost, slickspots cannot be re-created on the landscape. For a detailed discussion of these factors, refer to the final listing rule for the 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, we have only recently received independent evaluations of the direct relationship between the more significant threats and indicators of population viability specifically for the slickspot peppergrass. New evidence suggests a significant negative association between cover of nonnative plant species and wildfire and the abundance of the 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).

We acknowledge that gaps exist in available information on the slickspot peppergrass; however, the best information available was used for developing this Opinion. While science is useful for evaluating alternatives and estimating outcomes, it is not the sole decision-making factor because the state of natural resources is often insufficient to give definitive cause and effect predictions. Unknowns and uncertainties will always be associated with predictions of decision outcomes. Science may reduce but can never completely estimate or eliminate the uncertainty regarding future events (Bureau 2000, p. 3, 5). As stated in the Endangered Species Consultation Handbook (Fish and Wildlife Service and NMFS 1998, p. 1-6), "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." 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 delay this consultation for many years. Thus, the Service has provided the benefit of the doubt to the slickspot peppergrass with respect to data gaps regarding the effects of the proposed LGPP ROWs action in our analyses in this Opinion. This subsequent analysis may have minor or major consequences (worst-case scenario), depending on the significance of the missing data to the effects determination. This Opinion uses the best information available for analyzing effects of the proposed action on the survival and recovery of the slickspot peppergrass.

2.4.2.1 Development, Including Rights-of-Way

Residential, commercial, and agricultural development prior to 1955 has been reported as the cause for five documented and four probable extirpations of slickspot peppergrass (Colket et al. 2006, p. 4). All forms of development can affect slickspot peppergrass and slickspot habitat, whether directly or indirectly, through habitat conversion (resulting in direct loss of individuals and permanent loss of habitat), or through habitat degradation and fragmentation as a result of consequent increased nonnative plant invasions, increased Off Road Vehicle (ORV) use, increased wildfire, and changes to insect populations (ILPG 1999, in litt. pp. 1–3; Robertson and White 2007, pp. 7, 13).

The most direct impact of development is the outright loss of slickspot peppergrass populations due to habitat conversion, such as when habitat occupied by the slickspot peppergrass is converted to a residential development or an agricultural field, resulting in the permanent loss of the plant population and the habitat.

Direct effects to the slickspot peppergrass also occur due to linear infrastructure associated with urban and residential development. In 2006, utility lines and accompanying roads were documented running through at least four EOs, natural gas pipelines were documented running through two EOs, and existing roads bisect at least six EOs (Colket et al. 2006, Appendix C). The proposed LGPP action represents a linear infrastructure project, although it is designed not to intersect with any known slickspot peppergrass EOs.

In addition to direct habitat destruction and the associated loss of individual slickspot peppergrass plants, residential and commercial developments and associated utility corridors and roads may allow increased ORV access, resulting in the potential destruction or degradation of

slickspots and possible direct mortality of individuals. These developments may also increase the chance of nonnative plant invasions (most notably cheatgrass) and human-ignited wildfires and contribute to habitat fragmentation and its associated consequences. Transportation and utility corridors associated with urban and residential development can increase the spread of nonnative invasive plants. Roads appear to create avenues for invasion by cheatgrass because there is generally a positive significant association between nonnative, disturbance-tolerant species such as cheatgrass and proximity to roads (Forman and Alexander 1998, p. 210; Gelbard and Belnap 2003, pp. 424-425, 430-431; Bradley and Mustard 2006, p. 1142). Bradley and Mustard (2006, p. 1146) found an even stronger association between the presence of cheatgrass and power-line corridors, and they suggest that the stronger relationship between cheatgrass and recent disturbance (that is, power lines; roads were considered an historical disturbance) suggests that future placement of either roads or power lines would very likely result in invasion by cheatgrass.

Increased urban and residential development also increases the probability of human-ignited wildfires, presumably by increasing the area of the urban-wildland interface (e.g., Keeley et al. 1999, p. 1829; Romero-Calcerrada et al. 2008, pp. 341, 351; Syphard et al. 2008, pp. 610–611). Increases in human habitation and activity in the rangelands of southern Idaho have contributed to the increase in wildfire starts in recent years. For example, in the Jarbidge Field Office area of the Bureau (Owyhee Plateau physiographic region), where 21 of 80 total EOs are found, 43 percent of the wildfires occurring since 1987 were human-caused (Launchbaugh et al. 2008, p. 3). Proximity to urban areas and roads can be an important causal factor associated with wildfire ignitions (Kalabokidis et al. 2002, p. 6; Brooks et al. 2004b, p. 3; Romero-Calcerrada et al. 2008, p. 351; Syphard et al. 2008, pp. 610–611). For additional details on wildfire, invasive nonnative plants, and habitat fragmentation threats, refer to the final listing rule for the slickspot peppergrass (74 FR 52014, October 8, 2009).

Insect populations may also be affected by development, potentially impacting the primary vector for pollination and genetic exchange for the slickspot peppergrass. Insect densities have been documented as being lower in developed areas than in native habitats (Gibbs and Stanton 2001, p. 82; McIntyre and Hostetler 2001, p. 215; Zanette et al. 2005, p. 117; Clark et al. 2007, p. 333). Changes in native habitat caused by ongoing development or conversion of lands to agriculture may impact insect pollinator populations by removing specific food sources or habitats required for breeding or nesting (Kearns and Inouye 1997, p. 298; McIntyre and Hostetler 2001, p. 215; Zanette et al. 2005, pp. 117–118). Habitat isolation and fragmentation resulting from development may also impact the slickspot peppergrass by decreasing pollination from distant sources, possibly resulting in decreased reproductive potential (e.g., lower seed set) and reduced genetic diversity. Reductions in pollinators due to development could thus potentially impact slickspot peppergrass reproductive success as well as contribute to reduced genetic variability, as the plant is dependent on insect pollination for successful reproduction and the transfer of genetic material between populations.

The Service considers development to be a significant threat within the Boise Foothills and Snake River Plain portions of the range of the slickspot peppergrass, as the outcome of this threat is severe where it occurs and likely results in the permanent loss of populations and irreplaceable

slickspot microsite habitats. However, this threat is not so imminent or sweeping in scope as to pose an immediate risk of extirpation to the populations of the slickspot peppergrass in these regions, nor do we consider the threat of development to be equal to the magnitude and intensity of the primary threats of the modified wildfire regime and invasive nonnative plants.

2.4.3 Role of the Action Area in the Survival and Recovery of the Slickspot Peppergrass

The action area has the potential to be important for the slickspot peppergrass due to the presence of slickspot microsites that may contain slickspot peppergrass or could be important for the recovery of the species in the Boise Foothills physiographic region. Additional inventory surveys within the project area may determine that slickspots within the action area contain the slickspot peppergrass. Slickspots in the action area may also be identified as future reintroduction sites for the species. As additional inventory surveys are conducted and a Recovery Plan for the species is developed, the relative importance of the action area in relation to the range of the species is expected to be further clarified. However, the proposed action was redesigned to avoid slickspot peppergrass EOs, minimizing potential adverse project-related effects to known slickspot peppergrass occurrences.

2.5 Effects of the Proposed 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, that will be added to the environmental baseline. Direct effects are defined as those that result from the 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 proposed action and are later in time, but still reasonably certain to occur. An interrelated activity is an activity that is part of the proposed action and depends on the proposed action for its justification. An interdependent activity is an activity that has no independent utility apart from the action under consultation.

In analyzing the effects of the proposed action on the slickspot peppergrass, the Bureau used *A Framework to Assist in Making Endangered Species Act Determinations of Effect for Slickspot Peppergrass (Lepidium papilliferum)* (Framework) (Service 2006a). The Framework is a tool developed to assist Federal agencies when working with the Service to assess effects of their actions on the slickspot peppergrass. The Framework was developed based on the species' life history, ecological requirements, and threats. 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 slickspot peppergrass is a desert annual, 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. See Appendix 1 of this Opinion for the completed Framework used to assist in the effects analysis for the Assessment for the proposed action.

2.5.1 Direct and Indirect Effects of the Proposed Action

The proposed LGPP ROWs proposed action represents a linear infrastructure development. These types of actions may directly or indirectly impact the slickspot peppergrass through habitat conversion (resulting in direct loss of individuals and permanent loss of habitat), or through habitat degradation and fragmentation as a result of consequent increased nonnative plant invasions, increased ORV use, increased wildfire, and changes to insect pollinator populations.

2.5.1.1 Direct Effects

No direct effects to known slickspot peppergrass EOs are expected to occur as the proposed action was redesigned to avoid slickspot peppergrass EOs.

Direct effects will occur if the proposed action impacts individual slickspot peppergrass plants, results in the permanent loss of slickspot microsites or native sagebrush steppe habitat, and/or results in the loss or deep burial of slickspot peppergrass seeds. Construction of the transmission lines and waterline or O&M activities could result in the crushing or destruction of above ground plants, or disturbance to slickspot peppergrass seedbanks and slickspot microsite habitat. Pre-construction surveys in suitable habitat for the slickspot peppergrass will be conducted during the growing season prior to construction and results will be used to re-design the proposed action as needed and where practicable to avoid direct impacts to the species. For example, the siting of individual tower locations within the 230-kV transmission line ROW has been modified to avoid impacts to slickspot microsites, and towers will be sited to the greatest extent possible to avoid slickspots along the 138-kV transmission line. Other areas of disturbance such as staging areas and access roads will also be relocated if necessary to avoid impacts to slickspot microsites. However, some individual slickpot microsites may be lost during construction of the 138-kV transmission line as not all slickspots may be possible to avoid. In addition, it will likely not be possible to realign the water pipeline to avoid the loss of all slickspot microsites along the proposed water pipeline ROW (Baczkowski in litt. 2010, p. 1), resulting in the loss of some slickspot microsites at a local level.

In addition, the slickspot peppergrass has life history characteristics which could result in this species not being detected during a one-time survey, making the plant potentially vulnerable to disturbance during construction if its seeds are present in slickspot microsites that are disturbed or lost during construction activities. Thus, some localized adverse impacts to some slickspot peppergrass seeds and some slickspot microsites may be unavoidable.

Although adverse impacts related to O&M activities are less likely due to avoidance of slickspot microsites and known EOs during construction activities, potential impacts could also include disturbance to populations that are located within or near the operational ROW and existing ROWs. O&M activities such as replacement of damaged transmission line structures or water pipeline repairs could result in ground disturbance or loss of slickspot microsites, potentially

affecting the slickspot peppergrass through habitat loss or loss of seeds within slickspot microsites.

It is possible that fires could occur due to transmission line or water pipeline construction as hot machinery may ignite fine fuels within or adjacent to the ROWs, which could impact slickspot peppergrass or slickspot microsites in the action area. EPMs included within the proposed action designed to minimize the risk of wildfire ignition during construction and O&M activities will substantially reduce potential adverse impacts to the slickspot peppergrass. In addition, Idaho Power would adhere to Federal, state, and county requirements relating to fire prevention and suppression during both construction and O&M activities. Idaho Power will also inspect the transmission lines to ensure that all structures and associated hardware are in good working order and meet industry requirements and standards. Ongoing inspections and follow-up maintenance are the most effective means to prevent facilities from starting fires. Idaho Power may also clear vegetation within a 10-foot radius circle around each structure and apply a Bureau-approved herbicide outside of slickspot microsites to minimize vegetation regrowth. This vegetation removal will minimize the amount of available fuels and further reduce the risk of fires starting from the transmission lines. While the risk of wildfire ignition is reduced by these EPMs, some risk still exists related to the operation of the transmission lines. Therefore, wildfire-related adverse effects to the slickspot peppergrass associated with the proposed action may occur.

Construction or O&M activities may also result in the loss or reduction in size of small pockets of native sagebrush steppe shrubs, grasses, and forbs within the ROWs. Areas that are disturbed in sagebrush communities will be restored; including the decompaction of non-slickspot soil, if necessary, and reseeding disturbed areas with native species. Because of the proliferation of cheatgrass and other invasive nonnative species within the action area, active reseeding will not be conducted in disturbed areas within other plant communities dominated by invasive nonnative plants. While efforts will be made to avoid native vegetation impacts through relocation and the restoration of impacted areas with at least 50 percent perennial native vegetation cover after all ground disturbing activities (unless ecological site conditions preclude that level of cover), there may be permanent loss of some localized native sagebrush steppe vegetation as restoration of sagebrush steppe habitat is often challenging, particularly in areas that already contain high levels of cheatgrass cover. In particular it may be difficult to reestablish native shrubs as it may take 20+ years for mature sagebrush to become successfully re-established in an area following removal. However, through implementation of Idaho Power's EPMs to avoid impacts to sagebrush steppe habitats and slickspot microsites, where possible, and to restore sagebrush steppe habitat where native vegetation removal cannot be avoided, it is expected that the overall extent of invasive nonnative plants in the project area will not be significantly modified from current habitat conditions.

Insect pollinators essential to slickspot peppergrass reproduction may also be impacted by construction or O&M activities associated with the proposed action. Impacts are expected to be minimal within degraded habitat areas dominated by invasive annual grasses within the action area, where insects important to the pollination of the slickspot peppergrass are expected to occur in relatively low concentrations due to a lack of appropriate habitat for shelter and foraging. While the localized loss or reduction of remnant pockets of native shrubs and forbs could result

in some impacts to insect pollinators, efforts to avoid or restore these areas are expected to minimize potential project-related impacts to insect pollinators.

2.5.1.2 Indirect Effects

Indirect effects to the slickspot peppergrass could occur if the proposed action resulted in further degradation of the habitat through soil compaction and introduction of invasive nonnative plant species; habitat fragmentation; introduction or spread of noxious weeds and other invasive nonnative plant species; increased frequency or likelihood of human-ignited wildfires; increased ORV use; and changes to insect pollinator populations following project construction. Idaho Power has proposed EPMs that will reduce the possibility and extent of indirect effects. The proposed ROWs locations were selected to minimize indirect impacts to known EOs and slickspot microsites. The location of the proposed new 138-kV ROW was modified during project planning to avoid bisecting EO 68. In addition, pre-construction surveys to select tower locations that do not impact slickspot microsites, where possible, will further reduce (although do not eliminate) potential adverse indirect effects.

Although the project area is already dominated by invasive nonnative annual grasses, the proposed action could result in changes in the local fire regime due to a localized increase in invasive species such as cheatgrass and medusahead that may proliferate due to construction or O&M-related disturbance near power poles, staging areas, and access roads. These potential increases in invasive nonnative plant cover in disturbed areas are expected to be minimal provided the proposed EPMs are effectively implemented during and following construction and O&M activities.

Overland travel associated with construction and O&M activities for the proposed 138-kV transmission line will result in the creation of a two-track road where a road currently does not exist. It is likely that recreationists such as ORV users and recreational shooters in the area will use this two-track road to the extent that it will become a permanent feature. This could result in indirect effects to the slickspot peppergrass and to slickspot microsites. These recreational users may ignite wildfires as vehicles may inadvertently ignite fine fuels along two track roads, recreational shooting may create sparks, or people smoking may scatter hot ash or embers. In addition, vehicle travel or hiking by recreational users could result in the spread of invasive nonnative plants, potentially impacting the slickspot peppergrass. As Idaho Power and the BLM have limited ability to control these public activities, some adverse effects to the slickspot peppergrass associated with recreational users in the ROWs may occur.

Insect pollinator distribution, diversity, and abundance could change over time as a result of the proposed action; however, adverse effects on pollinators are expected to be minimal as disturbed sagebrush steppe vegetation areas will be reseeded with a native seed mix that includes forbs and obtaining at least 50-percent perennial cover after all ground disturbing activities, unless ecological site conditions preclude that level of cover. As described in the Direct Effects section above, it is expected that the overall extent of invasive nonnative plants in the project area will not be significantly modified from current habitat conditions, and that effects to native sagebrush steppe habitat will be localized. Habitat fragmentation that could affect pollinator distribution is also possible, but will likely be minimal due to the narrowness of the two-track road along the

ROW and the relatively limited scope of ground disturbance associated with the water pipeline and transmission line ROWs construction.

2.5.2 Effects of Interrelated or Interdependent Actions

Interrelated actions are those that are part of a larger action and depend on the larger action for their justification or are associated with the Proposed Action. Interdependent actions are those that have no independent utility apart from the action under consideration or because of the proposed action.

The portion of the transmission lines and water line ROWs located on private lands are interrelated to the proposed ROWs on Bureau lands as the ROWs on private lands are associated with the proposed ROWs on Federal lands. No effects to known slickspot peppergrass EOs are anticipated as the result of construction of the transmission lines and water line on non-Federal lands. However, similar to the ROW segments located on Bureau lands, direct and indirect effects may occur as some slickspot microsites (which may or may not contain slickspot peppergrass seeds) may be disturbed or lost as the result of construction and O&M activities within the ROWs on private lands. Implementation of some EPMs/conservation measures by the project proponent to avoid potential impacts to slickspot microsites would further reduce the risk of impacts to the slickspot peppergrass from project related activities on private lands, although not to the level of conservation achieved on Bureau-administered lands, where additional EPMs/conservation measures will be implemented. Overall, adverse impacts to the slickspot peppergrass from construction and O&M activities in the ROWs on private lands are expected to be relatively low due to the high level of past ground disturbance associated with agricultural activities and road ROWs within proposed transmission line and water line ROWs on non-Federal lands. The likelihood of slickspot peppergrass or slickspot microsites remaining on these previously disturbed private lands is low.

The construction and operation of the LGPP will still occur if the 230-kV transmission line, 138-kV transmission line, and water pipeline ROWs are not granted by the Bureau. All three of these applications could alternatively be constructed on non-Bureau lands. Therefore, the proposed LGPP is not interrelated to or interdependent with the proposed action, and is not addressed as an interrelated or interdependent action in this assessment.

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 Biological Opinion. Future Federal actions that are unrelated to the proposed action are not considered in this section because they require separate consultation pursuant to section 7 of the Act.

Livestock grazing and chemical treatments for weed or insect control that may directly or indirectly affect the slickspot peppergrass can occur on both State and private lands in the vicinity of the proposed action. Residential, commercial, industrial (including the LGPP facility), and agricultural development on private lands can affect slickspot peppergrass plants,

slickspot microsites, and native sagebrush steppe habitat through habitat conversion, increased noxious and invasive weed invasions, increased ORV use, increased wildfire frequency, changes to insect pollinator populations, and increased habitat fragmentation. An internet search was conducted for future projects listed within the project area. No specific projects beyond the LGPP facility were identified, and the analysis assumes current activities on private and state lands will continue at the current rate.

The Service recognizes that some actions on non-Federal lands may have adverse effects on the slickspot peppergrass at the individual plant or EO level. Non-Federal lands within the vicinity of the proposed LGPP ROWs are not known to contain extant slickspot peppergrass EOs. It is expected that non-Federal lands in the vicinity of the proposed action are likely to contain slickspot microsites that could support slickspot peppergrass. However, because only 2 percent (322 ac) of the total EO acreage rangewide occurs on non-Federal lands (Table 1), the Service expects that any cumulative effects occurring within non-Federal lands in the vicinity of the proposed LGPP ROWs considered herein, including the LGPP facility, are not likely to significantly alter habitat conditions for the slickspot peppergrass.

2.7 Conclusion

The Service has reviewed the current status of the slickspot peppergrass, the environmental baseline in the action area, effects of the proposed action, and cumulative effects, and it is our conclusion that the proposed action is not likely to jeopardize the continued existence of the slickspot peppergrass. No critical habitat has been designated for the species, therefore none will be affected.

The Service concludes that direct and indirect effects to the slickspot peppergrass would be limited to some loss of slickspot microsites (which may or may not have the ability to support or currently contain the slickspot peppergrass), minimal increases in invasive nonnative plant cover within habitat known to contain slickspot microsites, an increased risk of wildfire ignition and invasive nonnative plant spread due to future public use of new ROW access roads in the New Plymouth Management Area, and minimal effects to insect pollinator populations due to habitat fragmentation and ground disturbance associated with construction and O&M activities. The effects of the proposed action on the slickspot peppergrass will occur at a localized level, and are not expected to result in direct or indirect impacts to known slickspot peppergrass EOs in the New Plymouth Management Area on either Bureau or private lands. The Service expects that the numbers, distribution, and reproduction of the slickspot peppergrass in the action area, in the New Plymouth Management Area, and for the species rangewide in southwestern Idaho will not be significantly changed as a result of this proposed action. As such, we have concluded that the survival and recovery of the slickspot peppergrass will not be jeopardized by activities associated with the proposed action.

The Service reached this no-jeopardy determination on the basis that the proposed action avoids direct and indirect impacts to all known slickspot peppergrass EOs, and avoids, to the extent possible, adverse impacts to slickspot microsites of unknown slickspot peppergrass occupancy within the action area on Bureau-administered lands. Conservation measures are used to

minimize impacts where potential impacts to slickspot microsites in the action area cannot be avoided, although a higher level of conservation effort is provided on Bureau-administered lands than on private lands located within the proposed ROWs.

The slickspot peppergrass conservation measures being implemented by the Bureau and its ROW permittee in conjunction with the proposed LGPP ROWs action considered in this document 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. The specific measures include management actions such as taking actions to reduce the risk of wildfire ignitions during construction and O&M activities, reducing the spread of nonnative plants, and locating ROWs away from known extant EOs. These specific conservation measures are intended to reduce the amount or extent of localized impacts, although localized adverse effects are not completely eliminated. The general conservation measures include management actions designed to maintain cover of native shrubs, forbs, and grasses, conserve existing sagebrush stands through fire protection, and implement BMPs to minimize erosion associated with ground disturbance. Some of these conservation measures are also identified for implementation on the portions of the ROWs that occur on private lands.

2.8 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 the 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 the 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:

- Implement all construction and O&M conservation measures identified for use on Bureau-administered lands for both the LGPP facility and segments of the proposed LGPP ROWs located on private lands.

- Use the conservation measures and associated implementation actions in the 2009 CA as a basis for developing conservation measures for future revised LUPs in order to continue recovery of the slickspot peppergrass. Given new information resulting from implementation actions identified in the 2009 CA (e.g., completion of surveys) and additional site specificity due to smaller action areas, LUPs may be revised to include more stringent conservation measures and implementation actions as appropriate.
- Continue to implement conservation measures for the 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 the slickspot peppergrass.
- Actively participate in critical habitat and recovery planning efforts for the slickspot peppergrass. These efforts are expected to be initiated shortly.
- 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 the slickspot peppergrass, including restoration techniques for sagebrush-steppe habitat and methods to reintroduce the 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 the 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 the slickspot peppergrass, 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 the slickspot peppergrass.
- Avoid or minimize ground-disturbing activities within EOs when soils are saturated and/or when the slickspot peppergrass is flowering (May–June).
- Avoid pesticide contact with slickspot peppergrass plants or insect pollinators near EOs.
- For upcoming Bureau permit renewals and reissuances, 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 the slickspot peppergrass.

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-Closing Statement

This concludes formal consultation on the proposed LGPP ROWs. 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.

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 above are not applicable to listed plants, including the slickspot peppergrass.

3. LITERATURE CITED

3.1 Published Literature

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.

Billinge, S.A. 2006. Reproductive performance as a function of outcrossing distance in *Lepidium papilliferum* (Brassicaceae), a rare plant endemic to southwest Idaho. Masters 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.

Bradley, B.A., and J.F. Mustard. 2006. Characterizing the landscape dynamics of an invasive plant and risk of invasion using remote sensing. Ecological Applications 16(3):1132-1147.

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.

Brooks, M., J. Matchett, C. Wallace, and T. Esque. 2004b. Fuels mapping and fire hazard assessment in a desert ecosystem. Arid Lands Newsletter 55:1-5. Available online at http://ag.arizona.edu/OALS/ALN/aln55/brooks.html.

Clark, P.J., J.M. Reed, and F.S. Chew. 2007. Effects of urbanization on butterfly species richness, guild structure, and rarity. Urban Ecosystems 10:321-337.

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. 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.

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. BLM Technical Report BLM/RS/ST-98/005+1730. July 1998. 492 pp.

Fish and Wildlife Service. 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.

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

Fish and Wildlife Service and National Marine Fisheries Service (Fish and Wildlife Service 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.

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.

Forman, R.T.T., and L. Alexander. 1998. Roads and their major ecological effects. Annual Review of Ecology and Systematics. 29:207-231.

Gelbard, J.L., and J. Belnap. 2003. Roads as conduits for exotic plant invasions in a semiarid landscape. Conservation Biology 17(2):420-432.

Gibbs, J.P., and E.J. Stanton. 2001. Habitat fragmentation and arthropod community change: carrion beetles, phoretic mites, and flies. Ecological Applications 11(1):79-85.

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

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. 73 pp.

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

Kalabokidis, K.D., P. Konstantinidis, and C. Vasilakos. 2002. GIS Analysis of physical and human impact on fire patterns. Page 38 *in* D.X. Viegas, (ed). Forest Fire Research and Wildland Fire Safety. Proceedings of IV International Conference on Forest Fire Research / 2002 Wildland Fire Safety Summit, Coimbra, Portugal, November 18-23, 2002. Millpress, Rotterdam.

Kearns, C.A., and D.W. Inouye. 1997. Pollinators, flowering plants, and conservation biology. BioScience 47(5):297-307.

Keeley, J.E., C.J. Fotheringham, and M. Morais. 1999. Reexamining fire suppression impacts on brushland fire regimes. Science 284(5421):1829-1832.

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.

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., S. Cooke, and C. Coulter. 2002. Field Investigation for *Lepidium Papilliferum* (LEPA) on Selected Idaho BLM Lands in Southwestern Idaho. Lower Snake River District BLM and Idaho Department of Fish and Game. Boise, Idaho.

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.

McIntyre, N.E., and M.E. Hostetler. 2001. Effects of urban land use on pollinator (Hymenoptera: Apoidea) communities in a desert metropolis. Basic and Applied Ecology 2:209-218.

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) habitat integrity index data analysis (1998–2001). Final Report. June 2006. Cooperative project between the Bureau of Land Management, Idaho Department of Fish and Game, and the Institute for Applied Ecology. 21 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, Utah. 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.

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).

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.

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.

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, ID. pp. 3–11.

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. BSU 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. BSU 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. MOA 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 of the Idaho Army National Guard. MOA 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.

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.

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

State of Idaho, Bureau of Land Management, Idaho Army National Guard, Nongovernmental Cooperators. 2006. Candidate conservation agreement for slickspot peppergrass (*Lepidium papilliferum*) and additional reports. 306 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.

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 U.S. Fish and Wildlife Service, Idaho Fish and Wildlife Office, Boise, ID. January 2009. 148 pp. + appendices.

Syphard, A.D., V.C. Radeloff, N.S. Keuler, R.S. Taylor, T.J. Hawbaker, S.I. Stewart, and M.K. Clayton. 2008. International Journal of Wildland Fire 17:602-613.

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

U.S. Bureau of Land Management (Bureau). 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 (Bureau). 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 and U.S. Fish and Wildlife Service (Bureau and Fish and Wildlife Service). 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 BLM land use plans signed August 27, 2009. pp. 34.

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.

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

Whiteaker, L., J. Henderson, R. Holmes, L. Hoover, R. Lesher, J. Lippert, E. Olson, L. Potash, J. Seevers, M. Stein, and N. Wogen. 1998. Survey Protocols for Survey and Manage Strategy 2 Vascular Plants. 68 pp. Available online at: http://www.blm.gov/or/plans/surveyandmanage/SP/VascularPlants/cover.htm (last accessed on May 18, 2010).

Zanette, L.R.S., R.P. Martins, and S.P. Ribeiro. 2005. Effects of urbanization on Neotropical wasp and bee assemblages in a Brazilian metropolis. Landscape and Urban Planning 71:105-121.

3.2 In Litt. References

Baczkowski, S. 2010, in litt. Email communication from Stacey Baczkowski, Environmental Specialist, Environmental Affairs, Idaho Power Company, Boise, Idaho to Barbara Chaney, Fish and Wildlife Biologist, Idaho Fish and Wildlife Office, Fish and Wildlife Service, Boise, Idaho regarding avoidance of slickspot microsites within the proposed Langley Gulch Power Plant transmission line and water pipeline rights-of-way. Email dated April 14, 2010.

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.

Interagency *Lepidium papilliferum* Group (ILPG). 1999, in litt. Meeting notes from December 7, 1999. Attendance included Bureau of Land Management, Idaho Army National Guard, U.S. Air Force, Idaho Conservation Data Center, Fish and Wildlife Service. Subject: Discussion of Programs/Activities with High Risk Potential for Slickspot Peppergrass Management. 4 pp.

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. 2003, in litt. Comments on the Issues Pertaining to the Proposed Listing of the Slick Spot Peppergrass. 45 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.

4. APPENDIX

EFFECTS DETERMINATION CHECKLIST FOR SLICKSPOT PEPPERGRASS - 09/14/06 version

SLICKSPOT PEPPERGRASS POLYGON NAME__Snake River Plains_____

(Snake River Plains Polygon, Owyhee Plateau Polygon)

NAME OF PROJECT BEING EVALUATED__Langley Gulch Power Plant Rights-of-Way __

Map illustrating the Action Area is attached, including slickspot peppergrass locations and/or suitable habitat.

PROJECT TYPE

(grazing, realty, etc.) ROWs grant for facility construction, maintenance, and operation**:** Energy development and transmission.

PROJECT STATUS

(ongoing action or proposed action) Proposed action.

NARRATIVE SUMMARY OF SLICKSPOT PEPPERGRASS OBSERVATIONS WITHIN ACTION AREA (Element Occurrence #, Element Occurrence Ranking, Survey Year, Survey Intensity, Number of Slickspot Peppergrass Plants Observed, Precipitation within Survey Year, etc.)

No element occurrences are located within the proposed temporary and permanent ROWs. Surveys were conducted in 2009 and slickspot microsites were observed in the project area. No slickspot peppergrass plants have been observed within the ROWs to date.

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	Predominantly occupied by non-native invasive species, the majority of which consists of *Bromus tectorum* (cheatgrass).	**L**	The potential for further spread and proliferation of the non-native communities and increased risk of wildland fire.	Slightly degrade	↓
	A-2. Level of ground disturbance within slickspots	Observed disturbance is restricted to livestock compaction and trampling, ant mound and badger burrow establishment, and invasive species encroachment. However, few of the slickspots demonstrated the cryptogamic crusts characteristic of pristine slickspots.	**M**	Soil compaction stemming from overland travel of construction and maintenance vehicles, where slickspots are not avoidable.	Slightly degrade	↓

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 (continued)	A-3. Level of organic debris and/or soil deposition and accumulation within slickspots	Most slickspots lacked a late seral cryptogamic crust and consisted of bare soil; lack of crust is most likely attributable to wildfire as opposed to aeolian or fluvial deposition. Where invasive species encroachment occurred, organic debris deposition was a subsequent by-product.	**L**	The proposed action is expected to impose minimal soil deposition effects on slickspots. There is potential for increased spread and proliferation of invasive species which may indirectly increase organic debris deposition.	Slightly degrade	↓
B. Habitat Characteristics within the Action Area Surrounding Occupied Slickspots	B-1. Level of ground disturbance within the action area	In areas where the corridors are situated along existing roads, ground disturbance can be significant. In areas away from existing roads, ground disturbance is restricted to residual wildfire impacts and typical post-wildfire grazing impacts.	**L**	Although relatively minor in scale, permanent impacts associated with road improvement and construction, as well as tower placement, will impose irreversible negative effects to the landscape by effectively transferring the land use.	Degrade	↓

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	The condition of native vegetation is degraded and sparse. Small pockets of sagebrush exist and Sandberg bluegrass (the latter likely a function of overgrazing). Intact communities of purple three-awn exist in good condition but occur few and far between on steeper, south-facing. Habitat fragmentation is demonstrable and widespread.	**L**	The proposed actions will have minimal impact on native vegetation as it will likely be avoidable.	Maintain	→
	B-3. Condition of native vegetation within the action area - presence of nonnative annuals and/or nonnative perennial plants	The presence of non-native species is prevalent and widespread and represents the overall characterization of the action area.	**L**	The proposed actions has potential to increase the spread and proliferation of non-native species, particularly annuals	Slightly degrade	↓

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	In association with residual native vegetation, biological soil crusts exhibit higher than expected cover. However, outside of these native pockets, crust cover is minimal and of an early seral state.	**L**	Assuming native pockets of vegetation can be avoided, adverse effects to biological soil crust cover is expected to be minimal.	Maintain	→
	B-5. Condition of native vegetation within the action area - % cover of native forbs	Due to the timing of the survey, determinations of native forb cover are not provided.	NA	NA	NA	**NA**
SUMMARY		**Summary of Overall Status of Baseline within the Action Area** EO rank:	**L**	**Summary of Potential Effects of the Action on the Baseline within the Action Area**	Degrade	↓

Dichotomous Key for Effects Determinations

***Lepidium papilliferum* Conference Framework**

Dichotomous Key for Effects Determinations

1. Are there documented occurrences of *Lepidium papilliferum* or slickspot peppergrass habitat present in the Action Area?

   A. NO — No Effect–consultation is not necessary

   B. YES — Go to #2

2. Does the Effects Determination Checklist show any potential change (degradation or restoration) in any of the Matrix Indicators resulting from the action?

   A. NO — No Effect–consultation not necessary

   B. YES — Go to #3

3. Is the potential effect of the action on Matrix Indicators measurably adverse to individuals or populations of *Lepidium papilliferum* within the Action Area?

   A. NO — May Affect, is Not Likely to Adversely Affect–Consultation and Fish and Wildlife Service concurrence requested

   B. YES — May Affect, is Likely to Adversely Affect-Formal Consultation required.