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Review of Ecological Resources, Potential Impacts and Mitigative Actions Associated with East Powerline Road

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Affected Environment

Vegetation Communities

Based on the results reported by Vilord et al (2005), eight distinct plant community types are found along the East Powerline Road between MFC and CITRC. About one-third of the length of the road is in the Sagebrush Steppe community type. This type is generally dominated by Wyoming big sagebrush (*Artemisia tridentata* ssp *wyomingensis*), but occasionally is dominated by basin big sagebrush (*Artemisia tridentata* ssp. *tridentata*). The understory is primarily native perennial grasses, other shrubs, including green rabbitbrush (*Chrysothamnus viscidiflorus*), and native perennial forbs.

Another one-third of the length of East Powerline Road is in communities dominated by green rabbitbrush with little if any sagebrush present. These communities generally occurred in areas that had burned since 1995, and are often co-dominated by bluebunch wheatgrass (*Pseudoroegneria spicata*). Forbs are also common in these community types.

Most of the route is in the community types of Sagebrush/saltbush, Rabbitbrush/saltbush, Native Grasslands, non-native Crested Wheatgrass plantings, and Playas and Disturbed areas. About one-quarter of the route is in communities co-dominated by Wyoming big sagebrush and green rabbitbrush with a rich understory of forbs and perennial grasses.

Soils

About 82 % of the East Powerline Road is in soils mapped by Olson et al (1995) as loess-derived soils of the Coffee-Nargon-Atom (C-N-A) Complex. These soils are typically loams and silt loams and are very deep to bedrock. Olson et al (1995) described these soils as having a slight hazard of wind erosion. Range improvement (revegetation) is limited by available water holding capacity.

The remainder of the route is mapped as sands over basalt and found in two groups: the Malm-Bondfarm-Matheson (M-B-M) Complex and the Grassy Butte series. The Grassy Butte soils are very deep, somewhat excessively drained, have a very high risk of wind erosion, and are not suitable for revegetation. The M-B-M complex represents primarily sandy loams. Vilord et al (2005) noted through field observations that the soils mapped as M-B-M had vegetation more like that described for Grassy Butte soils and likely have similar limitations as those described for Grassy Butte soils.

Sensitive Plant Species

Vilord et al (2005) prepared a table of sensitive species potentially occurring along the East Powerline road (Table 1). Unfortunately, Vilord et al (2005) were not able to conduct surveys for these species during the appropriate season so it is not possible to confirm either their presence or absence along the East Powerline Road.

Table 1. Sensitive species potentially occurring in the area affected by an upgrade of either the East Powerline road or T-24 and appropriate State of Idaho, U.S. Forest Service Region 4, and/or Bureau of Land Management Ranking (Vilord et al 2005).

Scientific Name	Common Name	State	USFS Reg. 4	BLM
Astragalus aquilonius	Lemhi milkvetch	GP3	S	TYPE 2
Astragalus diversifolius	meadow milkvetch	GP2	S	TYPE 3
Camissonia pterosperma	wing-seeded evening-primrose	S		TYPE 4
Catapyrenium congestum	earth lichen			S
Eriogonum capistratum Rev. var. *welshii* Rev.	Welsh's buckwheat	GP2	S	TYPE 3
Ipomopsis polycladon	spreading gilia	2		TYPE 3

Ethnobotany

Vilord et al (2005) reported finding twenty plant species of ethnobatanical concern. These species are among those thought to be of historical importance to local tribes (Anderson et al 1996). As with sensitive plant species, Vilord et al (2005) reported that they had not been able to conduct surveys for these species during the appropriate season. This suggests that more species of ethnobotanical concern are likely found along East Powerline Road than were reported by Vilord et al (2005).

Invasive and Non-Native Species

A total of eleven Idaho Noxious Weeds have been found on the INL. Vilord et al (2005) reported finding two species in the vicinity of the East Powerline Road during the surveys. These were musk thistle (*Carduus nutans*) and Canada thistle (*Cirsium arvense*). Other significant non-native and/or invasive species found by Vilord et al (2005) along East Powerline Road include: cheatgrass (*Bromus tectorum*), Russian thistle (*Salsola kali*), halogeton (*Halogeton glomeratus*), tumble mustard (*Sysimbrium altissimum*) and crested wheatgrass (*Agropyron cristatum*, *A. desertorum*, *A. sibericum*)

Hydrography

Vilord et al (2005) reported East Powerline Road crosses several small ephemeral streams. No riparian habitat was reported. These streams likely carry water only in the wettest of years and probably only associated with spring run-off, rain-on-snow events, or a significant rain storm. Vilord also noted that the route crosses several large basins that likely hold substantial amounts of run-off associated with the types of events listed above.

Wildlife Use

Scientists have recorded a total of 219 vertebrate species (Reynolds et al. 1986) occurring on the INL, many of which are directly associated with sagebrush steppe habitat. A

number of small mammals and reptiles permanently reside in the area around the East Powerline Road, while other bird species and large mammals use this habitat in a seasonally transitory manner. Wildlife species of concern addressed in this report include all migratory birds (including greater sage-grouse [*Centrocercus urophasianus*] and raptors), pygmy rabbits (*Brachylagus idahoensis*), Great Basin rattlesnakes (*Crotalus oreganus lutosus*), and all large mammal species.

Migratory Birds

Most avian species occupying the INL use both sagebrush and grassland habitats ranging from a few days for feeding and rest during migration to several months for breeding and raising young. Nearly all birds observed on the INL are protected under the Migratory Bird Treaty Act of 1918.

Field surveys along the East Powerline road in 2005 (Vilord et al. 2005) found: western meadowlark (*Sturnella neglecta),* white-crowned sparrow (*Zonotrichia albicollis*), sage thrasher (*Oreoscoptes montanu),* horned lark (*Eremophila alpestris),* sage sparrow (*Amphispiza belli),* and mourning dove (*Zenaida macroura*). Twenty-nine bird nests were located on the East Powerline road, but due to the season (autumn) when these surveys were conducted, all nests were inactive. Raptors observed during this survey include Swainson's hawk (*Buteo swainsoni*), red-tailed hawk (*Buteo jamaicensis),* ferruginous hawk (*Buteo regalis*), northern harrier (*Circus cyaneus*), prairie falcon (*Falco mexicanus*), and American kestrel (*Falco sparverius*). No raptor nests were observed.

Sage-grouse

Breeding, brood-rearing, and over-wintering habitats for sage-grouse occur within the proposed road upgrade area. Protecting habitat for non-migratory populations when sagebrush is distributed uniformly includes minimizing disturbance to sagebrush and herbaceous understory within 3.2 km from active lek locations, and 5 km when sagebrush is not distributed uniformly (Connelly et al. 2000). Sage-grouse populations on the INL exhibit numerous seasonal movements and can be considered migratory populations because they make long-distance movements (> 10km one way) between or among these habitats (Connelly et al. 1988. Connelly et al. 2000). Migratory populations require the consideration of protecting areas within 18 km from leks to include important nesting habitat (Connelly et al. 2000). Research has shown that protecting habitat immediately around leks may not provide protection of important nesting areas (Wakkinen et al. 1992).

There is 5.4 km of the East Powerline Road within the 3.2 km non-migratory population buffer, and about 12.5 km of the road lies within the 5 km buffer. This total distance would increase if the leks with unknown activity status were considered (Figure 1). The entire road is within the migratory population buffer distance of 18 km.
There is a sage-grouse radio telemetry study currently being conducted by the Wildlife Conservation Society (WCS) across the INL. Sage-grouse were captured and collared at numerous leks throughout the INL in 2008 including a lek located between the East Powerline Road and T-24 southwest of MFC (Figure 1). This lek is located less than 3

km from the East Powerline Road. Twelve birds were collared from this lek in 2008 and telemetry surveys show that seven birds remained in the area between T-24 and East Powerline Road through spring and into early summer (Figure 1). In 2008, there were three sage-grouse nests located within 3.5 km (about 2 miles) of the East Powerline Road (Figure 1).

Pygmy Rabbits

Pygmy rabbits are a sagebrush steppe obligate species and are currently being considered for protection under the Endangered Species Act. Pygmy rabbits depend on sagebrush for cover and forage, and once sagebrush is removed from an area pygmy rabbits disappear (Green and Flinders 1980, Katzner et al 1997).

Pygmy rabbit sign was identified by Vilord et al (2005) in two locations along the East Powerline Road (Figure 1). One location was within contiguous sagebrush habitat and the other was isolated in the middle of a large burn. Active burrow systems are widespread across the INL where sagebrush is present and local populations appear stable. WCS surveys are ongoing and preliminary sampling on selected 400 m^2 plots shows that there are 31 burrow systems within 1.6 km (1 mile) of the East Powerline Road and more burrows in adjacent areas.

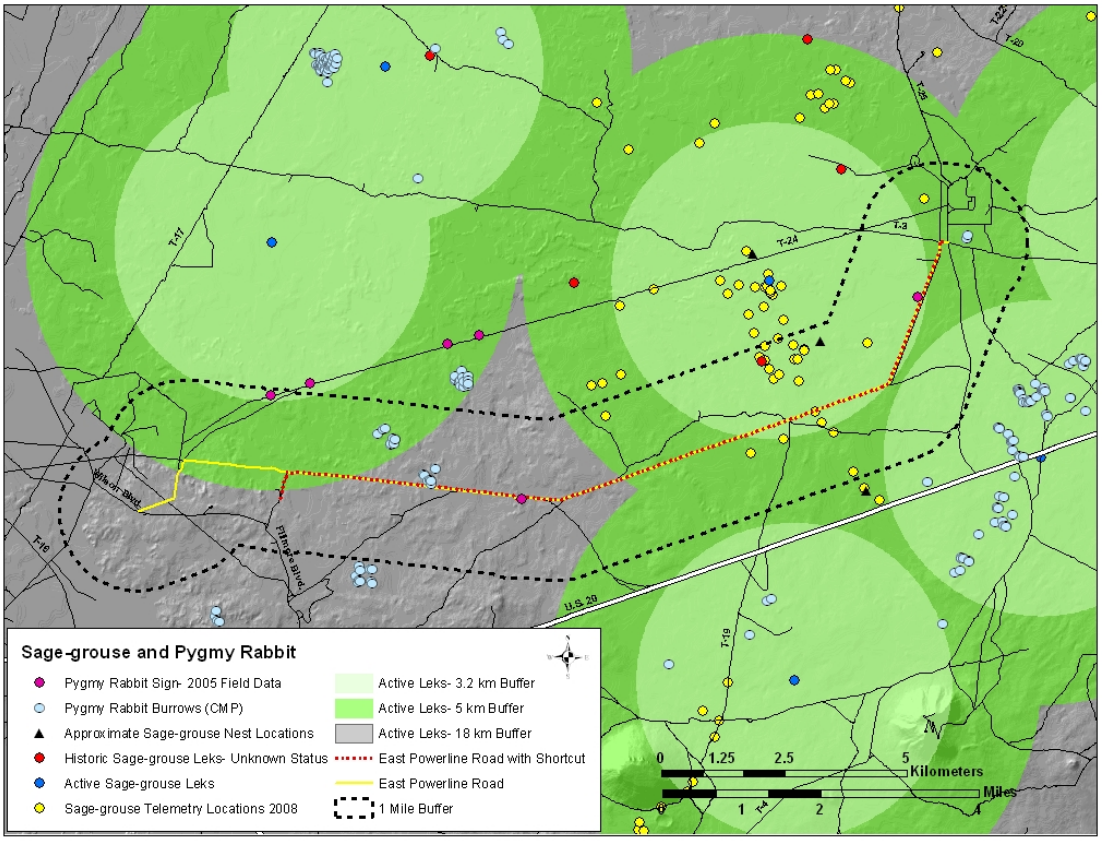

Figure 1. Presence of sagebrush obligate species (i.e. sage grouse and pygmy rabbits) based on 2005 field surveys and ongoing Wildlife Conservation Society Surveys 2006-present.

Rattlesnakes

No snake hibernacula were observed on the East Powerline Road, and little potential rattlesnake winter habitat was found (Vilord et al 2005). One garter snake (*Thamnophis elegans*) was observed suggesting there may be a potential rattlesnake hibernaculum in the area since different species of snakes often overwinter in the same locations on the INL (Cooper-Doering 2005). Fifty-eight percent of the vegetation along the East Powerline Road was characteristic of preferred rattlesnake summer habitat (Vilord et al 2005). Vilord et al (2005 found one rattlesnake shed along the East Powerline Road indicating that snakes use this area as summer habitat.

Large Mammals

Elk (*Cervus Canadensis*), mule deer (*Odocoileus hemionus*), and pronghorn antelope (*Antilocapra americana*) have been observed during semi-annual surveys using the general area around the East Powerline Road. Comer (2000) found that elk tend to utilize sagebrush on lava habitat more frequently than any other habitat type across the INL. Pronghorn and mule deer are more randomly scattered throughout the INL, with

concentrations being greater near the Big Lost River Sinks and juniper woodlands, respectively.

Sign of elk, mule deer, and pronghorn antelope use of the area were observed during the 2005 survey (Vilord et al. 2005), and ESER semi-annual survey data shows that over the past five years large mammals have been observed near the East Powerline Road and surrounding areas (Figure 2).

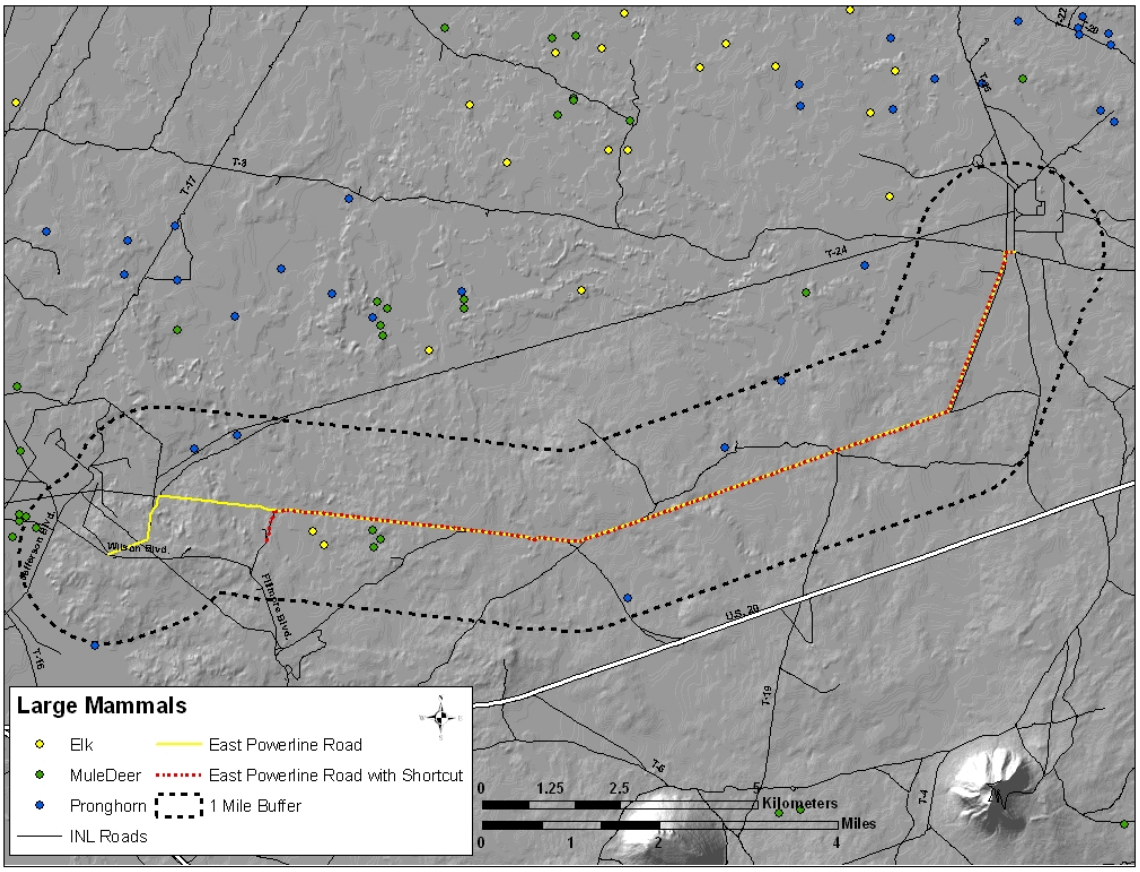

Figure 2. Large mammal observations from ESER semi-annual aerial surveys 2004-2008.

Environmental Consequences and Mitigative Measures

Vegetation Communities

Road improvement along East Powerline Road will increase soil disturbance and vegetation community fragmentation. An increase in soil disturbance will likely lead to an associated increase in weedy non-native species and the potential to displace native plants in communities adjacent to the upgraded road.

Potential impacts to vegetation communities along the road can be mitigated to some extent by minimizing the footprint of the soil disturbance and revegetating the areas that

have been disturbed. Revegetating with a diverse mix of native species similar in composition to the existing plant community may help maintain the diversity of those communities. Weed control may also be necessary, as even the slightest amount of soil disturbance can lead to non-native species invasion.

Soils

Soil disturbance for road construction will result in a direct loss of native vegetation and will provide opportunities for invasive and other non-native plants to become established. In the proposed project, soil would be disturbed to a width of approximately 36 meters (120 feet) along the length of the new road, along with any potential construction laydown areas that have yet to be identified.

Soil degradation may occur as a result of soil compaction. Soil compaction may have a serious negative impact on soil structure and vegetation recovery, which in turn, may impact the ecosystem as a whole. Environmental disruption by soil compaction is a long-term event; as the recovery of compacted sandy soils (sandy soils are more susceptible, and recover more slowly than clay soils) is extremely slow and can take longer than 50 years (Caling and Adams 1999).

Eighteen percent of the East Powerline road may be in areas with sandy soils that are not suitable for rangeland plantings, are susceptible to wind erosion, and are at substantial risk to invasion by cheatgrass and other non-native annual plants following disturbance. Soil disturbing activities in these areas should be kept to an absolute minimum.

Invasive Species

Soil disturbance is a primary contributor to the spread of invasive plants. Invasive and non-native plants are present on the much of the East Powerline roadway and could be spread by mowing, blading, and any other means used to remove the vegetation in order to build a road. Seed dispersal may be limited by disturbing as little area as possible along the road corridors. Also, timing is critical to seed dispersion. If the disturbance does not occur during peak seed dispersal, it will help reduce the number of viable seeds on the ground. This will limit spread of weeds into areas presently not infested. Failure to limit seed dispersal from these areas will likely increase the level of effort necessary for revegetation and weed management.

Revegetation and Weed Management Plan

Revegetation of all areas with soil disturbance and loss of native vegetation should be accomplished based on the guidelines of Anderson and Shumar (1989) and Twitchell (2001). The revegetation target for this project should be to achieve 70 % of the background cover of native species present in the surrounding undisturbed plant community.

It will be important to stockpile the topsoil for use during the revegetation after the road is upgraded. This topsoil may be redistributed over the revegetation area to provide a better soil medium for growing native seed.

Normally at the INL, seeds are planted using a drill seeder late in the fall (INL owns a Truax range drill), one-quarter inch deep, and covered with a wood chip or similar mulch. Broadcast and hydroseeding are not recommended for any revegetation projects on the INL due to lack of seed protection from the wind. Transplanting native containerized stock is another option for revegetation that has proven successful at the INL. Transplanted mature plants are hardier and may produce seed in the first growing season if they receive enough water and are not heavily grazed. The number one limiting factor and key to revegetation success is sufficient moisture during the first growing season. The use of a water truck may be very beneficial to the establishment of vegetation during that period. A vital component for long term success in revegetation is monitoring, maintenance and weed management.

Ethnobotany

Because the soil disturbance and risk of non-native species invasion will impact populations of species of ethnobotanical concern, the most effective mitigative measure to protect those populations is to minimize the amount of soil disturbance, revegetating those areas that have been disturbed with a diverse native seed mix, and weed control.

Wildlife Impacts and Mitigation

The East Powerline Road upgrade will have common unavoidable impacts such as: 1) loss of ground-dwelling wildlife species and associated habitat, 2) displacement of certain wildlife species due to increased habitat fragmentation, and 3) an increase in the potential for collisions between wildlife and motor vehicles. Mitigation measures will result in lessening the impact of roads on wildlife. Mitigation techniques include, but are not limited to: seasonal timing of activities, lower speed limits, fencing, warning signs, reflectors, ultrasonic warning whistles, habitat alteration, hazing animals from the road, and awareness programs.

Cumulative Impacts

There is extensive literature discussing the potential short-term impacts of road building. In addition to the direct impacts from the road, the existence of a new road would likely increase the need for infrastructure and will encourage future development, thus creating additional cumulative impacts.

- **Cumulative Impacts.** Those impacts on the environment, which result from the incremental impact of the action when added to other past, present, and reasonable foreseeable future actions regardless of what agency (Federal of non-Federal) or person undertakes such other actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time. [40 CFR 1508.7].

The resources to develop a quantitative assessment of cumulative impacts to ecological resources are not yet available. However, as new developments occur on the INL, as good condition sagebrush steppe habitat and populations of sagebrush obligate species

continues to decline all across the West and as the risk of being required to manage for those species continues to increase, it will become increasingly more important that cumulative impacts on the INL be quantified. Being able to quantify cumulative impacts and plan INL developments to minimize those impacts will reduce the likelihood of impacts to the INL mission due to requirement for conservation management of ecological resources.

Habitat Fragmentation

Habitat fragmentation will result from the proposed road construction action and cause some negative impacts. The physical presence of roads on the landscape creates new habitat edges, alters hydrological dynamics, and disrupts other ecosystem processes and habitats. Road maintenance and traffic contaminate the surrounding environment with a variety of chemical pollutants and noise. In addition, infrastructure and traffic impose dispersal barriers to most non-flying terrestrial animals, and vehicle traffic causes the death of millions of individual animals per year. The various biotic and abiotic factors operate in a synergistic way across several scales, and cause not only an overall loss and isolation of wildlife habitat, but also split up the landscape in a literal sense (Seiler 2001).

Studies concerning roads and their influence on habitat fragmentation offer sufficient reason for adopting a precautionary stance toward road issues (Brittingham and Temple 1983). Roads precipitate fragmentation by dissecting previously large habitats into smaller ones. As the density of roads on landscapes increases, these effects increase as well. Even though roads occupy a small fraction of the landscape in terms of land area, their influence extends far beyond their immediate boundaries (Reed et al. 1996).

Permits and Regulatory Compliance

Wildlife/Habitat Resources

Soil disturbing activities, including those associated with the use of unimproved roads, have the potential to increase noxious weeds and invasive plant species that would be managed according to the "Management of Undesirable Plants on Federal Lands" (7 United States Code Section 2814) and the Invasive Species Executive Order 13112. The INL would follow the applicable requirements to manage undesirable plants according to PLN-611.

In analyzing the potential environmental impacts of the use of East Powerline Road for this project, DOE-ID has followed the requirements of the Endangered Species Act (16 U.S.C. Sections 1531 et seq.) and has reviewed the most current lists for threatened and endangered plant and animal species.

Other Federal laws that could be applicable include: the Fish and Wildlife Coordination Act (16 U.S.C. § 661 et seq.), Bald Eagle Protection Act (16 U.S.C. § 668), and the Migratory Bird Treaty Act (16 U.S.C. Sections 715 to 715s).

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Glossary Terms

Detectability: The ability to discover the existence or presence of something.

Ethnobotany: The study of plants as they pertain to an indigenous culture.

Ethnoecology: The study of the natural environment as it pertains to an indigenous culture.

Habitat fragmentation: A splitting of contiguous areas into smaller and increasingly dispersed fragments.

Hibernacula: A protective structure in which an organism remains dormant for the winter.

Home range: The geographic area to which an organism normally confines its activity.

Lek: An area where male grouse congregate for breeding purposes.

Non-game species: Animals which are not normally hunted, fished, or trapped.

Sagebrush obligate species: A species that is only able to exist or survive in sagebrush habitat.

Senesce: The dormancy of plants due to dry or cold conditions.

Sympatric: Species or other taxa with ranges that overlap.

Transitory: Existing or lasting only a short time; short-lived or temporary.

Wilding: Individual plants that are removed from nearby natural communities and immediately transplanted onto a disturbed site.