BIOLOGICAL EVALUATION ON THE POTENTIAL IMPACTS OF CORRIDOR ALTERNATIVES FROM THORNCREEK ROAD TO MOSCOW ON LONG-EARED MYOTIS AND PYGMY NUTHATCHES

Prepared by

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INTRODUCTION

A network of Federal, State, and County highways comprise a transportation system that is crucial to the daily lives of most Idahoans and to the economy. Without this network of roads and the means to deliver and retrieve products, many of the conveniences most people take for granted would become measurably less convenient. While we gain from better roads and vehicles to transport us more quickly to our destinations, wildlife can be the unfortunate victim of these improvements. Large ungulates, including deer (*Odocoileus* spp.), elk (*Cervus elaphus*), and moose (*Alces alces*) are the most notable species associated with wildlife-vehicle collisions due to their large size, the potential for extensive damage to vehicles and the loss of human lives, and the fact that a dead deer or moose on or along the road is pretty hard not to notice. Conversely, small animals, including birds, mammals, reptiles, and amphibians, rarely cause vehicle damage, generally go unnoticed by motorists, and often get deflected off the road when hit. Because of their small size and difficulty to detect, we have little knowledge of the impact transportation corridors have on most of these species. For many species, the direct impact on them may be insignificant, but the indirect and cumulative effects resulting from the loss of important habitat could be much greater. The long-eared myotis (*Myotis evotis*) and pygmy nuthatch (*Sitta pygmaea*), both classified as Species of Special Concern (SSC) by the Idaho Department of Fish and Game (IDFG), were identified as species to consider in evaluating alternatives for the widening of US 95 into a divided 4-lane highway.

The Palouse Prairie

This segment is paraphrased from the draft Idaho Comprehensive Wildlife Conservation Strategy (ICWCS), recently completed by the IDFG (IDFG 2005) and located on their website at **http://fishandgame.idaho.gov/cms/tech/CDC/cwcs.cfm** . The Palouse Prairie is typified by loess-covered basalt plains, rolling hills, plateaus, and river breaklands. Elevation ranges from 1,200 to 6,000 ft (366 to 1,830 m). Precipitation ranges from 10 to 30 in (250 to 760 mm), mostly in the form of winter snow. Summers are warm, dry, and often windy. The Snake River is the major drainage in this Section.

Bluebunch wheatgrass (*Agropyron spicatum*) and Idaho fescue (*Festuca idahoensis*) dominate the arid portions of this section while meadow-steppe vegetation, including Idaho fescue and common snowberry (*Symphoricarpus albus*), are common in the areas of greater precipitation. Ponderosa pine (*Pinus ponderosa*) woodlands and forests prevail on hills and low mountains. Douglas-fir (*Pseudotsuga menziesii*) forests dominate in higher elevations with isolated fragments of Western red cedar (*Thuja plicata*) and Grand fir (*Abies grandis*) on sheltered north slopes. At least 11 of the 14 bats occurring in Idaho, including the long-eared myotis, are found in the Palouse Prairie (Gillies 2004). And the ponderosa pine woodlands and forests are habitat for the pygmy nuthatch.

PROJECT DESCRIPTION

ITD personnel are evaluating alternatives for the widening of US 95 into a divided 4-lane highway. The Project Area includes approximately 6.5 miles of realignment of US 95 from Thorncreek Road south of Reisenauer Hill, north to Moscow, Idaho, and from the west slope of Paradise Ridge, west to the Idaho-Washington border. Three potential transportation corridors are being evaluated. The Existing Improved Corridor would follow the current route of US 95. The Eastern Corridor would realign the highway from Reisenauer Hill to Moscow, in the area between existing US 95 and the west slope of Paradise Ridge. The Western Corridor would realign the highway in an area north of Thorncreek Road to the South Fork Palouse River at the edge of Moscow, and between the Idaho-Washington border and existing US 95. Public and agency meetings have been held and are continuing to be held to help determine proposed alternatives within each corridor. ITD does not anticipate selection of a new route until 2006.

OBJECTIVE

The primary objective of this project was to prepare a Biological Evaluation (BE) for the Idaho Transportation Department (ITD) that provides information on the potential impacts of the highway project on the long-eared myotis and pygmy nuthatch.

METHODS

Based on the ecological requirements of each species, the Project Area was surveyed to determine suitable habitat. Suitable habitat were mapped and the perimeter plotted with a hand-held GPS unit (Garmin GPSmap 76CS). I assumed that each species was present at some time during the year at those locations identified as suitable habitat. Attempts to observe each species were made during field visits, however, mist-netting for bats was not an objective at this time. Information from personal contacts with knowledgeable individuals, review of available data, and identification of suitable habitat for each species was used to evaluate the direct, indirect, and potential cumulative effects of each corridor within the Project Area and associated human activities during and after completion of the Project.

I relied heavily on several excellent documents and sources for drafting the species accounts for both the pygmy nuthatch and long-eared myotis. Most notable from this list included the Ecology, Conservation and Management of Western Bat Species (Western Bat Working Group 1998), the GAP (Geographic Approach to Planning for biological diversity) Analysis of Idaho (Scott et al. 2002), the draft Idaho Bat Conservation Plan (Gillies 2004), the Atlas of Idaho's Wildlife (Groves et al. 1997), and the draft ICWCS (IDFG 2005).

GENERAL ECOLOGY

Bats

Bats are a diverse group comprising more than 20% of all mammalian species in the world. There are 145 species of bats known to occur in North America, with 46 species found in the United States and 14 species in Idaho (Baker et al. 2003 as cited in Gillies 2004). The bats of Idaho all belong to the family Vespertilionidae (vesper or mouse-eared bat) and are strictly insectivorous. Most species of bats occurring in Idaho are difficult to distinguish because of their dark brown wing membranes and short brownish fur (Gillies 2004). However, the long-eared myotis has the longest ears (0.84 inches) of any North American myotis (Adams 2003).

Bats occupy virtually every habitat except the extreme arctic and polar regions, and are found throughout North America. However, the number of species increases in southern latitudes and decrease in northern latitudes. Their range is governed by food, temperature, and roost-site availability (Richardson 2002 as cited in Gillies 2004).

The seasonal distribution of a bat species may vary throughout the year. In Idaho, this aspect of bat ecology is understudied (Gillies 2004). Many species migrate to warmer or cooler climates when fall arrives. However, 12 of the 14 species in Idaho, including the long-eared myotis, hibernate in cool hibernacula sites, usually traveling short distances to these locations.

Bats are long-lived for their size, and have been known to exceed 30 years in the wild (Richardson 2002 as cited in Gillies 2004). Their low rate of reproduction is compensated for by their longevity. However, because of this low reproductive rate, bat populations are more susceptible to dramatic demographic fluctuations, including population size, growth, density, and distribution.

Bats in Idaho consume large numbers of insects each night, thus playing a critical role in maintaining the balance of night-flying insect populations. Scientists estimate that a single little brown bat (*M. lucifugus*) can consume up to 600 mosquito-sized insects in an hour (Gillies 2004).

Many bats forage, capture prey, and feed while in flight. Foraging at different levels of the forest canopy allow bats to minimize competition for available insects. Insectivorous bats are well adapted to the short and ephemeral life cycles of their prey. Riparian areas such as wetlands, springs, and ponds are important foraging areas because they tend to concentrate insects.

Bats use a variety of natural and man-made (e.g., , barns and other buildings, bat boxes, and artificial bark) roost sites that serve as day and night roosts (which are generally separate sites), maternity roosts (where reproductive females and their young congregate), and hibernacula (overwintering sites) (Gillies 2004). There are specific requirements associated with each kind of roost. Besides protecting the bats from

predators and being relatively free from disturbance, there may be explicit environmental requirements for roost selection, depending on species. Roosts suitable for maternity colonies must be warm (for fetal and juvenile development) and close to adequate foraging areas (Tuttle 1997 as cited in Gillies 2004). Hibernacula must be cold, yet humid to prevent dehydration. Although different species select for different conditions, hibernaculum temperatures are usually below 50° F, with temperatures remaining stable throughout the season (Richardson 2002 as cited in Gillies 2004).

Bat distribution and population sizes are significantly correlated to the availability of suitable roosting sites. Bats display a high degree of fidelity for maternity and hibernaculum sites, but they are less loyal to night and day roosts. Because bats are concentrated in maternity and hibernaculum sites, these locations deserve special conservation efforts.

Long-eared Myotis

The long-eared myotis is a small forest bat with 2 subspecies, *M. e. evotis* and *M. e. pacificus,* found in Idaho (Larrison and Johnson 1981). An adult weighs between 0.2 and 0.3 ounces and has a wingspan of 10-12 inches (Adams 2003). This species is named for its prominently long blackish ears that extend beyond the tip of the nose when laid forward (Larrison and Johnson 1981). Its pelage is dull or pale brown to straw-colored (Adams 2003). Distinguishing between the long-eared myotis and the fringed myotis (*M. thysanodes*) is simplified by the differences in ear length.

The long-eared myotis is well distributed across the western landscape, ranging from southern British Columbia, Alberta, and Saskatchewan to the Baja peninsula and east into the Great Plains of North Dakota, South Dakota, and Nebraska (Groves et al. 1997, Adams 2003). This species ranges throughout Idaho, missing only from parts of the Snake River Plain and the Bruneau River Canyon (Gillies 2004).

The long-eared myotis is a species associated with a variety of habitat types in the Pacific Northwest, including forested areas, forest edge habitats, riparian areas, and water sources, especially those with rocky outcrops (Csuti et al. 1997; Groves et al. 1997). The species is common in lodgepole pine (*Pinus contorta*) forests (Groves et al. 1997). Except for developed areas, most habitats are generally considered acceptable (Johnson and Cassidy 1997). Idaho cover types associated with this species includes grasslands, xeric shrublands, broadleaf forests, needleleaf forests, mixed broadleaf/needleleaf forests, burnt timber, forested riparian and wetland areas, and barren land cover types with exposed rock (Gillies 2004).

The long-eared myotis is adapted for foraging in dense vegetation, sometimes gleaning insects from leaves, bark, rocks, and the ground. Prey includes beetles, flies, lace-winged insects, moths, true bugs, and wasps (Adams 2003). Sexual prey selection has been observed, with males taking more moths and females more beetles (Gillies 2004). Long-eared myotis may be especially adept at high elevation foraging in cold ambient temperatures (Gillies 2004).

Individuals roost under exfoliating tree bark, dead and live trees, caves, mines, cliff face crevices, sink holes, rocky outcrops on the ground, buildings, and bridges (Manning and Jones 1989; Vonhof and Barclay 1996, 1997). Large diameter trees and snags are preferred roost sites in Arizona (Rabe et al. 1998; Waldien et al. 2000). Emergence and foraging times likely vary with prey availability, temperature, precipitation, and reproductive status.

Like many other temperate members of the Genus *Myotis*, this species mates during fall and fertilization occurs after ovulation in spring. A single pup is produced in May-July, depending on local temperatures, with lactation occurring into late July. Pups grow rapidly, learn to fly, and become fully-grown at 3-6 weeks of age. As might be expected, the highest rate of mortality occurs in the first year when juveniles are learning to fly and hunt independently. Nonetheless, individuals may live for 22 years or more (Manning and Jones (1989). Small maternity colonies form in late spring while non-reproductive females and males roost singly or in small clusters nearby (Manning and Jones 1989).

Winter habits are poorly understood. This species may be a short distance migrant to suitable hibernacula, likely mines and caves.

Nuthatches

There are 4 species of nuthatches in the family Sittidae (Sibley 2000). Nuthatches have short bills and tails and a unique tree-climbing method; they often climb head down, feeding on insects gleaned from the crevices of bark. They accomplish this by using only their legs and feet, with 1 foot placed lower as a brace and the other foot placed higher to grip the bark of the tree.

Pygmy Nuthatch

The pygmy nuthatch is a tiny bird (4.5 inches long and weighing 0.37 ounces) with a brown cap, grayish-blue back, and creamy-buff underparts. Females incubate 4-9 eggs for 15-16 days, with the young leaving the nest at approximately 22 days. At least 6 subspecies of pygmy nuthatches have been described; *S. p. melanotis* is the subspecies present in Idaho.

The pygmy nuthatch is a year-round resident in ponderosa and similar pines from south-central British Columbia and mountains of the western U.S. to central Mexico. Throughout its range, the patchy distribution of the nuthatch is dictated by the patchy distribution of pines (Kingery and Ghalambor 2001 as cited in IDFG 2005). In northern Idaho, it is locally common, less common in the west-central mountains, and rare in the southern and eastern parts of the state (Groves et al. 1997).

In Idaho, the pygmy nuthatch is generally limited in its distribution to the southern slope of mountains at elevations up to approximately 3,500 feet, where it occupies suitable habitat year-round. While primarily associated with ponderosa pine forests and

woodlands, it may also inhabit other dry forest habitat types, including Douglas-fir (*Pseudotsuga menziesii*), and less frequently pinyon/juniper (Groves et al 1997).

Nuthatches nest in natural or excavated cavities in dead pines, live trees with dead sections, standing snags, and they may even use posts (Groves et al. 1997). The birds may use the same cavity trees for nesting and year-round roosting (K. Dumroese, personal communication). Nuthatches prefer old-growth, mature, undisturbed forests for nesting, with unlogged forests hosting significantly more pygmy nuthatches than logged forests (Sydeman et al. 1988 as cited in IDFG 2005). Pygmy nuthatch numbers correlate significantly with the volume of ponderosa pine, and studies suggesting this species needs heterogeneous stands with a mixture of well-spaced old pines and vigorous trees of intermediate age (see pygmy nuthatch species account in IDFG 2005).

The birds forage on outer branches and twigs, and along tree trunks. The diet consists of insects, such as ants, beetles, grasshoppers, moths, and wasps, but may also include spiders and pine seeds (Groves et al. 1997).

Pygmy nuthatches are social throughout the year and small family groups will travel together after the nesting season. Larger family groups of 5-15 individuals may form loose flocks in fall and winter where they forage as a flock and roost communally within the group territory. Pygmy nuthatches occasionally join mixed-species flocks during winter.

ENVIRONMENTAL BASELINE

Long-eared Myotis

Status in the Project Area

There are few data on bat population abundance, population trends, and habitat requirements in Idaho (Gillies 2004). The distribution of the long-eared myotis in Idaho is poorly understood, and the status of this bat in the Project Area is largely unknown. A master's thesis from the University of Idaho examined bats on the Palouse (Bonnell 1967) and found that the long-eared myotis always roosted near water. The single element occurrence record for this species in the IDFG Conservation Data Center database came from Bonnell's study. A female specimen was collected from an abandoned gold mine NE of Moscow on 24 April 1966, outside the Project Area.

The U.S. Forest Service (FS) and IDFG conducted bat surveys on portions of the Palouse Ranger District as part of the FS Region One Bat Grid Project (Jageman 2005). Sampling occurred during a 10-survey-night period from 17-29 July 2005. Eleven of the 38 bats captured with mist nets were long-eared myotis. While no surveying was done within or adjacent to the Project Area, the results would suggest that the long-eared myotis likely occurs in the Project Area.

Rita Dixon (R. Dixon, IDFG, personal communication) mist-netted long-eared myotis at a mine north of Deary, Idaho, and has captured them elsewhere in the Palouse. She indicated that she would expect to find them in the Paradise Ridge area, and recommended netting at ponds in the Project Area to see if long-eared myotis are present.

Threats

Recent concern over the decline of bat populations on local, national, and global levels has prompted management agencies to focus their attention on bat conservation. Reasons for decline vary according to individual species and populations and include natural and human-related causes. However, common themes include habitat alteration, loss, and degradation; roost disturbance and destruction; pesticide application; and lack of public awareness.

Human disturbance, either directly (at roost sites) or indirectly (habitat alteration), is especially important in contributing to bat population declines. Maternity colonies and hibernacula are particularly sensitive to disturbance. All bat species listed as federally endangered in the United States spend at least part of their lives in caves (Gillies 2004). The increasing popularity of cave exploration is possibly one of the most important causes of population declines in bats (Tuttle 1997 as cited in Gillies 2004).

Roost sites are considered to be a limiting factor in bat population biology (Fenton 1997) and, therefore, deserve special conservation attention and protection from disturbance. Roost destruction is a direct threat to maternity colonies and hibernacula, specifically mine closure without proper biological surveys, recreational caving, and building exclosures.

Forest management techniques that remove snags could affect roost sites. Habitat alteration through timber harvest directly reduces the availability of roost sites and indirectly reduces prey populations. Fire, either natural or prescribed, reduces roost-site availability in some instances, but also creates additional sites.

For the long-eared myotis, information on virtually all aspects of their seasonal life requirements is needed. Knowledge of population trends and limiting factors are lacking, and the importance of snags as summer roosts in the Project Area is of particular interest.

Conservation Status

The following Federal and State status and rank classification for the long-eared myotis were taken from Gillies (2004) and the IDFG website (Idaho Conservation Data Center 2005). The long-eared myotis has a global ranking of G5 (demonstrably widespread, abundant, and secure) from the network of Natural Heritage and Conservation Data Centers for species based on range-wide status. Its state (Idaho) rank based on the same source is “S3?” (rare or uncommon but not imperiled, based on occurrence data; the question mark indicates uncertainty exists about the stated rank). In Idaho, all bats are classified as “Protected” by the IDFG and the long-eared myotis is also a Species of

Special Concern (SSC) Type 5. SSC include any native species that could become listed as threatened or endangered throughout all or a significant portion of its Idaho range due to 1 or more of 3 factors. It is classified as a "Type 5" or "Watch List" species by both the IDFG and Bureau of Land Management (BLM). Watch List species are not considered BLM sensitive species, but they could be added to the sensitive species list depending on new information concerning threats, species biology, or statewide trends. The Watch List includes species with insufficient data on population or habitat trends or the threats are poorly understood. However, there are indications that these species may warrant special status designation and appropriate inventory or research efforts should be a management priority. Neither the FS nor the U.S. Fish and Wildlife Service (FWS) provide special classification for the long-eared myotis.

The Western Bat Working Group identifies the long-eared myotis as a "Medium priority" species (Western Bat Working Group 1998). Medium priority indicates a level of concern that should warrant closer evaluation, more research, and conservation actions of both the species and possible threats. Adams (2003) considers the threat to long-eared myotis populations to be low in Montana, northern Idaho, and adjacent areas.

Pygmy Nuthatch

Status in the Project Area

The pygmy nuthatch is an uncommon bird in Idaho, although locally common in northern Idaho (Groves et al. 1997). Nuthatches normally occurs in pine forests and woodlands, especially ponderosa pine stands typical of Paradise Ridge. I have observed pygmy nuthatches at various ponderosa pine stands in the Palouse in the past. Rita Dixon (R. Dixon, IDFG, personal communication) told me that the area around Robinson Lake Park in Moscow regularly has pygmy nuthatches, as does Idler's Rest and pretty much any of the areas on the Palouse that still have ponderosa pines.

Kas Dumroese, who resides just outside the Eastern Corridor of the Project Area, but also has land inside the corridor, commonly observes pygmy nuthatches in his ponderosa pine stand (a portion of which is inside the Eastern Corridor) adjacent to his home (K. Dumroese, personal communication). Dr. Dumroese has maintained meticulous records of pygmy nuthatch occurrences on his property since 1996. Between 18 August 1996 and 9 July 2005, he has documented 206 records of pygmy nuthatches on his property, with flocks of up to 26 individuals constituting a single record (Dumroese 2005).

Threats

Timber harvest, fire suppression, and grazing have been identified as key factors causing the degradation of ponderosa pine forests in Idaho and the intermountain west. These human impacts have caused extensive changes in the distribution, structure, and species composition of ponderosa pine forests during the last 100-150 years. Loss of historically open, park-like stands of pine during the 1900's may be responsible for the pygmy nuthatch population declines apparent in recent times. Restoring ponderosa pine forests

and woodlands in Idaho, along with studies to determine why nuthatches are declining need to be undertaken in an effort to reverse this trend.

Conservation Status

Range-wide, the pygmy nuthatch is secure (G5), although statewide, it is classified as critically imperiled (S1). However, in a list of Idaho's Special Status Birds (IDFG website **www.fishandgame.idaho.gov/cms/tech/CDC/animals/birds.cfm**), the pygmy nuthatch is given a statewide S2S3 ranking, meaning there is uncertainty of which ranking they should be, S2 (imperiled because of rarity or because other factors demonstrably make it very vulnerable to extinction) or S3 (Rare or uncommon but not imperiled). The FS classifies the pygmy nuthatch as a "sensitive species", which includes taxa for which viability is a concern, as evidenced by significant current or predicted downward trends in population numbers or density, or significant current or predicted downward trends in habitat capability that would reduce a species' existing distribution. The BLM includes the pygmy nuthatch on its Watch List (Type 5), and it is classified by IDFG as Protected Nongame and a Species of Special Concern (a native species which is either low in numbers, limited in distribution, or has suffered significant habitat loss). Declining pygmy nuthatch observations on the annual statewide Breeding Bird Survey have been responsible, in part, for concern over the status of this species in Idaho.

RESULTS OF FIELD INVESTIGATIONS

Field trips were made to the Project Area on 27 August and 9 September 2005. Because I am somewhat familiar with the Project Area as a result of a similar project on large ungulates, the first trip was primarily a broad reconnaissance to get an idea of potential suitable sites for pygmy nuthatches and long-eared myotis. The second field trip was for the purpose of visiting potential suitable habitat within and adjacent to the Project Area, documenting these sites with photographs, and obtaining GPS coordinates.

Long-eared Myotis

The lack of data on most aspects of long-eared myotis life requirements in Idaho hampers a rigorous analysis of the animal in the Project Area. For example, only 1 graduate project has been completed on this species in Idaho. Based on what we know about habitat preferences and roosting requirements, long-eared myotis likely occur throughout the Project Area, however, densities are unknown. Assuming the bats will roost in timber and are attracted to water to forage, the Eastern Corridor probably provides the greatest amount of suitable foraging habitat and is adjacent to timbered roosting habitat. Ponds located within this corridor likely attract insects that, in turn, attract bats. Dr. Dumroese frequently sees bats foraging in the vicinity of his home, which is adjacent to the Eastern Corridor, however, he does not know which species they are (K. Dumroese, personal communication). Unfortunately, without mist-netting selected sites, the identification of bats to species would not be possible.

Bats could forage throughout the entire Project Area, and if they use man-made structures (e.g., buildings) for roosts, they likely frequent each of the 3 corridors. Given the range of habitats the long-eared myotis occupies, this species appears quite adaptable and able to use features found in all corridors.

Based on what little data are available, it seems apparent that caves and abandoned mines are key components of the bat's habitat needs. However, what we don't know is whether or not caves and mines are necessary for an area to be occupied by the bats, or what influence they have on the level of use and density of bats in a given area. As far as I know, caves and mines are absent from the Project Area.

Cliffs are another habitat feature that attracts bats, especially if there are suitable holes and crevices for them to roost in. No actual cliffs occur in and adjacent to the Project Area, although there is a rocky outcrop on the southwest slope of Paradise Ridge at N46°39.797', W116°59.057' (Figure 1). On 9 September 2005, I inspected this outcrop; fissures in the rocks were few and I did not see any evidence of bat use.

I did not visit any of the ponds in and adjacent to the Project Area for this investigation. However, ponds and their associated insects clearly attract bats. As previously stated, large diameter trees and snags are preferred roost sites in Arizona. And if forested areas, forest edge habitats, riparian areas, and water sources are, indeed, the kinds of areas these bats prefer, the Eastern Corridor should provide the best habitat in the Project Area.

Pygmy Nuthatch

Ponderosa pine stands largely define suitable habitat for the pygmy nuthatch. Suitable habitat is extremely limited in the Project Area and found only at 2 sites along the eastern edge of the Eastern Corridor. I inspected these sites on 9 September 2005.

At the lower end of a forested draw, there is a sparse triangular-shaped stand of ponderosa pine (Figure 2), defined by the following GPS coordinates:
N46°40.578', W116°59.469' (Location A)
N46°40.559', W116°59.469' (Location B)
N46°40.670', W116°59.436' (Location C)
The entire stand, defined by these coordinates, has no more than 60 mature ponderosa pine trees. Locations A and C are adjacent to the intermittent stream associated with the forested draw. I believe that only 5 pine trees (Figure 2, Location A) fall within the eastern boundary of the Eastern Corridor. I did not observe any nuthatches at this site, nor were there any snags or evidence of possible nesting (no cavities were observed). However, participants of the Audubon Societies' Christmas Bird Count have observed pygmy nuthatches in this area (K. Dumroese, personal communication).

The remaining site visited is a stand of ponderosa pine owned by the Dumroese family (Figure 3). This stand is defined by the following GPS coordinates:
N46°39.673', W116°59.742' (Location D)

N46°39.675', W116°59.759' (Location E)
N46°39.677', W116°59.924' (Location F)
N46°39.724', W116°59.853' (Location G)
N46°39.753', W116°59.780' (Location H)
N46°39.740', W116°59.746' (Location I)
N46°39.766', W116°59.658' (Location J)
N46°39.743', W116°59.612' (Location K)
N46°39.683', W116°59.477' (Location L)
N46°39.679', W116°59.565' (Location M)
N46°39.718', W116°59.644' (Location N)
The densest part of this stand occurs within the boundaries of Locations D-F. Pines are more sparsely distributed in the area defined by Locations J-N. The down-slope side of the stand borders an intermittent stream and is defined by Locations F-L. The proposed right-of-way alignment for old Alternative 10A (now called E-2) is at Location E. The area located within the Eastern Corridor is loosely defined by Locations E-H (Figure 4).

Pygmy nuthatch vocalizations were heard numerous times while hiking through the stand. On several occasions, nuthatches were observed feeding at outer branches of mature pines. These birds were part of mixed-species flocks that included black-capped chickadees (*Parus atricapillus*), ruby-crowned kinglets (*Regulus calendula*), and likely other small insect-eating passerines. Dr. Dumroese has observed pygmy nuthatches year-round in this stand of pines (K. Dumroese, personal communication). He has also observed juveniles soliciting adults for food at his bird feeders, suggesting that nesting occurs in the vicinity.

Snags (Figure 5) and live trees with dead tops (Figure 6) were observed throughout the pine stand. The left photos in Figure 5 (N46°39.685', W116°59.805') and Figure 6 (N46°39.705', W116°59.851') are within the Eastern Corridor boundary. Approximately 10 snags and a minimum of 4 live ponderosa pine trees with dead tops were observed throughout the woodlot. Cavities were present in all of these snags and trees, attesting to the value of these structures to cavity-nesting birds.

Another small stand of ponderosa pine is located just south and east of the Dumroese stand and east of the Eastern Corridor boundary (Figure 7). This stand was not visited, but it appears to contain suitable habitat for pygmy nuthatches.

ANALYSIS OF EFFECTS

Direct, indirect, and potential cumulative effects were evaluated for each of the target species and discussed below. The assessment was then synthesized and tabulated (Table 1) for ease in comparing the corridor alternatives. Direct effects are those impacts caused directly by the proposed action. Indirect effects are those caused by or that will result from the proposed action, but are likely to occur at a later time (not immediate). Finally, potential cumulative effects are the combined effects of this action along with unrelated

activities that are likely to occur within the Project Area, and when evaluated collectively, could impact these species.

Long-eared Myotis

Direct

I do not foresee any direct effects on this species resulting from highway construction at any of the 3 proposed transportation corridors. Bats do not appear to forage over highways and are thus not prone to collisions with vehicles.

Indirect

Eastern Corridor: No indirect effects were identified, unless water sources (ponds) and stands of ponderosa pine located on the Dumroese property and the bottom of the forested draw are removed and there is no mitigation (e.g., installation of bat boxes) for this removal. However, because so little is known about the presence or density of long-eared myotis in the Project Area, it is difficult to gauge the effect level.
Existing Improved Corridor: No indirect effects were identified, provided existing water features are maintained or mitigated for.
Western Corridor: No indirect effects were identified, provided existing water features are maintained or mitigated for.

Potential Cumulative

Potential cumulative effects may result if there is any pond reduction (all corridors) or if roosting habitat is removed (timbered portions of the Eastern Corridor).

Pygmy Nuthatch

Direct

I do not foresee any direct effects on this species resulting from highway construction at any of the 3 proposed transportation corridors. Pygmy nuthatches do not forage over highways and will not be prone to collisions with vehicles.

Indirect

Eastern Corridor: The removal of suitable habitat (ponderosa pines) at the lower end of the forested draw and the timber stand on the Dumroese property would result in the likely loss of nesting, foraging, and roosting habitat for pygmy nuthatches.
Existing Improved Corridor: No indirect effects were identified if highway construction were to occur in this corridor.
Western Corridor: No indirect effects were identified if highway construction were to occur in this corridor.

Potential Cumulative

Any loss of ponderosa pines, especially mature trees, could have a cumulative effect on the pygmy nuthatch, considering its imperiled status.

SUMMARY OF FINDINGS

Long-eared Myotis

The surface area required for twinning of highways and the associated right-of-ways will result in some loss of potential/existing foraging habitat in the Project Area, irrespective of which transportation corridor is selected. If the Existing Improved Corridor is selected, this loss could be less if parts of existing US 95 are retained. However, there is no way of either measuring this difference or knowing the overall significance road construction may have on bat populations.

Pygmy Nuthatch

Cavity-nesting birds, like pygmy nuthatches, have suffered because of the loss of natural cavities (Ritter 1997). Pygmy nuthatches do occur in the Eastern Corridor and almost certainly nest in ponderosa pines and snags located on the Dumroese property. Suitable nuthatch habitat occurs throughout the Paradise Ridge area, especially the south-facing slopes that are dominated by ponderosa pines.

No suitable pygmy nuthatch habitat occurs in either the Existing Improved Corridor or Western Corridor. There is a small stand of young ponderosa pines in 1 of the habitat patches located in Washington, west of the Western Corridor. This particular area is surveyed each year during the Audubon Societies' Christmas Bird Count, but no pygmy nuthatches have ever been detected (K. Dumroese, personal communication).

CONCLUSIONS

Long-eared Myotis

I believe that impacts, if any, to the long-eared myotis or its habitat resulting from the construction of a new twinned highway in the 3 potential corridors should be negligible and should not jeopardize bat populations. In comparing the 3 potential corridors, impacts would be greater in the Eastern Corridor, primarily because of the diversity of foraging and roosting habitat that exists in and adjacent to this area.

Pygmy Nuthatch

Similarly, impacts to pygmy nuthatches would be greatest if construction occurred in the Eastern Corridor, as that is where suitable habitat exists and is adjacent to additional

suitable habitat on Paradise Ridge. While it isn't possible to know if nuthatch populations would be adversely impacted, the potential for loss of nesting, foraging, and roosting habitat exists in the Eastern Corridor, depending on the specific location of the highway. There should be no impact on pygmy nuthatch populations if construction occurred in either the Existing Improved Corridor or the Western Corridor.

Impacts of 10 Alignments within the Project Area

The ITD recently identified 10 preliminary alignments in the 3 potential corridors within the Project Area and requested these alignments be evaluated based on the evaluation for each of the 3 corridor areas. The following section includes my assessment as to whether any issues involving long-eared myotis or pygmy nuthatch are significant enough to warrant construction unacceptable in any of the particular alignments.

Eastern Corridor

The preliminary alignments in the Eastern Corridor include E-1, E-2, and E-3. All 3 alignments follow US 95 from Thorncreek Road to the top of Reisenauer Hill. Alignment E-1 extends straight north from Reisenauer Hill, following an existing powerline before rejoining US 95 at the south end of Moscow. Alignments E-2 and E-3 leave US 95 at Reisenauer Hill, extending far enough east to apparently pass through a stand of ponderosa pines on the Dumroese property (see Figure 3). Alignment E-2 passes through the lower end of a forest draw (see Figure 2), while E-3 crosses this draw below (to the west) of the timber and adjacent to a small pond. Selection of alignment E-1 would not have any impact on either species. Selection of alignment E-2 would result in loss of existing habitat for the pygmy nuthatch on the Dumroese property and the lower end of the forest draw. Selection of alignment E-3 would result in habitat loss for nuthatches only in the ponderosa pine stand on the Dumroese property. If we assume long-eared myotis are roosting in trees and tree cavities, then the selection of either alignment E-2 or E-3 would result in the removal of likely roosting habitat for the bats. However, because so little is known about this bat species in the Palouse Area, I'm unable to predict the impact that either of these alignments would have on resident long-eared myotis populations. Further, without an accurate understanding of the actual status and distribution of pygmy nuthatches in the Palouse area, it is difficult to predict the impact of losing part of the ponderosa pine stand on the Dumroese property to the resident nuthatch population if alignment E-2 or E-3 were selected. See the RECOMMENDATIONS section of the report for both species.

Existing Improved Corridor

The preliminary alignments in the Existing Improved Corridor include C-1, C-2, and C-3. Alignment C-1 follows existing US 95. Alignment C-2 follows existing US 95 from Thorncreek Road to just north of Jacksha Road, then continues into Moscow west of the existing highway. Alignment C-3 follows existing US 95 to just north of Eid Road. At that point, C-3 extends north, generally paralleling, and to the east of, US 95, until it reconnects with the highway near Cameron Road just south of Moscow. None of these alignments would have a detrimental impact on either long-eared myotis or pygmy nuthatch populations.

Western Corridor

The preliminary alignments in the Western Corridor include W-1, W-2, W-3, and W-4. Except for W-4, all alignments extend west of US 95 from Thorncreek Road, rejoining US 95 just south of Moscow. W-4 follows US 95 to just north of Jacksha Road, then extends to the east before returning to US 95 at the outskirts of Moscow. W-1 and W-3 extend the farthest west of all the alignments, but none of the 4 alignments pass through existing bat or nuthatch habitat. None of these alignments would have a detrimental impact on resident long-eared myotis or pygmy nuthatch populations.

RECOMMENDATIONS

Long-eared Myotis

1. Ensure the presence of at least the same number of ponds currently located in the Project Area for the benefit of numerous wildlife species, including bats. Increasing the number of ponds might provide even more benefits to bats and other wildlife.
2. Construct and install bat boxes at selected sites to provide bat roosts. See the Bat Conservation International website at **www.batcon.org** or Nongame Wildlife Leaflet No. 11 on bats (Wackenhut and McGraw 1996) for details on building a bat house.
3. Avoid construction along the eastern edge of the Eastern Corridor where the removal of timbered areas would be necessary.

Pygmy Nuthatch

1. Avoid construction along the eastern edge of the Eastern Corridor where the removal of timbered areas would be necessary.
2. Ponderosa pine snags do not last many years before they rot and the trees topple. Nuthatches would benefit from the installation of nest boxes at selected sites to augment the limited number of natural nesting sites currently available.

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TABLES

Table 1. Possible direct, indirect, and cumulative effects of corridor alternatives on the long-eared myotis and pygmy nuthatch in the Project Area.

Table 1. Possible direct, indirect, and cumulative effects of corridor alternatives on the long-eared myotis and pygmy nuthatch in the Project Area.

Species and Effects	Eastern Corridor	Existing Improved Corridor	Western Corridor[1]
Long-eared Myotis			
Direct Effects[1]	None	None	None
Indirect Effects[2]	None, provided existing water sources and timbered habitat are maintained	None, provided existing water sources are maintained	None, provided existing water sources are maintained
Cumulative Effects[3]	Loss of existing suitable habitat	None	None
Pygmy Nuthatch			
Direct Effects	None	None	None
Indirect Effects	Potential loss of nesting, foraging, and roosting habitat	None	None
Cumulative Effects	Loss of existing suitable habitat	None	None

[1] Direct Effects (DE) are the immediate impacts caused by the proposed action.
[2] Indirect Effects (IE) are the impacts caused by or that will result from the proposed action, but are likely to occur at a later time.
[3] Cumulative Effects (CE) are the combined impacts of this action along with unrelated activities that are likely to occur within the project area, and when evaluated collectively, could impact the species.

FIGURES

Figure 1. Crevice shown in a fractured rock on the southwest end of Paradise Ridge. Bats are known to use rock crevices for roosting.

Figure 2. Ponderosa pines in the lower end of a forested draw, west slope of Paradise Ridge, are reportedly used by pygmy nuthatches. The right photo shows 5 mature ponderosa pines that are located within the boundary of the Eastern Corridor.

Figure 3. This stand of ponderosa pine, owned by the Dumroese family, is used by pygmy nuthatches for foraging and likely roosting and nesting. The top photo was taken from Paradise Ridge; the lower end of this stand, shown in the bottom photo, is located inside the eastern boundary of the Eastern Corridor.

Figure 4. These photographs show the lower end of the ponderosa pine stand owned by the Dumroese family that is located inside the Eastern Corridor boundary.

Figure 5. Snags such as these, as depicted by the holes, are important to cavity-nesting birds, including pygmy nuthatches. The snag in the left photo is inside the Eastern Corridor boundary.

Figure 6. Dead tops of ponderosa pines are used by cavity-nesting birds, including pygmy nuthatches, for nesting and roosting. The tree in the left photo is inside the Eastern Corridor boundary.

Figure 7. A stand of ponderosa pines southeast of Eid Road and just east of the Eastern Corridor is likely used by pygmy nuthatches.

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Figure 6. Dead tops of ponderosa pines are used by cavity-nesting birds, including pygmy nuthatches, for nesting and roosting. The tree in the left photo is inside the Eastern Corridor boundary.

Figure 7. A stand of ponderosa pines south of Eid Road and east of the Eastern Corridor is likely used by pygmy nuthatches.