3.12 Wildlife Resources

The study area for direct and indirect impact assessments for wildlife resources includes the area within the project boundary and riparian, stream, spring/pond, and wetland habitats within the maximum extent of the 10-foot groundwater drawdown contour. The cumulative effects study areas (CESAs) for wildlife resources generally extend from the northern end of the Independence Range northeast of the study area, south to the Humboldt River and northern end of the Piñon Range. The CESAs were determined by the Bureau of Land Management (BLM) and Nevada Department of Wildlife (NDOW) based on wildlife use in the region and include contiguous areas that provide important seasonal habitat for wildlife species such as mule deer, pronghorn, and elk (**Figures 3.12-1** through **3.12-4**). Past, present, and reasonably foreseeable future actions (RFFAs) are summarized in Section 3.2.

3.12.1 Affected Environment

As discussed in Section 3.8, Vegetation Resources, three vegetation cover types and disturbed land (i.e., industrial/commercial) are located within the study area. The vegetation cover types include sagebrush shrubland, grassland, and riparian/wetland habitats. Grassland is the most common vegetation type within the study area.

Wildlife species and habitats found within the study area are typical of the Great Basin Region (AECOM 2010b,c,d; Rawlings and Neel 1989). Riparian/wetland habitats within the study area, particularly those that maintain open water and riparian vegetation, support a greater diversity and population density of wildlife species than any other habitat types occurring in the study area (Rawlings and Neel 1989). Currently, the primary riparian/wetland habitat within the study area occurs along Little Antelope Creek and Antelope Creek, which originate northeast of the study area in the Santa Renia and Tuscarora mountains, respectively. Little Antelope Creek and Antelope Creek are classified as intermittent creeks through the study area.

Information regarding wildlife species and habitat within the study area and CESAs was obtained from a review of existing published sources, BLM, NDOW, and United States Fish and Wildlife Service (USFWS) file information, as well as Nevada Natural Heritage Program (NNHP) database information, and site-specific field surveys.

3.12.1.1 Big Game Species

Mule deer, pronghorn, and elk are the primary big game species that may occur within the study area (Miller 2010a; NDOW 2010a,b). The study area occurs entirely within NDOW's Management Area 6, specifically Hunting Unit 068.

Population numbers for mule deer, pronghorn, and elk fluctuate slightly from year to year based on fluctuations in habitat conditions. Water availability and amount of quality habitat are the limiting factors within the study area. Water availability, forage quality, cover, and weather patterns typically determine the level of use and movement of big game species through the study area. Winter use in the study area depends on snow depth and forage availability.

<u>Mule Deer</u>

Population numbers for mule deer in Management Area 6 have demonstrated a general decline from historic population levels over the last 10 years due to a reduction in winter habitat quality, primarily resulting from wildfires. Large scale fires from 1999 to 2007 have caused a severe reduction in available forage (i.e., shrub browse) and an overall increase of noxious weeds and non-native invasive plant species such as cheatgrass (*Bronus tectorum*), thistle (*Onopordum acanthium*), and low white-top (*Cardaria draba*) (BLM 2008b; NDOW 2010b). However, improved habitat conditions in 2009 as a result of abundant moisture, caused a 12 percent increase in mule deer populations in 2010

(NDOW 2010b). During spring 2011 helicopter surveys, NDOW classified approximately 3,810 mule deer in Management Area 6 (NDOW 2011). Mule deer use of the study area is highly variable but typically peaks during fall and spring migrations. A majority of the mule deer in the project region typically spend the summer months in the Bull Run and Tuscarora mountain ranges north and east of the study area and winter in the Dunphy Hills area south and west of the study area (NDOW 2010a). Several habitat types including limited use, transitional, and crucial winter habitat intersect the study area. Approximately 11,256 acres of undisturbed (e.g., not burned) limited use habitat and 5,262 acres of undisturbed transitional habitat occur within the study area. No undisturbed crucial winter habitat occur within the study area. NDOW data indicates that a historic mule deer migration corridor passes through the study area. However, mule deer migrating through the study area typically avoid the Hollister Site and migrate through undisturbed habitat southeast and northwest of the Hollister Site. Mule deer habitat and migration corridors within the study area are presented in **Figure 3.12-5**.

Pronghorn

Pronghorn numbers have been stable to increasing in Management Area 6 over the past several years (BLM 2008b; NDOW 2010b). NDOW ground surveys classified 766 animals during January 2011 surveys (NDOW 2011). Use of the study area by pronghorn is highly dependent on water and forage availability. The majority of the study area is summer habitat for pronghorn (**Figure 3.12-6**). Approximately 14,920 acres of undisturbed (e.g., not burned) summer habitat occurs within the study area.

Elk

Elk numbers in Management Area 6 have increased over the last several years due to an increase in herbaceous forage as a result of wildfires (NDOW 2011). NDOW currently estimates the herd at approximately 550 animals (Miller 2010a; NDOW 2011). Elk are not typically found within the study area but may occur within the study area depending on snow depth and forage conditions. Elk low-density habitat occurs throughout the majority of the study area and crucial winter habitat occurs in the southeast portion of the study area (**Figure 3.12-7**). Approximately 14,118 acres of undisturbed (e.g., unburned) low-density habitat and 2,399 acres of undisturbed crucial winter habitat occurs within the study area.

Mountain Lion

In Nevada, mountain lions also are classified as a big game species. Mountain lions are fairly common in north-central Nevada and typically occupy the higher elevations surrounding the study area. They often travel between mountain ranges and valleys depending on prey availability. Mountain lion populations in eastern Nevada have remained stable over the past 5 years despite a decrease in the mule deer population (NDOW 2010b).

3.12.1.2 Small Game Species

Several upland game bird species are found within the study area including greater sage-grouse, chukar, gray partridge, and mourning dove. Chukar are found in the hills within the study area, especially on rocky ridges and hillsides with cheatgrass. Gray partridge are found in riparian areas along Little Antelope Creek and Antelope Creek (AECOM 2010c; BLM 2004a; NDOW 2009b). Mourning doves are found in a wide range of habitats in close proximity to water and are most likely to occur within the study area during spring, summer, and early fall (Floyd et al. 2007; Wildlife Action Plan Team 2006). The greater sage-grouse is a BLM sensitive species and is discussed in detail in Section 3.14, Special Status Species.

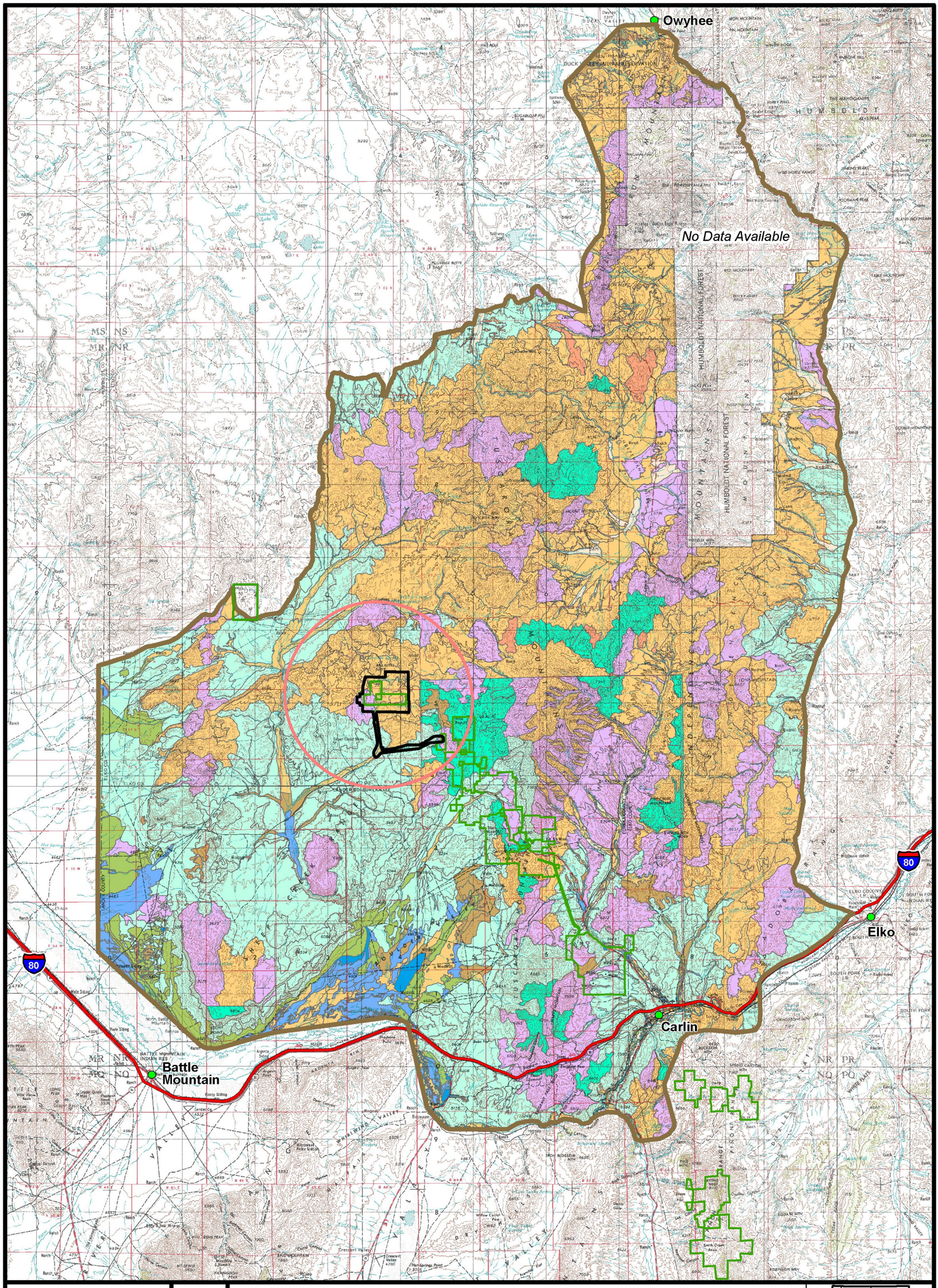


Figure 3.12-1

Wildlife Habitat and Vegetation Types in the Study Area and Cumulative Effects Study Area

Hollister Underground Mine Project EIS

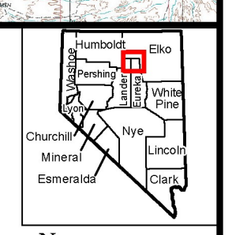
Legend

- Project Area Boundary
- Other Mine Plan Boundaries
- Cumulative Effects Study Area
- Maximum Extent of the 10-foot Groundwater Drawdown Contour

Vegetation Types

- Big Sagebrush Shrubland
- Basin Big Sagebrush Shrubland
- Bud Sagebrush Shrubland
- Wyoming Big Sagebrush Shrubland
- Mountain Big Sagebrush Shrubland
- Low Sagebrush Shrubland
- Salt-desert Shrubland
- Greasewood Shrubland
- Grassland
- Wet Meadow

Source: Based on ecological sites from USDA-NRCS 2011.



N

0 5 10 Miles

3.12-3

3/23/2012

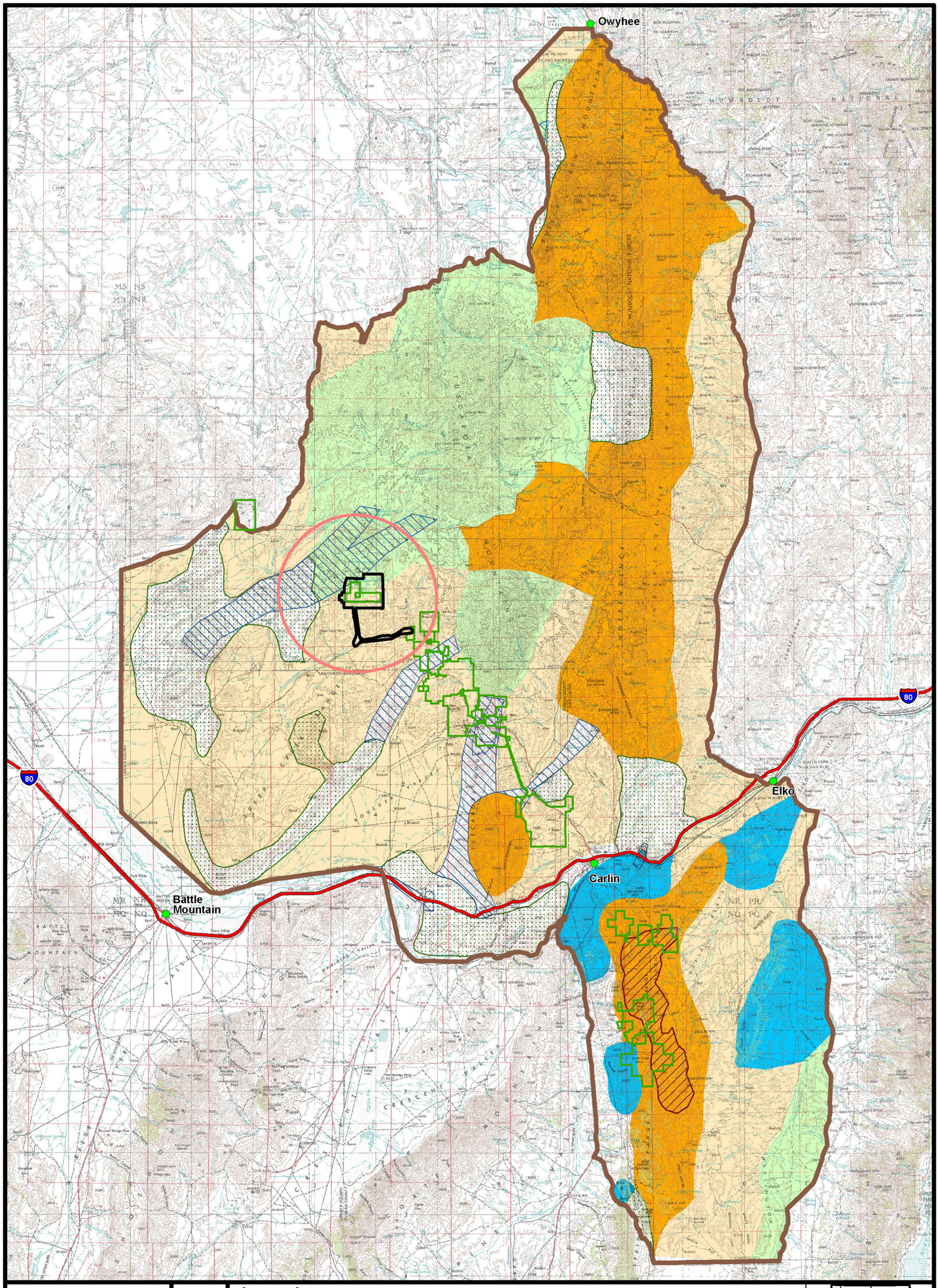


Figure 3.12-2

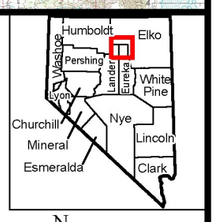
Mule Deer Cumulative Effects Study Area

Hollister Underground Mine Project EIS

Legend

- Project Area Boundary
- Cumulative Effects Study Area
- Other Mine Plan Boundary
- Maximum Extent of the 10-foot Groundwater Drawdown Contour
- Crucial Summer Habitat
- Movement Corridor
- Crucial Winter Habitat
- Winter Habitat
- Limited Use Habitat
- Summer Habitat
- Transition Habitat

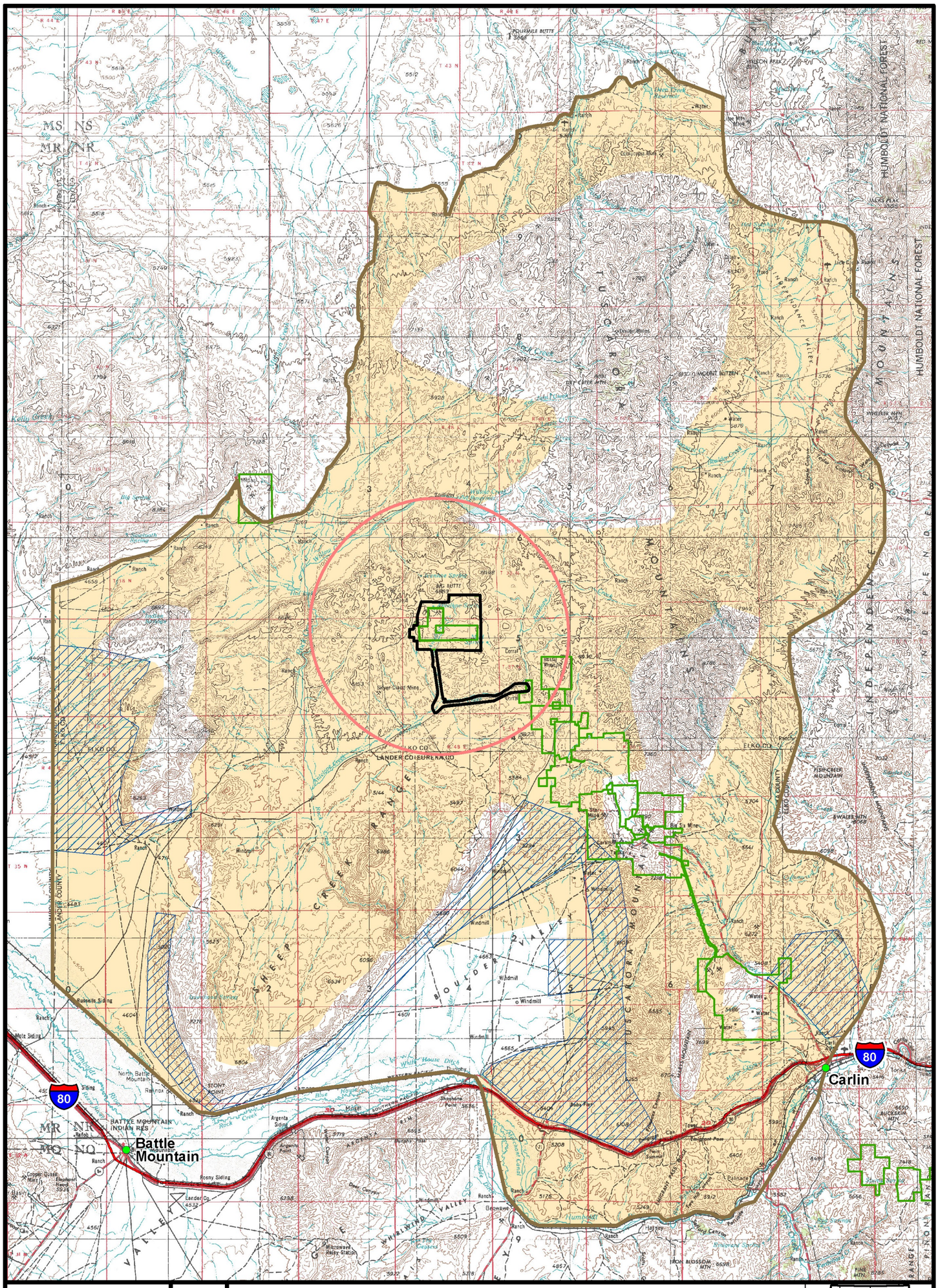
Source: BLM 2011d.



N

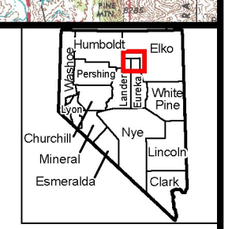
0 5 10 Miles

3/2/2012



Legend

- Project Area Boundary
- Cumulative Effects Study Area
- Other Mine Plan Boundaries
- Maximum Extent of the 10-foot Groundwater Drawdown Contour
- Crucial Winter Habitat
- Summer Habitat



N

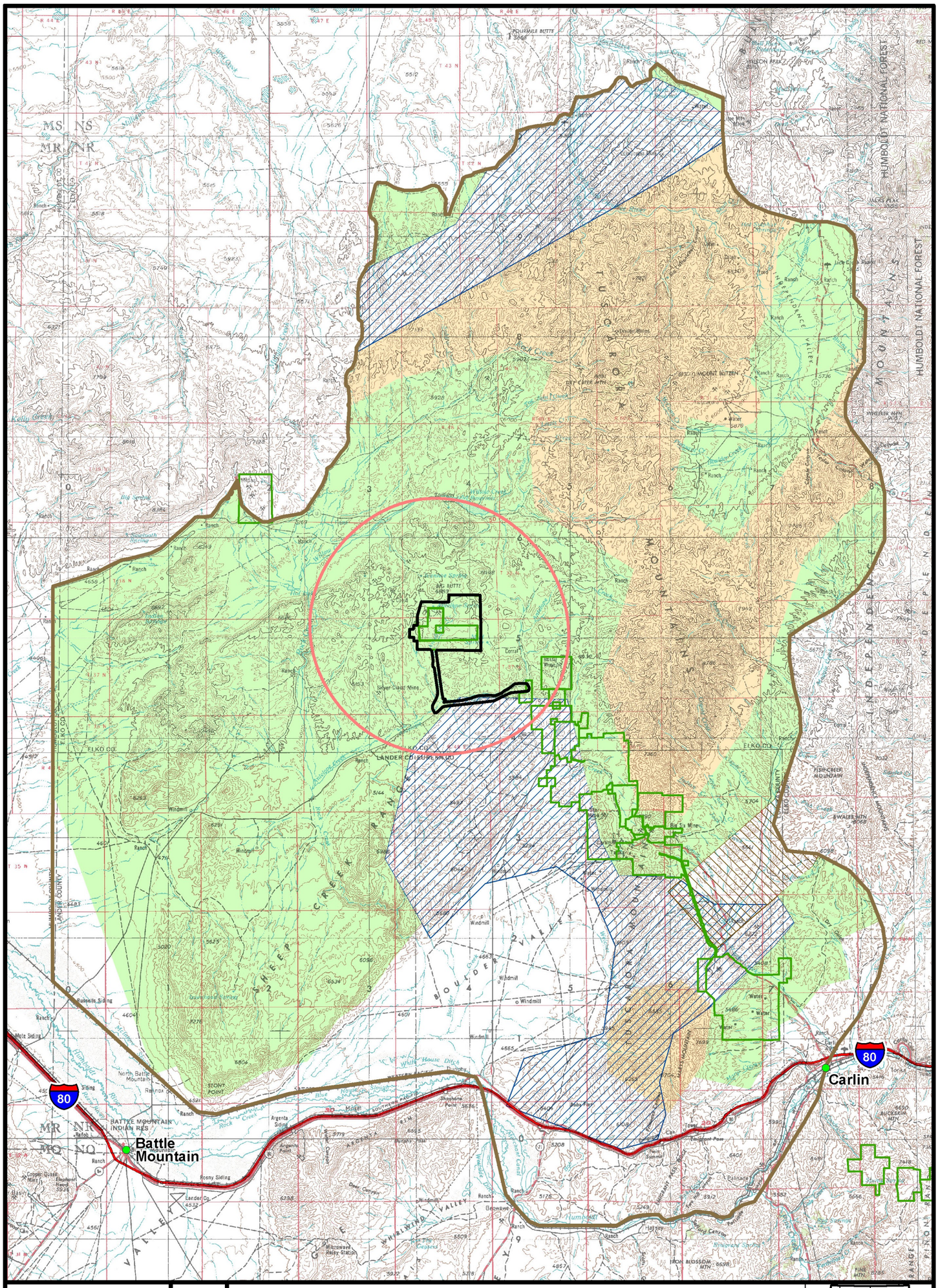
0 2.5 5 10 Miles

Source: BLM 2011d.

Hollister Underground Mine Project EIS

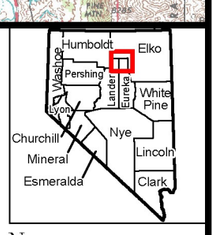
Figure 3.12-3
Pronghorn Cumulative Effects Study Area

3/2/2012



Legend

- Project Area Boundary
- Cumulative Effects Study Area
- Other Mine Plan Boundaries
- Maximum Extent of the 10-foot Groundwater Drawdown Contour
- Crucial Winter Habitat
- Movement Corridor
- Low-Density Habitat
- Summer Habitat



N

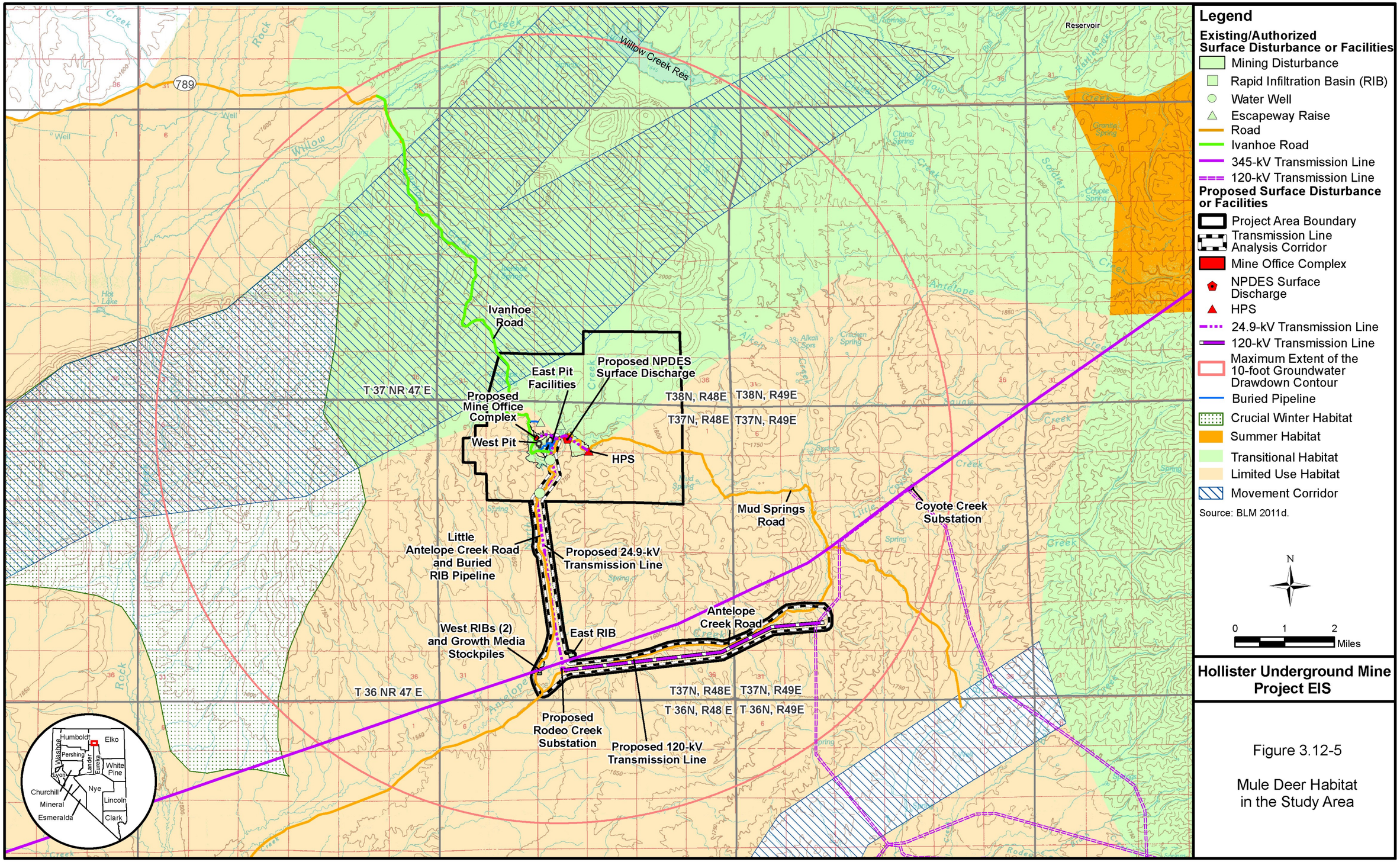
0 2.5 5 10 Miles

Source: BLM 2011d.

Hollister Underground Mine Project EIS

Figure 3.12-4
Elk
Cumulative Effects Study Area

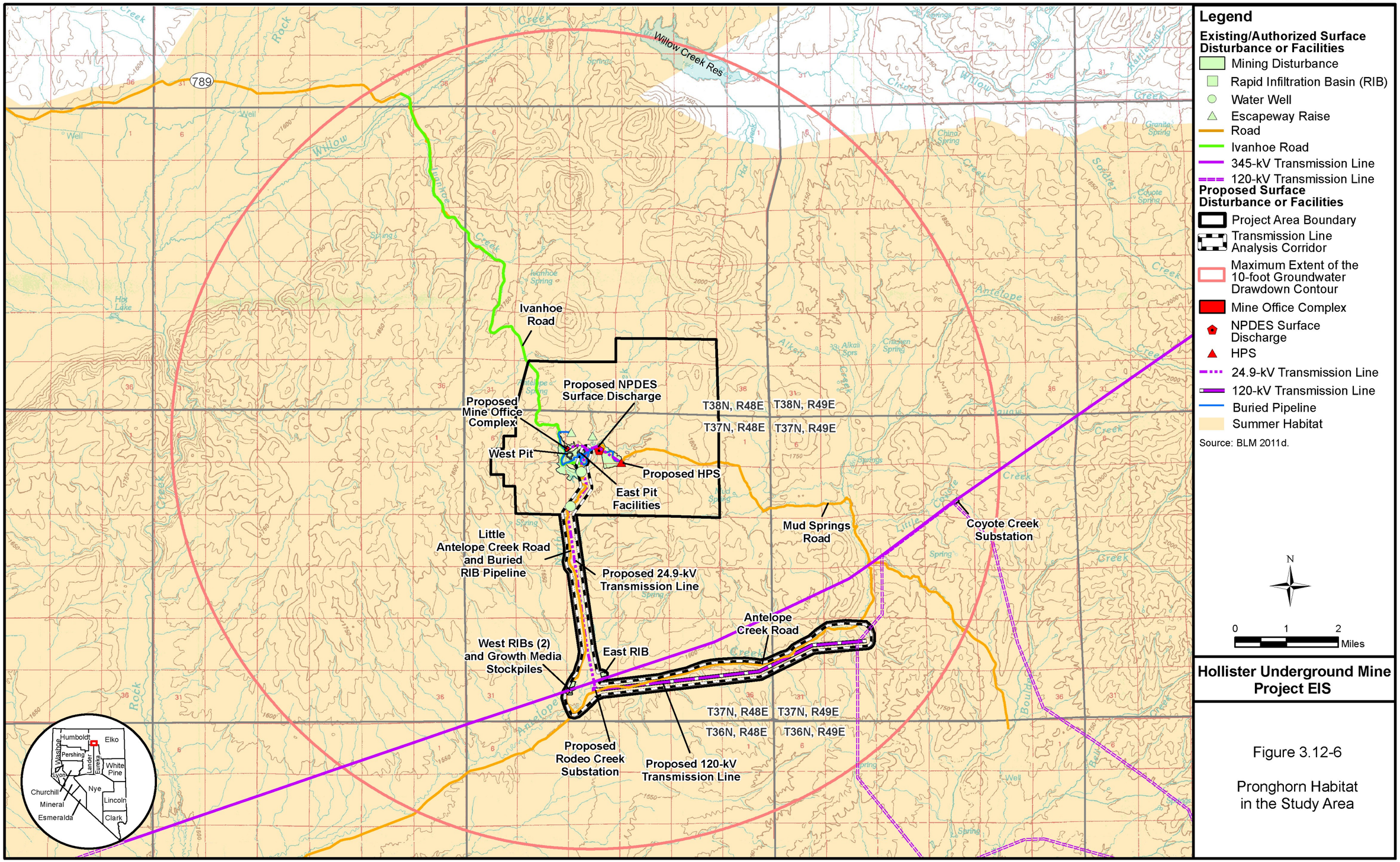
3/2/2012



Hollister Underground Mine Project EIS

Figure 3.12-5

Mule Deer Habitat in the Study Area

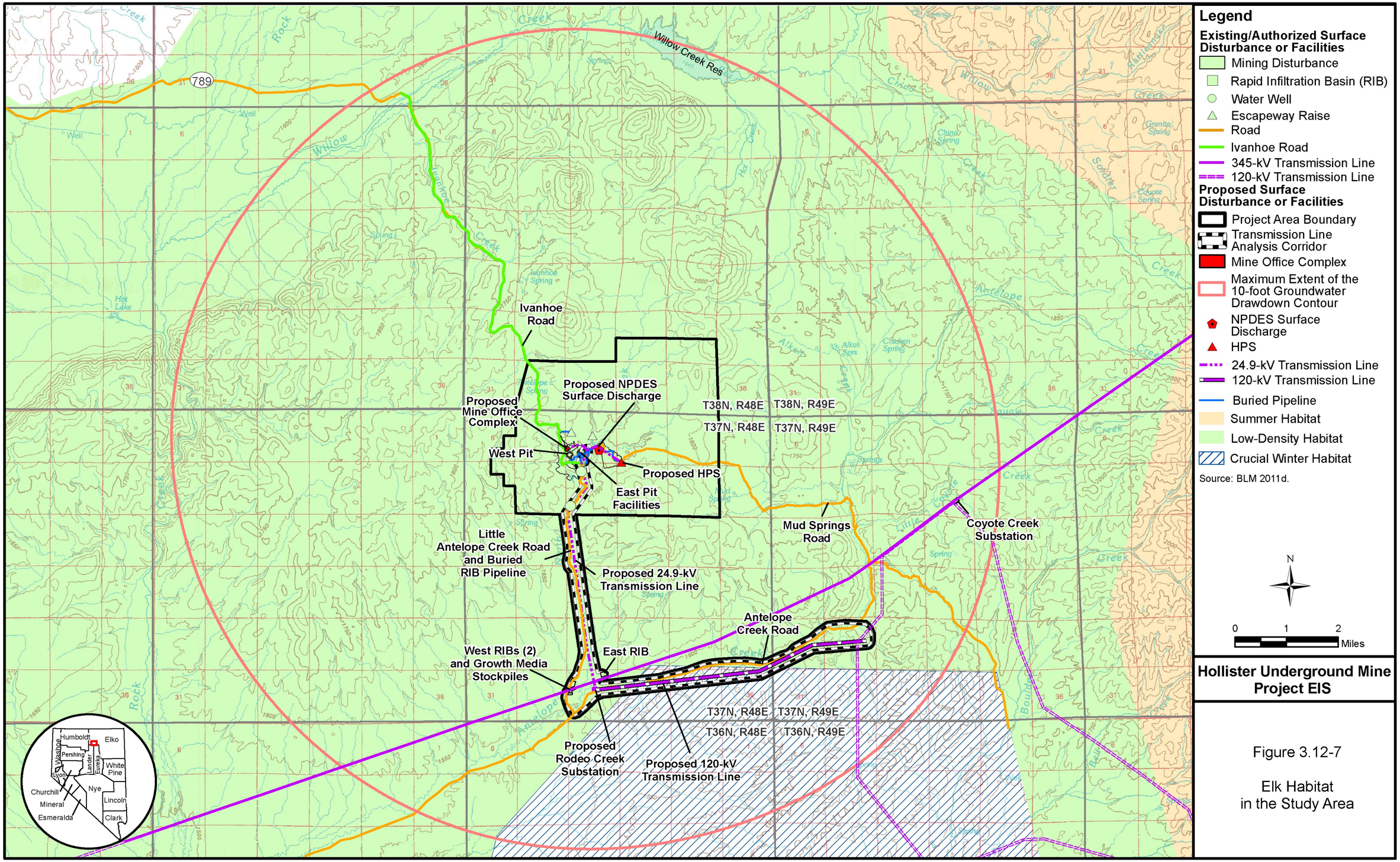


Hollister Underground Mine Project EIS

Figure 3.12-6

Pronghorn Habitat in the Study Area

3/2/2012



Hollister Underground Mine Project EIS

Figure 3.12-7

Elk Habitat in the Study Area

3/2/2012

Several rabbit species are known to occur within the study area including cottontail and pygmy rabbit. The pygmy rabbit has been documented at four locations in the study area and are typically found in areas with deeper developed soils in taller sagebrush habitat (BLM 2004b; NDOW 2010a). Although the pygmy rabbit is considered a game species in Nevada (NDOW 2009b), it also is a BLM sensitive species and is discussed in Section 3.14, Special Status Species.

Nevada Administrative Code (NAC) 503.025 classifies several mammal species as furbearers. Furbearer species that may occur within the study area include gray fox, kit fox, bobcat, muskrat, and mink (Wildlife Action Plan Team 2006). Due to increased structural diversity and available food sources, a higher diversity of furbearers is likely present along the riparian areas along Little Antelope Creek and Antelope Creek. Other mammal species that may occur within the study area include coyote, badger, short-tailed weasel, long-tailed weasel, spotted skunk, and black-tailed jackrabbit.

Due to limited habitat, waterfowl concentrations are limited to ponds, springs, and streams located in the study area. Species that are likely to be found within the study area include mallard, blue-winged teal, wigeon, gadwall, and pintail (AECOM 2010c; Floyd et al. 2007; Wildlife Action Plan Team 2006).

3.12.1.3 Nongame Species

A diversity of nongame species (e.g., small mammals, passerines, raptors, reptiles, and amphibians) occupies a wide range of trophic levels and habitat types within the study area. Habitats found within the study area (i.e., sagebrush shrubland, grassland, riparian/wetland) support a variety of resident and seasonal nongame species. Nongame mammals include the deer mouse, western harvest mouse, vagrant shrew, Merriam's shrew, Ord's kangaroo rat, sagebrush vole, golden-mantled ground squirrel, least chipmunk, and desert woodrat (BLM 2008b; NDOW 2010a; Wildlife Action Plan Team 2006). Rodent populations provide a large prey base for predators found within the study area.

<u>Bats</u>

A number of bat species are known to inhabit the project region; however, detection surveys for bat species has not been conducted within the study area. Due to the presence of seeps, springs, and creeks, the study area contains suitable roosting and foraging habitat for several bat species including pallid bat, Townsend's big-eared bat, big brown bat, small-footed myotis, little brown myotis, California myotis, long-eared myotis, long-legged myotis, Yuma myotis, and western pipistrelle bat (BLM 2004a; Bradley et al. 2006; NDOW 2010a). All of the bats identified as potentially occurring within the study area are currently BLM sensitive species and/or Nevada protected species (Bradley et al. 2006; NNHP 2010a). These species are presented in detail in Section 3.14, Special Status Species.

<u>Migratory Birds</u>

Nongame birds encompass a variety of passerine and raptor species including migratory bird species that are protected under the Migratory Bird Treaty Act (MBTA) (16 United States Code 703-711) and Executive Order (EO) 13186 (66 Federal Register 3853). Pursuant to EO 13186, a Memorandum of Understanding (MOU) between the BLM and USFWS outlines a collaborative approach to promote the conservation of migratory bird populations. The purpose of the MOU is to strengthen migratory bird conservation by identifying and implementing strategies that promote conservation and avoid or minimize adverse impacts on migratory birds in coordination with state, tribal, and local governments. This MOU identifies specific activities where cooperation between the BLM and USFWS would contribute to the conservation of migratory birds and their habitat. In addition, the BLM Nevada State Office prepared Migratory Bird Best Management Practices for the Sagebrush Biome in order to assist BLM field offices in the consideration of migratory birds in land management activities (BLM 2003). In Nevada, all birds protected under the MBTA also are state protected (NAC 503.050). Many of the sensitive migratory bird species found in Nevada also are identified in the Nevada Partners in Flight (PIF) Bird Conservation Plan (Neel 1999). This plan, along with the Birds of Conservation Concern

(BCC) Plan (USFWS 2008), prioritizes migratory bird species for management actions according to habitat types.

In order to document migratory bird species that occur within the study area, a breeding bird survey was conducted May 22 to 26, 2010, along Little Antelope Creek and Antelope Creek. A total of 45 avian species were observed and recorded and are presented in **Table 3.12-1** (AECOM 2010c).

Table 3.12-1 Inventory of Migratory Bird Species Potentially Occurring within the Study Area

Common Name	Scientific Name	Status[1]	Observed in Study Area[2]
American robin	*Turdus migratorius*		Yes
American kestrel	*Falco sparverius*		Yes
Bald eagle	*Haliaeetus leucocephalus*	BCC	No
Black-billed magpie	*Pica pica*		Yes
Black-chinned hummingbird	*Archilochus alexandri*		Yes
Black-crowned night heron	*Nycticorax nycticorax*		Yes
Black-headed grosbeak	*Pheucticus melanocephalus*		Yes
Blue-gray gnatcatcher	*Polioptila caerulea*		Yes
Brewer's blackbird	*Euphagus cyanocephalus*		Yes
Brewer'sparrow	*Spizella breweri*	BCC	Yes
Bullock's oriole	*Icterus bullockii*		Yes
Burrowing owl	*Athene cunicularia*	BLM, PIF	Yes
Cinnamon teal	*Anas cyanoptera*		Yes
Chipping sparrow	*Spizella passerina*		Yes
Cliff swallow	*Hirundo pyrrhonota*		Yes
Common raven	*Corvus corax*		Yes
Common snipe	*Gallinago gallinago*		Yes
Ferruginous hawk[3]	*Buteo regalis*	BLM, PIF	Yes
Golden eagle	*Aquila chrysaetos*	BLM, BCC	Yes
Greater sage-grouse	*Centrocercus urophasianus*	BLM, BCC, PIF	No
Horned lark	*Eremophila alpestris*		No
Juniper titmouse	*Baeolophus ridgwayi*	BLM, PIF	No
Killdeer	*Charadrius vociferus*		Yes
Lark sparrow	*Chondestes grammacus*		Yes
Lazuli bunting	*Passerina amoena*		Yes
Lewis' woodpecker	*Melanerpes lewis*	BLM, BCC, PIF	No
Loggerhead shrike	*Lanius ludovicianus*	BLM, BCC, PIF	Yes
Long-eared owl	*Asio otus*	BLM, PIF	No
MacGillivray's warbler	*Oporornis tolmiei*	PIF	Yes

Table 3.12-1 Inventory of Migratory Bird Species Potentially Occurring within the Study Area

Common Name	Scientific Name	Status[1]	Observed in Study Area[2]
Mallard	*Anas platyrhynchos*		Yes
Mourning dove	*Zenaida macroura*		Yes
Northern flicker	*Colaptes auratus*		Yes
Northern harrier	*Circus cyaneus*		Yes
Piñon jay	*Gymnorhinus cyanocephalus*	BLM, BCC, PIF	No
Prairie falcon	*Falco mexicanus*	BLM, PIF	Yes
Red-tailed hawk	*Buteo jamaicensis*		Yes
Red-winged blackbird	*Agelaius phoeniceus*		Yes
Rough-legged hawk	*Buteo lagopus*		No
Sage sparrow	*Amphispiza belli*	BCC, PIF	No
Sage thrasher	*Oreoscoptes montanus*	BCC, PIF	No
Say's phoebe	*Sayornis saya*		Yes
Short-eared owl	*Asio flammeus*	BLM, PIF	Yes
Snowy egret	*Egretta thula*		Yes
Swainson's hawk	*Buteo swainsoni*	BLM, PIF	No
Turkey vulture	*Cathartes aura*		Yes
Vesper sparrow	*Pooecetes gramineus*	BLM, PIF	No
Willow flycatcher	*Empidonax trailii*	BCC, PIF	Yes
Western kingbird	*Tyrannus verticalis*		Yes
Western meadowlark	*Sturnella magna*		Yes
Western tanager	*Piranga ludoviciana*		Yes
Western wood-peewee	*Contopus sordidulus*		Yes
Wilson's warbler	*Wilsonia pusilla*	PIF	Yes
Yellow-breasted chat	*Icteria virens*	BLM, PIF	No
Yellow-headed blackbird	*Xanthocephalus xanocephalus*		Yes
Yellow warbler	*Dendroica petechia*		Yes
Yellow-rumped warbler	*Dendroica coronata*		Yes

[1] BLM = BLM Sensitive.
BCC = USFWS Birds of Conservation Concern.
PIF = Nevada Partners in Flight Priority Bird Species.

[2] Identified during the riparian bird survey May 22 to 26, 2010.

[3] Identified during the Columbia spotted frog and Pacific chorus frog survey June 15 to 17, 2010.

Sources: AECOM 2010c,d; BLM 2004a; Floyd et al. 2007; NDOW 2010a; Neel 1999; USFWS 2008.

Many of these species are associated with a variety of habitat types, and some species occur within the study area year-round (e.g., red-tailed hawk, chukar, gray partridge). However, due to the higher level of plant diversity and structure, more abundant potential nest sites, and greater food base, the riparian areas along Little Antelope Creek and Antelope Creek support the highest diversity of bird species within the study area.

Raptor species that could potentially occur as residents or migrants within the study area include eagles (bald and golden eagles), buteos (e.g., red-tailed hawk, Swainson's hawk, ferruginous hawk), falcons (e.g., prairie falcon, American kestrel), accipiters (e.g., Cooper's hawk, sharp-shinned hawk), owls (e.g., great-horned owl, burrowing owl, long-eared owl, short-eared owl), northern harrier, and turkey vulture (Floyd et al. 2007; Herron et al. 1985). Twelve raptor nests were documented during field surveys within the study area including two American kestrel, one short-eared owl, one ferruginous hawk, one red-tailed hawk, and seven unknown raptor nests (AECOM 2010c). Four of the 10 raptor nests were located on the existing 345-kilovolt (kV) electric power transmission line (transmission line) that crosses the study area north of Antelope Creek. According to NDOW records, a historic prairie falcon nest occurs approximately 2 miles northeast of the Hollister Site (NDOW 2010a). In addition, a suspected raptor migration route occurs near the study area along the Tuscarora Mountains and Sheep Creek Range (Herron et al. 1985). Surveys performed to date have not identified any raptor nests within areas proposed for new surface disturbance.

Details on sensitive bird species such as golden eagle, prairie falcon, short-eared owl, vesper sparrow, and loggerhead shrike are discussed further in Section 3.14, Special Status Species.

Reptiles and Amphibians

Several species of reptiles and amphibians (collectively referred to as herptiles) are known to occur within the study area including Great Basin whiptail, bull snake, western rattlesnake, Great Basin collared lizard, desert horned lizard, western skink, and western fence lizard (NDOW 2010a). Amphibian presence is limited to areas with seasonal flow and riparian vegetation present (e.g., willows, sedges, etc.). Pacific chorus frogs have been documented within the study area along Little Antelope Creek and Antelope Creek (**Figure 3.13-2**) (AECOM 2010d; BLM 2004a; NDOW 2010a). Details on sensitive species such as the Columbia spotted frog are discussed in Section 3.14, Special Status Species.

3.12.2 Environmental Consequences

Wildlife-related issues addressed by this analysis were determined through consultation with BLM, NDOW, and USFWS. The primary issues related to wildlife include: loss or alteration of native habitats, increased habitat fragmentation, animal displacement, direct loss of wildlife, and impacts associated with water management.

Potential impacts on terrestrial wildlife may include the temporary (short-term and long-term) and permanent reduction or loss of habitat. Short-term impacts arise from habitat removal and disturbance as well as from activities associated with mine operation; these impacts would cease upon mine closure and completion of successful reclamation. Long-term impacts consist of changes to habitats and the wildlife populations that depend on those habitats, irrespective of reclamation success. Permanent impacts are typically associated with construction/expansion of open pits and therefore, are not included in the impact analysis for the proposed project.

Direct impacts to wildlife populations could include limited direct mortalities from mine development, habitat loss or alteration, incremental habitat fragmentation, and animal displacement. Indirect impacts could include increased noise, additional human presence, and the potential for increased vehicle-related mortalities. The riparian habitat along Little Antelope Creek and Antelope Creek within the study area supports a greater number of species than other habitat types within the study area. As a result, project-related impacts may be prominent for species closely associated with riparian

corridors. The degree of the impacts on terrestrial wildlife species and their upland habitats would depend on factors such as the sensitivity of the species, seasonal use patterns, type and timing of project activity, and physical parameters (e.g., topography, cover, forage, and climate).

3.12.2.1 Proposed Action

Surface Disturbance

The Proposed Action would result in the long-term loss of approximately 117 acres of wildlife habitat, including 25 acres associated with exploration activities and 34.7 acres would be associated with the transmission line. The Proposed Action disturbance would be in addition to the previously authorized approximately 105 acres of disturbance for a total of approximately 222 acres. The disturbance associated with the Proposed Action would be reclaimed following completion of mining activities.

Impacts to wildlife from mine and exploration surface disturbance activities would include the temporary reduction or loss of habitat. Habitat loss or alteration would result in direct losses of smaller, less mobile species of wildlife, such as small mammals and reptiles, and the displacement of more mobile species into adjacent habitats. In areas where habitats are at, or near, carrying capacity, animal displacement could result in some unquantifiable reductions in local wildlife populations. Mine and exploration surface disturbance also would result in an incremental increase in habitat fragmentation at the Hollister Site until reclamation has been completed and vegetation has been re-established. It is anticipated that the potential displacement and habitat fragmentation effects would be highest for wildlife species that use the riparian corridors along Little Antelope Creek and Antelope Creek.

Game Species

Potential direct impacts to mule deer would include the incremental long-term reduction of potential forage and the incremental increase of habitat fragmentation from vegetation removal associated with mine development activities. The proposed project would disturb approximately 84 acres of the 11,256 acres (<1 percent) of undisturbed mule deer limited use habitat within the study area and approximately 33 acres of the 5,262 acres (<1 percent) of undisturbed mule deer transitional habitat within the study area. These habitats consist primarily of grassland and sagebrush shrubland. Additional loss of habitat, especially unburned sagebrush shrublands, would result in an incremental reduction in the amount of available mule deer habitat in the study area. No mule deer crucial winter habitat would be disturbed as a result of the proposed project.

Impacts to pronghorn would be similar to those previously discussed for mule deer. Potential direct impacts would include the incremental long-term reduction of approximately 117 acres of the 14,920 acres (<1 percent) of undisturbed pronghorn summer habitat within the study area. Similar to mule deer, additional loss of habitat, especially unburned sagebrush shrublands, would result in an incremental reduction in the amount of available pronghorn habitat in the study area. No pronghorn low density habitat would be disturbed as a result of the proposed project.

Potential direct impacts to elk would include the incremental long-term reduction of approximately 105 acres of the 14,118 acres (<1 percent) of undisturbed low-density habitat within the study area and approximately 12 acres of the 2,399 acres of undisturbed crucial winter habitat within the study area. However, unlike mule deer and pronghorn, elk prefer grasses to sagebrush and are therefore less susceptible to the effects of large scale fires. In fact, the conversion of large tracts of sagebrush habitat to grassland habitat favors elk and may lead to population increases and expansion into previously unoccupied habitat.

Impacts to mountain lions are expected to be low, as these species occur at low densities in and around the study area.

Direct impacts to small game species (e.g., chukar, Hungarian partridge, mourning dove) would include the long-term loss of approximately 117 acres of potentially suitable habitat. Impacts also would include displacement from the disturbance areas and increased habitat fragmentation, until reclamation has been completed and vegetation is re-established. In most instances, suitable habitat adjacent to disturbance areas would be available for use by these species. However, displacement would increase competition and could include some local reductions in wildlife populations if adjacent habitats are at carrying capacity. Potential impacts also could include nest and burrow abandonment or loss of eggs or young. These temporary losses would reduce productivity for that breeding season, given the duration of construction activities in a specific area.

Nongame Species

Impacts to nongame species would be similar to those previously discussed for small game species. Direct impacts to nongame species (e.g., small mammals, passerines, raptors, and reptiles) would include the long-term loss of approximately 117 acres of potentially suitable habitat. Impacts also would include displacement from the disturbance areas and increased habitat fragmentation, until vegetation is re-established. In most instances, suitable habitat adjacent to disturbance areas would be available for use by these species. However, displacement would increase competition and could result in some local reductions in wildlife populations if adjacent habitats are at carrying capacity. Potential impacts also could include nest and burrow abandonment or loss of eggs or young. These temporary losses would reduce productivity for that breeding season, given the duration of construction activities in a specific area.

Migratory Birds

A variety of resident and migratory bird species (e.g., raptors and passerines) have been identified as potentially occurring within the study area. Potential direct impacts to bird species would include the long-term loss of approximately 117 acres of potentially suitable breeding, roosting, and foraging habitat. However, this temporary loss is expected to have little effect on local bird populations based on the amount of suitable breeding and foraging habitat in the surrounding area. Continuous mine water discharging into Little Antelope Creek may expand riparian habitat along Little Antelope Creek as the amount of surface water increases. This would create additional habitat and water sources for migratory bird species, thus creating a beneficial impact to migratory bird species that utilize the riparian areas along Little Antelope Creek for the 20-year life of the project. It is anticipated that this newly created riparian habitat and available surface water along Little Antelope Creek would decline once groundwater pumping operations cease. This would have a negative impact on migratory bird species that utilize these riparian areas. If construction or development of the proposed facilities was to occur during the breeding season (approximately March 1 through July 31, depending on species), direct impacts to breeding birds could include the possible direct loss of nests or indirect effects (e.g., abandonment) from increased human noise and human presence within close proximity of an active nest site. In order to minimize impacts to raptors during the breeding season, Rodeo Creek Gold Inc (RCG) has committed to conducting a breeding raptor survey and implementing appropriate mitigation measures, such as buffer zones around occupied nests, as needed. In addition, for the protection of breeding songbirds, RCG has committed to avoiding habitat removal on currently undisturbed lands, to the extent possible, between March 1 and July 31 or, alternately, conducting breeding bird surveys and implementing appropriate mitigation in coordination with the BLM and NDOW. With implementation of these measures, residual impacts to nesting bird species within the study area would be limited to temporary habitat loss. This loss is anticipated to have little impact given the extent of native habitats in the surrounding region.

As described in Section 2.4.6.1, Electrical Power, a 24.9-kV transmission line and 120-kV transmission line would be constructed to supply power to the Hollister Site. These transmission line segments would run approximately 4.5 miles and 5.4 miles along Little Antelope Creek and Antelope Creek, respectively. As described in Section 2.4.6.1, surface disturbance from the transmission line would result in the long-term disturbance of 21 acres of wildlife habitat. Transmission lines pose an

electrocution hazard for raptor species attempting to perch on the structures. To minimize this potential impact, RCG has committed to using Avian Power Line Interaction Committee (APLIC) raptor-deterring design measures which may include, but would not be limited to, a 60-inch separation between conductors and/or grounded hardware in eagle-use areas as well as the use of insulating or cover up materials for perch management. The transmission line also would incrementally increase the collision potential for migrating and foraging bird species. However, collision potential typically is dependent on variables such as the location in relation to high-use habitat areas (e.g., nesting, foraging, and roosting), line orientation to flight patterns and movement corridors, species composition, visibility, and line design (APLIC 2006).

Human Presence and Noise

The most common wildlife responses to noise and human presence are avoidance or accommodation. Avoidance would result in displacement of animals from an area larger than the actual disturbance area. The total extent of habitat loss as a result of the wildlife avoidance response is impossible to predict because the degree of this response varies from species to species and can even vary between individuals of the same species. Also, after initial avoidance of human activity and noise-producing areas, certain wildlife species may acclimate to the activity and begin to reoccupy areas formerly avoided. For example, during the initial development phases, it is likely that big game (i.e., pronghorn and deer) would be displaced from a larger area than the actual disturbance sites due to the avoidance response. However, these big game species have demonstrated the ability to acclimate to a variety of activities as long as human harassment levels do not increase substantially (Ward 1976). Therefore, it is possible that the extent of displacement would approximate the actual disturbance area after the first few years of mine operation (Ward 1976). In addition to avoidance response, increased human presence intensifies the potential for wildlife/human interactions ranging from harassment of wildlife to poaching and legal harvest.

Studies also have shown that reductions in bird population densities in both open grasslands and woodlands also may be attributed to a reduction in habitat quality produced by elevated noise levels (Reijnen et al. 1997, 1995). Although visual stimuli in open landscapes may add to density effects at relatively short distances, the effects of noise appear to be the most critical factor since breeding birds of open grasslands (threshold noise range of 43 to 60 decibels on the A-weighted scale [dBA]) and woodlands (threshold noise range of 36 to 58 dBA) respond very similarly to disturbance by traffic volume (Reijnen et al. 1997). Reijnen et al. (1996) determined a threshold effect for bird species to be 47 dBA, while a New Mexico study in a piñon-juniper community found that impacts of gas well compressor noise on bird populations were strongest in areas where noise levels were greater than 50 dBA. However, moderate noise levels (40 to 50 dBA) also showed some effect on bird densities in this study (LaGory et al. 2001).

Based on the results of the noise measurement conducted in and around the Hollister Site (see Section 3.23, Noise), existing levels of noise at and near the Hollister Site are relatively low and not expected to increase significantly as a result of the proposed project. Therefore, impacts to wildlife species from increased noise are anticipated to be low. Details regarding noise impacts to greater sage-grouse are presented in Section 3.14, Special Status Species.

Several factors would combine to help minimize the potential effects related to human presence in the study area. First, the Proposed Action is an expansion of an existing Hollister Site where human activity associated with underground exploration operations continues to date. Second, RCG would continue to implement its mandatory employee education program for all personnel working in and around the Hollister Site. Third, the potential for increased wildlife mortalities from vehicles along the mine access roads is expected to remain negligible, due to mine-regulated speed limits on mine roads, and bus/van transportation to and from the Hollister Site for mine employees traveling from Winnemucca, Nevada.

Water Management Activities

As discussed in Section 3.6, Surface Water Resources and Watersheds, disposal of excess mine water into Little Antelope Creek, is not anticipated to affect groundwater quality or the surface water quality of associated seeps, springs, or gaining reaches of streams (e.g., Little Antelope Creek). As a result, there would be no associated impacts to wildlife species associated with water quality.

Under the Proposed Action, continuous mine water discharging into Little Antelope Creek may expand riparian habitat along Little Antelope Creek as the amount of surface water increases. This would create additional habitat and water sources for wildlife, thus creating a beneficial impact to wildlife species that utilize the riparian areas along Little Antelope Creek for the 20-year life of the project. It is anticipated that this newly created riparian habitat and available surface water along Little Antelope Creek would decline to current levels once groundwater pumping operations cease. This would have a negative impact to wildlife species that have been accustomed to utilizing these riparian areas. It is likely that impacts would be more pronounced for species such as migratory birds and amphibians due to their association with riparian habitats and water sources.

Under the Proposed Action, RCG would continue groundwater pumping operations at the Hollister Site and increase pumping rates from current levels of 400 gallons per minute (gpm) to an estimated maximum of 1,100 gpm. As discussed in Section 3.6, Surface Water Resources and Watersheds and Section 3.9, Riparian and Wetland Areas, groundwater drawdown under the Proposed Action has the potential to impact surface water features (e.g., seeps, springs) in four spring complexes and 12 acres of associated wetland habitat and riparian habitat within the maximum extent of the 10-foot groundwater drawdown contour (**Figure 3.6-2**). Given the total of 408 acres of wetland habitat and 560 acres of riparian habitat within the maximum extent of the 10-foot groundwater drawdown contour, the Proposed Action may impact 2.9 percent and 1.6 percent of the wetland habitat and riparian habitat, respectively. Therefore, impacts to wildlife that utilize any impacted wetland and riparian habitats within the maximum extent of the 10-foot groundwater drawdown contour would increase as a result of increased groundwater pumping, but would decrease once geotechnical water removal operations cease and groundwater levels rebound. Therefore, impacts would include a potential decrease in available surface water and associated riparian and wetland vegetation.

Hazardous Materials Spill

The possibility of a transportation-related spill of process chemicals along the transportation route is discussed in Section 3.24, Hazardous Materials and Solid Waste. The potential for wildlife exposure to toxic chemicals as a result of a transportation-related spill would be greatest if an accident were to occur near aquatic habitats. Spills in dryland habitat would pose only minimal risk to most wildlife species since these spills would be adjacent to highways and could be rapidly contained and cleaned up. In general, the materials of greatest concern would be sulfuric acid and diesel fuel. The effects of a sulfuric acid release would be highly variable and would depend on the quantity released, the location of the release (e.g., dry upland area, wet meadow area, or flowing stream area), the species exposed, and the chemical conditions at the release location. The most likely effect of a potential release of sulfuric acid would be the poisoning of terrestrial or aquatic species. Animal species that drink contaminated water could suffer severe effects or death depending on the concentration of sulfuric acid and the volume of the water consumed. A diesel spill has the potential to contaminate soil, surface water, and groundwater in addition to harming aquatic life and vegetation. Although unlikely, such a spill also could ignite from the accident and cause a wildfire. Since cleanup actions would take place immediately, diesel contamination has a low potential to result in long-term impacts to soil, surface water, and possibly groundwater. Hazardous chemicals would be transported via U.S. Department of Transportation-certified containers and transporters, and transportation of sulfuric acid and other chemical reagents would be in accordance with all applicable rules and regulations. In addition, as discussed in Section 3.24, Hazardous Materials and Solid Waste, RCG would implement their Spill Prevention, Control, and Countermeasures Plan that establishes procedures for responding to accidental spills or releases of hazardous materials to minimize environmental risks.

3.12.2.2 Mud Springs Road Transmission Line Alternative

Impacts to wildlife resources would be the same as described for under the Proposed Action except the transmission line under this alternative would disturb 9.5 and 15.2 fewer acres of vegetation (50 percent sagebrush shrubland and 50 percent grassland) for North and South Options, respectively. This would reduce the extent of impacts associated with habitat disturbance, habitat fragmentation, and bird/bat collisions with the transmission line.

3.12.2.3 Mud Springs Waste Rock Storage Facility Alternative

Impacts to wildlife resources would be the same as described for the Proposed Action except for an additional 18.9 acres of disturbance to grassland habitat as a result of the Mud Springs Waste Rock Storage Facility (WRSF) and Mud Springs Road Diversion. The Mud Springs Road Diversion has the potential to increase habitat fragmentation; however, 30 percent of the 18.9 acres of grassland habitat disturbance occurs in previously burned (2005) habitat. Consequently, this area has already experienced habitat loss and fragmentation as a result of wildfires and any additional impacts to wildlife resources as a result of this alternative are expected to be low. Developing a stable land form design for the Mud Springs Waste Rock Facility that compliments the surrounding topography may reduce impacts to wildlife associated with human presence and noise.

3.12.2.4 Backfill Alternative

Impacts to wildlife resources would be the same as described for the Proposed Action except for an additional 10.6 acres of primarily grassland habitat would be lost temporarily until reclamation activities are completed. After closure and reclamation, noise and activity associated with the Backfill Alternative would be eliminated. Areas would be returned to wildlife habitat once re-seeded and successfully reclaimed.

3.12.2.5 No Action Alternative

Under the No Action Alternative, the Hollister Development Block Project would continue to operate under existing authorizations. The proposed project would not be developed, and the associated potential impacts to wildlife would not occur.

3.12.3 Cumulative Impacts

The CESAs for wildlife resources encompass a portion of NDOW's Management Area 6 (Hunting Units 062, 064, 067, and 068) as depicted in **Figures 3.12-1**, **3.12-2**, and **3.12-3**. The CESAs were determined by the BLM and NDOW based on wildlife use in the region and include a contiguous area that provides very important seasonal habitat for general wildlife species as well as mule deer and pronghorn. Generally, the CESAs extend from the northern end of the Independence Range in the north to the Humboldt River and northern end of the Piñon Range to the South. Cumulative impacts to wildlife resources would primarily be directly related to habitat loss, habitat fragmentation, and animal displacement. Cumulative effects on wildlife in the CESAs have resulted primarily from wildfires, mineral exploration, mining activities, noxious weeds and non-native invasive plant species, livestock grazing, drought, urbanization, and seeding of native range with introduced herbaceous species (BLM 2010d,e). Other industrial development activities in the area that result in habitat disturbance, fragmentation, and animal displacement include power plants, transmission lines, pipelines, and roads (BLM 2010d,e). Development of reasonably foreseeable mine projects would continue to impact big game in their respective CESAs. However, most mine areas proposed for development within the Carlin Trend typically have been within or adjacent to existing mine areas (BLM 2010d,e).

Past and present actions and RFFAs (Section 3.2) for mining activities in the wildlife, mule deer, and pronghorn CESAs resulted, or would result, in the direct disturbance of habitat (**Table 3.12-2**). A portion of the cumulative disturbance areas have been, or would be, reclaimed or has recovered

materially (i.e., wildfire areas). The reclaimed areas, and areas associated with habitat conversion, would be capable of supporting wildlife use; however, species composition and densities may change.

Within the wildlife, mule deer, pronghorn, and elk CESAs (**Figures 3.12-1** through **3.12-4**) mining has removed wildlife habitat, primarily as a function of fencing and/or land disturbance associated with mining operations. The proposed project and other mining operations within the Carlin Trend are located in the vicinity of migration corridors that connect important summer and winter range for big game (primarily mule deer and pronghorn). By definition, a wildlife movement corridor is a linear habitat with a primary function of connecting at least two significant habitat areas (Sawyer et al. 2005). Throughout the western U.S., big game species rely on seasonal ranges to satisfy their annual nutritional and energetic requirements (Sawyer et al. 2005). Over the past 10 to 20 years, seasonal big game movement corridors have been restricted due to mining operations in the project region (Area 6 Mule Deer Working Group 2010; BLM 2010d,e 2008b).

Within the mule deer CESA, a large herd of mule deer migrates south from their summer range in the Tuscarora Range, Independence Range, and Santa Renia Mountains to their winter range in the lower elevations of Boulder Valley, Dunphy Hills, Izzenhood area, and the southern end of the Sheep Creek Range (Area 6 Mule Deer Working Group 2010; BLM 2010d,e 2008b; NDOW 2010b). The Carlin Trend and surrounding areas developed by mining operations, including Betze/Post, Genesis/Blue Star, Lantern, Mill #1, Bootstrap /Capstone, Tara, Rossi, Dee, and Ren mines, is a mule deer migration corridor for movement to and from the winter range in the Dunphy Hills. Up to 4,000 deer migrate through this area twice annually. Due to the recent expansion of mining developments along the Tuscarora Range, little opportunity remains for north/south big game movement in Management Area 6 (Area 6 Mule Deer Working Group 2010; BLM 2008b; NDOW 2010b). This restriction has created a significant impact to the mule deer migration in this part of the Carlin Trend. In addition, wildfire has created one of the primary cumulative effects on these species. **Figure 3.12-1** describes wildlife habitat and vegetation. As shown in **Figure 3.2-3** and **Table 3.12-2**, from 1980 to 2009, thousands of acres of wildlife habitat have been impacted by large-scale wildfires. Wildfire has resulted in the long-term loss of shrubs that provide forage and cover as habitat components, which has caused reductions in mule deer and pronghorn herds throughout their respective CESAs. Effects of wildfires to terrestrial wildlife species include loss of habitat (forage and cover), which can lead to die-offs of mule deer and pronghorn as well as other species. The loss of shrub canopy cover and forb and grass diversity is prevalent across the burned areas and the recovery of these plant communities varies in terms of time and cover. In many areas, native shrub communities have been replaced by cheatgrass-dominated grasslands (Area 6 Mule Deer Working Group 2010; BLM 2010d,e). A breakdown of cumulative disturbance by the Proposed Action, wildfire, and mining operations is presented in **Table 3.12-2**.

Nesting raptor species also would be susceptible to these cumulative impacts since encroaching human activities along the Carlin Trend have resulted in bird displacement and habitat fragmentation in areas that may be at their relative carrying capacity for these resident species. Mine groundwater pumping activities within the CESAs could result in a reduction or loss of flows in springs and seeps that support wildlife and wildlife habitat (i.e., wetlands and riparian areas) (BLM 2010d). Reductions or elimination of flows in springs and seeps could impact wildlife species dependent on these sites (e.g., birds and amphibians) and may impact the distribution and use of habitat by other species of wildlife (e.g., big game and bats).

Many of the local wildlife populations (e.g., small game, migratory birds) that occur in the CESA would continue to occupy their respective ranges and breed successfully, although population numbers may decrease relative to the amount of cumulative habitat loss and disturbance from incremental development and groundwater pumping activities.

Table 3.12-2 Cumulative Wildlife, Mule Deer, and Pronghorn Habitat Disturbance

CESA and Habitat Type[1,2]	Total Acres of Habitat	Acres of Habitat Disturbed by Fire[3]	Acres Disturbed by Proposed Action	Acres of Habitat Disturbed by Mining Operations (Past, Present, RFFAs[4])	Total Acres of Habitat Disturbed
Wildlife	2,389,947	1,131,690 (47%)	129[5] (<1%)	38,622 (2%)	1,170,441 (49%)
Mule Deer - Limited Use	1,087,735	468,225 (43%)	84 (<1%)	31,448 (3%)	499,757 (46%)
Mule Deer - Transitional	553,849	315,304 (57%)	24[5] (<1%)	3,978 (4%)	319,306 (58%)
Pronghorn - Summer	1,199,893	723,871 (60%)	117 (<1%)	36,452 (3%)	760,440 (63%)
Elk - Low-density	776,312	496,482 (64%)	96[5] (<1%)	23,348 (3%)	519,926 (67%)
Elk - Crucial Winter	256,765	183,622 (>2%)	12 (<1%)	2,651 (1%)	186,285 (73%)

1 The special status CESA is identical to the wildlife CESA, excluding greater sage-grouse.

2 Habitat types such as mule deer summer habitat and pronghorn crucial winter habitat are not impacted by the proposed project and therefore not included in the cumulative analysis.

3 Fire data used for this analysis has been further refined and modified since the Betze Pit Expansion Supplemental Environmental Impact Statement (BLM 2008b).

4 See **Table 3.2-1** for breakdown of mining projects.

5 Includes 12 acres of potentially impacted wetland habitat within the maximum extent of the 10-foot groundwater drawdown contour as a result of groundwater pumping. Riparian habitat also would be impacted, but is not quantified.

Source: BLM 2011d; U.S. Geological Survey 2004.

Cumulative impacts to wildlife resources for the Mud Springs Road Transmission Line, Mud Springs WRSF, and Backfill alternatives generally would be the same as described for the Proposed Action. The exception would be 9.5 or 15.2 acres less habitat disturbance and reduced habitat fragmentation associated with the Mud Springs Road Transmission Line Alternative (North and South Options), 18.9 acres more surface disturbance for the Mud Springs WRSF, and 10.6 acres more disturbance for the Backfill Alternative.

3.12.4 Potential Monitoring and Mitigation Measures

No additional mitigation measures have been identified for wildlife resources.

3.12.5 Residual Impacts

All disturbance from the Proposed Action would be reclaimed. Residual impacts to wildlife resources under the Proposed Action would include the long-term loss of 43.8 acres of sagebrush shrubland. The loss of shrub-dominated communities would represent a long-term change in wildlife habitat composition (i.e., shrub-dominated communities to grass/forb dominated communities) under the Proposed Action because it would take up to approximately 25 years for mature shrubs to become established in these communities. In addition, 12 acres of wetland habitat and some riparian habitat may be impacted in the long-term under the Proposed Action due to the impacts associated with groundwater pumping within the maximum extent of the 10-foot groundwater drawdown contour.