US Department of the Interior
Bureau of Land Management
Winnemucca District, Nevada

Burning Man Event Special Recreation Permit
Environmental Impact Statement

BIOLOGICAL RESOURCES BASELINE REPORT
MARCH 2019

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ACRONYMS AND ABBREVIATIONS

Acronym	Full Phrase
ACOE	US Army Corps of Engineers
BLM	United States Department of the Interior, Bureau of Land Management
CFR	Code of Federal Regulations
EIS	environmental impact statement
°F	degrees Fahrenheit
IPaC	Information for Planning and Consultation
LCT	Lahontan cutthroat trout
LED	light-emitting diode
MBTA	Migratory Bird Treaty Act
mph	miles per hour
NCA	National Conservation Area
NDOW	Nevada Department of Wildlife
NNHP	Nevada Natural Heritage Program
NWI	United States Fish and Wildlife Service National Wetland Inventory
OHV	off-highway vehicle
SRP	Special Recreation Permit
USC	United States Code
USFWS	United States Department of the Interior, Fish and Wildlife Service

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Chapter 1. Introduction

This section presents important introductory information and lays out the basis for this wildlife resources effects synthesis. It presents a list of wildlife agencies consulted in preparation of the Burning Man Event Draft Environmental Impact Statement (EIS) and summarizes the results of internal and public scoping with respect to wildlife resources issues.

1.1 PROPOSED SPECIAL RECREATION PERMIT/PROJECT INFORMATION

The Burning Man event is a combination art festival, social event, and experiment in community living. Burning Man was first held on the Black Rock Desert in 1990 and has continued on an annual basis. The Burning Man organization, Black Rock City LLC (applicant), is applying for a 10-year Special Recreation Permit (SRP) under 43 CFR 2930 to conduct the Burning Man event on public lands administered by the Bureau of Land Management (BLM). The proposed Burning Man event would be beyond the scope of the existing 2012 Burning Man Environmental Analysis; thus, the BLM has identified the need for a new or enhanced analysis due to the new event parameters.

Please refer to Chapter 1 of the Draft EIS for detailed information.

1.2 RELATION TO THE DRAFT EIS

This document provides a review and synthesis of the potential environmental effects of Alternative A (Proposed Action) on wildlife resources. It is anticipated that the effects analyses in the Draft EIS, including for migratory birds, fish and wildlife, and special status wildlife species, would reference this document in order to help reduce the overall size and increase the readability of the Draft EIS.

1.3 WILDLIFE AGENCIES CONSULTED

The following wildlife agencies were contacted to help characterize wildlife resources in the project area:

- US Fish and Wildlife Service (USFWS) Information for Planning and Consultation (IPaC) query, December 2017
- Nevada Department of Wildlife (NDOW), November 2017
- Nevada Natural Heritage Program (NNHP), November 2017

Records of consultation are provided in **Attachment 1** of this document.

1.4 INTERNAL SCOPING AND PUBLIC OUTREACH SUMMARY

In November 2017, the BLM issued a press release to the public for a series of public outreach meetings with the goal of soliciting early public input regarding the proposed renewal of the Burning Man event SRP. Three public outreach meetings were held, on December 4, 5, and 6 in Gerlach, Reno, and Lovelock, Nevada. The press release also solicited input on the issues, impacts, and potential alternatives, and the public was encouraged to send comments to blm_nv_burningmaneis@blm.gov.

A total of 77 pieces of correspondence were received during the public outreach period. Potential topics and issues relating to wildlife resources and effects on these resources were identified during this process. Issues were further developed during internal meetings between the BLM and cooperating wildlife agencies. Issues are summarized below. These topics and issues were used to develop the outline of this document.

- What are the current and proposed impacts of the Burning Man event on wildlife?
- What are the Burning Man event's impacts on nearby aquatic species?
- What are the environmental impacts of increasing the number of participants allowed to attend the Burning Man event?

For a detailed summary of the public outreach process, please refer to the Public Outreach Technical Memorandum (BLM 2018).

The public and wildlife agencies will have additional opportunities for future input on topics and issues relating to wildlife resources, such as during the Draft EIS review. If additional issues relating to potential wildlife impacts are identified, they will be addressed during the Final EIS preparation.

Chapter 2. Affected Environment Summary

This section summarizes the affected environment for wildlife resources in the planning area and provides a brief project area description. It is organized into the same supplemental authorities and additional affected resources that are analyzed in the EIS.

2.1 ASSESSMENT AREAS

The assessment areas are the spatial boundaries of where the effects of the Alternative A (Proposed Action) are evaluated. These are also the areas for which the affected environment for each resource is described (See EIS Appendix E).

For biological resources, the affected environment and effects assessment area (**Figure 1**) for direct effects is the Closure Area and event access road. For indirect effects, the assessment area is the playa, adjacent dunes, access roads, travel routes (with a distance of 0.5 miles on each side of the route), and points of interest, such as hot springs in the Black Rock Desert-High Rock Canyon Emigrant Trails National Conservation Area (NCA). Travel routes are as follows:

- County Road 447, north of Gerlach to the Nevada state line (Cedarville Area)
- State Route 447, from Wadsworth to Gerlach
- Jungo Road
- County Road 34 (within the NCA)

2.2 PROJECT AREA DESCRIPTION

2.2.1 General Setting

The Black Rock Desert landscape consists of a large, barren playa and adjacent wind-formed mounds, sheet sands, dunes, alluvial slopes, terraces, foothills, and mountains. The Black Rock Desert playa is one of the largest flat surfaces on earth. Elevations for approximately 120 square miles (310 square kilometers) of the playa differ within a 3-foot (1-meter) range, with elevations ranging from 3,905 to 3,908 feet (1,190.2 to 1,191.2 meters).

Most of the proposed Burning Man Closure Area (14,820 acres) is in the Black Rock Desert-High Rock Canyon NCA. Almost 1,400 acres along the southern border of the Closure Area are outside the NCA, which was established by legislation in 2000 (Public Law 106-554). The act includes language related to permitting of large-scale recreation events: "[t]he Secretary may continue to permit large-scale events in defined, low impact areas of the Black Rock Desert playa in the conservation area in accordance with the management plan…"

Alternative A (Proposed Action) is in the southwestern portion of the playa. Here the surface is a flat, unvegetated ephemeral lakebed. Variations in surface relief develop seasonally. Wind and water change the shape and size of dunes, sheets of silt and sand, and mounds.

2.2.2 Climate

The climate in the region is semiarid and characterized by warm, dry summers. The nearest weather station with recent (2008) data is at the Lovelock airport in central Pershing County.

Mean annual precipitation for the period of record (1996–2008) is 5.24 inches. During August and September, the average monthly precipitation is 0.17 and 0.21 inches, respectively; maximum daily averages for each month are 0.52 and 0.60 inches, respectively.

Average high temperatures are 94 degrees Fahrenheit (°F) in August and 84°F in September; average low temperatures are 52°F and 43°F. During August and September, daily average peak gusts are 25 and 21 miles per hour (mph), respectively. The maximum peak wind gusts recorded were 58 mph in August 2003 and 53 mph in September 2002 (WRCC 2017).

2.2.3 Soils

The Black Rock Desert playa is a remnant of the former lakebed of Pleistocene Lake Lahontan (Adams and Sada 2010). Playas occupy the flat central basins of desert plains with interior drainage and where evaporation greatly exceeds water inflow.

The Black Rock Desert playa is composed primarily of fine-grained sediments dominated by clay and silt, with a small percentage of fine-grained sand. The sediments are highly alkaline and contain varying amounts of soluble salts. The fine-grained clayey sediments form a hard, durable crust over the playa surface as the water that inundates the area in the winter evaporates and the sediments dry out (Bilbo 2008).

As the sediments dry out, polygonal desiccation cracks form that may be up to a foot or so in diameter and may extend several feet below the surface (Bilbo 2008). This hard crust reduces wind-driven erosion of the fine playa sediments.

A review of the West Pershing County Soil Survey (USDA NRCS 1998) indicates that most of the Closure Area is underlain by a soil unit labeled "playas;" this is classified as a "miscellaneous area," which has little to no soil material and supports little to no vegetation.

2.3 Migratory Birds

The Migratory Bird Treaty Act (MBTA) (16 USC 703 et. seq.) protects migratory birds and their nests, including eggs and young. A list of MBTA-protected birds is found in 50 CFR 10.13). The potential for migratory bird species to occur in the assessment area was based on a review of protected species under the MBTA, local habitat, and information from the NDOW and USFWS.

The assessment areas for analysis of migratory birds are described in **Section 2.1**, Assessment Areas, and shown in **Figure 1**.

The Pacific Flyway is a north-south flight path used by migratory birds in North and South America. It extends from Alaska to Patagonia in Argentina; it includes Alaska, Arizona, California, Idaho, Nevada, Oregon, Utah, Washington, and portions of Colorado, Montana, New Mexico, and Wyoming that are west of the Continental Divide (**Diagram 1**, NOAA 2018).

At least a billion birds migrate along the Pacific Flyway each year and depend on the availability of diverse habitats as stopover points along their route. Stopover sites, such as the playa and surrounding habitat that provide food and water, are critical to migratory birds (Pacific Flyway Council 2017).

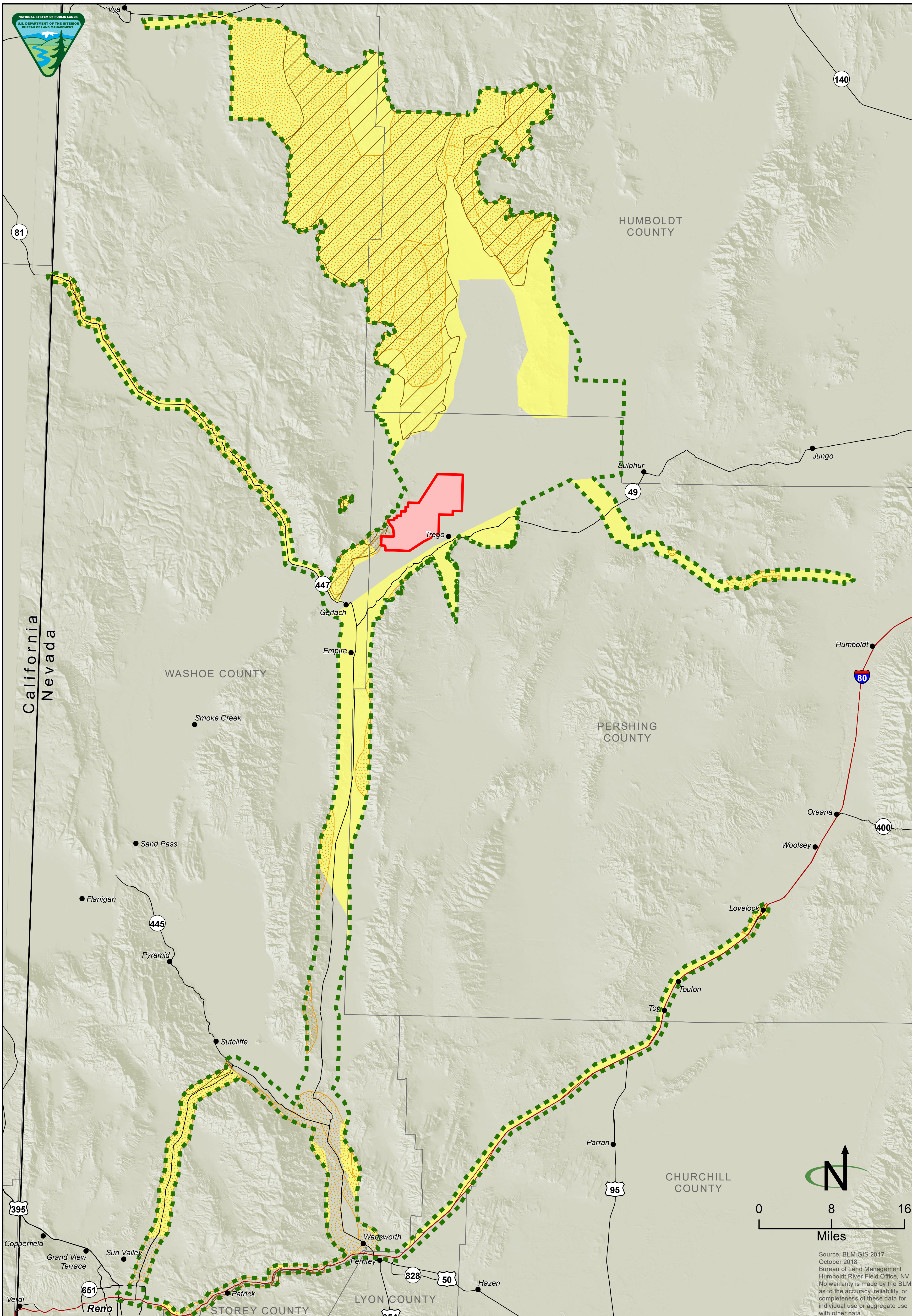

Figure 1
Biological Resources Affected Environment and Effects Assessment Area

Biological resources assessment area
Alternatives analysis area
Bighorn sheep range
Mule deer range
Pronghorn range

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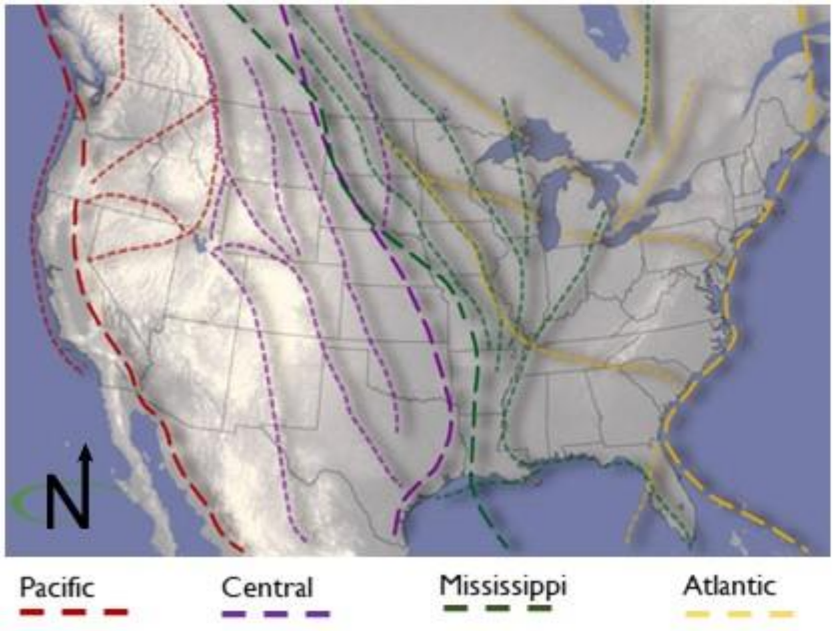
Diagram 1. Migratory Bird Flyways



Source: Hunter Allen. 2010

The potential for migratory bird species in the assessment area was based on a review of protected species under the Migratory Bird Treaty Act (USFWS 2013), local habitat, and information from the NDOW. Other migratory bird species may be present in the assessment area, if suitable habitat exists.

The playa, covering 198,560 acres in the assessment area, provides seasonal habitat for migratory birds during periods of inundation. When flooded, the playa supports phytoplankton, microbes, and crustaceans that are a food source for these birds; however, the value of this area depends on the availability of water, thus it can vary yearly and seasonally (Wildlife Action Plan Team 2012). Species occasionally present on the playa may include common snipe (*Gallinago gallinago*), American bittern (*Botaurus lentiginosus*), least bittern (*Ixobrychus exilis*), killdeer (*Charadrius vociferous*), western snowy plover (*C. alexandrinus nivosus*), willet (*Tringa semipalmata*), American avocet (*Recurvirostra americana*), long-billed curlew (*Numenicus americanus*), northern pintail (*Anas acuta*), canvasback (*Aythya valisineria*), redhead (*A. americana*), black tern (*Chlidonias niger*), long-billed dowitcher (*Limnodromus scolopaceus*), western sandpiper (*Calidris mauri*), Wilson's phalarope (*Phalaropus tricolor*), red-necked phalarope (*P. lobatus*), American white pelican (*Pelecanus erythrorhynchos*), and bald eagle (*Haliaeetus leucocephalus*) (Wildlife Action Plan Team 2012; NDOW 2017a).

In addition, salt-desert scrub and sagebrush scrub surround the playa. This consists of upland vegetation communities, with a shrubland aspect and variable understory of grasses and forbs. These communities provide food, structure, shelter, and thermal relief for migratory birds. The species that may use this habitat type are black-throated sparrow (*Amphispiza bilineata*), Brewer's blackbird (*Euphagus cyanocephalus*), Brewer's sparrow (*Spizella breweri*), canyon wren (*Catherpes mexicanus*), gray flycatcher (*Empidonax wrightii*), green-tailed towhee (*Pipilo chlorurus*), loggerhead shrike (*Lanius ludovicianus*), rock wren (*Salpinctes obsoletus*), sage sparrow (*Amphispiza belli*), sage thrasher (*Oreoscoptes montanus*), western meadowlark (*Sturnella neglecta*), and vesper sparrow (*Pooecetes gramineus*) (Great Basin Bird Observatory 2004).

Pinyon-juniper woodland is an open forest dominated by low, bushy junipers, pinyon pines, and associated species. Migratory birds that may use this habitat type are black-throated sparrow, Brewer's blackbird, Brewer's sparrow, canyon wren, gray flycatcher, rock wren, sage sparrow, sage thrasher, western meadowlark, vesper sparrow, gray vireo (*Vireo vicinior*), pinyon jay (*Gymnorhinus cyanocephalus*), mountain bluebird (*Sialia currucoides*), western scrub-jay (*Aphelocoma californica*), juniper titmouse (*Baeolophus ridgwayi*), black-throated gray warbler (*Dendroica nigrescens*), Cassin's finch (*Carpodacus cassinii*), chucker (*Alectoris chukar*), common raven (*Corvus corax*), and common nighthawk (*Chordeiles minor*) (Great Basin Bird Observatory 2004).

Riparian areas are crucial sources of water, food, and structure for migratory birds. Species that may use montane riparian areas in the playa area are MacGillivray's warbler (*Oporornis tolmiei*), Wilson's warbler (*Wilsonia pusilla*), warbling vireo (*Vireo gilvus*), Lewis' woodpecker (*Melanerpes lewis*), red-naped sapsucker (*Sphyrapicus nuchalis*), Virginia's warbler (*Vermivora virginiae*), orange-crowned warbler (*V. celata*), calliope hummingbird (*Stellula calliope*), broad-tailed hummingbird (*Selasphorus platycercus*), fox sparrow (*Passerella iliaca*), song sparrow (*Melospiza melodia*), Lincoln's sparrow (*M. lincolnii*), dark-eyed junco (*Junco hyemalis*), willow flycatcher (*Empidonax traillii*), dusky flycatcher (*E. oberholseri*), brown-headed cowbird (*Molothrus ater*), American robin (*Turdus migratorius*), house finch (*Carpodacus mexicanus*), and Cassin's finch (Great Basin Bird Observatory 2004).

Species that may use lowland riparian areas are American robin, bank swallow (*Riparia riparia*), barn swallow (*Hirundo rustica*), Bewick's wren (*Thryomanes bewickii*), black-chinned hummingbird (*Archilochus alexandri*), black-headed grosbeak (*Pheucticus melano-cephalus*), broad-tailed hummingbird, brown-headed cowbird, downy woodpecker (*Picoides pubescens*), house finch, house wren (*Troglodytes aedon*), lazuli bunting (*Passerina amoena*), lesser goldfinch (*Carduelis psaltria*), northern flicker (*Colaptes auratus*), northern mockingbird (*Mimus polyglottos*), northern oriole (*Icterus galbula*), northern rough-winged swallow (*Stelgidopteryx serripennis*), song sparrow (*Melospiza melodia*), spotted sandpiper (*Actitis macularia*), tree swallow (*Tachycineta bicolor*), violet-green swallow (*T. thalassina*), warbling vireo (*Vireo gilvus*), western kingbird (*Tyrannus verticalis*), western wood-pewee (*Contopus sordidulus*), willow flycatcher, yellow-breasted chat (*Icteria virens*), and yellow warbler (*Dendroica petechia*) (Great Basin Bird Observatory 2004).

Migratory birds visiting the playa during periods of inundation provide forage for raptors, which use diverse habitat types, such as desert scrub, and may reside in the vicinity of the assessment area. Raptor species with distribution ranges that include the assessment area surrounded by 4 miles (NDOW 2017) are American kestrel (*Falco sparverius*), bald eagle, barn owl (*Tyto alba*), burrowing owl (*Athene cunicularia*), Cooper's hawk (*Accipiter cooperii*), ferruginous hawk (*Buteo regalis*), golden eagle (*Aquila chrysaetos*), great horned owl (*Bubo virginianus*), long-eared owl (*Asio otus*), merlin (*Falco columbarius*), northern goshawk (*Accipiter gentilis*), northern harrier (*Circus cyaneus*), northern saw-whet owl (*Aegolius acadicus*), osprey (*Pandion haliaetus*), peregrine falcon (*Falco peregrinus*), red-tailed hawk (*Buteo jamaicensis*), rough-legged hawk (*B. lagopus*), sharp-shinned hawk (*Accipiter striatus*), short-eared owl, Swainson's hawk (*Buteo swainsoni*), turkey vulture (*Cathartes aura*), and western screech owl (*Otus kenni-cottii*).

Mature trees in the assessment area may support nesting northern goshawk and great-horned owl (*Bubo virginianus*). Cliff and rim habitats in the assessment area, particularly near High Rock Canyon, support high densities of nesting raptors, such as golden eagle, peregrine falcon, and prairie falcon (*Falco mexicanus*) (Great Basin Bird Observatory 2004). Northern goshawk, peregrine falcon, and prairie falcon have been directly observed in the vicinity of the Closure Area, and there are 15 known raptor nest sites within ten miles of it (NDOW 2017).

2.4 SPECIAL STATUS SPECIES

The assessment area for special status species analysis is described in **Section 2-1**, Assessment Areas, and shown in **Figure 1**. The potential for special status species to occur in the assessment area was determined by reviewing existing data sources of known occurrences and suitable habitat. Based on a search of the NNHP database (2017), and NDOW diversity database (2017a), and knowledge of the area, the species listed in **Table 2-1** are known to occur or have the potential to occur within the assessment area. Other special status species may be present in the assessment area if suitable habitat exists.

Table 2-1
Special Status Species Occurring in the Burning Man Assessment Area

Species	Scientific Name	Common Name	Status
Plants	*Cryptantha schoolcraftii*	Schoolcraft catseye	BLM sensitive
	Eriogonum crosbyae	Crosby buckwheat	ESA species of concern, BLM sensitive
	Ivesia rhypara	Grimy mousetails	ESA species of concern, BLM sensitive
	Mentzelia mollis	Smooth stickleaf	BLM sensitive
	Astragalus tiehmii	Tiehm milkvetch	BLM sensitive
	Oryctes nevadensis	Oryctes	BLM sensitive
Reptiles and Amphibians	*Lithobates pipiens*	Northern leopard frog	BLM sensitive, state protected
Birds	*Centrocercus urophasianus*	Greater sage-grouse	BLM sensitive, state protected
	Charadrius alexandrinus	Western snowy plover	BLM sensitive, State protected
	Falco peregrinus	Peregrine falcon	BLM sensitive, State protected
	Aquila chrysaetos	Golden eagle	BLM sensitive, State protected
	Athene cunicularia hypugaea	Western burrowing owl	BLM sensitive, State protected
	Buteo swainsoni	Swainson's hawk	BLM sensitive, State protected
	Gymnorhinus cyanocephalus	Pinyon jay	BLM sensitive, State protected
	Lanius ludovicianus Loggerhead	Loggerhead shrike	BLM sensitive, State protected
	Spizella breweri	Brewer's sparrow	State protected
	Asio flammeus	Short-eared owl	BLM sensitive, State protected
Mammals	*Brachylagus idahoensis*	Pygmy rabbit	BLM sensitive, State protected
	Lasionycteris noctivagans	Silver-haired bat	BLM sensitive
	Parastrellus hesperus	Canyon bat	BLM sensitive
	Antrozous pallidus	Pallid bat	BLM sensitive, State protected
	Corynorhinus townsendii	Townsend's big-eared bat	BLM sensitive, State protected
	Lasiurus cinereus	Hoary bat	BLM sensitive
	Myotis californicus	California myotis	BLM sensitive
	Myotis ciliolabrum	Western small-footed myotis	BLM sensitive
	Myotis thysanodes	Fringed myotis	BLM sensitive, State protected
	Myotis volans	Long-legged myotis	BLM sensitive
	Tadarida brasiliensis	Brazilian free-tailed bat	BLM sensitive, State protected
	Ovis canadensis	Bighorn sheep	BLM sensitive
	Eptesicus fuscus	Big brown bat	BLM sensitive
	Myotis evotis	Long-eared myotis	BLM sensitive

Source: NNHP 2017; NDOW 2017a; BLM 2012a

Although there are no resident special status species on the playa, more than 25 silver-haired bats were recorded there (BLM 2012a); however, because roosting habitat is not present on the playa, these bats were likely foraging or were observed flying.

The remainder of the special status species listed in in **Table 2-1** may occur in suitable habitat throughout the assessment area.

Greater Sage-Grouse

On September 22, 2015, the BLM signed the Record of Decision (ROD) and Approved Resource Management Plan Amendment for Nevada and Northeastern California (BLM 2015). The RMP Amendment and ROD include greater sage-grouse habitat management direction through land use allocations that apply to the species' habitat. **Figure 2** depicts greater sage-grouse habitat management areas found in the biological resources assessment area. The management areas are priority habitat management areas (PHMAs), general habitat management areas (GHMAs), and other habitat management areas (OHMAs).

In 2016, the USGS released updated greater sage-grouse habitat data (Coates et al. 2016; see **Figure 3**). The USGS data identifies greater sage-grouse habitat types as core, priority, and general habitats. For the purposes of describing habitat, the BLM's greater sage-grouse habitat management areas and USGS habitat types correspond as follows: core habitat is equivalent to PHMA, priority habitat is equivalent to GHMA, and general habitat is equivalent to OHMA. This EIS uses the 2016 USGS habitat data, which is the best available science, to identify greater sage-grouse habitat; this data does not replace or modify the adopted habitat management areas.

According to the updated greater sage-grouse habitat data, there are approximately 280 acres of General Habitat in the Closure Area (USGS GIS 2016). There are no greater sage-grouse habitat management areas in the Closure Area according to the BLM 2015 RMP Amendment and ROD. There is no greater sage-grouse lekking, nesting, summer, or winter habitat in these areas. There are no leks within 4 miles of the Closure Area (NDOW 2017).

Travel routes in the assessment area traverse greater sage-grouse Core, Priority, and General Habitat. SR-447 between Gerlach and Cedarville in particular, traverses a relatively large amount of Core Habitat. There is greater sage-grouse lekking, nesting, summer, and winter habitat in these areas. There are six known active or inactive leks within 4 miles of travel routes (NDOW GIS 2017a).

Bighorn Sheep

Bighorn sheep range in the assessment area is shown in **Figure 1**. There are 70 acres of bighorn sheep year-round range in the southwest portion of the Closure Area, immediately west of CR 34 (NDOW GIS 2017b). There are approximately 380,000 acres of year-round range in the assessment area (NDOW GIS 2017b).

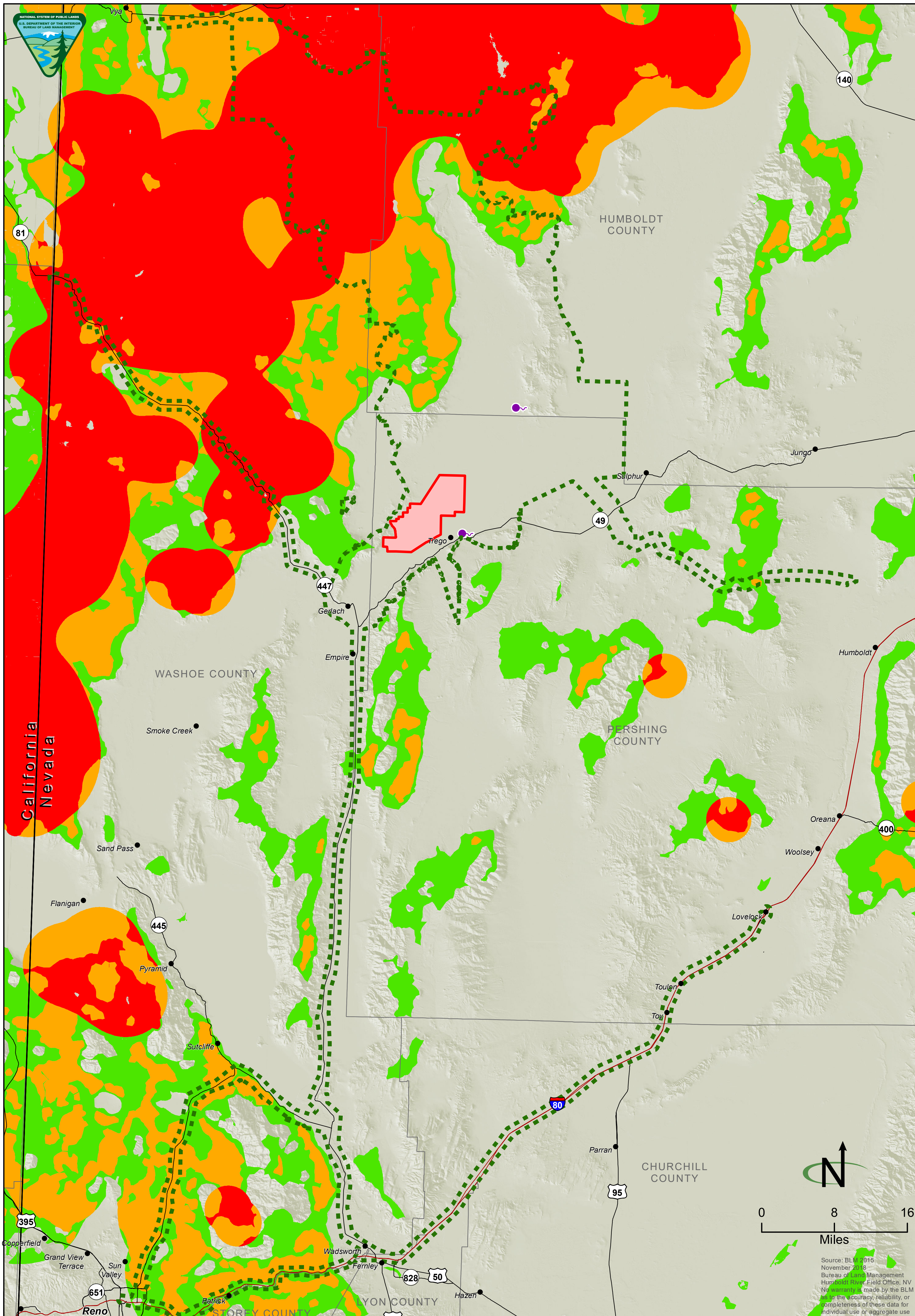


Figure 2, Greater Sage-Grouse Habitat
(BLM 2015 Approved Resource Management Plan Amendment)

Biological resources assessment area
Alternatives analysis area
Hot spring

Sage Grouse Habitat Management
PHMA
GHMA
OHMA

Greater sage-grouse habitat management areas are found in the biological resources assessment area. The management areas are priority habitat management areas (PHMAs), general habitat management areas (GHMAs), and other habitat management areas (OHMAs).

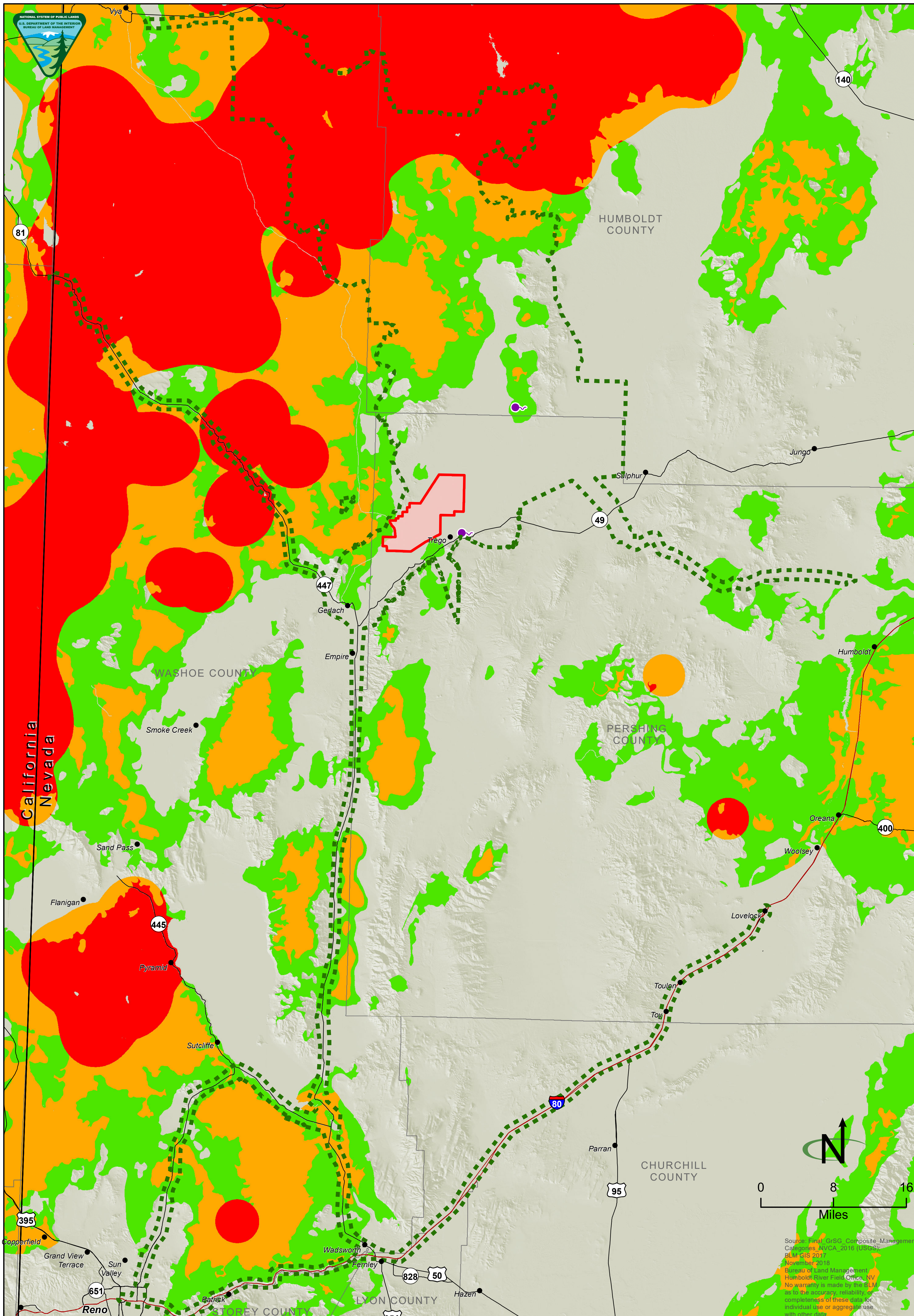


Figure 3, Greater Sage-Grouse Habitat (USGS 2016 Habitat Modelling for Nevada and Northeastern California)

Biological resources assessment area
Alternatives analysis area

Sage Grouse Habitat
Core
Priority
General

In 2016, the USGS released updated greater sage-grouse habitat data (Coates et al. 2016). The USGS data identifies greater sage-grouse habitat types as core, priority, and general habitats. For the purposes of describing habitat, the BLM's greater sage-grouse habitat management areas and USGS habitat types correspond as follows: core habitat is equivalent to PHMA, priority habitat is equivalent to GHMA, and general habitat is equivalent to OHMA. This EIS uses the 2016 USGS habitat data, which is the best available science, to identify greater sage-grouse habitat; this data does not replace or modify the adopted habitat management areas.

2.5 Threatened and Endangered Species

The assessment area for threatened and endangered species analysis is described in **Section 2-1**, Assessment Areas, and shown in **Figure 1**.

The USFWS provided an Official Species List indicating threatened and endangered species that may occur within the biological assessment area and/or may be affected by the proposed project (USFWS 2018). These species, their status, critical habitat, and a description of their habitat are described in **Table 2-2**.

Table 2-2
Threatened and Endangered Species with Potential to Occur in the Assessment Area

Species	Common Name *Scientific Name*	Status	Critical Habitat in Assessment Area (Yes/No/Not Designated)[1]	Habitat
Mammals	North American wolverine *Gulo gulo luscus*	PT	N	No critical habitat has been designated. It occurs in a wide variety of alpine, boreal, and arctic habitats, including boreal forests, tundra, and western mountains throughout Alaska and Canada.
Birds	Yellow-billed cuckoo *Coccyzus americanus*	FT	N	Proposed critical habitat does not overlap the assessment area. Breeding habitat is usually mature riparian woodland with dense stands of cottonwood and willow. Nonbreeding habitat includes various forests, woodlands, and scrub.
Fishes	Cui-ui *Chasmistes cujus*	FE	ND	No critical habitat has been designated. It is found only on the Pyramid Lake Paiute Reservation. It spends most of its life in Pyramid Lake, leaving only to spawn in the lower Truckee River, between March and June.
	Desert dace *Eremichthys acros*	FT	Y	Designated critical habitat overlaps the assessment area. This species is endemic to eight spring systems in the Soldier Meadows area where it inhabits warm springs and their outflow creeks, with temperatures of 64°F–104°F.
	Lahontan cutthroat trout *Oncorhynchus clarki henshawi*	FT	ND	No critical habitat has been designated. This species is native to the Lahontan basin of northern Nevada, eastern California, and southern Oregon. It requires cool, well-oxygenated water with well-vegetated and stable stream banks.

Species	Common Name *Scientific Name*	Status	Critical Habitat in Assessment Area (Yes/No/Not Designated)[1]	Habitat
Insects	Carson wandering skipper *Pseudocopaeodes eunus obscurus*	FE	ND	No critical habitat has been designated. Locally it is distributed in grassland habitats on alkaline substrates in Nevada and California.
Plants	Webber's ivesia *Ivesia webberi*	FT	N	Designated critical habitat for this species does not overlap the assessment area. It is restricted to sites with sparse vegetation and shallow, rocky, clay soils on mid-elevation flats, benches, or terraces between 4,475 and 6,237 feet elevation.

Sources: BLM 2015; USFWS 1995, 1997, 2014a–2014f

[1] Status Codes: FE = federally listed endangered, FT = federally listed threatened, PT = proposed threatened; ND = no critical habitat designated

Although some species listed in **Table 2-2** may occur or have the potential to occur near the Event site, some of these species have not been documented within the biological assessment area and none occur on the Black Rock Playa. Based on information provided on the USFWS and NNHP websites (https://ecos.fws.gov/ and http://heritage.nv.gov/) as well as a review of literature, only the Lahontan cutthroat trout (LCT; *Oncorhynchus clarki henshawi*) and cui-cui (*Chasmistes cujus*) occur or are likely to occur within the biological assessment area (BLM 2012; USFWS 1995, 2014a, 2014b).

Although critical habitat for the desert dace (*Eremichthys acros*) occurs within the biological assessment area, this species is endemic to Soldier Meadows within the Black Rock Desert-High Rock Canyon Emigrant Trails NCA. The 2004 BLM Recreation Management Plan EA (BLM 2004) analyzed the impacts of recreational hot spring use on desert dace. The Event may attract recreationists to visit the NCA. Concerns from recreation in desert dace habitat were addressed in the 2004 recreation management plan EA. Alternative A (Proposed Action) would have no anticipated effects on desert dace or their critical habitat. Therefore, the desert dace was dismissed from further analysis.

The North American wolverine (*Gulo gulo luscus*), yellow-billed cuckoo (*Coccyzus americanus*), Carson wandering skipper (*Pseudocopaeodes eunus obscurus*), and Webber's ivesia (*Ivesia webberi*) were dismissed from further analysis because they are not likely to occur within the biological assessment area and no critical habitat for these species occurs in the biological assessment area (NDOW 2017; USFWS 2002, 2014c, 2014d, 2014e, 2014f, 2014g).

Cui-ui

Cui-ui was federally listed as endangered on March 11, 1967 (*Federal Register*, Volume 32, Number 48). A recovery plan has been finalized (USFWS 1992). A 5-year review for this species was initiated in 2010 (*Federal Register*, Volume 75, Number 98).

Cui-ui is a large, robust sucker fish, with a long, broad, and deep head. The dorsal side of its coarsely scaled body is blackish-brown, with a bluish-gray cast that fades to a creamy-white belly. It weighs up to 7.7 pounds (3.5 kilograms; Miller and Smith 1981). Females have been documented exceeding 27.6

inches (70 centimeters) in length; males are slightly shorter, at 26.1 inches (66 centimeters; USFWS 1992).

The species occurs only in Pyramid Lake and the lower Truckee River, downstream of Derby Dam (USFWS 1992). In the Assessment Area, SR 447 crosses the Truckee River in Nixon, and in places between Wadsworth and Nixon, open water is less than 300 feet from the roadway. SR 427 crosses the Truckee River in Wadsworth, and Interstate 80 runs near the Truckee River for approximately 25 miles between Reno and Wadsworth. Most of this habitat in the Lower Truckee River (below Derby Dam) is occupied seasonally by cui-ui during spawning,[1] (USFWS 1992).

Pyramid Lake provides rearing habitat for larvae, juveniles, and adult cui-ui, while the lower Truckee River provides the primary spawning habitat. Pyramid Lake is saline, alkaline, and monomictic, meaning that the water mixes from top to bottom once during the year. For much of the year, adult and juvenile cui-ui inhabit the littoral (shore) zone, at depths of 60 to 100 feet (18 to 31 meters). Juveniles appear to concentrate at the north and south ends of the lake (USFWS 1992).

Adults, eggs, and larvae may be present in the Truckee River for a maximum of several weeks. They access the river via the Truckee River delta or through the Pyramid Lake fishway. The species spawns between March and June, and most spawners migrate less than 6 miles (9.7 kilometers) upstream. Spawning runs may continue for 4 to 8 weeks, but most fish migrate during a 1- to 2-week period.

In the early 1990s, the elevation of Pyramid Lake was nearly 80 feet (24 meters) lower than it was in the early 1900s, which has exposed structural impediments to fish passage in cui-ui habitat (USFWS 1992). Upstream storage and diversions of water in the Truckee River have reduced inflow to Pyramid Lake. In addition, timber harvesting and irrigated agriculture in the basin in the nineteenth century altered the quantity and quality of Truckee River runoff. Increasing agricultural, municipal, and industrial water demands have altered the volume and timing of river flows, which has disrupted cui-ui reproduction. Further, channelization, grazing, and timber harvesting in and along the Truckee River have reduced riparian canopy and increased bank erosion (USFWS 1992).

Several conservation measures for cui-ui recovery are ongoing. These are passage of the Truckee-Carson-Pyramid Lake Settlement Act of 1990 (PL 101-618), which, in part, authorizes acquisition of sufficient water rights to promote cui-ui recovery and emphasizes lower Truckee River rehabilitation; ongoing research and monitoring; and continued operation of fisheries infrastructure and hatcheries (USFWS 1992; Wildlife Action Plan Team 2012).

Critical habitat has not been proposed or designated for cui-ui.

Lahontan cutthroat trout

LCT was listed as endangered on October 13, 1970 (*Federal Register*, Volume 35, Number 199); it was reclassified as threatened in 1975 (*Federal Register*, Volume 40, Number 137) to facilitate management and to allow and regulate angling. A recovery plan was completed in 1995 (USFWS 1995).

[1] SR 447 is also within approximately 150 feet of the Pyramid Lake Fishway at Marble Bluff just north of Nixon, which may be occupied when in operation.

LCT is a subspecies of cutthroat trout endemic or native to lakes and streams throughout the Lahontan Basin of northern Nevada, eastern California, and southern Oregon. Stream-dwelling LCT average 10 inches (25.4 centimeters) in length, weigh 1 pound (0.45 kilogram), and live less than 5 years; lake-dwelling LCT are larger, at up to 50 inches (1.3 meters) and 40 pounds (18 kilograms), living between 5 and 14 years (USFWS 1995).

LCT optimal stream habitat is clear, cold water with a silt-free substrate and a pool to riffle ratio of one to one. Streams should have a variety of habitats, including areas with slow deep water, abundant instream cover, such as large woody debris, boulders, and undercut banks, and relatively stable streamflow and temperature regimes. Streambanks should be well vegetated to provide cover, shade, and bank stabilization.

LCT also occurs in large terminal alkaline lakes, alpine lakes, slow meandering rivers, and small headwater tributary streams (USFWS 1995); however, it spawns in streams. Spawning takes place between February and July and depends on stream flow, elevation, and water temperature. Females reach sexual maturity at between 3 and 4 years, while males mature at 2 to 3 years (USFWS 1995).

LCT are endemic to the Lahontan Basin of northern Nevada, eastern California, and southern Oregon. At the time of the last 5-year review for the species, it occupied approximately 588 miles (945 kilometers). This represents 9 percent of streams in 16 different hydrologic units in their historical range in the Lahontan basin. The species occupied an additional 53 miles (85 kilometers) of habitat in 11 hydrologic units outside its historical range (out-of-basin), for a total of 641 miles (1,030 kilometers) of occupied stream habitat (USFWS 2009).

In lake habitat, LCT occupied five of their historical lakes: Summit, Independence, Pyramid, Fallen Leaf, and Walker Lakes. This constitutes 47 percent of its historical lake habitat; however, only Summit and Independence Lakes have self-sustaining populations, which comprises less than 1 percent of the historical lake habitat. All other lake populations in the Lahontan Basin are completely maintained by federal, state, and Tribal hatchery stocking programs. LCT are also stocked for recreational purposes into many other lakes, such as Heenan Lake and Red Lake in the Carson River watershed. These lakes are outside its historical range (USFWS 2009).

In the Assessment Area, SR 447 crosses the Truckee River in Nixon, and in places between Wadsworth and Nixon, open water is less than 300 feet from the roadway. SR 427 crosses the Truckee River in Wadsworth, and Interstate 80 runs near the Truckee River for approximately 25 miles between Reno and Wadsworth. LCT occupy this habitat year-round,[2] (USFWS 1995). Within the biological assessment area, LCT also occur in Colman Creek, North Fork Battle Creek, and Snow Creek. The assessment area also encompasses Donnelly Creek, which is an unoccupied designated recovery stream (BLM 2012).

Habitat alteration and degradation following Euro-American settlement have caused LCT to occupy about 0.4 percent of its former lake habitat and 10.7 percent of former stream habitat within its native range (USFWS 1995). The principal threats to this species are isolation and competition with nonnative

[2] SR 447 is also within approximately 150 feet of the Pyramid Lake Fishway at Marble Bluff just north of Nixon, which may be occupied when in operation.

species. As subpopulations become isolated, due to physical and biological fragmentation, migration rates decrease, local extirpation may become permanent, and the entire population may move incrementally toward extinction (USFWS 1995).

Maintaining a networked population may help populations recover without the need to establish fish in every tributary and may also promote self-sustaining lake populations for long-term persistence. Although the presence of nonnative species has dramatically altered aquatic ecosystems, hybridization and competitive interaction between lake-dwelling LCT and nonnative species is not well understood (USFWS 2014b).

2.6 Vegetation (Including Invasive, Nonnative Species)

General Vegetation

The regional setting of the assessment area is the Intermountain Region, Great Basin Division, Central Great Basin Section floristic zone (Cronquist et al. 1972). This zone includes elevated valleys that are generally higher than 5,000 feet above sea level. Vegetation in this section is dominated by sagebrush on the valley bottoms and a narrow belt of shadscale and halophytic[1] vegetation in saline playas. Pinyon-juniper woodland occurs in the higher elevations where moisture is slightly higher, except for the portion north of the Humboldt River, which is beyond the range of singleleaf pinyon (Cronquist et al. 1972).

General vegetation in the assessment area is summarized in **Table 2-3**, below. General vegetation types in the Closure Area are briefly described below. Land cover descriptions are provided in the report Southwest Regional GAP Analysis Project—Land Cover Descriptions (SWReGAP 2005), which is incorporated by reference.

Table 2-3
Vegetation

SWReGAP Land Cover Type	Approximate Acres[1]	
	Closure Area	Assessment Area[2]
Intermountain Basins Mixed Salt Desert Scrub	1,060	312,830
Intermountain Basins Big Sagebrush Shrubland	10	238,950
Intermountain Basins Playa	12,730	198,560
Great Basin Xeric Mixed Sagebrush Shrubland	0	104,740
Intermountain Basins Greasewood Flat	500	78,900
Intermountain Basins Montane Sagebrush Steppe	0	30,860
Intermountain Basins Cliff and Canyon	<10	17,720
Intermountain Basins Mountain Mahogany Woodland and Shrubland	0	6,730
Open water	0	6,580
Great Basin Pinyon-Juniper Woodland	0	6,550
Agriculture	0	6,290
Invasive Annual Grassland	<10	5,820
Developed, Medium - High Intensity	0	5,250
Inter-Mountain Basins Semi-Desert Grassland	0	4,400
Developed, Open Space - Low Intensity	0	4,030
Rocky Mountain Aspen Forest and Woodland	0	3,460

[1] Plants that can tolerate a high concentration of salt in the soil

SWReGAP Land Cover Type	Approximate Acres[1]	
	Closure Area	Assessment Area[2]
Inter-Mountain Basins Semi-Desert Shrub Steppe	0	2,350
Great Basin Foothill and Lower Montane Riparian Woodland and Shrubland	0	1,640
North American Arid West Emergent Marsh	0	1,450
Inter-Mountain Basins Subalpine Limber-Bristlecone Pine Woodland	0	920
Invasive Annual and Biennial Forbland	0	860
Inter-Mountain Basins Big Sagebrush Steppe	0	590
Inter-Mountain Basins Active and Stabilized Dune	0	580
Sierra Nevada Cliff and Canyon	0	550
Invasive Southwest Riparian Woodland and Shrubland	0	410
Barren Lands, Non-specific	0	330
Recently Mined or Quarried	0	260
Mojave Mid-Elevation Mixed Desert Scrub	0	140
Recently Burned	0	20
Rocky Mountain Alpine-Montane Wet Meadow	0	10
Rocky Mountain Montane Dry-Mesic Mixed Conifer Forest and Woodland	0	10

Sources: BLM GIS 2018; SWReGAP GIS 2005

[1] Acreage cannot be calculated in the playa, adjacent dunes, and points of interest components of the assessment area. This is because these areas are not defined spatially; however, land cover types in these areas are discussed qualitatively, as applicable, throughout the section.
[2] Acreage of land cover types in the travel routes is calculated with a distance of 0.5 miles on each side of the route. SWReGAP land cover types are not available for California, thus the portion of SR 447 from Cedarville to the California/Nevada state line is not included in these calculations.

The playa, including the Closure Area, is characterized by the SWReGAP land cover type Intermountain Basins Playa. These systems are composed of barren and sparsely vegetated playas (generally less than 10 percent plant cover). They are intermittently flooded; highly impermeable subsurface soils prevent percolation and result in water evaporation, leading to salinity (SWReGAP 2005). In the assessment area, this system is devoid of vegetation due to the highly alkaline soils (BLM 2012a).

The assessment area includes dunes next to the playa, which are characterized by the SWReGAP land cover type Intermountain Basins Active and Stabilized Dune. These unvegetated to moderately vegetated systems are composed of plants adapted to shifting, coarse sand substrates and tend to form patchy or open grasslands, shrublands, or steppe (SWReGAP 2005). In the assessment area, common species growing on dunes and terraces next to the playa are greasewood (*Sarcobatus vermiculatus*), saltgrass (*Distichlis spicata*), and shadscale (*Atriplex confertifolia*) (BLM 2012a). This land cover type does not appear in **Table 2-3**; however, small areas of this type are known from site visits conducted by the BLM.

The SWReGAP land cover type Intermountain Basins Mixed Salt Desert Scrub is the primary vegetated land cover type in the Closure Area. This land cover type contains open-canopied shrublands of typically saline basins, alluvial slopes, and plains. Their substrates are often saline and calcareous,[2] medium- to fine-textured, alkaline soils. Vegetation is characterized as typically open to moderately dense shrubland,

[2] Chalky; contains calcium carbonate

composed of one or more saltbush (*Atriplex*) species, and the herbaceous layer varies from sparse to moderately dense (SWReGAP 2005).

Intermountain Basins Greasewood Flat is the second most prevalent land cover type in the Closure Area. This land cover type typically occurs near drainages on stream terraces and flats, or it may form rings around more sparsely vegetated playas. Soils are typically saline, with a shallow water table and intermittent flooding, but they remain dry for most growing seasons. Vegetation is usually a mosaic of multiple communities, with open to moderately dense shrublands dominated or co-dominated by greasewood (*Sarcobatus* spp.); they are often surrounded by Mixed Salt Desert Scrub.

In other portions of the Closure Area, a small amount of Intermountain Basins Big Sagebrush Shrubland is present. In this community, dominant shrub species are big sagebrush (*Artemisia tridentata*), low sagebrush (*A. arbuscula* var. *arbuscula*), black sagebrush (*A. arbuscula* var. *nova*), Mormon tea (*Ephedra* spp.), antelope bitter-brush (*Purshia tridentata*), spiny hopsage (*Grayia spinosa*), and rabbitbrush (*Ericameria* spp.). Flowering herbaceous plants and perennial bunchgrasses, such as Great Basin wild rye (*Leymus cinereus*), squirreltail (*Elymus elymoides*), and Indian rice grass (*Oryzopsis hymenoides*), occur among the shrubs (BLM 2012a).

Wetland and riparian vegetation in the assessment area is discussed in **Section 2.7**, Wetlands/Riparian Areas.

Invasive, Nonnative Species

In general, weeds can be native or nonnative, invasive or noninvasive, and noxious or not noxious. Legally, a noxious weed is any plant designated as undesirable by a federal, state, or county government as injurious to public health, agriculture, recreation, wildlife, or property. Noxious weeds are nonnative and invasive; their control is based on resource or treatment priorities and is governed by budgetary constraints.

Invasive plants include not only noxious weeds but also other plants that are not native to the United States. The BLM considers plants invasive if they have been introduced into an environment where they did not evolve and, as a result, usually have no natural competition to limit their reproduction and spread (Westbrooks 1998).

The BLM recognizes and targets for treatment, noxious weeds from the US Department of Agriculture (USDA) Federal Noxious Weed List (USDA 2017), and the NDA-maintained Nevada Noxious Weed List (NDA 2017). The latter includes 47 noxious weed species in the state that require control.

Of these federal and state noxious weeds, 15 species commonly occur on lands administered by the Winnemucca District Office (WDO; BLM 2015). The most widespread species are perennial pepperweed (*Lepidium latifolium*), hoary cress (*Cardaria draba*), saltcedar (*Tamarix* spp.), Russian knapweed (*Acroptilon repens*), and Scotch thistle (*Onopordum acanthium*). All of these are commonly found along roads and near other developed areas. The primary invasive, nonnative plant in the WDO is cheatgrass (*Bromus tectorum*), an annual that dominates wide swaths of the Great Basin, increases fine fuel loads, and alters fire regimes (BLM 2015).

In the assessment area, the playa, including portions of the Closure Area that are on the playa, are devoid of vegetation, including noxious weeds and invasive, nonnative species (BLM 2012a). Noxious weeds and invasive, nonnative species are known from other portions of the assessment area, including adjacent dunes, points of interest in the NCA, and along travel route corridors. Weed inventories conducted for the NCA Administrative Facility at the south end of the playa documented several occurrences of the noxious weeds, Russian knapweed, along County Road 34, and perennial pepperweed along Nevada SR 447 (BLM 2009). Additional noxious weeds in the assessment area are musk thistle and salt cedar, both mapped on County Road 34 north of Gerlach (CISEH 2017).

2.7 WETLANDS AND RIPARIAN AREAS

Although there are differing regulatory definitions of wetlands, these areas are generally considered to be those lands that are inundated or saturated by water for at least several weeks of the year and contain hydric soils[1] and hydrophytic[2] vegetation.

Riparian is a term that refers to the habitat next to or near streams, lakes, ponds, and wetlands that is influenced by water (Prichard et al. 1993). The term is used here to include both lotic (running water) systems and lentic (standing water) systems.

In the Black Rock Desert, surface water resources and their associated riparian plant communities are sparse. Permanent and intermittent streams (see EIS Section 3.2.9, Water Quality) and cold water and thermal springs occur occasionally throughout the NCA. Often these features support riparian vegetation or wet meadows, which are discussed below.

The acres of NWI wetlands in the assessment area are summarized below in **Table 2-4**.

Most of the Closure Area and the entire event area are on the Black Rock playa, which is classified as a lake under the NWI (USFWS GIS 2017). The playa floods in years with precipitation, generally during March and into June, as snowmelt from the surrounding ranges drains into it. The playa is typically dry by the late summer before the Burning Man event.

Most of the Closure Area is on the Black Rock Playa, which is classified as a lake under the National Wetlands Inventory (EMPSi 2018a, USFWS GIS 2017). This feature may be considered Other Waters of the US by the US Army Corps of Engineers (ACOE), potentially placing it under ACOE jurisdiction under Section 404 of the Clean Water Act. The ACOE regulates discharge or fill into Other Waters of the US, including temporary fill. Placement of art installations and decomposed granite to protect the playa surface and fencing and other temporary Event infrastructure, may be considered fill and be subject to regulatory approval.

The NWI also maps several intermittent riverine features in the hills immediate west of the Closure Area . These features include channels that drain to the playa and that contain flowing water only part of the year. When the water is not flowing, it may remain in isolated pools, or surface water may be absent. The dominant plant communities may change as soil moisture conditions change.

[1] Soils "formed under conditions of saturation, flooding, or ponding long enough during the growing season to develop anaerobic conditions in the upper part" (*Federal Register* July 13, 1994).
[2] Vegetation composed of hydrophytes, or plants that grow wholly or partly submerged in water.

Table 2-4
National Wetlands Inventory Features

NWI Wetland	Description[3]	Approximate Acres[1] Closure Area	Approximate Acres[1] Assessment Area[2]
Lake (lacustrine)	Wetlands and deepwater habitats with all of the following characteristics: situated in a topographic depression or a dammed river channel; lacking trees, shrubs, persistent emergents, emergent mosses, or lichens with 30 percent or greater coverage; and total area of at least 20 acres.	12,300	133,070
Riverine	All wetlands and deepwater habitats contained within a channel, with the exception of wetlands dominated by trees, shrubs, persistent emergents, emergent mosses, or lichens.	40	12,790
Freshwater emergent Wetland (palustrine emergent)	All nontidal wetlands dominated by trees, shrubs, persistent emergents, emergent mosses, or lichens; characterized by erect, rooted, herbaceous hydrophytes, excluding mosses and lichens. This vegetation is present for most of the growing season in most years. These wetlands are usually dominated by perennial plants.	—	4,100
Freshwater forested/shrub wetland (palustrine scrub-shrub)	All nontidal wetlands dominated by woody vegetation less than 20 feet tall. The species include true shrubs, young trees (saplings), and trees or shrubs that are small or stunted because of environmental conditions.	—	820
Freshwater pond (palustrine)	Nontidal wetland habitats with less than 30 percent vegetation cover.	—	810

Sources: BLM GIS 2018; USFWS GIS 2017; Cowardin et al. 1979

[1] Acreage cannot be calculated within the playa, adjacent dunes, and points of interest components of the assessment area. This is because these are not defined spatially; however, wetlands in these areas are discussed qualitatively in this section.
[2] Acreage of wetlands in the travel routes is calculated with a distance of 0.5 miles on each side of the route.
[3] Adapted from Cowardin et al. (1979)

Several of the NWI wetland types above are described in **Section 2.6**, Vegetation. For example, the SWReGAP land cover type Intermountain Basins playa is represented by the NWI lake wetland system. SWReGAP North American arid west emergent marsh is represented by several types of NWI wetland systems, including freshwater emergent wetland. SWReGAP Great Basin foothill and lower montane riparian woodland and shrubland largely overlaps the NWI riverine wetland system.

Wetlands and Riparian Areas at Assessment Area Springs

Springs are small-scale aquatic systems that occur where groundwater reaches the surface (Meinzer 1923). They range widely in size, water chemistry, morphology, landscape setting, and persistence, and most are geographically isolated from other aquatic and riparian systems. Some dry each year, some dry only during extended droughts, and a few persist for millennia (Abele 2011). Many springs flow directly into streams, but others form small isolated ponds or marshy areas. Springs and seeps may also form channels that transition to flowing streams, or they may lose their surface expression and recharge alluvial fill material or other permeable soils (BLM 2015).

Springs and seeps may support diverse wet meadows and riparian areas. Typical common species in these areas are willows (*Salix* spp.), bulrushes (*Scirpus* spp.), rushes (*Juncus* spp.), sedges (*Carex* spp.), and wetland grasses (e.g., *Agrostis* spp. and *Danthonia* spp.) (BLM 2015). Because of the continuous flow and constant temperature of most springs, riparian communities frequently remain permanently green, providing habitat, thermal and escape cover, and forage for wildlife, including special status wildlife species, throughout the year (see **Section 2.4**, Special Status Species, for a discussion of these species).

In the assessment area, several thermal springs surround the playa, including Trego Hot Springs and Frog Pond Hot Springs to the southeast, and Black Rock Hot Springs and Double Hot Springs to the northeast. Riparian vegetation is associated with most of these springs, and the outflows supply hydrology to wet meadows of varying size. Springs fall under the NWI categories of freshwater emergent wetland, freshwater forested/shrub wetland, and freshwater pond (USFWS GIS 2017), depending on the type of vegetation present.

Several thermal springs in the assessment area are popular with recreationists. Because of the relatively frequent recreation at hot springs, informal trails and other structures, such as wooden benches, are common around spring edges within riparian and wetland vegetation.

Camping is currently permitted near several of the springs on BLM-administered lands in the assessment area. Camping is restricted to over 300 feet from springs by BLM regulation and the Nevada Revised Statutes (503.660); however, there are informal fire rings and other evidence of camping close to some of these areas, including within wetland and riparian vegetation.

2.8 WILDLIFE

The assessment area for wildlife analysis is described in **Section 2-1**, Assessment Areas, and shown in **Figure 1**.

The potential for wildlife species to occur in the assessment area was determined by reviewing data sources of known occurrences and suitable habitat. Species that are known or that have potential to occur in the assessment area were determined based on local habitat and information from the Nevada Natural Heritage Program (2017b) and NDOW (2017). Other wildlife species may be present in the assessment area if suitable habitat exists.

Given the lack of vegetation and permanent water sources, the playa's value to wildlife is ephemeral. During dry periods, the playa does not support terrestrial wildlife, though some species, such as coyote (*Canis latrans*), mule deer (*Odocoileus hemionus*), and pronghorn antelope (*Antelocapra americana*), may occasionally cross the playa when travelling between habitats. Shorebirds, waterfowl, and other migratory birds may use temporary pools that appear on the playa after winter and spring storms (see **Section 2.3**, Migratory Birds).

When flooded, the playa supports phytoplankton and crustaceans as well as aquatic invertebrates that are specially adapted to the prolonged drought and occasional inundation cycles of the playa (see **Section 2.3**, Migratory Birds, and **Section 2.6**, Vegetation). These aquatic invertebrates are primarily branchiopods,[1] which persist as cysts encased in dry playa soil until sufficient precipitation occurs for them to hatch, reproduce, and complete their life cycle before drying out again (Adams and Sada 2010). According to a study conducted by the Desert Research Institute, four different branchiopods occur on the playa: two types of fairy shrimp (*Branchinecta mackini* and *B. gigas*), tadpole shrimp (*Lepidurus*

[1] Crustaceans, such as shrimp

lemmoni), and water flea (*Moina* sp.) (Adams and Sada 2010). These species are common and are widely distributed throughout Great Basin playas.

In the assessment area, habitats surrounding the playa that contain more diverse topography and vegetation support species common to the Great Basin. The desert salt scrub vegetation surrounding the playa provides habitat for the horned lizard (*Phrynosoma* sp.), Great Basin whip-tail (*Cnemidophorus tigris tigris*), rattlesnake (*Crotalus oreganus lutosus*), and other reptiles, as well as the ground squirrel (*Spermophilus* sp.), kangaroo rat (*Dipodomys* sp.), kit fox (*Vulpes macrotis*), and other small mammals and rodents. Mountain ranges, sagebrush, and other open areas may support herds of chukar (*Alectoris chukar*), mule deer, and pronghorn antelope. Other common terrestrial wildlife species in the assessment area are the black-tailed jack rabbit (*Lepus californicus*), bobcat (*Lynx rufus*), badger (*Taxidea taxus*), and mountain lion (*Felis concolor*).

Aquatic habitat includes perennial and intermittent streams that can support various fish and amphibians, such as the common carp (*Cyprinus carpio*) and rainbow trout (*Oncorhynchus mykiss*). Springs also can serve as habitat for native invertebrates that are adapted to the constant temperatures and distinctive geothermal environments that some springs provide.

Big game species

The ranges for big game species and acres of habitat in the assessment area, including mule deer and pronghorn antelope, are shown in **Figure 1** and are listed in **Table 2-5**, below. Mule deer occupy portions of the assessment area and a 4-mile surrounding area. Occupied pronghorn antelope habitat exists outside of the assessment area in portions of the 4-mile surrounding area. No known occupied elk distribution exists in the vicinity of the assessment area (NDOW 2017a). Bighorn sheep are discussed in **Section 2.4**, Special Status Species.

Table 2-5
Mule Deer and Pronghorn Antelope Habitat in the Assessment Area

Habitat Type		Acres of Habitat
Mule Deer	Agricultural	31,460
	Crucial summer	21,930
	Crucial winter	162,810
	Limited use	173,150
	Summer range	24,800
	Winter range	28,330
	Year-round	76,250
	Total	**518,730**
Pronghorn antelope	Agricultural	3,059
	Crucial summer	174,027
	Crucial winter	95,344
	Crucial year-round	21,903
	Limited use	149,650
	Summer range	171,032
	Winter range	17,913
	Year-round	129,323
	Total	**762,251**

Source: BLM GIS 2017

Mule deer are widespread and are typically associated with complex middle to upper elevation landforms that support a variety of sagebrush, mountain shrubs, quaking aspen, juniper, and herbaceous vegetation. Although they occupy almost all types of habitat within their range, mule deer prefer arid, open areas and rocky hillsides. Areas with bitterbrush and sagebrush provide common habitat. Mature bucks tend to prefer rocky ridges for bedding grounds, while does and fawns bed in more open areas (NDOW 2017b).

During the summer, pronghorn antelope are widely distributed throughout valleys, mountain foothills, and mountaintops. This species prefers gentle rolling to flat, wide-open topography. Low sagebrush and northern desert shrubs are the preferred vegetation types, as areas with low understory allow pronghorn antelope greater visibility and permit them to move quickly to avoid predators (NDOW 2017c).

Chapter 3. Wildlife Effects Synthesis

This section contains a review and summary of relevant literature describing the nature and type of potential impacts on wildlife resources that may occur as a result of the project.

3.1 LIGHTING

3.1.1 Impacts from Lighting on Avian Species

Studying methods to disperse avian species, Lustick (1973) investigated the effects of high-intensity lasers on European starlings (*Sturnus vulgaris*), Mallards (*Anas platyrhynchos platyrhynchos*), and gulls (*Larus* spp.), which tended to avoid the concentrated beam. Blackwell et al. (2002) reviewed the effectiveness of newer, safer lasers for dispersing flocks of various species and found that results differed among species and situations (i.e., urban vs. rural) and ranged from no reaction to effective dispersal.

Birds see in colors at shorter wavelengths than humans, including portions of the violet and ultraviolet spectra (Cuthill et al. 1999). Short-wavelength light, the type of light emitted by light-emitting diodes (LEDs), has been shown to alter avian foraging behavior (Lind et al. 2013) and breeding biology (Bennett et al. 1997; Hunt et al. 2003).

Bright LED lights can also act as an avian deterrent, causing alert responses in passerine species (Doppler et al. 2015) and avoidance behavior in red-tailed hawks (*Buteo jamaicensis*; Foss et al. 2017).

Migrating birds may become attracted to or disoriented by artificial lights, particularly during inclement weather (Rich and Longcore 2006), which could pose collision risks if light sources are tall infrastructure, transmission lines, or similar structures. Bird strike may be particularly pronounced for night-migrating species, which may become disoriented by nighttime lights on tall structures (Squires and Hanson 1918; Rich and Longcore 2006). Artificial night lighting has also been shown to affect avian reproductive physiology, circadian rhythms, and flight behavior (Cabrera-Cruz et al. 2018).

Reflected lighting from industrial-scale photovoltaic solar arrays may disorient avian species, or increase the potential for collision-related injury or mortality (Smith and Dwyer 2016; Walston et al. 2015).

3.1.2 Impacts from Lighting on Mammals

High-intensity lasers can inflict ocular damage in mammal species, including humans (Harris et al. 2003) and aquatic mammals (Zorn et al. 2006). Conversely, red lasers have been shown to be ineffective at dispersing white-tailed deer (*Odocoileus virginianus*), suggesting that these lower-intensity lasers have little impact on this species (VerCauteren et al. 2003).

Other light sources may pose direct risks to mammal species. Shang et al. (2013) showed that LED lighting, particularly those emitting high-intensity blue light, can damage rat retinas. The magnitude of damage depends on the level and duration of exposure.

Artificial night lighting sources can affect nocturnal mammals (e.g., kangaroo mice) if they are present in the lit area. Using artificial night lighting may cause nocturnal rodents to decrease activity (Kramer and Birney 2001; Clarke 1983) and alter foraging behavior (Vasquez 1994). Artificial night light may reduce activity, movement, and food consumption (Beier 2006). Also, using artificial night lighting can increase owl hunting effectiveness on nocturnal rodents (Clarke 1983).

Nighttime lighting can attract insects, which in turn can alter bat behavior by concentrating foraging opportunities (Rich and Longcore 2006). This risk is associated with any and all facilities that use conventional nighttime lighting sources. The lighting itself poses no direct risks to bats, but the increased activity in these areas near anthropogenic activity could pose some amount of risk to these species.

3.2 NOISE

In terrestrial systems, the impacts of anthropogenic noise on wildlife include behavioral change, masking of sounds important to survival and reproduction, stress and associated physiological responses, startling, interference with mating, and population declines (Slabbekoorn and Ripmeester 2008; Barber et al. 2009; Blickley and Patricelli 2010). Effects on individual animals may lead to population decreases if survival and reproduction of individuals in disturbed habitats are lower than survival and reproduction of individuals in similar but undisturbed habitats (Slabbekoorn and Ripmeester 2008). Population size may also decline if animals avoid affected habitat, which may cause a reduction in the area available for foraging and reproduction.

3.2.1 Impacts from Noise on Avian Species

Anthropogenic noise, such as from traffic, can affect avian species through direct stress, masking of predator arrival sounds and/or associated alarm calls, and interference with communication and sound-driven behavior (Slabbekoorn and Ripmeester 2008). Chronic and frequent noise inhibits the ability of birds to detect important sounds (Jacobson 2005), whereas intermittent and unpredictable noise is often perceived as a threat (Francis and Barber 2013). Hampering of vital life history functions (e.g., mate attraction, predator detection, and territory defense) due to acoustic interference can have direct negative consequences on fitness (Slabbekoorn and Ripmeester 2008).

The magnitude of the impact depends on the frequency of the noise, as well as the sound frequency to which a particular species is attuned. Noise will disproportionately affect species that are attuned to the same frequency as the noise. This would increase the potential for the noise to interfere with their calls (Coffin 2007).

Many bird species are less abundant near highways, and reproductive success may be reduced in noisy territories. Reijnen and Foppen (2006, as cited in Slabbekoorn and Ripmeester 2008) showed that highways have a negative impact on bird breeding density and diversity, which may be attributed to increased noise levels associated with roads.

Noise also can affect avian species that are not adapted to high levels of background noise by increasing physiological stress, which ultimately can affect disease resistance, survival, and reproductive success. Several studies have reported evidence of elevated stress-related hormones in avian species exposed to human activities. For example, Davies et al. (2017) found that urban wrens had higher initial (pre-restraint) corticosterone than rural wrens before exposure to either traffic noise or a non-traffic noise control and that traffic noise elevated initial corticosterone of rural, but not urban, wrens.

Blickley et al. (2012a) conducted an experimental playback study to demonstrate that noise from industrial activity (natural gas drilling and road noise) affects the level of immunoreactive corticosterone metabolites (an indicator of physiological stress) in greater sage-grouse (*Centrocercus urophasianus*). Another study found declines in male lek attendance in response to noise playbacks (Blickley et al. 2012b). These studies suggest that chronic noise pollution can cause habitat avoidance and elevated stress levels in greater sage-grouse (Blickley et al. 2012a).

Noise can have community-level impacts by altering species relationships (Slabbekoorn and Ripmeester 2008). For example, Francis et al. (2009) showed that anthropogenic noise can negatively affect the breeding density of several avian species but have positive effects on other species that benefit from a noise-associated decline in a major nest predator. Noise disturbance influences the rate of nest initiation in sage-grouse hens up to 3 kilometers from construction activities surrounding oil and gas development (Lyon and Anderson 2003).

3.2.2 Impacts from Noise on Mammals

Similar to impacts on birds, noise also inhibits the perception of sounds (i.e., masking) by mammals, which ultimately can affect foraging behavior and success, interfere with communication networks, and have unknown consequences for reproductive processes (Hansen et al. 2005). Anthropogenic noise can also mask alarm calls, making some mammals vulnerable to threats. Sloan and Hare (2008) showed that the inability to hear just one of a group of alarm calling individuals can cause ground squirrels to underestimate the urgency of their response. Noise may displace bighorn sheep into habitats farther from human activity (Campbell and Remington 1981).

Animal responses are likely to depend on the intensity of perceived threats rather than the intensity of the noise itself. Chronic and recurring noise may interfere with the ability for wildlife to detect important sounds, whereas they may view intermittent and unpredictable noise as a threat (Anderson 1995).

Bats depend on echolocation to navigate and locate prey, and therefore may be particularly sensitive to noise pollution. Schuab et al. (2008) demonstrated that noise affects bat foraging behavior and the distribution of prey capture events. Traffic noise deterred foraging behavior to a greater degree than other environmental noise sources. This suggests that busy roads and other sources of intense, broadband noise degrade the suitability of foraging habitat for some bats. Jones (2008) demonstrated that traffic noise reduces foraging time and effort in greater mouse-eared bats (*Myotis myotis*), presumably by masking sounds made by moving arthropods.

Bunkley et al. (2015) used acoustic monitoring to compare the activity level (number of minutes in a night with a bat call) of bat assemblage at sites with compressor stations, which produce continuous broadband noise, to control sites. They found that activity levels for the Brazilian free-tailed bat (*Tadarida brasiliensis*) were 40 percent lower at loud compressor sites compared with quieter sites, whereas the activity levels of four other species (*Myotis californicus, M. cillolabrum, M. lucifugus, Parastrellus hesperus*) were not affected by noise. They also measured a 70 percent decrease in the assemblage of bat species emitting low-frequency (less than 35 kilohertz) echolocation calls at loud sites relative to quieter sites, indicating lower activity levels and a potential reduction in habitat and forging success.

Some mammals can compensate for noise to some extent by modifying their vocalizations (Barber et al. 2009). Evidence for the Lombard effect (an increase in the amplitude of vocalizations during increased noise) and/or other noise-induced vocal modifications has been found for various mammalian species, such as the mouse-tailed bat (*Rhinopoma microphyllum*), California ground squirrel (*Spermophilus beecheyi*), and domestic cat (*Felis catus*). The magnitude of the effect varies within and among species (Hotchkin and Parks 2013).

Individuals of five bat species (*Myotis oxygnathus, Eptesicus fucus, Tadarida brasiliensis, Rhinolophus ferrumequinum,* and *Rhinopoma microphyllum*) exposed to broadband white noise all increased the amplitude of echolocation signals, and several species also changed pulse bandwidths and temporal components, whereas bats exposed to narrowband noise from conspecifics' echolocation sounds shifted pulse frequencies or temporal characteristics without modifying vocalization amplitude (Hotchkin and Parks 2013). Free-tailed bats (*Tadarida brasiliensis*) produced simultaneous changes to vocalization amplitude, duration, and bandwidth during noise playback experiments (Tressler et al. 2011); however, call alterations might affect prey detection (Bunkley et al. 2015).

Finally, noise can cause auditory damage to mammals. For example, noise emitted from certain types of off-highway vehicles (OHVs) can be as high as 110 decibels, which is near the threshold of human pain (Lovich and Bainbridge 1999 in Ouren et al. 2007) and can have significant effects on wildlife (Ouren et al. 2007). After exposure to less than 10 minutes of dune buggy playback recordings (played intermittently at lower levels than would actually occur), sand lizards (*Uma scoparia*) and kangaroo rats (*Dipodomys deserti*) experienced hearing loss lasting for weeks and were unresponsive to recordings of predator sounds (Brattstrom and Bondello 1983 in Ouren et al. 2007). In two other studies, kangaroo rats (*Dipodomys spectabilis*) experienced inner ear bleeding when subjected to OHV noise (Berry 1980 and Bury 1980 in Ouren et al. 2007).

3.3 AIR QUALITY

3.3.1 Impacts from Air Quality on Avian Species

Because of their highly efficient respiratory systems, birds may be particularly vulnerable to air pollution. In a literature review of published reports since 1950 on avian responses to air pollution, Sanderfoot and Holloway (2017) presented evidence for adverse health impacts on birds due to exposure to gas-phase and particulate air pollutants, including carbon monoxide, ozone, sulfur dioxide, smoke, and heavy metals, as well as mixtures of urban and industrial emissions. Avian responses to air pollution include respiratory distress and illness, increased detoxification effort, elevated stress levels, immunosuppression, behavioral changes, and impaired reproductive success. Exposure to air pollution may furthermore reduce population density, species diversity, and species richness in bird communities (Sanderfoot and Holloway 2017).

Exposure to air pollution may cause behavioral changes in avian species. Sterner (1993a in Sanderfoot and Holloway 2017) measured declines in preening and ambulatory activity of rock doves (*Columba livia*) following exposure to phosphoric acids aerosols as well as reduced water intake, food intake, and body weight relative to control groups (Sterner 1993b in Sanderfoot and Holloway 2017).

Air pollution may lead to overall habitat degradation by reducing the availability and quality of food sources, which can lessen reproduction success (Belskii and Grebennikov 2014). One study reported reduced foraging efficiency of pied flycatchers (*Ficedula hypoleuca*) at heavily polluted sites compared with background sites, resulting in calcium deficiency in 20 to 50 percent of breeding females (Belskii and Grebennikov 2014). This ultimately caused an increase in clutch desertion and clutches with defective eggshells as well as a decrease in the number of fledglings per nest (Belskii and Grebennikov 2014). The effects of dust from traffic on dirt roads may lessen the photosynthetic ability of roadside plants, which could indirectly affect insectivorous and granivorous[8] species of migratory birds (Thompson et al. 1984).

3.3.2 Impacts from Air Quality on Mammals

Vehicle- and road-borne air pollution has cytotoxic effects (increased cell death and intensified oxidative stress) and genotoxic effects (increased chromosomal abnormalities and elevated micronuclei frequencies), and thus poses a serious threat to wildlife. These impacts can ultimately result in negative impacts on fitness (e.g., developmental abnormalities, impaired organism functioning, and inhibition of certain behaviors; Leonard and Hochuli 2017).

Inhalation of exhaust particles as well as tire and roadside particles may reduce lung function and increase mortality (Leonard and Hochuli 2017). Sagai et al. (1996) showed that exposure to 0.1 and 0.2 milligram of diesel exhaust particles four times over 16 weeks significantly reduced the lung function of house mice (*Mus musculus*), increasing the infiltration of inflammatory cells and airway constriction.

Inhalation of large amounts of dust may overload clearance mechanisms in mammalian respiratory passages, facilitate infections, and reduce resistance to infections (Hartung and Saleh 2007).

3.3.3 Impacts from Air Quality on Invertebrates

Vehicle- and road-borne air pollution may cause avoidance and attractant behaviors in certain species of invertebrates (Leonard and Hochuli 2017). Sims and Lacey (2000) demonstrated that lepidopteran (*Luffia ferchauletella*) larvae avoid feeding on algal material grown in the immediate vicinity of roads due to elevated concentrations of metals associated with road pollution. In contrast, vehicle exhaust, and in particular nitrogen oxides, elevates the concentration of leaf nitrogen in road-side plants (Kammerbauer and Dick 2000), which makes leaves more palatable to some insect herbivores such as aphids (*Rhopalosiphum padi*; Spencer et al. 1988).

Some components of vehicle exhaust can indirectly alter invertebrate foraging behaviors by reducing the detectability of plant-emitted odors such as floral volatile blends and green leaf volatiles. In a study of the effect of diesel exhaust on plant-pollinator interactions, Girling et al. (2013) demonstrated that oxides of nitrogen (nitric oxide and nitrogen dioxide at between 0.1 to 10 parts per million) can reduce the prominence of oilseed rape flower volatiles, in turn reducing the ability of honeybees (*Apis mellifera*) to recognize and locate flowers.

3.3.4 Impacts from Air Quality on Wildlife Habitat

Fugitive dust raised by traffic can affect wildlife habitat through impacts on vegetation near roads. Along Alaskan roads heavily traveled by various types of vehicles, Walker and Everett (1987) found significant dust impacts up to 10.9 yards from the roadside and dust blankets up to 3.9 inches thick on mosses and other low-standing vegetation.

Several morphological factors contribute to plant susceptibility to heavy dust loads, including mat or prostrate growth form, lack of a protective stem cortex or leaf cuticle, and intricate branching or closely spaced leaves that tend to trap dust (Walker and Everett 1987; Spellerberg and Morrison 1998). Dust

[8] Species that feed on insects and grain

may affect vegetative processes including photosynthesis, respiration, and transpiration due to blocked stomata and cell destruction (Spellerberg and Morrison 1998), all of which could result in reduced plant growth, size, productivity, and/or survivorship. Ultimately, these changes could decrease habitat availability and habitat quality for wildlife.

3.4 TRAFFIC

Traffic has numerous direct and indirect ecological impacts on wildlife, including mortality or injury from vehicle collisions; habitat loss or degradation; alteration of movement and behavior; and pollution from chemicals, light, and noise. Impacts of traffic on specific wildlife groups are described below. Impacts of traffic noise on wildlife are described in **Section 3.2.1**, Impacts from Noise on Avian Species.

3.4.1 Impacts from Traffic on Mammals

In the United States (US), roadkill has surpassed hunting in its effect on vertebrate mortality; an estimated one million vertebrates per day are killed on roads (Forman and Alexander 1998). Large and medium-sized mammals are especially susceptible to two-lane, high-speed roads, whereas smaller mammals are more susceptible to wider, high-speed highways (Oxley et al. 1974).

Some studies indicate that traffic volume is a direct indicator of collision potential, particularly for deer (McShea et al. 2008). Large mammals with expansive home ranges may completely avoid crossing roads during periods of high vehicle volume, but this change in behavior could temporarily inhibit protection of territory and subsequently the ability to mate (Jackson 2000; van Langevelde and Jaarsma 2005). Studies that quantify the avoidance and potential for vehicle collisions with small mammals are limited; however, migration and travel of small mammals does not appear to be inhibited by the volume of passing traffic; instead, they are more inhibited by the width of the road and the type of vegetation that is present along roadsides (McGregor et al. 2008).

Olson (2013) estimated that 2 to 5 percent of the statewide deer population in Utah is killed in vehicle collisions annually and that the effect of these mortalities on deer abundance depends on the number of deer killed as well as their demographic group.

Research has shown that roads and traffic volumes interfere with habitat use by large mammals such as elk and deer (Rost and Bailey 1979; Gagnon et al. 2007) but may not affect densities of small mammals (McGregor et al. 2008). Adams and Geis (1983) found that many small mammals are found in higher densities near roads due to increased dispersal and reduced numbers of predators, while Benítez-López et al. (2010) showed that mammal and bird densities declined in the vicinity of infrastructure.

Traffic can cause indirect impacts on mammals through habitat degradation, as vehicles carry and deposit seeds along road and thereby act as conduits for weed spread (Gelbard and Belknap 2003). The edges of roads, extending several yards into the adjacent landscape, generally are considered uninhabitable to many species as roads and traffic cause microclimatic changes that influence leaf litter and vegetation composition, soil macroinvertebrates, interior-dwelling forest birds, herptiles, mammals, and overall species richness (Coffin 2007). Godefroid and Koedam (2004) showed that forest paths have a significant effect on the surrounding plant assemblages and result in an increase in the number of ruderal species, disturbance indicators, nitrogen-demanding species, and soil compaction.

Where vehicle traffic leaves designated roads and enters habitat, impacts on small mammals, including injury or mortality, can occur if vehicles cause burrow or den collapse.

3.4.2 Impacts from Traffic on Aquatic Invertebrates

Vehicles directly affect aquatic invertebrates through damage such as crushing.

Sada et al. (2013) examined the effect of recreational vehicles on branchiopod eggs in the Black Rock Playa by comparing egg density in Black Rock City roads before and following the Burning Man Event. Fairy shrimp eggs in Black Rock City roads decreased by approximately 30 percent following the festival. There were only minor differences in water flea egg abundance before and following the festival, suggesting that they are more resilient to disturbance.

Effects on crustacean egg abundance in Black Rock City were greater in camping areas, which are subjected to continuous disturbance during the festival, than on roads, suggesting that periodic wetting for dust control may armor playa substrate and protect eggs (Sada et al. 2013). The increased susceptibility of wet eggs to fracture (Hathaway et al. 1996, see below) suggests that egg fracture may increase if too much water is added during dust control (Sada et al. 2013).

Sada et al. (2013) found that branchiopod egg susceptibility to vehicle damage on the Black Rock Playa varied across sampling sites. This may suggest that spatial differences in playa substrate matrix may influence egg susceptibility to vehicle effects.

Another study found that 20 passes by a 1974 Toyota Corolla Sedan (972 kilograms, exerting a downward pressure of approximately 3 kilograms/square centimeter) damaged or destroyed approximately 30 percent of fairy shrimp eggs on Bicycle Dry Lake playa in San Bernardino County, California (Eriksen et al. 1988 in Sada et al. 2013).

In a laboratory study, Hathaway et al. (1996) found that the force required to crush individual eggs differed among eight species and that forces between 0.1 and less than 1 newton were enough to damage dry and wet eggs, respectively.

3.4.3 Impacts from Traffic on Avian Species

Collisions with vehicles are believed to be among the top five direct causes of bird mortality in the US. A recent study estimated that between 89 and 340 million birds die annually from vehicle collisions on US roads (Loss et al. 2014).

Ground-dwelling and ground-nesting birds, water birds, fruit-eating birds, and birds that are drawn to attractants on roads are considered to be at higher risk of vehicle collisions. These species are more likely to experience mortality from collision with automobiles due to the fast speeds at which the cars are traveling (Erickson et al. 2005). Mortality rates are positively correlated with traffic speed and volume (Case 1978), and rates are generally highest during spring and summer (Loss et al. 2014). Mortality rates are also greater for juvenile birds and in areas with favorable habitat near roads and/or abundant bird populations (Gunson et al. 2010; Boves and Belthoff 2012). Also, risks may be increased for passerine species like horned larks (*Eremophila alpestris*), which have been observed to increase concentrations along newly constructed roads in sagebrush habitats (Inglefinger and Anderson 2004).

For some avian species, such as barn owls (*Tyto alba*), vehicle collisions may constitute the majority of total mortality (Moore and Mangel 1996; Newton et al. 1997). Mortality from collisions also can create population sinks (Mumme et al. 2000; Boves and Belthoff 2012; Grilo et al. 2012) and contribute to population declines (Bujoczek et al. 2011).

Nationwide, annual fatalities from collisions with aircraft exceed 25,000 birds, 77 percent of which involve gulls (31%), waterfowl (31%), and raptors (15%) (Erickson et al. 2005).

Female sage-grouse moved greater distances from leks and had lower rates of nest initiation in areas disturbed by vehicle traffic (1-12 vehicles/day; Lyon and Anderson 2003).

3.4.4 Impacts from Traffic on Aquatic Species

The effects of roads on fish and aquatic habitat are well documented (see Forman and Alexander 1998, Wheeler et al. 2005). Roads can affect the hydrology, geomorphology, and disturbance regimes in stream networks (Jones et al. 2000). Precipitation and shallow groundwater can be intercepted by roads and rerouted into the streams at road crossings, which can increase sediment delivery to streams. Sediment deposition can affect spawning habitat by filling interstitial space between larger gravels and reducing oxygenated water flow to developing embryos, reducing their survival (Quinn 2005).

Highway surfaces collect a variety of chemical pollutants from automobile traffic (Wheeler et al. 2005). Pollutants are mobilized by runoff water and transported to streams, where the accumulate and spread, having potentially widespread effects (Wu et al. 1998). Traffic residues commonly contribute several metal contaminants, including iron, zinc, lead, cadmium, nickel, copper, and chromium. Metal concentrations in stream sediments has been positively correlated to traffic volume on adjacent highways (Van Hassel et al. 1980, Callender and Rice 2000), and accumulate in proportion to the length of highway drained (Maltby et al. 1995).

Highway surfaces also accumulate petroleum, motor oil, platinum group elements (PGEs; e.g., platinum, palladium, rhodium), which are created by catalytic converters (Rauch and Morrison 1999). The amount of PGEs in roadside soils are correlated with traffic volume (Ely et al. 2001). Accidental spills involving toxic chemicals, from both freight shipments, and produced during automobile wrecks, contribute chemical constituents into roadside areas, increasing the potential for their mobilization into waterways (Wheeler et al. 2005).

3.5 TRASH AND POLLUTION

3.5.1 Impacts from Trash on Avian Species

Predation is recognized as an important source of avian mortality, egg loss, and nest failure (Côté and Sutherland 1997). Corvid predators, such as American crow (*Corvus brachyrhynchos*) and common raven (*C. corax*), and coyotes (*Canis latrans*) may be attracted to areas of anthropogenic activity due to the presence of supplemental food items (i.e., trash; Baker 2007; Colwell et al. 2009).

Corvids are known to prey on western snowy plover (Liebezeit and George 2002; USFWS 2007), and coyotes have been documented to prey opportunistically on snowy plover nests at Mono Lake in California (Page et al. 1983). Thus, where anthropogenic activity is concentrated in or near snowy plover nesting habitat, increased predation leading to egg loss, nest failure, and population declines may result.

Townsend and Barker (2014) found that over 85 percent of American crow nests in agricultural and urban areas contained anthropogenic materials, and that 5 percent of nestlings in these nets became entangled in this material. They found the odds of nestling entanglement increases 7.55 times per meter of anthropogenic material incorporated into the nest. Other studies report on plastics found in gannet nests (Montevecchi 1991), mortality of nestling osprey due to twine woven into the nest (Blem et al. 2002), and mourning doves becoming entangled in fishing line as part of the nest (Parker and Blomme 2007).

Avian species may ingest foreign anthropogenic waste, leading to injury or mortality. In a study of reintroduced California condor (*Gymnogyps californianus*), Mee et al. (2007) found that of eight nestlings examined, six died at or near nests, and in two of these, ingested foreign anthropogenic wastes were the determined cause of death. In the same study, of ten nests examined, all but one contained foreign anthropogenic waste material.

3.5.2 Impacts from Trash on Herpetofauna

A number of studies report herpetofauna entanglement in anthropogenic wastes, which can cause injury or death. These studies report snakes becoming entangled in beer can tabs (Herrington 1985), erosion control mesh netting (Walley et al. 2005; Kapfer and Paloski 2011), and wildlife exclusion fencing (Kapfer and Paloski 2011). Walde et al. (2007) reported that a desert tortoise (*Gopherus agassizii*) was observed with a balloon ribbon extending from its mouth. When removed, the ribbon measured 108 centimeters in length.

3.5.3 Impacts from Pollution on Wildlife

Terrestrial organisms can uptake and concentrate environmental pollutants common in anthropogenic waste. Gaylor et al. (2012) found that house crickets (*Acheta domesticus*) accumulated substantial amounts of PBDE, a flame retardant chemical common in many plastic consumer products, when given access to food sources containing polymers treated with the chemical. Once ingested, pollutants may be dispersed via terrestrial food webs, movements, and/or predation (Gaylor et al. 2012).

In a study comparing published acute toxicity values of organic pollutants on aquatic invertebrates, Sánchez-Bayo (2006) found that several types of hydrocarbon pollutants were acutely toxic to aquatic branchiopods and copepods. Further, apart from their acute toxicity, some types of hydrocarbons can be mutagenic or carcinogenic, and accumulate in certain types of aquatic invertebrates.

Soaps and detergents alter water quality and can injure or kill aquatic wildlife when used in aquatic habitat, like hot springs outflows (Sada et al. 2001).

3.5.4 Impacts from Pollution on Aquatic (Fish) Species

Native fish species in the Truckee River watershed may be affected by reduced quarter quality, as indicated by increased total dissolved solids (TDS) concentrations (Sigler et al. 1985). Bioassay tests (LOSL 1982) demonstrate the intolerance of cui-ui eggs to TDS concentrations above 525 mg/l. Tests found that acute toxicity may only be apparent at high TDS concentrations, chronic exposure to lower TDS concentrations can result in death or abnormalities. See also, **Section 3.4.4**, Impacts from Traffic on Aquatic Species.

3.6 HUMAN PRESENCE

The principal way in which human presence can affect wildlife is by altering the ability of animals to exploit important resources (Gill 2007). This can come about either through directly restricting access to resources such as food supplies, nesting sites or roosting sites, or by altering the actual or perceived quality of these sites. Direct restriction of access to resources can occur through animals avoiding areas where humans are present.

3.6.1 Impacts from Human Presence on Mammals

Boyle and Samson (1985) conducted a review of non-consumptive recreation (e.g., hiking and camping, OHV use, wildlife observation and photography, and similar activities) on wildlife species. Inadvertent disturbance of large mammals by hikers can result in temporary displacement of animals but has little effect on large-scale distribution and movements. Boyle and Samson (1985) found that studies reviewed showed that where large mammals are habituated to human presence, effects are reduced, but may reduce foraging efficiency.

Human presence can affect the vigilance and flight behaviors of some animals, such as mule deer (Price et al. 2014). The presence of humans may also influence the quality of habitat, altering the perception of predation risk (Price et al. 2014).

Human entry into caves or abandoned mine features that support roosting bats can have effects on bats. Recreational cave exploration has been implicated in the decline of several populations of bats in the US (Boyle and Samson 1985). Hibernating bats are particularly vulnerable to harassment, expending critical energy stores when aroused by even unintentional disturbance.

3.6.2 Impacts from Human Presence on Avian Species

Increased human activity can influence eagle behavior (including breeding and foraging behaviors) and productivity (Watson 1997), and in general, eagles tend to avoid human activity.

Beach- and shore-based recreationists can disrupt shorebird breeding, causing birds to flush from nests, or force birds in to less-preferred habitats (Boyle and Samson 1985).

3.6.3 Impacts from Human Presence on Aquatic Species

Recreationists using aquatic species habitat, such as hot spring outflows, may affect aquatic species. Habitat modifications include building up soaking pools, which may alter water quantity or quality in other parts of the spring outflows, and removing riparian vegetation cover through trampling, compacting the soil, and camping (Abele et al. 2001). Recreationists may also unintentionally trample adults, eggs, or larvae, resulting in injury or mortality. Human presence could also disturb species, temporarily displacing them from preferred habitats.

Chapter 4. Effects Summary

Table 4-1, Effects Summary, summarizes the proposed project elements which may affect wildlife, and the potential effects on wildlife species discussed above in **Section 3**.

Table 4-1
Effects Summary

Element	Effect	Relevant Literature
Lighting	Various light sources, including lasers and LEDs, cause avoidance and altered foraging and breeding behavior in avian species. Migrating birds may become disoriented by lights, especially during the night, increasing the chance of injury or mortality from collision with tall structures.	Lustick 1973 Bennett et al. 1997 Cuthill et al. 1999 Blackwell et al. 2002 Hunt et al. 2003 Rich and Longcore 2006 Lind et al. 2013 Doppler et al. 2015
	High-intensity light sources can inflict physiological damage on mammal eyes, while low-intensity sources may have no effects.	Harris et al. 2003 VerCauteren et al. 2003 Zorn et al. 2006 Shang et al. 2013
	Artificial night lighting sources can decrease activity, alter foraging behavior, and increase predation pressure on nocturnal rodents. Night lighting can affect foraging behavior and the success of bats by attracting insects. Night lighting can cause avian disorientation, increasing collision risk, especially during migration.	Squires and Hanson 1918 Clarke 1983 Vasquez 1994 Kramer and Birney 2001 Beier 2006 Cabrera-Cruz et al. 2018
	Reflected lighting from industrial-scale photovoltaic solar arrays may disorient avian species or increase the potential for collision-related injury or mortality.	Walston et al. 2015 Smith and Dwyer 2016
Noise	Anthropogenic noise alters wildlife foraging and breeding behavior and stress levels and physiological response. Noise masks sounds, rendering habitat unsuitable and effectively reducing available habitat.	Anderson 1995 Jacobson 2005 Slabbekoorn and Ripmeester 2008 Barber et al. 2009 Blickley and Patricelli 2010 Lyon and Anderson 2003
	In avian species, anthropogenic noise increases stress, masks predator sounds or alarm calls, and interferes with communication and vital life history function, especially if the noise interferes with species-specific calls. Intermittent and unpredictable noise is perceived as a threat. The density, diversity, and success of breeding avian species is lowered near highways.	Reijnen and Foppen 2006 Coffin 2007 Slabbekoorn and Ripmeester 2008 Francis et al. 2009 Blickley et al. 2012a Blickley et al. 2012b Francis and Barber 2013 Davies et al. 2017

Element	Effect	Relevant Literature
Noise *(cont'd)*	In mammal species, anthropogenic noise masks sounds, which can affect foraging behavior, interfere with communication, and may affect reproduction success. Some mammals may alter vocalizations to compensate. Noise may lead to displacement as mammals move away from human activity. Bats, which depend on echolocation, may be particularly sensitive to noise effects. Loud noises can cause auditory (physiological) damage.	Berry 1980 Bury 1980 Campbell and Remington 1981. Brattstrom and Bondello 1983 Lovich and Bainbridge 1999 Hansen et al. 2005 Ouren et al. 2007 Schaub et al. 2008 Jones 2008 Sloan and Hare 2008 Barber et al. 2009 Tressler et al. 2011 Hotchkin and Parks 2013 Bunkley et al. 2015
Air Quality	Avian species can be particularly vulnerable to air pollution, having adverse health effects from gas-phase and particulate air pollution. Responses are respiratory distress and illness, elevated stress, behavioral changes, and impaired reproductive success.	Sterner 1993a Sterner 1993b Belskii and Grebennikov 2014 Sanderfoot and Holloway 2017
	Air pollution from vehicles and roads can have toxic effects on wildlife, reducing fitness, depressing lung function, and increasing mortality in mammals.	Sagai et al. 1996 Hartung and Saleh 2007 Leonard and Hochuli 2017
	Certain invertebrates may avoid roadside habitat due to high concentrations of vehicle- and road-related air pollution. Air pollution may reduce foraging success in honeybees. Increased nitrogen deposition near roads may increase vegetative growth, increasing habitat suitability for certain invertebrates.	Spencer et al. 1998 Kammerbauer and Dick 2000 Sims and Lacey 2000 Leonard and Hochuli 2017
	Fugitive dust can affect wildlife habitat near roads, through physiological impacts on vegetation near roads, and impacts on foraging efficiency for some avian species.	Thompson et al. 1984 Walker and Everett 1987 Spellerberg and Morrison 1998
Traffic	Roadkill is a significant source of vertebrate wildlife mortality in the US. Large and medium-sized mammals are particularly susceptible to two-lane high-speed highways. Roads and highways can restrict large mammal migration, movement, and population dynamics, while serving as dispersal corridors for other species. Road avoidance can inhibit territory protection and, subsequently, mating success. Small mammals' ability to cross roads may be affected by road width and vegetation presence more so than traffic volume.	Oxley et al. 1974 Rost and Bailey 1979 Adams and Geis 1983 Forman and Alexander 1998 Jackson 2000 van Langevelde and Jaarsma 2005 McGregor et al. 2008 Gagnon et al. 2007 McShea et al. 2008 Benítez-López et al. 2010 Olson 2013
	Traffic and roads can degrade wildlife habitat by transporting weed seeds and facilitating infestation spread. Road edges have different habitat characteristics than surrounding vegetation. Vehicles driving off-road can collapse burrows or dens.	Gelbard and Belknap 2003 Godefroid and Koedam 2004 Coffin 2007
	Vehicles can affect aquatic invertebrates like branchiopods by crushing cysts when habitats are dry, reducing cyst abundance and thus species abundance. On playas, vehicles break surface crusts, exposing cysts to damage.	Eriksen et al. 1988 Hathaway et al. 1996 Sada et al. 2013

Element	Effect	Relevant Literature
Traffic *(cont'd)*	Vehicle collisions are a significant source of avian injury and mortality. Certain species are at higher risk, especially ground-nesting birds and those attracted to roads. Morality rates are positively correlated with traffic speed and volume, and season. Mortality is higher when roads are in or near high-quality avian habitat.	Case 1978 Moore and Mangel 1996 Newton et al. 1997 Mumme et al. 2000 Inglefinger and Anderson 2004 Gunson et al. 2010 Bujoczek et al. 2011 Boves and Belthoff 2012 Grilo et al. 2012 Loss et al. 2014
	Fatalities from collisions with aircraft are most likely to affect gulls, waterfowl, and raptors.	Erickson et al. 2005
	Roads affect hydrology, geomorphology, and disturbance regimes in stream networks, and increase sediment delivery. Sediment can negatively affect gravel spawning habitat.	Forman and Alexander 1998 Jones et al. 2000 Quinn 2005 Wheeler et al. 2005
	Highway surfaces collect a variety of chemical pollutants from automobile traffic, which can be mobilized by runoff water and transported to streams. Common traffic residues are metal contaminants, petroleum, motor oil, and platinum group elements from catalytic converters. Accidental spills from freight shipments, and produced during automobile wrecks, also deposit chemical pollutants on roadways.	Callender and Rice 2000 Ely et al. 2001 Maltby et al. 1995 Rauch and Morrison 1999 Van Hassel et al. 1980 Wheeler et al. 2005 Wu et al. 1998
Trash and Pollution	In areas with high amounts of trash, predation on avian species can be elevated because predators, like ravens, crows, and coyotes, are attracted to trash. Predation can result in higher mortality, egg loss, and nest abandonment.	Page et al. 1983 Côté and Sutherland 1997 Liebezeit and George 2002 Baker 2007 USFWS 2007 Colwell et al. 2009
	Avian species can use trash to build nests, which can lead to increased mortality from ingestion and entanglement.	Montevecchi 1991 Blem et al. 2002 Mee et al. 2007 Parker and Blomme 2007
	Herpetofauna can become entangled in, or attempt to consume, trash, causing injury or death.	Herrington 1985 Walley et al. 2005 Walde et al. 2007 Kapfer and Paloski 2011
	Terrestrial organisms can uptake and concentrate potentially toxic environmental pollutants common in anthropogenic waste. Once ingested, pollutants may be dispersed via terrestrial food webs, movements, and/or predation.	Sánchez-Bayo 2006 Gaylor et al. 2012
	Soaps and detergents alter water quality and can injure or kill aquatic wildlife, when used in aquatic habitat, such as hot spring outflows.	Sada et al. 2001
	High (TDS) concentrations can be acutely toxic to cui-ui eggs and chronic exposure to lower TDS concentrations can also result in death or abnormalities.	LOSL 1982 Sigler et al. 1985

Element	Effect	Relevant Literature
Human Presence	In general, human presence affects wildlife by altering their ability to exploit resources. Recreation activities can disturb or displace large mammal species from habitat. Human presence can affect vigilance and flight behaviors of some animals. Human entry into caves or mines can disturb bat hibernation and other life history elements.	Boyle and Samson 1985 Gill 2007 Price et al. 2014
	Human presence can influence eagle behavior and productivity. Beach- and shore-based recreation can disturb ground-nesting shorebirds, causing flushing, nest abandonment, and displacement from habitat.	Boyle and Samson 1985 Watson 1997
	Recreationists can modify habitat in hot spring outflows by impounding or diverting water, trampling vegetation, and using soaps or detergents. They also can disturb species and injure or destroy them by stepping on aquatic invertebrates, eggs, or larvae.	Sada et al. 2001 Abele 2011

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Attachment I

Agency Coordination

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STATE OF NEVADA

DEPARTMENT OF WILDLIFE

6980 Sierra Center Parkway, Suite 120
Reno, Nevada 89511
(775) 688-1500 • Fax (775) 688-1495

BRIAN SANDOVAL
Governor

TONY WASLEY
Director

ELIZABETH O'BRIEN
Deputy Director

JACK ROBB
Deputy Director

November 8, 2017

Morgan Trieger
Biologist
EMPSi
4741 Caughlin Pky
Reno, Nevada 89519

Re: Burning Man Event Special Recreation Permit EIS

Dear Morgan Trieger:

I am responding to your request for information from the Nevada Department of Wildlife (NDOW) on the known or potential occurrence of wildlife resources in the vicinity of the Burning Man Event Special Recreation Permit EIS located in Pershing County, Nevada. In order to fulfill your request an analysis was performed using the best available data from the NDOW's wildlife occurrences, raptor nest sites and ranges, greater sage-grouse leks and habitat, and big game distributions databases. No warranty is made by the NDOW as to the accuracy, reliability, or completeness of the data for individual use or aggregate use with other data. These data should be considered **sensitive** and may contain information regarding the location of sensitive wildlife species or resources. All appropriate measures should be taken to ensure that the use of this data is strictly limited to serve the needs of the project described on your GIS Data Request Form. Abuse of this information has the potential to adversely affect the existing ecological status of Nevada's wildlife resources and could be cause for the denial of future data requests.

To adequately provide wildlife resource information in the vicinity of the proposed project the NDOW delineated an area of interest that included a four-mile buffer around the project area provided by you on Wednesday, November 08, 2017. Wildlife resource data was queried from the NDOW databases based on this area of interest. The results of this analysis are summarized below.

Big Game - Occupied bighorn sheep and mule deer distributions exist within portions of the project area and four-mile buffer area. Occupied pronghorn antelope distribution exists outside of the project area within portions of the four-mile buffer area. No known occupied elk distribution exists in the vicinity of the project area. Please refer to the attached maps for details regarding big game distributions relative to the proposed project area.

Greater Sage-Grouse - Greater sage-grouse habitat in the vicinity of the project area has primarily been classified as Other habitat by the Nevada Sagebrush Ecosystem Program (http://sagebrusheco.nv.gov). General habitat also exists in the vicinity of the project area. Please refer to the attached map for details regarding greater sage-grouse habitat relative to the proposed project area. There are no known radio-marked greater sage-grouse tracking locations in the vicinity of the project area. There are no known greater sage-grouse lek sites in the vicinity of the project area.

Raptors - Various species of raptors, which use diverse habitat types, may reside in the vicinity of the project area. American kestrel, bald eagle, barn owl, burrowing owl, Cooper's hawk, ferruginous hawk, golden eagle, great horned owl, long-eared owl, merlin, northern goshawk, northern harrier, northern saw-whet owl, osprey, peregrine falcon, red-tailed hawk, rough-legged hawk, sharp-shinned hawk, short-eared owl, Swainson's hawk, turkey vulture, and western screech owl have distribution ranges that include the project area and four-mile buffer area. Furthermore, northern goshawk, peregrine falcon, and prairie falcon have been directly observed in the vicinity of the project area.

Raptor species are protected by State and Federal laws. In addition, bald eagle, burrowing owl, California spotted owl, ferruginous hawk, flammulated owl, golden eagle, northern goshawk, peregrine falcon, prairie falcon, and short-eared owl are NDOW species of special concern and are target species for conservation as outlined by the Nevada Wildlife Action Plan. Per the *Interim Golden Eagle Technical Guidance: Inventory and Monitoring Protocols; and Other Recommendations in Support of Golden Eagle Management and Permit Issuance* (United States Fish and Wildlife Service 2010) we have queried our raptor nest database to include raptor nest sites within ten miles of the proposed project area. There are 15 known raptor nest sites within ten miles of the project area:

Probable Use	Last Check	Last Active	Township/Range/Section
Accipiter/Buteo	4/26/1983	4/26/1983	21 0340N 0220E 026
Accipiter/Buteo	4/26/1983	4/26/1983	21 0340N 0230E 019
Accipiter/Buteo	4/26/1983	4/26/1983	21 0340N 0230E 029
Accipiter/Buteo	4/26/1983	4/26/1983	21 0340N 0230E 032
Buteo	4/11/1974		21 0340N 0230E 006
Buteo	4/26/1983	4/26/1983	21 0330N 0230E 005
Buteo	5/4/2011	5/4/2011	21 0340N 0230E 018
Buteo/Corvid	5/4/2011	5/4/2011	21 0330N 0240E 006
Eagle	4/12/1974		21 0340N 0230E 008
Eagle	6/15/1981	6/15/1981	21 0330N 0240E 008
Eagle	5/4/2011	5/4/2011	21 0330N 0230E 005
Eagle	5/4/2011	5/4/2011	21 0330N 0230E 015
Eagle	5/4/2011	5/4/2011	21 0330N 0240E 006
Eagle	5/4/2011	5/4/2011	21 0340N 0220E 023
Eagle	5/4/2011	5/4/2011	21 0340N 0230E 008

Other Wildlife Resources

There are no big game and three small game water developments in the vicinity of the project area. The following species have also been observed in the vicinity of the project area:

Common Name	ESA	State	SWAP SoCP
desert horned lizard			Yes
desert woodrat			
gophersnake			
Great Basin collared lizard			Yes
Great Basin fence lizard			
long-nosed leopard lizard			Yes
long-tailed pocket mouse			
pinyon deermouse			
silver-haired bat			Yes
striped whipsnake			
western mosquitofish			
western pipistrelle			
western small-footed myotis			Yes
yellow-backed spiny lizard			

ESA: Endangered Species Act Status
State: State of Nevada Special Status

SWAP SoCP: Nevada State Wildlife Action Plan (2012) Species of Conservation Priority

The proposed project area may also be in the vicinity of abandoned mine workings, which often provide habitat for state and federally protected wildlife, especially bat species, many of which are protected under NAC 503.030. To request data regarding known abandoned mine workings in the vicinity of the project area please contact the Nevada Division of Minerals (http://minerals.state.nv.us/).

The above information is based on data stored at our Reno Headquarters Office, and does not necessarily incorporate the most up to date wildlife resource information collected in the field. Please contact the Habitat Division Supervising Biologist at our Western Region Reno Office (775.688.1500) to discuss the current environmental conditions for your project area and the interpretation of our analysis. Furthermore, it should be noted that the information detailed above is preliminary in nature and not necessarily an identification of every wildlife resource concern associated with the proposed project. Consultation with the Supervising Habitat biologist will facilitate the development of appropriate survey protocols and avoidance or mitigation measures that may be required to address potential impacts to wildlife resources.

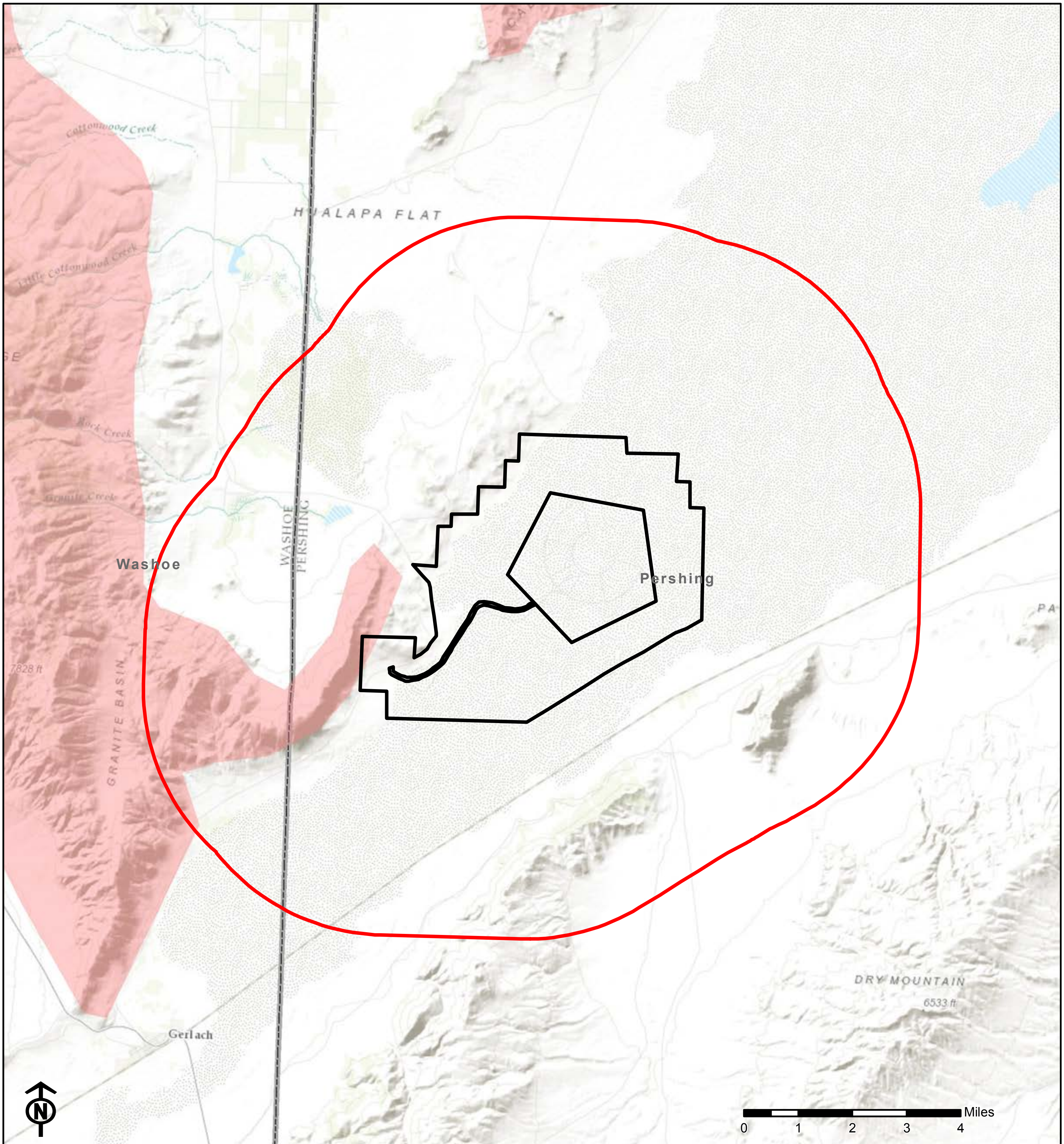
Mark Freese - Western Region Supervising Habitat Biologist (775.688.1145)

Federally listed Threatened and Endangered species are also under the jurisdiction of the United States Fish and Wildlife Service. Please contact them for more information regarding these species.

If you have any questions regarding the results or methodology of this analysis please do not hesitate to contact our GIS office at (775) 688-1439.

Sincerely,

Bonnie Weller, GIS Analyst
Data and Technology Services
Nevada Department of Wildlife
6980 Sierra Center Parkway, Ste. 120
Reno, Nevada 89511
(775) 688-1439
bweller@ndow.org



Project Area

Four Mile Buffer Area Boundary

Bighorn Sheep Distribution

Burning Man Event Special Recreation Permit EIS
Bighorn Sheep Distribution

November 08, 2017

Projection: UTM Zone 11 North, NAD83

No warranty is made by the Nevada Department of Wildlife as to the accuracy, reliability, or completeness of the data for individual use or aggregate use with other data.

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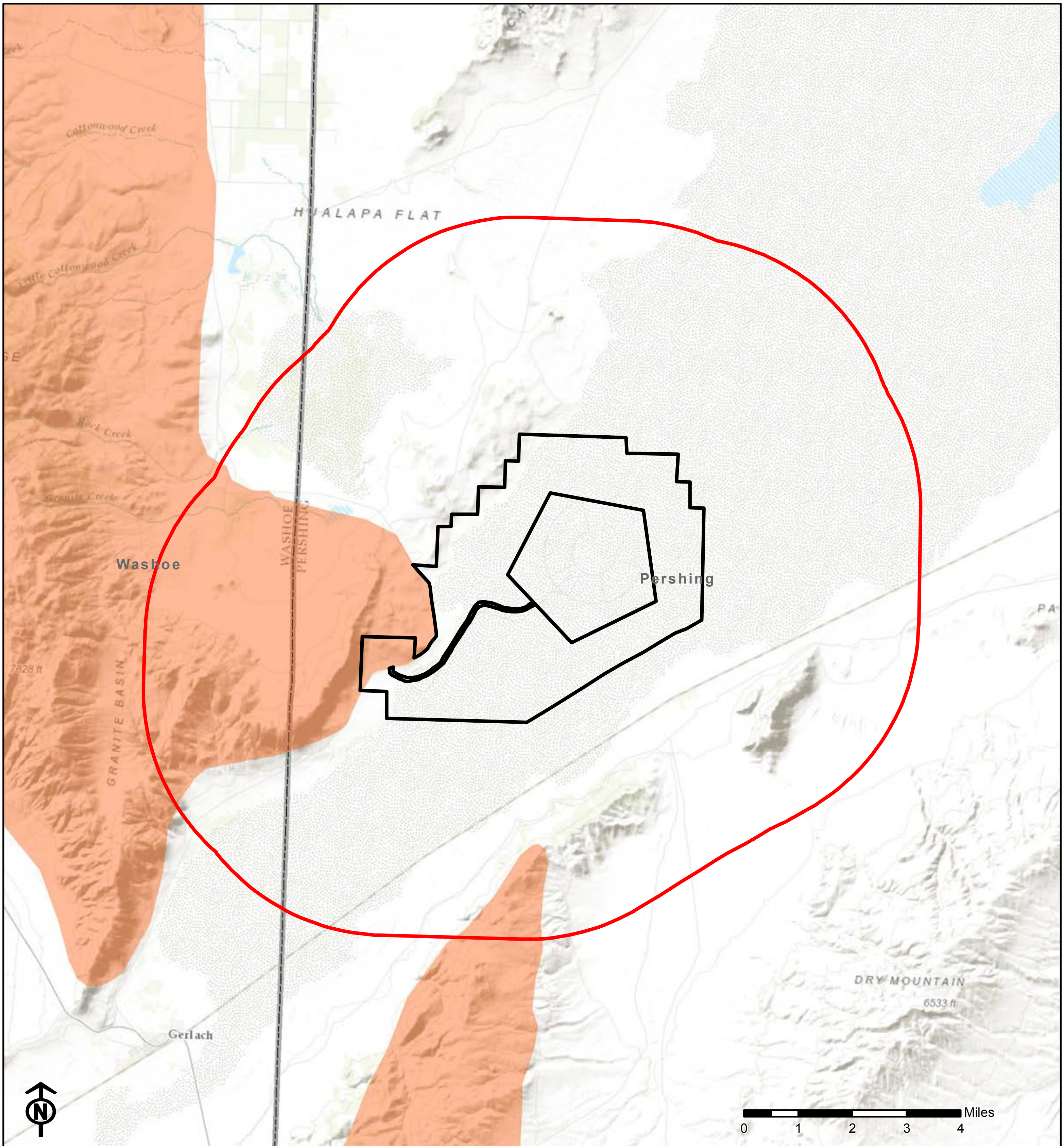

Project Area

Four Mile Buffer Area Boundary

Mule Deer Distribution

Burning Man Event Special Recreation Permit EIS
Mule Deer Distribution

November 08, 2017

Projection: UTM Zone 11 North, NAD83

No warranty is made by the Nevada Department of Wildlife as to the accuracy, reliability, or completeness of the data for individual use or aggregate use with other data.

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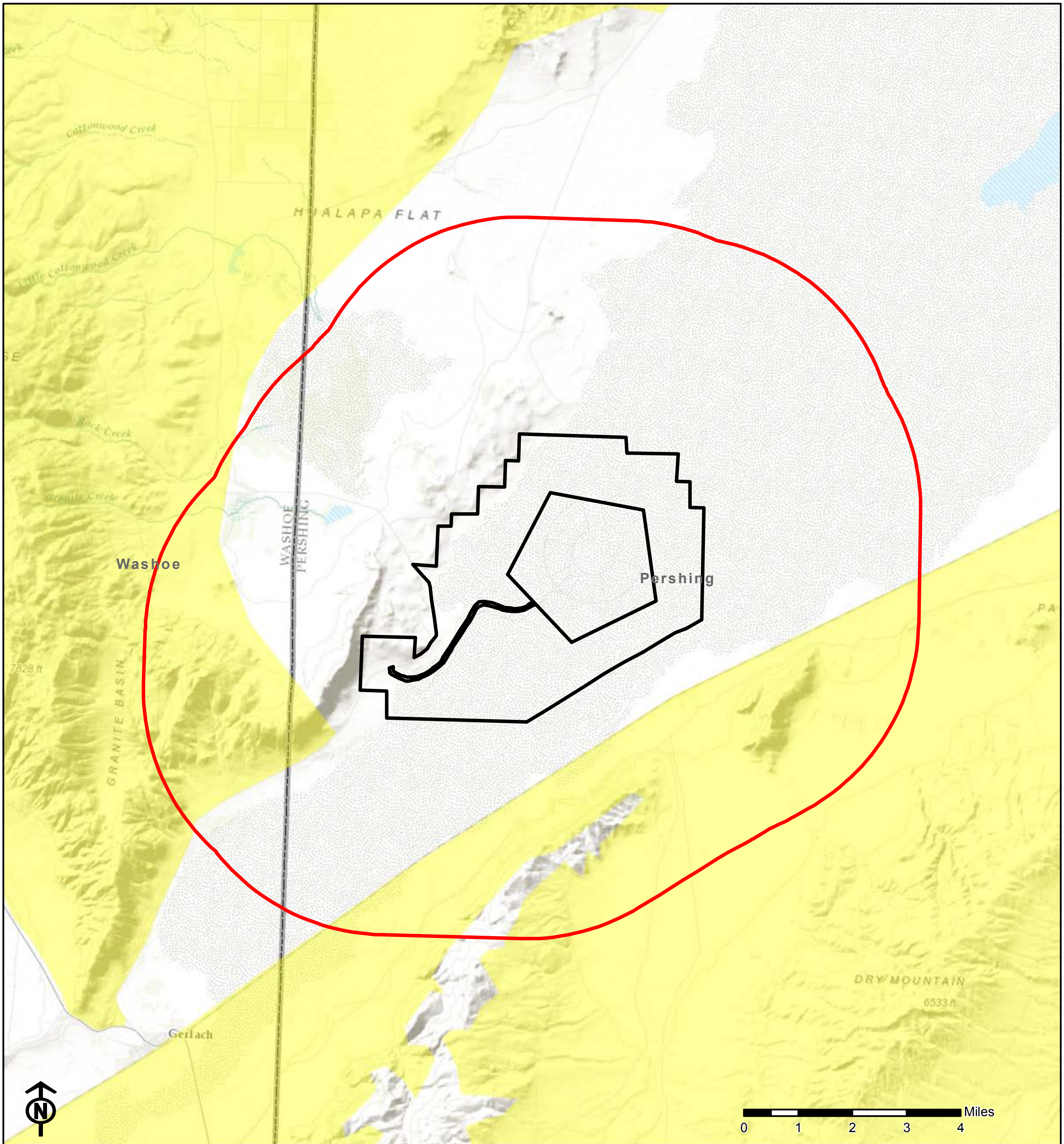


Project Area

Four Mile Buffer Area Boundary

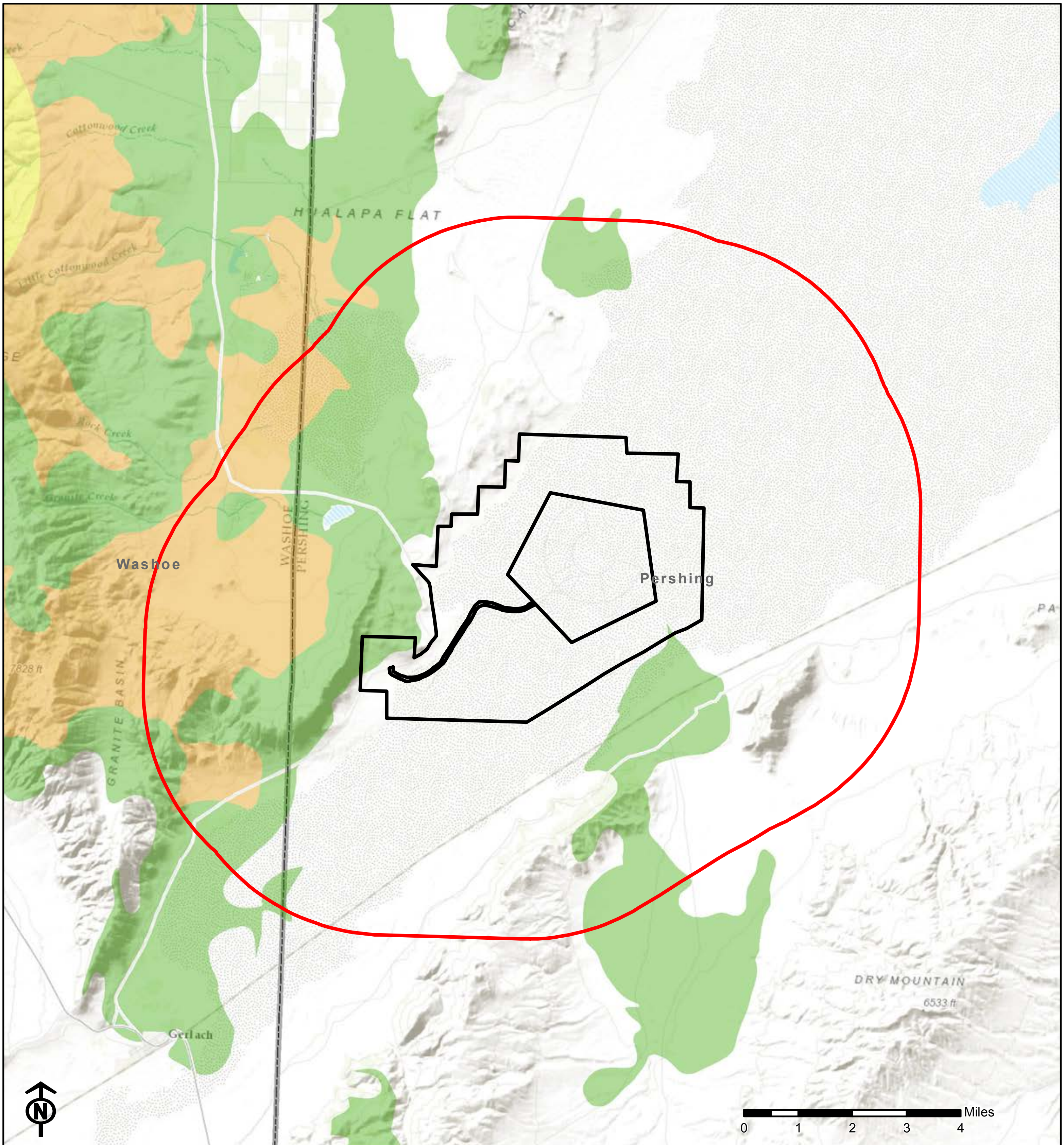
Pronghorn Antelope Distribution

Burning Man Event Special Recreation Permit EIS
Pronghorn Antelope Distribution

November 08, 2017

Projection: UTM Zone 11 North, NAD83

No warranty is made by the Nevada Department of Wildlife as to the accuracy, reliability, or completeness of the data for individual use or aggregate use with other data.



- Project Area
- Four Mile Buffer Area Boundary
- Priority Habitat
- General Habitat
- Other Habitat
- Bi-State Habitat

Burning Man Event Special Recreation Permit EIS
Greater Sage-Grouse Habitat

November 08, 2017

Projection: UTM Zone 11 North, NAD83

No warranty is made by the Nevada Department of Wildlife as to the accuracy, reliability, or completeness of the data for individual use or aggregate use with other data.

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09 November 2017

Morgan Trieger
Environmental Management and Planning Solutions, Inc.
4741 Caughlin Parkway, Suite 4
Reno, NV 89519

RE: Data request received 07 November 2017

Dear Mr. Trieger:

We are pleased to provide the information you requested on endangered, threatened, candidate, and/or at risk plant and animal taxa recorded within or near the Burning Man Event Special Recreation Permit Project in Pershing County. We searched our database and maps for the following, a two kilometer radius around the shapefiles provided of the project area.

There are no at risk taxa recorded within the given area. However, habitat may be available for, the Golden Eagle, *Aquila chrysaetos*, a Nevada Bureau of Land Management (BLM) Sensitive Species and the silver-haired bat, *Lasionycteris noctivagans*, a Nevada BLM Sensitive Species. The Nevada Department of Wildlife (NDOW) manages, protects, and restores Nevada's wildlife resources and associated habitat. Please contact Bonnie Weller, NDOW GIS Biologist (775 688-1439) to obtain further information regarding wildlife resources within and near your area of interest. Removal or destruction of state protected flora species (NAC 527.010) requires a special permit from Nevada Division of Forestry (NRS 527.270).

Please note that our data are dependent on the research and observations of many individuals and organizations and in most cases are not the result of comprehensive or site-specific field surveys. Natural Heritage reports should never be regarded as final statements on the taxa or areas being considered, nor should they be substituted for on-site surveys required for environmental assessments.

Thank you for checking with our program. Please contact us for additional information or further assistance.

Sincerely,

Eric S. Miskow
Biologist/Data Manager

(4 sf)

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Reno Fish And Wildlife Office
1340 Financial Boulevard, Suite 234
Reno, NV 89502-7147
Phone: (775) 861-6300 Fax: (775) 861-6301
http://www.fws.gov/nevada/

In Reply Refer To: December 04, 2017
Consultation Code: 08ENVD00-2018-SLI-0110
Event Code: 08ENVD00-2018-E-00282
Project Name: Burning Man Environmental Impact Statement

Subject: List of threatened and endangered species that may occur in your proposed project location, and/or may be affected by your proposed project

To Whom It May Concern:

The attached species list indicates threatened, endangered, proposed, and candidate species and designated or proposed critical habitat that may occur within the boundary of your proposed project and/or may be affected by your proposed project. The species list fulfills the requirements of the U.S. Fish and Wildlife Service (Service) under section 7(c) of the Endangered Species Act of 1973, as amended (ESA, 16 U.S.C. 1531 et seq.), for projects that are authorized, funded, or carried out by a Federal agency. Candidate species have no protection under the ESA but are included for consideration because they could be listed prior to the completion of your project. Consideration of these species during project planning may assist species conservation efforts and may prevent the need for future listing actions. For additional information regarding species that may be found in the proposed project area, visit http://www.fws.gov/nevada/es/ipac.html.

The purpose of the ESA is to provide a means whereby threatened and endangered species and the ecosystems upon which they depend may be conserved. Under sections 7(a)(1) and 7(a)(2) of the ESA and its implementing regulations (50 CFR 402 et seq.), Federal agencies are required to utilize their authorities to carry out programs for the conservation of threatened and endangered species and to determine whether projects may affect threatened and endangered species and/or designated critical habitat.

A Biological Assessment is required for construction projects that are major Federal actions significantly affecting the quality of the human environment as defined in the National Environmental Policy Act (42 U.S.C. 4332(2) (c)). For projects other than major construction activities, the Service suggests that a biological evaluation similar to a Biological Assessment be prepared to determine whether the project may affect listed or proposed species and/or designated or proposed critical habitat. Guidelines for preparing a Biological Assessment can be found at: http://www.fws.gov/midwest/endangered/section7/ba_guide.html.

If a Federal action agency determines, based on the Biological Assessment or biological evaluation, that listed species and/or designated critical habitat may be affected by the proposed project, the agency is required to consult with the Service pursuant to 50 CFR 402. In addition, the Service recommends that candidate species, proposed species, and proposed critical habitat be addressed within the consultation. More information on the regulations and procedures for section 7 consultation, including the role of permit or license applicants, can be found in the "Endangered Species Consultation Handbook" at: http://www.fws.gov/endangered/esa-library/pdf/TOC-GLOS.PDF.

New information based on updated surveys, changes in the abundance and distribution of species, changed habitat conditions, or other factors could change this species list. Please feel free to contact us if you need more current information or assistance regarding the potential impacts to federally listed, proposed, and candidate species and federally designated and proposed critical habitat. Please note that under 50 CFR 402.12(e) of the regulations implementing section 7 of the ESA, the accuracy of this species list should be verified after 90 days. This verification can be completed formally or informally, as desired. The Service recommends that verification be completed by visiting the ECOS-IPaC website at regular intervals during project planning and implementation, for updates to species lists and information. An updated list may be requested through the ECOS-IPaC system by completing the same process used to receive the attached list.

The Nevada Fish and Wildlife Office (NFWO) no longer provides species of concern lists. Most of these species for which we have concern are also on the Animal and Plant At-Risk Tracking List for Nevada (At-Risk list) maintained by the State of Nevada's Natural Heritage Program (Heritage). Instead of maintaining our own list, we adopted Heritage's At-Risk list and are partnering with them to provide distribution data and information on the conservation needs for at-risk species to agencies or project proponents. The mission of Heritage is to continually evaluate the conservation priorities of native plants, animals, and their habitats, particularly those most vulnerable to extinction or in serious decline. In addition, in order to avoid future conflicts, we ask that you consider these at-risk species early in your project planning and explore management alternatives that provide for their long-term conservation.

For a list of at-risk species by county, visit Heritage's website (http://heritage.nv.gov). For a specific list of at-risk species that may occur in the project area, you can obtain a data request form from the website (http://heritage.nv.gov/get_data) or by contacting the Administrator of Heritage at 901 South Stewart Street, Suite 5002, Carson City, Nevada 89701-5245, (775) 684-2900. Please indicate on the form that your request is being obtained as part of your coordination with the Service under the ESA. During your project analysis, if you obtain new information or data for any Nevada sensitive species, we request that you provide the information to Heritage at the above address.

Furthermore, certain species of fish and wildlife are classified as protected by the State of

Nevada (http://www.leg.state.nv.us/NAC/NAC-503.html). You must first obtain the appropriate license, permit, or written authorization from the Nevada Department of Wildlife (NDOW) to take, or possess any parts of protected fish and wildlife species. Please visit http://www.ndow.org or contact NDOW in northern Nevada (775) 688-1500, in southern Nevada (702) 486-5127, or in eastern Nevada (775) 777-2300.

Please be aware that bald and golden eagles are protected under the Bald and Golden Eagle Protection Act (16 U.S.C. 668 et seq.), and projects affecting these species may require development of an eagle conservation plan (http://www.fws.gov/windenergy/eagle_guidance.html). Additionally, wind energy projects should follow the Service's wind energy guidelines (http://www.fws.gov/windenergy/) for minimizing impacts to migratory birds and bats.

The Service's Pacific Southwest Region developed the Interim Guidelines for the Development of a Project Specific Avian and Bat Protection Plan for Wind Energy Facilities (Interim Guidelines). This document provides energy facility developers with a tool for assessing the risk of potential impacts to wildlife resources and delineates how best to design and operate a bird- and bat-friendly wind facility. These Interim Guidelines are available upon request from the NFWO. The intent of a Bird and Bat Conservation Strategy is to conserve wildlife resources while supporting project developers through: (1) establishing project development in an adaptive management framework; (2) identifying proper siting and project design strategies; (3) designing and implementing pre-construction surveys; (4) implementing appropriate conservation measures for each development phase; (5) designing and implementing appropriate post-construction monitoring strategies; (6) using post-construction studies to better understand the dynamics of mortality reduction (e.g., changes in blade cut-in speed, assessments of blade “feathering” success, and studies on the effects of visual and acoustic deterrents) including efforts tied into Before-After/Control-Impact analysis; and (7) conducting a thorough risk assessment and validation leading to adjustments in management and mitigation actions.

The template and recommendations set forth in the Interim Guidelines were based upon the Avian Powerline Interaction Committee's Avian Protection Plan template (http://www.aplic.org/) developed for electric utilities and modified accordingly to address the unique concerns of wind energy facilities. These recommendations are also consistent with the Service's wind energy guidelines. We recommend contacting us as early as possible in the planning process to discuss the need and process for developing a site-specific Bird and Bat Conservation Strategy.

The Service has also developed guidance regarding wind power development in relation to prairie grouse leks (sage-grouse are included in this). This document can be found at: http://www.fws.gov/southwest/es/Oklahoma/documents/te_species/wind%20power/prairie%20gr
.

Migratory Birds are a Service Trust Resource. Based on the Service's conservation responsibilities and management authority for migratory birds under the Migratory Bird Treaty Act of 1918, as amended (MBTA; 16 U.S.C. 703 et seq.), we recommend that any land clearing or other surface disturbance associated with proposed actions within the project area be timed to avoid potential destruction of bird nests or young, or birds that breed in the area. Such destruction may be in violation of the MBTA. Under the MBTA, nests with eggs or young of migratory birds may not be harmed, nor may migratory birds be killed. Therefore, we recommend land clearing be conducted outside the avian breeding season. If this is not feasible, we recommend a qualified biologist survey the area prior to land clearing. If nests are located, or if other evidence of nesting (i.e., mated pairs, territorial defense, carrying nesting material, transporting food) is observed, a protective buffer (the size depending on the habitat requirements of the species) should be delineated and the entire area avoided to prevent destruction or disturbance to nests until they are no longer active.

Guidance for minimizing impacts to migratory birds for projects involving communications towers (e.g., cellular, digital television, radio, and emergency broadcast) can be found at: http://www.fws.gov/migratorybirds/CurrentBirdIssues/Hazards/towers/towers.htm; http://www.towerkill.com; and http://www.fws.gov/migratorybirds/CurrentBirdIssues/Hazards/towers/comtow.html.

If wetlands, springs, or streams are are known to occur in the project area or are present in the vicinity of the project area, we ask that you be aware of potential impacts project activities may have on these habitats. Discharge of fill material into wetlands or waters of the United States is regulated by the U.S. Army Corps of Engineers (ACOE) pursuant to section 404 of the Clean Water Act of 1972, as amended. We recommend you contact the ACOE's Regulatory Section regarding the possible need for a permit. For projects located in northern Nevada (Carson City, Churchill, Douglas, Elko, Esmeralda, Eureka, Humboldt, Lander, Lyon, Mineral, Pershing, Storey, and Washoe Counties) contact the Reno Regulatory Office at 300 Booth Street, Room 3060, Reno, Nevada 89509, (775) 784-5304; in southern Nevada (Clark, Lincoln, Nye, and White Pine Counties) contact the St. George Regulatory Office at 321 North Mall Drive, Suite L-101, St. George, Utah 84790-7314, (435) 986-3979; or in California along the eastern Sierra contact the Sacramento Regulatory Office at 650 Capitol Mall, Suite 5-200, Sacramento, California 95814, (916) 557-5250.

We appreciate your concern for threatened and endangered species. Please include the Consultation Tracking Number in the header of this letter with any request for consultation or correspondence about your project that you submit to our office.

The table below outlines lead FWS field offices by county and land ownership/project type. Please refer to this table when you are ready to coordinate (including requests for section 7 consultation) with the field office corresponding to your project, and send any documentation regarding your project to that corresponding office. Therefore, the lead FWS field office may not be the office listed above in the letterhead.

Lead FWS offices by County and Ownership/Program

County	Ownership/Program	Species	Office Lead*
Alameda	Tidal wetlands/marsh adjacent to Bays	Salt marsh species, delta smelt	BDFWO

Alameda	All ownerships but tidal/estuarine	All	SFWO
Alpine	Humboldt Toiyabe National Forest	All	RFWO
Alpine	Lake Tahoe Basin Management Unit	All	RFWO
Alpine	Stanislaus National Forest	All	SFWO
Alpine	El Dorado National Forest	All	SFWO
Colusa	Mendocino National Forest	All	AFWO
Colusa	Other	All	By jurisdiction (see map)
Contra Costa	Legal Delta (Excluding ECCHCP)	All	BDFWO
Contra Costa	Antioch Dunes NWR	All	BDFWO
Contra Costa	Tidal wetlands/marsh adjacent to Bays	Salt marsh species, delta smelt	BDFWO
Contra Costa	All ownerships but tidal/estuarine	All	SFWO
Del Norte	All	All	AFWO
El Dorado	El Dorado National Forest	All	SFWO
El Dorado	LakeTahoe Basin Management Unit		RFWO
Glenn	Mendocino National Forest	All	AFWO
Glenn	Other	All	By jurisdiction (see map)
Humboldt	All except Shasta Trinity National Forest	All	AFWO
Humboldt	Shasta Trinity National Forest	All	YFWO
Lake	Mendocino National Forest	All	AFWO

Lake	Other	All	By jurisdiction (see map)
Lassen	Modoc National Forest	All	KFWO
Lassen	Lassen National Forest	All	SFWO
Lassen	Toiyabe National Forest	All	RFWO
Lassen	BLM Surprise and Eagle Lake Resource Areas	All	RFWO
Lassen	BLM Alturas Resource Area	All	KFWO
Lassen	Lassen Volcanic National Park	All (includes Eagle Lake trout on all ownerships)	SFWO
Lassen	All other ownerships	All	By jurisdiction (see map)
Marin	Tidal wetlands/marsh adjacent to Bays	Salt marsh species, delta smelt	BDFWO
Marin	All ownerships but tidal/estuarine	All	SFWO
Mendocino	Russian River watershed	All	SFWO
Mendocino	All except Russian River watershed	All	AFWO
Modoc	Modoc National Forest	All	KFWO
Modoc	BLM Alturas Resource Area	All	KFWO
Modoc	Klamath Basin National Wildlife Refuge Complex	All	KFWO
Modoc	BLM Surprise and Eagle Lake Resource Areas	All	RFWO
Modoc	All other ownerships	All	By jurisdiction (See map)
Mono	Inyo National Forest	All	RFWO

Mono	Humboldt Toiyabe National Forest	All	RFWO
Napa	All ownerships but tidal/estuarine	All	SFWO
Napa	Tidal wetlands/marsh adjacent to San Pablo Bay	Salt marsh species, delta smelt	BDFWO
Nevada	Humboldt Toiyabe National Forest	All	RFWO
Nevada	All other ownerships	All	By jurisdiction (See map)
Placer	Lake Tahoe Basin Management Unit	All	RFWO
Placer	All other ownerships	All	SFWO
Sacramento	Legal Delta	Delta Smelt	BDFWO
Sacramento	Other	All	By jurisdiction (see map)
San Francisco	Tidal wetlands/marsh adjacent to San Francisco Bay	Salt marsh species, delta smelt	BDFWO
San Francisco	All ownerships but tidal/estuarine	All	SFWO
San Mateo	Tidal wetlands/marsh adjacent to San Francisco Bay	Salt marsh species, delta smelt	BDFWO
San Mateo	All ownerships but tidal/estuarine	All	SFWO
San Joaquin	Legal Delta excluding San Joaquin HCP	All	BDFWO
San Joaquin	Other	All	SFWO
Santa Clara	Tidal wetlands/marsh adjacent to San Francisco Bay	Salt marsh species, delta	BDFWO

		smelt	
Santa Clara	All ownerships but tidal/estuarine	All	SFWO
Shasta	Shasta Trinity National Forest except Hat Creek Ranger District (administered by Lassen National Forest)	All	YFWO
Shasta	Hat Creek Ranger District	All	SFWO
Shasta	Bureau of Reclamation (Central Valley Project)	All	BDFWO
Shasta	Whiskeytown National Recreation Area	All	YFWO
Shasta	BLM Alturas Resource Area	All	KFWO
Shasta	Caltrans	By jurisdiction	SFWO/AFWO
Shasta	Ahjumawi Lava Springs State Park	Shasta crayfish	SFWO
Shasta	All other ownerships	All	By jurisdiction (see map)
Shasta	Natural Resource Damage Assessment, all lands	All	SFWO/BDFWO
Sierra	Humboldt Toiyabe National Forest	All	RFWO
Sierra	All other ownerships	All	SFWO
Siskiyou	Klamath National Forest (except Ukonom District)	All	YFWO
Siskiyou	Six Rivers National Forest and Ukonom District	All	AFWO
Siskiyou	Shasta Trinity National Forest	All	YFWO
Siskiyou	Lassen National Forest	All	SFWO
Siskiyou	Modoc National Forest	All	KFWO

Siskiyou	Lava Beds National Volcanic Monument	All	KFWO
Siskiyou	BLM Alturas Resource Area	All	KFWO
Siskiyou	Klamath Basin National Wildlife Refuge Complex	All	KFWO
Siskiyou	All other ownerships	All	By jurisdiction (see map)
Solano	Suisun Marsh	All	BDFWO
Solano	Tidal wetlands/marsh adjacent to San Pablo Bay	Salt marsh species, delta smelt	BDFWO
Solano	All ownerships but tidal/estuarine	All	SFWO
Solano	Other	All	By jurisdiction (see map)
Sonoma	Tidal wetlands/marsh adjacent to San Pablo Bay	Salt marsh species, delta smelt	BDFWO
Sonoma	All ownerships but tidal/estuarine	All	SFWO
Tehama	Mendocino National Forest	All	AFWO
Tehama	Shasta Trinity National Forest except Hat Creek Ranger District (administered by Lassen National Forest)	All	YFWO
Tehama	All other ownerships	All	By jurisdiction (see map)
Trinity	BLM	All	AFWO
Trinity	Six Rivers National Forest	All	AFWO
Trinity	Shasta Trinity National Forest	All	YFWO
Trinity	Mendocino National Forest	All	AFWO
Trinity	BIA (Tribal Trust Lands)	All	AFWO

Trinity	County Government	All	AFWO
Trinity	All other ownerships	All	By jurisdiction (See map)
Yolo	Yolo Bypass	All	BDFWO
Yolo	Other	All	By jurisdiction (see map)
All	FERC-ESA	All	By jurisdiction (see map)
All	FERC-ESA	Shasta crayfish	SFWO
All	FERC-Relicensing (non-ESA)	All	BDFWO

***Office Leads:**

AFWO=Arcata Fish and Wildlife Office

BDFWO=Bay Delta Fish and Wildlife Office

KFWO=Klamath Falls Fish and Wildlife Office

RFWO=Reno Fish and Wildlife Office

YFWO=Yreka Fish and Wildlife Office

Attachment(s):

- Official Species List
- USFWS National Wildlife Refuges and Fish Hatcheries
- Migratory Birds
- Wetlands

Official Species List

This list is provided pursuant to Section 7 of the Endangered Species Act, and fulfills the requirement for Federal agencies to "request of the Secretary of the Interior information whether any species which is listed or proposed to be listed may be present in the area of a proposed action".

This species list is provided by:

Reno Fish And Wildlife Office
1340 Financial Boulevard, Suite 234
Reno, NV 89502-7147
(775) 861-6300

Project Summary

Consultation Code: 08ENVD00-2018-SLI-0110

Event Code: 08ENVD00-2018-E-00282

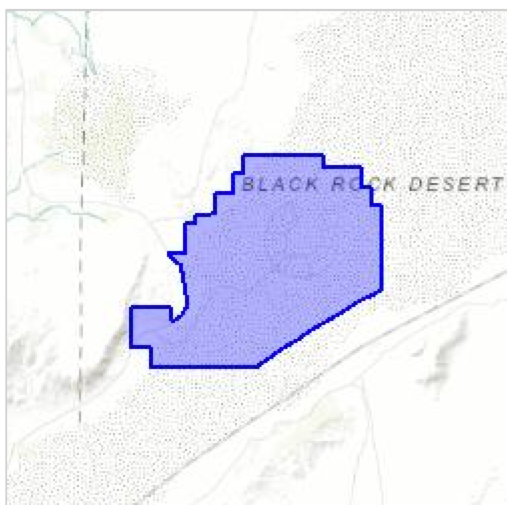
Project Name: Burning Man Environmental Impact Statement

Project Type: ** OTHER **

Project Description: The purpose of the Federal action is to respond to a request for a Special Recreation Permit under 43 CFR 2930 to conduct the Burning Man arts festival for ten years on public lands administered by the BLM Winnemucca District on portions of the Black Rock Desert playa on or near the South Playa. (Need species list for public closure areas)

Project Location:

Approximate location of the project can be viewed in Google Maps: https://www.google.com/maps/place/40.779084542855735N119.21738670888419W



Counties: Pershing, NV

Endangered Species Act Species

There is a total of 1 threatened, endangered, or candidate species on this species list. Species on this list should be considered in an effects analysis for your project and could include species that exist in another geographic area. For example, certain fish may appear on the species list because a project could affect downstream species. See the "Critical habitats" section below for those critical habitats that lie wholly or partially within your project area under this office's jurisdiction. Please contact the designated FWS office if you have questions.

Fishes

NAME	STATUS
Lahontan Cutthroat Trout *Oncorhynchus clarkii henshawi*	Threatened

No critical habitat has been designated for this species.

Species profile: https://ecos.fws.gov/ecp/species/3964
Species survey guidelines:
https://ecos.fws.gov/ipac/guideline/survey/population/233/office/14320.pdf

Critical habitats

THERE ARE NO CRITICAL HABITATS WITHIN YOUR PROJECT AREA UNDER THIS OFFICE'S JURISDICTION.

USFWS National Wildlife Refuge Lands And Fish Hatcheries

Any activity proposed on lands managed by the National Wildlife Refuge system must undergo a 'Compatibility Determination' conducted by the Refuge. Please contact the individual Refuges to discuss any questions or concerns.

THERE ARE NO REFUGE LANDS OR FISH HATCHERIES WITHIN YOUR PROJECT AREA.

Migratory Birds

Certain birds are protected under the Migratory Bird Treaty Act[1] and the Bald and Golden Eagle Protection Act[2].

Any activity that results in the take of migratory birds or eagles is prohibited unless authorized by the U.S. Fish and Wildlife Service[3]. There are no provisions for allowing the take of migratory birds that are unintentionally killed or injured. Any person or organization who plans or conducts activities that may result in the take of migratory birds is responsible for complying with the appropriate regulations and implementing appropriate conservation measures, as described below.

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1. The Migratory Birds Treaty Act of 1918.
2. The Bald and Golden Eagle Protection Act of 1940.
3. 50 C.F.R. Sec. 10.12 and 16 U.S.C. Sec. 668(a)

The birds listed below are USFWS Birds of Conservation Concern that might be affected by activities in this location. The list does not contain every bird you may find in this location, nor is it guaranteed that all of the birds on the list will be found on or near this location. To get a better idea of the specific locations where certain species have been reported and their level of occurrence, please refer to resources such as the E-bird data mapping tool (year-round bird sightings by birders and the general public) and Breeding Bird Survey (relative abundance maps for breeding birds). Although it is important to try to avoid and minimize impacts to all birds, special attention should be given to the birds on the list below. To get a list of all birds potentially present in your project area, visit the E-bird Explore Data Tool.

NAME	BREEDING SEASON
Brewer's Sparrow *Spizella breweri* **Bird of Conservation Concern (BCC)** https://ecos.fws.gov/ecp/species/9291	Breeds May 15 to Aug 10
Clark's Grebe *Aechmophorus clarkii* **Bird of Conservation Concern (BCC)**	Breeds Jan 1 to Dec 31
Golden Eagle *Aquila chrysaetos* **Bird of Conservation Concern (BCC)** https://ecos.fws.gov/ecp/species/1680	Breeds Apr 1 to Aug 31
Green-tailed Towhee *Pipilo chlorurus* **Bird of Conservation Concern (BCC)** https://ecos.fws.gov/ecp/species/9444	Breeds May 1 to Aug 10
Long-billed Curlew *Numenius americanus* **Bird of Conservation Concern (BCC)**	Breeds Apr 1 to Jul 31

NAME	BREEDING SEASON
https://ecos.fws.gov/ecp/species/5511	-
Lewis's Woodpecker *Melanerpes lewis* **Bird of Conservation Concern (BCC)** https://ecos.fws.gov/ecp/species/9408	Breeds Apr 20 to Sep 30
Lesser Yellowlegs *Tringa flavipes* **Bird of Conservation Concern (BCC)** https://ecos.fws.gov/ecp/species/9679	Breeds elsewhere
Olive-sided Flycatcher *Contopus cooperi* **Bird of Conservation Concern (BCC)** https://ecos.fws.gov/ecp/species/3914	Breeds May 20 to Aug 31
Pinyon Jay *Gymnorhinus cyanocephalus* **Bird of Conservation Concern (BCC)** https://ecos.fws.gov/ecp/species/9420	Breeds Feb 15 to Jul 15
Sagebrush Sparrow *Artemisiospiza nevadensis* **Bird of Conservation Concern (BCC)**	Breeds Mar 15 to Jul 31
Sage Thrasher *Oreoscoptes montanus* **Bird of Conservation Concern (BCC)** https://ecos.fws.gov/ecp/species/9433	Breeds Apr 15 to Aug 10
Virginia's Warbler *Vermivora virginiae* **Bird of Conservation Concern (BCC)** https://ecos.fws.gov/ecp/species/9441	Breeds May 1 to Jul 31
Willow Flycatcher *Empidonax traillii* **Bird of Conservation Concern (BCC)** https://ecos.fws.gov/ecp/species/3482	Breeds May 20 to Aug 31
Williamson's Sapsucker *Sphyrapicus thyroideus* **Bird of Conservation Concern (BCC)** https://ecos.fws.gov/ecp/species/8832	Breeds May 1 to Jul 31

Additional information can be found using the following links:

- Birds of Conservation Concern http://www.fws.gov/birds/management/managed-species/birds-of-conservation-concern.php
- Measures for avoiding and minimizing impacts to birds http://www.fws.gov/birds/management/project-assessment-tools-and-guidance/conservation-measures.php
- Nationwide conservation measures for birds http://www.fws.gov/migratorybirds/pdf/management/nationwidestandardconservationmeas

Wetlands

Impacts to NWI wetlands and other aquatic habitats may be subject to regulation under Section 404 of the Clean Water Act, or other State/Federal statutes.

For more information please contact the Regulatory Program of the local U.S. Army Corps of Engineers District.

LAKE

- L2US
- L2USJ

RIVERINE

- R4SBJ

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