

3.10 THREATENED, ENDANGERED, AND SPECIAL STATUS SPECIES

3.10.1 Affected Environment

A number of Federal and State threatened, endangered, or special status species occur throughout northern Nevada. Any action that could affect a Federally-listed species is subject to consultation with the USFWS pursuant to Section 7 of the Endangered Species Act (ESA) of 1973.¹⁶ For special status species (e.g., candidate, and/or species of concern), BLM policy (6840.02 B) is to not authorize actions that could adversely affect their populations and thus contribute to listing any of these species under provisions of the ESA. BLM also signed a Memorandum of Understanding with the U.S. Geological Survey, U.S. Department of Agriculture Forest Service, Smithsonian Institution, U.S. National Park Service, USFWS, and The Nature Conservancy (signed November 6, 1998) to conserve springsnail species throughout the Great Basin. On May 13, 2002, the USFWS provided BLM with a list of Federally threatened, endangered, candidate, and species of concern that could occur within areas affected by the proposed action.

Species on the USFWS list occupy a variety of habitat types and few of them occur throughout the assessment area. Table 3.10-1 includes all Federally-listed threatened and endangered species; Table 3.10-2 includes all proposed threatened and candidate species, and Table 3.10-3 lists all species of concern. These tables also list other rare species known from the assessment area, identify broad, salient habitat features required by each species, and identify hydrographic basin(s), PVAs, and KGRAs where geothermal development is most likely to affect their abundance and distribution. These tables are not intended to provide definitive ecological or distributional information that is necessary to thoroughly assess the impacts of the proposed action on each taxon, but are intended to provide a framework for this assessment, to identify where species could be affected, and to indicate the types of habitat that are occupied by each species. Additional surveys could determine that species are found in or near additional hydrographic basins, PVAs, and KGRAs.

¹⁶ Endangered Species Act of 1973 (P.L. 93-205 as amended (16 USC §1531 *et seq.*))

**TABLE 3.10-1
 THREATENED AND ENDANGERED SPECIES**

Common Name	Habitat	Hydrographic Basin	PVA	KGRA
3.1.1.1 Endangered Species				
Bald eagle ¹ (<i>Haliaeetus leucocephalus</i>)	Primarily winter resident; nesting sensitive to disturbance	All	All	All
3.1.1.2 Threatened Species				
Desert dace ² (<i>Eremichthys acros</i>)	Thermal springs, insectivorous	2		
Lahontan cutthroat trout ³ (<i>Oncorhynchus clarki henshawi</i>)	Lower elevation and lower gradient perennial streams, high quality water, gravel substrate and pools	1, 2, 4	1, 2, 6	

¹ Herron et al. 1985; Ryser 1985

² Hubbs and Miller 1948; Vinyard 1996

³ USFWS 1995

**TABLE 3.10-2
PROPOSED THREATENED AND CANDIDATE SPECIES**

Common Name	Habitat	Hydrographic Basin	PVA	KGRA
Proposed Threatened Species				
Mountain plover ¹ (<i>Charadrius montanus</i>)	Neo-tropical migrant, scarce in Great Basin, grassland breeding habitat	1,2, 4, 8, 10	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13	Rye Patch, Brady, New York Canyon, Dixie Valley
Candidate Species				
Western yellow-billed cuckoo ² (<i>Coccyzus americanus</i>)	Riparian vegetation, summer resident for nesting			

¹ Graul 1975; Graul and Webster 1976

² Ryser 1985

**TABLE 3.10.3
SPECIES OF CONCERN**

Common Name	Habitat	Hydrographic Basin	PVA	KGRA
Species of Concern				
Pygmy rabbit ¹ (<i>Brachylagus idahoensis</i>)	Sagebrush shrub	All	All	All
Pacific Townsend's big-eared bat ¹ (<i>Corynorhinus townsendii townsendii</i>)	Associated with caves and mines from 600-11,000 feet. Pinyon-juniper, sagebrush and salt desert shrub, agriculture lands	All	All	All

Common Name	Habitat	Hydrographic Basin	PVA	KGRA
Pale Townsend's big-eared bat ¹ (<i>Corynorhinus townsendii pallescens</i>)	Associated with caves and mines from 600-11,000 feet. Pinyon-juniper, sagebrush and salt desert shrub, agriculture lands	All	All	All
Spotted bat ¹ (<i>Euderma maculatum</i>)	Associated with cliffs from 600-7,000 feet. Coniferous forest, sagebrush and riparian habitats	1, 2, 5	1, 8	Gerlach, San Emidio
Small-foot myotis ¹ (<i>Myotis ciliolabrum</i>)	Elevations 1,500-6,000 feet. Associated with caves, mines and trees. Pinyon-juniper woodlands, sagebrush and desert shrub, grasslands, agriculture lands	All	All	All
Long-eared myotis ¹ (<i>Myotis evotis</i>)	Primarily forest and sagebrush shrub from 2,000-10,000 feet.	All	All	All
Fringed myotis ¹ (<i>Myotis thysanodes</i>)	Scarce in northern NV, primarily coniferous forest and desert brush shrub from 1,500-7,000 feet.	2, 5, 8,10	8, 12, 13	Brady, Dixie Valley
Long-legged myotis ¹ (<i>Myotis volans</i>)	Widespread in mid to high elevations (3,000-12,000 feet) in northern NV. Coniferous forest and sagebrush	All	All	All
Yuma myotis ¹ (<i>Myotis yumanensis</i>)	Mid to low elevations (1,500-8,000 feet), coniferous forest, sagebrush and riparian habitats	All	All	All
Preble's shrew ¹ (<i>Sorex preblei</i>)	Willow riparian			

Common Name	Habitat	Hydrographic Basin	PVA	KGRA
Northern goshawk ² (<i>Accipiter gentilis</i>)	Mountain forests and riparian woodlands	1, 2, 4, 5, 8, 10	All	Rye Patch, Dixie Valley, New York Canyon, McGee Mountain
Western burrowing owl ² (<i>Athene cunicularia hypugea</i>)	Open, treeless, sagebrush shrub	All	All	All
Sage grouse ¹ (<i>Centrocercus urophasianus</i>)	Sagebrush shrub	All	All	All
Black tern ¹ (<i>Chlidonias niger</i>)	Marshlands	1, 2, 4, 8, 10	All except 4, 8, 10, 12,	McGee Mountain, Rye Patch, Dixie Valley
Least bittern ³ (<i>Ixobrychus exilis hesperis</i>)	Dense emergent vegetation of larger marshlands	Unknown	Unknown	Unknown
White-faced ibis ³ (<i>Plegadis chihi</i>)	Marshlands	All	All	All, except San Emidio
Alvord chub ⁴ (<i>Gila alvordensis</i>)	Springs and small streams	1	1	
Sheldon tui chub ⁵ (<i>Gila bicolor eurysoma</i>)	Small, spring-fed streams	1	1	McGee Mountain
Pleasant Valley tui chub ¹ (<i>Gila bicolor ssp.</i>)	Cold springs	4, 10	11, 13	
Lahontan creek tui chub ⁶ (<i>Gila bicolor robustus</i>)*	Springs, streams, and rivers	2, 4	2, 6, 7, 9	Gerlach, Rye Patch, Dixie Valley
Columbia spotted frog ¹ (<i>Rana luteiventris</i>)*	Springs, margins of streams and rivers	1, 2	1, 2	McGee Mountain

Common Name	Habitat	Hydrographic Basin	PVA	KGRA
California floater ¹ (<i>Anodonta californiensis</i>)	Valley floor, perennial streams, small substrates, high quality water	2, 4	2, 6, 7, 9	Rye Patch
Rice's blue butterfly ¹ (<i>Euphilotes pallescens ricei</i>)	Dry desert flats and dune edges	7	None	None
Nevada viceroy ¹ (<i>Limenitus archippus lahontani</i>)	Moist, open or shrubby areas, willow thickets, wet meadows	4, 8	8	Brady
Denio sandy skipper ¹ (<i>Polites sabuleti sinemaculata</i>)	Alkali grasslands, moist meadows, salt marshes, alpine fell-fields, sagebrush flats	1	1	McGee Mountain
Springsnails ⁷				
<i>Pyrgulopsis augustae</i>	Springs	4	13	Dixie Valley
<i>Pyrgulopsis aurata</i>	Springs	4	11	
<i>Pyrgulopsis dixensis</i>	Thermal springs	10	13	Dixie Valley
<i>Pyrgulopsis gibba</i>	Springs	1, 2, 3, 4, 10	1, 2, 6, 7, 10, 11, 13	Gerlach
<i>Pyrgulopsis imperialis</i>	Springs	2	2	
<i>Pyrgulopsis limaria</i>	Thermal springs	2		
<i>Pyrgulopsis longiglans</i>	Springs	2, 5	4, 8	Gerlach
<i>Pyrgulopsis militaris</i>	Thermal springs	2		
<i>Pyrgulopsis notidicola</i>	Thermal springs	2		
<i>Pyrgulopsis pictilis</i>	Springs	4	13	Dixie Valley
<i>Pyrgulopsis sadai</i>	Cold and thermal springs	10	13	
<i>Pyrgulopsis umbilicata</i>	Thermal springs	2		
<i>Pyrgulopsis bruesi</i> *	Thermal springs	2		Gerlach

Common Name	Habitat	Hydrographic Basin	PVA	KGRA
Plants				
Weak milkvetch ¹ (<i>Astragalus solitarius</i>)	Clay soils and low gullied hills, 4,600 – 5,210 feet	2	5	
Tiehm’s milkvetch ¹ (<i>Astragalus tiehmii</i>)	Volcanic ash and clay soils on gentle slopes, 5,280 – 5,750 feet	2		
Osgood Mountains milkvetch ¹ (<i>Astragalus yoder-williamsii</i>)	Dry, open, decomposed granite soils, 5,660 – 7,300 feet	4	7	
Schoolcraft’s cryptantha (<i>Cryptantha schoolcraftii</i>)	Volcanic ash and clay soils on gentle slopes, 4,880 – 5,760 feet	1, 2		
Goodrich biscuitroot ¹ (<i>Cymopterus goodrichii</i>)	Alpine, moderate to steep talus slopes, 7,300 – 11,100 feet	4	9	Rye Patch
Windloving buckwheat ¹ (<i>Eriogonum anemophilum</i>)	Exposed ridges and slopes, limestone and volcanic outcrops, 4,750 – 9,830 feet	2, 4, 6, 8	2, 7, 9, 11, 13	Rye Patch, Brady
Crosby’s buckwheat ¹ (<i>Eriogonum crosbyae</i>)	Volcanic ash and clay soils on gentle slopes, 4,600 – 7,000 feet	1, 2		Gerlach
Grimy ivesia ¹ (<i>Ivesia rhypara</i> var. <i>rhypara</i>)	Dry, barren slopes, 5,370 – 6,200 feet	1, 2	1, 2, 3	
Bruneau River prickly phlox ¹ (<i>Leptodactylon glabrium</i>)	Crevices in steep, crumbling volcanic cliffs, 4,710 – 5,300 feet	4	6, 9	Rye Patch
Smooth stickleaf ¹ (<i>Mentzelia mollis</i>)	Dry, open, clay badlands 4,360 – 5,250 feet	2	3	
Nevada orcytes ¹ (<i>Orcytes nevadensis</i>)	Deep, loose, sandy soils, 3,900 – 5,900 feet	2, 4, 5, 8	4, 5, 7, 8, 9	Rye Patch, Brady
Nevada dune beardtongue ¹ (<i>Penstemon arenarius</i>)	Deep, loose, sandy soils, 3,920 – 5,960 feet	5, 8	8	Brady

Common Name	Habitat	Hydrographic Basin	PVA	KGRA
Cordelia beardtongue ¹ (<i>Penstemon floribundus</i>)	Dry, open, volcanic talus, 4,240 – 7,400 feet	2	2, 3	
Obscure scorpion plant ¹ (<i>Phacelia inconspicua</i>)	Loose, organic soils, 5,000 – 8,280 feet	4	9	Rye Patch
Soldier Meadow cinquefoil ¹ (<i>Potentilla basaltica</i>)	Moist, alkaline soils, 4,380 – 4,580 feet	2	None	None

* Denotes rare species that are also known from the assessment area but not listed on the USFWS list

¹ Nevada Heritage Program Database

² Herron, et al. 1985

³ Riser 1985

⁴ Williams and Bond 1983

⁵ Williams and Bond 1981

⁶ Deacon and Williams 1981

⁷ Hershler 1998

3.10.2 Environmental Impacts

Geothermal development could affect endangered, threatened, proposed, candidate, and species of concern in a variety of indirect ways. Potential impacts are summarized below, but a more thorough analysis of how each species would be affected would be conducted when site-specific EAs are prepared for development of each lease.

Environmental impacts of geothermal resource development are similar to other activities that affect terrestrial and aquatic species and habitats. While each species would respond differently to various impacts, all species could be affected by activities that alter thermal, physical, or chemical characteristics of aquatic and terrestrial habitats. Physical habitat alteration could include on-site facility construction, road and power line construction, and impacts of groundwater removal that could affect spring and stream discharge (which could modify physical, chemical, and thermal characteristics of aquatic habitats), and alter the thermal characteristics of soils. Surface discharge of thermal waters could also affect chemical and thermal characteristics of habitats that are important to terrestrial and aquatic communities.

Avian species could be most affected by direct and indirect influences of power line construction, operation, and maintenance, which include constructing roads, building towers, and stringing high-tension power lines. Habitat alteration and fragmentation, and modification of thermal and chemical characteristics of surface waters could affect vegetation used for nesting and foraging. Mortality could increase from electrocution when power lines are used for roosting. Indirect effects are largely attributed to increase human activity, which could displace individuals or reduce nesting success of species that are sensitive to disturbance. Road construction could also increase human access into areas that are currently remote, which could result in additional non-native species introductions, affect species sensitive to disturbance, or increase legal and illegal take.

Plant species could be most affected by habitat alteration during powerhouse facility, road, and power line construction, and inadvertent surface release of water. Removal of geothermal resources could also cause changes in thermal characteristics of soils.

Species associated with larger aquatic habitats (e.g., stream, marshland, and riparian species) could be adversely affected by increased activity in riparian systems (e.g., road construction, disturbances that increase erosion, etc.) and by changes in water quality that could be associated with surface release of geothermal water or construction materials. Spring-dependent species could also be affected by these factors in addition to alterations in discharge and thermal characteristics that could occur with increased groundwater use. Recent studies have also revealed that springs are biodiversity ‘hotspots’ in desert regions (Myers and Resh, 1999), which suggests that activities that adversely affect these resources would impact a relatively large amount of species that occur within the assessment area. Springs are occupied by a large number of mollusks that are endemic to the assessment area and Nevada (Hershler, 1998). Many of these habitats have been altered by previous activities such as groundwater use and livestock management (Shepard, 1993; Sada and Vinyard, 2002). Site-specific EAs that would be prepared for development of individual leases would consider the cumulative impacts of current

and potential activities on spring biota. Sada, et al. (2001) summarizes guidance to implement resource activities while protecting spring resources.

3.10.2.1 Proposed Action

Direct Impacts – There are no direct impacts to issuing leases for future geothermal exploration, development, and production activities.

Indirect Impacts – When considering the “reasonably foreseeable development scenario,” there are no significant environmental impacts concerning threatened, endangered, and special status species. Using an updated PEA and stipulations as the guideline for new leases would more adequately provide the level of protection required to ensure that these species are protected under current Federal and State statutes.

The following are the potential environmental impacts on threatened, endangered, and special status species when analyzing the “reasonably foreseeable development scenario.”

Exploration. The environmental impacts on threatened, endangered, and special status species are expected to be restricted to small geographical areas during the geothermal energy exploration phase. Unless special precautions are made, displacement of threatened, endangered, and special status species could cause long-term changes to habitat quality or their distribution and abundance, particularly species with restricted distribution and specific habitat requirements. In most cases, exploration would not be allowed in areas where these activities could have a negative impact on threatened, endangered, and special status species.

Development. Impacts of the development phase on threatened, endangered, and special status species would be very similar to the exploration phase although it would be expected to last somewhat longer and create more disruption. In most cases, development would not be allowed in areas where these activities could have a negative impact on threatened, endangered, and special status species.

Production. During the production phase, long-term impacts could occur to threatened, endangered, and special status species depending on where the permanent facilities are located and electrical power transmission lines are built. With production lasting up to several decades, these impacts would be long lasting; however they could be restricted to small geographical areas. The most significant impacts to threatened, endangered, and special status species include disturbance of soils and vegetation communities that could be difficult to rehabilitate, and alteration of groundwater resources that could alter spring and stream discharge.

Close-Out. Close-out of a developed geothermal production operation could cause short-term changes to threatened, endangered, and special status species due to increased dismantling activity and noise. Once the commercial activity has been closed-out and returned to its original, natural configuration, under proper management processes, any threatened, endangered, and special status species impacted by close-out are expected to return to normal activities.

3.10.2.2 No Action Alternative

Direct Impacts – There are no direct impacts to issuing leases for future geothermal exploration, development, and production activities.

Indirect Impacts – Indirect impacts from the No Action Alternative would be similar to those described in the Proposed Action; however, updated mitigation measures and stipulations would not apply using the 1982 Geothermal EA.