



NEVADA TEST AND TRAINING RANGE (NTTR)

Land Withdrawal Application Packages/
Case File and Legislative EIS



KEY HABITATS OF THE NEVADA TEST AND TRAINING RANGE AND POTENTIAL EXPANSION ALTERNATIVES



FINAL
October 2017

**KEY HABITATS
OF THE NEVADA TEST AND TRAINING RANGE
AND POTENTIAL EXPANSION ALTERNATIVES**

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Acronyms and Abbreviations

BLM	Bureau of Land Management
DNWR	Desert National Wildlife Range
DoD	U.S. Department of Defense
DOI	U.S. Department of the Interior
MSL	Mean Sea Level
NDOW	Nevada Department of Wildlife
NEPA	National Environmental Policy Act
NNRP	Nellis Natural Resources Program
NTTR	Nevada Test and Training Range
USAF	United States Air Force
WAP	Wildlife Action Plan

Introduction

The United States Air Force (USAF) is in the process of extending the withdrawal of land for military operations and training on the Nevada Test and Training Range (NTTR). In addition to extending the current withdrawal, the USAF is evaluating several potential expansion alternatives. The current withdrawal will expire on November 6, 2021, unless Congress enacts legislation to extend it. In accordance with Section 3016 of the Military Land Withdrawal Act (MLWA), the USAF, in coordination with the Department of Defense (DoD), has notified Congress of a continuing military need for the NTTR withdrawal. Furthermore, the USAF plans to submit a Legislative Environmental Impact Statement (LEIS) that supports a legislative withdrawal proposal which will be submitted through the Department of the Interior (DOI) to extend the withdrawal.

As part of the LEIS process, the USAF is preparing documentation required to support the Application Package, Case File, and legislative language to successfully accomplish the NTTR land withdrawal by November 2021. To maintain critical test and training capabilities at the NTTR, the USAF must complete all required studies in compliance with the National Environmental Policy Act (NEPA), the *Engle Act*, *Federal Land Policy and Management Act*, the MLWA, and Land Withdrawals regulations set forth in Title 43 Code of Federal Regulations (CFR) Part 2300. The results of this biological special study are needed to comply with NEPA and Land Withdrawals regulations and support submittal of an application to the Bureau of Land Management (BLM), provision of a Case File to the DOI, and development of draft legislation for Congressional approval of the withdrawal in accordance with applicable rules and regulations.

The scope of this study is to document historic reports and recent surveys and projects involving key habitats that may be impacted by the land withdrawal renewal. Key habitats were defined by the Wildlife Action Plan Team that prepared the 2006 and 2012 Nevada Wildlife Action Plan (WAP) (Wildlife Action Plan Team, 2006; Wildlife Action Plan Team, 2013). The team included representatives from The Nature Conservancy (TNC), Lahontan Audubon Society, and Nevada Department of Wildlife (NDOW). The 2006 and 2012 WAPs fulfilled NDOW's wildlife diversity program funding and planning obligations for the federal State Wildlife Grant program and provided a roadmap of strategies to be considered for the judicious management of key habitats and the associated species of conservation concern they support. The 2006 and 2012 WAPs were used by NTTR for guidance in the development of their natural resources management program.

Description of the Study Area

The study area for this report includes NTTR and potential expansion areas designated as Alternatives 3A, 3B, and 3C. NTTR consists of 2,949,603 acres, in rural portions of Nye, Lincoln, and Clark Counties, Nevada (Figure 1). The potential expansion areas are shown in Figure 1 and consist of about 302,000 acres. Alternative 3A is 18,000 acres lying along the southwest boundary of the North Range of NTTR. Alternative 3B is 57,000 acres located immediately south of the South Range of NTTR. Alternative 3C is 227,000 acres immediately east of the South Range of NTTR in the Desert National Wildlife Refuge (DNWR). Geology varies from limestone/dolomite in the south to volcanic fields in the north. The South Range Study Area lies in the eastern Mojave Desert, and the North Range Study Area lies in the southern Great Basin (Figure 2).

Natural sources of water are scarce across most of the study area. Annual precipitation ranges from 3 to 5 in. in the basins, to 16 in. in upper elevations of mountains. Vegetation composition is strongly influenced by the levels of precipitation. Most of the active springs are found in the North Range Study Area, especially in the Kawich, Belted, and Cactus Mountain Ranges, and Stonewall Mountain. Only five springs are found in the South Range Study Area. Most water sources for wildlife in the South Range Study Area

are provided by wildlife water developments, which collect water from storm events and store it in water tanks.

The South Range Study Area is typical of the Mojave Desert. Except for the higher elevations, most of the mountains are covered by scattered populations of various desert brush and cactus species. Typical physiography of the area consists of mountain ranges which drain into bajadas (collections of alluvial fans) and ultimately drain into playas. Most of these areas are considered basins which are self-contained and do not drain into any of the major rivers in the area. Playas tend to have little or no vegetation while bajadas are often dominated by creosote bush (*Larrea tridentata*) and bursage (*Ambrosia dumosa*) in the lower bajadas and blackbrush (*Coleogyne ramosissima*) and Joshua tree (*Yucca brevifolia*) in the upper bajadas and foothills. Mountain ranges support scattered populations of bitterbrush (*Purshia* spp.), matchweed (*Gutierrezia* spp.), and shadscale (*Atriplex confertifolia*). At higher elevations, plant communities may be dominated by Utah juniper (*Juniperus osteosperma*) and pinyon pine (*Pinus monophylla*).

The North Range Study Area is typical of the southern portions of the Great Basin Desert. The physiography of the area is comprised of mountains and closed basins similar to the South Range Study Area. However, rainfall is slightly higher in the North Range Study Area, averaging 6-10 inches annually and resulting in denser plant communities compared to the South Range Study Area, which averages 2-6 inches annually. Like the South Range Study Area, playas in the North Range Study Area contain little or no vegetation. From the boundaries of the playas to the base of mountains, plant communities are typically dominated by greasewood (*Sarcobatus* spp.) and shadscale (*Atriplex* spp.) in lower elevations and sagebrush (*Artemisia* spp.) in higher elevations. The upper elevations

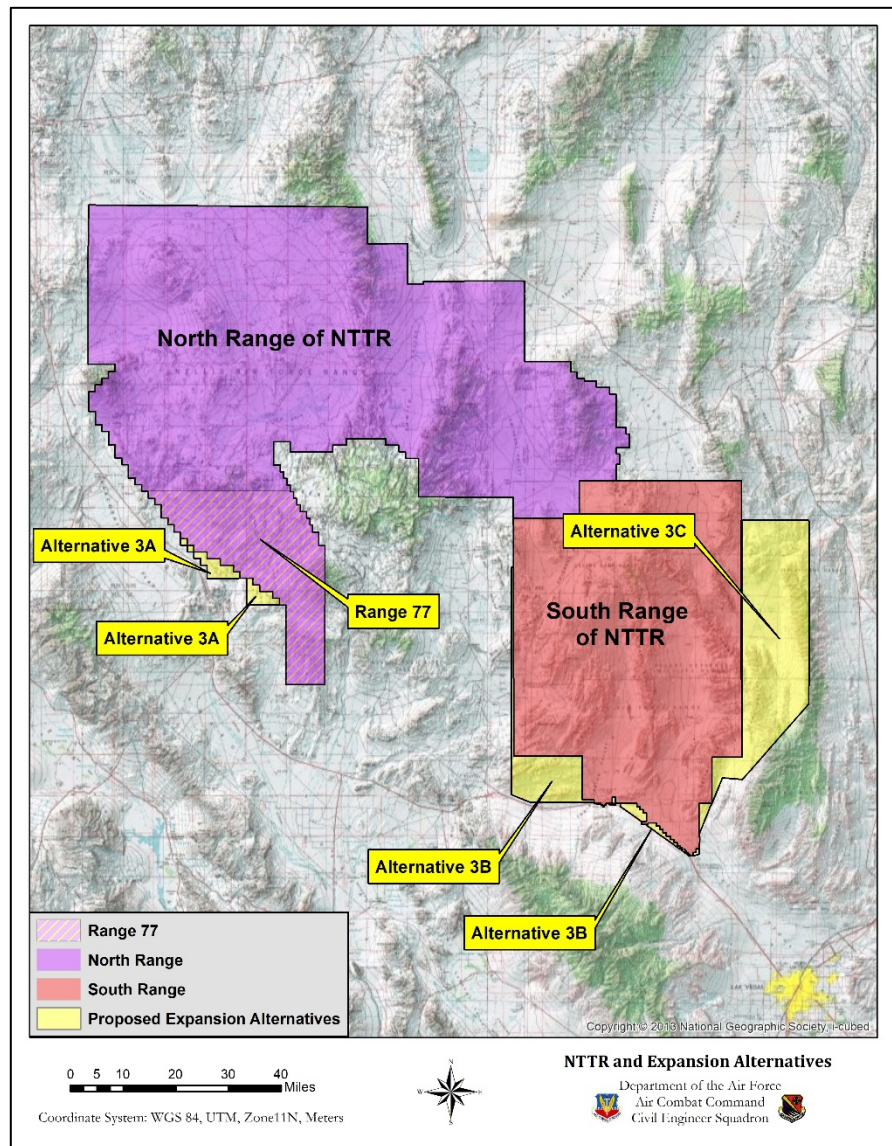


Figure 1. Location of the North and South Ranges of NTR as well as Alternatives 3A, 3B, and 3C

in the mountains are dominated by Utah juniper (*Juniperus osteosperma*) and pinyon pine (*Pinus monophylla*).

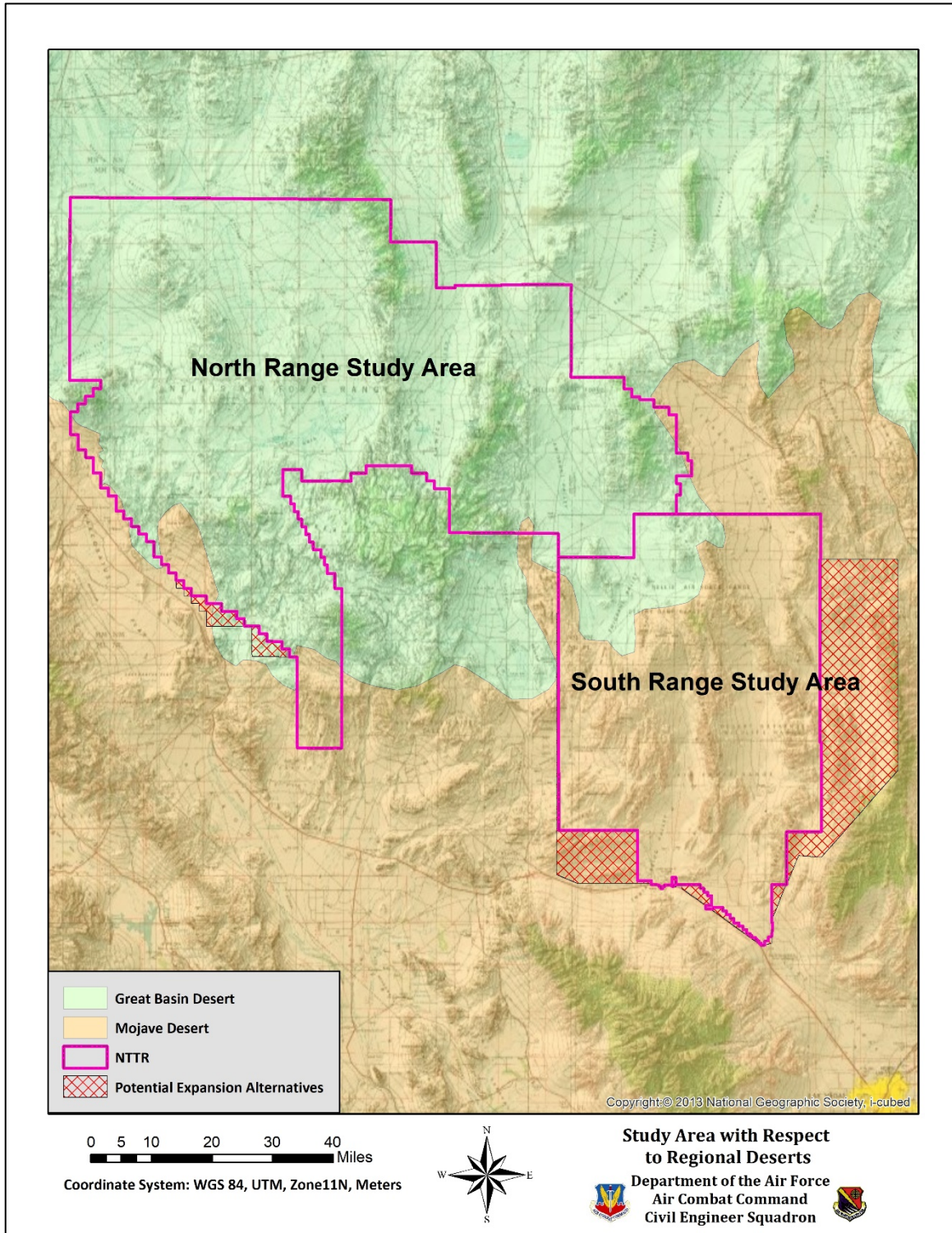


Figure 2. Location of the study area with respect to the Great Basin Desert and the Mojave Desert

Key Habitats

Since 2005, the Nellis Natural Resources Program (NNRP) has conducted field surveys to provide baseline data on wildlife and vegetation across the NTTR. Additionally, in 2016, Adams Ecology conducted field surveys to supplement existing information that has been previously gathered on the vegetation and wildlife of the potential expansion alternatives (Alternatives 3A, 3B, and 3C). The NTTR baseline data collected over the years was used by the NNRP to prepare a Unique Habitat Guideline Manual for management of wildlife on NTTR (Nellis Natural Resources Program, 2015). This guideline was prepared using the NDOW Wildlife Action Plan (WAP) as a template (Wildlife Action Plan Team, 2006; Wildlife Action Plan Team, 2013). The WAP used data derived from the Southwest Regional Gap Analysis Project to organize ecological systems (areas essential to conservation of fish and wildlife) into 27 key habitat types of which 17 are found on the study area. Multi-level strategies were developed for each of these key habitats to integrate the conservation requirements for species of concern and other species assemblages. Key habitat designations provide an excellent tool for natural resources managers to use to conserve, protect, and manage wildlife within the boundaries of their jurisdiction. The NNRP has conscientiously used the key habitat designation to manage wildlife and vegetation within the boundaries of the NTTR.

It is the intention of the NNRP to eventually improve and enhance the key habitat maps provided in the WAP using vegetation maps currently being developed and based on current high-resolution satellite imagery. Until then, shapefiles created by NDOW for the 2006 WAP depicting key habitats will be used for wildlife habitat management on NTTR. The maps and key habitats depicted in this report follow those of the NNRP Unique Habitat Guidelines, which have not been updated to the new maps and habitats found in the 2012 WAP. Differences will be discussed in each key habitat section for the report.

In the sections that follow, each of the seventeen key habitats found on the NTTR and potential expansion alternatives is described. The list of species that have been identified by biologists in those habitats is also provided. The list of species for each key habitat were prepared by intersecting point locations of historical and recent species observations with key habitat polygons using ArcMap. Locations of species observations were obtained from the NTTR Geodatabase and a database created for the potential expansion alternatives that contains information on wildlife and plant surveys conducted on those areas. Maps of key habitats on the study area were prepared using the NDOW WAP key habitat shape files prepared in 2006. Descriptions of each of the key habitats are based on the WAP and may be eventually modified to more site-specific descriptions when vegetation and habitat mapping is completed by the NNRP. The key habitat descriptions are taken from the Unique Habitat Management Guideline prepared and updated by the NNRP in 2015 (Nellis Natural Resources Program, 2015). Those descriptions have been modified to some extent for use in this document. The common names of plants are followed by the scientific name in parentheses because many of the plants are not listed in the tables. Wildlife species will be designated in the text by their common names. Scientific names are listed in the tables of species provided in each key habitat section of the report.

Please note that only key habitats that have been confirmed by the NNRP are included in this report. This habitat has been documented by Beatley to be located on Bald Mountain in the Groom Range which is currently inaccessible to NNRP biologists (Military Operations Airspace Ranges 74A and 4808A). Beatley (1976) noted that the plant community was only found on Bald Mountain and was apparently absent from Wheel Barrow Peak and Kawich Peak in the Kawich Range. Pritchett, Smith, Knight, & Cooper (1997) found limber pine (*Pinus flexilis*) in scattered patches on the summits of the Kawich Range. However, it was concluded that this habitat was probably transitional between the Pinyon Pine Series and the Limber Pine Series. The Limber Pine Series was also not directly sampled by the biologists. Based on this infor-

mation, these areas were tentatively determined to not be Intermountain Coniferous Forests and Woodlands, but a transitional habitat between that key habitat and the Lower Montane Woodland key habitat. Therefore, the Intermountain Coniferous Forests and Woodlands key habitat has not included in this report.

Intermountain Cold Desert Shrub

HABITAT DESCRIPTION

Intermountain Cold Desert Shrub is the dominant key habitat on the North Range Study Area. It clearly dominates the basins between the major mountain ranges of the North Range Study Area, including the Cactus Range, Belted Range, Kawich Range, and Stonewall Mountain (Figure 3). Topography within this habitat type tends to be flat to rolling. Although the habitat is found in Range 77 and the South Range Study Area, it only occurs at higher elevations along bases of mountains in those areas and is restricted to the Intermountain Basins Semi-Desert Scrub Steppe ecological system. Outcrops supporting this habitat include alluvial deposits in the valley basins and volcanic and sedimentary outcrops in higher elevations on bajadas and the bases of mountains. Soils are usually stony, gravelly, or sandy with a siltaceous or loamy matrix.

Three major ecological systems were identified on the study area that are in this key habitat. The composition of these ecological systems appears to be dependent on latitude and elevation. In the lowest elevations of this key habitat are scattered occurrences of the Intermountain Basins Greasewood Flat ecological system. Soils in this ecological system tend to be silts or loams that are fine in texture and are often soft-to-loose in structure. Sandy patches are found interspersed in these soils and the substrates have scattered to 100% cover of fine gravels. Dominant plants are mostly short shrubs and include shadscale saltbush (*Atriplex confertifolia*), bud sagebrush (*Picrothamnus desertorum*), desert pepperweed (*Lepidium fremontii*), greasewood (*Sarcobatus* spp.), winterfat (*Krascheninnikovia lanata*), four-winged saltbush (*Atriplex canescens*), princesplume (*Stanleya* spp.), and amaranth (*Amaranthus* spp.).

Immediately above the valley bottom is the Intermountain Basins Mixed Salt Desert Scrub which is the predominant ecological system on the North Range Study Area. Here the soils are loose-sandy with scattered to 100% cover of fine gravels. Dominant plant species include winterfat (*Krascheninnikovia lanata*), greasewood (*Sarcobatus* spp.), Nevada Mormon tea (*Ephedra nevadensis*), bud sagebrush (*Picrothamnus desertorum*), shadscale saltbush (*Atriplex confertifolia*), spiny menodora (*Menodora spinescens*), James' galleta (*Pleuraphis jamesii*), desert needlegrass (*Achnatherum speciosum*), and Indian ricegrass (*Achnatherum hymenoides*).

The Intermountain Basins Semi-Desert Scrub Steppe is the ecological system found on the broad bajadas of the northern South Range Study Area. Soils are soft-to-loose, fine-gravelly loams and tuffs with 100% gravel cover. Dominant species include shadscale saltbush (*Atriplex confertifolia*), blackbrush (*Coleogyne ramosissima*), Nevada Mormon tea (*Ephedra nevadensis*), winterfat (*Krascheninnikovia lanata*), bud sagebrush (*Picrothamnus desertorum*), greasewood (*Sarcobatus* spp.), desert pepperweed (*Lepidium fremontii*), cheesebush (*Hymenoclea salsola*), spiny hopsage (*Grayia spinosa*), spiny menodora (*Menodora spinescens*), princesplume (*Stanleya* spp.), big galleta (*Pleuraphis rigida*), and Indian ricegrass (*Achnatherum hymenoides*).

Wildlife

- Important habitat for several monitored species; including kit fox, pale kangaroo mouse, and loggerhead shrike.
- Soils of this habitat tend to be loose and either sandy or gravelly and are easily excavated by denning or burrowing animals.
- The two most dependable herbivorous food staples are Indian ricegrass (*Achnatherum hymenoides*) and shadscale (*Atriplex* spp.) seeds, although forb seeds and leaf material will also be used when present.
- Primary habitat of the longnose leopard lizard.
- Important feeding habitat for pallid bats.
- Loggerhead shrikes breed in valley bottoms where fourwing saltbush may create large mature plants as much as 10 ft. in diameter.
- Rough legged hawks and eagles hunt in the valley bottoms, preying on small mammals and rabbits.
- Serves as an important support habitat for several sagebrush breeders; including sage thrasher, sage sparrow, Brewer's sparrow, and black-throated sparrow.
- Washes are prominent features and have unique attributes for certain terrestrial species. By retaining higher soil moisture than surrounding upland areas they support denser stands of vegetation for wildlife forage and cover. Washes also provide a conduit for movement of wildlife, facilitating a healthy distribution of wildlife populations across the landscape.

Plants

- Hermit cactus (*Sclerocactus polyancistrus*) is found on dry rocky soils and low outcrops of rhyolite, tuff, and possibly other rock types, on gentle slopes in open areas on the upper margins of the basins of this habitat.
- Darin's buckwheat (*Eriogonum concinnum*) occurs on deep, loose sand derived from light colored tuff or other volcanic rocks. It is often found in crevices, at the base of cliffs, and on outcrops on the upper margins of Intermountain Cold Desert Shrub.
- Black woollypod (*Astragalus funereus*) may be found on gravelly volcanic tuffs and limestone screes on mountain slopes in Intermountain Cold Desert Shrub.
- Pygmy poreleaf (*Porophyllum pygmaeum*) is found in dry, open, relatively deep, rocky carbonate soils of alluvial fans and hillsides, often in slight depressions which are on the upper margins of Intermountain Cold Desert Shrub. It is often found at the bases of outcrops and cliffs.
- Clokey's eggvetch (*Astragalus oophorus* var. *clokeyanus*) and Beatley's milkvetch (*Astragalus beatleyae*) are most commonly found in pinyon-juniper associations at elevations of 5,000 to 10,300 ft. but have been observed in the upper elevations of this habitat type in association with black sagebrush. While not previously reported, the microsite preference of Clokey's eggvetch (*Astragalus oophorus* var. *clokeyanus*) appears to be small islands and the edges of narrow, shallow drainages, while Beatley's milkvetch (*Astragalus beatleyae*) appears to prefer gravelly slopes.
- Sanicle biscuitroot (*Cymopterus ripleyi* var. *saniculoides*) is most commonly found on the dunes and deep sands of the study area, but has potential to occur on isolated sandy areas in this habitat.
- Cane spring suncup (*Camissonia megalantha*) grows in areas dominated by shadscale or black sagebrush, often in disturbed sites, at elevations of 3,300 to 6,500 ft. MSL. It is established in loose, gravelly tuffs or sands on flats and slopes, and sometimes in outcrop crevices.

- Eastwood’s milkweed (*Asclepias uncialis*) grows in shallow drainages in mixed desert scrubs, pinyon-juniper, and black sagebrush communities at elevations of 4,680 to 7,080 ft. MSL of Intermountain Cold Desert Shrub. Common associates are shadscale saltbush (*Atriplex confertifolia*), bud sagebrush (*Picrothamnus desertorum*), greasewood (*Sarcobatus* spp.), horsebrush (*Tetradymia* spp.), green molly (*Bassia americana*), pinyon pine (*Pinus monophylla*), Utah juniper (*Juniperus osteosperma*), Nevada Mormon tea (*Ephedra nevadensis*), and black sagebrush (*Artemisia nova*).
- Inyo hulsea (*Hulsea vestita* ssp. *inyoensis*) grows on rocky sites on the upper limits of Intermountain Cold Desert Shrub. Associated gravels and soil are derived from volcanic parent material. Recorded elevations range from 4,800 to 9,900 ft. MSL in black sagebrush (*Artemisia nova*) and big sagebrush (*Artemisia tridentata*) habitat that may be found in the upper limits of Intermountain Cold Desert Shrub.
- White bearpoppy (*Arctomecon merriamii*) would probably not be expected to occur on the North Range Study Area, but may occur in scattered populations on calcareous soils on the South Range Study Area in Intermountain Cold Desert Shrub.

SPECIES OBSERVED

Table 1. List of plant and wildlife species that have been observed on the Intermountain Cold Desert Shrub key habitat

Status	Common Name	Scientific Name
Bats		
	Pallid Bat	<i>Antrozous pallidus</i>
*	Townsend’s Big-eared Bat	<i>Corynorhinus townsendii</i>
**	Big Brown Bat	<i>Eptesicus fuscus</i>
	Western Red Bat	<i>Lasiurus blossevillii</i>
**	Hoary Bat	<i>Lasiurus cinereus</i>
	California Leaf-nosed Bat	<i>Macrotus californicus</i>
	Southwestern Myotis	<i>Myotis auriculus</i>
**	California Myotis	<i>Myotis californicus</i>
**	Western Small-footed Myotis	<i>Myotis ciliolabrum</i>
**	Long-eared Myotis	<i>Myotis evotis</i>
	Little Brown Myotis	<i>Myotis lucifugus</i>
*	Fringed Myotis	<i>Myotis thysanodes</i>
**	Long-legged Myotis	<i>Myotis volans</i>
**	Western Pipistrelle	<i>Parastrellus hesperus</i>
*	Mexican Free-tailed Bat	<i>Tadarida brasiliensis</i>
Birds		
	Red-winged Blackbird	<i>Agelaius phoeniceus</i>
	Chukar	<i>Alectoris chukar</i>
**	Sage Sparrow	<i>Amphispiza belli</i>
	Black-throated Sparrow	<i>Amphispiza bilineata</i>
	Northern Shoveler	<i>Anas clypeata</i>
	Green-winged Teal	<i>Anas crecca</i>
	Western Scrub-jay	<i>Aphelocoma californica</i>
	Golden Eagle	<i>Aquila chrysaetos</i>
	Black-chinned Hummingbird	<i>Archilochus alexandri</i>
	Great Blue Heron	<i>Ardea herodias</i>
	Burrowing Owl	<i>Athene cunicularia</i>
	Juniper Titmouse	<i>Baeolophus ridgwayi</i>
	Red-tailed Hawk	<i>Buteo jamaicensis</i>
	Rough-legged Hawk	<i>Buteo lagopus</i>
**	Ferruginous Hawk	<i>Buteo regalis</i>
	Swainson’s Hawk	<i>Buteo swainsoni</i>
	Hummingbird sp.	<i>Calypte</i> sp.
	House Finch	<i>Carpodacus mexicanus</i>

Status	Common Name	Scientific Name
	Turkey Vulture	<i>Cathartes aura</i>
	Northern Harrier	<i>Circus cyaneus</i>
	Western Wood-pewee	<i>Contopus sordidulus</i>
	Common Raven	<i>Corvus corax</i>
	Yellow Warbler	<i>Dendroica petechia</i>
	Flycatcher sp.	<i>Empidonax sp.</i>
	Horned Lark	<i>Eremophila alpestris</i>
	Merlin	<i>Falco columbarius</i>
**	Prairie Falcon	<i>Falco mexicanus</i>
	American Kestrel	<i>Falco sparverius</i>
	Greater Roadrunner	<i>Geococcyx californianus</i>
	Scott's Oriole	<i>Icterus parisorum</i>
	Dark-eyed Junco	<i>Junco hyemalis</i>
*	Loggerhead Shrike	<i>Lanius ludovicianus</i>
	Northern Mockingbird	<i>Mimus polyglottos</i>
	Ash-throated Flycatcher	<i>Myiarchus cinerascens</i>
**	Sage Thrasher	<i>Oreoscoptes montanus</i>
	Osprey	<i>Pandion haliaetus</i>
	Common Poorwill	<i>Phalaenoptilus nuttallii</i>
	Ladder-backed Woodpecker	<i>Picoides scalaris</i>
	Hairy Woodpecker	<i>Picoides villosus</i>
	White-faced Ibis	<i>Plegadis chihi</i>
	Blue-gray Gnatcatcher	<i>Poliophtila caerulea</i>
	Rock Wren	<i>Salpinctes obsoletus</i>
	Say's Phoebe	<i>Sayornis saya</i>
	Mountain Bluebird	<i>Sialia currucoides</i>
	Western Kingbird	<i>Tyrannus verticalis</i>
	Mourning Dove	<i>Zenaida macroura</i>
	White-crowned Sparrow	<i>Zonotrichia leucophrys</i>
Mammals		
	Pronghorn	<i>Antilocapra americana</i>
	Wild burro	<i>Equus asinus</i>
	Wild horse	<i>Equus ferus</i>
	Mule Deer	<i>Odocoileus hemionus</i>
	Desert Bighorn Sheep	<i>Ovis canadensis nelsoni</i>
	Mountain Lion	<i>Puma concolor</i>
	Kit Fox	<i>Vulpes macrotis</i>
	Coyote	<i>Canis latrans</i>
	White-tailed Antelope Squirrel	<i>Ammospermophilus leucurus</i>
	Long-tailed Pocket Mouse	<i>Chaetodipus formosus</i>
**	Desert Kangaroo Rat	<i>Dipodomys deserti</i>
	Merriam's Kangaroo Rat	<i>Dipodomys merriami</i>
	Chisel-toothed Kangaroo Rat	<i>Dipodomys microps</i>
	Ord's Kangaroo Rat	<i>Dipodomys ordii</i>
	Black-tailed Jackrabbit	<i>Lepus californicus</i>
*	Desert Valley Kangaroo Mouse	<i>Microdipodops megacephalus albiventer</i>
	Pallid Kangaroo Mouse	<i>Microdipodops pallidus</i>
	Desert Woodrat	<i>Neotoma lepida</i>
	Northern Grasshopper Mouse	<i>Onychomys leucogaster</i>
	Southern Grasshopper Mouse	<i>Onychomys torridus</i>
	Little Pocket Mouse	<i>Perognathus longimembris</i>
	Great Basin Pocket Mouse	<i>Perognathus parvus</i>
	Canyon Mouse	<i>Peromyscus crinitus</i>
	Deer Mouse	<i>Peromyscus maniculatus</i>
	Western Harvest Mouse	<i>Reithrodontomys megalotis megalotis</i>
	Desert Cottontail	<i>Sylvilagus audubonii</i>
	Pocket Gopher	<i>Thomomys bottae</i>
	Round-tailed Ground Squirrel	<i>Xerospermophilus tereticaudus</i>
Reptiles		
	Great Basin Whiptail	<i>Aspidoscelis tigris tigris</i>
	Western Zebra-tailed Lizard	<i>Callisaurus draconoides rhodostictus</i>

Status	Common Name	Scientific Name
**	Western Banded Gecko	<i>Coleonyx variegatus</i>
	Great Basin Rattlesnake	<i>Crotalus oreganus lutosus</i>
	Panamint Rattlesnake	<i>Crotalus stephensi</i>
**	Great Basin Collared Lizard	<i>Crotaphytus bicinctores</i>
**	Longnose Leopard Lizard	<i>Gambelia wislizenii</i>
	Desert Striped Whipsnake	<i>Masticophis taeniatus taeniatus</i>
**	Desert Horned Lizard	<i>Phrynosoma platyrhinos</i>
	Great Basin Gopher Snake	<i>Pituophis catenifer deserticola</i>
	Great Basin Skink	<i>Plestiodon skiltonianus utahensis</i>
	Long-nosed Snake	<i>Rhinocheilus lecontei</i>
	Mohave Patch-nosed Snake	<i>Salvadora hexalepis Mojavensis</i>
**	Common Chuckwalla	<i>Sauromalus ater</i>
	Sagebrush Lizard	<i>Sceloporus graciosus graciosus</i>
	Great Basin Fence Lizard	<i>Sceloporus occidentalis longipes</i>
	Yellow-backed Spiny Lizard	<i>Sceloporus uniformis</i>
	Common Side-blotch Lizard	<i>Uta stansburiana</i>
Rare Plants		
*	Gilman's Milkvetch	<i>Astragalus gilmanii</i>
*	Clokey's Pincushion	<i>Escobaria vivipara var. rosea</i>
*	Hermit Cactus	<i>Sclerocactus polyancistrus</i>
**	Coville's Abronia	<i>Abronia nana var. covillei</i>
**	Ivory-spined Agave	<i>Agave utahensis var. eborispina</i>
**	White Bearpoppy	<i>Arctomecon merriamii</i>
**	Eastwood's Milkweed	<i>Asclepias uncialis</i>
**	Sheep Range Milkvetch	<i>Astragalus amphioxys var. musimonum</i>
**	Beatley's Milkvetch	<i>Astragalus beatleyae</i>
**	Black Woollypod	<i>Astragalus funereus</i>
**	Clokey's Eggvetch	<i>Astragalus oophorus var. clokeyanus</i>
**	Cane Spring Suncup	<i>Camissonia megalantha</i>
**	New York Mountains Catseye	<i>Cryptantha tumulosa</i>
**	Sanicle Biscuitroot	<i>Cymopterus ripleyi var. saniculooides</i>
**	Death Valley Mormon Tea	<i>Ephedra funerea</i>
**	Antelope Canyon Goldenbush	<i>Ericameria cervina</i>
**	Sheep Fleabane	<i>Erigeron ovinus</i>
**	Darin's Buckwheat	<i>Eriogonum concinnum</i>
**	Rough Dwarf Greasebush	<i>Glossopetalon pungens var. pungens</i>
**	Inyo Hulsea	<i>Hulsea vestita ssp. inyoensis</i>
**	Bashful Four-O'Clock	<i>Mirabilis pudica</i>
**	Pahute Mesa Beardtongue	<i>Penstemon pahutensis</i>
**	Beatley's Scorpionflower	<i>Phacelia beatleyae</i>
**	Clarke's Phacelia	<i>Phacelia filiae</i>
**	Weasel Phacelia	<i>Phacelia mustelina</i>
**	Pygmy Poreleaf	<i>Porophyllum pygmaeum</i>

*State/Federal listed and critically imperiled species.

**Special status species.

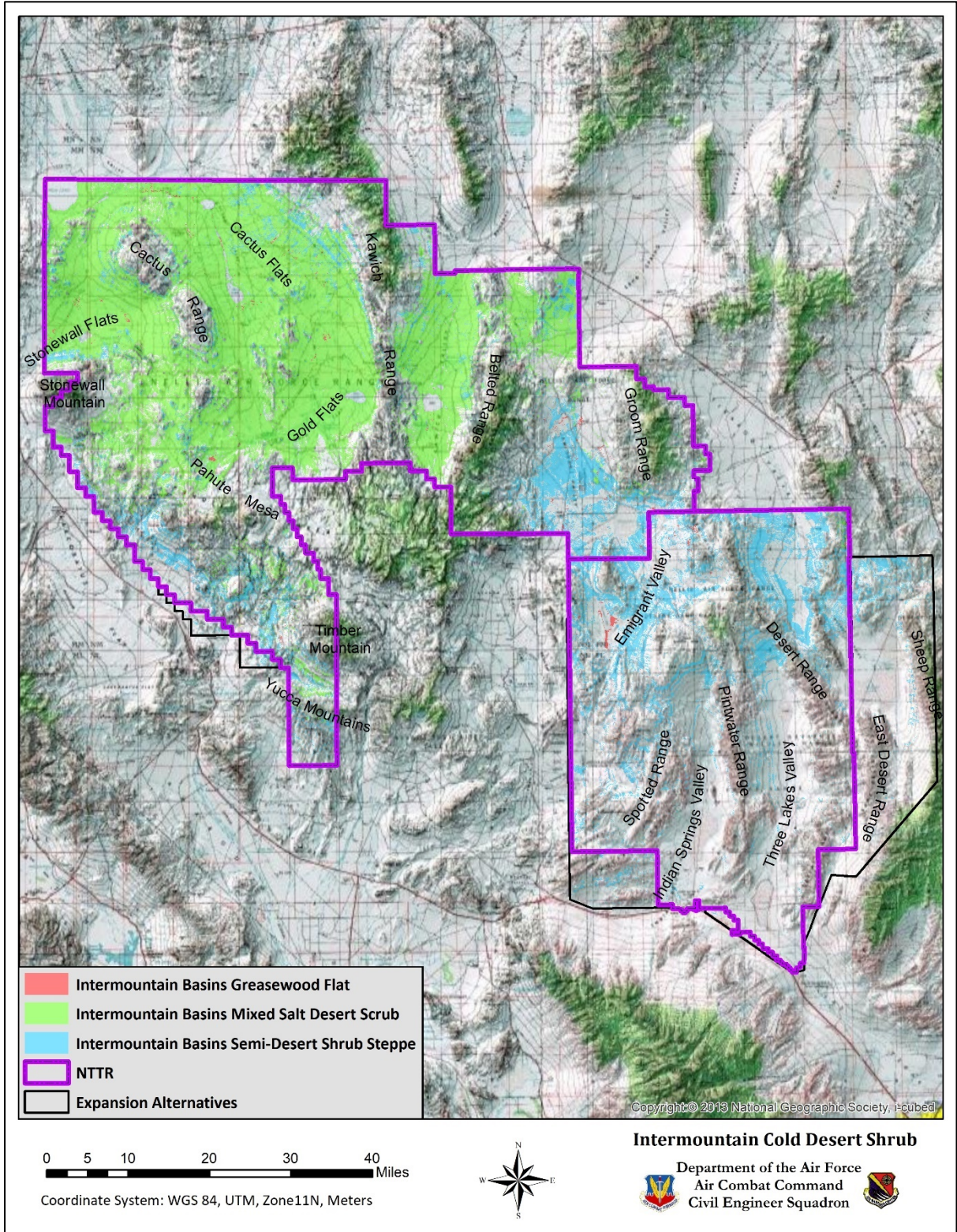


Figure 3. Map of Intermountain Cold Desert Shrub on the study area

Mojave/Sonoran Warm Desert Scrub

HABITAT DESCRIPTION

In the 2012 WAP, the Mojave/Sonoran Warm Desert Scrub and the Mojave Mid-Elevation Mixed Desert Scrub were combined into the Mojave Warm Desert and Mixed Desert Scrub. The current Unique Habitat Management Guidelines for NTTR still uses the 2006 key habitats and this report will separate these two key habitats until the guidelines are updated. Mojave/Sonoran Warm Desert Scrub is found in similar topography as the Intermountain Cold Desert Shrub, but at lower elevations and latitudes. It is most commonly found in the valley basins of the South Range Study Area and Range 77. The habitat extends from the edges of dry lakes and playas, upward in elevation across bajadas and up to the base of mountain ranges. Excellent examples of the habitat may be found in Three Lake Valley and Indian Springs Valley (Figure 4). The upper edge of this habitat is usually identified by a marked decrease in creosote bush (*Larrea tridentata*) and a corresponding increase in Joshua tree (*Yucca brevifolia*), blackbrush (*Coleogyne ramosissima*), and banana yucca (*Yucca baccata*).

On the study area, this key habitat occurs in two ecological systems. The first ecological system, the Sonora-Mojave Mixed Salt Desert Scrub, occurs on the more saline edges of playas and dry lakes. These areas are usually dominated by white bursage (*Ambrosia dumosa*), shadscale saltbush (*Atriplex confertifolia*), fourwinged saltbush (*Atriplex canescens*), and Mexican bladdersage (*Salazaria mexicana*). Disturbed areas are often infested with Russian thistle (*Salsola tragus*) and red brome (*Bromus madritensis* ssp. *rubens*) with saltlover (*Halogeton glomeratus*) infesting the more saline areas at higher elevations (especially on the North Range Study Area). The edge of this plant association is marked by the increased occurrence of creosote bush (*Larrea tridentata*).

The second ecological system, Sonoran-Mojave Creosote Bush-White Bursage Desert Scrub, occurs on the lower elevation of the bajadas and is dominated by creosote bush (*Larrea tridentata*) and white bursage (*Ambrosia dumosa*) interspersed with xeric plants species such as Fremont's dalea (*Psoralea fremontii*), littleleaf rhatany (*Krameria erecta*), desert holly (*Atriplex hymenelytra*), Mojave yucca (*Yucca schidigera*), beavertail pricklypear (*Opuntia basilaris*), silver cholla (*Cylindropuntia echinocarpa*), and Mormon tea (*Ephedra* spp.). Herbaceous plants include desert trumpet (*Eriogonum inflatum*), Mojave wood-yaster (*Xylorhiza tortifolia*), threadleaf snakeweed (*Gutierrezia microcephala*), desert princesplume (*Stanleya pinnata*), desert rock daisy (*Perityle emoryi*), purple threeawn (*Aristida purpurea*), and low woolly-grass (*Dasyochloa pulchella*). Within this habitat are drainages that contain more mesic plant communities often dominated by desert pepperweed (*Lepidium fremontii*), big galleta (*Pleuraphis rigida*), cheese-bush (*Hymenoclea salsola*), and water jacket (*Lycium andersonii*). Desert globemallow (*Sphaeralcea ambigua*), with its showy orange flowers, is found throughout this habitat type, but is most dense on the bajadas.

VALUE TO WILDLIFE AND PLANTS

Wildlife

- This key habitat is critical to the survival of the federal and state threatened desert tortoise in Nevada.
- Large kit fox den complexes are often found in this key habitat.
- Reptile species that are dependent on this key habitat include the desert iguana, spotted leaf-nosed snake, and the speckled and sidewinder rattlesnakes.

- Sparsely vegetated plant communities dominated by creosote bush (*Larrea tridentata*) and shadscale saltbush (*Atriplex confertifolia*) provide food and cover for Le Conte’s thrasher.
- Desert kangaroo rats and the desert pocket mouse depend on wind-blown sandy areas associated with this key habitat, and creosote bush (*Larrea tridentata*) seeds comprise a significant portion of the desert pocket mouse’s diet.
- In this key habitat, small mammals and others are an important prey source for snakes as well as various bird species including the burrowing owl and loggerhead shrike.

Plants

- White bearpoppy (*Arctomecon merriamii*) populations may be found on calcareous soils on the South Range Study Area in this key habitat.
- Cane spring suncup (*Camissonia megalantha*) grows in areas dominated by shadscale saltbush (*Atriplex confertifolia*) or black sagebrush (*Artemisia nova*), often in disturbed sites, at elevations of 3,300 to 6,500 ft. This species would be considered marginal in this key habitat, only occurring at the higher elevations.
- Black woollypod (*Astragalus funereus*) may be found on limestone screes on lower mountain slopes in this key habitat. The species would be considered marginal in this habitat, only occurring at the higher elevations.
- Sanicle biscuitroot (*Cymopterus ripleyi* var. *saniculoides*) is most commonly found on the dunes and deep sands of the study area, but has been shown to occur on isolated sandy areas in this key habitat. Its occurrence would be considered marginal.
- Pygmy poreleaf (*Porophyllum pygmaeum*) is found in dry, open, relatively deep, rocky carbonate soils of alluvial fans and hillsides in slight depressions which are on the upper margins of this key habitat at the bases of cliffs and mountains.
- Parish’s phacelia (*Phacelia parishii*) occurs on moist to superficially dry, open, flat, mostly barren land. Soils are often salt crusted, silty, and usually found on valley bottom flats, lake deposits, and playa edges. The species may be found in the transitional areas between the playas and adjacent mixed desert scrub.
- Very little information is available for Clarke’s phacelia (*Phacelia filiae*), but it is similar to Parish’s phacelia (*Phacelia parishii*) and may be found in similar areas of this key habitat.
- Clokey’s buckwheat (*Eriogonum heermannii* var. *clokeyi*) is found in carbonate outcrops and gravelly washes and banks in the creosote-bursage, shadscale and blackbrush plant communities at elevations of 4,000 to 6,000 ft. MSL.
- Beatley’s scorpionflower (*Phacelia beatleyae*) is found in dry, open, loose gravelly soils on slopes and bases of white to brownish volcanic tuff outcrops on all slopes and aspects. It is also found in drainages in the mixed-shrub, shadscale, and upper creosote-bursage plant communities.
- Sheep Range milkvetch (*Astragalus amphioxys* var. *musimonum*) is found on carbonate alluvial gravels, particularly along drainages, roadsides, and in other microsites with enhanced run-off, in mixed desert scrub communities.

SPECIES OBSERVED

Table 2. List of plant and wildlife species that have been observed on the Mojave/Sonoran Warm & Mixed Desert Scrub key habitat

Status	Common Name	Scientific Name
Bat		
*	Pallid Bat	<i>Antrozous pallidus minor</i>
*	Pallid Bat	<i>Antrozous pallidus pallidus</i>
**	California Myotis	<i>Myotis californicus</i>
**	California Myotis	<i>Myotis californicus pallidus</i>

Status	Common Name	Scientific Name
*	Fringed Myotis	<i>Myotis thysanodes</i>
**	Western Pipistrelle	<i>Parastrellus hesperus</i>
**	Western Pipistrelle	<i>Parastrellus hesperus hesperus</i>
*	Mexican Free-tailed bat	<i>Tadarida brasiliensis</i>
*	Mexican Free-tailed bat	<i>Tadarida brasiliensis mexicana</i>
Birds		
	White-throated Swift	<i>Aeronautes saxatalis</i>
	Black-throated Sparrow	<i>Amphispiza bilineata</i>
	Golden Eagle	<i>Aquila chrysaetos</i>
	Black-chinned Hummingbird	<i>Archilochus alexandri</i>
	Short-eared Owl	<i>Asio flammeus</i>
	Long-eared Owl	<i>Asio otus</i>
	Burrowing Owl	<i>Athene cunicularia</i>
	Great Horned Owl	<i>Bubo virginianus</i>
	Red-tailed Hawk	<i>Buteo jamaicensis</i>
	Rough-legged Hawk	<i>Buteo lagopus</i>
	Anna's Hummingbird	<i>Calypte anna</i>
	Costa's Hummingbird	<i>Calypte costae</i>
	Cactus Wren	<i>Campylorhynchus brunneicapillus</i>
	House Finch	<i>Carpodacus mexicanus</i>
	Lesser Nighthawk	<i>Chordeiles acutipennis</i>
**	Common Nighthawk	<i>Chordeiles minor</i>
	Northern Harrier	<i>Circus cyaneus</i>
	Western Wood-pewee	<i>Contopus sordidulus</i>
	Common Raven	<i>Corvus corax</i>
	Gray Flycatcher	<i>Empidonax wrightii</i>
	Horned Lark	<i>Eremophila alpestris</i>
**	Prairie Falcon	<i>Falco mexicanus</i>
**	Peregrine Falcon	<i>Falco peregrinus</i>
	American Kestrel	<i>Falco sparverius</i>
	Barn Swallow	<i>Hirundo rustica</i>
	Scott's Oriole	<i>Icterus parisorum</i>
*	Loggerhead Shrike	<i>Lanius ludovicianus</i>
	Northern Mockingbird	<i>Mimus polyglottos</i>
	Ash-throated Flycatcher	<i>Myiarchus cinerascens</i>
**	Sage Thrasher	<i>Oreoscoptes montanus</i>
	House Sparrow	<i>Passer domesticus</i>
**	Phainopepla	<i>Phainopepla nitens</i>
	Common Poorwill	<i>Phalaenoptilus nuttallii</i>
	Blue-gray Gnatcatcher	<i>Polioptila caerulea</i>
	Black-tailed Gnatcatcher	<i>Polioptila melanura</i>
	Common Grackle	<i>Quiscalus quiscula</i>
	Ruby-crowned Kinglet	<i>Regulus calendula</i>
	Rock Wren	<i>Salpinctes obsoletus</i>
	Say's Phoebe	<i>Sayornis saya</i>
	Mountain Bluebird	<i>Sialia currucoides</i>
*	Brewer's Sparrow	<i>Spizella breweri</i>
	Chipping Sparrow	<i>Spizella passerina</i>
	Calliope Hummingbird	<i>Stellula calliope</i>
**	Crissal Thrasher	<i>Toxostoma crissale</i>
**	Le Conte's Thrasher	<i>Toxostoma lecontei</i>
	Western Kingbird	<i>Tyrannus verticalis</i>
	Plumbeous Vireo	<i>Vireo plumbeus</i>
**	Gray Vireo	<i>Vireo vicinior</i>
	Mourning Dove	<i>Zenaida macroura</i>
	White-crowned Sparrow	<i>Zonotrichia leucophrys</i>
Mammals		
	White-tailed Antelope Squirrel	<i>Ammospermophilus leucurus</i>
	Coyote	<i>Canis latrans</i>
	Long-tailed Pocket Mouse	<i>Chaetodipus formosus</i>
*	Desert Pocket Mouse	<i>Chaetodipus penicillatus</i>

Status	Common Name	Scientific Name
**	Desert Kangaroo Rat	<i>Dipodomys deserti</i>
	Merriam's Kangaroo Rat	<i>Dipodomys merriami</i>
	Chisel-Toothed Kangaroo Rat	<i>Dipodomys microps levipes</i>
	Chisel-Toothed Kangaroo Rat	<i>Dipodomys microps occidentalis</i>
	Ord's Kangaroo Rat	<i>Dipodomys ordii</i>
	Wild Burro	<i>Equus asinus</i>
	Black-tailed Jackrabbit	<i>Lepus californicus</i>
	Bobcat	<i>Lynx rufus baileyi</i>
	Striped Skunk	<i>Mephitis mephitis major</i>
	House Mouse	<i>Mus musculus</i>
	Desert Woodrat	<i>Neotoma lepida</i>
	Mule Deer	<i>Odocoileus hemionus</i>
	Southern Grasshopper Mouse	<i>Onychomys torridus longicaudus</i>
	Desert Bighorn Sheep	<i>Ovis canadensis nelsoni</i>
	Long-tailed Pocket Mouse	<i>Perognathus formosus formocus</i>
	Little Pocket Mouse	<i>Perognathus longimembris</i>
	Little Pocket Mouse	<i>Perognathus longimembris panamintinus</i>
	Great Basin Pocket Mouse	<i>Perognathus parvus</i>
	Canyon Mouse	<i>Peromyscus crinitus</i>
	Canyon Mouse	<i>Peromyscus crinitus stephensi</i>
	Cactus Mouse	<i>Peromyscus eremicus</i>
	Cactus Mouse	<i>Peromyscus eremicus eremicus</i>
	Deer Mouse	<i>Peromyscus maniculatus</i>
	Western Harvest Mouse	<i>Reithrodontomys megalotis megalotis</i>
	Townsend's Ground Squirrel	<i>Spermophilus townsendii mollis</i>
	Round-tailed Ground Squirrel	<i>Spermophilus tereticaudus</i>
	Desert Cottontail	<i>Sylvilagus audubonii</i>
	Chipmunk	<i>Tamias sp.</i>
	American Badger	<i>Taxidea taxus berlandieri</i>
	Botta's Pocket Gopher	<i>Thomomys bottae centralis</i>
	Botta's Pocket Gopher	<i>Thomomys bottae perpallidus</i>
	Southern Pocket Gopher	<i>Thomomys umbrinus centralis</i>
	Gray Fox	<i>Urocyon cinereoargenteus scottii</i>
	Kit Fox	<i>Vulpes macrotis</i>
	Round-tailed Ground Squirrel	<i>Xerospermophilus tereticaudus</i>
Reptiles		
*	Desert Tortoise	<i>Gopherus agassizii</i>
	Great Basin Whiptail	<i>Aspidoscelis tigris tigris</i>
	Western Zebra-tailed Lizard	<i>Callisaurus draconoides rhodostictus</i>
**	Western Banded Gecko	<i>Coleonyx variegatus</i>
	Mohave Desert Sidewinder	<i>Crotalus cerastes cerastes</i>
	Southwestern Speckled Rattlesnake	<i>Crotalus mitchellii</i>
**	Great Basin Collared Lizard	<i>Crotaphytus bicinctores</i>
	Rough-tailed Gecko	<i>Cytropodion scabrus</i>
	Desert Iguana	<i>Dipsosaurus dorsalis dorsalis</i>
**	Longnose Leopard Lizard	<i>Gambelia wislizenii</i>
	Mediterranean House Gecko	<i>Hemidactylus turcicus</i>
	California Kingsnake	<i>Lampropeltis getula californiae</i>
	Desert Striped Whipsnake	<i>Masticophis flagellum piceus</i>
**	Desert Horned Lizard	<i>Phrynosoma platyrhinos</i>
	Spotted Leaf-nosed Lizard	<i>Phyllorhynchus decurtatus perkinsi</i>
	Great Basin Gopher Snake	<i>Pituophis catenifer deserticola</i>
	Long-nosed Snake	<i>Rhinocheilus lecontei</i>
	Mohave Patch-nosed Snake	<i>Salvadora hexalepis Mojavensis</i>
**	Common Chuckwalla	<i>Sauromalus ater</i>
	Desert Spiny Lizard	<i>Sceloporus magister</i>
	Great Basin Fence Lizard	<i>Sceloporus occidentalis longipes</i>
	Yellow-backed Spiny Lizard	<i>Sceloporus uniformis</i>
	Common Side-blotch Lizard	<i>Uta stansburiana</i>
**	Desert Night Lizard	<i>Xantusia vigilis</i>

Status	Common Name	Scientific Name
Rare Plants		
*	Clokey's Pincushion	<i>Escobaria vivipara var. rosea</i>
*	Kingston Mountains Bedstraw	<i>Galium hilendiae ssp. kingstonense</i>
*	Hermit Cactus	<i>Sclerocactus polyancistrus</i>
**	Ivory-spined Agave	<i>Agave utahensis var. eborispina</i>
**	White Bearpoppy	<i>Arctomecon merriamii</i>
**	Sheep Range Milkvetch	<i>Astragalus amphioxys var. musimonum</i>
**	Black Woollypod	<i>Astragalus funereus</i>
**	Nye Milkvetch	<i>Astragalus nyensis</i>
**	Cane Springs Suncup	<i>Camissonia megalantha</i>
**	Death Valley Mormon Tea	<i>Ephedra funerea</i>
**	Darin's Buckwheat	<i>Eriogonum concinnum</i>
**	Darrow's Buckwheat	<i>Eriogonum darrovii</i>
**	Clokey's Buckwheat	<i>Eriogonum heermannii var. clokeyi</i>
**	Ripley's Gilia	<i>Gilia ripleyi</i>
**	Bashful Four-O'Clock	<i>Mirabilis pudica</i>
**	Desert Rockdaisy	<i>Perityle intricata</i>
**	Beatley's Scorpionflower	<i>Phacelia beatleyae</i>
**	Clarke's Phacelia	<i>Phacelia filiae</i>
**	Parish's Phacelia	<i>Phacelia parishii</i>
**	Notch-beak Milkwort	<i>Polygala heterorhyncha</i>
**	Pygmy Poreleaf	<i>Porophyllum pygmaeum</i>

*State/Federal listed and critically imperiled species.

**Special status species.

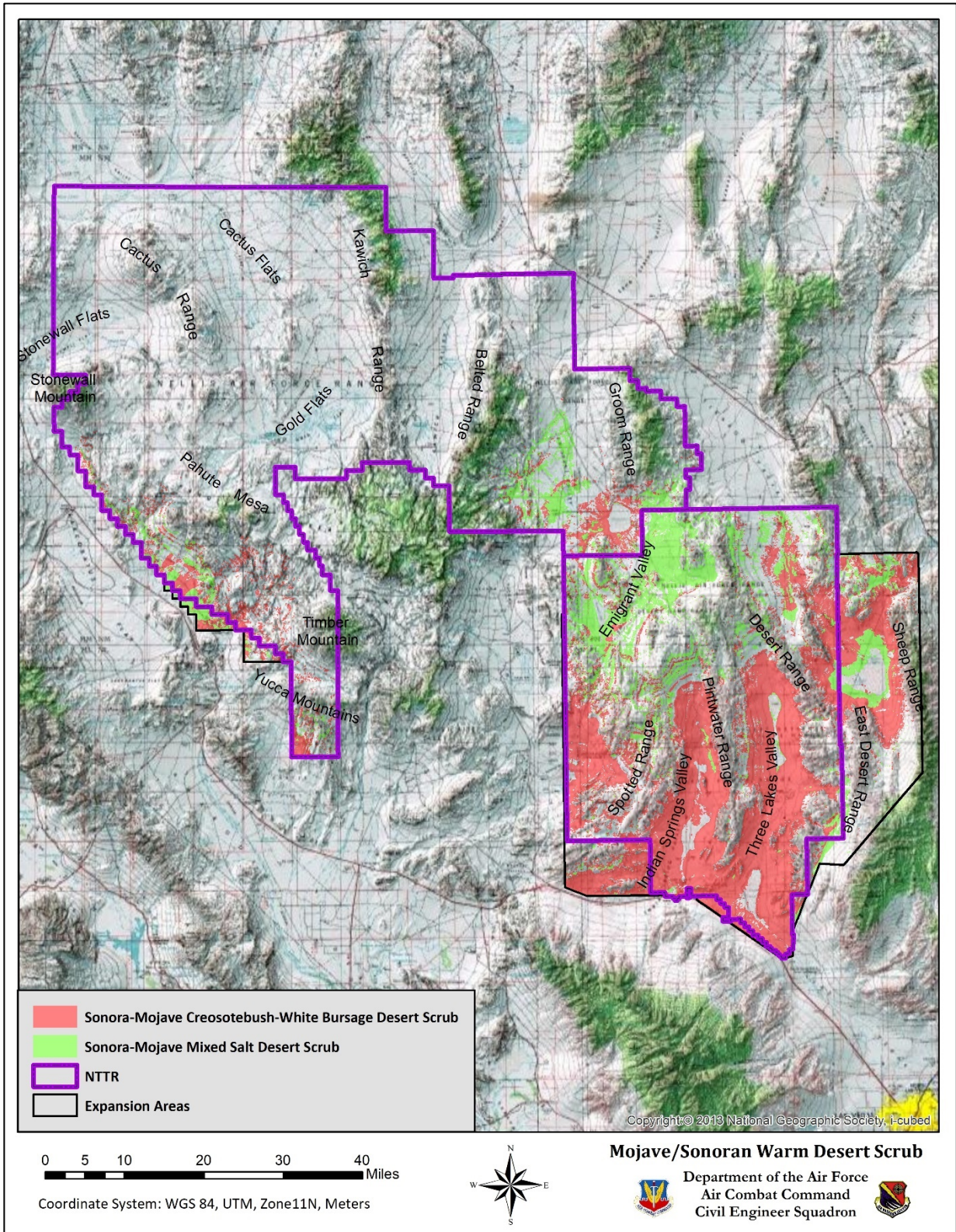


Figure 4. Map of Mojave/Sonoran Warm Desert Scrub on the study area

Mojave Mid-Elevation Mixed Desert Scrub

HABITAT DESCRIPTION

Mojave Mid-Elevation Mixed Desert Scrub key habitat is found below the pinyon-juniper woodland of Range 77, and on the upper reaches of bajadas around 4,000 ft. MSL in the South Range Study Area (Figure 5). The key habitat begins where creosote bush (*Larrea tridentata*) becomes less common and is replaced by a plant community dominated by blackbrush (*Coleogyne ramosissima*) and Joshua tree (*Yucca brevifolia*). On the study area, only one of the ecological systems in this key habitat is present (Mojave Mid-Elevation Mixed Desert Scrub). Soils are gravelly loams and gravelly silt loams. Soil surfaces are usually completely covered with small and large gravel, as well as rocks and cobble. Species diversity is high and, in addition to blackbrush (*Coleogyne ramosissima*) and Joshua tree (*Yucca brevifolia*), includes Nevada Mormon tea (*Ephedra nevadensis*), spiny menodora (*Menodora spinescens*), spiny hopsage (*Grayia spinosa*), water jacket (*Lycium andersonii*), matchweed (*Gutierrezia* spp.), cheesebush (*Hymenoclea salsola*), silver cholla (*Cylindropuntia echinocarpa*), hedgehog cactus (*Echinocereus* spp.), Nevada jointfir (*Ephedra nevadensis*), and wild buckwheat (*Eriogonum* spp.). Indian ricegrass (*Achnatherum hymenoides*), and desert needlegrass (*Achnatherum speciosa*) are common grasses in this key habitat.

VALUE TO WILDLIFE AND PLANTS

Wildlife

- Joshua tree (*Yucca brevifolia*) is critical to the presence of Bendire's thrashers, ferruginous hawks, and desert night lizards in this key habitat. Joshua tree is also an important habitat for Scott's orioles, although they are also found in pinyon-juniper habitats, sometimes in the absence of Joshua tree.
- The black-chinned sparrow has a very limited distribution in Nevada and may be found in shrubby stands of blackbrush (*Coleogyne ramosissima*) in the upper reaches of this key habitat near the pinyon-juniper interface.
- The ringtail is typically found near rock outcrops, rimrock, or in canyons that are often in or adjacent to this key habitat.
- During spring and summer precipitation events, ephemeral pools forming on suitable substrates in this habitat type and lasting sufficient time periods can support invertebrates, such as tadpole shrimp (*Triops* spp.). These species are dependent on temporary aquatic habitats for life history cycles and remain dormant in the substrate during dry periods.
- Amphibians including the red-spotted toad (*Anaxyrus punctatus*) may also use ephemeral pools in this key habitat for reproduction, provided other suitable habitat is present in the area to provide year-round moisture requirements.

Plants

- White bearpoppy (*Arctomecon merriamii*) would probably not be expected to occur on the North Range Study Area, but may be found on calcareous soils on the South Range Study Area in this key habitat. It is often found on gravelly slopes on the upper bajadas and foothills to the Desert Range, Pintwater Range, and Spotted Range.
- Ackerman's milkvetch (*Astragalus ackermanii*) may be found in this habitat, associated with Utah agave (*Agave utahensis*), ragged rockflower (*Crossosoma bigelovii*), beavertail pricklypear (*Opuntia basilaris*), and desert needlegrass (*Achnatherum speciosa*).
- Black woollypod (*Astragalus funereus*) may be found on gravelly volcanic tuffs and limestone screes on hillside slopes in this key habitat.

- Cane spring suncup (*Camissonia megalantha*) grows in areas dominated by shadscale or black sagebrush in loose, gravelly tuffs or sands on flats and slopes, and sometimes in outcrop crevices.
- Sanicle biscuitroot (*Cymopterus ripleyi* var. *saniculoides*) is most commonly found on the dunes and deep sands of the study area, but has potential to occur on isolated sandy areas in this key habitat.
- Darin's buckwheat (*Eriogonum concinnum*) occurs on deep loose sand derived from light colored tuff or other volcanic rocks in crevices and at the base of cliffs on the upper margins of this key habitat.
- Inyo hulsea (*Hulsea vestita* ssp. *inyoensis*) may be found on rocky sites on the upper limits of this key habitat in gravels and soils derived from volcanic parent material.
- Pygmy poreleaf (*Porophyllum pygmaeum*) is found in dry, open, relatively deep, rocky carbonate soils of alluvial fans and hillsides, often in slight depressions, which are on the upper margins of this habitat at the base of outcrops and cliffs.
- Sheep Range milkvetch (*Astragalus amphioxys* var. *musimonum*) is found on carbonate alluvial gravels, particularly along drainages, roadsides, and in other microsites with enhanced run-off within mixed desert scrub communities at elevations from 4,400 to 6,000 ft. MSL.
- Halfring milkvetch (*Astragalus mohavensis* var. *hemigyris*) grows in carbonate gravels and derivative soils on terraced hills and ledges, open slopes, and along washes in this key habitat at elevations from 3,000 to 5,600 ft. MSL.
- Bullfrog Hills sweetpea (*Lathyrus hitchcockianus*) is found in open, dry to slightly moist gravels of rocky drainage bottoms in canyons and on upper alluvial slopes or washes. Populations often become established at the base of boulders or canyon walls in volcanic tuff, carbonate rocks, or sandy soils from 4,000 to 6,990 ft. MSL.
- Beatley's scorpionflower (*Phacelia beatleyae*) grows in dry, open, early barren scree and loose gravelly soils on slopes and bases of white to brownish volcanic tuff outcrops on all slopes and aspects, and in adjacent drainages at elevations from 3,540 to 5,500 ft. MSL.

SPECIES OBSERVED

Table 3. Rare plant and wildlife species that have been observed in Mojave Mid-Elevation Desert Scrub key habitat

Status	Common Name	Scientific Name
Bat		
*	Townsend's Big-eared Bat	<i>Corynorhinus townsendii</i>
**	California Myotis	<i>Myotis californicus</i>
**	Western Pipistrelle	<i>Parastrellus hesperus</i>
*	Mexican Free-tailed bat	<i>Tadarida brasiliensis</i>
Birds		
	Cooper's Hawk	<i>Accipiter cooperii</i>
	White-throated Swift	<i>Aeronautes saxatalis</i>
	Chukar	<i>Alectoris chukar</i>
	Black-throated Sparrow	<i>Amphispiza bilineata</i>
	Western Scrub-jay	<i>Aphelocoma californica</i>
	Golden Eagle	<i>Aquila chrysaetos</i>
	Short-eared Owl	<i>Asio flammeus</i>
	Burrowing Owl	<i>Athene cunicularia</i>
	Verdin	<i>Auriparus flaviceps</i>
	Juniper Titmouse	<i>Baeolophus ridgwayi</i>
	Great Horned Owl	<i>Bubo virginianus</i>
	Red-tailed Hawk	<i>Buteo jamaicensis</i>
	Swainson's Hawk	<i>Buteo swainsoni</i>
	Anna's Hummingbird	<i>Calypte anna</i>

Status	Common Name	Scientific Name
	Costa's Hummingbird	<i>Calypte costae</i>
	Cactus Wren	<i>Campylorhynchus brunneicapillus</i>
	House Finch	<i>Carpodacus mexicanus</i>
	Turkey Vulture	<i>Cathartes aura</i>
	Canyon Wren	<i>Catherpes mexicanus</i>
	Common Nighthawk	<i>Chordeiles acutipennis</i>
	Northern Flicker	<i>Colaptes auratus</i>
	Western Wood-pewee	<i>Contopus sordidulus</i>
	Common Raven	<i>Corvus corax</i>
	Dusky Flycatcher	<i>Empidonax oberholseri</i>
	Horned Lark	<i>Eremophila alpestris</i>
**	Prairie Falcon	<i>Falco mexicanus</i>
**	Peregrine Falcon	<i>Falco peregrinus</i>
	American Kestrel	<i>Falco sparverius</i>
**	Pinyon Jay	<i>Gymnorhinus cyanocephalus</i>
	House Finch	<i>Haemorhous mexicanus</i>
	Scott's Oriole	<i>Icterus parisorum</i>
	Dark-eyed Junco	<i>Junco hyemalis</i>
*	Loggerhead Shrike	<i>Lanius ludovicianus</i>
	Northern Mockingbird	<i>Mimus polyglottos</i>
	Townsend's Solitaire	<i>Myadestes townsendi</i>
	Ash-throated Flycatcher	<i>Myiarchus cinerascens</i>
	MacGillivray's Warbler	<i>Oporornis tolmiei</i>
	Unknown Passerine	Passeriformes sp.
**	Phainopepla	<i>Phainopepla nitens</i>
	Common Poorwill	<i>Phalaenoptilus nuttallii</i>
	Black-headed Grosbeak	<i>Pheucticus melanocephalus</i>
	Ladder-backed Woodpecker	<i>Picoides scalaris</i>
	Green-tailed Towhee	<i>Pipilo chlorurus</i>
	Western Tanager	<i>Piranga ludoviciana</i>
	Blue-gray Gnatcatcher	<i>Polioptila caerulea</i>
	Black-tailed Gnatcatcher	<i>Polioptila melanura</i>
	Bushtit	<i>Psaltriparus minimus</i>
	Ruby-crowned Kinglet	<i>Regulus calendula</i>
	Rock Wren	<i>Salpinctes obsoletus</i>
	Say's Phoebe	<i>Sayornis saya</i>
	Broad-tailed Hummingbird	<i>Selasphorus platycercus</i>
	Mountain Bluebird	<i>Sialia currucoides</i>
	Western Bluebird	<i>Sialia mexicana</i>
*	Brewer's Sparrow	<i>Spizella breweri</i>
	Calliope Hummingbird	<i>Stellula calliope</i>
	Violet-green Swallow	<i>Tachycineta thalassina</i>
	Bewick's Wren	<i>Thryomanes bewickii</i>
**	Crissal Thrasher	<i>Toxostoma crissale</i>
	Hummingbird sp.	Trochilidae sp.
	House Wren	<i>Troglodytes aedon</i>
	Western Kingbird	<i>Tyrannus verticalis</i>
	Orange-crowned Warbler	<i>Vermivora celata</i>
**	Gray Vireo	<i>Vireo vicinior</i>
	Wilson's Warbler	<i>Wilsonia pusilla</i>
	Mourning Dove	<i>Zenaida macroura</i>
	White-crowned Sparrow	<i>Zonotrichia leucophrys</i>
Mammals		
	White-tailed Antelope Squirrel	<i>Ammospermophilus leucurus</i>
	Pronghorn	<i>Antilocapra americana</i>
	Long-tailed Pocket Mouse	<i>Chaetodipus formosus mohavensis</i>
**	Desert Kangaroo Rat	<i>Dipodomys deserti</i>
	Merriam's Kangaroo Rat	<i>Dipodomys merriami</i>
	Wild Burro	<i>Equus asinus</i>
	Wild Horse	<i>Equus ferus</i>
	Black-tailed Jackrabbit	<i>Lepus californicus</i>

Status	Common Name	Scientific Name
	Desert Woodrat	<i>Neotoma lepida</i>
	Mule Deer	<i>Odocoileus hemionus</i>
	Rock Squirrel	<i>Otospermophilus variegatus</i>
	Desert Bighorn Sheep	<i>Ovis canadensis nelsoni</i>
	Little Pocket Mouse	<i>Perognathus longimembris panamintinus</i>
	Great Basin Pocket Mouse	<i>Perognathus parvus</i>
	Canyon Mouse	<i>Peromyscus crinitus stephensi</i>
	Deer Mouse	<i>Peromyscus maniculatus</i>
	Pinyon Mouse	<i>Peromyscus truei truei</i>
	Mountain Lion	<i>Puma concolor</i>
	Desert Cottontail	<i>Sylvilagus audubonii</i>
	Cliff Chipmunk	<i>Tamias dorsalis grinnelli</i>
	Colorado Chipmunk	<i>Tamias quadrivittatus nevadensis</i>
	Uinta Chipmunk	<i>Tamias umbrinus nevadensis</i>
	Botta's Pocket Gopher	<i>Thomomys bottae phelleoecus</i>
	Kit Fox	<i>Vulpes macrotis</i>
	Sierra Nevada Red Fox	<i>Vulpes vulpes necator</i>
Reptiles		
*	Desert Tortoise	<i>Gopherus agassizii</i>
	Great Basin Whiptail	<i>Aspidoscelis tigris tigris</i>
	Western Zebra-tailed Lizard	<i>Callisaurus draconoides rhodostictus</i>
	Mohave Desert Sidewinder	<i>Crotalus cerastes cerastes</i>
**	Great Basin Collared Lizard	<i>Crotaphytus bicinctores</i>
**	Desert Horned Lizard	<i>Phrynosoma platyrhinos</i>
**	Common Chuckwalla	<i>Sauromalus ater</i>
	Sagebrush Lizard	<i>Sceloporus graciosus graciosus</i>
	Great Basin Fence Lizard	<i>Sceloporus occidentalis longipes</i>
	Yellow-backed Spiny Lizard	<i>Sceloporus uniformis</i>
	Common Side-blotch Lizard	<i>Uta stansburiana</i>
Rare Plants		
*	Clokey's Pincushion	<i>Escobaria vivipara var. rosea</i>
*	Kingston Mountains Bedstraw	<i>Galium hildendiae ssp. kingstonense</i>
*	Hermit Cactus	<i>Sclerocactus polyancistrus</i>
**	Coville's Abronia	<i>Abronia nana var. covillei</i>
**	Ivory-spined Agave	<i>Agave utahensis var. eborispina</i>
**	Ackerman's Milkvetch	<i>Astragalus ackermanii</i>
**	Sheep Range Milkvetch	<i>Astragalus amphioxys var. musimonum</i>
**	Beatley's Milkvetch	<i>Astragalus beatleyae</i>
**	Black Woollypod	<i>Astragalus funereus</i>
**	Halfring Milkvetch	<i>Astragalus mohavensis var. hemigyryus</i>
**	Nye Milkvetch	<i>Astragalus nyensis</i>
**	Cane Spring Suncup	<i>Camissonia megalantha</i>
**	New York Mountains Catseye	<i>Cryptantha tumulosa</i>
**	Death Valley Mormon Tea	<i>Ephedra funerea</i>
**	Antelope Canyon Goldenbush	<i>Ericameria cervina</i>
**	Darin's Buckwheat	<i>Eriogonum concinnum</i>
**	Clokey's Buckwheat	<i>Eriogonum heermannii var. clokeyi</i>
**	Ripley's Gilia	<i>Gilia ripleyi</i>
**	Inyo Hulsea	<i>Hulsea vestita ssp. inyoensis</i>
**	Bullfrog Hills Sweetpea	<i>Lathyrus hitchcockianus</i>
**	Rayless Tansy Aster	<i>Machaeranthera grindelioides var. depressa</i>
**	Bashful Four-o'Clock	<i>Mirabilis pudica</i>
**	Desert Rockdaisy	<i>Perityle intricata</i>
**	Beatley's Scorpionflower	<i>Phacelia beatleyae</i>
**	Weasel Phacelia	<i>Phacelia mustelina</i>
**	Pygmy Poreleaf	<i>Porophyllum pygmaeum</i>

*State/Federal listed and critically imperiled species

**Special status species.

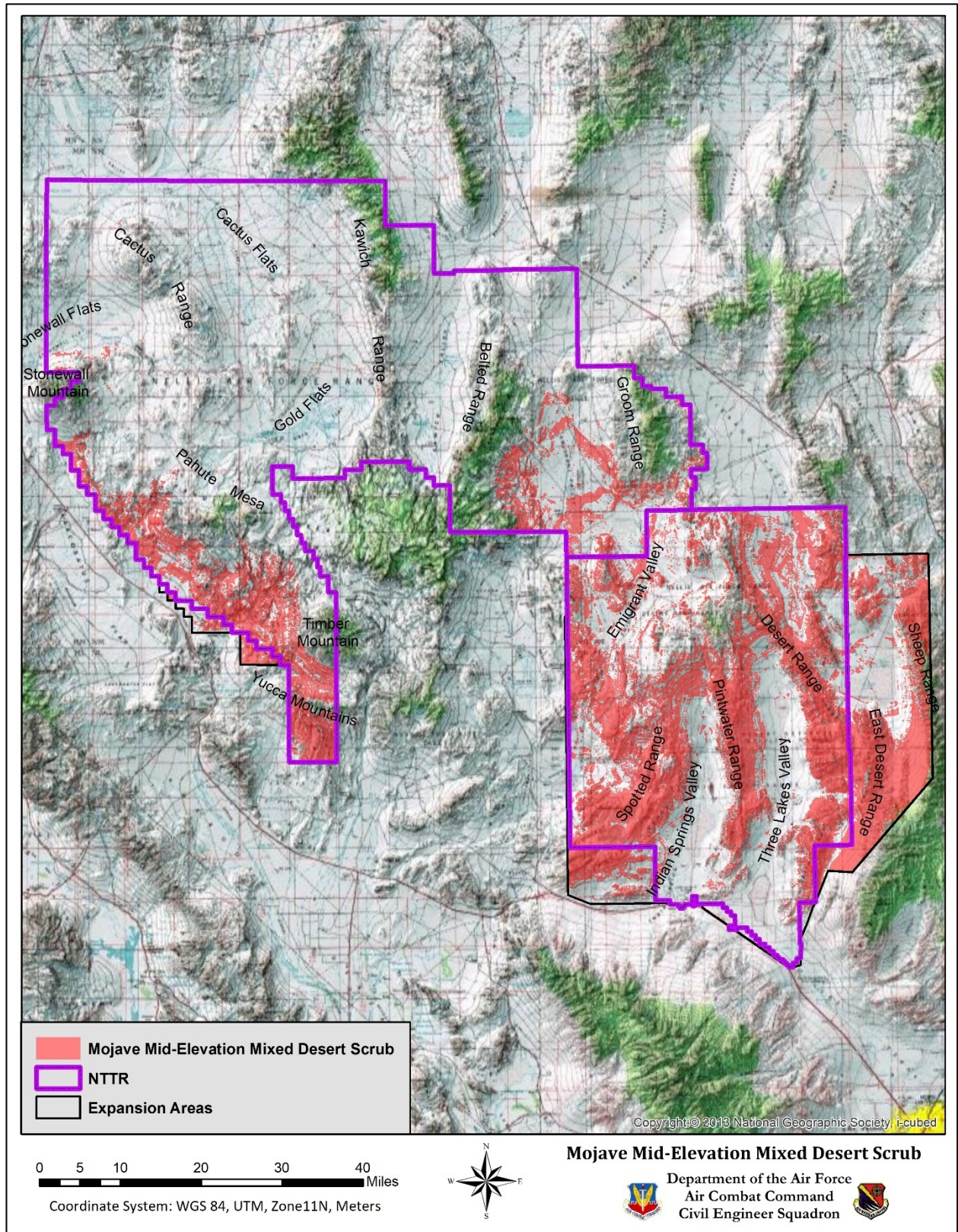


Figure 5. Map of Mojave Mid-Elevation Mixed Desert Scrub on the study area

Sagebrush

HABITAT DESCRIPTION

Sagebrush key habitat is one of the more common habitat types on the North Range Study Area and occurs in the northwest South Range Study Area. This key habitat is usually found between the Mojave Mid-Elevation Mixed Desert Scrub or Intermountain Cold Desert Shrub and the initiation of Lower Montane Woodlands and Chaparral. Great Basin Xeric Mixed Sagebrush Shrubland is located on the upper elevations of this habitat and is usually dominated by big sagebrush (*Artemisia tridentata*) and may be mixed with Utah juniper (*Juniperus osteosperma*) and pinyon pine (*Pinus monophylla*) at higher elevations (Figure 6). This ecological system is experiencing some loss in acreage as Utah juniper (*Juniperus osteosperma*) and pinyon pine (*Pinus monophylla*) encroach into the habitat because of overgrazing (Young & Sparks, 2002) and fire suppression (Blackburn & Tueller, 1970; Pyne, 2004). At lower elevations, big sagebrush is primarily found in the deep soils of drainages as it fingers out into the lower bajadas and basins supporting the Intermountain Basins Big Sagebrush Shrubland. Areas between the washes support dense populations of the shorter species of sagebrush including black sagebrush (*Artemisia nova*) and little sagebrush (*Artemisia arbuscula*). Other species associated with these two ecological systems include Nevada jointfir (*Ephedra nevadensis*), Mormon tea (*Ephedra viridis*), and rubber rabbitbrush (*Ericameria nauseosa*). Squirreltail (*Elymus elymoides*), Indian ricegrass (*Achnatherum hymenoides*), James' galleta (*Pleuraphis jamesii*), and purple threeawn (*Aristida purpurea*) are common grasses found throughout this key habitat. On the Intermountain Basins Big Sagebrush Shrubland, black sagebrush (*Artemisia nova*) and little sagebrush (*Artemisia arbuscula*) are the predominant species and may be mixed with Nevada jointfir (*Ephedra nevadensis*), Mormon tea (*Ephedra viridis*), winterfat (*Krascheninnikovia lanata*), snakeweed (*Gutierrezia* spp.), shadscale saltbush (*Atriplex confertifolia*), antelope bitterbrush (*Purshia tridentata*), and squirreltail (*Elymus elymoides*). Sagebrush key habitat is very important for supporting pronghorn, greater sage-grouse, and pygmy rabbit populations.

VALUE TO WILDLIFE AND PLANTS

Wildlife

- In Nevada, eight species are predominantly dependent on sagebrush for most of their life history. These species are pygmy rabbit, Great Basin pocket mouse, sagebrush vole, sagebrush lizard, greater sage-grouse, sage thrasher, Brewer's sparrow, and sage sparrow. Mule deer are also dependent on the sagebrush habitat for some of its life requirements.
- The greater sage-grouse is probably the species most highly adapted to the use of sagebrush itself. Ninety-eight percent of the year-round diet of the adult sage grouse is comprised of sagebrush leaves. The species uses sagebrush habitat almost exclusively for breeding, roosting, and winter cover.
- Sage thrashers, Brewer's sparrows, and sage sparrows depend heavily on the sagebrush for nesting substrate, and their distribution is closely tied to this key habitat. Black-throated sparrows, loggerhead shrikes, and gray flycatchers also nest in the mature shrub component.
- Pygmy rabbits prefer big sagebrush (*Artemisia tridentata*) that grows on deeper soils, but their occurrence is governed more by the presence of the deep soils (for burrowing) than by the tallness or character of the sagebrush.
- Sagebrush key habitat in good condition also supports a lush undergrowth of bunchgrasses and forbs. The presence of this highly productive understory is critical to the needs of other wildlife species, including the sagebrush vole.

- Greentailed towhees as well as Inyo shrews thrive in the microsites of sagebrush.
- Several raptors including prairie falcons, golden eagles, peregrine falcons, ferruginous hawks, and red-tailed hawks nest on habitats adjacent to sagebrush habitat, but hunt over sagebrush range where they primarily prey on ground squirrels, rabbits, and other rodents and small mammals.

Plants

- Clokey’s eggvetch (*Astragalus oophorus* var. *clokeyanus*) and Beatley’s milkvetch (*Astragalus beatleyae*) are most commonly found in pinyon-juniper associations at elevations of 5,000 to 10,300 ft. MSL, but have been observed in this key habitat along drainages, especially where Utah juniper and pinyon pine are beginning to encroach into the area. While not previously reported, the microsite preference of Clokey’s eggvetch (*Astragalus oophorus* var. *clokeyanus*) appears to be small islands and the edges of narrow, shallow drainages, while Beatley’s milkvetch (*Astragalus beatleyae*) appears to prefer gravelly slopes slightly upgradient of drainages.
- Cane spring suncup (*Camissonia megalantha*) grows in association with black sagebrush (*Artemisia nova*), often in disturbed sites, at elevations of 3,300 to 6,500 ft. MSL in loose, gravelly tuffs or sands on flats, slopes, and outcrop crevices.
- Inyo hulsea (*Hulsea vestita* ssp. *inyoensis*) grows on rocky sites at elevations greater than 4,800 ft. MSL and dominated by big sagebrush (*Artemisia tridentata*) or black sagebrush (*Artemisia nova*). The plant grows in gravels and soil derived from volcanic parent material, making the lower elevations of the Kawich and Belted Ranges potential habitat for this species.
- Weasel phacelia (*Phacelia mustelina*) may be found in black sagebrush (*Artemisia nova*) communities on western and southwestern parts of the North Range Study Area around Stonewall Mountain, Tolicha Peak, Thirsty Canyon, and the Cactus Range.
- Gilman’s milkvetch (*Astragalus gilmanii*) may be found on light-colored volcanic tuff slopes where this habitat merges with pinyon-juniper woodlands from elevations of 5,000 to 6,000 ft. MSL.
- Darrow’s buckwheat (*Eriogonum darrovii*) grows in the pinyon-juniper zone, from elevations of 6,100 to 6,500 ft. MSL in soils that are fine, hard, and mixed with limestone rock. The upper reaches of Sagebrush key habitat may support this species.

SPECIES OBSERVED

Table 4. Wildlife and rare plants that have been observed on the Sagebrush key habitat

Status	Common Name	Scientific Name
Bat		
*	Pallid Bat	<i>Antrozous pallidus</i>
*	Townsend's Big-eared Bat	<i>Corynorhinus townsendii</i>
**	Spotted Bat	<i>Euderma maculatum</i>
**	Silver-haired Bat	<i>Lasionycteris noctivagans</i>
	Western Red Bat	<i>Lasiurus blossevillii</i>
	California Leaf-nosed Bat	<i>Macrotus californicus</i>
	Southwestern Myotis	<i>Myotis auriculus</i>
**	California Myotis	<i>Myotis californicus</i>
**	Western small-footed Myotis	<i>Myotis ciliolabrum</i>
**	Long-eared Myotis	<i>Myotis evotis</i>
	Little Brown Myotis	<i>Myotis lucifugus</i>
*	Fringed Myotis	<i>Myotis thysanodes</i>
	Southwest Cave Myotis	<i>Myotis velifer brevis</i>
**	Long-legged Myotis	<i>Myotis volans</i>
**	Western Pipistrelle	<i>Parastrellus hesperus</i>
*	Mexican Free-tailed bat	<i>Tadarida brasiliensis</i>
Birds		

Status	Common Name	Scientific Name
	Cooper's Hawk	<i>Accipiter cooperii</i>
	Chukar	<i>Alectoris chukar</i>
**	Sage Sparrow	<i>Amphispiza belli</i>
	Black-throated Sparrow	<i>Amphispiza bilineata</i>
	Western Scrub-jay	<i>Aphelocoma californica</i>
	Golden Eagle	<i>Aquila chrysaetos</i>
	Short-eared Owl	<i>Asio flammeus</i>
	Long-eared Owl	<i>Asio otus</i>
	Western Burrowing Owl	<i>Athene cunicularia</i>
	Great Horned Owl	<i>Bubo virginianus</i>
	Red-tailed Hawk	<i>Buteo jamaicensis</i>
	Rough-legged Hawk	<i>Buteo lagopus</i>
**	Ferruginous Hawk	<i>Buteo regalis</i>
	Swainson's Hawk	<i>Buteo swainsoni</i>
	Costa's Hummingbird	<i>Calypte costae</i>
	Lesser Goldfinch	<i>Carduelis psaltria</i>
	House Finch	<i>Carpodacus mexicanus</i>
	Turkey Vulture	<i>Cathartes aura</i>
	Canyon Wren	<i>Catherpes mexicanus</i>
*	Greater Sage Grouse	<i>Centrocercus urophasianus</i>
	Killdeer	<i>Charadrius vociferus</i>
	Lark Sparrow	<i>Chondestes grammacus</i>
	Northern Harrier	<i>Circus cyaneus</i>
	Northern Flicker	<i>Colaptes auratus</i>
	Western Wood-pewee	<i>Contopus sordidulus</i>
	Common Raven	<i>Corvus corax</i>
	Yellow Warbler	<i>Dendroica petechia</i>
	Townsend's Warbler	<i>Dendroica townsendi</i>
	Gray Flycatcher	<i>Empidonax wrightii</i>
	Horned Lark	<i>Eremophila alpestris</i>
	Brewer's Blackbird	<i>Euphagus cyanocephalus</i>
	Merlin	<i>Falco columbarius</i>
**	Prairie Falcon	<i>Falco mexicanus</i>
	American Kestrel	<i>Falco sparverius</i>
	Wilson's Snipe	<i>Gallinago delicata</i>
**	Pinyon Jay	<i>Gymnorhinus cyanocephalus</i>
	Barn Swallow	<i>Hirundo rustica</i>
	Scott's Oriole	<i>Icterus parisorum</i>
	Dark-eyed Junco	<i>Junco hyemalis</i>
*	Loggerhead Shrike	<i>Lanius ludovicianus</i>
	Franklin's Gull	<i>Larus pipixcan</i>
	Song Sparrow	<i>Melospiza melodia</i>
	Northern Mockingbird	<i>Mimus polyglottos</i>
	Brown-headed Cowbird	<i>Molothrus ater</i>
	Townsend's Solitaire	<i>Myadestes townsendi</i>
	Ash-throated Flycatcher	<i>Myiarchus cinerascens</i>
	MacGillivray's Warbler	<i>Oporornis tolmiei</i>
	Osprey	<i>Pandion haliaetus</i>
	Lazuli Bunting	<i>Passerina amoena</i>
	Bunting sp.	<i>Passerina sp.</i>
	Common Poorwill	<i>Phalaenoptilus nuttallii</i>
	Hairy Woodpecker	<i>Picoides villosus</i>
	Spotted Towhee	<i>Pipilo maculatus</i>
	Western Tanager	<i>Piranga ludoviciana</i>
	Mountain Chickadee	<i>Poecile gambeli</i>
	Blue-gray Gnatcatcher	<i>Poliotilta caerulea</i>
	American Avocet	<i>Recurvirostra americana</i>
	Ruby-crowned Kinglet	<i>Regulus calendula</i>
	Rock Wren	<i>Salpinctes obsoletus</i>
	Say's Phoebe	<i>Sayornis saya</i>
	Mountain Bluebird	<i>Sialia currucoides</i>

Status	Common Name	Scientific Name
*	Brewer's Sparrow	<i>Spizella breweri</i>
	Northern Rough-winged Swallow	<i>Stelgidopteryx serripennis</i>
	Western Meadowlark	<i>Sturnella neglecta</i>
	Violet-green Swallow	<i>Tachycineta thalassina</i>
	Western Kingbird	<i>Tyrannus verticalis</i>
	Bell's Vireo	<i>Vireo bellii</i>
	Wilson's Warbler	<i>Wilsonia pusilla</i>
	Mourning Dove	<i>Zenaida macroura</i>
	White-crowned Sparrow	<i>Zonotrichia leucophrys</i>
Mammals		
	Pronghorn	<i>Antilocapra americana</i>
	Wild Burro	<i>Equus asinus</i>
	Wild Horse	<i>Equus ferus</i>
	Mule Deer	<i>Odocoileus hemionus</i>
	Desert Bighorn Sheep	<i>Ovis canadensis nelsoni</i>
	Mountain Lion	<i>Puma concolor</i>
	Coyote	<i>Canis latrans</i>
	Kit Fox	<i>Vulpes macrotis</i>
	White-tailed Antelope Squirrel	<i>Ammospermophilus leucurus</i>
	Long-tailed Pocket Mouse	<i>Chaetodipus formosus</i>
**	Desert Kangaroo Rat	<i>Dipodomys deserti</i>
	Merriam's Kangaroo Rat	<i>Dipodomys merriami</i>
	Chisel-toothed Kangaroo Rat	<i>Dipodomys microps</i>
	Ord's Kangaroo Rat	<i>Dipodomys ordii</i>
	Kangaroo Rat	<i>Dipodomys spp</i>
	Cliff Chipmunk	<i>Eutamias dorsalis</i>
	Black-tailed Jackrabbit	<i>Lepus californicus</i>
	Dark Kangaroo Mouse	<i>Microdipodops megacephalus</i>
	Pallid Kangaroo Mouse	<i>Microdipodops pallidus</i>
	Desert Woodrat	<i>Neotoma lepida</i>
	Northern Grasshopper Mouse	<i>Onychomys leucogaster</i>
	Plains Pocket Mouse	<i>Perognathus flavescens</i>
	Little Pocket Mouse	<i>Perognathus longimembris</i>
	Great Basin Pocket Mouse	<i>Perognathus parvus</i>
	Canyon Mouse	<i>Peromyscus crinitus</i>
	Deer Mouse	<i>Peromyscus maniculatus</i>
	Pinyon Deer Mouse	<i>Peromyscus truei</i>
**	Merriam's Shrew	<i>Sorex merriami leucogenys</i>
	Desert Cottontail	<i>Sylvilagus audubonii</i>
Reptiles		
	Great Basin Whiptail	<i>Aspidoscelis tigris tigris</i>
	Western Zebra-tailed Lizard	<i>Callisaurus draconoides rhodostictus</i>
	Southwestern Speckled Rattlesnake	<i>Crotalus mitchellii</i>
	Great Basin Rattlesnake	<i>Crotalus oreganus lutosus</i>
	Panamint Rattlesnake	<i>Crotalus stephensi</i>
**	Great Basin Collared Lizard	<i>Crotaphytus bicinctores</i>
**	Longnose Leopard Lizard	<i>Gambelia wislizenii</i>
	Desert Striped Whipsnake	<i>Masticophis flagellum piceus</i>
	Desert Striped Whipsnake	<i>Masticophis taeniatus taeniatus</i>
**	Desert Horned Lizard	<i>Phrynosoma platyrhinos</i>
	Great Basin Gopher Snake	<i>Pituophis catenifer deserticola</i>
**	Western Red-tailed Skink	<i>Plestiodon gilberti rubricaudatus</i>
**	Common Chuckwalla	<i>Sauromalus ater</i>
	Sagebrush Lizard	<i>Sceloporus graciosus graciosus</i>
	Great Basin Fence Lizard	<i>Sceloporus occidentalis longipes</i>
	Yellow-backed Spiny Lizard	<i>Sceloporus uniformis</i>
	Great Basin Spadefoot	<i>Spea intermontana</i>
	Common Side-blotch Lizard	<i>Uta stansburiana</i>
Rare Plants		
*	Gilman Milkvetch	<i>Astragalus gilmanii</i>
*	Clokey's Pincushion	<i>Escobaria vivipara var. rosea</i>

Status	Common Name	Scientific Name
*	Hermit Cactus	<i>Sclerocactus polyancistrus</i>
**	Ivory-spined Agave	<i>Agave utahensis</i> var. <i>eborispina</i>
**	Beatley's Milkvetch	<i>Astragalus beatleyae</i>
**	Black Woollypod	<i>Astragalus funereus</i>
**	Nye Milkvetch	<i>Astragalus nyensis</i>
**	Clokey's Eggvetch	<i>Astragalus oophorus</i> var. <i>clokeyanus</i>
**	Cane Spring Suncup	<i>Camissonia megalantha</i>
**	Death Valley Mormon Tea	<i>Ephedra funerea</i>
**	Darin's Buckwheat	<i>Eriogonum concinnum</i>
**	Darrow's Buckwheat	<i>Eriogonum darrovii</i>
**	Inyo Hulsea	<i>Hulsea vestita</i> ssp. <i>inyoensis</i>
**	Bullfrog Hills Sweetpea	<i>Lathyrus hitchcockianus</i>
**	Rayless Tansy Aster	<i>Machaeranthera grindelioides</i> var. <i>depressa</i>
**	Pahute Mesa Beardtongue	<i>Penstemon pahutensis</i>
**	Desert Rockdaisy	<i>Perityle intricata</i>
**	Weasel Phacelia	<i>Phacelia mustelina</i>
**	Notch-beak Milkwort	<i>Polygala heterorhyncha</i>
**	Charleston Grounddaisy	<i>Townsendia jonesii</i> var. <i>tumulosa</i>

*State/Federal listed and critically imperiled species

**Special status species.

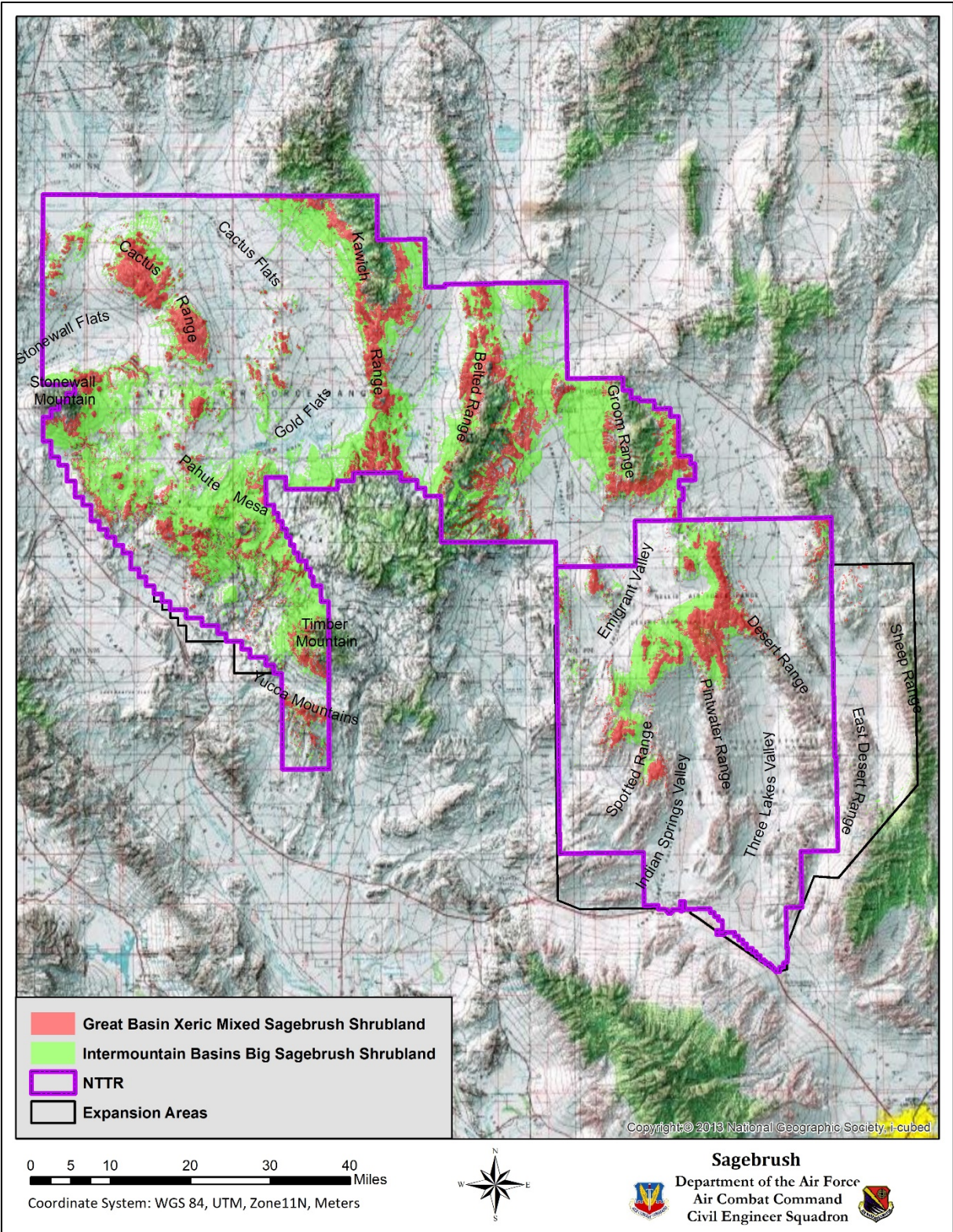


Figure 6. Map of Sagebrush habitat on the study area

Lower Montane Woodlands & Chaparral

HABITAT DESCRIPTION

This key habitat initiates at about 6,500 ft. MSL in the foothills and mountains at the upper reaches of bajadas. On the study area, this key habitat includes the Great Basin Pinyon-Juniper Woodland ecological system and the Rocky Mountain Gambel Oak-Mixed Montane Shrubland ecological system. It is found throughout the higher elevations of the North Range Study Area and only in the highest points on the mountain ranges of the South Range Study Area (Figure 7). Soils are loose, gravelly tuffs with scattered gravels in the substrate. Rock outcrops, steep slopes and cliffs are common. On the Kawich and Belted Range, this key habitat is often comprised of dense vegetation that often encroaches on roads, making them impassible. The woody plant community often supports open areas dominated by big sagebrush (*Artemisia tridentata*), rubber rabbitbrush (*Ericameria nauseosa*), and Gambel oak (*Quercus gambelii*). At higher elevations on the Belted Range, Gambel oak stands can become extremely thick, especially where periodic fires have been suppressed. Additionally, mountain-mahogany (*Cercocarpus* spp.) and Mormon tea (*Ephedra viridis*) may be present. Grasses include James' galleta (*Pleuraphis jamesii*), beardless wildrye (*Leymus triticoides*), red brome (*Bromus madritensis* ssp. *rubens*), desert needlegrass (*Achnatherum speciosa*), Parish's needlegrass (*Achnatherum parishii*), and purple threeawn (*Aristida purpurea*). Seeps and springs are commonly found in this key habitat. In the lower reaches of this habitat, pinyon pine (*Pinus monophylla*) is largely absent and Utah juniper (*Juniperus osteosprema*) is the dominant species with sub-dominants including big sagebrush (*Artemisia tridentata*), Mormon tea (*Ephedra viridis*), bitterbrush (*Purshia* spp.) and squirreltail (*Elymus elymoides*). Mojave rabbitbrush (*Ericameria paniculata*), beardless wildrye (*Leymus triticoides*), skunkbush sumac (*Rhus trilobata*), and snakeweed (*Gutierrezia* spp.) are common in drainages. This juniper dominated habitat is especially common on the Cactus Range, Stonewall Mountain, Mountain Helen, Tolicha Peak, and Thirsty Canyon. The juniper becomes sparse and scattered at lower elevations, mixing with the black sagebrush (*Artemisia nova*), big sagebrush (*Artemisia tridentata*), and blackbrush (*Coleogyne ramosissima*) plant communities.

VALUE TO WILDLIFE AND PLANTS

Wildlife

- Pinyon-juniper woodlands provide a variety of sheltering functions for wildlife including vegetative cover, wood cavities, and nest sites for birds, bats, and small mammals.
- As an evergreen cover, the forests provide important thermal protection for wildlife during winter, and provide shelter from summer's intense sun.
- The ferruginous hawk exploits pinyon-juniper by relying on older trees of sufficient size and structure to support large nest platforms. These trees must be located at the lower edge of the forest where they also provide a view of surrounding open sagebrush expanses where prey can be observed and hunted.
- For birds and bats, the pinyon-juniper woodland provides structure for nesting and roosting, and locations for foraging that would otherwise be missing from the adjacent sagebrush and mixed scrub plant communities that are dominated by shrubs.
- One of the critical products of the pinyon-juniper woodland is the pinyon nut crop, which is exploited by species such as the pinyon jay.
- The juniper berry crop is also an important food resource for birds and small mammals.

- Gambel oak (*Quercus gambelii*) leaves provide browse for mule deer. Acorns are foraged by small mammals and many species of birds. Serviceberry (*Amelanchier* spp.) provides browse for deer and fruit for small mammals and birds.
- Mountain-mahogany (*Cercocarpus* spp.) provides similar values – cover, nest sites, and foraging opportunities – but in a subtly different fashion. The overstory created by mountain-mahogany tends to be sparser than the thick canopy of pinyon-juniper woodlands allowing more diffused light to reach the ground. Because of this, mountain-mahogany often supports a variety of forbs, grasses, and shrubs; all of which offer foraging opportunities for birds, small mammals, and reptiles.

Plants

- Darin’s buckwheat (*Eriogonum concinnum*) occurs on deep loose sand derived from light colored tuff or other volcanic rocks in crevices, at the base of cliffs, and on outcrops throughout this key habitat.
- Clokey’s eggvetch (*Astragalus oophorus* var. *clokeyanus*) and Beatley’s milkvetch (*Astragalus beatleyae*) are most commonly found in these pinyon-juniper woodlands at elevations of 5,000 to 10,300 ft., especially in and along drainages.
- Weasel phacelia (*Phacelia mustelina*) is most commonly found in black sagebrush (*Artemisia nova*) communities at the lower elevations of this key habitat on western and southwestern parts of the North Range Study Area around Stonewall Mountain, Tolicha Peak, Thirsty Canyon and the Cactus Range.
- Pahute Mesa beardtongue (*Penstemon pahutensis*) is found in big sagebrush/pinyon-juniper plant communities in this key habitat.
- Sheep fleabane (*Erigeron ovinus*) is found on limestone rock outcrops and at the base of cliffs within the pinyon-juniper woodlands from elevations 3,600 to 8,400 ft. MSL in association with single-leaf pinyon pine (*Pinus monophylla*) and mountain-mahogany (*Cercocarpus* spp.). This plant is known only from the Sheep and Groom Ranges, but could potentially occur on the Desert Range, Pintwater Range, Belted Range, and Kawich Range.
- Gilman’s milkvetch (*Astragalus gilmanii*) is found on light-colored volcanic tuff slopes in this habitat from elevations of 5,383 to 6,000 ft. MSL.

SPECIES OBSERVED

Table 5. Wildlife and rare plants that have been observed on the Lower Montane Woodlands & Chaparral key habitat

Status	Common Name	Scientific Name
Bat		
*	Pallid Bat	<i>Antrozous pallidus</i>
*	Townsend's Big-eared Bat	<i>Corynorhinus townsendii</i>
	Western Red Bat	<i>Lasiurus blossevillii</i>
**	Hoary Bat	<i>Lasiurus cinereus</i>
**	California Myotis	<i>Myotis californicus</i>
**	Western small-footed Myotis	<i>Myotis ciliolabrum</i>
**	Long-eared Myotis	<i>Myotis evotis</i>
	Little Brown Myotis	<i>Myotis lucifugus</i>
*	Fringed Myotis	<i>Myotis thysanodes</i>
**	Long-legged Myotis	<i>Myotis volans</i>
**	Yuma Myotis	<i>Myotis yumanensis</i>
**	Western Pipistrelle	<i>Parastrellus hesperus</i>
*	Mexican Free-tailed bat	<i>Tadarida brasiliensis</i>
Birds		
	Cooper's Hawk	<i>Accipiter cooperii</i>
	Chukar	<i>Alectoris chukar</i>

Status	Common Name	Scientific Name
	Black-throated Sparrow	<i>Amphispiza bilineata</i>
	Western Scrub-jay	<i>Aphelocoma californica</i>
	Golden Eagle	<i>Aquila chrysaetos</i>
	Black-chinned Hummingbird	<i>Archilochus alexandri</i>
	Short-eared Owl	<i>Asio flammeus</i>
	Juniper Titmouse	<i>Baeolophus ridgwayi</i>
	Red-tailed Hawk	<i>Buteo jamaicensis</i>
	Gambel's Quail	<i>Callipepla gambelii</i>
	Costa's Hummingbird	<i>Calypte costae</i>
	House Finch	<i>Carpodacus mexicanus</i>
	Canyon Wren	<i>Catherpes mexicanus</i>
	Northern Flicker	<i>Colaptes auratus</i>
	Western Wood-pewee	<i>Contopus sordidulus</i>
	Common Raven	<i>Corvus corax</i>
	Yellow-rumped Warbler	<i>Dendroica coronata</i>
	Black-throated Gray Warbler	<i>Dendroica nigrescens</i>
	Dusky Flycatcher	<i>Empidonax oberholseri</i>
	Gray Flycatcher	<i>Empidonax wrightii</i>
	Horned Lark	<i>Eremophila alpestris</i>
	Merlin	<i>Falco columbarius</i>
**	Prairie Falcon	<i>Falco mexicanus</i>
**	Peregrine Falcon	<i>Falco peregrinus</i>
	American Kestrel	<i>Falco sparverius</i>
**	Pinyon Jay	<i>Gymnorhinus cyanocephalus</i>
	House Finch	<i>Haemorhous mexicanus</i>
	Scott's Oriole	<i>Icterus parisorum</i>
	Dark-eyed Junco	<i>Junco hyemalis</i>
*	Loggerhead Shrike	<i>Lanius ludovicianus</i>
	Western Screech-owl	<i>Megascops kennicottii</i>
	Lewis's Woodpecker	<i>Melanerpes lewis</i>
	Brown-headed Cowbird	<i>Molothrus ater</i>
	Townsend's Solitaire	<i>Myadestes townsendi</i>
	Ash-throated Flycatcher	<i>Myiarchus cinerascens</i>
	Clark's Nutcracker	<i>Nucifraga columbiana</i>
	MacGillivray's Warbler	<i>Oporornis tolmiei</i>
	Black-headed Grosbeak	<i>Pheucticus melanocephalus</i>
	Ladder-backed Woodpecker	<i>Picoides scalaris</i>
	Hairy Woodpecker	<i>Picoides villosus</i>
	Spotted Towhee	<i>Pipilo maculatus</i>
	Western Tanager	<i>Piranga ludoviciana</i>
	Mountain Chickadee	<i>Poecile gambeli</i>
	Blue-gray Gnatcatcher	<i>Polioptila caerulea</i>
	Bushtit	<i>Psaltriparus minimus</i>
	Ruby-crowned Kinglet	<i>Regulus calendula</i>
	Rock Wren	<i>Salpinctes obsoletus</i>
	Black-throated Gray Warbler	<i>Setophaga nigrescens</i>
	Western Bluebird	<i>Sialia mexicana</i>
	Red-breasted Nuthatch	<i>Sitta canadensis</i>
	White-breasted Nuthatch	<i>Sitta carolinensis</i>
	Lesser Goldfinch	<i>Spinus psaltria</i>
	Chipping Sparrow	<i>Spizella passerina</i>
	Bewick's Wren	<i>Thryomanes bewickii</i>
	House Wren	<i>Troglodytes aedon</i>
	American Robin	<i>Turdus migratorius</i>
	Western Kingbird	<i>Tyrannus verticalis</i>
	Unknown	<i>Unknown sp.</i>
**	Gray Vireo	<i>Vireo vicinior</i>
	Wilson's Warbler	<i>Wilsonia pusilla</i>
	Mourning Dove	<i>Zenaidura macroura</i>
	White-crowned Sparrow	<i>Zonotrichia leucophrys</i>
Mammals		

Status	Common Name	Scientific Name
	Pronghorn	<i>Antilocapra americana</i>
	Wild Horse	<i>Equus ferus</i>
	Mule Deer	<i>Odocoileus hemionus</i>
	Desert Bighorn Sheep	<i>Ovis canadensis nelsoni</i>
	Bobcat	<i>Lynx rufus</i>
	Mountain Lion	<i>Puma concolor</i>
	White-tailed Antelope Squirrel	<i>Ammospermophilus leucurus</i>
	Pygmy Rabbit	<i>Brachylagus idahoensis</i>
	Long-tailed Pocket Mouse	<i>Chaetodipus formosus</i>
	Merriam's Kangaroo Rat	<i>Dipodomys merriami</i>
	Black-tailed Jackrabbit	<i>Lepus californicus</i>
	Desert Woodrat	<i>Neotoma lepida</i>
	Great Basin Pocket Mouse	<i>Perognathus parvus</i>
	Deer Mouse	<i>Peromyscus maniculatus</i>
	Pinyon Deer Mouse	<i>Peromyscus truei</i>
	Rock Squirrel	<i>Spermophilus variegatus</i>
	Desert Cottontail	<i>Sylvilagus audubonii</i>
	Cliff Chipmunk	<i>Tamias dorsalis</i>
Reptiles		
	Great Basin Whiptail	<i>Aspidoscelis tigris tigris</i>
	Great Basin Rattlesnake	<i>Crotalus oreganus lutosus</i>
**	Longnose Leopard Lizard	<i>Gambelia wislizenii</i>
	Desert Striped Whipsnake	<i>Masticophis taeniatus taeniatus</i>
	Sagebrush Lizard	<i>Sceloporus graciosus graciosus</i>
	Great Basin Fence Lizard	<i>Sceloporus occidentalis longipes</i>
	Yellow-backed Spiny Lizard	<i>Sceloporus uniformis</i>
	Common Side-blotch Lizard	<i>Uta stansburiana</i>
Rare Plants		
*	Gilman's Milkvetch	<i>Astragalus gilmanii</i>
*	Inyo Milkvetch	<i>Astragalus inyoensis</i>
*	Clokey's Pincushion	<i>Escobaria vivipara var. rosea</i>
*	Kingston Mountains Bedstraw	<i>Galium hilendiae ssp. kingstonense</i>
*	Rock Purpusia	<i>Ivesia arizonica var. saxosa</i>
*	Cliff Needlegrass	<i>Piptatherum shoshoneanum</i>
**	Ivory-spined Agave	<i>Agave utahensis var. eborispina</i>
**	Ackerman's Milkvetch	<i>Astragalus ackermanii</i>
**	Beatley's Milkvetch	<i>Astragalus beatleyae</i>
**	Clokey's Eggvetch	<i>Astragalus oophorus var. clokeyanus</i>
**	Watson's Goldenbush	<i>Ericameria watsonii</i>
**	Sheep Fleabane	<i>Erigeron ovinus</i>
**	Darin's Buckwheat	<i>Eriogonum concinnum</i>
**	Rough Dwarf Greasebush	<i>Glossopetalon pungens var. pungens</i>
**	Inyo Hulsea	<i>Hulsea vestita ssp. inyoensis</i>
**	Rayless Tansy Aster	<i>Machaeranthera grindelioides var. depressa</i>
**	Pahute Mesa Beardtongue	<i>Penstemon pahutensis</i>
**	Jaeger's Phacelia	<i>Phacelia geraniifolia</i>
**	Weasel Phacelia	<i>Phacelia mustelina</i>
**	Parish's Phacelia	<i>Phacelia parishii</i>
**	Notch-beak Milkwort	<i>Polygala heterorhyncha</i>

*State/Federal listed and critically imperiled species

**Special status species.

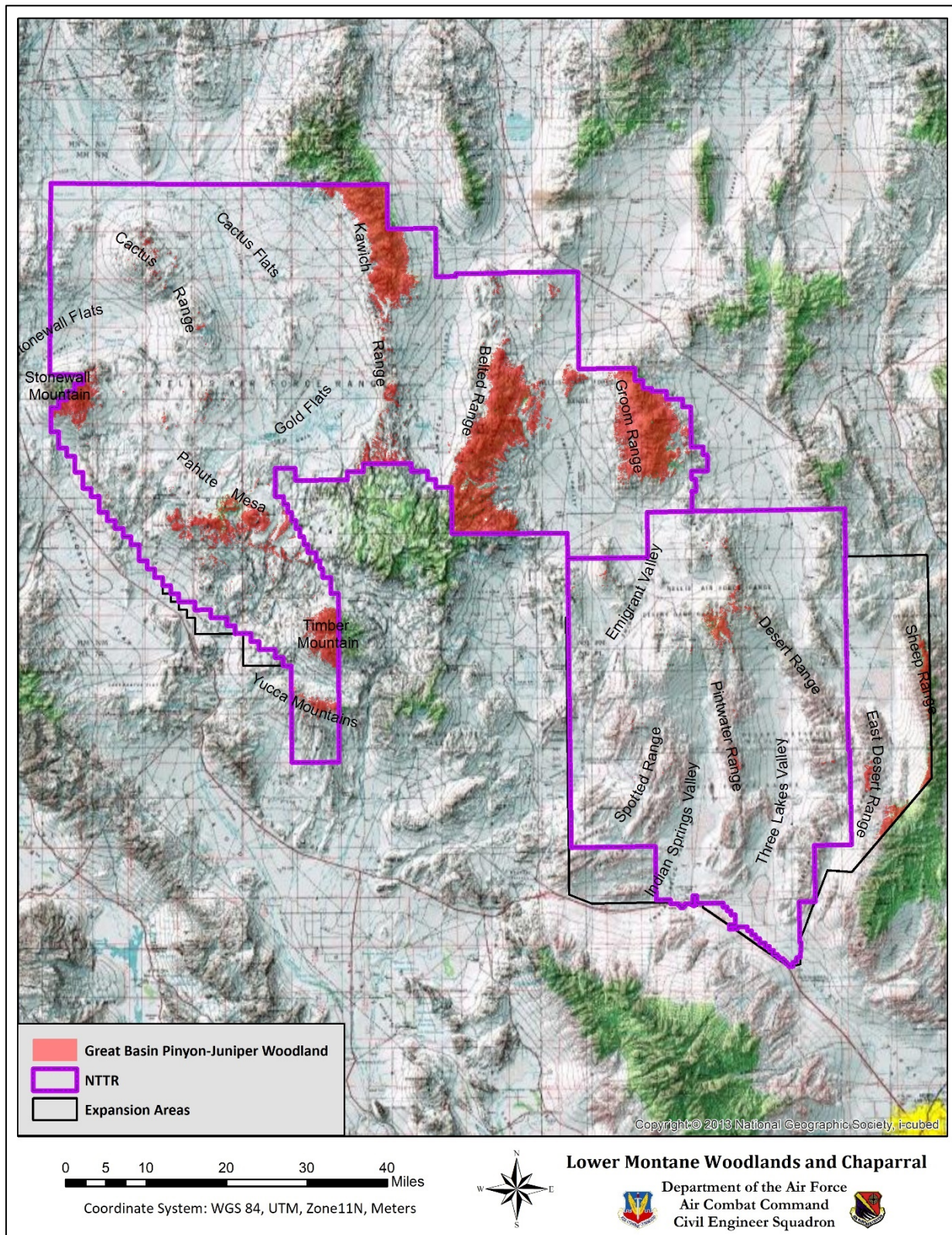


Figure 7. Map of Lower Montane Woodlands on the study area

Grasslands and Meadows

HABITAT DESCRIPTION

This key habitat is found in small patches across the North Range Study Area, especially around the Cactus Range and east of Mud Lake (Figure 8). The ecological system associated with this habitat on the study area is Intermountain Basins Semi-Desert Grassland. The key habitat is characterized by dominance of grasses as compared to short brush species in the adjacent areas. Grasses found in these patches include big galleta (*Pleuraphis rigida*), James galleta (*Pleuraphis jamesii*), purple threeawn (*Aristida purpurea*), desert needlegrass (*Achnatherum speciosa*), smooth brome (*Bromus tectorum*), low woollygrass (*Dasyochloa pulchella*), Indian ricegrass (*Achnatherum hymenoides*), and beardless wildrye (*Leymus triticoides*). Red brome (*Bromus madritensis* ssp. *rubens*), Russian thistle (*Salsola tragus*), and saltlover (*Halogeton glomeratus*) may encroach on areas that have been heavily grazed or impacted by soil disturbance activities. The dominant species is usually determined by soil texture, depth, and moisture. This habitat is important for providing forage for populations of small mammals, western cottontail, jackrabbits, pronghorn and wild horses.

VALUE TO WILDLIFE AND PLANTS

Wildlife

- Light shrub occurrence in these grassland systems will attract loggerhead shrikes and sage thrashers.
- Stands of ricegrass and needlegrass occurring within the cold desert scrub landscape can be important to kangaroo mice and kangaroo rats as a primary food source.
- Montane meadows serve as critical brooding habitat for greater sage-grouse within the sagebrush landscape, offering succulent forbs vital to the development of the chicks as well as brooding hens.
- Short-eared owls nest on the ground under grassy hummocks.
- Mule deer feed on the forbs in meadows.
- The pocket gopher and moles prefer loose soils for excavating burrows.

Plants

Although no plant species of concern have been identified on this habitat, it represents a unique environment that is restricted to small, isolated areas. As more of these areas are identified on the study area, rare plants may be found.

SPECIES OBSERVED

No species have been documented as occurring in this key habitat on the study area. Future surveys may provide more information on the species of plants and wildlife associated with this habitat on the study area.

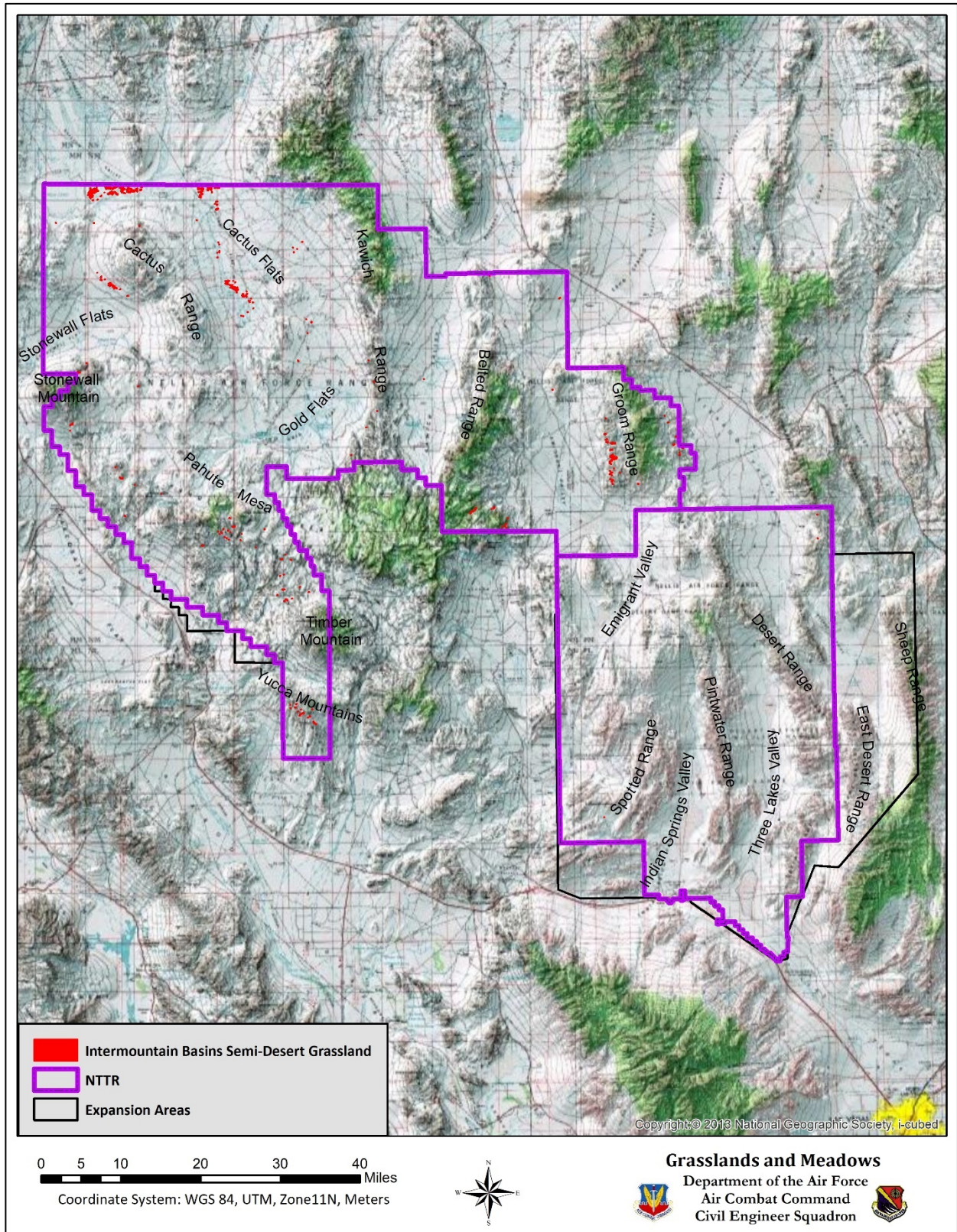


Figure 8. Map of Grasslands and Meadows on the study area

Wet Meadows

HABITAT DESCRIPTION

Wet Meadows are found in small, isolated areas on the North Range Study Area (Figure 9). Locations are currently being delineated using high resolution satellite imagery and ground truthing because field observations have identified small areas of this habitat in several locations. Current NDOW maps do not show this habitat on the study area due to the areas being too small to accommodate in the habitat map, which is created from Southwest ReGAP and cannot show areas at scales larger than 1:100,000. Two of these areas are found on the North Range Study Area. One area is located upstream of George's Water on the Kawich Range, while the other is located on the west side of the Kawich Range. This habitat appears to be associated with shallow water tables, springs, and seeps. Some may result from accumulation of snowmelt in higher elevations. Most of the wet meadows on the North Range Study Area support relatively dense stands of herbaceous perennials including spike rush (*Eleocharis* spp.), soft-stemmed bulrush (*Schoenoplectus tabernaemontani*), common reed (*Phragmites australis*), cattails (*Typha* spp.), and various species of sedges and rushes. Grasses found on these meadows include beardless wildrye (*Leymus triticoides*), Indian ricegrass (*Achnatherum hymenoides*), desert needlegrass (*Achnatherum speciosa*), blue grama (*Bouteloua gracilis*), smooth brome (*Bromus tectorum*), spike bentgrass (*Agrostis exarata*), Mexican rush (*Juncus mexicanus*), and sand dropseed (*Sporobolus cryptandrus*). Some of the meadows support small stands of Geyer willow (*Salix geyeriana*) and narrowleaf willow (*Salix exigua*). This habitat provides forage for mule deer, pronghorn, and desert bighorn sheep; as well as cover and forage for small mammals and birds.

VALUE TO WILDLIFE AND PLANTS

Wildlife

- Though small in extent in Nevada, wet meadows add significantly to the diversity of landscapes where they occur.
- Some of these sites provide free-standing water for wildlife, though as the summer season progresses free water may only be found below ground at many wet meadows.
- These sites provide lush vegetation for an extended period of the growing season, a resource that is valuable for mule deer and pronghorn.
- The presence of water also fosters a ready supply of insects for bats and insectivorous birds.
- Many species of amphibian rely heavily on wet meadows to meet their life history requirements.

Plants

No plant species of concern have been found in wet meadows to date.

SPECIES OBSERVED

Table 6. Wildlife and rare plants that have been observed on the Wet Meadows key habitat

Status	Common Name	Scientific Name
Birds		
	Cooper's Hawk	<i>Accipiter cooperii</i>
	Black-throated Sparrow	<i>Amphispiza bilineata</i>
	Western Scrub-jay	<i>Aphelocoma californica</i>
	Short-eared Owl	<i>Asio flammeus</i>
	Red-tailed Hawk	<i>Buteo jamaicensis</i>
	Anna's Hummingbird	<i>Calypte anna</i>

Status	Common Name	Scientific Name
	Cassin's Finch	<i>Carpodacus cassinii</i>
	House Finch	<i>Carpodacus mexicanus</i>
	Black-throated Gray Warbler	<i>Dendroica nigrescens</i>
**	Pinyon Jay	<i>Gymnorhinus cyanocephalus</i>
	Brown-headed Cowbird	<i>Molothrus ater</i>
	Townsend's Solitaire	<i>Myadestes townsendi</i>
	Ash-throated Flycatcher	<i>Myiarchus cinerascens</i>
	Clark's Nutcracker	<i>Nucifraga columbiana</i>
	MacGillivray's Warbler	<i>Oporornis tolmiei</i>
	Black-headed Grosbeak	<i>Pheucticus melanocephalus</i>
	Ladder-backed Woodpecker	<i>Picoides scalaris</i>
	Hairy Woodpecker	<i>Picoides villosus</i>
	Spotted Towhee	<i>Pipilo maculatus</i>
	Western Tanager	<i>Piranga ludoviciana</i>
	Mountain Chickadee	<i>Poecile gambeli</i>
	Black-tailed Gnatcatcher	<i>Poliptila melanura</i>
	Bushtit	<i>Psaltriparus minimus</i>
	Rock Wren	<i>Salpinctes obsoletus</i>
	Mountain Bluebird	<i>Sialia currucoides</i>
	Red-breasted Sapsucker	<i>Sphyrapicus ruber</i>
*	Brewer's Sparrow	<i>Spizella breweri</i>
	American Robin	<i>Turdus migratorius</i>
Reptiles		
	Great Basin Fence Lizard	<i>Sceloporus occidentalis longipes</i>
	Common Side-blotch Lizard	<i>Uta stansburiana</i>
Amphibians		
	Great Basin Spadefoot	<i>Spea intermontana</i>
	Tadpoles	Unknown

*State/Federal listed and critically imperiled species

**Special status species.

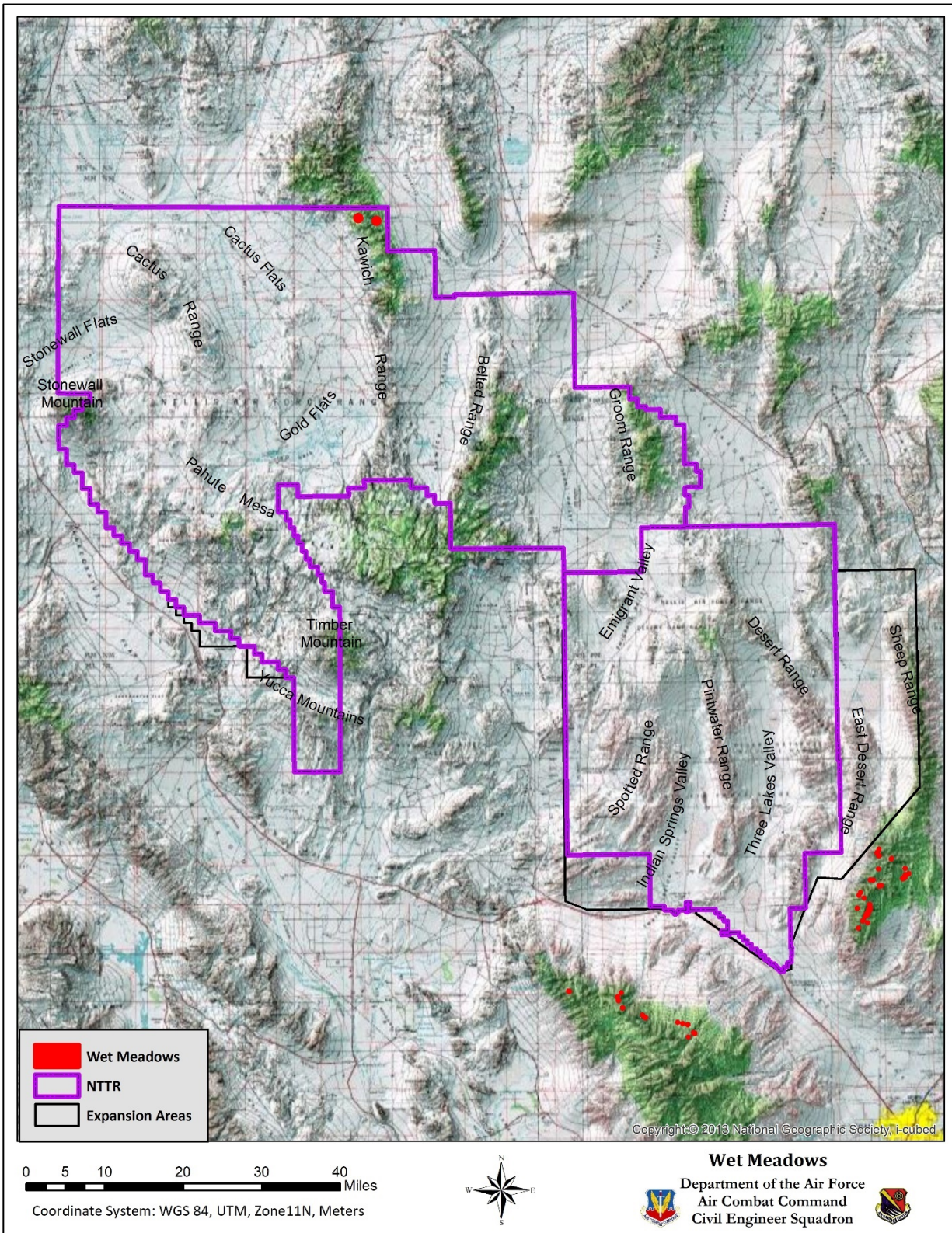


Figure 9. Map of Wet Meadows on the study area

Springs and Springbrooks

HABITAT DESCRIPTION

Even though Nevada has the most known springs of any state in the U.S. (Wildlife Action Plan Team, 2006), Spring and Springbrooks key habitat is relatively rare on the study area. These areas tend to be very small (0.05 to 0.1 acre) and highly susceptible to damage by wild horses using the sites for feeding and grazing. Springs are rare on the South Range Study Area and more common on the North Range Study Area, especially in the Kawich and Belted Ranges (Figure 10). Most of the springs form small accumulations of water and do not flow. Some of the springs such as Silverbow Spring and Stonewall Spring have sufficient flow to support a short-lived brook that may range from 10 ft. to 1 or 2 mi. long. Most springs may flow a few feet before they are absorbed back into the ground. These habitats are typically lush in green vegetation, especially perennial herbaceous plants such as spike rush (*Eleocharis* spp.), soft-stemmed bulrush (*Schoenoplectus tabernaemontani*), Mexican rush (*Juncus mexicanus*), common reed (*Phragmites australis*), cat-tails (*Typha* spp.), spike bentgrass (*Agrostis exarata*), beardless wildrye (*Leymus triticoides*), and several flowering species. Fremont’s cottonwood (*Populus fremontii*), Geyer willow (*Salix geyeriana*), narrowleaf willow (*Salix exigua*), and Gambel oak (*Quercus gambelii*) may also be found around springs depending on the locations and elevation. Many of the springs located in areas frequented by wild horses have been protected by fencing to prevent damage from horse grazing and watering. In the South Range Study Area, outside of wild horse habitat, many of the springs have been developed to improve their use by bighorn sheep and mule deer.

Included in Figure 10 are the locations of surface water features including dugouts, construction ponds, and wildlife water developments because their function in the ecosystem is similar to springs and springbrooks. These are very important in providing water for wildlife on the study area.

VALUE TO WILDLIFE AND PLANTS

Wildlife

- In addition to the critical role of springs in the survival and conservation of endemic aquatic species, they also play a very important role for other wildlife species.
- Nevada, which has the lowest annual rainfall in the U.S., has limited surface water resources, particularly during drought. Springs provide a vital water source between infrequent surface waters. These features provide water and food resources for a wide range of Nevada’s wildlife.
- The broad distribution of springs across the study area is vitally important to the sustainable existence of wildlife. The diversity of wildlife attracted to these features is exemplified by the list of species in Table 7.

Plants

- Coville’s abronia (*Abronia nana* ssp. *covillei*) and rayless tansy aster (*Machaeranthera grindelioides* var. *depressa*) have been identified in this key habitat.

SPECIES OBSERVED

Table 7. Wildlife and rare plant species that have been observed on Spring and Springbrook key habitat

Status	Common Name	Scientific Name
Bat		
*	Pallid Bat	<i>Antrozous pallidus</i>
*	Townsend's Big-eared Bat	<i>Corynorhinus townsendii</i>
**	Silver-haired Bat	<i>Lasiorycteris noctivagans</i>

Status	Common Name	Scientific Name
	Western Red Bat	<i>Lasiurus blossevillii</i>
**	Hoary Bat	<i>Lasiurus cinereus</i>
	California Leaf-nosed Bat	<i>Macrotus californicus</i>
	Southwestern Myotis	<i>Myotis auriculus</i>
**	California Myotis	<i>Myotis californicus</i>
**	Western Small-footed Myotis	<i>Myotis ciliolabrum</i>
**	Long-eared Myotis	<i>Myotis evotis</i>
	Little Brown Myotis	<i>Myotis lucifugus</i>
*	Fringed Myotis	<i>Myotis thysanodes</i>
	Southwestern Cave Myotis	<i>Myotis velifer brevis</i>
**	Long-legged Myotis	<i>Myotis volans</i>
**	Western Pipistrelle	<i>Parastrellus hesperus</i>
*	Mexican Free-tailed bat	<i>Tadarida brasiliensis</i>
Birds		
	Cooper's Hawk	<i>Accipiter cooperii</i>
	Sharp-shinned Hawk	<i>Accipiter striatus</i>
	Spotted Sandpiper	<i>Actitis macularius</i>
	White-throated Swift	<i>Aeronautes saxatalis</i>
	Chukar	<i>Alectoris chukar</i>
**	Sage Sparrow	<i>Amphispiza belli</i>
	Black-throated Sparrow	<i>Amphispiza bilineata</i>
	Western Scrub-jay	<i>Aphelocoma californica</i>
	Golden Eagle	<i>Aquila chrysaetos</i>
	Long-eared Owl	<i>Asio otus</i>
	Verdin	<i>Auriparus flaviceps</i>
	Juniper Titmouse	<i>Baeolophus ridgwayi</i>
	Cedar Waxwing	<i>Bombycilla cedrorum</i>
	Red-tailed Hawk	<i>Buteo jamaicensis</i>
	Rough-legged Hawk	<i>Buteo lagopus</i>
	Lark Bunting	<i>Calamospiza melanocorys</i>
	Costa's Hummingbird	<i>Calypte costae</i>
	Cactus Wren	<i>Campylorhynchus brunneicapillus</i>
	Pine Siskin	<i>Carduelis pinus</i>
	Lesser Goldfinch	<i>Carduelis psaitria</i>
	American Goldfinch	<i>Carduelis tristis</i>
	Cassin's Finch	<i>Carpodacus cassinii</i>
	House Finch	<i>Carpodacus mexicanus</i>
	Turkey Vulture	<i>Cathartes aura</i>
*	Greater Sage Grouse	<i>Centrocercus urophasianus</i>
	Lark Sparrow	<i>Chondestes grammacus</i>
	Northern Flicker	<i>Colaptes auratus</i>
	Western Wood-pewee	<i>Contopus sordidulus</i>
	Common Raven	<i>Corvus corax</i>
	Yellow-rumped Warbler	<i>Dendroica coronata</i>
	Black-throated Gray Warbler	<i>Dendroica nigrescens</i>
	Yellow Warbler	<i>Dendroica petechia</i>
	Townsend's Warbler	<i>Dendroica townsendi</i>
	Sparrow sp.	Emberizidae family
	Dusky Flycatcher	<i>Empidonax oberholseri</i>
	Flycatcher sp.	<i>Empidonax sp.</i>
	Willow Flycatcher	<i>Empidonax traillii</i>
	Gray Flycatcher	<i>Empidonax wrightii</i>
	Horned Lark	<i>Eremophila alpestris</i>
	Brewer's Blackbird	<i>Euphagus cyanocephalus</i>
**	Prairie Falcon	<i>Falco mexicanus</i>
	American Kestrel	<i>Falco sparverius</i>
	Common Yellowthroat	<i>Geothlypis trichas</i>
**	Pinyon Jay	<i>Gymnorhinus cyanocephalus</i>
	Barn Swallow	<i>Hirundo rustica</i>
	Bullock's Oriole	<i>Icterus bullockii</i>
	Scott's Oriole	<i>Icterus parisorum</i>

Status	Common Name	Scientific Name
	Dark-eyed Junco	<i>Junco hyemalis</i>
*	Loggerhead Shrike	<i>Lanius ludovicianus</i>
	Belted Kingfisher	<i>Megaceryle alcyon</i>
	Lewis's Woodpecker	<i>Melanerpes lewis</i>
	Song Sparrow	<i>Melospiza melodia</i>
	Northern Mockingbird	<i>Mimus polyglottos</i>
	Brown-headed Cowbird	<i>Molothrus ater</i>
	Townsend's Solitaire	<i>Myadestes townsendi</i>
	Ash-throated Flycatcher	<i>Myiarchus cinerascens</i>
	Clark's Nutcracker	<i>Nucifraga columbiana</i>
	MacGillivray's Warbler	<i>Oporornis tolmiei</i>
**	Sage Thrasher	<i>Oreoscoptes montanus</i>
	House Sparrow	<i>Passer domesticus</i>
	Lazuli Bunting	<i>Passerina amoena</i>
	Cliff Swallow	<i>Petrochelidon pyrrhonota</i>
	Black-headed Grosbeak	<i>Pheucticus melanocephalus</i>
	Ladder-backed Woodpecker	<i>Picoides scalaris</i>
	Hairy Woodpecker	<i>Picoides villosus</i>
	Green-tailed Towhee	<i>Pipilo chlorurus</i>
	Spotted Towhee	<i>Pipilo maculatus</i>
	Western Tanager	<i>Piranga ludoviciana</i>
	Summer Tanager	<i>Piranga rubra</i>
	Mountain Chickadee	<i>Poecile gambeli</i>
	Blue-gray Gnatcatcher	<i>Polioptila caerulea</i>
	Black-tailed Gnatcatcher	<i>Polioptila melanura</i>
	Bushtit	<i>Psaltriparus minimus</i>
	Ruby-crowned Kinglet	<i>Regulus calendula</i>
	Rock Wren	<i>Salpinctes obsoletus</i>
	Black Phoebe	<i>Sayornis nigricans</i>
	Say's Phoebe	<i>Sayornis saya</i>
	Broad-tailed Hummingbird	<i>Selasphorus platycercus</i>
	Rufous Hummingbird	<i>Selasphorus rufus</i>
	Western Bluebird	<i>Sialia mexicana</i>
	Red-breasted Nuthatch	<i>Sitta canadensis</i>
*	Brewer's Sparrow	<i>Spizella breweri</i>
	Chipping Sparrow	<i>Spizella passerina</i>
	Bewick's Wren	<i>Thryomanes bewickii</i>
	House Wren	<i>Troglodytes aedon</i>
	Orange-crowned Warbler	<i>Vermivora celata</i>
	Plumbeous Vireo	<i>Vireo plumbeus</i>
**	Gray Vireo	<i>Vireo vicinior</i>
	Wilson's Warbler	<i>Wilsonia pusilla</i>
	Yellow-headed Blackbird	<i>Xanthocephalus xanthocephalus</i>
	Mourning Dove	<i>Zenaida macroura</i>
	White-crowned Sparrow	<i>Zonotrichia leucophrys</i>
Mammals		
	Pronghorn	<i>Antilocapra americana</i>
	Coyote	<i>Canis latrans</i>
	Bobcat	<i>Lynx rufus</i>
	Mule Deer	<i>Odocoileus hemionus</i>
	Desert Bighorn Sheep	<i>Ovis canadensis nelsoni</i>
	Desert Cottontail	<i>Sylvilagus audubonii</i>
	Round-tailed Ground Squirrel	<i>Xerospermophilus tereticaudus</i>
Reptiles		
	Great Basin Whiptail	<i>Aspidoscelis tigris tigris</i>
	Panamint Rattlesnake	<i>Crotalus stephensi</i>
*	Great Basin Collared Lizard	<i>Crotaphytus bicinctores</i>
*	Longnose Leopard Lizard	<i>Gambelia wislizenii</i>
	Great Basin Fence Lizard	<i>Sceloporus occidentalis longipes</i>
	Common Side-blotch Lizard	<i>Uta stansburiana</i>
Rare Plants		

Status	Common Name	Scientific Name
**	Coville's Abronia	<i>Abronia nana</i> var. <i>covillei</i>
**	Rayless Tansy Aster	<i>Machaeranthera grindelioides</i> var. <i>depressa</i>

*State/Federal listed and critically imperiled species

*Special status species.

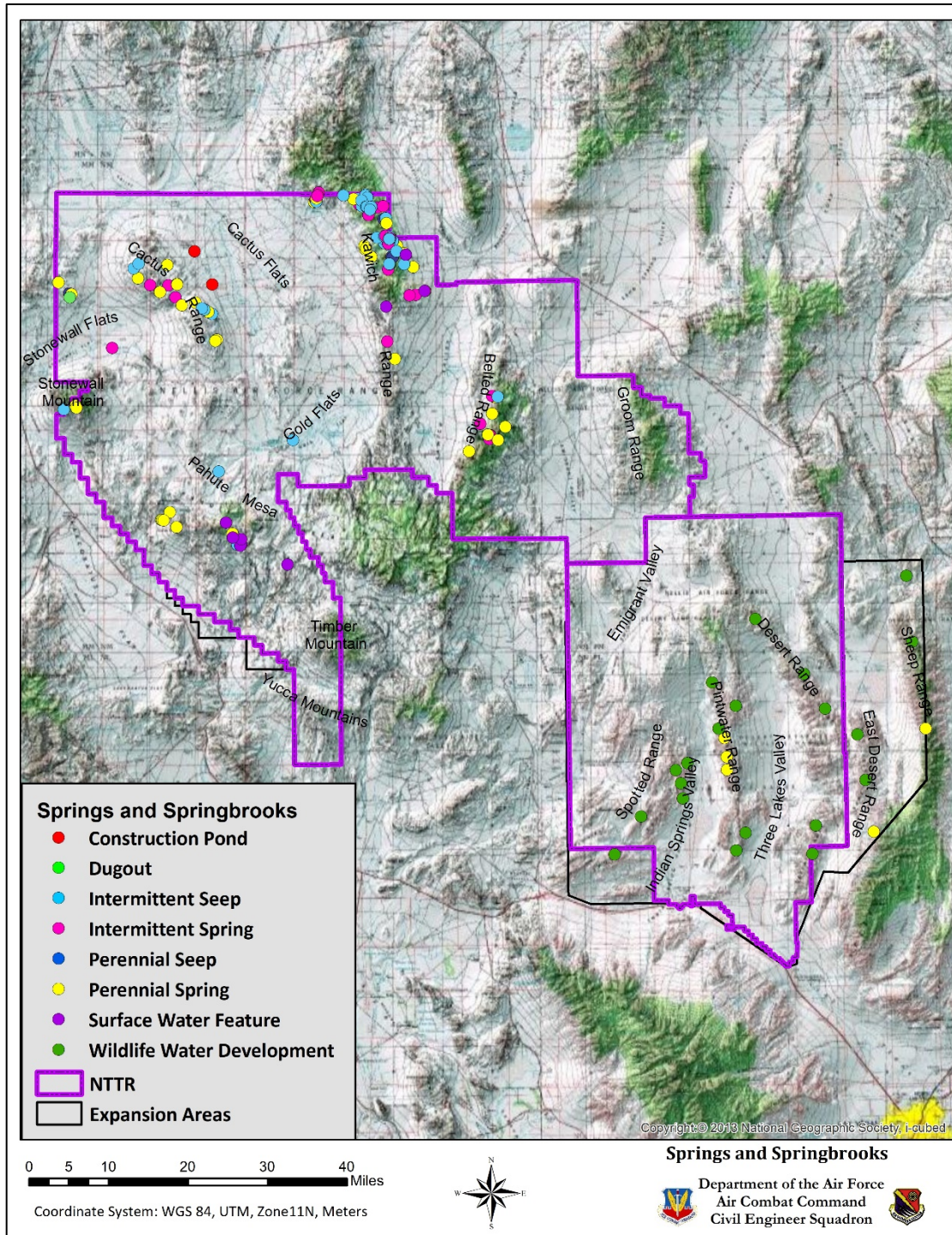


Figure 10. Map of Springs and Springbrooks on the study area

Mesquite Bosques and Desert Washes

HABITAT DESCRIPTION

Mesquite bosques and desert washes are found in areas with deep soils and shallow water tables along washes and riparian areas, and in isolated patches in low-lying areas, such as the edges of dry lake beds. This habitat is only found in isolated patches on the South Range Study Area (Figure 11). The characteristic plant species in this key habitat are honey mesquite (*Prosopis glandulosa*) and catclaw acacia (*Acacia greggii*). Honey mesquite and catclaw acacia may be infected with mistletoe, which enhances their value to fruit-eating birds. Mesquite bosques are the primary habitat of the phainopepla, a species of bird listed as threatened by the State of Nevada. Other plant species occurring in this habitat include water jacket (*Lycium andersonii*), cheesebush (*Hymenoclea salsola*), snakeweed (*Gutierrezia* spp.), skunkbush sumac (*Rhus trilobata*), and desert almond (*Prunus fasciculata*). Common grasses found in mesquite habitat include beardless wildrye (*Leymus triticoides*), alkali sacaton (*Sporobolus airoides*), and big galleta (*Pleuraphis rigida*). Saltcedar (*Tamarix* spp.) often invades this habitat and should be removed and controlled as soon as populations are identified.

VALUE TO WILDLIFE AND PLANTS

Wildlife

- Mesquite Bosques and Desert Washes contribute significantly to the wildlife diversity of the Mojave Desert to an inordinate scale when their acreage is compared to the surrounding bajada vegetation.
- Of the birds that use bosques and washes, Lucy's warbler, Crissal thrasher, and phainopepla would probably not be found in the desert landscape without the presence of mesquite.
- Sandy soils deposited and maintained by desert washes are critical to the requirements and distribution of the desert pocket mouse. Nevada represents the northernmost extent of the desert pocket mouse's range and the Nevada subspecies, *Chaetodipus penicillatus sobrinus*, has been demonstrated to be geographically isolated from any other populations of the species, making conservation in Nevada particularly critical.
- Although desert washes do not generally contain permanent water, with the rare exception of occasional spring and seep features, they serve as seasonal conduits of higher soil moisture and occasional surface flow which can often leave remaining ephemeral pools and sinks well after the end of precipitation events. These accumulations of water are critical in the life cycle of certain amphibians and invertebrates.

Plants

This habitat supports a relatively rare and unique plant assemblage on the study area. Rare plants that have been observed in this habitat are listed in Table 8.

SPECIES OBSERVED

Table 8. Wildlife and rare plant species that have been observed on the Mesquite Bosques and Desert Washes key habitat

Status	Common Name	Scientific Name
Birds		
	Black-throated Sparrow	<i>Amphispiza bilineata</i>
	Common Raven	<i>Corvus corax</i>
*	Loggerhead Shrike	<i>Lanius ludovicianus</i>
	Mourning Dove	<i>Zenaida macroura</i>

Status	Common Name	Scientific Name
**	Pinyon Jay	<i>Gymnorhinus cyanocephalus</i>
	Red-tailed Hawk	<i>Buteo jamaicensis</i>
	Rock Wren	<i>Salpinctes obsoletus</i>
	Ruby-crowned Kinglet	<i>Regulus calendula</i>
**	Sage Thrasher	<i>Oreoscoptes montanus</i>
	Say's Phoebe	<i>Sayornis saya</i>
	White-crowned Sparrow	<i>Zonotrichia leucophrys</i>
Mammals		
	White-tailed Antelope Squirrel	<i>Ammospermophilus leucurus</i>
	Coyote	<i>Canis latrans</i>
	Bobcat	<i>Lynx rufus baileyi</i>
	Desert Bighorn Sheep	<i>Ovis canadensis nelsoni</i>
	American Badger	<i>Taxidea taxus berlandieri</i>
	Kit Fox	<i>Vulpes macrotis</i>
Reptiles		
	Great Basin Whiptail	<i>Aspidoscelis tigris tigris</i>
	Desert Iguana	<i>Dipsosaurus dorsalis dorsalis</i>
Rare Plants		
*	Clokey's Pincushion	<i>Escobaria vivipara var. rosea</i>
**	Sheep Range Milkvetch	<i>Astragalus amphioxys var. musimonum</i>
**	Clokey's Buckwheat	<i>Eriogonum heermannii var. clokeyi</i>

***State/Federal listed and critically imperiled species**

***Special status species.**

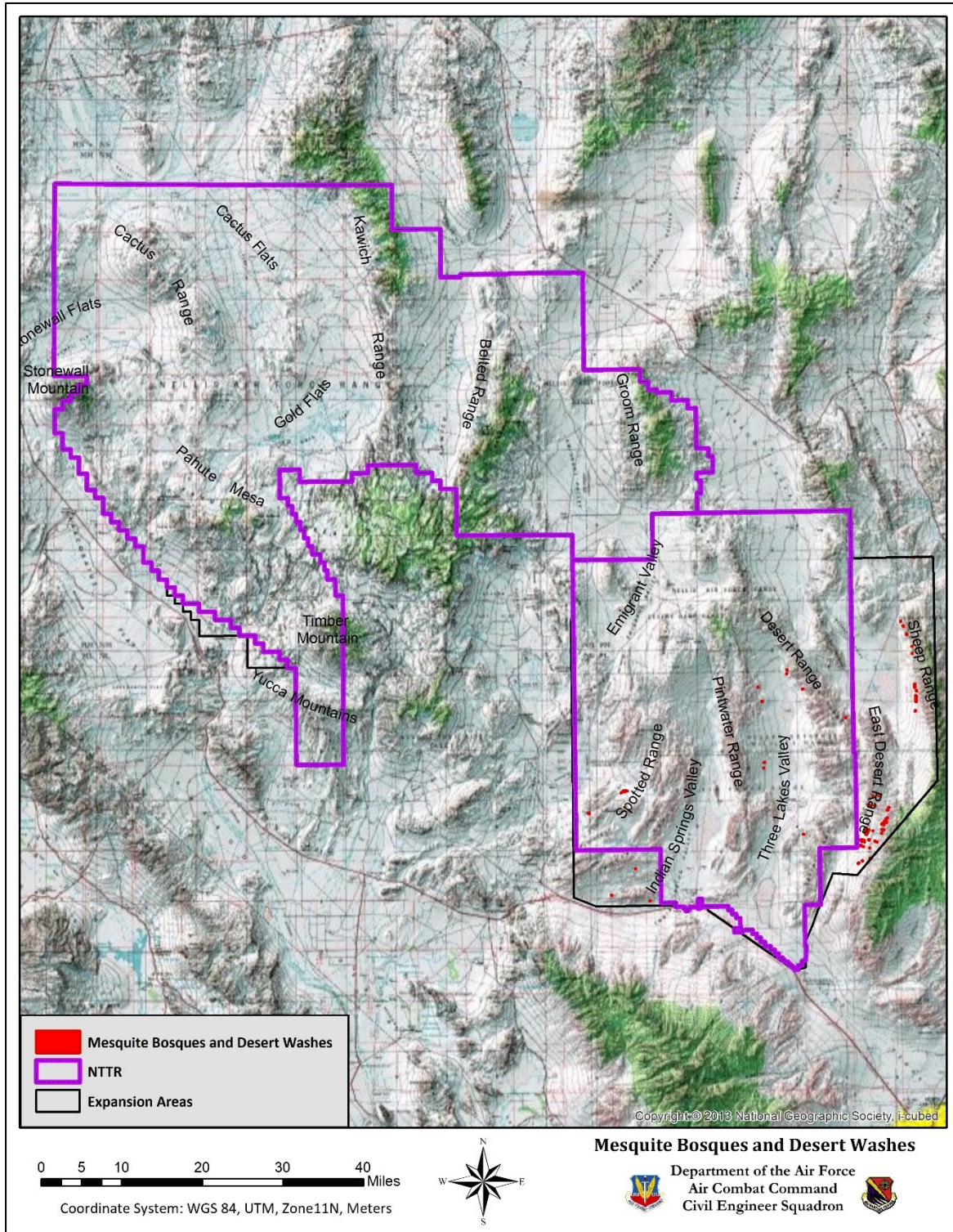


Figure 11. Map of Mesquite Bosques and Desert Washes on the study area

Desert Playas and Ephemeral Pools

HABITAT DESCRIPTION

Playas, or dry lakes, are found in the lowest elevations of most valleys on the study area. Water accumulates periodically and is lost primarily by evaporation, but also by percolation. When water accumulates in the playas, populations of wading birds, waterfowl, and shorebirds may temporarily use the habitat to forage for invertebrates. This key habitat is comprised of two ecological systems that are found on the project area (Figure 12). The Intermountain Basins Playa ecological system is found on the North Range Study Area and the North American Warm Desert Playa is found on the South Range Study Area. Soils are fine (clays and silts) and vegetation is absent except on raised islands and along the playa edges. Along the edges of the playas, soils tend to be fine and are often loose. They may be interspersed with sandy patches. Substrates have scattered to 100% coverage of fine gravels and concretions. Shrubs are scattered and much shorter in stature than upslope species. In these edge communities; dominant plants include shadscale saltbush (*Atriplex confertifolia*), green molly (*Bassia americana*), bud sagebrush (*Picrothamnus desertorum*), greasewood (*Sarcobatus* spp.), winterfat (*Krascheninnikovia lanata*), fourwinged saltbush (*Atriplex canescens*), desert princesplume (*Stanleya pinnata*), and fringed amaranth (*Amaranthus fimbriatus*). Mojave seablite (*Suaeda moquinii*) and four-winged saltbush (*Atriplex canescens*) often form somewhat dense communities in areas where water accumulates in low areas of playas.

VALUE TO WILDLIFE AND PLANTS

Wildlife

- Most playas in Nevada do not have permanent sources of water. Therefore, the value of playas to flying and terrestrial wildlife is largely ephemeral in nature.
- When playas are watered for the proper period of time, they often produce lush growth of emergent and submergent vegetation and prodigious volumes of aquatic invertebrates attracting a myriad of waterfowl, shorebirds, and small water birds.
- Snowy Plovers thrive on brine flies and their larvae when occupying these habitats.

Plants

- Parish’s phacelia (*Phacelia parishii*) occurs in this habitat on moist to superficially dry, open, flat, mostly barren land.
- Clarke’s phacelia (*Phacelia filiae*) is found in a similar habitat as Parish’s phacelia.
- Sanicle biscuitroot (*Cymopterus ripleyi* var. *saniculoides*) is most commonly found on the dunes and deep sands of the study area, but has potential to occur on isolated sandy areas in this key habitat.

SPECIES OBSERVED

Table 9. Wildlife and rare plant species that have been observed on the Desert Playas and Ephemeral Pools key habitat

Status	Common Name	Scientific Name
Bats		
**	Silver-haired Bat	<i>Lasiorycteris noctivagans</i>
**	Hoary Bat	<i>Lasiurus cinereus</i>
**	Western small-footed Myotis	<i>Myotis ciliolabrum</i>
**	Long-legged Myotis	<i>Myotis volans</i>
*	Mexican Free-tailed bat	<i>Tadarida brasiliensis</i>
Birds		
	Black-throated Sparrow	<i>Amphispiza bilineata</i>

Status	Common Name	Scientific Name
	Northern Shoveler	<i>Anas clypeata</i>
	Cinnamon Teal	<i>Anas cyanoptera</i>
	Blue-winged Teal	<i>Anas discors</i>
	Black-chinned Hummingbird	<i>Archilochus alexandri</i>
	Western Sandpiper	<i>Calidris mauri</i>
	House Finch	<i>Carpodacus mexicanus</i>
	Turkey Vulture	<i>Cathartes aura</i>
	Killdeer	<i>Charadrius vociferus</i>
	Northern Harrier	<i>Circus cyaneus</i>
	Common Raven	<i>Corvus corax</i>
	Horned Lark	<i>Eremophila alpestris</i>
**	Prairie Falcon	<i>Falco mexicanus</i>
	Black-necked Stilt	<i>Himantopus mexicanus</i>
	Dark-eyed Junco	<i>Junco hyemalis</i>
*	Loggerhead Shrike	<i>Lanius ludovicianus</i>
	White-faced Ibis	<i>Plegadis chihi</i>
	American Avocet	<i>Recurvirostra americana</i>
*	Brewer's Sparrow	<i>Spizella breweri</i>
	Lesser Yellowlegs	<i>Tringa flavipes</i>
	Western Kingbird	<i>Tyrannus verticalis</i>
	Mourning Dove	<i>Zenaida macroura</i>
Mammals		
	Pronghorn	<i>Antilocapra americana</i>
	Desert Bighorn Sheep	<i>Ovis canadensis nelsoni</i>
	Wild Horse	<i>Equus ferus</i>
	Kit Fox	<i>Vulpes macrotis</i>
	Merriam's Kangaroo Rat	<i>Dipodomys merriami</i>
	Black-tailed Jackrabbit	<i>Lepus californicus</i>
Reptiles		
	Great Basin Whiptail	<i>Aspidoscelis tigris tigris</i>
**	Longnose Leopard Lizard	<i>Gambelia wislizenii</i>
**	Desert Horned Lizard	<i>Phrynosoma platyrhinos</i>
	Common Side-blotch Lizard	<i>Uta stansburiana</i>
Rare Plants		
**	Bashful Four-O'Clock	<i>Mirabilis pudica</i>
**	Clarke's Phacelia	<i>Phacelia filiae</i>
**	Parish's Phacelia	<i>Phacelia parishii</i>

*State/Federal listed and critically imperiled species.

**Special status species.

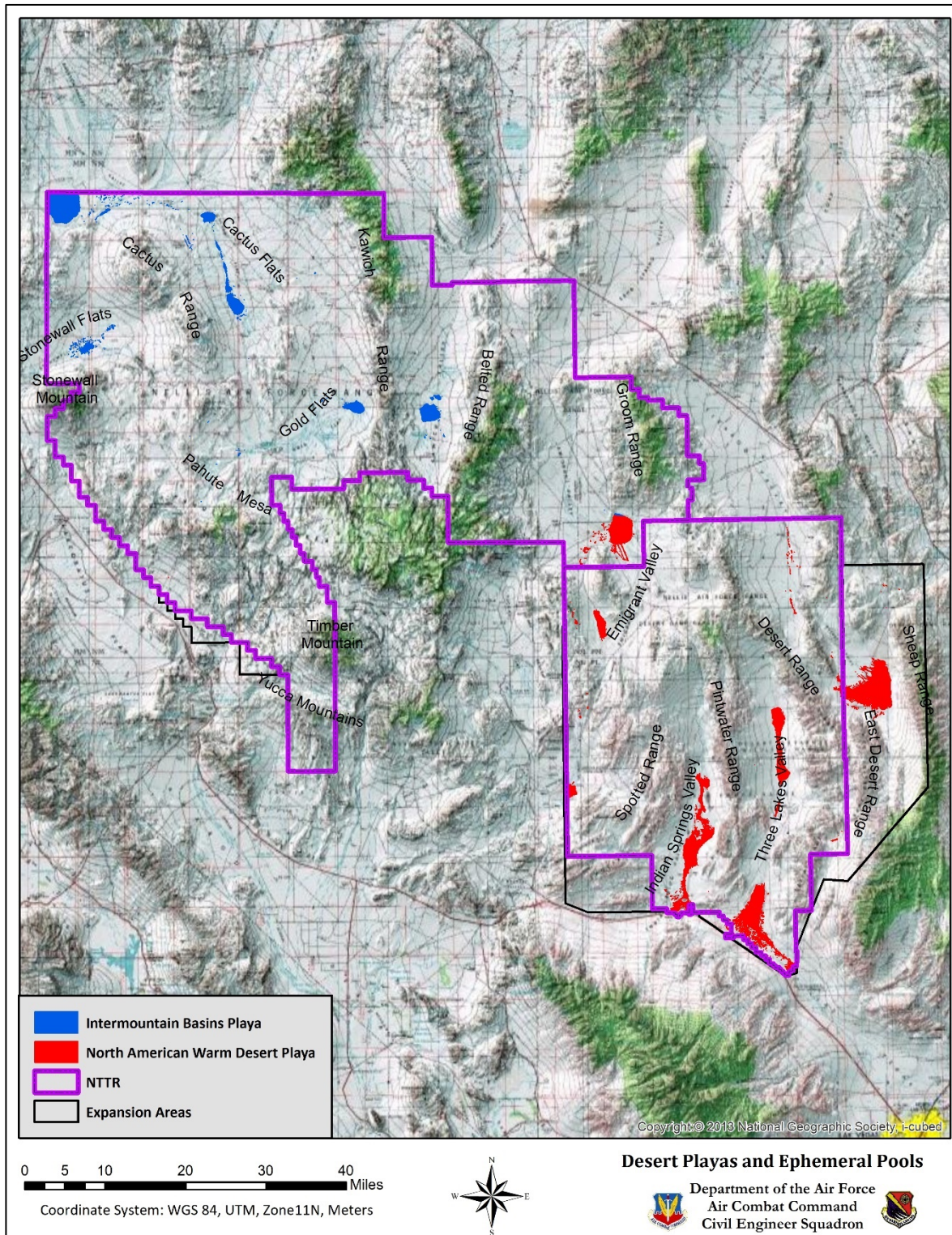


Figure 12. Map of Desert Playas and Ephemeral Pools on the study area

Sand Dunes and Badlands

HABITAT DESCRIPTION

Two ecological systems of this key habitat are found on the study area. The North American Warm Desert Pavement ecological system is found in several locations on the South Range Study Area and the North American Warm Desert Active and Stabilized Dune is only found on the dune areas of the National Desert Wildlife Refuge on the west side of the Sheep Range. Sand dunes are characterized by loose, windblown sand that forms low dunes (Figure 13). The dunes are dynamic due to their soil composition and local wind action, but are partially stabilized by vegetation. Dunes may be found in valley bottoms, especially along the northern and eastern periphery of playas including Mud Lake and Antelope Reservoir. In other locations, dunes may be found at higher elevations along the base of mountains or foothills such as the dunes in Indian Spring Valley along the western side of the Pintwater Range. Some of the basin areas are characterized by stabilized dunes that support healthy populations of perennial vegetation. Soils associated with dunes are usually deep sands that may be covered with a thin layer of coarse gravel. Many of these areas have not been mapped and fully documented for the study area, but will be documented in the future as more definitive vegetation surveys are completed.

Badlands are basically areas devoid of vegetation due to poor soil characteristics, fertility, moisture, or structure. Highly alkaline soils found in many locations across the study area are typical of these types of environments. Other areas may be bare outcrops with only scattered vegetation that may become established in cracks and fissures along the surface. Vegetation is sparse on these areas and is typically fourwing saltbush (*Atriplex canescens*) or shadscale saltbush (*Atriplex confertifolia*). Desert pavement is also placed in this category due to the lack of vegetation growing on the surface of the pavement. Large portions of the South Range have scattered areas of desert pavement interspersed with drainages containing vegetation, often dominated by white bursage (*Ambrosia dumosa*), fourwing saltbush (*Atriplex canescens*) or shadscale saltbush (*Atriplex confertifolia*).

VALUE TO WILDLIFE AND PLANTS

Wildlife

- Many sand dune systems in Nevada have a high diversity of dune invertebrates including beetles, solitary bees, crickets, and ants; some of which are sand dune obligates.
- Annual seed production is positively correlated with rainfall in sand dune habitats. As a result, the diversity and occurrence of seed-eating rodents and perennial shrubs in these habitats are directly tied to annual rainfall.
- Desert kangaroo rats are closely restricted to areas where accumulations of wind driven sand have reached considerable depths.
- Sand dune species may burrow in the sand to rest, forage, and build nests.
- Western banded geckos, desert night lizards, and desert horned lizards feed on insects and spiders in sand dune and badland habitats.
- Prey seeking species are drawn to sand dune and badland habitats to feed on small mammals, lizards, and other inhabitants.

Plants

- Sanicle biscuitroot (*Cymopterus ripleyi* var. *saniculoides*) is found on the dunes and deep sands of the study area, especially in the North Range Study Area.

SPECIES OBSERVED

Table 10. Wildlife and rare plant species observed on the Sand Dunes and Badlands key habitat

Status	Common Name	Scientific Name
Bats		
	Western Mastiff Bat	<i>Eumops perotis californicus</i>
**	Western Small-footed Myotis	<i>Myotis ciliolabrum</i>
**	Long-eared Myotis	<i>Myotis evotis</i>
	Little Brown Myotis	<i>Myotis lucifugus</i>
**	Yuma Myotis	<i>Myotis yumanensis</i>
	Big Free-tailed Bat	<i>Nyctinomops macrotis</i>
**	Western Pipistrelle	<i>Parastrellus hesperus</i>
*	Mexican Free-tailed Bat	<i>Tadarida brasiliensis</i>
Birds		
	Black-throated Sparrow	<i>Amphispiza bilineata</i>
	Anna's Hummingbird	<i>Calypte anna</i>
	Northern Harrier	<i>Circus cyaneus</i>
	Common Raven	<i>Corvus corax</i>
	Horned Lark	<i>Eremophila alpestris</i>
	Savannah Sparrow	<i>Passerculus sandwichensis</i>
*	Brewer's Sparrow	<i>Spizella breweri</i>
	Mourning Dove	<i>Zenaida macroura</i>
Mammals		
	Kit Fox	<i>Vulpes macrotis</i>
	White-tailed Antelope Squirrel	<i>Ammospermophilus leucurus</i>
**	Desert Kangaroo Rat	<i>Dipodomys deserti</i>
	Merriam's Kangaroo Rat	<i>Dipodomys merriami</i>
	Ord's Kangaroo Rat	<i>Dipodomys microps</i>
	Black-tailed Jackrabbit	<i>Lepus californicus</i>
	House Mouse	<i>Mus musculus</i>
	Great Basin Pocket Mouse	<i>Perognathus parvus</i>
	Deer Mouse	<i>Peromyscus maniculatus</i>
	Round-tailed Ground Squirrel	<i>Xerospermophilus tereticaudus</i>
Reptiles		
	Great Basin Whiptail	<i>Aspidoscelis tigris tigris</i>
	Western Zebra-tailed Lizard	<i>Callisaurus draconoides rhodostictus</i>
	Rough-tailed Gecko	<i>Cytropodion scabrus</i>
	Desert Iguana	<i>Dipsosaurus dorsalis dorsalis</i>
	Mediterranean House Gecko	<i>Hemidactylus turcicus</i>
Rare Plants		
**	Sanicle Biscuitroot	<i>Cymopterus ripleyi</i> var. <i>saniculoides</i>

*State/Federal listed and critically imperiled species.

**Special status species.

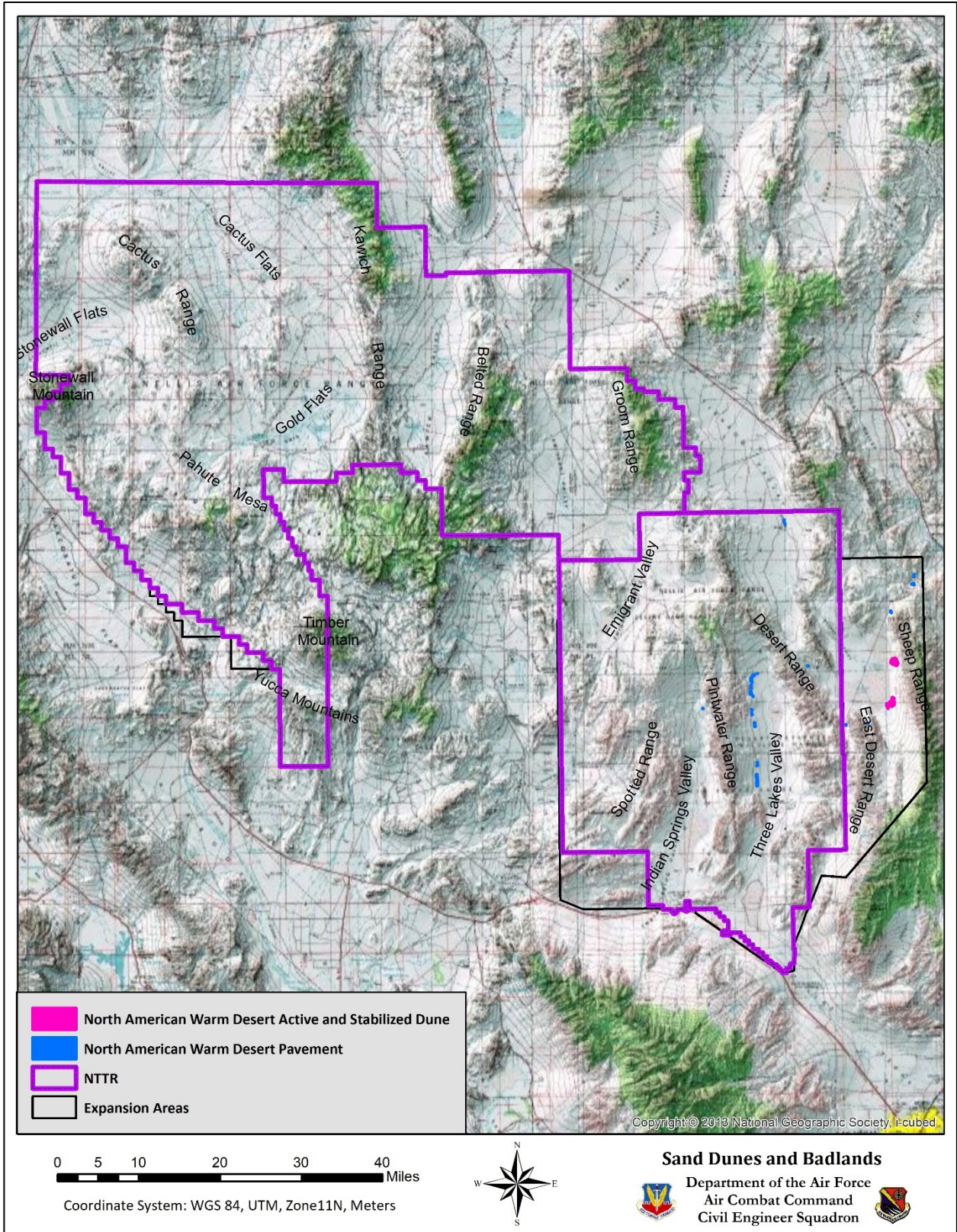


Figure 13. Map of Sand Dunes and Badlands on the study area

Cliffs and Canyons

HABITAT DESCRIPTION

Cliffs and canyons represent a very important habitat on the study area. The WAP breaks this key habitat into three ecological systems—Intermountain Basins Cliff and Canyon on the North Range Study Area, North American Warm Desert Bedrock Cliff and Outcrop on the South Range Study Area, and North American Warm Desert Volcanic Rockland on small areas of EC-South and the South Range Study Area (Wildlife Action Plan Team, 2006) (Figure 14). Cliffs often lack vegetation, but outcrops with cracks, overhangs, crevices, talus slopes, and other geologic features provide excellent cover for raptors and owls, as well as other bird species. Additionally, these areas are important habitat for desert bighorn sheep, mountain lions, bobcats, various small mammals, and reptiles. Rugged cliffs and slopes provide very important escape routes for desert bighorn sheep from their predators. Cracks and crevices as well as the bases of cliffs provide a unique microclimate that supports many different plant species of concern. Additionally, many of the rare plants observed on the study area are found in the washes and talus of narrow canyons in the mountain ranges.

Physical features of the cliffs and canyons are very similar across the study area. In most cases, the slope tends to be 70° to sheer cliffs. Located along the cliff face are cracks and crevices which tend to collect organic matter and soil or gravel. Often, the cliffs will have ledges which provide level surfaces for wildlife to walk or run and flat or concave surfaces for accumulation of organic matter and soil, which allows for plant growth. In most cases, soils are very shallow sands, silty sands, and silt loams. These are often covered by fine to coarse gravel, rocks, and cobble. The surface of the cliffs and canyons is dominated by bedrock and boulders.

Vegetation of cliffs and canyons is highly variable. Plant communities in cliffs and canyons of the South Range Study Area tend to be different in composition from those of the North Range Study Area. This is probably due to the fact that the parent materials are different. Also, the South Range Study Area mountains are at a lower latitude and elevation, resulting in microclimates that are much harsher, hot, and dry compared to the North Range Study Area. Some cliffs and canyons are solid bedrock with washes that are virtually plant-free. Many of the cliff faces contain cracks and crevices that are filled with sufficient soil and organic matter to support plants. Often, lush plant communities may form in the soil or gravel depositions in shady areas at the base of cliffs where moisture may be persistent and a mesic microclimate prevails. Some of the washes are well-shaded and protected from direct sunlight allowing for a higher level of moisture in the soils that supports a plant community that may differ from those on more open, sunlit washes. Aspect may also impact plant community development with more mesic plants growing in the cool, shaded north and east facing slopes and xeric plants growing on the hot, sunlit south and west facing slopes.

Woody plants commonly found in cliffs and canyons of the South Range Study Area include skunkbush sumac (*Rhus trilobata*), water jacket (*Lycium andersonii*), Apache plume (*Fallugia paradoxa*), antelope bitterbrush (*Purshia tridentata*), cliff rose (*Purshia mexicana/stansburiana*), desert almond (*Prunus fasciculata*), desert snowberry (*Symphoricarpos longiflorus*), rubber rabbitbrush (*Ericameria nauseosa*), jointfir/Mormon tea (*Ephedra* spp.), Utah agave (*Agave utahensis*), broom snakeweed (*Gutierrezia sarothrae*), and various species of rabbitbrush (*Chrysothamnus* spp.). On the North Range Study Area, especially on the Kawich and Belted Ranges, canyons often support populations of Gambel oak (*Quercus gambelii*), desert snowberry (*Symphoricarpos longiflorus*), cliff rose (*Purshia mexicana/stansburiana*), antelope bitterbrush (*Purshia tridentata*), pinyon pine (*Pinus monophylla*), Utah juniper (*Juniperus osteosperma*) and mountain-mahogany (*Cercocarpus* spp.). Herbaceous plants include desert pepperweed (*Lepidium fremontii*), beardless wildrye (*Leymus triticoides*), James' galleta (*Pleuraphis jamesii*), Indian ricegrass (*Achnatherum hymenoides*), purple threeawn

(*Aristida purpurea*), bush muhly (*Muhlenbergia porteri*), smooth brome (*Bromus tectorum*), desert needlegrass (*Achnatherum speciosa*), and various species of milkvetch (*Astragalus* spp.), phacelia (*Phacelia* spp.), and beardtongue (*Penstemon* spp.).

VALUE TO WILDLIFE AND PLANTS

Wildlife

- Cliff and canyon habitats are important to wildlife, especially desert bighorn sheep, because they provide structure for resting and protection from predators and the hot sun. Small mammals, birds, reptiles and furbearers also use this habitat for nesting, roosting or denning, and areas for foraging.
- Peregrine falcons, prairie falcons, and golden eagles are obligate nesters in cliff and canyon habitats on the study area.
- The white-throated swift (*Aeronautes saxitalus*) uses this habitat for nesting and roosting.
- Chuckwallas and gila monsters use rocks and crevices in cliff and canyon habitat for burrowing and protective cover on the South Range Study Area.
- Rock crevices, boulder piles, or talus are most commonly used by ringtails for denning.
- Crevices are often used by various species of bats for roosting. The spotted bat (*Euderma maculatum*) is a special status species is one such species.
- Pikas also utilize rocky habitats but are obligates of talus slopes containing rock 0.2 to 1.0-meter diameter.
- Persistent ephemeral pools that may form in this habitat after spring and summer storm events provide invertebrates and amphibians temporary aquatic environments for reproduction and other life cycle requirements.

Plants

- Black woollypod (*Astragalus funereus*) may be found on gravelly volcanic tuffs and limestone screes on mountain slopes in this key habitat.
- Bullfrog Hills sweetpea (*Lathyrus hitchcockianus*) is found in open, dry to slightly moist gravels of rocky drainage bottoms in canyons and on upper alluvial slopes, or washes, often at the base of boulders or canyon walls and climbing up through shrubs, in areas of volcanic tuff or carbonate rocks, or sandy soils from 4,000 to 7,000 ft. MSL.
- Darin's buckwheat (*Eriogonum concinnum*) occurs on deep loose sand derived from light colored tuff or other volcanic rocks, often found in crevices, at the base of cliffs, and outcrops throughout this key habitat.
- Pintwater rabbitbrush (*Chrysothamnus eremobius*) is found in crevices on carbonate cliffs of desert mountains at elevations from 4,850 to 6,400 ft. MSL.
- Sheep fleabane (*Erigeron ovinus*) is found on limestone rock outcrops and at the base of cliffs within the pinyon-juniper woodlands at elevations from 3,600 to 8,400 ft. MSL, in association with single-leaf pinyon pine (*Pinus monophylla*) and mountain-mahogany (*Cercocarpus* spp.). This plant is known only from the Sheep and Groom Ranges, but could potentially occur on the Desert Range, Pintwater Range, Belted Range, and Kawich Range.
- Pahute Mesa beardtongue (*Penstemon pahutensis*) grows in the big sagebrush/pinyon-juniper zone and may be found in this key habitat at elevations of 5,800 to 7,500 ft. MSL.
- Pygmy poreleaf (*Porophyllum pygmaeum*) is found in dry, open, relatively deep and rocky carbonate soils of hillsides, often in slight depressions at the base of outcrops and cliffs.

- Ackerman's milkvetch (*Astragalus ackermanii*) may be found in this habitat in crevices and at the base of cliffs in narrow canyons and associated with Utah agave (*Agave utahensis*), ragged rock-flower (*Crossosoma bigelovii*), beavertail pricklypear (*Opuntia basilaris*), and desert needlegrass (*Achnatherum speciosa*).

SPECIES OBSERVED

Table 11. Wildlife and rare plant species that have been observed in Cliffs and Canyons key habitat

Status	Common Name	Scientific Name
Birds		
	Black-throated Sparrow	<i>Amphispiza bilineata</i>
	Golden Eagle	<i>Aquila chrysaetos</i>
	Great Horned Owl	<i>Bubo virginianus</i>
	Red-tailed Hawk	<i>Buteo jamaicensis</i>
	Swainson's Hawk	<i>Buteo swainsoni</i>
	Costa's Hummingbird	<i>Calypte costae</i>
	Cactus Wren	<i>Campylorhynchus brunneicapillus</i>
	House Finch	<i>Carpodacus mexicanus</i>
	Turkey Vulture	<i>Cathartes aura</i>
	Common Raven	<i>Corvus corax</i>
**	Prairie Falcon	<i>Falco mexicanus</i>
**	Peregrine Falcon	<i>Falco peregrinus</i>
	American Kestrel	<i>Falco sparverius</i>
*	Loggerhead Shrike	<i>Lanius ludovicianus</i>
	Rock Wren	<i>Salpinctes obsoletus</i>
	Say's Phoebe	<i>Sayornis saya</i>
Mammals		
	White-tailed Antelope Squirrel	<i>Ammospermophilus leucurus</i>
	Wild Horse	<i>Equus ferus</i>
	Desert Woodrat	<i>Neotoma lepida</i>
	Southern Grasshopper Mouse	<i>Onychomys torridus longicaudus</i>
	Desert Bighorn Sheep	<i>Ovis canadensis nelsoni</i>
	Great Basin Pocket Mouse	<i>Perognathus parvus</i>
	Deer Mouse	<i>Peromyscus maniculatus</i>
	American Badger	<i>Taxidea taxus berlandieri</i>
Reptiles		
	Desert Tortoise	<i>Gopherus agassizii</i>
	Great Basin Whiptail	<i>Aspidoscelis tigris tigris</i>
	Western Zebra-tailed Lizard	<i>Callisaurus draconoides</i> var. <i>rhodostictus</i>
**	Western Banded Gecko	<i>Coleonyx variegatus</i>
**	Great Basin Collared Lizard	<i>Crotaphytus bicinctores</i>
	Desert Iguana	<i>Dipsosaurus dorsalis dorsalis</i>
**	Desert Horned Lizard	<i>Phrynosoma platyrhinos</i>
**	Common Chuckwalla	<i>Sauromalus ater</i>
	Yellow-backed Spiny Lizard	<i>Sceloporus uniformis</i>
	Common Side-blotch Lizard	<i>Uta stansburiana</i>
**	Desert Night Lizard	<i>Xantusia vigilis</i>
Rare Plants		
*	Pintwater Rabbitbrush	<i>Chrysothamnus eremobius</i>
*	Clokey's Pincushion	<i>Escobaria vivipara</i> var. <i>rosea</i>
*	Kingston Mountains Bedstraw	<i>Galium hilendiae</i> ssp. <i>kingstonense</i>
*	Hermit Cactus	<i>Sclerocactus polyancistrus</i>
**	Ivory-spined Agave	<i>Agave utahensis</i> var. <i>eborispinga</i>
**	White Bearpoppy	<i>Arctomecon merriamii</i>
**	Ackerman's Milkvetch	<i>Astragalus ackermanii</i>
**	Sheep Range Milkvetch	<i>Astragalus amphioxys</i> var. <i>musimonum</i>
**	Black Woollypod	<i>Astragalus funereus</i>
**	Mojave Milkvetch	<i>Astragalus mohavensis</i> var. <i>hemigyris</i>
**	Nye Milkvetch	<i>Astragalus nyensis</i>
**	New York Mountains Catseye	<i>Cryptantha tumulosa</i>

Status	Common Name	Scientific Name
**	Death Valley Mormon Tea	<i>Ephedra funerea</i>
**	Clokey's Buckwheat	<i>Eriogonum heermannii</i> var. <i>clokeyi</i>
**	Ripley's Gilia	<i>Gilia ripleyi</i>
**	Rayless Tansy Aster	<i>Machaeranthera grindelioides</i> var. <i>depressa</i>
**	Desert Rockdaisy	<i>Perityle intricata</i>
**	Clarke's Phacelia	<i>Phacelia filiae</i>
**	Pygmy Poreleaf	<i>Porophyllum pygmaeum</i>

***State/Federal listed and critically imperiled species.**

****Special status species.**

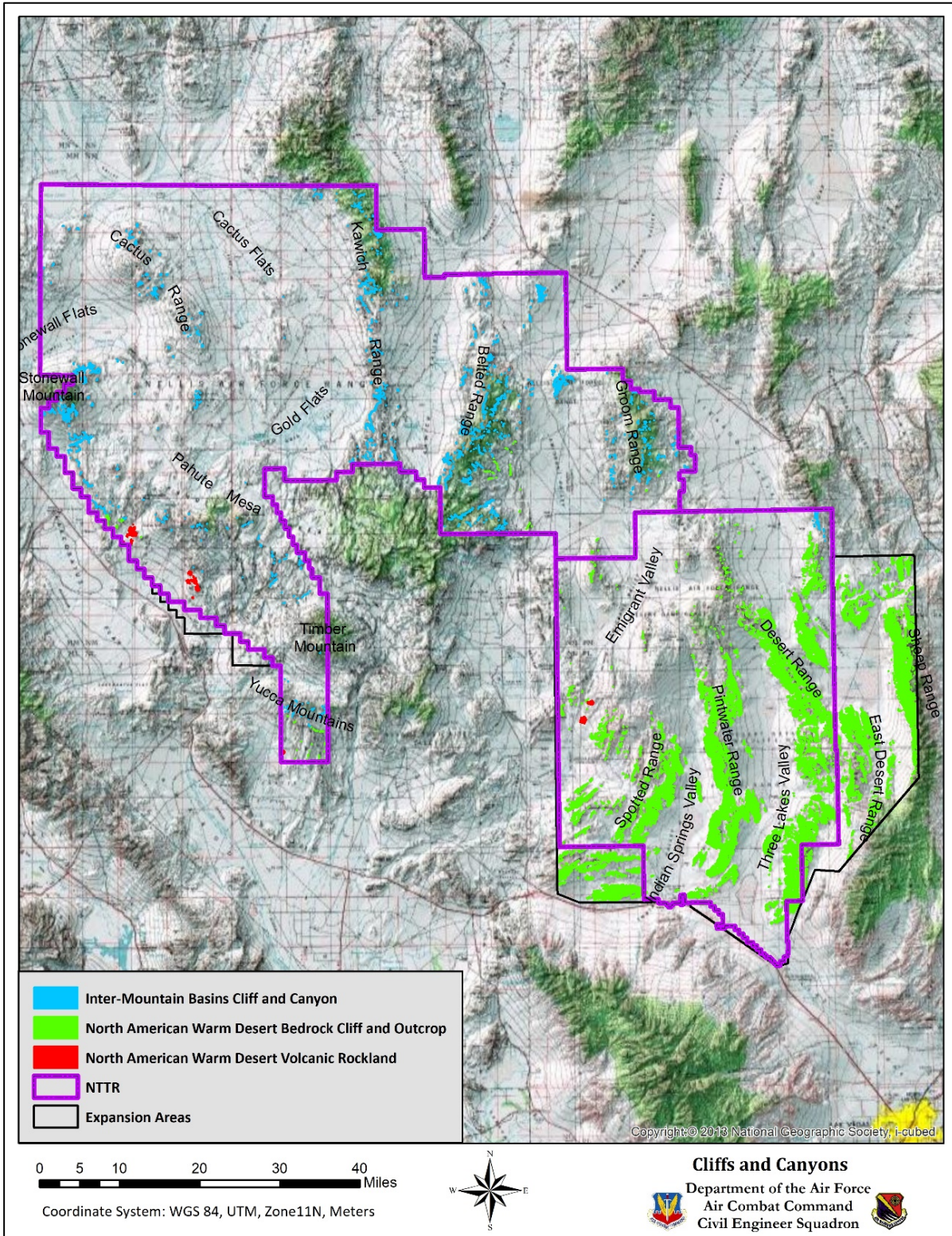


Figure 14. Map of Cliffs and Canyons on the study area

Caves and Mines

HABITAT DESCRIPTION

Caves and mines are common throughout the study area. Since mining is not allowed on most of the study area, all of the mines are abandoned and have had no activity for over 40 years. The largest concentrations of mines on the study area are located on the northwest portion of the North Range Study Area (Figure 15). However, mines are also scattered across the remainder of the North Range Study Area with very few mines on the South Range Study Area. Mine shafts provide good roosting and nesting habitat for bats, small mammals, reptiles, and other wildlife. Caves and hollows are common throughout the study area. These caves provide shelter for various species of wildlife including owls, small mammals, mountain lions, bobcats, bats, and reptiles. Many of the hollows are used by raptors and falcons for nests and eyries.

VALUE TO WILDLIFE AND PLANTS

Wildlife

- Tunnel mines that were excavated since the mid-1800s provide potential roosting sites for 19 of Nevada’s bat species.
- Desert tortoises have occasionally been found in mine tunnels.
- Nevada’s cave systems provide habitat for several obligate invertebrate cave dwellers that are restricted to these environments throughout their life cycle.

Plants

In general, mines, caves and hollows do not provide habitat that is viable for vegetation. Some hollows may contain shade tolerant species of grasses and forbs; however, these areas tend to lack significant vegetation because of low light conditions and high disturbance due to use by wildlife. In a few cases, water flowing from caves or mines may provide moisture for lush areas of vegetation on areas adjacent to the opening of the cave or mine. Most of this habitat would be considered Spring and Springbrooks habitat with the water originating from a cave or mine.

SPECIES OBSERVED

Table 12. Wildlife and rare plant species that have been observed in Cave and Mines key habitat

Status	Common Name	Scientific Name
Bat		
*	Pallid Bat	<i>Antrozous pallidus</i>
*	Townsend's Big-eared Bat	<i>Corynorhinus townsendii</i>
**	Big Brown Bat	<i>Eptesicus fuscus</i>
*	Spotted Bat	<i>Euderma maculatum</i>
	California Leaf-nosed Bat	<i>Macrotus californicus</i>
	Southwestern Myotis	<i>Myotis auriculus</i>
**	California Myotis	<i>Myotis californicus</i>
**	Western Small-footed Myotis	<i>Myotis ciliolabrum</i>
**	Long-eared Myotis	<i>Myotis evotis</i>
	Little Brown Myotis	<i>Myotis lucifugus</i>
*	Fringed Myotis	<i>Myotis thysanodes</i>
**	Long-legged Myotis	<i>Myotis volans</i>
**	Western Pipistrelle	<i>Parastrellus hesperus</i>
*	Mexican Free-tailed Bat	<i>Tadarida brasiliensis</i>

*State/Federal listed and critically imperiled species.

**Special status species.

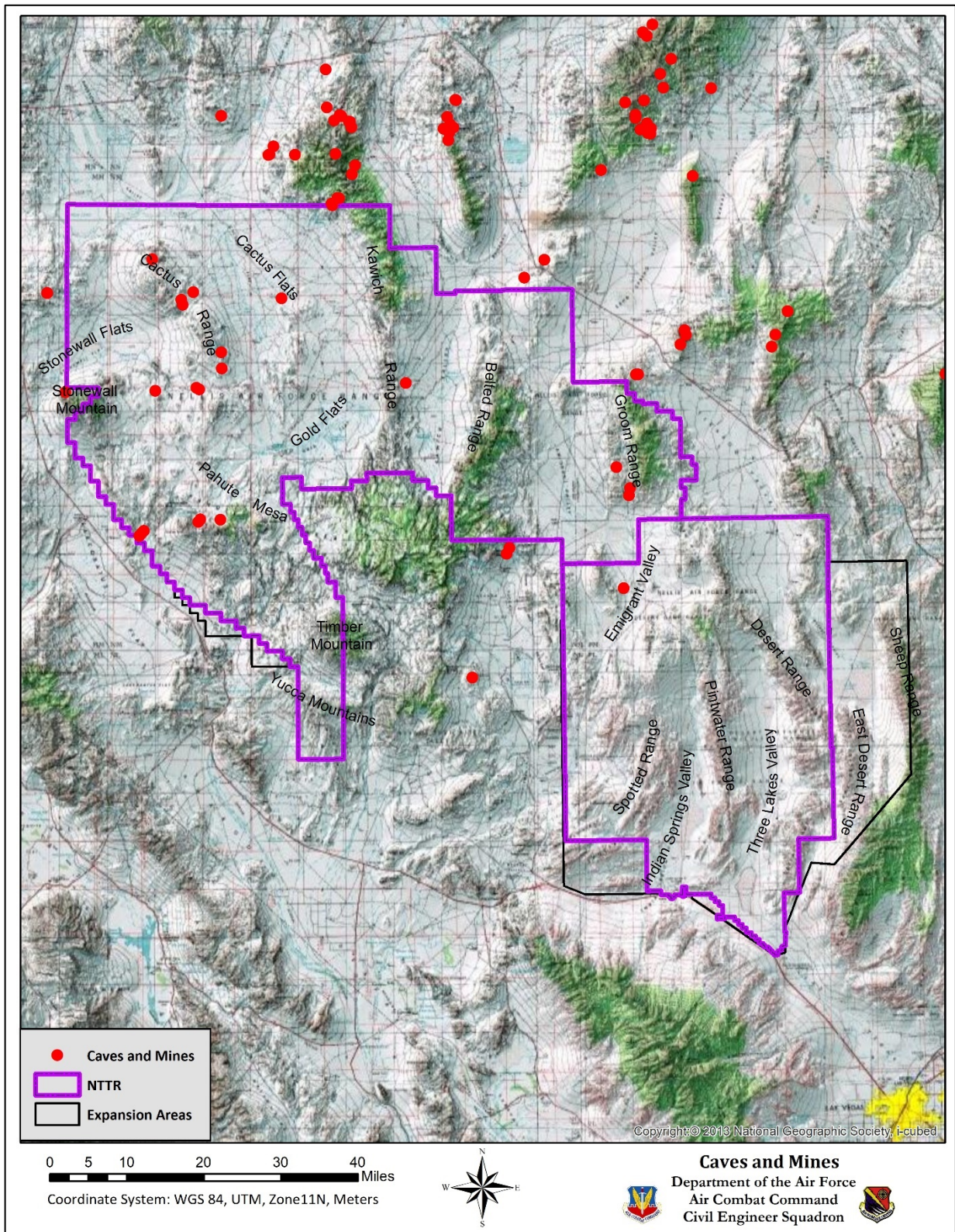


Figure 15. Map of Caves and Mines on the study area

Barren Landscapes

HABITAT DESCRIPTION

On the study area, most barren landscapes are caused by natural processes or, on NTTR, may also be abandoned and active target sites (Figure 16). Other barren landscapes may have been cleared in the past for military mission activities or excavated for base material and gravel. These areas are slowly recovering, but some could probably be restored at a more rapid rate with planting or seeding. Many of the barren landscapes on the study area are the result of natural processes. These areas include bedrock faces on mountains, outcrops of rock, desert pavement, scarps, talus, slides, scree, alkaline or gypsiferous soils. Vegetation is sparse on these areas, comprising less than 10% cover.

VALUE TO WILDLIFE AND PLANTS

Wildlife

- Much of the value of the disturbed sites lies in their potential for reclamation to meet wildlife habitat needs.
- Some reptiles will utilize these areas, though probably making only brief incursions before returning to more favorable habitat types.
- Large mammals such as bighorn sheep and mule deer will cross or traverse these areas, primarily during daily or seasonal movements. In recovering areas, young forage may be available.
- Where ledges and crevices occur in open pit mine walls, bats and some species of cliff-nesting birds will utilize such sites for nesting or roosting.
- In particular, the talus and slide elements can be used for cover and foraging areas for a variety of wildlife, and they are critical to American pika. Pika require a secure environment where they can readily escape from predators. Pikas cache the hay supplies that allow them to endure long winters in these areas and, most importantly, the rocky cover offers a refuge from warm temperatures which pikas are physiologically incapable of surviving.

Plants

Barren landscapes usually support sparse populations of plants, some of which may be rare. On the study area, gypsiferous soils may potentially support scattered populations of Las Vegas bearpoppy, Las Vegas buckwheat, or Merriam's bearpoppy. Of these species, only Merriam's bearpoppy has been identified on the study area.

SPECIES OBSERVED

The only wildlife species that have been recorded in the NTTR and expansion geodatabases in this habitat are two bats, the little brown Myotis (*Myotis lucifugus*) and the long-legged Myotis (*Myotis volans*).

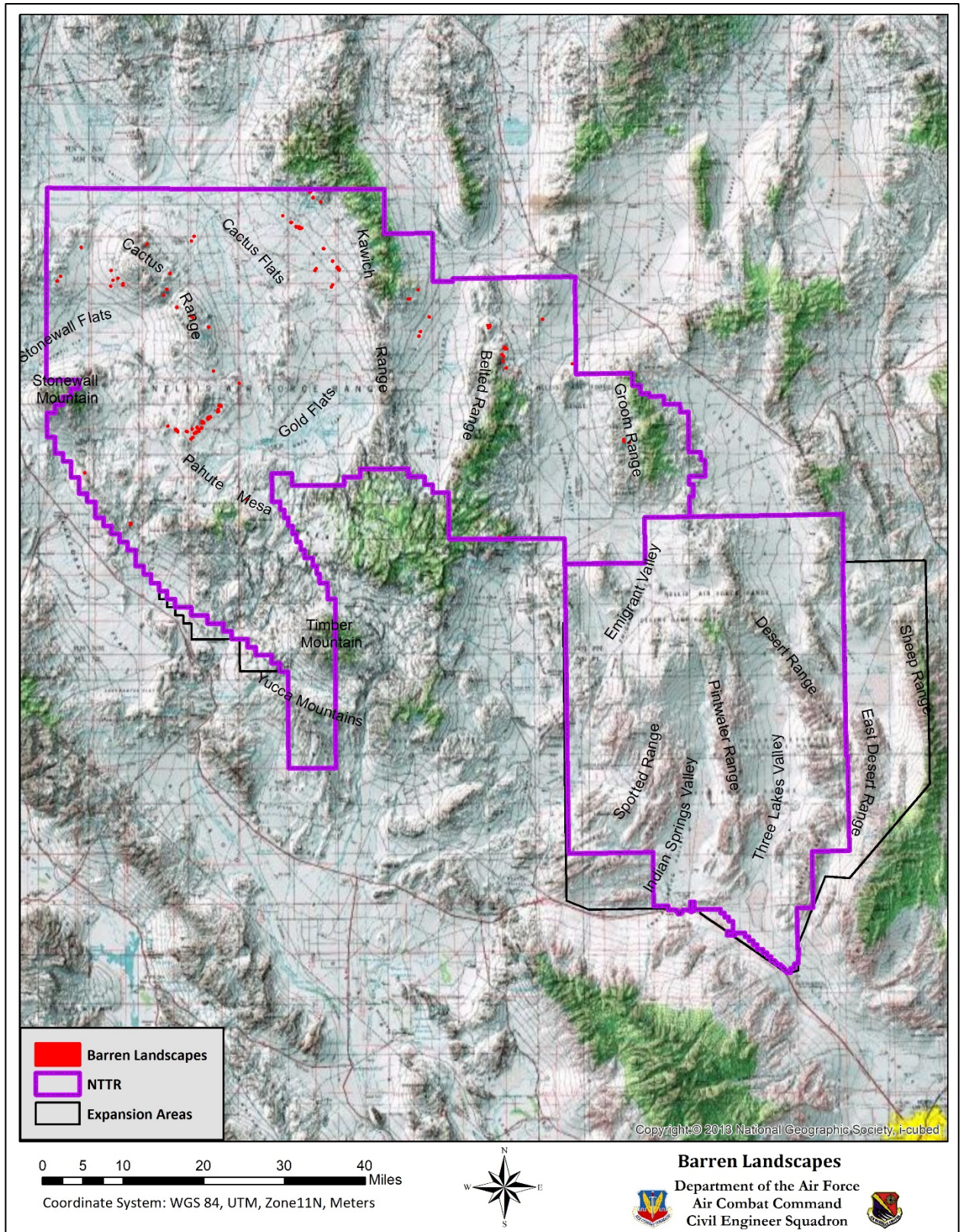


Figure 16. Map of Barren Landscapes on the study area

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