

# **INITIAL BIOLOGICAL ASSESSMENT DEHAVEN RANCH HARDING COUNTY, NEW MEXICO**



Robert Sivinski  
RCS Southwest  
Santa Fe, New Mexico

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## Introduction

DeHaven Ranch is a 680-acre property about 22 air miles ENE of Roy in Harding County, New Mexico. It is situated across Alamocita Creek – including the valley bottom, slopes and some adjacent open prairie. The north to south length of the creek run on the property is approximately 1.2 miles with elevation ranging from 5,260 feet at the south end of the creek up to 5,500 feet in the upland prairie on the west side of the ranch.

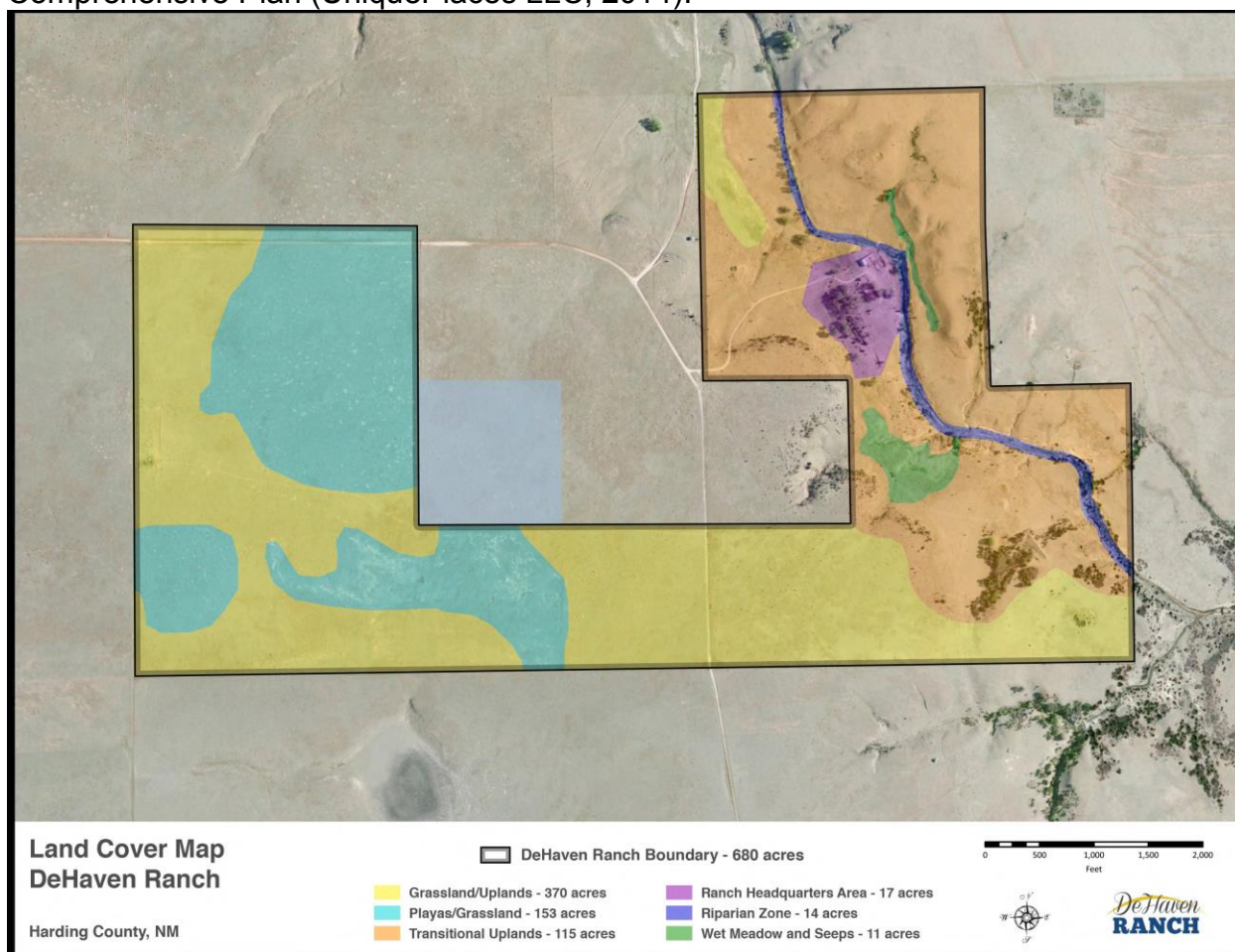
Most of northeastern New Mexico occurs within the shortgrass prairie of the Great Plains biotic region. DeHaven not only has representative shortgrass prairie, but also has the topographic relief and permanent water of the Alamocita valley. A variety of habitats are available to plants and animals from relatively dry upland down to the stream channel, but the most special biological aspect of DeHaven Ranch is its wealth of wetlands and riparian woodlands.

## Methods

This biological assessment for DeHaven Ranch is not the result of extensive field surveys. The author visited this property for only one day on May 17, 2015. The purpose of the field visit was to determine the habitats and vegetation communities on the ranch and extrapolate potential use by common and special status vertebrate animal species. A few of the animals listed in this report were actually observed during the one-day field visit, but most are included on the basis of the author's and landowner's experience, review of published literature, and publically available databases for wildlife distributions and habitats.

Prior to the field survey, the U.S. Fish and Wildlife Service (USFWS), New Mexico Department of Game and Fish (NMDG&F) Biota Information System of New Mexico (BISON-M), and the New Mexico Rare Plant Technical Council (NMRPT) New Mexico Rare Plants websites were reviewed to identify any protected or sensitive plant and animal species with potential for occurring on the ranch. A longer list of common animals was generated with the BISON-M database and later refined with published references for New Mexico mammals (Findley 1975), reptiles (Dagenhart et al. 1996), predatory birds (Cartron 2010), New Mexico Ornithological Society field notes database for local bird observations, and Nature Serve Explorer for all classes of wildlife. Nomenclature for plant species follows Allred (2012) and animal nomenclature conforms to that used in BISON-M. A list of all the plant species observed during the one-day field survey is attached as an appendix. The ranch owners can find Internet images of these plant species on the SEINet portal at <http://swbiodiversity.unm.edu/>.

Figure 1. Distribution and amounts of land cover types from the DeHaven Ranch Comprehensive Plan (UniquePlaces LLC, 2014).



## Biotic Communities

DeHaven Ranch has habitats ranging from open-water aquatic to dry uplands. The principle vegetation divisions are shortgrass prairie, riparian woodland, wet meadows and upland woodland. The agricultural plot and woodlot of mostly non-native trees at the ranch headquarters were not assessed in this biological survey.

The land cover map in the DeHaven Ranch Comprehensive Plan needs some minor corrections and additional explanation for biological context. Most of the ranch can be classified as shortgrass prairie, but the areas mapped as ‘Transitional Uplands’ and ‘Playas/Grasslands’ represent some important topographic subdivisions. The so-called transitional uplands are almost entirely shortgrass prairie that occurs on valley slopes with greater diversity of soil types and plant species as well as rock outcrops and pockets of woody trees and shrubs that further enhance spatial diversity and edge effects for wildlife habitats. The playas/grassland designation on the western side of the ranch is inaccurate and instead a very interesting micro-topographic feature of prairie mounds (Figure 8). These small, low mounds are naturally created by wind and

burrowing rodent activities that accumulate soil mounds on prairie areas of flat hardpan substrate. The low areas between the mounds have very low infiltration rates and can pool water during periods of high precipitation. Like larger playas, these small pools are important to ephemeral invertebrate and avian wildlife, but are more accurately called 'vernal pools' instead of 'playas'.

Riparian and wetland cover on the ranch is very diverse and more extensive than illustrated in Figure 1. Alamocita Creek is actually a groundwater spring run through the ranch property and a permanent fresh water feature. Alluvial groundwater is forced to the surface by sandstone bedrock strata and the valley slopes help maintain water flow from large spring seeps in numerous places. Wet meadows of wetland plants occur on the less rocky portions of valley bottom and where the valley slopes are seeping water. Figure 1 attributes 11 acres to wet meadows, but the actual area is likely twice that amount. In fact, much of the grassland area in the northwest corner (northwest of the barn) is a very large sloping wet meadow of several acres that is not included as such in the land cover calculations.

More specific plant associations for the ranch are as follows:

### **Riparian Woodland**

Riparian vegetation along the banks and floodplain of the creek and cover about 14 acres (Figure 1). Dominant tree and species are Rio Grande cottonwood (*Populus deltoides* var. *wislizeni*), Rocky Mountain juniper (*Juniperus scopulorum*) and coyote willow (*Salix exigua*) (Figures 2 and 3). The tree willows could not be confidently identified at this early date, but appear to mostly be Goodding's willow (*Salix gooddingii*) or peachleaf willow (*Salix amigdaloides*). Most of the tree willows are old and decadent and may have been purposely planted several decades ago. Non-native honey locust (*Gleditsia triacanthos*) is frequent in the riparian woodland and also apparently planted where it does occur. Woody plants that are common in the riparian understory include three-leaf sumac (*Rhus trilobata*), wax currant (*Ribes cereum*), Wood's rose (*Rosa woodsii*) and mapleleaf grape (*Vitis acerifolia*). All of these understory shrubs produce fruits that are eaten by some birds and mammals.

### **Upland Woodland**

The slopes of the Alamocita valley have occasional small patches of upland woodland that are important wildlife habitat (Figure 4). These woodlands are usually associated with bedrock outcrops and small ravines that are naturally irrigated by spring seeps. Dominant trees or large shrubs are a hybrid white oak called wavy-leaf oak (*Quercus x undulata*), Rocky Mountain juniper (*Juniperus scopulorum*) and netleaf hackberry (*Celtis reticulata*). Upland woodlands on spring seeps also have few willows and cottonwoods, which makes them inseparable from adjacent riparian woodland.

## **Wet Meadow Spring Seeps**

Wet meadows are natural wetlands that occur on spring seeps and adjacent to spring runs. In New Mexico these lush, groundwater irrigated meadows are called ‘vegas’ or ‘ciénegas’. Local vernacular prefers to use the term ‘vega’. Biologists, however, have adopted the term ‘ciénega’ for spring-fed wet meadows in, otherwise, arid landscapes – like the shortgrass prairie. Ciénegas are very rare and endangered biotic communities that are rapidly being degraded or eliminated in the American southwest (Sivinski and Tonne, 2011).

Wet meadows on spring seeps at DeHaven Ranch occur along the Alamocita Creek (spring run) in the valley bottom (Figure 5) and on broad and narrow spring seeps on the valley slopes (Figures 4 and 6). These meadows produce a dense native vegetation cover of wooly sedge (*Carex pellita*), Nebraska sedge (*Carex nebrasensis*), field sedge (*Carex praeegracilis*), Baltic rush (*Juncus balticus*), swordleaf rush (*Juncus ensifolius*), common spikerush (*Eleocharis palustris*), beaked spikerush (*Eleocharis rostellata*) and strict blue-eyed grass (*Sisyrinchium montanum*). Drier margins have Indiangrass (*Sorghastrum nutans*) and Maximilian sunflower (*Helianthus maximiliani*), both of which are tallgrass prairie species that occur in this relatively arid location because they are subirrigated by spring seeps. All these plants propagate with underground stems (rhizomes) that form dense colonies and can withstand heavy, but not continuous, grazing pressure.

Open water marsh only occurs within the creek and a small impoundment with emergent hardstem bulrush (*Schoenoplectus acutus*), southern cattail (*Typha domingensis*), water-cress (*Nasturtium officinale*), cutleaf waterparsnip (*Berula erecta*) and spotted water-hemlock (*Cicuta maculata*), which has poisonous roots (Figure 5).

## **Shortgrass Prairie**

The following is in the Southwest GAP Analysis Project land cover description:

“Western Great Plains Shortgrass Prairie is found primarily in the eastern third of New Mexico and occurs primarily on flat to rolling uplands with loamy, ustic soils ranging from sandy to clayey. Although mid-height grass species may be present especially on more mesic land positions and soils, they are secondary in importance to the sod-forming short grasses. High variation in amount and timing of annual precipitation impacts the relative cover of cool and warm season herbaceous species. Large-scale processes such as climate, fire, and grazing influence this habitat. Fire is less important than other prairie habitats because the often dry and xeric climate conditions can decrease the fuel load and thus the relative fire frequency. The short grasses that dominate this habitat type are extremely drought- and grazing-tolerant. These species evolved with drought and large herbivores and, because of their stature, are relatively resistant to overgrazing. Areas of the central and western range have been impacted by

the unsuccessful attempts to develop dryland cultivation during the Dust Bowl of the 1930s.”

The grasslands on DeHaven Ranch were never plowed for dryland agriculture so the native soils and vegetation are intact. The ranch is only lightly grazed and had very good grass cover at the time of this survey (Figure 7). Grassland cover on the relatively flat portion of the ranch is predominantly the perennial sod-forming grass – blue grama (*Bouteloua gracilis*) and buffalograss (*Bouteloua dactyloides*) with a scattering of plains yucca (*Yucca glauca*). Other common perennial grasses include western wheatgrass (*Elymus smithii*), purple three-awn (*Aristida purpurea*), and sand dropseed (*Sporobolus cryptandrus*). Prairie mounds had similar vegetation cover, but the adjacent vernal pool areas were dry and barren (Figure 8).

Sloping grasslands on the sides of Alamosa valley have bedrock outcrops, surface gravel and a variety of soil types (Figures 9 and 10). These slopes have the common grasses of the flat shortgrass prairie, but a much greater species diversity of grasses and forbs including sideoats grama (*Bouteloua curtipendula*), little bluestem (*Schizachyrium scoparium*), stemmy four-nerve daisy (*Tetaneuris scaposa*), purple prairie-clover (*Dalea purpurea*), chocolate flower (*Berlandiera lyrata*), hoary fleabane (*Erigeron canus*) to name just a few.

## WILDLIFE

Creeks, springs and their adjacent uplands in arid environments are especially rich in animal diversity because the watered land is highly productive for habitat cover and forage, and both the aquatic and dryland habitats each have their own suites of plant and animal species. DeHaven Ranch is such a place where aquatic, riparian and dry upland animal habitats converge. Table 1 is a list of vertebrate animals that are likely to use the Harding County habitats where the ranch is located. The animals on this list may or may not be abundant, but probably occur regularly enough to be present during one or more seasons every year. This list is too large to discuss each species and for most species, their actual presence on the ranch is yet to be verified.

In general, the riparian woodlands will have the greatest diversity and abundance of wildlife. This habitat has water, abundant forage and plant seeds and fruits for herbivores. Large populations of invertebrate and vertebrate prey species attract carnivores. Most birds and mammals of the ranch vicinity will live in or visit riparian woodland during their travel, foraging or breeding routines each year. More bird species are more likely to use this habitat than any other on the ranch. It is especially suitable for nesting, not only in the branches, but in cavities created in dead cottonwood and willow trees. Some woodpeckers, wrens, chickadees and nuthatches depend on these cavity nests for reproductive success.

Aquatic habitats are also relatively rare and special in arid New Mexico. The creek on the ranch contains crawfish, other aquatic invertebrates, small fish, amphibians and

turtles that live all or much of their lives in water, but no attempt was made to capture and identify these aquatic wildlife species during this brief survey. Wet meadow habitats are also relatively rare and unique for northeastern New Mexico and could be important habitat for amphibians, mollusks and prairie bird species.

Some keystone species of the shortgrass prairie are now entirely missing or locally extirpated from northeastern New Mexico. American bison (*Bison bison*) and elk (*Cervus elaphus*) no longer graze and move through these grasslands. Black-tailed prairie dogs (*Cynomys ludovicianus*) have been severely reduced in numbers and no longer provide extensive burrow habitats and predator prey for numerous other wildlife species. Even the iconic lesser prairie-chicken (*Tympanuchus pallidicinctus*) has disappeared from Harding County. Pronghorn (*Antilocapra americana*) continue to occur in the shortgrass prairie of DeHaven Ranch as do numerous species of grassland birds such as horned lark meadow larks.

## **SPECIAL STATUS SPECIES**

### **Endangered or Sensitive Species**

Table 2 lists all the threatened, endangered or sensitive plant and animal species that are known to occur, or have potential to occur, on DeHaven Ranch. The only rare plant species that might be on the ranch is the Great Plains lady's tresses orchid (*Spiranthes magnicamporum*). This short, white wildflower blooms in early autumn (September) and occurs in New Mexico only in wet meadow habitats. It is listed as 'Endangered' by the State of New Mexico because its ciénega habitats are rare and threatened and this orchid could be extirpated from the state. There are suitable wet meadow habitats on DeHaven Ranch, but this orchid cannot be detected until September.

New Mexico Department of Game and Fish's Comprehensive Wildlife Conservation Strategy for New Mexico (2006) identifies shortgrass prairie as one the key terrestrial habitats in the ecoregional framework of the plan. Marsh/Cienega/Spring/Seep are also identified in this plan as key perennial aquatic habitats. DeHaven Ranch has both of these key terrestrial and aquatic habitats in abundance. This conservation strategy designates some declining or sensitive wildlife species within key habitats as a 'Species of Greatest Conservation Need' (SGCN). A few SGCN species were detected during the brief field survey of the ranch including mourning dove (*Zenaida macroura*) and mule deer (*Odocoileus hemionus*) in the riparian woodland; and ornate box turtle (*Terrapene ornate*) and long-billed curlew (*Numenius americanus*) on the shortgrass prairie.

The other SGCN sensitive species listed in Table 2 have potential habitat on DeHaven Ranch, but too little is known about their distributions in Harding County to make any statements about their use of the ranch. Actual field surveys, especially for bats, would be necessary to determine if they are present or absent.



## **Noxious Weeds**

There are dozens of non-native plant species growing without cultivation on DeHaven Ranch, but only one of them are listed as 'noxious' by the NM Department of Agriculture (NMDA 2009). Cheatgrass (*Bromus tectorum*) is an annual grass that is ubiquitous throughout northern New Mexico. It does not attain problematic densities on DeHaven Ranch and should be of no great concern – especially where native perennial plant cover is maintained.

The most obnoxious non-native plants on the ranch are the two tumble weed species Russian thistle (*Salsola tragus*) and kochia (*Kochia scoparia*). Good summer rainfall years see a proliferation of these highly flammable annuals on disturbed soils and overgrazed rangeland. The dead plants roll in the autumn winds accumulating against fences and shrubs, and clogging ravines and stream channels.

Noxious non-native bull thistle (*Cirsium vulgare*) and Creeping thistle (a.k.a. Canada thistle) (*Cirsium arvense*) are nearby in the Canadian River canyon and could potentially reach the ranch and infest the wet meadows. The native wavy-leaf thistle (*Cirsium undulatum*) does occur in low numbers in the grassland and woodlands of the ranch. It is a harmless native plant important to pollinators and should not be molested just because it is a thistle.

## **FURTHER RECOMMENDATIONS**

DeHaven Ranch has a variety of habitats that support a very diverse flora and fauna. Some of the dominant or abundant plants and animals are easy to locate, but the only way to definitively determine most of the species present on the ranch is to conduct intensive field surveys with competent biologists. The valleys and shortgrass prairie of Harding County is almost entirely privately owned land, which discourages exploration by field biologists. DeHaven Ranch will learn a great deal about the resident biota by making the ranch available for study to biologists from the NM Game and Fish Department and biology students and professors from New Mexico and Colorado universities and colleges. Aquatic animal census in the creek and adjacent springs, a bat census of the ranch, or a nesting bird census in the prairie and woodland could all be research topics that may interest wildlife agency biologists or university students.

The field visit to the ranch was a very brief and incomplete survey so only a few additional recommendations for managing wildlife come to mind.

- All dead willow and cottonwood tree snags in the riparian woodland should allowed to remain standing until they naturally fall (except snags that threaten power lines or structures). Fallen trees should be allowed to rot in place (except



logs that block roads or paths). Snags are important habitat for nesting birds and rotting logs provide shelter and insect prey for many species of wildlife.

- Black-tailed prairie dogs should be encouraged to establish a colony on the west side of the property. Prairie dogs are keystone species that provide habitat for other wildlife and are also prey animals for native predators.
- Soil disturbance should be revegetated as soon as possible with perennial native plants to discourage production of annual weeds like Russian thistle. Blue grama seed is relatively easy to obtain for grassland reclamation and should be lightly raked into the soil surface just before the onset of the summer rains. If the disturbed area is relatively flat, plugs of living buffalo grass can be taken from existing patches with a shovel and transplanted to disturbed soils where this grass will quickly spread. Transplants should be timed for the rainy season or given supplemental water during dry periods. Disturbance on wet soils at spring seeps or the creek bank will heal more quickly if plugs of sedges and rushes are transplanted from existing wetlands to the disturbed wet-soil sites.
- Wet meadows are very productive habitats that should be regularly, but not abusively, grazed by livestock, or periodically burned. Sedges and rushes are not especially desirable livestock forage and tend to accumulate into a dense thatch of dead leaves and stems. If this thatch is not removed, productivity and species diversity will rapidly decline in the wet meadow habitat.



Figure 2. Mixed riparian woodland on Alamocita Creek.



Figure 3. Riparian woodland on Alamocita Creek dominated by cottonwood trees.





Figure 4. Upland woodland of mostly wavy-leaf oak and Rocky Mountain Juniper at a sloping spring seep indicated by bright green grass and sedge.



Figure 5. Wet meadow of rushes and sedges on Alamocita Creek. Tall emergent plants (lower right) are hardstem bulrush.



Figure 6. Part of large wet meadow on a sloping hillside spring seep northwest of the barn. Tall yellow grass among green sedges is Indiangrass.



Figure 7. Flat shortgrass prairie on west side of ranch. Large plants are plains yucca.





Figure 8. Low prairie mounds and vernal pools (dry) on west side of ranch.



Figure 9. Gravelly slope on east side of valley with little bluestem bunchgrass.



Figure 10. Hillside outcrop of limy sandstone in grassland with a few three-leaf sumac shrubs.

**Table 1.** Probable regular or common native wildlife in DeHaven Ranch habitats. List constructed with the Bison-M database.

Common Name	Scientific Name	Category	GapVeg
Boreal Chorus Frog	<i>Pseudacris maculata</i>	Amphibians	AQUATIC RIPARIAN
Plains Leopard Frog	<i>Lithobates blairi</i>	Amphibians	AQUATIC RIPARIAN
Canyon Treefrog	<i>Hyla arenicolor</i>	Amphibians	AQUATIC RIPARIAN WOODLANDS
Tiger Salamander	<i>Ambystoma mavortium mavortium; nebulosum</i>	Amphibians	AQUATIC RIPARIAN SHORT GRASS STEPPE WOODLANDS
Couch's Spadefoot	<i>Scaphiopus couchii</i>	Amphibians	AQUATIC RIPARIAN SHORT GRASS STEPPE

New Mexico Spadefoot	<i>Spea multiplicata</i>	Amphibians	AQUATIC RIPARIAN SHORT GRASS STEPPE WOODLANDS
Plains Spadefoot	<i>Spea bombifrons</i>	Amphibians	AQUATIC RIPARIAN SHORT GRASS STEPPE WOODLANDS
Great Plains Toad	<i>Anaxyrus cognatus</i>	Amphibians	AQUATIC RIPARIAN SHORT GRASS STEPPE
Red-spotted Toad	<i>Anaxyrus punctatus</i>	Amphibians	AQUATIC RIPARIAN WOODLANDS
Woodhouse's Toad	<i>Anaxyrus woodhousii</i>	Amphibians	AQUATIC RIPARIAN SHORT GRASS STEPPE WOODLANDS
Coachwhip	<i>Coluber flagellum</i>	Reptiles	RIPARIAN SHORT GRASS STEPPE WOODLANDS
Eastern Collared Lizard	<i>Crotaphytus collaris</i>	Reptiles	RIPARIAN SHORT GRASS STEPPE WOODLANDS
Common Lesser Earless Lizard	<i>Holbrookia maculata approximans; maculata; bunkerii</i>	Reptiles	RIPARIAN SHORT GRASS STEPPE WOODLANDS
Central Fence Lizard	<i>Sceloporus consobrinus</i>	Reptiles	RIPARIAN SHORT GRASS STEPPE WOODLANDS
Round-tailed Horned Lizard	<i>Phrynosoma modestum</i>	Reptiles	RIPARIAN SHORT GRASS STEPPE WOODLANDS
Texas Horned Lizard	<i>Phrynosoma cornutum</i>	Reptiles	RIPARIAN SHORT GRASS STEPPE
Hernandez's Short-horned Lizard	<i>Phrynosoma hernandesi</i>	Reptiles	RIPARIAN SHORT GRASS STEPPE WOODLANDS
Common Side-blotched Lizard	<i>Uta stansburiana</i>	Reptiles	RIPARIAN SHORT GRASS STEPPE WOODLANDS
North American Racer	<i>Coluber constrictor</i>	Reptiles	RIPARIAN SHORT GRASS STEPPE WOODLANDS
Prairie Racerunner	<i>Aspidoscelis sexlineata</i>	Reptiles	SHORT GRASS STEPPE



Western Diamond-backed Rattlesnake	<i>Crotalus atrox</i>	Reptiles	RIPARIAN SHORT GRASS STEPPE WOODLANDS
Red-eared Slider	<i>Trachemys scripta</i>	Reptiles	AQUATIC RIPARIAN
Texas Blind Snake	<i>Rena dissectus</i>	Reptiles	RIPARIAN SHORT GRASS STEPPE WOODLANDS
Black-necked Gartersnake	<i>Thamnophis cyrtopsis</i>	Reptiles	AQUATIC RIPARIAN
Marcy's Checkered Gartersnake	<i>Thamnophis marcianus</i>	Reptiles	AQUATIC RIPARIAN
Plains Gartersnake	<i>Thamnophis radix</i>	Reptiles	AQUATIC RIPARIAN
Wandering Gartersnake	<i>Thamnophis elegans</i>	Reptiles	AQUATIC RIPARIAN SHORT GRASS STEPPE WOODLANDS
Glossy Snake	<i>Arizona elegans</i>	Reptiles	RIPARIAN SHORT GRASS STEPPE WOODLANDS
Gophersnake	<i>Pituophis catenifer</i>	Reptiles	RIPARIAN SHORT GRASS STEPPE WOODLANDS
Plains Hog-nosed Snake	<i>Heterodon nasicus</i>	Reptiles	RIPARIAN SHORT GRASS STEPPE WOODLANDS
Lined Snake	<i>Tropidoclonion lineatum</i>	Reptiles	RIPARIAN SHORT GRASS STEPPE WOODLANDS
Texas Long-nosed Snake	<i>Rhinocheilus lecontei</i>	Reptiles	RIPARIAN SHORT GRASS STEPPE WOODLANDS
Chihuahuan Nightsnake	<i>Hypsiglena jani</i>	Reptiles	RIPARIAN SHORT GRASS STEPPE WOODLANDS
Mountain Patchnose Snake	<i>Salvadora grahamiae</i>	Reptiles	WOODLANDS
Arid Land Ribbonsnake	<i>Thamnophis proximus</i>	Reptiles	AQUATIC RIPARIAN
Ringneck Snake	<i>Diadophis punctatus</i>	Reptiles	RIPARIAN SHORT GRASS STEPPE WOODLANDS
Spiny Softshell Turtle	<i>Apalone spinifera</i>	Reptiles	AQUATIC RIPARIAN

Ornate Box Turtle	<i>Terrapene ornata</i>	Reptiles	RIPARIAN SHORT GRASS STEPPE WOODLANDS
Yellow Mud Turtle	<i>Kinosternon flavescens</i>	Reptiles	AQUATIC RIPARIAN
Snapping Turtle	<i>Chelydra serpentina</i>	Reptiles	AQUATIC RIPARIAN
Common Checkered Whiptail	<i>Aspidoscelis tessellata</i>	Reptiles	RIPARIAN SHORT GRASS STEPPE WOODLANDS
Chihuahuan Spotted Whiptail	<i>Aspidoscelis exsanguis</i>	Reptiles	RIPARIAN SHORT GRASS STEPPE WOODLANDS
Plateau Striped Whiptail	<i>Aspidoscelis velox</i>	Reptiles	RIPARIAN SHORT GRASS STEPPE WOODLANDS
Red-winged Blackbird	<i>Agelaius phoeniceus</i>	Birds	AQUATIC RIPARIAN
Indigo Bunting	<i>Passerina cyanea</i>	Birds	AQUATIC RIPARIAN
Lark Bunting	<i>Calamospiza melanocorys</i>	Birds	RIPARIAN SHORT GRASS STEPPE
Bushtit	<i>Psaltiriparus minimus</i>	Birds	RIPARIAN SHORT GRASS STEPPE WOODLANDS
Gray Catbird	<i>Dumetella carolinensis</i>	Birds	RIPARIAN
Yellow-breasted Chat	<i>Icteria virens</i>	Birds	AQUATIC RIPARIAN
Mountain Chickadee	<i>Poecile gambeli</i>	Birds	RIPARIAN SHORT GRASS STEPPE WOODLANDS
Brown-headed Cowbird	<i>Molothrus ater</i>	Birds	AQUATIC RIPARIAN SHORT GRASS STEPPE WOODLANDS
Sandhill Crane	<i>Grus canadensis</i>	Birds	AQUATIC RIPARIAN SHORT GRASS STEPPE
American Crow	<i>Corvus brachyrhynchos</i>	Birds	RIPARIAN SHORT GRASS STEPPE WOODLANDS
Yellow-billed Cuckoo (eastern pop)	<i>Coccyzus americanus occidentalis</i>	Birds	AQUATIC RIPARIAN

Long-billed Curlew	<i>Numenius americanus</i>	Birds	AQUATIC RIPARIAN SHORT GRASS STEPPE
Dickcissel	<i>Spiza americana</i>	Birds	SHORT GRASS STEPPE
Mourning Dove	<i>Zenaida macroura</i>	Birds	RIPARIAN SHORT GRASS STEPPE WOODLANDS
Mallard Duck	<i>Anas platyrhynchos</i>	Birds	AQUATIC RIPARIAN SHORT GRASS STEPPE
Bald Eagle	<i>Haliaeetus leucocephalus</i>	Birds	AQUATIC RIPARIAN SHORT GRASS STEPPE
Peregrine Falcon	<i>Falco peregrinus</i>	Birds	AQUATIC RIPARIAN SHORT GRASS STEPPE
Prairie Falcon	<i>Falco mexicanus</i>	Birds	AQUATIC RIPARIAN SHORT GRASS STEPPE
House Finch	<i>Haemorhous mexicanus</i>	Birds	RIPARIAN SHORT GRASS STEPPE WOODLANDS
Northern Flicker	<i>Colaptes auratus</i>	Birds	RIPARIAN SHORT GRASS STEPPE WOODLANDS
Ash-throated Flycatcher	<i>Myiarchus cinerascens</i>	Birds	RIPARIAN SHORT GRASS STEPPE
Olive-sided Flycatcher	<i>Contopus cooperi</i>	Birds	RIPARIAN WOODLANDS
Lesser Goldfinch	<i>Spinus psaltria</i>	Birds	RIPARIAN SHORT GRASS STEPPE WOODLANDS
Common Grackle	<i>Quiscalus quiscula</i>	Birds	AQUATIC RIPARIAN SHORT GRASS STEPPE
Black-headed Grosbeak	<i>Pheucticus melanocephalus</i>	Birds	AQUATIC RIPARIAN WOODLANDS
Blue Grosbeak	<i>Passerina caerulea</i>	Birds	RIPARIAN
Ferruginous Hawk	<i>Buteo regalis</i>	Birds	RIPARIAN SHORT GRASS STEPPE

Red-tailed Hawk	<i>Buteo jamaicensis</i>	Birds	AQUATIC RIPARIAN SHORT GRASS STEPPE
Swainson's Hawk	<i>Buteo swainsoni</i>	Birds	RIPARIAN SHORT GRASS STEPPE
Great Blue Heron	<i>Ardea herodias</i>	Birds	AQUATIC RIPARIAN
White-faced Ibis	<i>Plegadis chihi</i>	Birds	AQUATIC RIPARIAN
Pinyon Jay	<i>Gymnorhinus cyanocephalus</i>	Birds	RIPARIAN SHORT GRASS STEPPE
American Kestrel	<i>Falco sparverius</i>	Birds	RIPARIAN SHORT GRASS STEPPE
Killdeer	<i>Charadrius vociferus</i>	Birds	AQUATIC RIPARIAN SHORT GRASS STEPPE
Western Kingbird	<i>Tyrannus verticalis</i>	Birds	AQUATIC RIPARIAN SHORT GRASS STEPPE
Belted Kingfisher	<i>Megaceryle alcyon</i>	Birds	AQUATIC RIPARIAN
Horned Lark	<i>Eremophila alpestris</i>	Birds	AQUATIC SHORT GRASS STEPPE
Eastern Meadowlark	<i>Sturnella magna</i>	Birds	SHORT GRASS STEPPE
Western Meadowlark	<i>Sturnella neglecta</i>	Birds	RIPARIAN SHORT GRASS STEPPE
Northern Mockingbird	<i>Mimus polyglottos</i>	Birds	RIPARIAN SHORT GRASS STEPPE WOODLANDS
Common Nighthawk	<i>Chordeiles minor</i>	Birds	AQUATIC RIPARIAN SHORT GRASS STEPPE
Pygmy Nuthatch	<i>Sitta pygmaea</i>	Birds	RIPARIAN
White-breasted Nuthatch	<i>Sitta carolinensis</i>	Birds	RIPARIAN WOODLANDS
Bullock's Oriole	<i>Icterus bullockii</i>	Birds	AQUATIC RIPARIAN
Baltimore Oriole	<i>Icterus galbula</i>	Birds	AQUATIC RIPARIAN
Scott's Oriole	<i>Icterus parisorum</i>	Birds	RIPARIAN
Burrowing Owl	<i>Athene cunicularia</i>	Birds	RIPARIAN SHORT GRASS STEPPE

Great Horned Owl	<i>Bubo virginianus</i>	Birds	AQUATIC RIPARIAN SHORT GRASS STEPPE WOODLANDS
Long-eared Owl	<i>Asio otus</i>	Birds	RIPARIAN WOODLANDS
Wilson's Phalarope	<i>Phalaropus tricolor</i>	Birds	AQUATIC RIPARIAN
Say's Phoebe	<i>Sayornis saya</i>	Birds	AQUATIC RIPARIAN SHORT GRASS STEPPE
Mountain Plover	<i>Charadrius montanus</i>	Birds	AQUATIC SHORT GRASS STEPPE
Snowy Plover	<i>Charadrius nivosus</i>	Birds	AQUATIC RIPARIAN SHORT GRASS STEPPE
Wild Turkey	<i>Meleagris gallopavo</i>	Birds	RIPARIAN WOODLANDS
Scaled Quail	<i>Callipepla squamata</i>	Birds	RIPARIAN SHORT GRASS STEPPE
Chihuahuan Raven	<i>Corvus cryptoleucus</i>	Birds	RIPARIAN SHORT GRASS STEPPE
Common Raven	<i>Corvus corax</i>	Birds	AQUATIC RIPARIAN SHORT GRASS STEPPE WOODLANDS
Greater Roadrunner	<i>Geococcyx californianus</i>	Birds	RIPARIAN SHORT GRASS STEPPE
Williamson's Sapsucker	<i>Sphyrapicus thyroideus</i>	Birds	RIPARIAN WOODLANDS
Loggerhead Shrike	<i>Lanius ludovicianus</i>	Birds	RIPARIAN SHORT GRASS STEPPE
Baird's Sparrow	<i>Ammodramus bairdii</i>	Birds	SHORT GRASS STEPPE
Black-throated Sparrow	<i>Amphispiza bilineata</i>	Birds	RIPARIAN SHORT GRASS STEPPE
Brewer's Sparrow	<i>Spizella breweri</i>	Birds	RIPARIAN SHORT GRASS STEPPE
Cassin's Sparrow	<i>Peucaea cassinii</i>	Birds	SHORT GRASS STEPPE
Chipping Sparrow	<i>Spizella passerina</i>	Birds	RIPARIAN SHORT GRASS STEPPE WOODLANDS
Lark Sparrow	<i>Chondestes grammacus</i>	Birds	RIPARIAN SHORT GRASS STEPPE

Rufous-crowned Sparrow	<i>Aimophila ruficeps</i>	Birds	RIPARIAN
Barn Swallow	<i>Hirundo rustica</i>	Birds	AQUATIC RIPARIAN
Cliff Swallow	<i>Petrochelidon pyrrhonota</i>	Birds	AQUATIC RIPARIAN
N. Rough-winged Swallow	<i>Stelgidopteryx serripennis</i>	Birds	AQUATIC RIPARIAN
Summer Tanager	<i>Piranga rubra</i>	Birds	AQUATIC RIPARIAN
Curve-billed Thrasher	<i>Toxostoma curvirostre</i>	Birds	RIPARIAN SHORT GRASS STEPPE WOODLANDS
Sage Thrasher	<i>Oreoscoptes montanus</i>	Birds	RIPARIAN SHORT GRASS STEPPE WOODLANDS
Canyon Towhee	<i>Melospiza fusca</i>	Birds	RIPARIAN SHORT GRASS STEPPE WOODLANDS
Turkey Vulture	<i>Cathartes aura</i>	Birds	AQUATIC RIPARIAN SHORT GRASS STEPPE
Hooded Warbler	<i>Setophaga citrina</i>	Birds	RIPARIAN
Yellow Warbler	<i>Setophaga petechia</i>	Birds	RIPARIAN
Ladder-backed Woodpecker	<i>Picoides scalaris</i>	Birds	RIPARIAN SHORT GRASS STEPPE
Lewis's Woodpecker	<i>Melanerpes lewis</i>	Birds	RIPARIAN
Red-headed Woodpecker	<i>Melanerpes erythrocephalus</i>	Birds	RIPARIAN SHORT GRASS STEPPE
Bewick's Wren	<i>Thryomanes bewickii</i>	Birds	RIPARIAN SHORT GRASS STEPPE WOODLANDS
Cactus Wren	<i>Campylorhynchus brunneicapillus</i>	Birds	RIPARIAN SHORT GRASS STEPPE
House Wren	<i>Troglodytes aedon</i>	Birds	RIPARIAN WOODLANDS
Rock Wren	<i>Salpinctes obsoletus</i>	Birds	RIPARIAN SHORT GRASS STEPPE
Common Yellowthroat	<i>Geothlypis trichas</i>	Birds	AQUATIC RIPARIAN
Pale Townsend's Big-eared Bat	<i>Corynorhinus townsendii</i>	Mammals	RIPARIAN SHORT GRASS STEPPE WOODLANDS

Big Brown Bat	<i>Eptesicus fuscus</i>	Mammals	RIPARIAN SHORT GRASS STEPPE WOODLANDS
Big Free-tailed Bat	<i>Nyctinomops macrotis</i>	Mammals	RIPARIAN SHORT GRASS STEPPE WOODLANDS
Brazilian Free-tailed Bat	<i>Tadarida brasiliensis</i>	Mammals	RIPARIAN SHORT GRASS STEPPE WOODLANDS
Fringed Myotis	<i>Myotis thysanodes</i>	Mammals	RIPARIAN SHORT GRASS STEPPE WOODLANDS
Hoary Bat	<i>Lasiurus cinereus</i>	Mammals	RIPARIAN SHORT GRASS STEPPE WOODLANDS
Southwestern Myotis	<i>Myotis auriculus</i>	Mammals	RIPARIAN SHORT GRASS STEPPE WOODLANDS
Long-legged Myotis	<i>Myotis volans</i>	Mammals	RIPARIAN SHORT GRASS STEPPE WOODLANDS
Pallid Bat	<i>Antrozous pallidus</i>	Mammals	RIPARIAN SHORT GRASS STEPPE WOODLANDS
Silver-haired Bat	<i>Lasionycteris noctivagans</i>	Mammals	RIPARIAN SHORT GRASS STEPPE WOODLANDS
Western Small-footed Myotis	<i>Myotis ciliolabrum</i>	Mammals	RIPARIAN SHORT GRASS STEPPE WOODLANDS
Yuma Myotis	<i>Myotis yumanensis</i>	Mammals	RIPARIAN SHORT GRASS STEPPE WOODLANDS
Bobcat	<i>Lynx rufus</i>	Mammals	RIPARIAN SHORT GRASS STEPPE WOODLANDS
Colorado Chipmunk	<i>Tamias quadrivittatus</i> <i>quadrivittatus; australis;</i> <i>oscuraensis</i>	Mammals	RIPARIAN SHORT GRASS STEPPE WOODLANDS
Coyote	<i>Canis latrans</i>	Mammals	RIPARIAN SHORT GRASS STEPPE WOODLANDS



Mule Deer	<i>Odocoileus hemionus</i>	Mammals	RIPARIAN SHORT GRASS STEPPE WOODLANDS
Black-tailed Prairie Dog	<i>Cynomys ludovicianus ludovicianus</i>	Mammals	RIPARIAN SHORT GRASS STEPPE WOODLANDS
Badger	<i>Taxidea taxus</i>	Mammals	SHORT GRASS STEPPE WOODLANDS
Common Gray Fox	<i>Urocyon cinereoargenteus</i>	Mammals	RIPARIAN SHORT GRASS STEPPE WOODLANDS
Swift Fox	<i>Vulpes velox</i>	Mammals	AQUATIC RIPARIAN SHORT GRASS STEPPE WOODLANDS
Botta's Pocket Gopher	<i>Thomomys bottae</i> <i>actuosus; alienus; aureus;</i> <i>collis; connectens;</i> <i>cultellus; fulvus;</i> <i>guadalupensis; lachuguilla;</i> <i>mearnsi; morulus;</i> <i>opulentus; paguatae;</i> <i>pectoralis; peramplus;</i> <i>pervagus; planorum;</i> <i>rufidulus; ruidosae; tol</i>	Mammals	RIPARIAN SHORT GRASS STEPPE WOODLANDS
Mountain Lion	<i>Puma concolor</i>	Mammals	RIPARIAN SHORT GRASS STEPPE WOODLANDS
Brush Mouse	<i>Peromyscus boylii</i>	Mammals	RIPARIAN SHORT GRASS STEPPE WOODLANDS
Deer Mouse	<i>Peromyscus maniculatus</i>	Mammals	RIPARIAN SHORT GRASS STEPPE WOODLANDS
N. Grasshopper Mouse	<i>Onychomys leucogaster</i>	Mammals	RIPARIAN SHORT GRASS STEPPE WOODLANDS
Pinyon Mouse	<i>Peromyscus truei</i>	Mammals	RIPARIAN SHORT GRASS STEPPE WOODLANDS
Hispid Pocket Mouse	<i>Chaetodipus hispidus</i>	Mammals	RIPARIAN SHORT GRASS STEPPE WOODLANDS

Plains Pocket Mouse	<i>Perognathus flavescens</i>	Mammals	RIPARIAN SHORT GRASS STEPPE WOODLANDS
Northern Rock Mouse	<i>Peromyscus nasutus</i>	Mammals	RIPARIAN SHORT GRASS STEPPE WOODLANDS
White-footed Mouse	<i>Peromyscus leucopus</i>	Mammals	RIPARIAN SHORT GRASS STEPPE WOODLANDS
Pronghorn	<i>Antilocapra americana americana</i>	Mammals	SHORT GRASS STEPPE WOODLANDS
Common Raccoon	<i>Procyon lotor</i>	Mammals	RIPARIAN SHORT GRASS STEPPE WOODLANDS
Hispid Cotton Rat	<i>Sigmodon hispidus berlandieri; confinis; texianus</i>	Mammals	RIPARIAN SHORT GRASS STEPPE WOODLANDS
Ord's Kangaroo Rat	<i>Dipodomys ordii</i>	Mammals	RIPARIAN SHORT GRASS STEPPE WOODLANDS
S. Plains Wood Rat	<i>Neotoma micropus canescens</i>	Mammals	RIPARIAN SHORT GRASS STEPPE WOODLANDS
White-toothed woodrat	<i>Neotoma leucodon</i>	Mammals	RIPARIAN SHORT GRASS STEPPE WOODLANDS
Ringtail	<i>Bassariscus astutus</i>	Mammals	RIPARIAN SHORT GRASS STEPPE WOODLANDS
Striped Skunk	<i>Mephitis mephitis</i>	Mammals	RIPARIAN SHORT GRASS STEPPE WOODLANDS
Rock Squirrel	<i>Otospermophilus variegatus grammurus</i>	Mammals	RIPARIAN SHORT GRASS STEPPE WOODLANDS
Quick Gloss Snail	<i>Zonitoides arboreus</i>	Molluscs	WOODLANDS
Thin-lipped Vallonia Snail	<i>Vallonia perspectiva</i>	Molluscs	WOODLANDS
Montane Snaggleteooth Snail	<i>Gastrocopta pilsbryana</i>	Molluscs	WOODLANDS
Slim Snaggleteooth Snail	<i>Gastrocopta pellucida</i>	Molluscs	WOODLANDS
Mexican Coil Snail	<i>Helicodiscus eigenmani</i>	Molluscs	WOODLANDS
Minute Gem Snail	<i>Hawaiiia minuscula</i>	Molluscs	WOODLANDS

Beavertail Fairy Shrimp	<i>Thamnocephalus platyurus</i>	Crustaceans	AQUATIC
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**Table 2.** Known and potential threatened, endangered or sensitive species.

Common Name	Scientific Name	Category	Status	GapVeg
Great Plains lady's tresses orchid	<i>Spiranthes magnicamporum</i>	Plant	State NM: Endangered	RIPARIAN
Boreal Chorus Frog	<i>Pseudacris maculata</i>	Amphibians	State NM: Species of Greatest Conservation Need (SGCN)	AQUATIC RIPARIAN
Plains Leopard Frog	<i>Lithobates blairi</i>	Amphibians	State NM: Species of Greatest Conservation Need (SGCN)	AQUATIC RIPARIAN
Tiger Salamander	<i>Ambystoma mavortium mavortium; nebulosum</i>	Amphibians	State NM: Species of Greatest Conservation Need (SGCN)	AQUATIC RIPARIAN SHORTGRASS STEPPE WOODLANDS
Eastern Collared Lizard	<i>Crotaphytus collaris</i>	Reptiles	State NM: Species of Greatest Conservation Need (SGCN)	RIPARIAN SHORTGRASS STEPPE WOODLANDS
Western Diamond-backed Rattlesnake	<i>Crotalus atrox</i>	Reptiles	State NM: Species of Greatest Conservation Need (SGCN)	RIPARIAN SHORTGRASS STEPPE WOODLANDS
Arid Land Ribbonsnake	<i>Thamnophis proximus</i>	Reptiles	State NM: Species of Greatest Conservation Need (SGCN) State NM: Threatened	AQUATIC RIPARIAN
Ornate Box Turtle	<i>Terrapene ornata</i>	Reptiles	State NM: Species of Greatest Conservation Need (SGCN)	RIPARIAN SHORTGRASS STEPPE WOODLANDS
Sandhill Crane	<i>Grus canadensis</i>	Birds	State NM: Species of Greatest Conservation Need (SGCN)	AQUATIC RIPARIAN SHORTGRASS STEPPE
Yellow-billed Cuckoo (eastern pop)	<i>Coccyzus americanus occidentalis</i>	Birds	State NM: Sensitive taxa (informal) State NM: Species of Greatest Conservation Need (SGCN)	AQUATIC RIPARIAN
Long-billed Curlew	<i>Numenius americanus</i>	Birds	State NM: Species of Greatest Conservation Need (SGCN)	AQUATIC RIPARIAN SHORTGRASS STEPPE
Mourning Dove	<i>Zenaida macroura</i>	Birds	State NM: Species of Greatest Conservation Need (SGCN)	RIPARIAN SHORTGRASS STEPPE WOODLANDS

Bald Eagle	<i>Haliaeetus leucocephalus</i>	Birds	State NM: Species of Greatest Conservation Need (SGCN) State NM: Threatened	AQUATIC RIPARIAN SHORTGRASS STEPPE
Peregrine Falcon	<i>Falco peregrinus</i>	Birds	State NM: Species of Greatest Conservation Need (SGCN) State NM: Threatened	AQUATIC RIPARIAN SHORTGRASS STEPPE
Olive-sided Flycatcher	<i>Contopus cooperi</i>	Birds	State NM: Species of Greatest Conservation Need (SGCN)	RIPARIAN WOODLANDS
Ferruginous Hawk	<i>Buteo regalis</i>	Birds	State NM: Species of Greatest Conservation Need (SGCN)	RIPARIAN SHORTGRASS STEPPE
White-faced Ibis	<i>Plegadis chihi</i>	Birds	State NM: Species of Greatest Conservation Need (SGCN)	AQUATIC RIPARIAN
Pinyon Jay	<i>Gymnorhinus cyanocephalus</i>	Birds	State NM: Species of Greatest Conservation Need (SGCN)	RIPARIAN SHORTGRASS STEPPE
Burrowing Owl	<i>Athene cunicularia</i>	Birds	State NM: Species of Greatest Conservation Need (SGCN)	RIPARIAN SHORTGRASS STEPPE
Wilson's Phalarope	<i>Phalaropus tricolor</i>	Birds	State NM: Species of Greatest Conservation Need (SGCN)	AQUATIC RIPARIAN
Mountain Plover	<i>Charadrius montanus</i>	Birds	State NM: Sensitive taxa (informal) State NM: Species of Greatest Conservation Need (SGCN)	AQUATIC SHORTGRASS STEPPE
Snowy Plover	<i>Charadrius nivosus</i>	Birds	State NM: Species of Greatest Conservation Need (SGCN)	AQUATIC RIPARIAN SHORTGRASS STEPPE
Scaled Quail	<i>Callipepla squamata</i>	Birds	State NM: Species of Greatest Conservation Need (SGCN)	RIPARIAN SHORTGRASS STEPPE
Williamson's Sapsucker	<i>Sphyrapicus thyroideus</i>	Birds	State NM: Species of Greatest Conservation Need (SGCN)	RIPARIAN WOODLANDS
Loggerhead Shrike	<i>Lanius ludovicianus</i>	Birds	State NM: Sensitive taxa (informal) State NM: Species of Greatest Conservation Need (SGCN)	RIPARIAN SHORTGRASS STEPPE
Baird's Sparrow	<i>Ammodramus bairdii</i>	Birds	State NM: Species of Greatest Conservation Need (SGCN) State NM: Threatened	SHORTGRASS STEPPE
Sage Thrasher	<i>Oreoscoptes montanus</i>	Birds	State NM: Species of Greatest Conservation Need (SGCN)	RIPARIAN SHORTGRASS STEPPE WOODLANDS
Yellow Warbler	<i>Setophaga petechia</i>	Birds	State NM: Species of Greatest Conservation Need (SGCN)	RIPARIAN
Lewis's Woodpecker	<i>Melanerpes lewis</i>	Birds	State NM: Species of Greatest Conservation Need (SGCN)	RIPARIAN
Red-headed Woodpecker	<i>Melanerpes erythrocephalus</i>	Birds	State NM: Species of Greatest Conservation Need (SGCN)	RIPARIAN SHORTGRASS STEPPE

Pale Townsend's Big-eared Bat	<i>Corynorhinus townsendii</i>	Mammals	State NM: Sensitive taxa (informal)	RIPARIAN SHORTGRASS STEPPE WOODLANDS
Big Free-tailed Bat	<i>Nyctinomops macrotis</i>	Mammals	State NM: Sensitive taxa (informal)	RIPARIAN SHORTGRASS STEPPE WOODLANDS
Fringed Myotis	<i>Myotis thysanodes</i>	Mammals	State NM: Sensitive taxa (informal)	RIPARIAN SHORTGRASS STEPPE WOODLANDS
Long-legged Myotis	<i>Myotis volans</i>	Mammals	State NM: Sensitive taxa (informal)	RIPARIAN SHORTGRASS STEPPE WOODLANDS
Western Small-footed Myotis	<i>Myotis ciliolabrum</i>	Mammals	State NM: Sensitive taxa (informal)	RIPARIAN SHORTGRASS STEPPE WOODLANDS
Yuma Myotis	<i>Myotis yumanensis</i>	Mammals	State NM: Sensitive taxa (informal)	RIPARIAN SHORTGRASS STEPPE WOODLANDS
Mule Deer	<i>Odocoileus hemionus</i>	Mammals	State NM: Species of Greatest Conservation Need (SGCN)	RIPARIAN SHORTGRASS STEPPE WOODLANDS
Black-tailed Prairie Dog	<i>Cynomys ludovicianus ludovicianus</i>	Mammals	State NM: Sensitive taxa (informal) State NM: Species of Greatest Conservation Need (SGCN)	RIPARIAN SHORTGRASS STEPPE WOODLANDS
Swift Fox	<i>Vulpes velox</i>	Mammals	State NM: Sensitive taxa (informal) State NM: Species of Greatest Conservation Need (SGCN)	AQUATIC RIPARIAN SHORTGRASS STEPPE WOODLANDS
Ringtail	<i>Bassariscus astutus</i>	Mammals	State NM: Sensitive taxa (informal)	RIPARIAN SHORTGRASS STEPPE WOODLANDS
Beavertail Fairy Shrimp	<i>Thamnocephalus platyurus</i>	Crustaceans	State NM: Species of Greatest Conservation Need (SGCN)	AQUATIC

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