Navajo Nation
Endangered Species List

Species Accounts

Version 3.08: for Navajo Endangered Species List -- August 2008

NNHP
Navajo Natural Heritage Program

Created and Distributed by:

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PREFACE -- NESL SPECIES ACCOUNTS

Welcome to Version 3.08 of the Navajo Nation Endangered Species List Species Accounts which were produced to accompany The Navajo Nation's August 2008 revision to the Navajo Endangered Species List. The order of Accounts follows the August 2008 revision of the NESL, a copy of which is enclosed for reference. These Accounts were developed and distributed by the Navajo Natural Heritage Program, of the Navajo Nation Department of Fish and Wildlife, to help planners and biologists answer basic questions about species of concern during project planning. Your constructive comments are encouraged.

Species Accounts are preliminary tools for project planning. Their target audiences are project planners, and biologists not familiar with: 1) species' life histories and habitat in ***this*** region; and 2) Tribal and Federal protection requirements. Their purpose is to provide clear-cut information so that basic questions can be answered early in the planning process. Therefore, they should be reviewed as soon as potential species for the project area are identified. Accounts will prove useful early in the planning process, but they should be used as a quick-reference anytime. If protected species are found then more research and likely coordination with the Department will be necessary. At the end of each account is a short bibliography for planning the details of surveys, and answering more in-depth questions.

New! For planning surveys and developing avoidance/mitigation measures, Accounts no longer distinguish between required and recommended activities; i.e. the terms 'suggested survey method' or 'recommended avoidance' are not used in V 3.08. Consider those items found under "Survey Period", "Survey Guidelines" and "Avoidance" to be the necessary steps for consideration of project clearance though the Department's EA review process. The term "Formal Survey Protocol" indicates federally required methodology, often requiring training, Federal permitting, and the use of standard forms. The Service must be consulted if effects on federally listed species are not avoided.

Avoidance measures for aquatic species are based primarily on water quality protection standards found in the current draft of the "Navajo Nation Aquatic Resources Protection Plan" (Navajo Natural Heritage Program, 1994). See the Plan for more information.

The following abbreviations are used throughout the Accounts: ESA = Federal Endangered Species Act; MBTA = Migratory Bird Treaty Act; BGEPA = Bald and Golden Eagle Protection Act; NESL = Navajo Endangered Species List, pursuant to the Navajo Nation Code, Title 17 section 507. NESL groups are defined as follows: Group 2 and 3 species are "endangered". G2 includes those species or subspecies whose prospects of survival or recruitment ***are*** in jeopardy. G3 includes those species or subspecies whose prospects of survival or recruitment are ***likely to be*** in jeopardy in the foreseeable future. G4 are "candidates" and includes those species or subspecies which may be endangered but for which we lack sufficient information to support being listed. The Department is actively seeking information on these species to determine if they warrant inclusion in a different group or removal from the list. G1 species are extirpated on the Navajo Nation and not included in these Accounts.

For animals, the phenology is divided into three parts of the month as follows: e = 1st-10th; m = 11th-20th; l = 21st to month's end. For plants this time scheme applies generally, but is not intended to be as precise.

New! Finally in this version, we have added a Table of Contents, which is hyperlinked for quick and easy navigation to each account. Just click on the page-number link to be directed to the corresponding page. A Table of Contents (TOC) link is included on each page for one-click navigation back to the TOC. The NNHP is no longer printing hard-copies of this document for free distribution. You are free do so; but we also hope that this one digital version is all you will need for easy reference to all information contained in both plant and animal NESL Species Accounts.

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NAVAJO NATION

DIVISION OF NATURAL RESOURCES
DEPARTMENT OF FISH AND WILDLIFE

NAVAJO ENDANGERED SPECIES LIST
Resources Committee Resolution
No. RCS-41-08

September 10, 2008

GROUP 1: Those species or subspecies that no longer occur on the Navajo Nation.

GROUP 2 (G2) & GROUP 3 (G3): "Endangered" -- Any species or subspecies whose prospects of survival or recruitment within the Navajo Nation are in jeopardy or are likely within the foreseeable future to become so.

G2: A species or subspecies whose prospects of survival or recruitment are in jeopardy.

G3: A species or subspecies whose prospects of survival or recruitment are likely to be in jeopardy in the foreseeable future.

GROUP 4: Any species or subspecies for which the Navajo Nation Department of Fish and Wildlife NNDFW does not currently have sufficient information to support their being listed in G2 or G3 but has reason to consider them. The NNDFWL will actively seek information on these species to determine if they warrant inclusion in a different group or removal from the list.

The NNDFW shall determine the appropriate group for listing a species or subspecies due to any of the following factors:

1. The present or threatened destruction, modification, or curtailment of its habitat;
2. Over-utilization for commercial, sporting or scientific purposes;
3. The effect of disease or predation;
4. Other natural or man-made factors affecting its prospects of survival or recruitment within the Navajo Nation; or
5. Any combination of the foregoing factors

NAVAJO ENDANGERED SPECIES LIST – August 2008

	Scientific name	Common name
GROUP 1:		
MAMMALS	*Canis lupus*	Gray Wolf
	Lontra canadensis	Northern River Otter
	Ursus arctos	Grizzly or Brown Bear
FISHES	*Gila elegans*	Bonytail
GROUP 2:		
MAMMALS	*Mustela nigripes*	Black-footed Ferret
BIRDS	*Coccyzus americanus*	Yellow-billed Cuckoo
	Empidonax traillii extimus	Southwestern Willow Flycatcher
	Haliaeetus leucocephalus	Bald Eagle
AMPHIBIANS	*Lithobates pipiens*	Northern Leopard Frog
FISHES	*Gila cypha*	Humpback Chub
	Gila robusta	Roundtail Chub
	Ptychocheilus lucius	Colorado Pikeminnow
	Xyrauchen texanus	Razorback Sucker
PLANTS	*Astragalus cutleri*	Cutler's Milk-vetch
	Astragalus humillimus	Mancos Milk-vetch
	Erigeron rhizomatus	Rhizome Fleabane
	Pediocactus bradyi	Brady Pincushion Cactus
	Sclerocactus mesae-verdae	Mesa Verde Cactus
GROUP 3:		
MAMMALS	*Antilocapra americana* [1]	Pronghorn [1]
	Ovis canadensis [2]	Bighorn Sheep [2]
BIRDS	*Aquila chrysaetos*	Golden Eagle
	Buteo regalis	Ferruginous Hawk
	Cinclus mexicanus	American Dipper
	Strix occidentalis lucida	Mexican Spotted Owl
INVERTEBRATES	*Speyeria nokomis*	Western Seep Fritillary
PLANTS	*Allium gooddingii*	Gooding's Onion
	Asclepias welshii	Welsh's Milkweed
	Astragulus cremnophylax var. *hevroni*	Marble Canyon Milk-vetch
	Astragalus cronquistii	Cronquist Milk-vetch
	Astragalus naturitensis	Naturita Milk-vetch
	Carex specuicola	Navajo Sedge
	Erigeron acomanus	Acoma Fleabane
	Errazurizia rotundata	Round Dunebroom
	Lesquerella navajoensis	Navajo Bladderpod
	Pediocactus peeblesianus ssp. *fickeiseniae*	Fickeisen Plains Cactus
	Penstemon navajoa	Navajo Penstemon
	Perityle specuicola	Alcove Rock Daisy
	Platanthera zothecina	Alcove Bog-orchid
	Zigadenus vaginatus	Alcove Death Camas

NAVAJO ENDANGERED SPECIES LIST – August 2008

	Scientific name	Common name
GROUP 4:		
MAMMALS	*Corynorhinus townsendii*	Townsend's Big-eared Bat
	Dipodomys microps	Chisel-toothed Kangaroo Rat
	Dipodomys spectabilis [3]	Banner-tailed Kangaroo Rat [3]
	Microtus mogollonensis	Navajo Mountain Vole
	Perognathus amplus cineris	Wupatki [Arizona] Pocket Mouse
	Vulpes macrotis	Kit Fox
BIRDS	*Accipiter gentilis*	Northern Goshawk
	Aechmophorus clarkia	Clark's Grebe
	Aegolius acadicus	Northern Saw-whet Owl
	Athene cunicularia	Burrowing Owl
	Ceryle alcyon	Belted Kingfisher
	Charadrius montanus	Mountain Plover
	Dendragapus obscurus	Dusky Grouse
	Dendroica petechia	Yellow Warbler
	Empidonax hammondii	Hammond's Flycatcher
	Falco peregrinus	Peregrine Falcon
	Glaucidium gnoma	Northern Pygmy-Owl
	Gymnogyps californianus	California Condor
	Otus flammeolus	Flammulated Owl
	Patagioenas fasciata	Band-tailed Pigeon
	Picoides dorsalis	American Three-toed Woodpecker
	Porzana carolina	Sora
	Tachycineta bicolor	Tree Swallow
	Vireo vicinior	Gray Vireo
REPTILES	*Lampropeltis triangulum*	Milk Snake
	Sauromalus ater	Chuckwalla
FISHES	*Catostomus discobolus*	Bluehead Sucker
	Cottus bairdi	Mottled Sculpin
INVERTEBRATES	*Oreohelix strigosa*	Rocky Mountainsnail
	Oreohelix yavapai	Yavapai Mountainsnail
	Oxyloma kanabense	Kanab Ambersnail
PLANTS	*Aliciella formosa*	Aztec Gilia
	Amsonia peeblesii	Peebles Blue-star
	Asclepias sanjuanensis	San Juan Milkweed
	Astragalus beathii	Beath Milk-vetch
	Astragalus heilii	Heil's Milk-vetch
	Atriplex garrettii var. navajoensis	Navajo Saltbush
	Camissonia atwoodii	Atwood's Camissonia
	Cirsium rydbergii	Rydberg's Thistle
	Cypripedium parviflorum var. pubescens	Yellow Lady's Slipper
	Cystopteris utahensis	Utah Bladder-fern
	Ericameria arizonica	Grand Canyon Goldenweed
	Erigeron sivinskii	Sivinski's Fleabane
	Eriogonum lachnogynum var. sarahiae	Sarah's Buckwheat
	Phacelia indecora	Bluff Phacelia
	Primula specuicola	Cave Primrose
	Psorothamnus arborescens var. pubescens	Marble Canyon Dalea
	Puccinella parishii	Parish's Alkali Grass
	Salvia pachyphylla ssp. eremopictus	Arizona Rose Sage
	Sclerocactus cloverae brackii	Brack Hardwall Cactus
	Symphyotrichum welshii	Welsh's American-aster

NAVAJO ENDANGERED SPECIES LIST – August 2008

Scientific name Common name

[1] G3 designation **excludes** NNDFW Management Unit 16 'New Lands', the boundaries of which are: From Sanders, AZ east along Unit 4 boundary to the Zuni boundary; south along the boundary past AZ Hwy 61 to the Navajo Nation/state boundary; west along the boundary past US Hwy 666 to the Navajo Nation/state boundary; north along Rd 2007 to Navajo, AZ; west to the north and south of Interstate 40 to the state/Petrified Forest National Park boundary; north along the boundary to the Unit 8 boundary; east along the boundary to US Hwy 191; south to Chambers and east to Sanders. For a Unit 16 map, contact NNDFW, P.O. Box 1480, Window Rock, AZ, 86515, 928 871-6451.

[2] Special hunts of *Ovis canadensis* may be conducted in Management Unit 11 for management purposes.

[3]Group 4 status for this species pertains only to the populations in Arizona and Utah; populations in the New Mexico portion of the Navajo Nation are not considered for this designation.

Navajo Nation
Endangered Species List

GROUP
2

BLACK-FOOTED FERRET
(MUSTELA NIGRIPES)

Navajo/Federal Statuses: NESL G2 / listed endangered 11 MAR 1967 (32FR:4001).

Distribution: Former range extended from Canadian Great Plains to U.S. inter-mountain region and the Southwest. Navajo Nation historic records include: Mexican Springs, NM, 1948; Keams Canyon, Oraibi, Howell Mesa, AZ, pre-1960. No known wild ferrets on the Navajo Nation except for those associated with the Arizona Game & Fish Dept. re-introduction on Tribal Ranch lands of Big Boquillas in Aubrey Valley, Coconino Co.; there are likely prairie dog colonies of sufficient size elsewhere to support ferrets that have not been surveyed.

Habitat: Medium to large active prairie dog towns (>80 ha, and ≥20 burrows/ha) or complex of towns (two or more towns within 7 km). Prairie dogs are their main food source, and burrows are used for denning and rearing young. On the Navajo Nation, prairie dogs occupy extensive areas in low- to mid-elevation (1200-2000 m), plains and desert grassland and desertscrub habitats, and are recognized by clusters of burrows (10-15 cm dia.) with associated dirt mounds (approx. 60 cm dia., 10-20 cm height).

Similar Species: Long-tailed Weasel has shorter body, yellowish-white belly, with brown above and, in Southwest usually has a dark mask; mink are mostly uniform dark brown with white chin; European ferret (sold in pet industry) is very similar to *M.nigripes*, but has long hair, is variable in color and tail is usually dark the entire length.

Phenology:

e.MAR-l.APR:	mating
e.MAY-e.JUN:	birthing of young
l.JUN-l.JUL:	young first emerge from burrows
e.SEP-e.OCT:	young independent from parents, dispersal
year-round:	nocturnal, non-hibernating residents of prairie dog towns

Survey Guidelines: Preliminary survey* of prairie dog towns >4 ha to determine size and estimate burrow density; formal diurnal (1 DEC-31 MAR [15 APR*]) or nocturnal (1 JUL-15 SEP [31 OCT**]) survey during project year for towns >49-81 ha or towns or complexes >81 ha, and including at a minimum the portions of towns within ½ mile of project.

*Navajo Fish and Wildlife Department. 1985. Black-footed ferret guidelines for the Navajo Ind. Reserv.

**U.S. Fish and Wildlife Service. 1989. Black-footed ferret survey guidelines for compliance with the endangered species act. Denver & Albuquerque.

Avoidance: No alteration of prairie dog towns year-round where ferrets occur, or where no recent surveys have been conducted. Negative survey results are valid indefinitely if coverage included the entire town or complex (i.e., all towns within 7 km), otherwise results are valid for 1 year. Certain exceptions exist for actions of limited disturbance (see guidelines).

References:

Clark, T.W., T.M. Campbell, M.H. Schroeder and L. Richardson. 1984. Handbook of methods for locating black-footed ferrets. Wyoming Bur. Land Manage., Wildlife Technical Bulletin No.1. 39pp.

Fortenbery, D.K. 1972. Characteristics of the black-footed ferret. U.S. Dept. Interior, Fish & Wildlife Service, Resource Pub. 109. (description)

U.S. Fish & Wildlife Service. 1988. Black-footed ferret recovery plan. Denver.

Mikesic, D.G. 2008. Species Account for *Mustela nigripes*. Navajo Natural Heritage Program, P.O. Box 1480, Window Rock, AZ 86515.
For additional copies, visit: http://nnhp.nndfw.org; call 928-871-6472; or email: dmikesic@nndfw.org Revised: 17 MAR 2008

YELLOW-BILLED CUCKOO
(*COCCYZUS AMERICANUS*)

Navajo/Federal Statuses: NESL G2 / western U.S. 'Distinct Population Segment' listed as candidate on 25 JUL 2001 (66FR:38611); MBTA.

Distribution: Breeding range includes all eastern U.S. states, and formerly throughout most western U.S. states and northern Mexico (extirpated from British Columbia, WA, OR, and NV). Currently the western U.S. cuckoo population (which includes the Navajo Nation) is comprised of rare, local breeders in disjunct riparian habitats of major river valleys. Breeding may occur at all elevations throughout Navajo Nation, but currently only known from several sections of the San Juan River. Potential for breeding may also occur along the Little Colorado and Colorado rivers, within Canyon de Chelly, Chinle Valley, and other canyons or streams with appropriate habitat. Winters in Central and South America; migratory habitat for Navajo Nation is unknown.

Habitat: Nests within close proximity to water in mature riparian woodlands with dense understories that are, preferably, ≥17 ha with a minimum of 3 ha of closed-canopy broad-leaved forest; will also nest in orchards adjacent to river bottoms. Preferred riparian woodlands and nest substrate consists of willow, cottonwood, alder, mesquite, hackberry, soapberry, and cultivated fruit trees.

Similar Species: Body/tail size and shape, coloration, and call distinguish this species.

Phenology:

l.MAY-l.JUN:	arrival to breeding areas
m.JUN-m.JUL:	pair formation and nest building
l.JUN-e.AUG:	egg laying and incubation (9-11 days)
m.JUL-l.AUG:	nestling period (7-9 days)
l.AUG-l.SEP:	adults and young depart breeding area

Survey Method: ≥2 tape-playback surveys between 15 JUN-30 JUL, separated by ≥10 days.

Avoidance: No activity within 0.2 km (⅛ mi) of active nest from 1 JUN-15 SEP; extreme disturbances (e.g. blasting) may require larger buffer; no alteration of suitable habitat year-round within 0.4 km of habitat patches used for breeding, or potential habitat until surveyed.

References:

Hughes, J.M. 1999. Yellow-billed Cuckoo (*Coccyzus americanus*). *In* The Birds of North America, No.418 (A.Poole and F.Gill, eds.). The Birds of North America, Inc., Philadelphia, PA. (description p.2)

SOUTHWESTERN WILLOW FLYCATCHER
(*EMPIDONAX TRAILLII EXTIMUS*)

Navajo/Federal Statuses: NESL G2 / listed endangered 27 FEB 1995 (60FR:10694) with Critical Habitat proposed 12 NOV 2004 (69FR:60705); MBTA.

Distribution: Breeding range includes AZ, NM, southwestern CO, and southern portions of CA, NV, and UT. Breeding may occur at any elevation (except possibly above 2600 m) throughout Navajo Nation where appropriate habitat exists. Breeding is known to occur along the San Juan and Colorado Rivers. Migrant flycatchers have been found in less dense or abundant riparian habitat across Navajo Nation.

Habitat: Nesting is in dense riparian vegetation near surface water or saturated soil; either in monotypic or mixed stands of native (e.g. willow) and/or exotic (e.g. tamarisk or Russian olive) species, with or without an over-story. Vegetation is typically ≥3 m high, dense (i.e. a thicket) with a closed canopy, although the understory may be dispersed or clumped (especially when tamarisk or Russian olive). See Sogge *et.al*. 1997 for details. Nesting habitat greatly varies in size and shape, may be as small at 0.8 ha, but does not include linear riparian zones <10 m wide. Migrant flycatchers may use riparian habitats unsuitable for breeding and non-riparian areas.

Similar Species: Other *Empidonax* spp.; *extimus* ssp. nests in riparian habitat and has distinct "*fitz-bew*" song. Western Wood Pewee lacks white eye-ring.

Phenology:

l.APR-m.JUN:	arrival to breeding areas (male may arrive 1-2 weeks before female)
m.MAY-l.JUN:	nest building (2nd attempts into m.JUL usually within 20 m of 1st)
e.JUN-l.JUN:	egg laying
l.JUN-l.AUG:	fledging (may use non-riparian habitats near breeding area)
≥ m.SEP:	adults and young depart breeding area

Formal Survey Protocol: ≥5 surveys, one in each period of 15-31 MAY and 1-21 JUN, and ≥3 surveys during 22 JUN-17 JUL, with ≥5 days between surveys. Federal permit required.
U.S. Fish & Wildlife Service. 2000. Southwestern Willow Flycatcher Protocol Revision. replaces:
Sogge M.K.,R.M. Marshall,S.J. Sferra,& T.J. Tibbitts. 1997. A southwestern willow flycatcher natural history summary and survey protocol. National Park Service Cooperative Park Studies Unit/USGS Colorado Plateau Research Station-Northern Arizona University. NRTR-97/12.

Avoidance: No activity within 0.4 km (¼ mi) of potential habitat if no survey information; or within 0.4 km of active nest from 1 MAY-31 AUG; buffer will likely be less depending on activity type and noise level if nest is known; no alteration of suitable habitat year-round within 0.4 km of habitat patches used for breeding, or potential habitat until surveyed. No activity within migratory habitat from1MAY-15JUN.

References: Recovery Plan - 2002

Hubbard, J.P. 1987. The status of the willow flycatcher in New Mexico. Endangered Species Program, New Mexico Dept.Game & Fish, Santa Fe. 29pp.
Sedgwick, J.A. 2000. Willow Flycatcher (*Empidonax traillii*). *In* The Birds of North America, No.533 (A.Poole and F.Gill, eds.). The Birds of North America, Inc., Philadelphia, PA. (description p.2)
Sferra, S.J.,T.E. Corman,C.E. Paradzick,J.W. Rourke,J.A. Spencer & M.W. Sumner. 1997. Arizona Partners in Flight southwestern willow flycatcher survey: 1993-1996 summary report. Technical Report 113. Arizona Game and Fish Dept., Nongame and Endangered Wildlife Program. Phoenix.

BALD EAGLE
(*HALIAEETUS LEUCOCEPHALUS*)

Navajo/Federal Statuses: NESL G2 / delisted 9 JUL 2007 (72FR:37345), except perhaps for Sonoran population in AZ; BGEPA, with revised definition of 'disturb' (72FR:31131); MBTA.

Distribution: Breed across North America, from the Gulf of Mexico to the Arctic; most nesting in the Southwest is limited to the Salt, Verde, Animas, and Gila Rivers. There are few nesting records on Navajo Nation; and migrants use various lakes, including (but not limited to): Wheatfields, Tsaile, Many Farms, Morgan, Red and Black Lakes, and various lakes in the Chuska Mountains. Wintering eagles occur along the San Juan and Colorado Rivers.

Habitat: Typically nest within trees in forested areas, especially mature and old-growth stands, adjacent (usually <2 km) to large bodies of water with suitable forage of waterfowl and fish; rarely uses cliff face adjacent to large body of water. Winter roost in large trees in forests, river bottoms, or near canyon rims, usually within a few miles of ponds, lakes and rivers with adequate prey. Ponds and lakes are used until completely iced-over and prey availability is reduced.

Similar Species: Immature Golden Eagle resembles immature Bald, but has white restricted to base of tail and primary feathers.

Phenology:

e.FEB-m.MAR:	occupation of breeding area, nest-building, courtship and egg-laying
e.MAR-l.APR:	incubation (35 days)
e.JUN-l.JUL:	nestling period (8-14 weeks)
e.AUG-l.SEP:	fledgling, independence of young (4-10 weeks, variable)
e.OCT-m.DEC:	fall migration
e.DEC-l.FEB:	peak wintering population
m.JAN-m.APR:	spring migration

Survey Method: ≥1 pedestrian or aerial survey with high-power optics in suitable habitat during 1 FEB-15 JUN for nesting eagles; 1 DEC-31 MAR, examining likely perch sites and foraging areas for migrating/wintering eagles.

Avoidance: For wintering eagles, no activity during 15 OCT-15 APR within 0.8 km (½ mi) of roost/perch sites or lakes/rivers used for foraging; no tree removal in known roosting habitat. For nesting eagles, use 'Golden and Bald Eagle Nest Protection Policy': for active nests during 15 JAN-15 JUL, no brief activity within 600 m, no light activity within 800 m, no heavy activity within 1 km, and no loud activity within 1.2 km; no infrequent-use structures within 800 m, and no daily-use structures with 1 km of any nest, year-round.

References:

Buehler, D.A. 2000. Bald Eagle (*Haliaeetus leucocephalus*). *In* The Birds of North America, No.506 (A.Poole and F.Gill, eds.). The Birds of North America, Inc., Philadelphia, PA. (description p.2)

Grubb, T.G. and C.E. Kennedy. 1982. Bald Eagle winter habitat on southwestern national forests. Research Paper RM-237. USDA Forest Service, Fort Collins, CO.

Navajo Nation Dept. of Fish & Wildlife. 2008. Golden and Bald Eagle Nest Protection Policy. Unpub.

U.S. Fish and Wildlife Service. 1982. Bald Eagle recovery plan (southwestern population). U.S. Fish and Wildlife Service, Albuquerque, NM.

NORTHERN LEOPARD FROG
(*LITHOBATES*[1] *PIPIENS*)

Navajo/Federal Statuses: NESL G2 / not listed under the ESA.

Distribution: Range includes most of Canada and northeastern U.S. southwest to NV, central AZ and NM. On Navajo Nation, historic records include Chuska Mountains, Little Colorado, Colorado, and San Juan Rivers, Navajo and Chinle Creeks, Canyon de Chelly, and near Tuba City, Cameron, Thoreau, and Newcomb; most of these populations are now extirpated. Potential exists throughout the Navajo Nation where appropriate habitat is present.

Habitat: Breeds in wetlands usually with permanent water and aquatic vegetation (especially cattails), ranging from irrigation ditches and small streams to rivers, and small ponds and marshes to lakes or reservoirs.

Similar Species: *L.pipiens* has dorsolateral folds and a spotted dorsum; bullfrog is 2-3 times larger; striped chorus frog is smaller with spots and stripes; canyon treefrog has enlarged toe discs.

Phenology:

m.APR-l.JUL:	breeding & egg-laying
m.JUN-l.SEP:	larval stage & metamorphosis
>l.SEP:	overwintering

Survey Method: ≥1 pedestrian survey during 1 MAY-31 JUL (1 JUN-31 JUL for elevations >2100 m); habitat evaluation may be done year-round.

Avoidance: Within occupied habitat, no surface disturbance (year-round) within 60 m of lakes, 15-60 m of streams (depending on stream category, per Navajo Natural Heritage Program, 1994), or 60 m of wetlands; and avoid upstream activities that impact water quantity and chemistry.

References:

Degenhardt, W.G., C.W. Painter, A.H. Price. 1996. Amphibians and Reptiles of New Mexico. University of New Mexico Press, Albuquerque, NM. (description p.88)

Navajo Natural Heritage Program. 1994. Draft Guidance, Navajo Nation Aquatic Resources Protection Plan. Window Rock, AZ.

Sredl, M.J. 1997. Ranid frog conservation and management. Technical Report 121. Arizona Game and Fish Dept., Phoenix, AZ.

[1] per: Crothers, B.I. (ed.). 2008. Scientific and standard English names of amphibians and reptiles of North America north of Mexico, pp. 1-84. SSAR Herpetological Circular 37.

HUMPBACK CHUB
(*GILA CYPHA*)

Navajo/Federal Statuses: NESL G2 / listed endangered on 11 MAR 1967 (32FR:4001) with designated Critical Habitat 21 MAR 1994 (59FR:13374).

Distribution: Restricted to the Colorado River and a few of its narrow, canyon-bound tributaries in AZ, UT and CO. The largest population is found at the confluence of the Little Colorado (LCR) and Colorado Rivers; nearly all successful spawning downstream of the Glen Canyon Dam occurs within the lower 14 km of the LCR.

Habitat: First-year chubs (<65 mm in length) are found in shallow waters along edges of deeper waters. Adults use a variety of habitats including pools, riffles, and eddies; they seem to prefer whitewater reaches with deep, swirling eddies and the turbulent waters near boulders and submerged rocks. Spawning in LCR is thought to occur over gravel beds in swift water.

Similar Species: Adult razorback suckers have keel-shaped hump, and large, fleshy mouth. Young chubs may be confused with many other minnows.

Phenology:

JAN-FEB:	staging at mouth of LCR by adult chubs
MAR-APR:	adult chubs move upstream into LCR
MAY-JUL:	spawning occurs after peak spring flows in ≈20°C water
AUG-JAN:	some adults move downstream to Colorado River, others remain in LCR through the year

Formal Survey Protocol: Evaluations may be based on the presence of habitat or Federally designated Critical Habitat. Electrofishing or seine surveys may be required if the proposed action may result in an adverse effect to the species. Federal permit required for survey and collection.

Avoidance: Near occupied habitat, no surface disturbance year-round within 60 m of top of stream bank, and prevent changes to water chemistry or quantity upstream. Within federally designated critical habitat, no modification of constituent habitat elements within 100-year floodplain.

References:

Douglas, M.E. and P.C. Marsh. 1996. Population estimates/ population movements of *Gila cypha*, an endangered cyprinid fish in the Grand Canyon region of Arizona. Copeia 1996:15-28.

Minckley, W.L. 1973. Fishes of Arizona. Arizona Game and Fish Dept., Sims Printing Co., Inc. Phoenix, AZ. (description p.98)

U.S. Fish & Wildlife Service. 1990. Humpback chub recovery plan. U.S. Fish & Wildlife Service, Denver, Co.

ROUNDTAIL CHUB
(*GILA ROBUSTA*)

Navajo/Federal Statuses: NESL G2 / not listed under the ESA.

Distribution: Native to large streams and intermediate-sized rivers of the Colorado River System from WY to AZ and NM. On the Navajo Nation it has been extirpated from the Colorado River (Grand Canyon), but is extant in the San Juan and Mancos Rivers. Rarely encountered in recent surveys; they have been found from Shiprock to near Lake Powell with most between Shiprock and Aneth (RM 107-140).

Habitat: Adults inhabit the most permanent water in cool to warm water mid-elevation streams, typically using pools and eddies, adjacent to rapids and boulders. They are often found near cover (e.g. rocks, plant roots) and in pools behind irrigation diversions. Juveniles prefer the margins of flowing water and backwater areas. Spawning occurs over gravel bottoms in runs and pools with ≥25 cm water depth.

Similar Species: Other *Gila* species; see The Nature Conservancy, 1990.

Phenology:

e.APR-l.MAY:	spawning
e.MAY-l.JUN:	young first appear and reach length of 12-28 mm
e.JUL-l.MAR:	growth, dispersal of young; non-breeding season

Survey Method: Evaluations may be based on the presence of habitat. Electrofishing or seine surveys may be required if the proposed action may result in take or significant habitat alterations.

Avoidance: No disturbance year-round within 60 m of top of stream bank, and prevent changes to water chemistry or quantity within, or upstream of occupied habitat.

References:

Holden, P.B. and W. Masslich. 1997. San Juan River recovery implementation program, summary report 1991-1996, PRN-576-2. BIO/WEST, Inc., Logan, UT.

Minckley, W.L. 1973. Fishes of Arizona. Arizona Game and Fish Department, Sims Printing Co., Inc. Phoenix, AZ. (description p.100)

The Nature Conservancy. 1990. Element Stewardship Abstract for *Gila robusta* The Nature Conservancy, Arlington, VA.

COLORADO PIKEMINNOW
(*PTYCHOCHEILUS LUCIUS*)

Navajo/Federal Statuses: NESL G2 / listed endangered on 11 MAR, 1967 (32FR:4001) with designated Critical Habitat 21 MAR 1994 (59FR:13374).

Distribution: Currently restricted to the Upper Colorado River from WY to NM. On the Navajo Nation it has been documented throughout the San Juan River (SJR), from Shiprock to Lake Powell; the mouth of the Mancos River is used during the spring runoff period. The majority of adults use the stretch from about 11 km downstream of Shiprock (RM142) to just downstream of Four Corners (RM117), and spawn in 'The Mixer Area' (RM131-132); young-of-year have primarily been found within the lower 26 km of the SJR just upstream of Lake Powell.

Habitat: Adults use backwaters and flooded riparian areas during spring runoff, and migrate large distances (15-64 km in the SJR) to spawn in riffle-run areas with cobble/gravel substrates. Post-spawning adults primarily use run habitats, with eddies and slackwater also being important. Young-of-year (<120 mm length) use warm backwaters along shorelines. Deeper backwater areas (>1 m deep at confluence with main channel) are the preferred habitat of young fish into the subadult stage (>3 yrs. age and 200-400 mm length). Irrigation canals and ponds connected to SJR may be potential habitat.

Similar Species: Trout species have distinctive adipose fin; no other adult minnows may reach 1-2 m in length, but young are similar to other minnows.

Phenology:

l.JUN-m.JUL:	movements to spawning areas
m.JUL-l.JUL:	spawning occurs post-peak runoff in 22-25°C water
l.JUL-e.AUG:	dispersal from spawning areas

Formal Survey Protocol: None. Evaluations may be based on the presence of habitat or Federally designated Critical Habitat. Electrofishing or seine surveys may be required if the proposed action may result in an adverse effect to the species. Federal permit required for survey and collection.

Avoidance: Near occupied habitat, no surface disturbance year-round within 60 m of top of stream bank, and prevent changes to water chemistry or quantity upstream. Within federally designated critical habitat, no modification of constituent habitat elements within 100-year floodplain.

References:

Holden, P.B. and W. Masslich. 1997. San Juan River recovery implementation program, summary report 1991-1996, PRN-576-2. BIO/WEST, Inc., Logan, UT.

Minckley, W.L. 1973. Fishes of Arizona. Arizona Game and Fish Department, Sims Printing Co., Inc. Phoenix, AZ. (description p.119)

U.S. Fish and Wildlife Service. 1990. Colorado pikeminnow recovery plan. U.S. Fish and Wildlife Service, Denver, CO. 56pp.

RAZORBACK SUCKER
(*XYRAUCHEN TEXANUS*)

Navajo/Federal Statuses: NESL G2 / listed endangered 23 OCT 1991 (56FR:54957) with designated Critical Habitat 21 MAR 1994 (59FR:13374).

Distribution: Restricted to the Colorado River and a few of its warm-water tributaries; regularly found only in Lake Mohave, the upper Green River, UT and the lower Yampa River, CO; rare along the mainstem Colorado River in Marble Canyon and the mouth of the Little Colorado River, San Juan arm of Lake Powell, and upstream within the San Juan River (SJR). The only occurrences recorded for the SJR are from Bluff, UT; in 1976 two adult and 100-150 young were found in an irrigation pond connected to the river by a man-made canal, and in 1988 one adult was captured in the main channel. Results of recent releases of hatchery-raised suckers in the SJR are still pending.

Habitat: In mainstream portions of rivers, pre- and post-spawning suckers mostly use low-flow areas (backwaters over sand and silt substrate, deep eddies, and impoundments), but shallow to deep runs over sandbars and seasonally-flooded shorelines are also important. Spawning occurs in areas with shallow, swift riffles over gravel or cobble substrate, and they may also use backwater habitats. Young-of-year use warm, flooded bottomlands and backwaters. Irrigation canals and ponds connected to the San Juan River may be potential habitat.

Similar Species: Adult humpback chubs have a non-keeled dorsal hump, and do not have a large, fleshy mouth. Young may be confused with other sucker species.

Phenology:

≤m.APR:	move to spawning areas prior to peak spring runoff
m.APR-m.JUN:	spawning occurs during runoff in 9-17°C water
m.JUN-e.MAR:	growth, dispersal of young; non-breeding season

Formal Survey Protocol: None. Evaluations may be based on the presence of habitat or Federally designated Critical Habitat. Electrofishing or seine surveys may be required if the proposed action may result in an adverse effect to the species. Federal permit required for collection.

Avoidance: Near occupied habitat, no surface disturbance year-round within 60 m of top of stream bank, and prevent changes to water chemistry or quantity upstream. Within federally designated critical habitat, no modification of constituent habitat elements within 100-year floodplain.

References:

Bestgen, K.R. 1990. Status review of the razorback sucker, *Xyrauchen texanus*. Colorado State University Larval Fish Laboratory, contribution 44. 92pp.

Holden, P.B. and W. Masslich. 1997. San Juan River recovery implementation program, summary report 1991-1996, PRN-576-2. BIO/WEST, Inc., Logan, UT.

Minckley, W.L. 1973. Fishes of Arizona. Arizona Game and Fish Department, Sims Printing Co., Inc. Phoenix, AZ. (description p.153)

U.S. Fish & Wildlife Service. 1998. Razorback sucker (*Xyrauchen texanus*) Recovery Plan. Denver, Colorado. 81pp.

Astragalus cutleri (Barneby) Welsh
Copper Canyon Milkvetch, Cutler's Milkvetch

Family: Fabaceae

Synonyms: *Astragalus preussii* Gray var. *cutleri* Barneby

NESL Status: G2

Federal Status: None

Plant Description: Moderate, caulescent, short-lived perennial, often flowering as an annual, 10 – 35 cm tall, from a superficial caudex. Stems few to several, ascending to erect, forming bushy clumps. Stipules distinct, 2 – 6.5 mm long; leaves 3 – 13cm long, leaflets 5 – 17 (19), 3 – 17 (20) mm long, (3) 5 – 12 mm broad, elliptic to lanceolate, oblanceolate, or obovate, acute to obtuse or mucronulate, strigulose to glabrous below, glabrous above. Flowers 15 – 16 mm long, white or tinged (or drying) purplish. Pods ascending to erect, stipitate, the stipe 3 – 3.5 mm long, the inflated pod oblong-ellipsoid, 14 – 18 mm long, 9 – 11 mm thick, the valves thinly cartilaginous, greenish suffused (sometimes) with purple, unilocular, glabrous. Flowering and fruiting period is from mid April to early June.

Similar species: Similar to *Astragalus preusii* but differing in a smaller stature, pallid, whitish flowers with a faint blue tinge, and fewer leaflets.

Habitat: Warm desert shrub communities, on sandy, seleniferous soils with level to moderate slopes, on the Shinarump and Chinle Formations. Known populations from ca. 3800ft elevation

General Distribution: San Juan County, Utah, San Juan arm of Lake Powell.

Known Distribution on the Navajo Nation: Copper Canyon and Nokai Canyon, San Juan County, Utah.

Potential Navajo Nation Distribution: Canyons adjacent to Copper and Nokai Canyons where habitat is appropriate

Survey Period: April through early June. This is a mostly annual plant and can therefore only be located/identified during its flowering/fruiting period.

Avoidance: A 200 ft buffer zone is recommended to avoid disturbance; may be more or less, depending on slope, size and nature of the project.

References:

Atwood, D.N. et al. 1991. Utah Threatened, Endangered, and Sensitive Plant Field Guide. U.S. Forest Service Intermountain Region, National Park Service, Bureau of Land Management, Utah Natural Heritage Program, U.S. Fish & Wildlife Service, Environmental Protection Agency, Navajo Nation, and Skull Valley Goshute Tribe.

Cronquist, A. et al., eds. 1989. Intermountain Flora, vol. 3 part B. New York Botanical Garden, Bronx, NY. p. 66 -67.

Roth, D. 2007. Copper Canyon Milk-vetch (*Astragalus cutleri*). Status and Monitoring Report. Unpublished report prepared for the Navajo Natural Heritage Program, Window Rock, AZ 86515. http://nnhp.nndfw.org/docs_reps.htm

Utah Rare Plant Guide Team. 2003. Utah Rare Plant Guide. Utah Native Plant Society. http://www.utahrareplants.org/

Welsh, S. 1998. Astragalus (Leguminosae): Nomenclatural proposals and new taxa. Great Basin Naturalist 58(1), pp. 45-53.

Welsh, S.L., N.D. Atwood, S. Goodrich, L.C. Higgins. 2003. A Utah Flora: Third Edition. Brigham Young University, Provo, UT.

Astragalus cutleri ©Daniela Roth, NNHP

Astragalus cutleri habitat ©Daniela Roth, NNHP

Daniela Roth. 2001. Species account for *Astragalus cutleri*. Navajo Natural Heritage Program, P.O. Box 1480, Window Rock, AZ 86515.
Additional copies at http://nnhp.ndfw.org/ Revised: 15 MAY 2008

Astragalus humillimus Gray ex. Brand.
Mancos Milkvetch

Family: Fabaceae **Synonyms:** *Tragacantha humillima* (Gray) O.Kze, *Phaca humillima* (Gray) Rydb.

NESL Status: G2 **Federal Status:** Listed Endangered (50 FR 26568 26572)

Plant Description: Small, clump or mat forming perennial plants with **persistent spiny leaf stalks**. Stems up to 1 cm long. Leaves up to 4 cm long, with 7 –11 oval leaflets, 0.7 – 2.0 mm long. Flowers lavender to purplish with a conspicuous lighter colored spot in the throat of the corolla tube. Banner 7 – 10mm long, keel and banner petal 6 – 8 mm in length. Fruits ellipsoid, ca. 4.5 mm long and 2 mm wide. Flowers from mid April to early May.

Similar species: *Astragalus micromerius* Barneby does not have persistent spiny leaf stalks.

Habitat: Forms highly localized populations from 4 – 20 acres in size. It is typically found on large, nearly flat sheets of exfoliating whitish-tan colored sandstone, in small depressions and sand filled cracks on or near ledges and mesa tops in slickrock communities of Point Lookout & Cliffhouse Sandstone.

General Distribution: Known only from the Four Corners area of New Mexico, San Juan County, and adjacent Montezuma County, Colorado.

Navajo Nation Distribution: San Juan County, NM, Palmer Mesa east to the Hogback area and south of the San Juan River, to a hogback east of Little Water.

Potential Navajo Nation Distribution: Four Corners area, all slickrock formations of Point Lookout & Cliffhouse Sandstone, and possibly other related members.

Survey Period: Best during the flowering period from mid April to early May, but can be identified most of the year by an experienced individual. Suitable habitat can be identified year round.

Avoidance: A 200 ft buffer zone is recommended to avoid disturbance; may be more or less depending on size and nature of the project.

References:

Knight, P., and D. House. 1989. Mancos Milkvetch (*Astragalus humillimus*) Recovery Plan. Prepared for the U.S. Fish & Wildlife Service, Region 2, Albuquerque, NM.

New Mexico Rare Plant Technical Council. 1999. New Mexico Rare Plants. Albuquerque, NM. New Mexico Rare Plants Homepage. http://nmrareplants.unm.edu

Sivinski, R. 1995 Progress Report. Mancos Milkvetch (*Astragalus humillimus*). Section 6, Segment 10. NM Forestry Division. 6 pp.

Spackman, S. et al. 1997. Colorado Rare Plant Field Guide. Prepared for the Bureau of Land Management, the U.S. Forest Service and the U.S. Fish & Wildlife Service by the Colorado Natural Heritage Program. http://www.cnhp.colostate.edu/rareplants/cover.html

USDI Bureau of Land Management. 1995. The Farmington District Endangered, Threatened, and Sensitive Plant Field Guide. Prepared by Ecosphere Environmental Services, Inc., Farmington, NM.

Astragalus humillimus ©Daniela Roth, NNHP

Astragalus humillimus habitat ©Daniela Roth, NNHP

Erigeron rhizomatus Cronq.
Zuni Fleabane, Rhizome Fleabane

Family: Asteraceae

Synonyms: None

NESL Status: G2

Federal Status: Listed Threatened (50 FR 16680 16682)

Description: Herbaceous perennial with creeping rhizomes; stems 2.5 – 4.5 dm tall, sparsely branching from the base, growing in clumps ca 3 dm in diameter; leaves alternate, oblong, ca. 1 cm long, glabrous with the occasional ciliate hairs on the margins; flower heads solitary, 13 – 16 cm wide, involucral bracts in several series; ray flowers 25 – 45, white or tinged with blue-violet, 6 –7 mm long and 1.3 – 1.5 mm wide; disk flowers yellow. Flowering typically occurs from late May through June.

Similar Species: This species is distinct from other *Erigerons* by its rhizomatus habit, nearly hairless achenes, with 5-6 nerves, and very few hairs on the stems and leaves.

Habitat: Typically only found on fine textured clay hillsides of mid to high elevation between ca. 7000 and 8300ft. It is known from clays derived from the Chinle Formation in the Zuni and Chuska Mountains, and to similar clays of the Baca Formation in the Datil and Sawtooth ranges in New Mexico.

General Distribution: McKinley, San Juan and Catron counties, NM, and Apache Co., AZ.

Navajo Nation Distribution: Slopes of the Chuska Mountains from Lukachukai and west of Red Valley, Apache Co., AZ south to Navajo in McKinley County, NM.

Potential Navajo Nation Distribution: Chuska Mountains and in suitable habitat in the pinion-juniper associations between Lupton, Apache Co., AZ, and Prewitt, McKinley Co., NM.

Survey Period: Best during the flowering period between May and June, but can be identified by an experienced individual through July, possibly August. Suitable habitat can be identified year round.

Avoidance: A 200 ft buffer zone is recommended to avoid disturbance; may be more or less, depending on slope, size and nature of the project.

References:

Arizona Rare Plant Committee. 2001. Arizona rare plant field guide: a collaboration of agencies and organizations. Washington: U.S. Government Printing Office. http://aznps.org/rareplants.html

Christy, K. 2004. *Erigeron rhizomatus* – Survey and Status Report. Unpublished report prepared for the Navajo Nation. http://nnhp.nndfw.org/docs_reps.htm

Cronquist, A. 1974. A revision of the North American species of *Erigeron* north of Mexico. Brittonia 6:121-300.

New Mexico Native plants Protection Advisory Committee. 1984. A handbook of rare and endemic plants of New Mexico. University of New Mexico Press, Albuquerque, NM.

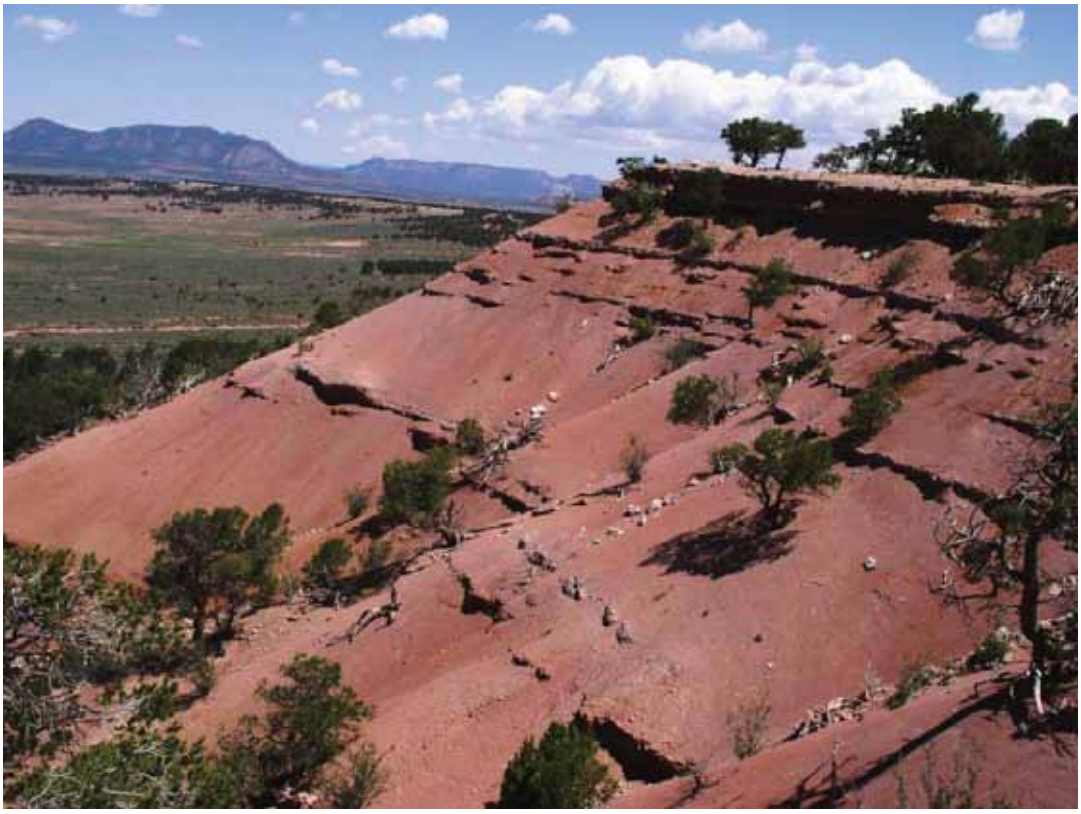
New Mexico Rare Plant Technical Council. 1999. New Mexico Rare Plants. Albuquerque, NM. New Mexico Rare Plants Homepage. http://nmrareplants.unm.edu

USDI Bureau of Land Management. 1995. The Farmington District Endangered, Threatened, and Sensitive Plant Field Guide. Prepared by Ecosphere Environmental Services, Inc., Farmington, NM.

U.S. Fish & Wildlife Service. 1988. Zuni fleabane (*Erigeron rhizomatus*) recovery plan. U.S. Fish & Wildlife Service, New Mexico Ecological Services Field Office, Albuquerque, NM.

Daniela Roth. 2001. Species account for *Erigeron rhizomatus*. Navajo Natural Heritage Program, P.O. Box 1480, Window Rock, AZ 86515.
Additional copies at http://nnhp.nndfw.org/ Revised: 15 MAY 2008

Erigeron rhizomatus ©Daniela Roth, NNHP



Erigeron rhizomatus habitat ©Daniela Roth, NNHP

Daniela Roth. 2001. Species account for *Erigeron rhizomatus*. Navajo Natural Heritage Program, P.O. Box 1480, Window Rock, AZ 86515.
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Pediocactus bradyi L. Benson
Brady Plains Cactus

Family: Cactaceae

Synonyms: *Toumeya bradyi* Earl

NESL Status: G2

Federal Status: Listed Endangered (44 FR 61784 61786)

Plant Description: Small semiglobose cacti, ranging from a 2.5 to 5 cm in diameter. Areoles white, somewhat pectinate. Central spines absent or rarely 1-2. Plants have contractile roots, pulling themselves underground during drought periods. Flowers are straw-yellow. Flowering time is from mid March to mid April.

Similar Species: Can be confused with juvenile forms of *Coryphantha vivipara* (Nutt.) Britton & Rose when not in flower. *P. bradyi* has distinct vertical elongate areoles and the radial spines tend to be shorter than those of *C. vivipara.*

Habitat: Kaibab limestone chips overlaying soils derived from Moenkopi shale and sandstone. It is typically found on gently sloping benches and terraces with sparse vegetation. Populations are known from 3340 – 5200 ft elevation.

Distribution: Coconino Co, AZ, vicinity of Marble Canyon rim.

Navajo Nation Distribution: South of Lees Ferry, east side of the Colorado River, south to the vicinity of Sheep Springs Wash.

Potential Navajo Nation Distribution: Lees Ferry south and west of Echo Cliffs, along the tributary canyons of the Colorado River, south to Shinumo Wash.

Survey Period: Mid March to late April. Suitable habitat can be identified year round.

Avoidance: A 200 ft buffer zone is recommended to avoid disturbance; may be more or less, depending on slope, size and nature of the project.

References:

Arizona Rare Plant Committee. 2001. Arizona rare plant field guide: a collaboration of agencies and organizations. Washington: U.S. Government Printing Office. http://aznps.org/rareplants.html

Benson, L. 1982. The Cacti of the United States and Canada. Stanford University Press, Stanford, CA.

Kelly, K. and J. McGinnis. 1994. Highly Safeguarded Protected Native Plants of Arizona. Arizona Department of Agriculture, Phoenix, AZ.

McDougall, W.B. 1973. Seed Plants of Northern Arizona. Museum of Northern Arizona, Flagstaff, AZ.

Phillips, A.M., B.G. Phillips, and M. Butterwick. 1985. Recovery Plan for the Brady Pincushion Cactus (*Pediocactus bradyi* L.Benson). Prepared for the U.S. Fish & Wildlife Service, Region 2, Albuquerque, NM.

Roth, D. 2004. *Pediocactus bradyi* (Brady Pincushion Cactus) Status Report. Unpublished report prepared for the USFWS. Navajo Natural Heritage Program, Window Rock, AZ. http://nnhp.nndfw.org/docs_reps.htm

Pediocactus bradyi ©Daniela Roth, NNHP

Pediocactus bradyi habitat ©Daniela Roth, NNHP

Daniela Roth. 2001. Species account for *Pediocactus bradyi*. Navajo Natural Heritage Program, P.O. Box 1480, Window Rock, AZ 86515.
Additional copies at http://nnhp.ndfw.org/ Revised: 15 MAY 2008

Sclerocactus mesae-verdae (Boissevain ex Hill & Salisbury) L. Benson
Mesa Verde Cactus

Family: Cactaceae

Synonyms: *Coloradoa mesae-verdae* Boissevain ex Hill & Salisbury

NESL Status: G2

Federal Status: Listed Threatened (44 FR 62471 62474)

Plant Description: Stems are mostly solitary, sometimes in clusters, oval to depressed-globose, 3 – 11 cm long, up to 10 cm in diameter; ribs 13 – 17; central spines absent or rarely one; radial spines 7 –13, straw-colored, spreading, 6 – 13 cm long; flowers yellowish-cream to pinkish, 1 – 3 cm wide, 1 – 3.5 cm long; fruits tan at maturity. Flowering occurs from beginning of April to early May.
Similar Species: *Sclerocactus parviflorus* ssp. *intermedius* has strongly hooked central spines and pink-purple flowers.
Habitat: Salt-desert scrub communities, typically in the Fruitland and Mancos shale formations, but also in the Menefee Formation overlaying Mancos shale. It is most frequently found on the tops of hills or benches and along slopes. Known populations occur between 4900 to 5500ft.

General Distribution: San Juan Co, NM, and adjacent Montezuma Co, CO.
Navajo Nation Distribution: Colorado border south to near Naschitti, NM.
Potential Navajo Nation Distribution: Within the known distribution to the north, south, and west. The eastern limits are still unclear.

Survey Period: Surveys are only acceptable during the flowering & fruiting period from April through May. Suitable habitat can be identified year round.

Avoidance: A 200 ft buffer zone is recommended to avoid disturbance; may be more or less, depending on slope, size, and nature of the project.

Comments: This species has been severely impacted by drought and subsequent predation by insects. Population levels have declined to an all-time low between 2002 and 2004.

References:

Benson, L. 1982. The Cacti of the United States and Canada. Stanford University Press, Stanford, CA.

Heil, K., and J.M. Porter. 1994. *Sclerocactus* (Cactaceae): A Revision. Haseltonia No. 2: 20 - 46.

Ladyman, J. 2004. Status Assessment Report for *Sclerocactus mesae-verdae* (Mesa Verde Cactus). Prepared for: The Navajo Natural Heritage Program, Window Rock, AZ. http://nnhp.nndfw.org/docs_reps.htm

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Spackman, S. et.al.. 1997. Colorado Rare Plant Field Guide. Prepared for the Bureau of Land Management, the U.S. Forest Service and the U.S. Fish & Wildlife Service by the Colorado Natural Heritage Program. http://www.cnhp.colostate.edu/rareplants/cover.html

USDI Bureau of Land Management. 1995. The Farmington District Endangered, Threatened, and Sensitive Plant Field Guide. Prepared by Ecosphere Environmental Services, Inc., Farmington, NM.

U.S. Fish & Wildlife Service. 1984. Mesa Verde Cactus (*Sclerocactus mesae-verdae*) recovery plan. U.S. Fish & Wildlife Service, New Mexico Ecological Services Field Office, Albuquerque, NM.

Daniela Roth. 2001. Species account for *Sclerocactus mesae-verdae*. Navajo Natural Heritage Program, P.O. Box 1480, Window Rock, AZ 86515. Additional copies at http://nnhp.nndfw.org/ Revised: 15 MAY 2008

Sclerocactus mesae-verdae ©Daniela Roth, NNHP

Sclerocactus mesae-verdae habitat ©Daniela Roth, NNHP

Navajo Nation
Endangered Species List

GROUP

3

PRONGHORN
(*ANTILOCAPRA AMERICANA*)

Navajo/Federal Statuses: NESL G3[1] / not listed under the ESA.

Distribution: Range includes most western U.S. states from south-central Canada west to NV and south to AZ, NM, and western TX. Occupied range on Navajo Nation is New Lands[1] area, the southwestern portion north of Flagstaff, and checkerboard lands in New Mexico.

Habitat: Found in grasslands or desertscrub areas with rolling or dissected hills or small mesas, and usually with scattered shrubs and trees (typically juniper and sagebrush).

Similar Species: Smaller in size than mule deer, and Pronghorn has pronged horns and large patches of white on throat, sides of face, rump, and underparts.

Phenology:

e.AUG-l.SEP:	mating season (peak in l.AUG-e.SEP)
e.MAY-m.JUN:	birthing of young (young travel with adult herd at 3 weeks)
l.JUL-l.SEP:	weaning of young

Survey Method: ≥1 pedestrian, automobile or aerial survey throughout year with high-power optics; or consultation with Navajo Nation Department of Fish and Wildlife (NNDFWL).

Avoidance: No disturbance within 1.6 km (1 mile) of known and potential lambing areas during 1 MAY-15 JUN; install wildlife-friendly fences within occupied habitat; avoid disturbances that cause habitat fragmentation of wintering, fawning, and seasonal-movement corridors; consultation with NNDFWL necessary.

References:

Hoffmeister, D.F. 1986. Mammals of Arizona. The University of Arizona Press. (description p.549)

[1]NESL G3 designation **excludes** 'New Lands' (Navajo Fish & Wildlife Management Unit 16), the boundaries of which are defined as: From Sanders, AZ east along the Management Unit 4 boundary line to the Zuni boundary; south along the boundary line past AZ Hwy.61 to the Navajo Nation/state boundary; west along the boundary line past US Hwy.666 to the Navajo Nation/state boundary; north along Rd.2007 to Navajo, AZ; west (to the north and south of Interstate 40) to the state/Petrified Forest National Park boundary; north along the boundary line to the Management Unit 8 boundary; east along the boundary line to US Hwy.191; south to Chambers and east to Sanders.

BIGHORN SHEEP
(*OVIS CANADENSIS*)

Navajo/Federal Statuses: NESL G3[2] / not listed under the ESA.

Distribution: Range of subspecies *O.c.nelsoni* range extends from CA to TX and south to northern Mexico. Present range on Navajo Nation includes San Juan River in UT, and possibly Little Colorado River; with rare sightings along Marble Canyon of the Colorado River. Potential throughout the deep-canyon reaches of San Juan, Colorado, and Little Colorado Rivers.

Habitat: Found year-round in arid, precipitous terrain with rocky slopes, ridges, cliffs, and rugged canyons; vegetation is typically low shrubs, grasses and forbs.

Similar Species: No other wild sheep on Navajo Nation; may be confused with exotic and domestic sheep.

Phenology:

e.NOV-l.DEC:	mating season (peak in AUG)
e.APR-l.JUN:	birthing of young (peak in MAY; young mobile at 1-4 days)
e.OCT-l.NOV:	weaning of young

Survey Method: ≥1 pedestrian or aerial survey throughout year with high-power optics; or consultation with Navajo Nation Department of Fish and Wildlife (NNDFWL).

Avoidance: No disturbance within 1.6 km (1 mile) of lambing areas during 1 APR-1 SEP; minimize disturbance to individuals and habitat year-round, especially activity during 1 APR-30 SEP that prevents access to feeding areas and to San Juan River for water; consultation with NNDFWL necessary.

References:

Hoffmeister, D.F. 1986. Mammals of Arizona. The University of Arizona Press. (description p.554)

[2] Occasional special hunts of *Ovis canadensis* for management / research purposes may be developed and implemented only by the Navajo Nation Department of Fish and Wildlife.

GOLDEN EAGLE
(AQUILA CHRYSAETOS)

Navajo/Federal Statuses: NESL G3 / BGEPA; MBTA; not listed under the ESA.

Distribution: Breeding range extends throughout Canada and western U.S. from SD south to western TX and northern Mexico, and west to the Pacific Coast. Nesting occurs at nearly all elevations across the Navajo Nation, and on nearly all types of cliff substrates including sandstone, limestone, and those of volcanic origin.

Habitat: Nest on steep cliffs, typically ≥30 m in height, although shorter cliffs (≥10 m) infrequently used. Nesting cliffs are normally directly adjacent to foraging habitat of desert grasslands or desertscrub, with only sparse shrubs if present, that provides primary prey of cottontail and jackrabbits. Nests usually placed in middle to upper parts of cliffs in sheltered ledges, potholes, or small caves which provide protection from the elements.

Similar Species: Immature Bald Eagle resembles immature Golden, but Golden has white restricted to base of tail and primary feathers; Turkey Vulture has unfeathered head, and has dark body feathers and gray primaries in flight.

Phenology:

e.JAN-l.FEB:	occupancy of nesting site, nest building, mating
m.FEB-e.APR:	egg-laying period, incubation period (41-45 days)
e.APR-l.JUN:	nestling period (60-75 days)
l.MAY-e.JUL:	fledging of young
l.MAY-l.AUG:	post-fledging period (60-70 days)
≥l.JUL:	dispersal of young from nesting area

Survey Method: Pedestrian or aerial survey with high-power optics for nest sites or breeding adults from 1 MAR-15 JUN. Habitat evaluation may be done year-round, but any large stick nests should be re-surveyed during nesting season.

Avoidance: Use 'Golden and Bald Eagle Nest Protection Policy': for active nests during 15 JAN-15 JUL, no brief activity within 600 m, no light activity within 800 m, no heavy activity within 1 km, and no loud activity within 1.2 km; no infrequent-use permanent structures within 800 m, and no daily-use permanent structures with 1 km of any nest, year-round.

References:

Johnsgard, P.A. 1990. Golden Eagle. Pp.260-268, *In* Hawks, Eagles & Falcons of North America. Smithsonian Institution Press.

Kochert, M.N., K. Steenhof, C.L. McIntyre & E.H. Craig. 2002. Golden Eagle (*Aquila chrysaetos*). *In* The Birds of North America, No.684 (A.Poole and F.Gill, eds.). The Birds of North America, Inc., Philadelphia, PA. (description p.2)

Navajo Nation Dept. of Fish & Wildlife. 2008. Golden and Bald Eagle Nest Protection Policy. Unpub.

Watson, J. 1997. The Golden Eagle. T&AD Poyser Ltd.London.

FERRUGINOUS HAWK
(*BUTEO REGALIS*)

Navajo/Federal Statuses: NESL G3 / MBTA; not listed under the ESA.

Distribution: Breeding range extends from ND and northern TX, west to WA and NV, including northern NM and AZ, and into southern Canada. Winter range extends from CO and southern NE south into Mexico and west to northern CA; Navajo Nation is used by Ferruginous Hawks year-round; most (>90%) breed and winter in northwestern NM, but also occur in Chinle Valley, and Dilkon area.

Habitat: Ferruginous Hawks nest in badlands, flat or rolling desert grasslands, and desertscrub. Most nests on Navajo Nation are on clay or rock pinnacles, small buttes, or short cliffs (< 30 m height); fewer are placed in top of juniper trees or on the ground, and there is one record of a nest on the crossarm of a transmission-line tower. Habitat surrounding nest site must support populations of their preferred prey items of cottontail and jackrabbits, prairie dogs, ground squirrels and gophers.

Similar Species: Other *Buteo* hawks and Northern Harrier: adult Ferruginous Hawk has mostly white underparts and primaries, rufous legs feathered to feet (which form a 'V' in flight when viewed from below), and unbanded white or pale-rufous tail; immatures distinguished by whitish breast, whitish fully-feathered legs, light banding in the tail, little white on back.

Phenology:

e.MAR-l.MAR:	courtship, nest building
m.MAR-m.MAY:	egg-laying and incubation (33 days)
e.MAY-l.JUN:	nestling period (38-50 days)
m.JUN-m.JUL:	fledging of young (peak in l.JUN)
m.JUL-m.SEP:	independence of young, dispersal from natal area
e.SEP-l.NOV:	migration of adults from breeding area

Survey Method: ≥1 pedestrian survey with high-power optics for nest sites and/or breeding adults from 1 MAR-15 JUN, avoiding disturbance to nesting adults until nestlings are ≥20 days old (see 'Avoidance'). Unoccupied Ferruginous Hawk nests may be confused with those of other species, but are most often positioned on/near top of nest substrate.

Avoidance: No disturbance within 0.8 km (½ mi) of occupied nest during 1 MAR-31 JUL for Brief activity; 1.0 km (⅝ mi) for Light activity; 1.2 km (¾ mi) for Heavy activity; and 1.6 km (1 mi) for Loud activity; No daily-use permanent structure any time of year within 1.6 km (1 mi), and no infrequent-use permanent structures within 1.0 km (5/8 mi), of nesting territory. Nests without eggs by May 1st of any year are considered 'inactive' for that breeding season. Activity may commence 30 days post-fledging provided accurate age determination of young. Ferruginous Hawks are especially prone to desert nests if disturbed during incubation. Consult "Ferruginous Hawk Management Guidelines for Nest Protection."

References:

Bechard, M.J. and J.K. Schmutz. 1995. Ferruginous Hawk (*Buteo regalis*). *In* The Birds of North America, No.172 (A.Poole and F.Gill, eds.). The Academy of Natural Sciences, Philadelphia, and The American Ornithologists' Union, Washington, D.C.

N.N. Dept.of Fish & Wildlife. 2005. Ferruginous Hawk Management Guidelines for Nest Protection. Unpub.

Ramakka, J.M. and R.T. Woyewodzic. 1993. Nesting ecology of Ferruginous Hawk in northwestern New Mexico. J.Raptor Res. 27:97-101.

AMERICAN DIPPER
(*CINCLUS MEXICANUS*)

Navajo/Federal Statuses: NESL G3 / MBTA; not listed under the ESA.

Distribution: Resident throughout AK and western Canada, and in isolated populations in most western states and Mexico from eastern Rocky Mountains to the Pacific Coast. Present on Navajo Nation on east and west faces of the Chuska Mountains, upper Canyon de Chelly, Little Colorado River, and upper Piute Canyon near Navajo Mountain. Potential exists anywhere perennial streams have the proper habitat parameters.

Habitat: Nests near clear, unpolluted streams usually ≤15 m in width and ≤2 m in depth, with a variety of riffles, pools, and waterfalls with substrate of rocks, sand, and rubble; instream and streamside boulders are necessary for perches. Nests are placed on ledges or in crevices on stream-bank structures of small cliffs, large rocks, fallen logs and tree roots. Streams used in winter may be larger and deeper, but lack of ice is major selection factor.

Similar Species: Body size, coloration, behavior, and habitat distinguish this species.

Phenology:

e.MAR-l.APR:	arrival to breeding areas, pair formation, mating
l.MAR-l.JUN:	egg-laying/incubation (14-17 days) (2nd broods possible)
m.APR-m.AUG:	nestling period (24-26 days)
m.MAY-m.AUG:	fledging period
l.MAY-m.SEP:	independence (4-24 days) and dispersal of young
e.OCT-l.DEC:	migration if necessary; non-migratory if stream remains unfrozen

Survey Method: ≥1 pedestrian surveys with high-power optics recommended for breeding pairs during 1 APR-15 JUL; habitat evaluation may be done year-round.

Avoidance: For nesting habitat, no surface disturbance within 15-60 m (depending on stream category, per Navajo Natural Heritage Program, 1994) of occupied habitat; no activity within 0.2 km (⅛ mi) of active nest during 15 MAR-15 AUG; buffer may be less depending on activity type and duration, but not less than 0.1 km; avoid upstream activities that affect water quantity and chemistry within occupied habitat.

References:

Kingery, H.E. 1996. American Dipper (*Cinclus mexicanus*). *In* The Birds of North America, No.229 (A.Poole and F.Gill, eds.) The Academy of Natural Sciences, Philadelphia, PA, and the American Ornithologists' Union, Washington, D.C. (description p.2)

Navajo Natural Heritage Program. 1994. Draft Guidance, Navajo Nation Aquatic Resources Protection Plan. Window Rock, AZ.

U.S. Fish and Wildlife Service. 1984. Draft habitat suitability index model for American Dipper (*Cinclus mexicanus*). Division Ecological Services, Sacramento, CA.

MEXICAN SPOTTED OWL
(*STRIX OCCIDENTALIS LUCIDA*)

Navajo/Federal Statuses: NESL G3/listed threatened 16 MAR 1993 (58FR:14248) with designated Critical Habitat 31 AUG 2004 (69FR:53181); MBTA.

Distribution: The *lucida* ssp. range includes central CO and central UT, south through AZ and NM into Mexico. On the Navajo Nation, owls are known to occur within, or adjacent to, the Chuska Mountain Range and Defiance Plateau, Canyon de Chelly, Black Mesa and the extensive canyonlands to the north. Numerous other potential areas exist that have yet to be surveyed.

Habitat: Three distinct types: 1) mid-aged to mature mixed-conifer stands dominated by Douglas-fir, typically on mountain slopes, with moderate to dense canopies and multiple canopy layers; and 2) steep-walled, narrow canyons (or side and hanging canyons in wide canyons) often with riparian vegetation and cool microclimates; and 3) moderately sloped drainages with Douglas fir, in pinyon-juniper woodland (*e.g.* Black Mesa). Not known to nest in ponderosa pine-oak forests on Navajo Nation, but will use a variety of habitats, including pinyon-juniper and clearings when foraging.

Similar Species: Great Horned Owl is ≤15 cm larger; Long-eared Owl is ≤8 cm smaller, both have 'ear tufts' and yellow eyes; only other owls with dark eyes are Flammulated Owl (which is 28 cm smaller) and Barn Owl (which has a white, heart-shaped face and whitish- or cinnamon-colored body).

Phenology:

l.FEB-l.MAR:	pair formation, courtship, nest-site selection
m.MAR-l.MAY:	egg-laying and incubation (30 days)
l.APR-l.JUN:	nestling period (34-36 days)
l.MAY-l.JUN:	fledging of young
l.JUN-l.AUG:	post-fledging period (60-90 days)
e.SEP-l.OCT:	independence of young, dispersal from natal area

Formal Survey Protocol: For project clearance, 2 consecutive years of 4 complete surveys each year between 1 MAR and 31 AUG, with ≥5 days between surveys; no more than 1 survey in MAR, minimum of 2 surveys before 30 JUN, and no more than 1 survey in each of JUL and AUG; daytime follow-up visit is necessary to find roost/nest if birds are detected during nocturnal survey. If bird(s) are present, monitoring should continue to 15 JUN to verify breeding status. Federal permit required.
US Fish & Wildlife Service. 2003. Mexican Spotted Owl survey protocol. Unpublished document.

Avoidance: No habitat alteration within 40-ha (100 acre) Core Area around nest; certain silvicultural treatments may occur during 1 SEP-28 FEB within remainder of 243-ha (600 acre) Protected Activity Center (PAC) as per Recovery Plan for the Mexican spotted owl, pp.84-89. No activity within 0.4 km (¼ mi) of known nest/roost site during 1 MAR-31 AUG, or within 0.4 km of PAC if nest/roost site unknown.

References:

Gutierrez, R.J., A.B. Franklin, and W.S. Lahaye. 1995. Spotted Owl (*Strix occidentalis*). *In* The Birds of North America, No.179 (A.Poole and F.Gill, eds.). The Academy of Natural Sciences, Philadelphia, and The American Ornithologists' Union, Washington, D.C. (description p.2)

U.S. Fish & Wildlife Service. 1995. Recovery plan for the Mexican spotted owl: Vol.1. Albuquerque, NM. 172pp.

WESTERN SEEP FRITILLARY
(*SPEYERIA NOKOMIS*)

Navajo/Federal Statuses: NESL G3 / not listed under the ESA.

Distribution: Range extends across eastern UT, western CO, and northern AZ and NM. On Navajo Nation, known from <10 populations in Chuska Mountains and Defiance Plateau: Tsaile, Wheatfields, Whiskey Creeks, and two springs near Washington Pass; potential throughout Chuska Mountains and Defiance Plateau where appropriate habitat is present.

Habitat: Perennially wet meadows associated with seeps, springs, and streams variable in size (0.1 ha to >1.2 ha), relatively open, and dominated by grasses and with few shrubs. Violets (*Viola nephrophylla*), found in wet soils in shady areas beneath shrubs or within stream banks, are a necessary component of habitat as the host plant for larvae.

Similar Species: Atlantis fritillary (*S.atlantis*) very similar, but slightly smaller with darker upperside of wings; typical habitat is non-meadow streamsides, more enclosed with shrubs.

Phenology:

l.JUL-e.SEP:	adult stage[1], mating/egg-laying
l.AUG-l.SEP:	eggs hatch 12-24 days, larval stage
e.SEP-e.MAY:	larval diapause (overwintering stage ≥8 months)
e.MAY-l.JUL:	larval growth and pupation to adult

[1]males emerge 1-2 weeks before females

Survey Method: ≥1 pedestrian survey for adults during 1 AUG-1 SEP; habitat evaluation may be done year-round.

Avoidance: No surface disturbance year-round within 60 m of occupied habitat; and upstream activities that impact water quantity and chemistry.

References:

Hammond, P.C. and D.V. McCorkle. 1983. The decline and extinction of *Speyeria* populations resulting from human environmental disturbances (Nymphalidae: Argynninae). Journal of Research on Lepidoptera, 22:217-224.

Tilden J.W. and A.C. Smith. 1986. A field guide to western butterflies. Peterson Field Guide Series, No.33. Houghton Mifflin Co., Boston. (description, p.80)

Vanderhorst, J.P. 1997. Element Stewardship Abstract, *Speyeria nokomis nokomis*. The Nature Conservancy.

Allium gooddingii Owenby
Goodding's Onion

Family: Liliaceae **Synonyms:** None

NESL Status: G3 **Federal Status:** None

Plant Description: Herbaceous perennial. Bulb elongate, 1 cm thick, terminating in a thick, iris-like rhizome. Outer bulb coats veined with parallel, not net-like, fibers. Leaves obtuse, flat, strap-like 12-30cm long, 8mm wide. Flowers purplish-pink, 1 cm wide; 6 petals, arranged in an umbel of about 20 flowers; flower stalk erect, longer than the leaves, up to 45 cm long. Flowering time is from the beginning of July to mid August.

Similar Species: *Allium gooddingii* can be distinguished from other species of onions within its range by its broad, flat, rather blunt leaves, its bulbs on thick iris-like rhizomes, and its thick bulb coat of persistent parallel fibers.

Habitat: Generally in spruce-fir forests and mixed conifer forests; in the Chuska Mts also under Gambel oak thickets interspersed with aspen, dogwood, and Douglas fir; in moist, shady canyon bottoms and north-facing slopes, often along streams. 6400 – 9400 ft elevation.

General Distribution: Apache Co, Greenlee Co, Pima Co., AZ, and New Mexico.

Navajo Nation Distribution: Canyon de Chelly, Chuska Mts, Apache County, AZ, McKinley & San Juan counties, NM.

Potential Navajo Nation Distribution: Throughout the Chuska Mts and the Defiance Plateau.

Survey Period: Mid July to August. Suitable habitat can be identified year round.

Avoidance: A 200 ft buffer zone is recommended to avoid disturbance; may be more, depending on slope, size and nature of the project. Any activity impacting groundwater will need special consideration

References:

Arizona Rare Plant Committee. 2001. Arizona rare plant field guide: a collaboration of agencies and organizations. Washington: U.S. Government Printing Office. http://aznps.org/rareplants.html

Kearney, T. H., R. H. Peebles, and collaborators. 1960. Arizona Flora. Second edition with supplement by J. T. Howell, E. McClintock, and collaborators. University of California Press, Berkeley, 1085 pp.

Kelly, K. and J. McGinnis. 1994. Highly Safeguarded Protected Native Plants of Arizona. Arizona Department of Agriculture, Phoenix, AZ.

McDougall, W.B. 1973. Seed Plants of Northern Arizona. Museum of Northern Arizona, Flagstaff, AZ.

USDI Fish & Wildlife Service and USDA Forest Service, Southwest Region. 1997. Goodding's Onion (*Allium gooddingii*); Conservation Assessment and Strategy.

Allium gooddingii ©Daniela Roth, NNHP

Allium gooddingii habitat ©Daniela Roth, NNHP

Daniela Roth. 2001. Species account for *Allium gooddingii*. Navajo Natural Heritage Program, P.O. Box 1480, Window Rock, AZ 86515.
Additional copies at http://nnhp.nndfw.org/ Revised: 15 MAY 2008

Asclepias welshii N& P. Holmgren
Welsh's Milkweed

Family: Asclepiadaceae

Synonyms: None

NESL Status: G3

Federal Status: Listed Threatened (52 FR 41435 41441)

Plant Description: Herbaceous perennial from extensive underground rootstock; stems erect, stout, 2.5 – 10 dm tall; leaves 6 – 9 (15) cam long, 3 – 6 (8) cam broad, opposite, elliptic to ovate or obovate, rounded to truncate and mucronate apically, rounded to cordate basally; young growth densely wooly, upper leaves with short petiole, lower leaves without petiole. Flowers cream-colored with a rose-tinged middle, 12 – 14 mm wide, in a tight spherical inflorescence, 7 cm wide, with ca. 30 flowers. Flowering occurs from June to July; seed development and dispersal occur from July to early September. The juvenile form of this species has long, linear leaves. Because of the differences between juvenile and mature plants, juveniles are easily overlooked or misidentified.
Similar Species: Recognized by its large seeds (20+ mm long), spreading to pendulous follicles, cottony-pubescent pedicles, and the main leaves obovate to broadly elliptic, rounded to truncate apically.

Habitat: Active sand dunes derived from Navajo sandstone in sagebrush, juniper, and ponderosa pine communities. Known populations occur from 5000 to 6230 ft elevation.

General Distribution: Kane Co, UT, northern AZ.
Navajo Nation Distribution: Coconino Co, north of Tuba City, south of Monument Valley in Navajo & Apache counties.
Potential Navajo Nation Distribution: All active sand dunes between Page and Tuba City, east to the Chinle Creek drainage.

Survey Period: June through September. Suitable habitat can be identified year round.

Recommended Avoidance: A 200 ft buffer zone is recommended to avoid disturbance; maybe more or less, depending on size and nature of the project

References:

Arizona Rare Plant Committee. 2001. Arizona rare plant field guide: a collaboration of agencies and organizations. Washington: U.S. Government Printing Office. http://aznps.org/rareplants.html

Atwood, D.N. et al. 1991. Utah Threatened, Endangered, and Sensitive Plant Field Guide. U.S. Forest Service Intermountain Region, National Park Service, Bureau of Land Management, Utah Natural Heritage Program, U.S. Fish & Wildlife Service, Environmental Protection Agency, Navajo Nation, and Skull Valley Goshute Tribe.

Cronquist, A. et al., eds. 1984. Intermountain Flora, Volume 4. The New York Botanical Garden, Bronx, New York.

Kelly, K. and J. McGinnis. 1994. Highly Safeguarded Protected Native Plants of Arizona. Arizona Department of Agriculture, Phoenix, AZ.

U.S. Fish & Wildlife Service. 1992. Welsh's Milkweed (*Asclepias welshii*) Recovery Plan. U.S. Fish & Wildlife Service, Denver, Colorado. 19pp.

Utah Rare Plant Guide Team. 2003. Utah Rare Plant Guide. Utah Native Plant Society. http://www.utahrareplants.org/

Welsh, S.L., N.D. Atwood, S. Goodrich, L.C. Higgins. 2003. A Utah Flora: Third Edition. Brigham Young University, Provo, UT.

Daniela Roth. 2001. Species account for *Asclepias welshii*. Navajo Natural Heritage Program, P.O. Box 1480, Window Rock, AZ 86515.
Additional copies at http://nnhp.nndfw.org/ Revised: 15 MAY 2008

Asclepias welshii – juvenile plants
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Asclepias welshii ©Daniela Roth, NNHP

Asclepias welshii habitat ©Daniela Roth, NNHP

Astragalus cremnophylax Barneby var. *hevronii* Barneby
Marble Canyon Milkvetch

Family: Fabaceae **Synonyms:** None

NESL Status: G3 **Federal Status:** None

Plant Description: Dwarf, evergreen, perennial herb, forming a mat less than 1.5 cm high, 2.5-16 cm in diameter. Short creeping stems 1.2 cm long with 5-9 compound leaflets with dolabriform hairs; leaf bases produced in the fall disjoint readily when dry, leaving the rachis as a stiff, upright spinescent structure; flowers are pale purplish-lilac and usually held slightly above the mat, banners 7-8 mm by 4.4-6 mm, the keel 5.2-5.4 mm. Fruits unilocular, obliquely egg-shaped, and densely hairy. Seeds orange. Flowering April to May, fruiting May to June

Similar Species: two varieties of the taxon are similar: *A. c. cremnophylax* and *A. c. myriorrhaphis*; along with A. *humillimus*, from New Mexico. All of these are considered rare and are geographically isolated from one another.

Habitat: crevices and depressions with shallow soils on Kaibab Limestone on rim-rock benches at the Marble Canyon edge in Great Basin Desertscrub communities, at ca. 5000ft elevation.

General Distribution: Rims of Marble Canyon near Shinumo Wash, Coconino Co.

Known Distribution on the Navajo Nation: East rim Marble Canyon, south of Shinumo Wash, north to Sheep Springs Wash.

Potential Navajo Nation Distribution: Marble Canyon, from the Little Colorado River Gorge to Navajo Bridge where habitat is suitable.

Survey Period: Best from April to May, but can be identified year-round by an experienced individual. Suitable habitat can be identified year round.

Avoidance: A 200 ft buffer zone is recommended to avoid disturbance; may be more or less, depending on size and nature of the project

References:

Arizona Rare Plant Committee. 2001. Arizona rare plant field guide: a collaboration of agencies and organizations. Washington: U.S. Government Printing Office. http://aznps.org/rareplants.html

Barneby, R. C. 1992. Centennial beans: a miscellany of American Fabales. Brittonia 44:238.

Cronquist, A. et al., eds. 1989. Intermountain Flora, vol. 3 part B. New York Botanical Garden, Bronx, NY. p. 66 -67.

Kearney, T. H., R. H. Peebles, and collaborators. 1960. Arizona Flora. Second edition with supplement by J. T. Howell, E. McClintock, and collaborators. University of California Press, Berkeley, 1085 pp.

Roth, D. 2007. The Marble Canyon milk-vetch (*Astragalus cremnophylax var. hevronii*). A 10-year monitoring update – Redwall Site, Coconino Co., AZ. Unpublished report prepared for the Navajo Natural Heritage Program, Window Rock, AZ. http://nnhp.nndfw.org/docs_reps.htm

Astragalus cremnophylax var. hevronii ©Daniela Roth, NNHP

Astragalus cremnophylax var. hevronii habitat ©Daniela Roth, NNHP

Astragalus cronquistii Barneby
Cronquist's Milkvetch

Family: Fabaceae **Synonyms:** None

NESL Status: G3 **Federal Status:** None

Plant Description: Perennial plant from a stout taproot and underground root crown; flowers pink-purple; ca. 1 cm long; leaves 1.5 to 4.5 cm long, leaflets 7 to 15, ea. 6 to 25 mm long, with straight, stiff hairs beneath and hairless above; seed pods narrow, two-chambered and drooping. Flowering and fruiting from April to June.

Similar Species: Similar to *A. fucatus*, but with narrow, two-chambered pods, vs. unilocular mottled pods found in *A. fucatus*.

Habitat: Salt desert shrub and blackbrush communities on sandy or gravelly soils derived from the Cutler and Morrison Formations. Also known to occur on Mancos Shale. 4750 to 5800ft elevation.

General Distribution: San Juan County, UT; Montezuma, Mesa, & Garfield counties, CO.

Navajo Nation Distribution: Known from S of Bluff, Aneth and near the Utah border with Colorado, San Juan Co., UT.

Potential Navajo Nation Distribution: Southeastern Utah.

Survey Period: May to June, when mature seedpods are present. Suitable habitat can be identified year round.

Avoidance: A 200 ft buffer zone is recommended to avoid disturbance; may be more or less depending on slope, size and nature of the project.

References:

Atwood, D.N. et al. 1991. Utah Threatened, Endangered, and Sensitive Plant Field Guide. U.S. Forest Service Intermountain Region, National Park Service, Bureau of Land Management, Utah Natural Heritage Program, U.S. Fish & Wildlife Service, Environmental Protection Agency, Navajo Nation, and Skull Valley Goshute Tribe.

Cronquist, A. et al., eds. 1989. Intermountain Flora, vol. 3 part B. New York Botanical Garden, Bronx, NY, p. 66 -67.

Spackman, S. et al. 1997. Colorado Rare Plant Field Guide. Prepared for the Bureau of Land Management, the U.S. Forest Service and the U.S. Fish & Wildlife Service by the Colorado Natural Heritage Program.http://www.cnhp.colostate.edu/rareplants/cover.html

Utah Rare Plant Guide Team. 2003. Utah Rare Plant Guide. Utah Native Plant Society. http://www.utahrareplants.org/

Welsh, S.L., N.D. Atwood, S. Goodrich, L.C. Higgins. 2003. A Utah Flora: Third Edition. Brigham Young University, Provo, UT.

Astragalus cronquistii ©Daniela Roth, NNHP

Astragalus cronquistii habitat ©Daniela Roth, NNHP

Daniela Roth. 2001. Species account for *Astragalus cronquistii*. Navajo Natural Heritage Program, P.O. Box 1480, Window Rock, AZ 86515.
Additional copies at http://nnhp.ndfw.org/ Revised: 15 MAY 2008

Astragalus naturitensis Payson
Naturita Milkvetch

Family: Fabaceae

Synonyms: *Astragalus arietinus* var. *stipularis* M.E. Jones

NESL Status: G3

Federal Status: None

Plant Description: Low, subacaulescent perennial; stems 2-6 cm long, leaves up to 6 cm long, with 9 – 15 leaflets that are covered with straight, overlapping hairs; flowers small, less than 1.2 cm long, petals bi-colored, banner white with lilac, wings and keel-tips purple. Flowers during late April and May.

Similar Species: *A. naturitensis* has dorsiventrally compressed pods, while *A. monumentalis* Barneby has pods that are compressed triquetrously

Habitat: Sand filled pockets of sandstone slickrock and rimrock pavement along canyons in the pinion-juniper zone. Known populations occur at 5000 – 7000ft elevation.

General Distribution: McKinley and San Juan Counties, NM, southwestern Colorado and adjacent Utah.

Known Distribution on the Navajo Nation: Hogback, San Juan Co., to the Pinetree Canyon area, McKinley Co., NM.

Potential Distribution on the Navajo Nation: In suitable habitat north of I-40 in McKinley Co., to the Hogback, San Juan Co., NM.

Survey Period: Only from late April through May because mature pods are essential for positive identification. Suitable habitat can be identified year round.

Avoidance: A 200 ft buffer zone is recommended to avoid disturbance; may be more or less, depending on slope, size and nature of the project.

References:

Cronquist, A. et al., eds. 1989. Intermountain Flora, vol. 3 part B. New York Botanical Garden, Bronx, NY. p.142.

New Mexico Rare Plant Technical Council. 1999. New Mexico Rare Plants. Albuquerque, NM. New Mexico Rare Plants Homepage. http://nmrareplants.unm.edu

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USDI Bureau of Land Management. 1995. The Farmington District Endangered, Threatened, and Sensitive Plant Field Guide. Prepared by Ecosphere Environmental Services, Inc., Farmington, NM.

Astragalus naturitensis ©Daniela Roth, NNHP

Astragalus naturitensis habitat ©Daniela Roth, NNHP

Daniela Roth. 2001. Species account for *Astragalus naturitensis*. Navajo Natural Heritage Program, P.O. Box 1480, Window Rock, AZ 86515.
Additional copies at http://nnhp.ndfw.org/ Revised: 15 MAY 2008

Carex specuicola J.T. Howell
Navajo Sedge

Family: Cyperaceae **Synonyms:** None

NESL: G3 **Federal Status:** Listed Threatened (50 FR 19370 19374)

Plant Description: Perennial grass-like plants with a dried persistent leaf base; leaves narrow, 1-3 mm wide, 12 – 30 cm long. Flowers inconspicuous with female flowers located above the male flowers; flowers grouped into 2-4 short spikelets 8- 20 mm long, clustered at the end of a long thin stalk, 2-3 times the length of the leaves. Pistillate scales pale brown with broad hyaline margins and a conspicuous green midvein. Flowering and fruit set occur from spring to summer, but most of the reproduction appears to be vegetative.
Similar Species: *Carex specuicola* is unusual in having both two-branched stigmas with lenticular achenes, and three-branched stigmas with trigonous achenes (predominantly two-branched). *C. specuicola* often grows with *Carex aurea* or *C. hassei* from which it can be distinguished by its strongly flattened perigynia and by having the female flowers located above the male flowers. *C. utahensis* (*C. parryana* sensu Goodrich) has stiff, erect culms and the pistillate scales are deep purple-brown with narrow inconspicuous hyaline margins (predominantly 3 stigmas).

Habitat: Typically found in seeps and hanging gardens, on vertical sandstone cliffs and alcoves. Known populations occur from 4600ft to 7200ft.
General Distribution: Northern Arizona, San Juan Co, Utah.
Navajo Nation Distribution: From the Navajo Creek drainage in Coconino Co, east to the Tsegi Canyon Watershed in Navajo Co, south to the Rock Point/Mexican Water & Canyon de Chelly National Monument, Apache Co, AZ area. Also known from Chinle Creek, San Juan Co, UT.
Potential Navajo Nation Distribution: Northern Arizona and southeastern Utah, especially in hanging gardens of the San Juan River drainage and Lake Powell.
Survey Period: Positive identification is only possible during flowering/fruiting season from late June through September. Suitable habitat can be identified year round.

Avoidance: A 200 ft buffer zone is recommended to avoid disturbance; may be more, depending on size and nature of the project. Any activity affecting groundwater will need special consideration.

References:
Arizona Rare Plant Committee. 2001. Arizona rare plant field guide: a collaboration of agencies and organizations. Washington: U.S. Government Printing Office. http://aznps.org/rareplants.html

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House, D.E. 1987. Recovery Plan for Navajo Sedge, *Carex specuicola* J.T. Howell. Prepared for the U.S. Fish & Wildlife Service, Region 2, Albuquerque, NM.

Kearney, T. H., R. H. Peebles, and collaborators. 1960. Arizona Flora. Second edition with supplement by J. T. Howell, E. McClintock, and collaborators. University of California Press, Berkeley, 1085 pp.

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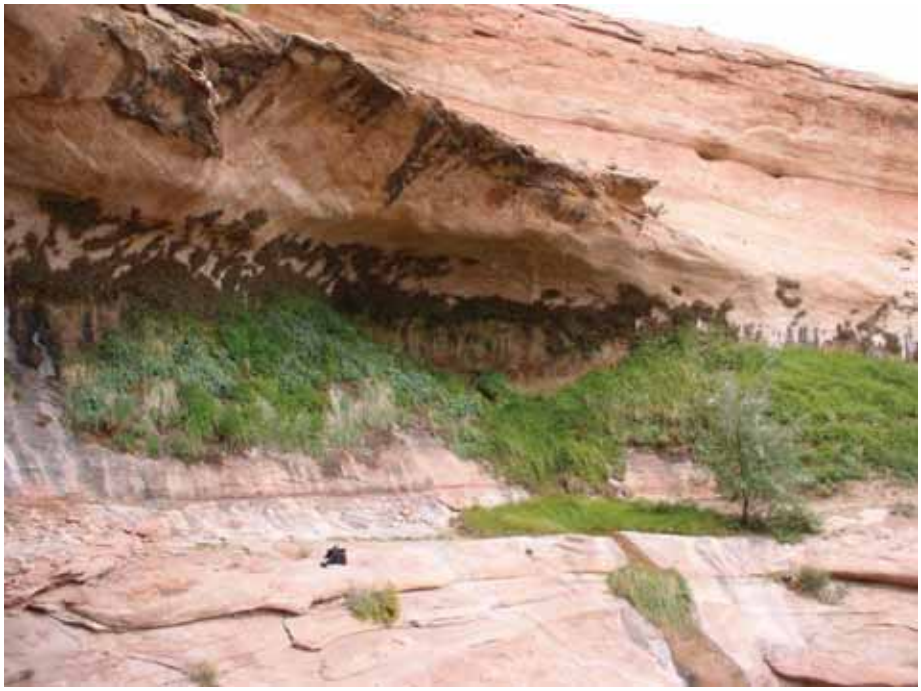
Carex specuicola ©Daniela Roth, NNHP

Carex specuicola ©Daniela Roth, NNHP



Carex specuicola habitat ©Daniela Roth, NNHP

Erigeron acomanus Spellenberg and Knight
Acoma fleabane

Family: Asteraceae **Synonyms:** None

NESL Status: G3 **Federal Status:** None

Plant Description: Taprooted perennial, mat-forming, 10 – 70 cm in diameter, leaves mostly basal, blades oblanceolate to narrowly obovate or spatulate; ray flowers white, disk corollas yellowish. Flowers in July.

Similar Species: *Erigeron tener* (A.Gray) A.Gray has bluish or pinkish rays and a densely caespitose habit. *E. vetensis* Rydb. has a greater number of ray flowers, pink or blue in color, and has densely glandular herbage. The Acoma fleabane has white rays, a mat-forming habit, and is consistently mono-cephalic.

Habitat: Sandy slopes beneath sandstone cliffs of the Entrada Sandstone Formation in pinion-juniper woodland communities. Populations are known from ca. 7000ft elevation.

General Distribution: McKinley Co., NM.

Known Distribution on the Navajo Nation: North of Thoreau and north of Prewitt.

Potential Navajo Nation Distribution: North of I-40 in McKinley County, NM.

Survey Period: June to August. Suitable habitat can be identified year round.

Avoidance: A 200 ft buffer zone is recommended to avoid disturbance; may be more or less, depending on slope, size and nature of the project.

Reference:

New Mexico Rare Plant Technical Council. 1999. New Mexico Rare Plants. Albuquerque, NM. New Mexico Rare Plants Homepage. http://nmrareplants.unm.edu

USDI Bureau of Land Management. 1995. The Farmington District Endangered, Threatened, and Sensitive Plant Field Guide. Prepared by Ecosphere Environmental Services, Inc., Farmington, NM.

Erigeron acomanus ©NNHP

Erigeron acomanus habitat ©NNHP

Daniela Roth. 2001. Species account for *Erigeron acomanus*. Navajo Natural Heritage Program, P.O. Box 1480, Window Rock, AZ 86515.
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Errazurizia rotundata (Wooton) Barn.
Round dune-broom

Family: Fabaceae

Synonym: *Paryella rotundata* Wooton

NESL Status: G3

Federal Status: None

Plant Description: A low, woody shrub, up to 3 dm tall, spreading clonally. The herbage is strigulose-canescent, with many prominent orange or purple, prickle shaped glands; leaves 3 – 13 cm long, with a recurving rachis and 29 to 61 broadly oblong-ovate to orbicular leaflets, 1 – 8 mm long, diminishing upward along the rachis. Spikes shortly 6 – 14 flowered, the axis not over 2 cm long in fruit. Calyx 5 – 6 mm long, turbinate-campanulate, the tube prominently 10-ribbed and glandular in the intervals. Flowers are about 5 mm long with only a pale yellow banner and no keels or wings. Pods are ovoid-ellipsoid, slightly compressed, and 9 – 11 mm long. Flowering period is from late April to late May.

Habitat: Known from several types of outcrops ranging from sandy soils in sandstone, gravelly soils in calcareous outcrops, to deep, alluvial cinders in sandstone breaks. Generally in exposed habitats in the semi-arid environment of the Great Basin Desertscrub. On the Navajo Nation populations are know from sandy pockets between outcroppings of Moenave Sandstone. Populations are known from 4600 to 5200ft elevation.

General Distribution: Coconino and Navajo Co, AZ, near Tuba City, Winslow, Holbrock, and Wupatki National Monument.

Known Distribution on the Navajo Nation: Known from between Moenave and Willow Springs, Coconino Co., AZ.

Potential Navajo Nation Distribution: In suitable habitats between Gap, Coconino County, and Petrified Forest NP, Apache Co., AZ.

Survey Period: Can be identified from mid April through September.

Avoidance: A 200 ft buffer zone is recommended to avoid disturbance; may be more or less depending on slope, size and nature of the project.

References:

Arizona Rare Plant Committee. 2001. Arizona rare plant field guide: a collaboration of agencies and organizations. Washington: U.S. Government Printing Office. http://aznps.org/rareplants.html

McDougall, W.B. 1973. Seed Plants of Northern Arizona. Museum of Northern Arizona, Flagstaff, AZ.

Kearney, T. H., R. H. Peebles, and collaborators. 1960. Arizona Flora. Second edition with supplement by J. T. Howell, E. McClintock, and collaborators. University of California Press, Berkeley, 1085 pp.

Errazurizia rotundata ©Daniela Roth, NNHP

Errazurizia rotundata habitat ©Daniela Roth, NNHP

Daniela Roth. 2001. Species account for *Errazurizia rotundata*. Navajo Natural Heritage Program, P.O. Box 1480, Window Rock, AZ 86515.
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Lesquerella navajoensis O'Kane
Navajo Bladderpod

Family: Brassicaceae **Synonyms:** None

NESL Status: G3 **Federal Status:** None

Plant Description: Herbaceous perennial, cushion forming from a thick taproot. Herbage silvery-gray, densely covered with overlapping stellate trichomes; leaves entire, linear-oblanceolate, tapering to base, 3-8(13) mm long, 0.7 – 1.4 mm wide. Flowers and fruits in dense few-flowered subcorymbose racemes at apexof flowering stems, not or barely exceeding the leaves. Petals 5.2 – 6.5 mm long, spatulate, yellow, faintly orange at the junction of the blade and claw. Fruit sessile to substipitate becoming reddish to copper colored at maturity. Flowering/fruiting period is from mid to late April to mid June

Similar species: *Lesquerella fendleri* has a deep orange "eye", the veins of the petals near the eye are also orange, the petals are much larger, and the stellate trichomes are webbed for at least half the length of the rays. *L. navajoensis* has a faint orange eye and no orange veins, the flowers are much smaller and the trichomes are not webbed. Additionally, *L. navajoensis* flowers and forms fruits earlier than does *L. fendleri.*

Habitat: *Lesquerella navajoensis* mostly occurs on windward, windswept mesa rims and nearby habitat with little vegetative cover and high insolation. Also found at the base and slopes of small hills of the Chinle Formation. Typically only found in a combination of Todilto Limestone overlaying Entrada Sandstone or Chinle outcrops in pinion-juniper communities.

General Distribution: Apache Co., AZ & McKinley Co., NM.

Known Distribution on the Navajo Nation: In New Mexico on mesa rims NW of Thoreau and Continental Divide, and Chuska Mts, at Todilto Park, McKinley Co. In Arizona, from the Red Valley area (N of Navajo, NM) to Wheatfields Lake, Apache Co.

Potential Navajo Nation Distribution: Todilto limestone and Chinle outcroppings NE and NW of Thoreau, and the Chuska Mts, McKinley & San Juan counties, NM. Possibly in the Chuska & Carrizo Mts, Apache County, AZ

Survey Period: Positive identification is only possible during the flowering period from May to early June. Suitable habitat can be identified year round.

Avoidance: A 200 ft buffer zone is recommended to avoid disturbance; may be more or less, depending on slope, size and nature of the project.

References:

New Mexico Rare Plant Technical Council. 1999. New Mexico Rare Plants. Albuquerque, NM. New Mexico Rare Plants Homepage. http://nmrareplants.unm.edu

O'Kane, S. 1999. *Lesquerella navajoensis* (Brassicaceae), a new species of the L. Hitchcockii complex from New Mexico. o, Vol. 46, No. 2, pp.Madron 88-91.

Lesquerella navajoensis ©Daniela Roth, NNHP

Lesquerella navajoensis habitat ©Daniela Roth, NNHP

Daniela Roth. 2001. Species account for *Lesquerella navajoensis*. Navajo Natural Heritage Program, P.O. Box 1480, Window Rock, AZ 86515.
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Pediocactus peeblesianus (Croizat) L. D. Benson ssp. *fickeiseniae* (Backeberg ex Hochstätter) Lüthy
Fickeisen Plains Cactus

Family: Cactaceae **Synonyms:** *Navajoa fickeisenii* Backeberg, *Toumeya fickeisenii* W.H. Earle

NESL Status: G3 **Federal Status:** Candidate

Plant Description: Stems 2.5 – 6.0 cm tall, 2.0 – 5.5 cm in diameter, spherical, usually solitary. Spines corky; central spine 1, 5 – 18mm long, radial spines 3 –7, each 4 –7 mm long. Flowers cream-yellow or yellowish-green, to 2.5 cm diameter, produced on the apex of the stem. Fruit top-shaped, smooth, turning reddish brown upon maturity. Flowering and fruiting occurs from mid March to late April, plants will retract into the soil in response to drought.

Habitat: Soils overlain by Kaibab Limestone in Navajoan desert or Great Plains Grassland, along canyon rims and flat terraces along washes, typically with limestone chips scattered across the surface. Populations are known to occur between 4000 and 6000ft elevation.

General Distribution: Arizona: Coconino Co., from House Rock Valley and Gray Mt., to the Little Colorado and Colorado rivers. Mohave Co., as far west as Dutchman Draw and Grandstand.

Navajo Nation Distribution: Gray Mountain to southwest of Bitter Springs, Coconino Co., AZ

Potential Navajo Nation Distribution: Marble Canyon to Gray Mountain.

Survey Period: Late March to late April. Suitable habitat can be identified year round.

Avoidance: A 200 ft buffer zone is recommended to avoid disturbance; may be more or less, depending on slope, size and nature of the project.

References:

Arizona Rare Plant Committee. 2001. Arizona rare plant field guide: a collaboration of agencies and organizations. Washington: U.S. Government Printing Office. http://aznps.org/rareplants.html

Benson, L. 1982. The Cacti of the United States and Canada. Stanford University Press, Stanford, CA.

Heil, K, & J. M. Porter. 2001. Vascular Plants of Arizona: Cactaceae Part Five: *Pediocactus* and *Sclerocactus*. Journal of Arizona –Nevada Academy of Science 33(1): 9-18.

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McDougall, W.B. 1973. Seed Plants of Northern Arizona. Museum of Northern Arizona, Flagstaff, AZ.

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Pediocactus peeblesianus ssp. *fickeiseniae* ©Daniela Roth, NNHP

Pediocactus peeblesianus ssp. *fickeiseniae* habitat ©Daniela Roth, NNHP

Penstemon navajoa N. Holmgren
Navajo Mountain Penstemon

Family: Scrophulariaceae **Synonyms:** None

NESL Status: G3 **Federal Status:** None

Plant Description: Short-lived perennial herb 2 – 4.5 dm tall; stems few, glabrous, slender, ascending to erect, inflorescence lax. Leaves glabrous, entire, 2.5 – 9 cm long, 1 – 15 mm wide, rounded to acute. Cymes 1 – 2 (3) flowered, calyx 3.5 – 4.5 mm long, glabrous. Corolla 18 – 21 (23) mm long, glabrous externally, throat and tube pale blue to white, the palate sparsely white-bearded; staminode glabrous, anthers exerted, the sacs (1.2) 1.4 – 1.8 mm long, glabrous or sparsely long-villous, dehiscing from the distal end to the connective. Flowering period is from July through early August.

Similar species: *Penstemon navajoa* can be distinguished from other *Penstemons* by its sparse flexuous anther hairs, filiform to linear, glabrous leaves, and laxly-flowered inflorescence.

Habitat: Rocky, open places in Ponderosa Pine, aspen, Douglas-fir communities from 7,000 to 10,300ft elevation.

General Distribution: Navajo Mountain and upper Dark Canyon, San Juan Co., UT

Known Distribution on the Navajo Nation: Navajo Mountain.

Potential Distribution on the Navajo Nation: Upper slopes of Navajo Mountain, potentially upper elevations of Skeleton Mesa.

Survey Period: Early July to early August to ensure positive identification. Suitable habitat can be identified year round.

Avoidance: A 200 ft buffer zone is recommended to avoid disturbance; may be more or less, depending on slope, size and nature of the project.

References:

Atwood, D.N. et al. 1991. Utah Threatened, Endangered, and Sensitive Plant Field Guide. U.S. Forest Service Intermountain Region, National Park Service, Bureau of Land Management, Utah Natural Heritage Program, U.S. Fish & Wildlife Service, Environmental Protection Agency, Navajo Nation, and Skull Valley Goshute Tribe.

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Utah Rare Plant Guide Team. 2003. Utah Rare Plant Guide. Utah Native Plant Society. http://www.utahrareplants.org/

Welsh, S.L., N.D. Atwood, S. Goodrich, L.C. Higgins. 2003. A Utah Flora: Third Edition. Brigham Young University, Provo, UT.

Penstemon navajoa ©Daniela Roth, NNHP

Penstemon navajoa habitat ©Daniela Roth, NNHP

Perityle specuicola Welsh & Neese
Alcove Rock Daisy

Family: Asteraceae **Synonyms:** None

NESL Status: G3 **Federal Status:** None

Plant Description: Perennial herb, 50 – 75 cm tall, stems mostly sprawling or pendulous, much branched. Herbage glandular-hispidulous. Leaves mostly alternate, short-petiolate, the blades 3 – 6 mm long, 1.5 – 3 mm wide, entire, ovate to elliptic. Heads few to many in a branching inflorescence. Ray flowers lacking, disk flowers numerous, yellow. Pappus of 3 (4) unequal scabrous bristles and often with one apically flattened and sigmoid scale. Flowering period is from mid July to mid September.

Similar species: Similar to *P. tenella*, but more robust in size (50 – 75 cm high vs. 9 –25 cm), the herbage hispidulous, and with 3 (4) unequal bristles.

Habitat: Known from hanging garden communities at 3690 to 4000 ft elevation.

Distribution: Endemic to Grand and San Juan counties, UT.

Known Distribution on the Navajo Nation: Only known from one site along the San Juan River, downstream from The Goosenecks State Park.

Potential Navajo Nation Distribution: Hanging gardens in the San Juan River drainages.

Survey Period: Positive identification is only possible from late July through September. Suitable habitat can be identified year round.

Avoidance: A 200 ft buffer zone is recommended to avoid disturbance; may be more, depending on size and nature of the project. Any activity impacting groundwater will need special consideration.

References:

Atwood, D.N. et al. 1991. Utah Threatened, Endangered, and Sensitive Plant Field Guide. U.S. Forest Service Intermountain Region, National Park Service, Bureau of Land Management, Utah Natural Heritage Program, U.S. Fish & Wildlife Service, Environmental Protection Agency, Navajo Nation, and Skull Valley Goshute Tribe.

Utah Rare Plant Guide Team. 2003. Utah Rare Plant Guide. Utah Native Plant Society. http://www.utahrareplants.org/

Welsh, S.L., N.D. Atwood, S. Goodrich, L.C. Higgins. 2003. A Utah Flora: Third Edition. Brigham Young University, Provo, UT.

Perityle specuicola ©Daniela Roth, NNHP

Perityle specuicola habitat ©Daniela Roth, NNHP

Daniela Roth. 2001. Species account for *Perityle specuicola*. Navajo Natural Heritage Program, P.O. Box 1480, Window Rock, AZ 86515.
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Platanthera zothecina (Higgins & Welsh) Kartesz and Ghandi
Alcove bog-orchid

Family: Orchidaceae

Synonyms: *Habenaria zothecina* Higgins & Welsh

NESL Status: G3

Federal Status: None

Plant Description: Perennial herb; plants large, erect, 1.5 – 6 dm tall. Stems leafy below, reduced upwards; leaves glabrous, oblong-elliptic to linear-oblong, 5 – 25 cm long, 0.8 – 6.0 cm wide; inflorescence laxly 5 – 20-flowered, flowers yellowish-green to greenish, spurs 1.5 – 2 times as long as the lip. Flowers from mid July to late August.

Similar Species: Distinct from other species by the spur length which is 1.5–2 times as long as the lip.

Habitat: Seeps, hanging gardens, and moist stream areas from the desert shrub to pinion-juniper & Ponderosa pine/mixed conifer communities. Known populations occur between 4000 and 7200ft elevation.

General Distribution: Emery, Garfield, Grand, Uintah, and San Juan Counties, Utah. Also in Moffat County, Colorado, and Navajo, Coconino, and Apache Counties, Arizona

Known Distribution on the Navajo Nation: Headwaters of Oljeto Wash, Tsegi Canyon Watershed, hanging gardens surrounding Navajo Mountain, Chinle Wash drainages.

Potential Distribution on the Navajo Nation: Northern AZ and San Juan Co., UT

Survey Period: Positive identification is only possible during the flowering period from July to August. Suitable habitat can be identified year round.

Avoidance: A 200 ft buffer zone is recommended to avoid disturbance; may be more, depending on size and nature of the project. Any activity impacting groundwater will need special consideration

References:

Arizona Rare Plant Committee. 2001. Arizona rare plant field guide: a collaboration of agencies and organizations. Washington: U.S. Government Printing Office. http://aznps.org/rareplants.html

Atwood, D.N. et al. 1991. Utah Threatened, Endangered, and Sensitive Plant Field Guide. U.S. Forest Service Intermountain Region, National Park Service, Bureau of Land Management, Utah Natural Heritage Program, U.S. Fish & Wildlife Service, Environmental Protection Agency, Navajo Nation, and Skull Valley Goshute Tribe.

Kartesz, J.T. and K.N. Ghandi. 1990. Nomenclatural notes from the North American Flora. III. Phytologia (September 1990) 69(3): 129-137.

Utah Rare Plant Guide Team. 2003. Utah Rare Plant Guide. Utah Native Plant Society. http://www.utahrareplants.org/

Welsh, S.L., N.D. Atwood, S. Goodrich, L.C. Higgins. 2003. A Utah Flora: Third Edition. Brigham Young University, Provo, UT.

Platanthera zothecina ©Daniela Roth, NNHP

Platanthera zothecina habitat ©Daniela Roth, NNHP

Zigadenus vaginatus (Rydberg) Macbride
Alcove Death Camas

Family: Liliaceae **Synonyms:** None

NESL Status: G3 **Federal Status: None**

Plant Description: Stout perennial from rhizomes, 3 – 10 dm tall; leaves 20 – 75 cm long, 6-18 mm wide, reduced upward; flowers perfect, paniculate, inflorescence 15 – 43 cm long; perianth white, 6 –7 mm long, capsules 10 – 15 mm long. Flowers from late July through August.

Similar species: *Zigadenus elegans* has larger flowers, occurs at higher elevations and flowers earlier in the year.

Habitat: Hanging gardens in seeps and alcoves, mostly on Navajo Sandstone, 3700 – 6700ft.

Distribution: Endemic to the Colorado Plateau in southern Utah and northern Arizona.

Navajo Nation Distribution: Hanging gardens in sandstone canyon surrounding Navajo Mountain, Coconino Co, AZ, and San Juan Co., UT, disjunct in Canyon de Chelly National Monument.

Potential Navajo Nation Distribution: Hanging gardens surrounding the drainages into Lake Powell and the drainages of Chinle Wash south to Canyon de Chelly NM, Apache and Coconino counties, AZ, San Juan Co., UT.

Survey Period: Mid July through August. Suitable habitat can be identified year round.

Avoidance: A 200 ft buffer zone is recommended to avoid disturbance; may be more, depending on size and nature of the project. Any activity impacting groundwater will need special consideration.

References:

Utah Rare Plant Guide Team. 2003. Utah Rare Plant Guide. Utah Native Plant Society. http://www.utahrareplants.org/

Welsh, S.L., N.D. Atwood, S. Goodrich, L.C. Higgins. 2003. A Utah Flora: Third Edition. Brigham Young University, Provo, UT.

Zigadenus vaginatus ©Daniela Roth, NNHP

Zigadenus vaginatus
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Zigadenus vaginatus habitat ©Daniela Roth, NNHP

Daniela Roth. 2001. Species account for *Zigadenus vaginatus*. Navajo Natural Heritage Program, P.O. Box 1480, Window Rock, AZ 86515.
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Navajo Nation
Endangered Species List

GROUP
4

TOWNSEND'S BIG-EARED BAT
(*CORYNORHINUS TOWNSENDII*)

Navajo/Federal Statuses: NESL G4 / not listed under the ESA.

Distribution: Range includes most western U.S. states from southern British Columbia southeast to SD and west to the Pacific Coast, south through TX and CA and throughout most of inland Mexico. Only two roost caves known on Navajo Nation (near Shiprock and Page), but potential throughout elevational range and habitats of Navajo Nation. Distribution is likely limited to areas with suitable roost sites. Reportedly common elsewhere in coniferous forests, but not yet documented from Chuska Mountains or Defiance Plateau.

Habitat: Roosts, raises young, and hibernates primarily in sandstone or limestone caves, lava tubes, mine tunnels, and other man-made structures; uses a variety of habitats for foraging, including coniferous forests and pinyon-juniper woodlands, deciduous riparian woodlands, and desertlands. During spring and summer, females form maternity colonies of < 100 adults in warm parts of mine/cave; males are solitary. During winter, they hibernate singly or in small groups in colder parts of mine/cave (near entrance and in well-ventilated areas).

Similar Species: Only 3 long-eared bats on Navajo Nation, *C.townsendii* has pale gray or brown fur on dorsum and buff-colored underparts; *Antrozous pallidus* (Pallid Bat) has creamy-yellow fur on dorsum and whitish underparts; *Euderma maculatum* (Spotted Bat) has white underparts, and black dorsum with 3 white spots.

Phenology:

e.OCT-e.APR:	hibernation (arouse frequently from hibernation)
l.OCT-l.FEB:	mating season
e.JUN-l.JUN:	birthing of young
e.AUG-l.AUG:	maternity colonies breakup, independence of young

Survey Method: ≥1 visual survey during 1 MAY-31 AUG, preferably with electronic bat-detector, at mine or cave portal for ≥3 hours at dusk; and, if possible, search interior of mine or cave during day for roosting bats.

Avoidance: No closure of occupied mines or caves (hibernacula, day- or maternity roosts) until consultation with Navajo Nation Department of Fish and Wildlife; feasibility of gating mine/cave opening should be considered; no activity within 60 m of occupied roost-site during 15 APR-31 AUG.

References:

Hoffmeister, D.F. 1986. Mammals of Arizona. The University of Arizona Press. (description p.107)
Kunz, T.H. and R.A. Martin. 1982. Plecotus townsendii; Mammalian Species, No.175, pp.1-6. American Society of Mammalogists.

CHISEL-TOOTHED KANGAROO RAT
(*DIPODOMYS MICROPS*)

Navajo/Federal Statuses: NESL G4 / not listed under the ESA.

Distribution: Species found throughout most of NV and extending into southeast OR, eastern CA, western UT and northwest AZ; subspecies *D.m.leucotis* is limited to Marble Canyon and House Rock Valley of Coconino County, AZ. Only known population on Navajo Nation is near Navajo Bridge of Marble Canyon; potential range is likely restricted to upper Marble Canyon area.

Habitat: Construct burrow system with multiple entrances on a discrete, raised mound (2-4 m diameter) in Great Basin desertscrub habitat with open, sandy areas and vegetation dominated by sparse grasses, shadscale, four-wing saltbush, or blackbrush. Preferred areas have surface soils with rock or gravel component, and are relatively undisturbed by cattle grazing.

Similar Species: *Dipodomys ordii* is shorter in hind-foot (40 vs. 43 mm), tail (137 vs. 164 mm), and total lengths (245 vs. 280 mm); and faces of lower-incisors are rounded rather than flat and broad; *Dipodomys spectabilis* has four toes on hind foot; all *Perognathus* spp. (pocket mice) have shorter body and hind feet and no white fur on hips and sides of tail.

Phenology:
e.MAY-l.SEP: pregnancy, birthing, lactating of young
l.SEP-e.MAY: non-breeding season

Survey Method: ≥1 pedestrian survey for habitat evaluation and presence of burrows/mounds; live-trapping necessary for species identification.

Avoidance: Recommended no activity (year-round) within 60 m of occupied habitat that could result in destruction of burrows/mounds and take of individuals.

References:
Hoffmeister, D.F. 1986. Mammals of Arizona. University of Arizona Press. (description p.304)
O'Farrell, M.J. 1995. Distribution of the Houserock Valley chisel-toothed kangaroo rat (*Dipodomys microps leucotis* Goldman). O'Farrell Biological Consulting, Las Vegas, NV for Bureau Land Management and Arizona Game and Fish Department.

BANNER-TAILED KANGAROO RAT
(*DIPODOMYS SPECTABILIS*)

Navajo/Federal Statuses: NESL G4[3] / not listed under the ESA.

Distribution: Range includes most of NM, southeast AZ, western TX, and northern Mexico, with small populations of the subspecies, *D.s.baileyi*, in northern AZ. Occupied range on the Navajo Nation includes small remnant populations just west of Chinle and possibly near Navajo Mountain, with patches of the desertlands of in NM also being occupied. Potential range includes all desertlands east of the Chuska Mountains, and east and north of Black Mesa in Apache Co., AZ and San Juan Co., UT.

Habitat: Construct elaborate, distinctive burrow system usually with 3-12 burrow openings on a discrete, raised (≤1.2 m tall) mound (1.5-4.5 m diameter) in Great Basin desert grassland or desertscrub, preferring areas with heavier soils than other *Dipodomys*. Presence of grasses is necessary, but habitats at the extremes of vegetation density and height are avoided. Burrow openings are invariable larger than necessary for size of animal.

Similar Species: All other *Dipodomys* are smaller in size, have five toes on hind foot, and black-tipped tails (*D.spectabilis* has four toes on hind foot that is usually > 45mm, and distal half of black tail is conspicuously white). *D.ordii* and *D.microps* hind-feet lengths are 36-43 mm and 42-45 mm, respectively; *D.microps* also has flat and broad faces of lower-incisors. All *Perognathus* spp. (pocket mice) have shorter body and hind feet and no white fur on hips and sides of tail.

Phenology:

e.JAN-l.SEP:	mating (peak percentage of pregnant females in APR)
l.JAN-m.SEP:	birthing of young (1-3 litters/year)
year-round:	mostly nocturnal, non-hibernating

Survey Method: ≥1 pedestrian survey for habitat evaluation and presence of burrows/mounds; live-trapping may be necessary for species identification; den mounds should be sufficiently distinctive for species identification (see Hoffmeister, p.307).

Avoidance: Recommended no activity (year-round) within 60 m of occupied habitat that could result in destruction of burrows/mounds and take of individuals.

References:

Hoffmeister, D.F. 1986. Mammals of Arizona. University of Arizona Press. (description p.305)
Vorhies, C.T. and W.P. Taylor. 1922. Life History of the Kangaroo Rat. U.S.D.A. Bulletin No.1091. Project Gutenberg E-Book #17966.

[3]The NESL G4- candidate status applies only to the population(s) in Arizona; the species is not listed on the NESL for populations east of the Chuska Mountain in New Mexico.

NAVAJO MOUNTAIN VOLE
(MICROTUS MOGOLLONENSIS)

Navajo/Federal Statuses: NESL G4 / not listed under the ESA.

Distribution: Range of *M.mogollonensis* is AZ, NM and Mexico with small populations in southern UT, CO, and TX. *M.m.navaho* range extends from Williams, AZ to Mesa Verde, CO, including four locations on Navajo Nation: Navajo Mountain, Black Mesa, Defiance Plateau, and Chuska Mountains.

Habitat: Typically occupy dry grassy vegetation in conifer forests, with variations including: dense prostrate shrub patches in ponderosa pine forests (Navajo Mountain); monotypic sagebrush stands, thick grasses in greasewood/ desert-olive stands and juniper stands, shrubby tamarisk thickets and chained pinyon and juniper woodlands (Black Mesa); and clear-cut pine flats with regenerating grasses and scattered oak (Chuska Mountains). Ground cover vegetation is necessary.

Similar Species: *Clethrionomys gapperi* has reddish fur on dorsum; *Microtus montanus* and *M. longicaudus* have slightly longer tails and four pair of mammary glands.

Phenology:
m.APR-l.AUG: pregnancy, birthing, lactating of young
e.SEP-m.APR: non-breeding season

Survey Method: ≥1 pedestrian survey for habitat evaluation and presence of runways; species identification requires live-trapping.

Avoidance: No activity (year-round) within 60 m of occupied habitat that could result in destruction of burrows/runways and take of individuals.

References:
Frey, J.K. and C.T. LaRue. 1993. Notes on the distribution of the mogollon vole (*Microtus mogollonensis*) in New Mexico and Arizona. Southwestern Naturalist 38:176-178.
Hoffmeister, D.F. 1986. Mammals of Arizona. University of Arizona Press. (description p.441).
Spicer, R.B. 1987. Status of the Navajo Mountain Mexican vole (*Microtus mexicanus navaho* Benson) along the Arizona-Utah border. Arizona Game & Fish Dept., Phoenix.

ARIZONA (WUPATKI) POCKET MOUSE
(*PEROGNATHUS AMPLUS*)

Navajo/Federal Statuses: NESL G4 / not listed under the ESA.

Distribution: Species range includes southwestern half of AZ and extreme northwestern Mexico. *P.a.cineris* occupies smaller disjunct range of a narrow swath of western Navajo Nation from northern Echo Cliffs south to Wupatki National Monument near Flagstaff, AZ. Potential range on Navajo Nation likely extends from the Colorado River (Marble Canyon) east to Kaibito Plateau, south through Cameron to Leupp area.

Habitat: Occupy Great Basin desertscrub habitat usually with sparse ground cover of greasewood, snakeweed, rabbitbrush, ephedra, shortgrass, and possibly, short junipers.

Similar Species: This species overlaps range with *P.flavus*, *P.flavenscens*, *Chaetodipus intermedius*, and possibly *P.longimembris*, *P.parvus*, *C.formosus* due to construction of Navajo Bridge. Of the small *Perognathus* (body length <~75 mm), only *P.amplus* and *P.longimembris* have tails longer than the body length (10-20% longer in *P.amplus*). The other small *Perognathus* have tails shorter than body (*P.flavus and P.flavenscens*, while the other species are larger in all measurements. *P.amplus* and *P.longimembris* are difficult to differentiate on measurements and appearance in northern AZ (see Hoffmeister, p.250), and possibly best separated by range (*P.amplus* east of, and *P.longimembris* west of, the Colorado River).

Phenology:

l.FEB-e.MAR:	mating season begins (reported for AZ, likely begins later in northern Arizona)
e.APR-m.MAY:	most females pregnant, birthing of young
e.JUN- l.JUN:	young first emerge
year-round:	mostly nocturnal, may become completely inactive in colder months (e.g. NOV-FEB)

Survey Method: ≥1 pedestrian survey for habitat evaluation; live-trapping may be necessary in suitable habitat within potential range for large ground-disturbing activities.

Avoidance: Recommended no activity (year-round) within 60 m of occupied habitat that could result in destruction of burrows and take of individuals.

References:

Hoffmeister, D.F. 1986. Mammals of Arizona. University of Arizona Press. (description p.260)

KIT FOX
(*VULPES MACROTIS*)

Navajo/Federal Statuses: NESL G4 / not listed under the ESA.

Distribution: Historic range includes desertland areas of southern OR and ID south through NV, UT, and CA to Baja Peninsula and southeast through AZ, NM, and western TX to northern-central Mexico; current range is reduced in size, but not well documented. Known from Navajo Nation east of Chuska Mountains and Chinle Valley in AZ and UT; potential in all desertlands on Navajo Nation.

Habitat: Dens excavated in desertscrub or desert grasslands with soft, alluvial or siltly-clay soils, and often with sparse saltbush, shadscale, greasewood, or sagebrush, and grasses. Dens have 2-25 key-hole-shaped entrances (average of 3) that are 20-25 cm (8-10 inches) in height and < 20-cm wide.

Similar Species: Smallest-bodied wild canine of Navajo Nation with pale grayish body, large ears for head size, black-tipped tail and buff-colored ears; red fox has reddish body and white-tipped tail; gray fox has grizzled body, median line of dark hairs on dorsum of tail, black-tipped tail, and reddish ears; coyote is much larger in body size and weight (4-times heavier).

Phenology:
e.SEP-l.OCT: females prepare natal dens
e.OCT-l.NOV: males join females at natal dens
e.DEC-e.FEB: mating season
e.FEB-l.MAR: birthing of young
e.MAR-l.APR: young first emerge from natal dens (1 month of age)
l.JUL-e.AUG: young acquire adult weight and fur, independent at 5 months
e.OCT-l.OCT: dispersal of young, family groups split

Survey Method: ≥1 nocturnal survey with spotlight, and/or diurnal survey for dens, during 1 APR-31 JUL.

Avoidance: No ground-disturbing activities, year-round, within 60 m of known den-site; no activity within 0.2 km (⅛ mi) of active den during 1 DEC-31 AUG.

References:
Hoffmeister, D.F. 1986. Mammals of Arizona. The University of Arizona Press. (description p.471)
McGrew, J.C. 1979. Mammalian Species, No.123, pp.1-6. American Society of Mammalogists.

NORTHERN GOSHAWK
(ACCIPITER GENTILIS)

Navajo/Federal Statuses: NESL G4 / MBTA; not listed under the ESA.

Distribution: Breeding range includes most of Canada, AK, northeastern U.S, northern Mexico, and most western states including UT, western CO and NM, and eastern AZ. On the Navajo Nation, goshawks occupy the Chuska Mountain Range, Defiance Plateau, and Black Mesa. Potential occurs throughout the Nation where appropriate habitat exists

Habitat: Typically nests in drainages, canyon bottoms, or north-facing forested slopes with ponderosa pine stands (also mixed-species, spruce-fir, and aspen stands) composed of large, mature trees and high (60-90%) canopy closure. A variety of forest types, ages, and successional stages often surround nest area and are used extensively by recently fledged young.

Similar Species: Adults larger than Cooper's and Sharp-shinned Hawks, have gray, finely streaked underparts and broad white eyestripe; immatures also larger with white eyestripe.

Phenology:

e.MAR-m.APR:	pair formation, courtship, nest-site selection
m.APR-e.JUN:	egg-laying and incubation (28-32 days)
m.MAY-m.JUL:	nestling period (35-42 days)
l.JUN-e.AUG:	fledging of young
m.AUG-e.SEP:	independence of young, dispersal from natal area
> e.SEP:	may overwinter in nest area or other forest areas

Survey Method: Two years of ≥1 survey broadcasting taped alarm-call every 300 m along 260-m wide transects from 15 JUN-31 JUL; surveys during courtship discouraged.
Kennedy and Stahlecker. 1993. Responsiveness of nesting northern goshawks to taped broadcasts of three conspecific calls. J.Wildl.Manage. 57:2249-257.

Avoidance: No activity within 0.4 km (¼ mi) of nest site during 1 MAR-15 AUG; no habitat alteration year-round within 0.2 km of nest site (=12 ha or 30 acre).

References:

Reynolds, R.T., R.T. Graham, M.H. Hildegard; and others. 1992. Management recommendations for the northern goshawk in the southwestern United States. Gen.Tech.Rept. RM-217. Ft. Collins, CO: U.S. Dept. Agriculture, Forest Service, Rocky Mountain Forest and Range Experiment Station. 90p.
Squires, J.R. and R.T. Reynolds. 1997. Northern Goshawk (*Accipiter gentilis*). *In* The Birds of North America, No.298 (A.Poole and F.Gill, eds.). The Academy of Natural Sciences, Philadelphia, and The American Ornithol. Union, Washington, D.C. (description p.2)

CLARK'S GREBE
(*AECHMOPHORUS CLARKII*)

Navajo/Federal Statuses: NESL G4 / MBTA; not listed under the ESA.

Distribution: Breeding range includes most of western U.S. and Canada, east to Great Lakes; winters along Pacific Coast of US and northern Mexico, and inland on open waters from CA east to southern TX. Only documented from Morgan Lake, but potential on open waters throughout Navajo Nation.

Habitat: Nests on fresh-water lakes and marshes with extensive areas of open water bordered by emergent vegetation; uses lakes and occasionally small ponds during migration.

Similar Species: Western Grebe has yellow-green bill and black crown extending below eyes; Pied-billed and Eared Grebes are smaller (30-35 cm vs. 64 cm in length).

Phenology:

l.APR-m.MAY:	arrival to breeding area, courtship
l.MAY-m.AUG:	egg-laying and incubation (24 days)
l.JUN-l.AUG:	hatching (young travel on adult's back post-hatching)
e.AUG-l.SEP:	independence of young (40-50 days)
m.SEP:	migration

Survey Method: ≥ 1 pedestrian survey with high-power optics during 15 MAY-1 JUL.

Avoidance: Within nesting habitat, no surface disturbance year-round within 60 m of lake-side vegetation or within 100-yr floodplain, whichever is greater; no activity within 0.2 km (⅛ mi) of active nest during 1 MAY-31 JUL; buffer may be less depending on activity type and duration, but not less than 0.1 km.

References:

Storer, R.W. and G.L. Nuechterlein. 1992. Western and Clark's Grebe. *In* The Birds of North America, No.26 (A.Poole, P.Stettenheim, and F.Gill, eds.). The Academy of Natural Sciences, Philadelphia, and The American Ornithologists' Union, Washington, D.C. (description p.2)

NORTHERN SAW-WHET OWL
(*AEGOLUIS ACADICUS*)

Navajo/Federal Statuses: NESL G4 / MBTA; not listed under the ESA.

Distribution: Breeding range includes most of northern and western US, Canada, and central Mexico. No documented breeding on Navajo Nation, but potential exists in forests and wooded canyons of Chuska Mountains, Defiance Plateau, Black Mesa, and Navajo Mountain.

Habitat: Nests in tree cavities in relatively open ponderosa pine, Douglas-fir, or mixed conifer forests; may also nest in old-growth riparian woodlands. Wintering habitat is variable but dense vegetation is critical.

Similar Species: Western Screech-owl has ear tufts and black-streaked, gray breast; Flammulated Owl has small ear tufts and brown eyes; Northern Pygmy-owl has long tail, two black nape spots, and inconspicuous facial disc; all can be distinguished by calls.

Phenology:

e.MAR-m.MAY:	pair formation, courtship, nest-site selection
m.MAR-e.JUN:	egg-laying and incubation (27-29 days)
m.APR-e.JUL:	nestling period (33 days)
m.MAY-e.AUG:	fledging of young
e.JUN-l.SEP:	independence of young
>l.SEP:	overwintering

Survey Method: ≥1 survey during 1 APR-30 JUN at an effort sufficient to have high likelihood of detecting the species; if protocol surveys for the Mexican Spotted Owl are necessary for project, they are typically sufficient to detect this species as well.

Avoidance: No activity within 0.2 km (⅛ mi) of nest site during 1 MAR-1 AUG; no habitat alteration year-round within 0.2 km of nest site (=12 ha or 30 acre).

References:

Cannings, R.J. 1993. Northern Saw-whet Owl (*Aegolius acadicus*). In The Birds of North America, No.42 (A.Poole and F.Gill, eds.). The Academy of Natural Sciences, Philadelphia, and The American Ornithologists' Union, Washington, D.C. (description p.2)

BURROWING OWL
(*ATHENE CUNICULARIA*)

Navajo/Federal Statuses: NESL G4 / MBTA; not listed under the ESA.

Distribution: Breeding range covers a wide distribution across western North America, generally from south-central Canada and the Dakotas, south through TX, to central Mexico, and west to CA, OR, and WA; a disjunct population occurs in FL and nearby islands. Winter range includes most of TX, and southern parts of NM, AZ, and CA, south through Mexico to northern parts of Central America. Potential range on Navajo Nation includes all low-elevation desertland to elevation of juniper habitats.

Habitat: Nests in ground burrow (often deserted prairie-dog burrow) typically in dry, open grasslands or desertscrub, but grasslands with sparse junipers may also be used on the Navajo Nation; presence of suitable nest burrow is critical requisite.

Similar Species: Size (19-25 cm), coloration, (buffy-white spots on brown body with bright yellow eyes), and life history (diurnal desert-dweller) distinguish this species.

Phenology:

e.MAR-m.APR:	arrival to breeding area, pair formation, nest-site selection
m.MAR-m.MAY:	egg-laying and incubation (28-30 days)
m.APR- m.AUG:	nestling period (~44 days)
m.JUL-l.AUG:	some independence from adult, but little dispersal from natal area
e.SEP-m.NOV:	migration to wintering areas

Survey Method: Follow "Survey Protocol" section of Arizona's Burrowing Owl Project Clearance Protocol to locate active owl burrows; no provisions for closing unoccupied burrows on Navajo Nation. Survey during hours of first light to 11 am, and 3 hours before sunset to dusk; no surveys during excessive rain or above 32°C (90°F) ambient temperature. Conduct ≥2 diurnal transect surveys (transects spaced 10 m) in suitable habitat with high-powered optics during 15 MAR-31 JUL; record locations of all burrows with sign of recent owl use (presence of muting, pellets, and/or feathers at suitable burrow); scan area for owls every 100 m with binoculars; remove owl sign at potentially active burrows on first visit; check all potentially active burrows for fresh sign on second visit 2-8 days later.

Avoidance: No activity within 0.4 km (¼ mi) of active nest burrow during 1 MAR-15 AUG; no habitat alteration year-round within 0.2 km of nest site.

References:

Arizona Burrowing Owl Working Group. 2007. Burrowing Owl Project Clearance Protocol, July 30, 2007.

Haug, E.A., B.A. Millsap, and M.S. Martell. 1993. Burrowing Owl (*Speotyto cunicularia*). *In* The Birds of North America, No. 61 (A.Poole and F.Gill, eds.). The Academy of Natural Sciences, Philadelphia, and The American Ornithologists' Union, Washington, D.C. (description p.2)

BELTED KINGFISHER
(*CERYLE ALCYON*)

Navajo/Federal Statuses: NESL G4 / MBTA; not listed under the ESA.

Distribution: Breeding range includes most of US and Canada, but is a local, occasional breeder in AZ and NM. On Navajo Nation, known from Chuska Mountains (Tsaile and Asaayi Creeks), Morgan Lake, and the Little Colorado River. Potential occurs throughout Navajo Nation where appropriate habitat exists.

Habitat: Nests in burrows in earthen banks usually near major water source (streams, rivers, ponds and lakes) with adequate prey supply of small fish and other aquatic animals. Clear water, riffles and lack of overgrown vegetation are important components of lotic habitat; small lakes/ponds or coves and shallow bays of larger lakes are preferred lentic habitats.

Similar Species: Large bill, unique blue/white color pattern, and loud-rattling call distinguish this species.

Phenology:

e.APR-l.APR:	arrival to breeding area, courtship, nest building
l.APR-m.JUN:	egg-laying and incubation (22 days)
l.MAY-m.JUL:	nestling period (27-29 days)
l.JUN-m.AUG:	fledging of young
l.JUL-e.SEP:	independence of young (21 days), dispersal of adults
m.SEP-m.NOV:	migration to wintering areas

Survey Method: ≥1 survey in suitable habitat with high-powered optics during 1 MAY-1 JUL.

Avoidance: No disturbance to nesting habitat year-round; no activity within 0.2 km (⅛ mi) of active nest during 15 APR-15 AUG; buffer may be less depending on activity type and duration, but not less than 0.1 km.

References:

Hamas, M.J. 1994. Belted Kingfisher (*Ceryle alcyon*). *In* The Birds of North America, No.84 (A.Poole and F.Gill, eds.). The Academy of Natural Sciences, Philadelphia, and The American Ornithologists Union, Washington, D.C. (description p.2)

Prose, B.L. 1985. Habitat suitability index models: Belted Kingfisher. U.S. Fish & Wildlife Service. Biological Report (10.87). 22pp.

MOUNTAIN PLOVER
(*CHARADRIUS MONTANUS*)

Navajo/Federal Statuses: NESL G4 / MBTA; not listed under the ESA.

Distribution: Breeding range includes most of MT, WY, eastern CO, central to northern NM, and OK and TX panhandles. Wintering range includes central CA, southern parts of AZ, NM and TX, and northern Mexico. Known breeding on Navajo Nation occurs only in NM. Grasslands between the Chuska Mountains and Black Mesa and southwest of Black Mesa to Little Colorado River are potential habitat.

Habitat: Typically nests in flat (≤2° slope) to slightly rolling expanses of grassland, semi-desert, or badland, in an area with short, sparse vegetation, large bare areas (often ≥⅓ of total area), and that is typically disturbed (e.g. grazed); may also nest in plowed or fallow cultivation fields. Nest is a scrape in dirt often next to a grass clump or old cow manure pile. Migration habitat is similar to breeding habitat.

Similar Species: Killdeer has 2 black breastbands and rufous rump.

Phenology:

e.MAR-l.MAR: arrival to breeding areas, courtship, nest building
e.APR-m.JUN: egg-laying and incubation[1] (28-31 days)
e.MAY-m.JUL: hatching, young leave nest within 3-24 hours
e.MAY-m.AUG: young travel with 1 parent, fledge 34 days post-hatch
e.JUL-l.AUG: migration from breeding area
[1]multiple-clutching possible – female lays 2 clutches, male incubates 1st

Survey Guidelines: 3 visual surveys, each separated by 14 days, from stationary vehicle within 0.2 km (⅛ mi) of proposed project from 1 MAY-15 JUN.
U.S. Fish & Wildlife Service. 1999. Mountain Plover survey guidelines. Unpublished document.

Avoidance: No ground-disturbance activities within occupied habitat during 1 APR-15 JUL; when nest is found, delay project for 37 days, within 0.2 km (⅛ mi) of active nest with eggs, or delay 7 days if brood of flightless chicks observed (per U.S. Fish & Wildlife, 1999).

References:

Craig, T.H. and E.H. Craig. 1985. Recent nesting and sighting records of mountain plovers in northwestern New Mexico. Southwestern Naturalist, 30:451-452.
Graul, W.D. 1975. Breeding biology of the mountain plover. Wilson Bulletin, 87:6-31.
Knopf, F.L. 1996. Mountain Plover (*Charadrius montanus*). *In* The Birds of North America, No.211 (A.Poole and F.Gill, eds.). The Academy of Natural Sciences, Philadelphia, PA, and The American Ornithologists' Union, Washington, D.C. (description p.2)

DUSKY GROUSE
(*DENDRAGAPUS OBSCURUS*)

Navajo/Federal Statuses: NESL G4 / not listed under the ESA.

Distribution: Resident to all major mountain ranges of western U.S. and Canada, from AZ and NM to British Columbia. On Navajo Nation, they are known only from Chuska Mountains with potential habitat occurring at all elevations, but greatest potential is in high-elevation pine and fir forests, especially during winter.

Habitat: Nests primarily in mixed-conifer stands with relatively open tree canopies, but possibly in nearly all montane forest habitats, especially those dominated by Douglas-fir with varying amounts of aspen, and possibly ponderosa pine. Winter habitat is nearly exclusively montane conifer forests composed of fir or spruce, and occasionally pinyon pine.

Similar Species: no other montane grouse on Navajo Nation.

Phenology:

e.APR-e.MAY:	arrival to breeding areas, pair formation, mating
e.MAY-l.JUL:	egg-laying/incubation (25-28 days)
e.JUN-l.JUL:	hatching[1], young leave nest within 12-24 hours
e.JUN-l.SEP:	young travel with female parent
≥l.SEP:	independence and dispersal of young

[1]peak hatch period is likely m.JUN-e.JUL

Survey Method: ≥1 pedestrian survey with high-power optics recommended for breeding pairs or territorial males during 1 APR-15 JUN. Territorial males are very vocal (throughout day) and perform loud flutter-flights (dawn and dusk) during peak breeding.

Avoidance: No activity within 0.2 km (⅛ mi) of active nest site during 1 APR-15 JUL; buffer may be less depending on activity type and duration, but not less than 0.1 km; no habitat alteration year-round within 0.2 km of nest site (=12 ha or 30 acre).

References:

Zwickel, F.C. 1996. Blue Grouse (*Dendragapus obscurus*). *In* The Birds of North America, No.15 (A.Poole, P.Stettenheim and F.Gill, Eds.) The Birds of North America, Inc., Philadelphia, PA. (description p.2)

YELLOW WARBLER
(*DENDROICA PETECHIA*)

Navajo/Federal Statuses: NESL G4 / MBTA; not listed under the ESA.

Distribution: Breeding range includes most of Canada and AK, most of the U.S. and interior Mexico, but fragmented and local in the Southwest (mostly absent from southern and eastern CA, NV, western UT, northern and western AZ, NM, and TX); winters from coastal Mexico to South America. No current breeding records for Navajo Nation, but potential exists throughout where suitable habitat is present (especially areas of the San Juan River and its tributaries).

Habitat: In western US, nests primarily in wet, deciduous thickets, especially those dominated by willows, and in disturbed and early successional habitats. Migration habitats are mainly semi-open scrub or shrublands and second-growth forests, often associated with wetlands.

Similar Species: No other warblers on Navajo Nation are entirely yellow (male has rusty breast streaks); Yellow-rumped, Grace's, and Virginia's Warblers have various patches of yellow on throat and rump only; MacGillivray's Warbler has yellow belly but slate-gray head; Orange-crowned Warbler is olive-green above and greenish-yellow below with few faint breast streaks; female Common Yellowthroat is olive-brown above with a white belly, and male has black mask; Yellow-breasted Chat is 5-cm larger, brownish above, with white belly and eye-ring; female Lesser Goldfinch is greenish-yellow with dark wings and tail, male has black cap and wings.

Phenology:

m.APR-m.MAY:	arrival to breeding areas, pair formation, mating
m.MAY-m.JUL:	egg-laying and incubation[1] (11 days)
e.JUN-l.JUL:	nestling period (8-10 days)
m.JUN-m.AUG:	fledging of young (young with adults ≥17 days post-fledge)
m.AUG-e.OCT:	independence of young and migration

[1]Yellow Warbler nests are often parasitized by Brown-headed Cowbirds

Survey Method: ≥1 pedestrian survey with high-power optics during 1 MAY-30 JUN.

Avoidance: No activity within 0.2 km (⅛ mi) of active nest from 15 APR-31 JUL; extreme disturbances (e.g. blasting) may require larger buffer; no alteration of suitable habitat year-round within 0.2 km of habitat patches used for breeding, or potential habitat until surveyed.

References:

Lowther, P.E., C. Celada, N.K. Klein, C.C. Rimmer, and D.A. Spector. 1999. Yellow Warbler (*Dendroica petechia*). *In* The Birds of North America, No.454 (A.Poole and F.Gill, eds.). The Birds of North America, Inc., Philadelphia, PA. (description p.2)

HAMMOND'S FLYCATCHER
(*EMPIDONAX HAMMONDII*)

Navajo/Federal Statuses: NESL G4 / MBTA; not listed under the ESA.

Distribution: Breeding range extends from central AK and western Canada south to central CA, and northern AZ and NM; winters in southeastern AZ, Mexico, and Central America. On Navajo Nation, only known nesting occurs in Chuska Mountains; potential also on Black Mesa and Navajo Mountain.

Habitat: Breeds in nearly all high-elevation (2-3,000 m) forest types, including monotypic Douglas-fir, ponderosa pine, and aspen, also mixed-conifer and aspen/conifer types; stands are typically dense old-growth with cool micro-climates. Migration habitat is less restrictive, but preferably mid-elevation forest and riparian habitats.

Similar Species: All other *Empidonax* flycatchers, but *E.hammondii* is unique in its high-elevation-conifer nesting and song. Western Wood Pewee is slightly larger and lacks a white eye-ring; Olive-sided Flycatcher is slightly larger, has dark chest patches, and white tuft on rump.

Phenology:

m.MAY-e.JUN:	arrival to breeding area, courtship, nest-building
e.JUN-m.JUL:	egg laying, incubation (15 days)
m.JUN-e.AUG:	nestling period (16-18 days)
e.JUL-m.AUG:	fledging of young
l.JUL-e.SEP:	dispersal of young (20 days post-fledging)
m.AUG-e.OCT:	migration to wintering area

Survey Method: ≥1 pedestrian survey with broadcast of taped vocalization in suitable habitat during 1 JUN-15 JUL.

Avoidance: No activity within 0.2 km (⅛ mi) of active nest during 15 MAY-15 AUG; buffer may be less depending on activity type and duration, but not less than 0.1 km; no habitat alteration year-round within 0.2 km of nest site (=12 ha or 30 acre).

References:

Sedgwick, J.A. 1994. Hammond's Flycatcher (*Empidonax hammondii*). *In* The Birds of North America, No.109 (A.Poole and F.Gill, Eds.). Philadelphia: The Academy of Natural Sciences; Washington, D.C.: The American Ornithologists' Union. (description p.2)

AMERICAN PEREGRINE FALCON
(*FALCO PEREGRINUS*)

Navajo/Federal Statuses: NESL G4 / delisted from endangered 25 AUG 1998 (64FR:46542); MBTA.

Distribution: Breeds throughout much of U.S., and in Canada and Mexico. Breeding occurs across the Navajo Nation where appropriate habitat exists, including but not limited to, Chuska Mountain Range, Canyon de Chelly, Black Mesa and north to Glen Canyon, the Dilkon-buttes region, and the canyon reaches of the San Juan, Colorado and Little Colorado Rivers.

Habitat: Nests on steep cliffs >30 m tall (typically ≥45 m) in a scrape on sheltered ledges or potholes. Foraging habitat quality is an important factor; often, but not always, extensive wetland and/or forest habitat is within the falcon's hunting range of ≤12 km. Variability in topographic features, such as elevation and slope, may also indicate the availability of prey.

Similar Species: Prairie Falcon has brown dorsum, white eyebrow stripe and black underwing near body. Merlin (winter resident or migrant) is ⅓ smaller.

Phenology:

m.FEB-m.APR:	occupancy of nesting site, courtship[1] (14-42 days)
e.APR-l.MAY:	egg-laying (5-10 days), incubation[2] (30 days)
e.MAY-l.JUN:	nestling period[3] (42-49 days)
l.JUN-l.JUL:	fledging
e.JUL-l.AUG:	post-fledging period (14-42 days)
≥l.AUG:	migration

[1]good time to determine territory occupancy
[2]adults are inconspicuous
[3]audible nestlings, frequent adult visits - ideal time to locate nest site

Survey Method: Two 8-hr surveys (4 hrs before dark and 4 hrs after sunrise next day) during each period: 1 FEB-30 APR (surveys during egg-laying/incubation discouraged) & 1 MAY-31 JUL (2nd survey preferably prior to JUL). Productivity surveys require ≥1 additional visits.
Ward, L.Z. 1994. 1994 Peregrine Falcon survey methods. Nongame Branch, Arizona Game and Fish Dept. 12pp.

Avoidance: No activity within 0.8 km (½ mi) of nest during 1 MAR-31 JUL. No use of explosives within 1.6 km of nest.

References:

Ellis, D.H. 1982. The Peregrine Falcon in Arizona: habitat utilization and management recommendations. Institute for Raptor Studies, Research Report, Oct.1982, No.1.

Johnsgard, P.A. 1990. Peregrine Falcon. Pp.301-313, *In* Hawks, Eagles, & Falcons of North America. Smithsonian Institution Press. (description pp.301-303)

U.S. Fish and Wildlife Service. 1984. American Peregrine Falcon recovery plan (Rocky Mountain/Southwest Population). Prepared in cooperation with the American Peregrine Falcon Recovery Team. USFWS, Denver, CO.

White, C.M., N.J. Clum, T.J. Cade, & W.G. Hunt. 2002. Peregrine Falcon (*Falco peregrinus*). *In* The Birds of North America, No.660 (A.Poole and F.Gill, eds.). The Birds of North America, Inc., Philadelphia, PA. (description p.2)

NORTHERN PYGMY-OWL
(*GLAUCIDIUM GNOMA*)

Navajo/Federal Statuses: NESL G4 / MBTA; not listed under the ESA.

Distribution: Breeding range includes most of western North America from southeast AK and British Columbia, south through central parts of the Four-Corner states, and through central Mexico to northern Central America. On Navajo Nation, known from Chuska Mountain Range and Tsegi Canyon. Potential throughout forested areas and canyonlands on Navajo Nation.

Habitat: Nests in tree cavities, often near openings (e.g. meadows, lakes and ponds), in a variety of montane forest habitats, and possibly wooded canyons. Montane habitats include coniferous (spruce, fir and ponderosa pine), mixed conifer-hardwood with oak and aspen, hardwood bottomlands, and occasionally aspen stands. May migrate to lower elevations and use woodlands or prairie foothills as wintering habitat.

Similar Species: Flammulated Owl has dark eyes, small ear tufts, and shorter tail; Western Screech-owl has conspicuous ear tufts and shorther tail; Northern Saw-whet Owl has softly streaked breast, shorter tail, and large facial disc; all can be distinguished by calls.

Phenology:

e.MAR-l.APR:	arrival to breeding area, pair formation
m.APR-m.JUN:	egg laying, incubation (28 days)
l.APR-m.JUL:	nestling period (23-28 days)
m.JUN-m.AUG:	fledging of young
m.JUL-m.SEP:	independence of young, dispersal
m.OCT-e.MAR:	migration, overwintering

Survey Method: ≥1 survey during 1 APR-15 JUL at an effort sufficient to have high likelihood of detecting the species; if protocol surveys for the Mexican Spotted Owl are necessary for project, they are typically sufficient to detect this species as well.

Avoidance: No activity within 0.2 km (⅛ mi) of nest site during 1 APR-15 AUG; no habitat alteration year-round within 0.2 km of nest site (=12 ha or 30 acre).

References:

Holt, D.W. and J.L. Petersen. 2000. Northern Pygmy-Owl (*Glaucidium gnoma*). *In* The Birds of North America, No.494 (A.Poole and F.Gill, Eds.). The Birds of North America, Inc., Philadelphia, PA. (description p.2)

Johnsgard, P.A. 1988. North American Owls. Smithsonian Institution Press, Washington, D.C.

CALIFORNIA CONDOR
(*GYMNOGYPS CALIFORNIANUS*)

Navajo/Federal Statuses: NESL G4 / listed endangered 11 MAR 1967 (32FR:4001); experimental, non-essential population designation for northern Arizona reintroduction 16 OCT 1996 (61FR:54044), includes Navajo Nation west of US Hwy.191 and north of Interstate Hwy.40; MBTA.

Distribution: Once widely distributed through North America, occupied range was restricted to southern CA by mid-20th century; two extant populations exist in southern CA and northern AZ resulting from reintroductions in the 1990s. Northern AZ population was reintroduced adjacent to the Navajo Nation at Vermilion Cliffs and now use much of Marble and Grand canyons for foraging and breeding, and to a smaller extent western Navajo Nation for foraging. Condors are now breeding in the wild in northern AZ, but not yet on the Navajo Nation; roosting on the Navajo Nation is mostly restricted to Marble Canyon.

Habitat: Ill-defined nest, if any, composed of existing debris within overhung cliff ledges, crevices, potholes, or caves; in northern AZ, nesting will likely be within walls of major river canyons or tall, steep cliffs within desertscrub and grasslands. Nest locations allow easy approach from the air, at least partial shelter from weather, and are usually inaccessible for terrestrial predators.

Similar Species: Despite its massive size, un-feathered head, and distinctive coloration, condors may be confused in-flight with smaller raptors, including: Golden Eagle (which has relatively longer tail, further-projecting head, and unique under-wing coloration), immature Bald Eagle (which has more underbody mottled-white appearance; and Turkey Vulture (which has upturned (dihedral) wings and much less steady flight).

Phenology:

e.NOV-l.JAN:	pair formation (pairs remain together on year-round, multi-year basis once formed)
m.JAN-e.APR:	egg laying, incubation (57 days)
l.MAR-e.JUN:	nestling period (5½-6 months)
e.SEP-m.NOV:	fledging of young (young independent from adults after 6 months)
year-round:	non-migratory wide-ranging residents

Survey Method: Contact the Navajo Nation Dept. of Fish and Wildlife which should have current information on nesting and roosting sites on the Navajo Nation; or ≥1 survey in suitable habitat with high-powered optics year-round. Rather current information may be obtained in the "Notes from the Field" link on www.peregrinefund.org.

Avoidance: No activity within 1.6 km (1 mi) of nest site during 1 FEB-30 JUN; avoidance period may be extended at either end depending on project; and no activity within 0.8 km (0.5 mi) of communal roosts while occupied by condors. If condor(s) occur at project site: activity should cease until condor(s) leave on their own; Navajo Nation Dept. of, or U.S., Fish and Wildlife should be contacted immediately; allow no human interaction with the bird(s), especially non-permitted hazing; project sites should be cleaned at the end of each day to minimize attracting condors.

References: Federal Recovery Plan - 1996

Snyder, N.F.R., and N.J. Schmitt. 2002. California Condor (*Gymnogyps californianus*). *In* The Birds of North America, No.610 (A.Poole and F.Gill, eds.). The Academy of Natural Sciences, Philadelphia, PA, and the American Ornithologists' Union, Washington, D.C. (description p.2)

FLAMMULATED OWL
(*OTUS FLAMMEOLUS*)

Navajo/Federal Statuses: NESL G4 / MBTA; not listed under the ESA.

Distribution: Breeding range includes most mountain ranges of western US, southern British Columbia, and Mexico. On Navajo Nation, known from Chuska Mountain Range, Defiance Plateau, and Black Mesa. Potential exists throughout forested areas of Navajo Nation.

Habitat: Nests in tree cavities in open conifer (usually ponderosa pine) or aspen forests, often with brushy understory of dense saplings or oak shrubs and clearings; areas with old-growth are preferred. Roosts within dense stands with large-diameter trees or regeneration. Nest and roost habitats need high abundance and diversity of nocturnal arthropods for prey. Winter in lower elevation habitats, especially riparian areas.

Similar Species: Flammulated Owl is the only small owl with dark eyes, rather than yellow; Western Screech-Owl is larger with grayish color; Northern Pygmy-Owl has long tail, two black nape spots, and no ear tufts; Northern Saw-whet Owl has reddish-streaked breast and no ear tufts; all can be distinguished by calls.

Phenology:

l.APR-m.MAY:	arrival to breeding area, pair formation
m.MAY-l.JUN:	egg laying, incubation (22 days)
e.JUN-m.JUL:	nestling period (22 days)
l.JUN-m.AUG:	fledging of young
l.JUL-m.SEP:	independence of young, dispersal (30-35 days)
>m.SEP:	migration, overwintering

Survey Method: ≥1 survey during 15 MAY-15 JUL at an effort sufficient to have high likelihood of detecting the species; if protocol surveys for the Mexican Spotted Owl are necessary for project, they are typically sufficient to detect this species as well.

Avoidance: No activity within 0.2 km (⅛ mi) of nest site during 1 MAY-15 AUG; no habitat alteration year-round within 0.2 km of nest site (=12 ha or 30 acre).

References:

Johnsgard, P.A. 1988. North American Owls. Smithsonian Institution Press, Washington, D.C.

McCallum, D.A. 1994. Flammulated Owl (*Otus flammeolus*). *In* The Birds of North America, No.93 (A.Poole and F.Gill, eds.). The Academy of Natural Sciences, Philadelphia, PA, and the American Ornithologists' Union, Washington, D.C. (description p.2)

BAND-TAILED PIGEON
(*PATAGIOENAS FASCIATA*)

Navajo/Federal Statuses: NESL G4 / MBTA; not listed under the ESA.

Distribution: Two disjunct breeding ranges extend: along Pacific Coast from northern WA to southern CA; and from central UT and CO south through AZ and NM and central Mexico throughout most Central American countries. Winters in central and southern CA, and throughout breeding range south of U.S.-Mexico border. Known from the Chuska Mountains on Navajo Nation; potential also for Defiance Plateau, and possibly Black Mesa and Navajo Mountain.

Habitat: In U.S. range, nests primarily in montane conifer or mixed-species forests dominated by pines and oaks at 1,600-2,700 m elevation (5,250-8,850 ft). Prefers pine-Douglas-fir forests and spruce-fir with abundant berry-producing shrubs in CO, northern AZ and NM; prefers Gambel's oak-dominated communities in southern UT. Migration habitat is generally same as used for nesting.

Similar Species: Band-tailed Pigeon has gray body, broad pale band across end of tail, yellow feet, yellow bill with black tip, and white crescent on nape of neck; Rock Dove (domestic pigeon) has various color variants, but has shorter tail, stockier body, dark bill, pinkish feet, white rump patch, and lacks white crescent on nape of neck; Mourning dove is brownish, smaller, and has pointed tail with large white spots on edges.

Phenology:

l.MAR-l.MAY:	arrival to breeding area (peak l.APR-m.MAY), nest building
m.MAY-e.AUG:	egg laying[1], incubation (16-22 days)
m.JUN-l.AUG:	nestling period (22-29 days) (may renest after 1st young fledges)
m.AUG-l.SEP:	migration to wintering area

[1]peak nesting period is estimated 16 JUN-15 JUL for CO and NM

Survey Method: ≥1 pedestrian survey with high-power optics for nesting pairs during 1 JUN-15 JUL.

Avoidance: No activity within 0.2 km (⅛ mi) of active nest site during 1 MAY-1 AUG; buffer may be less depending on activity type and duration, but not less than 0.1 km; no habitat alteration year-round within 0.2 km of nest site (=12 ha or 30 acre).

References:

Keppie, D.M., and C.E. Braun. 2000. Band-tailed Pigeon (*Columba fasciata*). *In* The Birds of North America, No.530 (A.Poole and F.Gill, Eds.). The Birds of North America, Inc., Philadelphia, PA. (description p.2)

AMERICAN THREE-TOED WOODPECKER
(*PICOIDES DORSALIS*)

Navajo/Federal Statuses: NESL G4 / MBTA; not listed under the ESA.

Distribution: Breeding range extends throughout AK and Canada to northeastern U.S., and south through most western states to eastern NV, central AZ, and southern NM. On Navajo Nation, known only from the Chuska Mountains, and low potential for Black Mesa and Navajo Mountain.

Habitat: Nests and winters primarily in spruce, fir, aspen, or mixed-conifer forests (and possibly adjacent ponderosa pine habitats) above 2,400 m (8,000 feet) elevation; ideal conditions have mature or old-growth stands, fire-killed trees, 42-52 snags per 40 ha (100 acres), and/or large numbers of bark-boring beetles. Nest is placed 1½-15 m high in a stump or dead/dying conifer or aspen.

Similar Species: Only woodpecker on Navajo Nation with 3 toes (all others have 4), barred sides, and males have yellow crown; Lewis's Woodpecker has red face-patch, pinkish belly, and wide gray collar; Acorn Woodpecker has red crown, white eyes and rump; Hairy and Downy Woodpeckers have white backs and eye-stripes, and males have red patch on back of head; Northern Flicker has spotted breast, red mustache, and black chest band; Williamson's Sapsucker males have yellow belly, red throat, and white wing and rump patches, while females have brown head, white rump, and white-black striped back; Red-naped Sapsucker has white wing patches, and red, white, and black striped head.

Phenology:

e.APR-e.MAY:	courtship, nest-building
e.MAY-l.JUN:	egg laying, incubation (11-14 days)
m.MAY-m.JUL:	nestling period (22-26 days)
e.JUN-m.AUG:	fledging of young (young remain with adults)
e.JUL-m.SEP:	growth and independence of young (≥30 days post-fledging)
>m.SEP:	over-wintering

Survey Method: ≥1 pedestrian survey with high-power optics during 15 APR-15 JUL for individuals, or year-round for potential habitat.

Avoidance: No activity within 0.2 km (⅛ mi) of active nest site during 1 MAY-1 AUG; buffer may be less depending on activity type and duration, but not less than 0.1 km; no habitat alteration year-round within 0.2 km of nest site (=12 ha or 30 acre).

References:

Leonard, D.L., Jr. 2001. Three-toed Woodpecker (*Picoides tridactylus*). *In* The Birds of North America, No.588 (A.Poole and F.Gill, eds.). The Birds of North America, Inc., Philadelphia, PA. (description p.2)

NatureServe Explorer: An online encyclopedia of life [web application]. 2000. Version 1.0. Arlington (VA): NatureServe. Available: http://www.natureserve.org/. (Accessed: October 31, 2000).

SORA
(*PORZANA CAROLINA*)

Navajo/Federal Statuses: NESL G4 / MBTA; not listed under the ESA.

Distribution: Breeding range includes most of Canada, northern and western US, south to central AZ and NM; winters in extreme southern US, Mexico, and Central America. Known from various ponds/lakes on Navajo Nation including several in Chuska Mountains, Morgan Lake, and near Tuba City. Potential at suitable wetlands throughout Navajo Nation.

Habitat: Nests in wetlands with shallow to intermediate-depth water and fine-leaved emergent vegetation (typically cattails, sedges, burreeds, and bulrushes); floating and submerged vegetation increases habitat quality. Wetlands with heavy snow, ice or high water until early May are unusable for nesting. Migration habitat is typically wetlands with tall, dense vegetation and shorter seed-producing plants, but occasionally may include upland habitats (e.g. fields and pastures).

Similar Species: Virginia Rail has longer bill and red legs, bill and breast; Common Snipe has long bill, black-striped head, and reddish tail.

Phenology:

e.APR-m.MAY:	arrival to breeding area, courtship
e.MAY-l.JUL:	egg-laying, incubation (16-19 days)
l.MAY-m.AUG:	nestling period (2-3 days), fledging of young
l.JUN-l.AUG:	independence of young (28 days post-fledging)
e.SEP-m.OCT:	migration to wintering area

Survey Method: ≥ 1 pedestrian survey with high-power optics during 1 MAY-1 AUG for individuals, or year-round for potential habitat.

Avoidance: For nesting habitat, no surface disturbance within 60 m of lakes and Category I wetlands and 45 m of Category II wetlands, per Navajo Natural Heritage Program (1994); no activity within 0.2 km (⅛ mi) of active nest during 1 MAY-1 AUG; buffer may be less depending on activity type and duration, but not less than 0.1 km.

References:

Melvin, S.M. and J.P. Gibbs. 1996. Sora (*Porzana carolina*). *In* The Birds of North America, No.250 (A.Poole and F.Gill, eds.). The Academy of Natural Sciences, Philadelphia, and The American Ornithologists' Union, Washington, D.C. (description p.2)

Navajo Natural Heritage Program. 1994. Draft Guidance, Navajo Nation Aquatic Resources Protection Plan. Window Rock, AZ.

TREE SWALLOW
(*TACHYCINETA BICOLOR*)

Navajo/Federal Statuses: NESL G4 / MBTA; not listed under the ESA.

Distribution: Breeding range includes most of central and northern North America, but is a local breeder in AZ and NM; winters in extreme southern US, Mexico, and Central America. Known from Chuska Mountains on Navajo Nation; but potential occurs throughout forested areas of Navajo Nation.

Habitat: Breeds in existing cavities of variety of tree species (coniferous and deciduous); often uses snags in open fields near water, especially marshes and wooded ponds.

Similar Species: Bank Swallow has brown dorsum and breastband; Northern Rough-winged Swallow has brown dorsum and dusky throat; Violet-green Swallow has a greener dorsum and white patches on sides of rump; Cliff Swallow has rusty-colored rump and dark throat; Barn Swallow has a dark throat and deeply-forked tail; White-throated Swift has white rump patches and black side patches on breast.

Phenology:

l.MAR-e.MAY:	arrival to breeding area, courtship, nest-building
m.MAY-l.JUN:	egg-laying and incubation (14-15 days)
l.MAY-e.AUG:	nestling period (18-22 days)
m.JUN-e.AUG:	fledging, independence of young (3 days post-fledge)
m.AUG-l.SEP:	migration to wintering area

Survey Method: ≥ 1 pedestrian survey with high-power optics during 1 May-15 JUL for individuals, or year-round for potential habitat.

Avoidance: No activity within 0.2 km (⅛ mi) of active nest site during 1 MAY-1 AUG; buffer may be less depending on activity type and duration, but not less than 0.1 km; no habitat alteration year-round within 0.2 km of nest site (=12 ha or 30 acre).

References:

Roberston, R.J., Stutchbury, B.J., and R.R. Cohen. 1992. Tree Swallow (*Tachycineta bicolor*). *In* The Birds of North America, No.11 (A.Poole, P.Stettenheim, and F.Gill, eds.). Philadelphia: The Academy of Natural Sciences; Washington, D.C.: The American Ornithologists' Union. (description p.2).

GRAY VIREO
(*VIREO VICINIOR*)

Navajo/Federal Statuses: NESL G4 / MBTA; not listed under the ESA.

Distribution: Breeding range includes mostly montane regions and adjacent scrubland of southwestern U.S. from south-central NM north to northwestern CO, southwest to southern NV and to southeastern AZ; local breeding in southern CA and southwestern TX; winters mostly in south-central AZ, Sonora Mexico, and the Baja Peninsula; also in southwestern TX. Distribution on Navajo Nation is relatively unknown; but potential occurs throughout pinyon-juniper woodlands of Navajo Nation.

Habitat: Prefers mixed juniper/pinyon, juniper sagebrush associations, and possibly in dry brushland and oak scrub woodlands; continuous shrub cover 0.5 – 2 m in height is important component of breeding habitat in CA and TX parts of range, possibly on Navajo Nation also. Nests in CO were 2 m above ground in 3 m tall junipers, on average; also nests in pinyon pine, sagebrush, sumac, mountain mahogany, and oak species. Species is often separated from other *Vireo* species by elevation preferences.

Similar Species: Most like, and may share habitat at higher elevations with, Plumbeous Vireo which has bold white eye rings and above beak and slower song; similar in appearance to Bell's Vireo which is not a breeding bird of Navajo Nation; Juniper Titmouse has slight tufted head and call similar to chickadee; Blue-gray Gnatcatcher is smaller and has darker gray colors, thin beak, and strong white outer edge of tail, which is usually held upright; Gray Flycatcher has slight olive coloration on dorsum and whitish below, shows white on outer edge of tail, which is dropped down slowly upon perching; bushtit is smaller and shows brown cheek patch, and usually found in large, active flock.

Phenology:

e.MAR-l.APR:	arrival to breeding area, courtship, nest-building (peak of migration is l.MAR-m.APR)
m.MAY-l.JUN:	egg-laying and incubation (12-14 days)
l.MAY-m.AUG:	nestling period (13-14 days)
l.JUN-l.AUG:	fledging, independence of young
m.AUG-m.OCT:	migration to wintering area (peak of migration is m.SEP)

Survey Method: Conduct 1 tape-playback survey between 15 MAY and 10 JUN in appropriate habitat (P-J stands between 5,800-7,200 ft. elev.) from dawn to noon; if no VIVI found, repeat survey between 15 and 30 JUN. Use 3, 2-min. listening periods with 2, 20-30 sec. tape-playing at survey points spaced 200-300 m apart. (Protocol per: Delong and Williams, 2006, Appendix C. Protocol for surveying for Gray Vireos in New Mexico.)

Avoidance: No activity within 0.2 km (⅛ mi) of active nest site during 1 MAY-31 AUG; buffer may be less depending on activity type and duration, but not less than 0.1 km; no habitat alteration year-round within 0.2 km of nest site (=12 ha or 30 acre).

References:

Barlow, J.C., S.N. Leckie, and C.T. Baril. 1999. Gray Vireo (*Vireo vicinior*). *In* The Birds of North America, No.447 (A.Poole, and F.Gill, eds.). The Birds of North America, Inc., Philadelphia, PA.

DeLong, J.P. and S.O. Williams III. 2006. Status report and biological review of the gray vireo in New Mexico. New Mexico Dept. Game and Fish Report.

MILK SNAKE
(*LAMPROPELTIS TRIANGULUM*)

Navajo/Federal Statuses: NESL G4 / not listed under the ESA. .

Distribution: Range extends from southeastern Canada and all eastern U.S. states, west to MT, central CO and NM, and south through Mexico to Ecuador; also disjunct populations in UT and AZ. Currently no records from Navajo Nation, but has been found in bordering areas (Farmington, Cameron, Bluff, Wupatki National Monument, and Petrified Forest National Park); potential throughout all elevations and habitats of Navajo Nation.

Habitat: Secretive species that uses rocks, logs, stumps, boards, and other surface objects as cover, within a variety of habitats including river valleys, desertscrub and grasslands, pinyon-juniper, and coniferous forests; most specimens from NM were found in high foothill grasslands and coniferous forests.

Similar Species: Uniquely colored species with thick red or orange bands, bordered by black, and separated by narrow yellow or white bands; 35-135 cm (14-52 inches) length.

Phenology:

e.MAR-l.APR:	arousal from hibernation, mating
e.MAY-e.JUL:	egg laying
e.JUL-l.AUG:	hatching of eggs
l.AUG-l.OCT:	growth of young and end of activity period
l.OCT-e.MAR:	hibernation

Survey Method: Pedestrian survey for individuals 1 APR-1 SEP, or evaluations may be based on the presence of habitat.

Avoidance: No surface disturbance within occupied habitat that could result in take of individuals or habitat alteration.

References:

Degenhardt, W.G., C.W. Painter, A.H. Price. 1996. Amphibians and Reptiles of New Mexico. University of New Mexico Press, Albuquerque. (description p.284)

CHUCKWALLA
(*SAUROMALUS ATER*)

Navajo/Federal Statuses: NESL G4 / not listed under the ESA.

Distribution: Range includes southern CA and NV south through Baja Peninsula and northwestern Mexico, and east through western AZ, including the canyons of the Colorado River in northern AZ and south-central UT. Known range on Navajo Nation is not well known, but likely includes deep canyons and adjacent desertlands of Little Colorado River, Marble Canyon area (including Echo Cliffs) of Colorado River, and San Juan River in UT.

Habitat: Typical habitats are low desertlands (especially with volcanic alluvia and lava flows or desert hardpan) and rocky canyons (especially with large boulders); also use margins of grass-oak woodlands in southern UT.

Similar Species: Unique species with body size of 14-20 cm (5½-8 inches), uniform dark-colored body, and loose folds of skin on sides and neck.

Phenology: (not well known for Navajo Nation)

e.MAR-l.MAY:	arousal from hibernation, territory establishment, mating
e.JUN-l.JUL:	egg laying (females may lay eggs only every other year)
e.AUG-e.OCT:	hatching and growth of young (adults may aestivate in summer)
e.AUG-l.FEB:	beginning of inactivity period and hibernation

Survey Method: ≥1 pedestrian survey for individuals 15 APR-15 AUG, or evaluations may be based on the presence of habitat.

Avoidance: No surface disturbance within occupied habitat that could result in take of individuals or habitat alteration.

References:

Hollingsworth, B.D. 1998. The systematics of chuckwallas (*Sauromalus*) with a phylogenetic analysis of other Iguanid lizards. Herpetological Monographs, 12:38-191. (description p.136)

Johnson, S.R. 1965. An ecological study of the chuckwalla, *Sauromalus obesus*, Baird, in the western Mojave Desert. American Midland Naturalist, 73:1-29.

BLUEHEAD SUCKER
(*CATOSTOMUS DISCOBOLUS*)

Navajo/Federal Statuses: NESL G4 / not listed under the ESA.

Distribution: Range includes eastern ID and western WY, and south throughout upper Colorado River drainage in UT, CO, and northwestern NM; also found in Colorado River in Grand Canyon area and upper Little Colorado River tributaries in AZ. On the Navajo Nation, known throughout San Juan River and its major tributaries, Little Colorado River at the confluence with the Colorado River, and in several drainages of western Chuska Mountains (Kinlichee, Whiskey, Wheatfields, and Tsaile Creeks). Potential in other Chuska Mountain streams, and perennial stretches of Canyon de Chelly. Chuska Mountain populations, especially Kinlichee Creek, are currently being compared (morphometrics and genetics) to the federal candidate Zuni bluehead Sucker (*C.d.yarrowi*).

Habitat: Occupies a wide range of water conditions within river/stream habitats, including variable water temperatures (16-26° C), and stream volumes (<1 to several hundred m^3/second); often occupy the swift-water areas in mountain streams. Smaller tributaries adjacent to large rivers are often nursery areas.

Similar Species: Only suckers have protractile mouths with large, fleshy lips; bluehead sucker is ≤45 cm in length and has silver-blue color; flannelmouth sucker is ≥45 cm in length and has very thick, elongated lower lip completely divided by median groove; razorback sucker is ≤60 cm and has keeled dorsal hump behind head.

Phenology:

e.MAY-m.JUL:	spawning season
m.JUL-m.SEP:	adults maintain brilliant breeding colors
m.SEP-l.MAY:	growth of young, non-breeding season

Survey Method: Evaluations may be based on the presence of habitat. Electrofishing or seine surveys may be important if the proposed action may result in significant habitat alterations.

Avoidance: Within occupied habitat, no surface disturbance year-round within 30-60 m of top of stream bank (depending on stream category, per Navajo Natural Heritage Program, 1994), and prevent changes to water chemistry or quantity.

References:

Holden, P.B. and W. Masslich. 1997. San Juan River recovery implementation program, summary report 1991-1996, PRN-576-2. BIO/WEST, Inc., Logan, UT.

Minckley, W.L. 1973. Fishes of Arizona. Arizona Game and Fish Department, Sims Printing Co., Inc. Phoenix, AZ. (description p.170)

Navajo Natural Heritage Program. 1994. Draft Guidance, Navajo Nation Aquatic Resources Protection Plan. Window Rock, AZ.

Smith, G.R. 1966. Distribution and evolution of the North American *Catostomid* fishes of the subgenus (*Pantosteus*, Genus *Catostomus*. Misc. Publicat. of Museum of Zoology, Univ. of Michigan, No.129, pp.82.97.

Mikesic, D.G. 2008. Species Account for *Catostomus discobolus*. Navajo Natural Heritage Program, P.O. Box 1480, Window Rock, AZ 86515.
For additional copies, visit: http://nnhp.nndfw.org/; call 928-871-6472; or email: dmikesic@nndfw.org Revised: 17 MAR 2008

MOTTLED SCULPIN
(*COTTUS BAIRDI*)

Navajo/Federal Statuses: NESL G4 / not listed under the ESA. .

Distribution: Range includes most of eastern U.S. and Canada; also present in northwestern U.S. and a few tributaries of the Colorado River. On Navajo Nation, known only from New Mexico-reach of San Juan River; potential also in Utah-reach and the perennial tributaries of San Juan River.

Habitat: Prefer stream sections with coarse gravel and small-to-large rock substrates (usually riffle areas) are preferred, regardless of water depth. Adults rarely use areas with slow current and silt substrate; young typically use areas with little or no current, and may hide within silt of slow-water shorelines. Spawning occurs within shallow, scooped-out depressions under large rocks as eggs are adhered to the underside of rocks; water velocity is not criteria for spawning sites. Males attend eggs until hatching.

Similar Species: Unique species with eyes on upper surface of large flat head, and slender body of 10-15 cm.

Phenology:

e.FEB-l.MAY: spawning (incubation period of eggs ≤30 days)
>m.APR: growth of young (reproduce at 2 yrs. of age)

Survey Method: Evaluations may be based on the presence of habitat. Electrofishing or seine surveys may be important if the proposed action may result in significant habitat alterations.

Avoidance: Within occupied habitat, no surface disturbance year-round within 30-60 m of top of stream bank (depending on stream category, per Navajo Natural Heritage Program, 1994), and prevent changes to water chemistry or quantity.

References:

Minckley, W.L. 1973. Fishes of Arizona. Arizona Game and Fish Department, Sims Printing Co., Inc. Phoenix, AZ. (description p.261)

Navajo Natural Heritage Program. 1994. Draft Guidance, Navajo Nation Aquatic Resources Protection Plan. Window Rock, AZ.

Ryden, D.W. and F.K. Pfeifer. 1996. Adult fish community monitoring on the San Juan River, 1995 Annual Progress Report. US Fish & Wildlife Service, Grand Junction, CO.

Zarbock, W.M. 1952. Life history of the Utah sculpin, *Cottus bairdi semiscaber* (Cope), in Logan River, Utah. Transactions of American Fisheries Society 81:249-259.

Mikesic, D.G. 2008. Species Account for *Cottus bairdi*. Navajo Natural Heritage Program, P.O. Box 1480, Window Rock, AZ 86515.
For additional copies, visit: http://nnhp.nndfw.org/; call 928-871-6472; or email: dmikesic@nndfw.org Revised: 17 MAR 2008

ROCKY MOUNTAINSNAIL
(*OREOHELIX STRIGOSA*)

Navajo/Federal Statuses: NESL G4 / not listed under the ESA.

Distribution: Species mostly occurs in swath through western states of WA, ID, and MT south through UT, CO to northern third of AZ and NM; subspecies on Navajo Nation (*O.s.depressa*) occurs in southern half of U.S. range. One historic record from south slope of Navajo Mountain, but presently known from few locations in the Chuska Mountains. Potential throughout forested areas and possibly canyonlands on Navajo Nation.

Habitat: On Navajo Nation, known populations are in leaf-litter or within/near rocks and rock outcrops within steep-sloped, northern-aspect coniferous forests; steep-walled canyons and areas that maintain moist soils are also potential. Within most of U.S. range, restricted to limestone outcrops or under vegetation on limestone slopes where presence of limestone is critical; sandstone seems to provide adequate substrate in some exceptions (especially on the Navajo Nation). Composition of the plant community is of little importance in determining potential habitat (ranging from no vegetation to sagebrush, deciduous shrubs and trees, and coniferous forests); however, a cool, moist microclimate and leaf mold are critical.

Similar Species: *Oreohelix* are the largest land snails on Navajo Nation, but species may be difficult to differentiate due to local variations in size and coloration; usually require examination by a expert specializing in mollusks. *Oreohelix* typically have a rough-textured, depressed-heliciform-shaped shell, are opaque with coloration of pale greyish-white to dark brownish, and typically have two bands of darker brown (one prominent band above and another just below the periphery). *O.strigosa* tends to be larger in circumference (~19-26 mm) and height of spire, and sometimes with more than two dark bands along shell. Other than *O.yavapai*, only one other *Oreohelix* (*O.houghi*) has been recorded on Navajo Nation (in Canyon Diablo); *O.houghi* is generally smaller in circumference (16-20mm), has irregular or spotted bands, and no spiral striation.

Phenology:
e.APR-l.OCT[1]: non-migratory residents, most active during/after rainy periods
e.NOV-l.MAR: over-wintering
[1]time periods estimated; information on phenology is lacking

Survey Method: ≥1 survey during 1 MAY-1 OCT, especially during rainy periods, at an effort sufficient to have high likelihood of detecting the species; locating dead shells on surface of ground is easiest way to determine presence.

Avoidance: No surface disturbance year-round within 60 m of occupied habitat.

References:
NatureServe Explorer: An online encyclopedia of life [web application]. 2005. Version 4.2. Arlington (VA): NatureServe. Available: http://www.natureserve.org/. (Accessed: January 12, 2005).
Pilsbry, H.A. 1939. Land Mollusca of North America (North of Mexico). The Academy of Natural Sciences of Philadelphia. Monograph No.3, Vol.1, Part 1.

YAVAPAI MOUNTAINSNAIL
(*OREOHELIX YAVAPAI*)

Navajo/Federal Statuses: NESL G4 / not listed under the ESA.

Distribution: Species mostly occurs in AZ, NM, and southern UT with smaller distributions in WY and MT. Historic records indicate two subspecies (*O.y.clutei* and *O.y.cummingsi*) from on, and around, Navajo Mountain, but presently known from one location in Canyon de Chelly National Monument (subspecies unknown). Potential throughout forested areas and possibly canyonlands on Navajo Nation.

Habitat: Only known extant population on Navajo Nation occurs on steep-sloped, northern-aspect coniferous forest with dense mossy groundcover over an exposed rock/boulder substrate. Cool, moist microclimate and dense moss are likely key habitat components here. Potential habitats include steep-forested slopes with leaf-litter and/or exposed rocks and rock outcrops, steep-walled canyons, and others areas that maintain a cool, microclimate and moist soils.

Similar Species: *Oreohelix* are the largest land snails on Navajo Nation, but species may be difficult to differentiate due to local variations in size and coloration; usually require examination by a expert specializing in mollusks. *Oreohelix* typically have a rough-textured, depressed-heliciform-shaped shell, are opaque with coloration of pale greyish-white to dark brownish, and typically have two bands of darker brown (one prominent band above and another just below the periphery). *O.yavapai* tends to be smaller in circumference (~12-16 mm) and more whitish in color with dull brown spire. Other than *O.strigosa*, only one other *Oreohelix* (*O.houghi*) has been recorded on Navajo Nation (in Canyon Diablo); *O.houghi* is generally larger in circumference (16-20mm), has irregular or spotted bands, and no spiral striation.

Phenology:
e.APR-l.OCT[1]: non-migratory residents, most active during/after rainy periods
e.NOV-l.MAR: over-wintering
[1]time periods estimated; information on phenology is lacking

Survey Method: ≥1 survey during 1 MAY-1 OCT, especially during rainy periods, at an effort sufficient to have high likelihood of detecting the species; locating dead shells on surface of ground is easiest way to determine presence.

Avoidance: No surface disturbance year-round within 60 m of occupied habitat.

References:
NatureServe Explorer: An online encyclopedia of life [web application]. 2005. Version 4.2. Arlington (VA): NatureServe. Available: http://www.natureserve.org/. (Accessed: January 12, 2005).
Pilsbry, H.A. 1939. Land Mollusca of North America (North of Mexico). The Academy of Natural Sciences of Philadelphia. Monograph No.3, Vol.1, Part 1.

KANAB AMBERSNAIL
(*OXYLOMA KANABENSE*)

Navajo/Federal Statuses: NESL G4 / listed endangered 17 APR 1992 (57FR:13657).

Distribution: Only two populations known: 1) near Kanab in Kane County, UT; 2) at Vasey's Paradise in Grand Canyon National Park (75.3 km downstream of Glen Canyon Dam). Potential is likely restricted to western Navajo Nation; including tributaries of Colorado and Little Colorado Rivers, springs on Echo Cliffs, and creeks north and west of Navajo Mountain.

Habitat: Restricted to perennially wet soil surfaces or shallow standing water and decaying plant matter associated with springs and seep-fed marshes near sandstone or limestone cliffs. Vegetative cover is necessary; cattails, monkeyflower, or watercress are present at the two known locations, but wetland grasses and sedges may suffice.

Similar Species: other Succineid snails; see Pilsbry, 1948.

Phenology:

m.MAR-l.MAR:	emergence from winter dormancy by previous year's young
e.APR-e.JUL:	maturation
e.JUL-l.AUG:	peak reproduction
l.AUG-l.SEP:	growth of young, die-off of adults
>l.SEP:	growth of young, winter dormancy

Survey Method: Pedestrian surveys within suitable habitat examining on and under wetland vegetation for live or dead snails. Federal permit required for collection. Suggested reference: Spamer and Bogan, in press.

Avoidance: No surface disturbance year-round within 60 m of occupied habitat; no alteration of water quantity and chemistry.

References:

Pilsbry, H.A. 1948. Land mollusca of North America (North of Mexico). Academy of Natural Sciences of Philadelphia Monographs II, No.3. (description, p.797)

Spamer, E.E. and A.E. Bogan. in press. Contrasting objectives in environmental mediation, reconnaissance biology, and endangered species protection - a case study in the Kanab Ambersnail, *Oxyloma haydeni kanabensis* Pilsbry, 1948 (Gastropoda: Stylommatophora: Succineidae). Submitted to Walkerana.

U.S. Fish & Wildlife Service. 1995. Kanab ambersnail (*Oxyloma haydeni kanabensis*) Recovery Plan. U.S. Fish & Wildlife Service, Denver, CO. 34pp.

Aliciella formosa (Greene ex A. Brand) J.M. Porter
Aztec Gilia

Family: Polemoniaceae

Synonyms: *Gilia formosa* Greene

NESL Status: G4

Federal Status: None

Plant Description: Herbaceous perennial, 7-30 cm tall, older plants woody at the base, glandular; stems numerous, branched; leaves entire, 25 mm long, sharp-pointed; flowers pinkish-purple, trumpet-shaped, about 22 mm long. Flowers late April and May.

Similar species: *A. formosa* is unique in having entire leaves and older plants have a woody base.

Habitat: Endemic to soils of the Nacimiento Formation. Salt desert scrub communities, 5,000-6,400 ft.

Distribution: San Juan County, New Mexico.

Navajo Nation Distribution: Currently only known from Kutz Canyon south of Bloomfield.

Potential Navajo Nation Distribution: South of Farmington and Bloomfield where the Nacimiento Formation occurs

Survey Period: During the flowering & fruiting period late April to June.

Avoidance: A 200 ft buffer zone is recommended to avoid disturbance; may be more or less depending on size and nature of the project.

References:

New Mexico Rare Plant Technical Council. 1999. New Mexico Rare Plants. Albuquerque, NM. New Mexico Rare Plants Homepage. http://nmrareplants.unm.edu

New Mexico Native Plants Protection Advisory Committee. 1984. A handbook of rare and endemic plants of New Mexico. University of New Mexico Press, Albuquerque.

Porter, J.M. 1998. *Aliciella*, a recircumscribed genus of Polemoniaceae. Aliso 17(1):23-46.

USDI Bureau of Land Management. 1995. The Farmington District Endangered, Threatened, and Sensitive Plant Field Guide. Prepared by Ecosphere Environmental Services, Inc., Farmington, NM.

Daniela Roth. 2008. Species account for *Aliciella formosa*. Navajo Natural Heritage Program, P.O. Box 1480, Window Rock, AZ 86515. Additional copies at http://nnhp.ndfw.org/

Aliciella formosa habitat ©Daniela Roth, NNHP

Daniela Roth. 2008. Species account for *Aliciella formosa*. Navajo Natural Heritage Program, P.O. Box 1480, Window Rock, AZ 86515. Additional copies at http://nnhp.nndfw.org/

Amsonia peeblesii R.E. Woodson
Peebles Blue Star

Family: Apocynaceae

Synonyms: None

NESL Status: G4

Federal Status: None

Plant Description: Herbaceous perennial, glabrous, 40 – 90 cm tall; lower leaves oblong-linear, 4 – 9 mm wide; upper leaves linear, 1 – 2 mm wide. Corolla trumpet shaped, white or light blue, the tube 13 – 19 mm long, the lobes 5 – 10 mm long; follicles 2 – 10 cm long; seeds cylindrical, corky, 8 – 11 mm long, 1.5 – 2.5 mm broad. Flowering period is from mid May to mid June.

Similar Species: *A. peeblesii* can be confused with the glabrous form of *A. tomentosa* var. *stenophylla*. The former possesses much larger flowers than the latter (13 – 19 mm long vs. 7 – 12 mm long) and the follicles of *A. peeblesii* are smoothly cylindrical while follicles of *A. tomentosa* var. *stenophylla* are moderately constricted between the seeds.

Habitat: Plains Grassland, Great Basin Shrub-Grassland, and Great Basin Desertscrub communities. Substrate types range from strongly alkaline sedimentary conglomerates to volcanic cinders. Elevation ranges from 4000 to 5620 ft.

General Distribution: Coconino, Navajo, and Apache counties, AZ.

Known Distribution on the Navajo Nation: Coconino County, Grand Falls to Gray Mountain and north to Cedar Ridge, west of HWY 89 between Cameron and Cedar Ridge.

Potential Navajo Nation Distribution: Marble Canyon south to the boundary near Gray Mountain, east to the Holbrock vicinity.

Survey Period: Best during the flowering and fruiting period from mid May through mid July. Plants can be located later during the growing season, but positive identification might not be possible.

Avoidance: A 200 ft buffer zone is recommended to avoid disturbance; may be more or less, depending on size and nature of the project

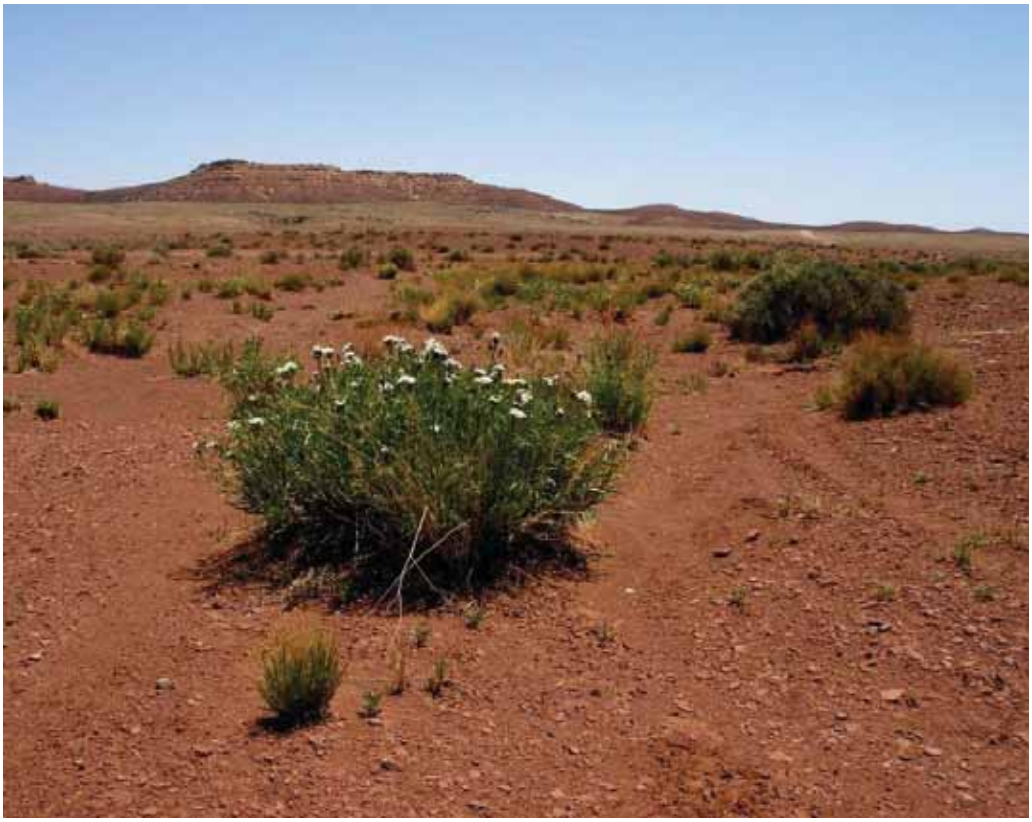
References:

Arizona Rare Plant Committee. 2001. Arizona rare plant field guide: a collaboration of agencies and organizations. Washington: U.S. Government Printing Office. http://aznps.org/rareplants.html

Reichenbacher, F.R. 1986. Status report, *Amsonia peeblesii* R.E. Woodson. F.W. Reichenbacher & Associates. 2739 North La Cienega Drive, Tucson, AZ. Prepared for the USFWS, Albuquerque, NM.

Kearney, T. H., R. H. Peebles, and collaborators. 1960. Arizona Flora. Second edition with supplement by J. T. Howell, E. McClintock, and collaborators. University of California Press, Berkeley, 1085 pp.

Amsonia peeblesii ©Daniela Roth, NNHP



Amsonia peeblesii habitat ©Daniela Roth, NNHP

Daniela Roth. 2001. Species account for *Amsonia peeblesii*. Navajo Natural Heritage Program, P.O. Box 1480, Window Rock, AZ 86515.
Additional copies at http://nnhp.ndfw.org/ Revised: 15 MAY 2008

Asclepias sanjuanensis Heil, Porter & Welsh
San Juan Milkweed

Family: Asclepiadaceae **Synonyms:** None

NESL Status: G4 **Federal Status:** None

Plant Description: Perennial herb from a woody taproot, 4 – 8 cm tall, prostrate to ascending; leaves 2 – 4 cm long, oblong to lanceolate, white-tomentulose on the leaf margins; inflorescence terminal umbel with 4 – 15 flowers, corolla brown-purple; follicle 3.5 – 6.5 mm long. Flowering period from late April through early May.

Similar species: *A. involucrata* is easily distinguished from *A. sanjuanensis* by its greenish white petals.

Habitat: Mostly in sandy or sandy loam soils in pinion-juniper woodlands and Great Basin grassland communities. Known populations occur from 5000 to 6200 ft elevation. Often in disturbed sites.

Distribution: San Juan Co., NM

Known Distribution on the Navajo Nation: East of U.S. HWY 666, south of the San Juan River, and just south of the San Juan County line.

Potential Navajo Nation Distribution: San Juan County and northern McKinley County, NM.

Survey Period: April through June.

Avoidance: A 200 ft buffer zone is recommended to avoid disturbance; may be more or less, depending on slope, size and nature of the project.

References:

Heil, K., Porter, J.M. and S.L. Welsh. 1989. A new species of *Asclepias* (Asclepiadaceae) from northwestern New Mexico. Great Basin Naturalist 49: 100-103.

New Mexico Rare Plant Technical Council. 1999. New Mexico Rare Plants. Albuquerque, NM. New Mexico Rare Plants Homepage. http://nmrareplants.unm.edu

Therrien, J.P. 1999. Genetic diversity in two rare milkweeds from the southwestern United States. Southwestern Naturalist 44: 247-255.

USDI Bureau of Land Management. 1995. The Farmington District Endangered, Threatened, and Sensitive Plant Field Guide. Prepared by Ecosphere Environmental Services, Inc., Farmington, NM.

Asclepias sanjuanensis ©Marian Rohman

Asclepias sanjuanensis habitat ©Marian Rohman

Astragalus beathii C.L. Porter
Beath Milkvetch

Family: Fabaceae **Synonyms:** None

NESL Status: G4 **Federal Status:** None

Plant Description: Malodorous robust perennial up to 60 cm high, often nearly prostrate. Leaves deep green, 6 – 12 cm long, with 11 – 21 narrowly elliptic leaflets; stipules 3 – 9 mm long, strongly decurrent half way around the stem or more. Flowers 10 – 27 in dense racemes at anthesis, later loosely spreading, 20 - 25 mm long, bright purple with pale or whitish wing tips. Pods spreading or deflexed, sessile, oblong – ellipsoid, 2.5 – 3.9 cm long. Ovules 29 –52. Flowering March to May.
Similar species: *A. preussii* var. *preussii* has stipitate pods and fewer ovules.

Habitat: Sandy flats, red clay knolls, and gullied washes in badlands, on selenium-bearing soils derived from Moenkopi sandstone shale at 4000 to 4800ft.

General Distribution: Navajo Nation, Coconino County, AZ.

Navajo Nation Distribution: North of Gray Mountain, west and southwest of Cameron, Coconino Co., AZ.
Potential Navajo Nation Distribution: Gray Mountain north to Navajo Bridge where Moenkopi shale is present, Coconino County, AZ.

Comments: Previously identified from Marble Canyon and near Wupatki National Monument. Specimens from these sites were determined misidentified. Previous collections between Cameron and Gap have not been relocated during surveys in 2003 & 2004.

Survey Period: Only possible during the flowering /fruiting period from late March to late May, perhaps into June. Suitable habitat can be identified year round.

Avoidance: A 200 ft buffer zone is recommended to avoid disturbance; may be more or less depending on size and nature of the project.

References:
Arizona Rare Plant Committee. 2001. Arizona rare plant field guide: a collaboration of agencies and organizations. Washington: U.S. Government Printing Office. http://aznps.org/rareplants.html

Barneby, R. C. 1964. Atlas of the North American Astragalus. The New York Botanical Garden. Bronx, New York.

McDougall, W.B. 1973. Seed Plants of Northern Arizona. The Museum of Northern Arizona. Flagstaff, Arizona.

Roth, D. 2004. *Astragalus beathii* (Beath's Milk-vetch) Status Report. Unpublished report prepared for the USFWS. Navajo Natural Heritage Program, Window Rock, AZ. http://nnhp.nndfw.org/docs_reps.htm

Roth, D. 2007. Beath's Milk-vetch (*Astragalus beathii*). Monitoring Report 2005 –2007. Unpublished report prepared for the Navajo Natural Heritage Program, Window Rock, AZ 86515.

Daniela Roth. 2001. Species account for *Astragalus beathii*. Navajo Natural Heritage Program, P.O. Box 1480, Window Rock, AZ 86515.
Additional copies at http://nnhp.nndfw.org/ Revised: 15 MAY 2008

Astragalus beathii ©Daniela Roth, NNHP

Astragalus beathii habitat ©Daniela Roth, NNHP

Daniela Roth. 2001. Species account for *Astragalus beathii*. Navajo Natural Heritage Program, P.O. Box 1480, Window Rock, AZ 86515.
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Astragalus heilii Welsh & Atwood
Heil's Milkvetch

Family: Fabaceae

Synonyms: None

NESL Status: G4

Federal Status: None

Plant Description: Tufted, low, subcaulescent perennial; basifixed pubescent; stems mostly 2-4 cm long, obscured by stipules and leaf bases; stipules 2-3 mm long, merely amplexicaul or the lowermost connate-sheathing; leaves 1-2.5 cm long; leaflets mostly 7-13, elliptic, obtuse, strigulose on both sides. Peduncles slender, 1-7 cm long; racemes with (1)2-4 ascending flowers; calyx 2.3-3 mm long; flowers 4-5mm long, whitish or tinged violet; pods spreading or pendulous, the body ellipsoid, subinflated, 9-9.8 mm long, 4.5-4.6 mm thick, slightly dorsiventrally compressed, thin-walled, red-mottled, unilocular; ovules 8-10. Flowers in mid to late May.

Similar species: *Astragalus knightii* has dolabriform hairs. *Astragalus kerrii* has incipiently dolabriform hairs and differs by having marcescent leaves and peduncles that form a thatch. Also, A. *heilii* is smaller in all parts than *A. kerrii*.

Habitat: Rocky ledges of the Mesa Verde Group in Pinion-juniper communities at 7200ft.

Distribution: McKinley County, New Mexico

Navajo Nation Distribution: Currently only known from the type locality near Borrego Pass.

Potential Navajo Nation Distribution: McKinley County, NM, on rocky ledges of the Mesa Verde Group in Pinion-juniper communities

Survey Period: Mid May through June.

Avoidance: A 200 ft buffer zone is recommended to avoid disturbance; may be more or less depending on size and nature of the project.

References:

New Mexico Rare Plant Technical Council. 1999. New Mexico Rare Plants. Albuquerque, NM. New Mexico Rare Plants Homepage. http://nmrareplants.unm.edu

Welsh, S.L., N.D. Atwood, S. Goodrich, L.C. Higgins. 2003. A Utah Flora: Third Edition. Brigham Young University, Provo, UT.

Astragalus heilii ©Daniela Roth, NNHP

Astragalus heilii habitat ©Daniela Roth, NNHP

Daniela Roth. 2008. Species account for *Astragalus heilii.* Navajo Natural Heritage Program, P.O. Box 1480, Window Rock, AZ 86515. Additional copies at http://nnhp.nndfw.org/

Atriplex garrettii Rydb.*var. navajoensis* (C.A. Hanson) S.L. Welsh & Crompton
Navajo Saltbush

Family: Chenopodiaceae

Synonyms: *Atriplex navajoensis* C.A. Hanson

NESL Status: G4

Federal Status: None

Plant Description: Dioecious shrub or subshrub to 1.5m tall. Leave blades yellow green, orbiculate or oblanceolate; subopposite proximally, alternate distally. Staminate flowers yellow, in panicles to 15cm. Pistillate flowers in panicles to 30cm. Fruiting bracteoles sessile or on stipes to 3mm, body 4-winged, 6-10 mm, wings lateral, 2-4 mm wide, bract wings deeply denticulate. Flowering July to October.

Similar species: *A. garrettii var. garretti* is much smaller, has brown staminate flowers and has bracts not nearly as denticulate as *A. garrettii var. navajoensis*.

Habitat: On Moenkopi Shale, often overlain with a Kaibab Limestone. Salt desert shrub communities at 3000 – 4000ft.

Distribution: Northern Coconino County, AZ, vicinity of Marble Canyon.

Navajo Nation Distribution: East side Marble Canyon from Lee's Backbone to Jackass Canyon.

Potential Navajo Nation Distribution: East side of Marble and Glen Canyon from Glen Canyon Dam to south and west of Echo Cliffs, along the tributary canyons of the Colorado River, south to Shinumo Wash.

Survey Period: August through November.

Avoidance: A 200 ft buffer zone is recommended to avoid disturbance; may be more or less depending on size and nature of the project.

References:

Flora of North America Editorial Committee, eds. 2003. Vol. 4: Magnoliophyta: Caryophyllidae, part 1. Oxford University Press, New York. 559 pp..

Hanson, C.A. 1962. New species of perennial Atriplex from the western United States. Studies in Systematic Botany, No. 1. Brigham Young University Press, Provo, UT.

Daniela Roth. 2008. Species account for *Atriplex garrettii var. navajoensis*. Navajo Natural Heritage Program, P.O. Box 1480, Window Rock, AZ 86515. Additional copies at http://nnhp.nndfw.org/

Atriplex garrettii var. navajoensis ©Daniela Roth, NNHP

Atriplex garrettii var. navajoensis habitat ©Daniela Roth, NNHP

Daniela Roth. 2008. Species account for *Atriplex garrettii var. navajoensis*. Navajo Natural Heritage Program, P.O. Box 1480, Window Rock, AZ 86515. Additional copies at http://nnhp.nndfw.org/

Camissonia atwoodii Cronq.
Atwood's Camissonia

Family: Onagraceae **Synonyms:** None

NESL Status: G4 **Federal Status:** None

Plant Description: Winter annual herb from taproot; stems 0.5 – 1.5 m tall and 2 – 8 dm broad, usually branched, with leaves basally disposed; herbage stipitate glandular; leaves petiolate, the blades 1.2 – 7.5 cm long, 0.8 – 5.5 cm wide, ovate or lanceolate or suborbicular, serrulate to serrate dentate; flowers numerous, petals lavender with purple spots, 8 – 14 mm long; capsules 11 – 20 mm long. Flowering period is from late September to early November

Similar species: *C. megalantha* is very similar, but geographically isolated.

Habitat: Clay soils of the Tropic Shale and Carmel Formations, salt desert shrub community. Known populations occur between 4060 and 5000ft elevation.

General Distribution: Endemic to the Last Chance drainage of Kane County, Utah.

Known Distribution on the Navajo Nation: Not yet known to occur on the Navajo Nation.

Potential Navajo Nation Distribution: Appropriate habitats along the shores and drainages of Lake Powell.

Survey Period: Positive identification is only possible during the flowering months from September to November. It may only grow in years with adequate rainfall. Suitable habitat can be identified year round.

Avoidance: A 200 ft buffer zone is recommended to avoid disturbance; may be more or less, depending on slope, size and nature of the project.

References:

Atwood, D.N. et al. 1991. Utah Threatened, Endangered, and Sensitive Plant Field Guide. U.S. Forest Service Intermountain Region, National Park Service, Bureau of Land Management, Utah Natural Heritage Program, U.S. Fish & Wildlife Service, Environmental Protection Agency, Navajo Nation, and Skull Valley Goshute Tribe.

Utah Rare Plant Guide Team. 2003. Utah Rare Plant Guide. Utah Native Plant Society. http://www.utahrareplants.org/

Welsh, S.L., N.D. Atwood, S. Goodrich, L.C. Higgins. 2003. A Utah Flora: Third Edition. Brigham Young University, Provo, UT.

Cirsium rydbergii Petrak
Rydberg's Thistle

Family: Asteraceae

Synonyms: *Cirsium lactucinum* Rydberg

NESL Status: G4

Federal Status: None

Plant Description: Perennial herbs 100 to 300cm tall. Stems 1 to several, erect, ascending to lax; leaves very large, blades elliptic, 30 – 90+ x 10 – 40cm, 1 to 2 times pinnately lobed, strongly undulate, main spines 5-15mm, faces often glaucous, glabrous or thinly tomentose, distal leaves much reduced bractlike and very spiny; linear or lanceolate; heads few to many, erect **or nodding** in clusters at tips of distal branches, involucres 1.4-2 cm, phyllary apices lance-ovate, rather abruptly contracted into **recurved spines** 3-25 mm, margins sparingly tomentose or glabrate; flowers pink or purple 16 – 20mm long; flowering late spring through September.

Similar species: *Cirsium arizonicum* var. *bipinnatum* (*Cirsium calcareum*) has consistently erect heads, larger flowers and shorter, slender and stout spines on the phyllaries, *C. joannae* has larger involucres (2.5-4 cm), shorter involucral spines and scabridulous –ciliolate margins

Habitat: Hanging gardens, seeps and sometimes stream banks below hanging gardens, 3300-6500 ft.

Distribution: Garfield, Grand, & San Juan counties, Utah. Coconino & Apache counties, Arizona.

Navajo Nation Distribution: Southern San Juan County, Utah, northern Coconino & Apache counties, Arizona.

Potential Navajo Nation Distribution: Southern San Juan County, Utah, northern Coconino & Apache counties, Arizona.

Survey Period: Best during the flowering & fruiting season from late spring through September or October.

Avoidance: A 200 ft buffer zone is recommended to avoid disturbance; may be more, depending on size and nature of the project. Any activity impacting groundwater will need special consideration.

References:

Flora of North America Editorial Committee, eds. 2006. Vol. 19: Magnoliophyta: Asteridae, part 6: Asteraceae, part 1. Oxford University Press, New York. 579 pp..

Welsh, S.L., N.D. Atwood, S. Goodrich, L.C. Higgins. 2003. A Utah Flora: Third Edition. Brigham Young University, Provo, UT.

Daniela Roth. 2008. Species account for *Cirsium rydbergii*. Navajo Natural Heritage Program, P.O. Box 1480, Window Rock, AZ 86515. Additional copies at http://nnhp.ndfw.org/

Cirsium rydbergii ©Daniela Roth, NNHP

Cirsium rydbergii ©Viola Willeto. NNFW

Cirsium rydbergii habitat ©Daniela Roth, NNHP

Daniela Roth. 2008. Species account for *Cirsium rydbergii*. Navajo Natural Heritage Program, P.O. Box 1480, Window Rock, AZ 86515. Additional copies at http://nnhp.nndfw.org/

Cypripedium parviflorum Salisb. *var. pubescens* (Willd.) Knight
Yellow Lady's Slipper

Family: Orchidaceae

Synonyms: *Cypripedium calceolus* L. var. *pubescens* (Willd.) Correll
Cypripedium pubescens Willd. var. *pubescens*

NESL Status: G4

Federal Status: None

Plant Description: Plants erect, often forming clumps with several stems, 30–40 cm tall. Stems and leaves sparsely pubescent to glandular, with 2 sheathing bracts below the 3-4 alternate lanceolate to elliptic, somewhat acuminate leaves, leaves 5 – 15 cm long. Flowers mostly solitary, often exceed by an erect leaf-like bract; sepals and petals greenish or yellowish or more often purplish-brown dorsal sepal suborbiculate or ovate to ovate-lance-acuminate, 19–80 × 7–40 mm; lateral sepals connate; 11–80 × 5–34 mm; petals horizontal to strongly descending, same color as sepals, commonly spirally twisted or undulate, sometimes flat, linear-lanceolate to lance-ovate or oblong, 24–97 × 3–12 mm; lip rather pale to deep yellow, very rarely white, rarely with reddish spots or suffusion on adaxial external surface, 15–54 mm; orifice basal; staminode cordiform-ovoid, deltoid, lance-ovoid, or ovoid-oblong. Flowers from late May to June.

Similar species: This is the largest and showiest orchid known from the Navajo Nation and not easily confused with any other species.

Habitat: In moderate shade along streambanks, mountain meadows and mesic places in Ponderosa pine, mixed conifer and aspen forest communities. On the Navajo Nation known from above 7000ft

Distribution: North America.

Navajo Nation Distribution: Only known from historic records near Toadlena, San Juan County, NM.

Potential Navajo Nation Distribution: Chuska Mountains

Survey Period: During the flowering/fruiting season from late May through June

Avoidance: A 200 ft buffer zone is recommended to avoid disturbance; may be more, depending on size and nature of the project. Any activity impacting groundwater will need special consideration.

References:

Coleman, R.A. 2002. The Wild Orchids of Arizona and New Mexico. Cornell University Press, Ithaca NY.

McDougall, W.B. 1973. Seedplants of northern Arizona. The Museum of Northern Arizona, Flagstaff.

Kearney, R.H. and T.H. Peebles. 1960. Arizona Flora (with supplement). University of California Press, Berkeley.

Daniela Roth. 2008. Species account for *Cypripedium parviflorum var. pubescens*. Navajo Natural Heritage Program, P.O. Box 1480, Window Rock, AZ 86515. Additional copies at http://nnhp.nndfw.org/

Cystopteris utahensis Windham & Haufler
Utah bladder-fern

Family: Polypodiaceae **Synonyms:** None

NESL Status: G4 **Federal Status:** None

Plant Description: Stems creeping, not cordlike, internodes short, heavily beset with old petiole bases, hairs absent; scales lanceolate. Leaves monomorphic, clustered at stem apex, to 45 cm, nearly all bearing sori. Petiole green to straw colored; blade deltate, 2-pinnate-pinnatifid, usually widest at or near the base, apex short-attenuate; rachis and costae with unicellular, gland-tipped hairs. Sporulating summer to fall.

Similar species: *Cystopteris utahensis* is distinguished from *C. fragilis* by small glands and scaly bulblets near the tip of the frond, as well as dark scales on the underground stem made up of cells with very thick walls.

Habitat: Seepages, cracks and ledges on cliffs; on calcareous substrates including sandstone, limestone, and dacite. Populations are known from 4200 to 8800 ft elevation.

General Distribution: Arizona, Colorado, New Mexico, Texas, and Utah.

Known Distribution on the Navajo Nation: Only known from Canyon de Chelly National Monument, Apache County, AZ.

Potential Navajo Nation Distribution: Anywhere where habitat is suitable.

Survey Period: Best from June through August, but can be identified any time fertile fronds are available. Suitable habitat can be identified year round.

Avoidance: A 200 ft buffer zone is recommended to avoid disturbance; may be more or less, depending on size and nature of the project. Any activity impacting groundwater will need special consideration.

References:

Flora of North America Editorial Committee. 1993. Flora of North America Vol.2. Oxford University Press, Oxford, New York.

Haufler C.H., and M.D. Windham. 1991. A New Species of North American *Cystopteris* and *Polypodium*, with comments on their reticulate relationships. American Fern Journal Vol. 81 (1): 7 – 15.

Utah Rare Plant Guide Team. 2003. Utah Rare Plant Guide. Utah Native Plant Society. http://www.utahrareplants.org/

Cystopteris utahensis ©Daniela Roth, NNHP

Cystopteris utahensis habitat ©Daniela Roth, NNHP

Ericameria arizonica R.P. Roberts, Urbatsch & J.L. Anderson
Grand Canyon Goldenweed

Family: Asteraceae

Synonyms: None

NESL Status: G4

Federal Status: None

Plant Description: Subshrub 20 to 50 cm high. Leaf blades elliptic to narrowly oblanceolate, 10–35 x 2–5 mm; faces short stipitate glandular, usually gland dotted; apices acute. Heads cymiform, phyllaries 30–40 in 4–5 series, tan, lanceolate to elliptic, 2-7 x 0.5 – 1.2 mm, strongly unequal; flowers yellow, ray florets 1–8, disk florets 5-15. Flowering during September and October.

Similar species: *E. cervina* has smaller leaves (9-18 x 2.5-4mm) and only 3-4 ray florets.

Habitat: Rocky ledges and cracks usually of Kaibab Limestone at 5500 to 6000ft.

Distribution: Northern Coconino County, AZ.

Navajo Nation Distribution: Along the rims of the western Little Colorado River Gorge.

Potential Navajo Nation Distribution: On limestone benches and ledges in the vicinity of the Little Colorado River Gorge and Marble Canyon.

Survey Period: Best from September through November.

Avoidance: A 200 ft buffer zone is recommended to avoid disturbance; may be more or less depending on size and nature of the project.

References:

Flora of North America Editorial Committee, eds. 2003. Vol. 20: Magnoliophyta: Asteridae, part 2. Oxford University Press, New York. 666 pp..

Daniela Roth. 2008. Species account for *Ericameria arizonica.* Navajo Natural Heritage Program, P.O. Box 1480, Window Rock, AZ 86515. Additional copies at http://nnhp.ndfw.org/

Ericameria arizonica ©Daniela Roth, NNHP

Ericameria arizonica habitat ©Daniela Roth, NNHP

Daniela Roth. 2008. Species account for *Ericameria arizonica.* Navajo Natural Heritage Program, P.O. Box 1480, Window Rock, AZ 86515. Additional copies at http://nnhp.ndfw.org/

Erigeron sivinskii Nesom
Sivinski's fleabane

Family: Asteraceae **Synonyms:** None

NESL Status: G4 **Federal Status:** None

Plant Description: Perennial herb from a thick taproot with numerous caudex branches; stems erect, unbranched, green, 5 – 8 cm tall; leaves green, arising in basal clusters, linear, 9 – 34 mm long , 0.5 - 0.8 mm wide; stem leaves strictly ascending and continuing relatively unreduced in size nearly all the way up the stems; heads solitary; ray flowers 21 –33, white, drying pinkish, corollas 7 - 10 mm long, 1.0 – 2.4 mm wide; achenes glabrous. Flowers from late May through June.

Similar Species: *E. consimilis* stems, leaves, and phyllaries are gray green; stems are scapose, and the phyllaries are thickened along the margins. Sivinski's fleabane stems, leaves, and phyllaries are green, stems have relatively unreduced leaves on at least the lower half, and the phyllaries are thin and herbaceous. *E. bistiensis* and *E. pulcherrimus* have densely strigose-sericeous achenes.

Habitat: Steep, barren, shale slopes of the Chinle Formation, in pinion-juniper woodland and Great Basin Desert Scrub communities. Known populations occur at 6100 to 7400ft elevation.

General Distribution: Only known from Apache Co, AZ, and McKinley Co., NM.

Known Distribution on the Navajo Nation: East and west slopes Carrizo and Chuska Mountains, Cove area, Round Rock area, N of Navajo, Apache County, AZ, and McKinley County, NM, near Crazy Woman Canyon.

Potential Navajo Nation Distribution: North of I-40 in New Mexico and the Chuska Mountains, McKinley & San Juan counties, NM and adjacent Apache County, Arizona.

Survey Period: Positive identification is only possible during the flowering/fruiting time from May through June. Suitable habitat can be identified year round.

Avoidance: A 200 ft buffer zone is recommended to avoid disturbance; may be more or less, depending on slope, size and nature of the project

Reference:

Arizona Rare Plant Committee. 2001. Arizona rare plant field guide: a collaboration of agencies and organizations. Washington: U.S. Government Printing Office. http://aznps.org/rareplants.html

Nesom, G.L. 1991. A new species of *Erigeron* (Asteraceae: Astereae) from northwestern New Mexico. Phytologia 71(5):416-419

New Mexico Rare Plant Technical Council. 1999. New Mexico Rare Plants. Albuquerque, NM. New Mexico Rare Plants Homepage. http://nmrareplants.unm.edu

USDI Bureau of Land Management. 1995. The Farmington District Endangered, Threatened, and Sensitive Plant Field Guide. Prepared by Ecosphere Environmental Services, Inc., Farmington, NM.

Erigeron sivinskii ©Daniela Roth, NNHP

Erigeron sivinskii habitat ©Daniela Roth, NNHP

Daniela Roth. 2001. Species account for *Erigeron sivinskii*. Navajo Natural Heritage Program, P.O. Box 1480, Window Rock, AZ 86515.
Additional copies at http://nnhp.ndfw.org/ Revised: 15 MAY 2008

Eriogonum lachnogynum var. sarahiae (N.D. Atwood and A. Clifford) Reveal Sarah's Buckwheat

Family: Polygonaceae **Synonyms**: *Eriogonum sarahiae* N.D. Atwood and A. Clifford

NESL Status: G4 **Federal Status:** None

Plant Description: Caespitose mound-forming perennial herb to 10 cm tall. Leaves in a basal rosette with numerous persistent old leaf bases, leaves narrowly elliptic, densely lanate below, strigose and greenish above, blade 4-8 mm long, 1.5-4 mm wide, slightly revolute on the lower margins with a prominent midrib. Flowering stems up to 40, 1.5-5.5 cm high; inflorescence capitate, perianth yellow, flowers 5-12 per involucre; petals villous pubescent on outer surface; ovaries and seeds villous Flowering May to July.

Similar species: *Eriogonum lachnogynum* differs from other perennial yellow-flowered wild buckwheats by its villous ovaries and seeds. Variety *lachnogynum* does not form mounds, has fewer flowers per involucre and usually has fewer and longer flowering stems with broader inflorescences than var. *sarahiae*. Variety *colobum* has very short inflorescences that usually do not exceed the leaves.

Habitat: Windswept mesa tops in pinion – juniper communities at 5900- 7500m. Endemic on the Owl Rock Member of the Chinle Fma. topped by Todilto Limestone.

Distribution: Apache Co., AZ and McKinley County, NM.

Navajo Nation Distribution: Only know from the vicinity of Red Valley, north of Red Lake.

Potential Navajo Nation Distribution: Chuska Mountains and between Lupton, Apache Co., AZ, and Prewitt, McKinley Co., NM. In pinion-juniper communities on appropriate substrates.

Survey Period: May through July.

Avoidance: A 200 ft buffer zone is recommended to avoid disturbance; may be more or less depending on size and nature of the project.

References:

Flora of North America Editorial Committee, eds. 2005. Vol. 5: Magnoliophyta: Caryophyllidae, part 2. Oxford University Press, New York. 656 pp..

New Mexico Rare Plant Technical Council. 1999. New Mexico Rare Plants. Albuquerque, NM. New Mexico Rare Plants Homepage. http://nmrareplants.unm.edu

Reveal J. 2004. *E. lachnogynum* var. *sarahiae*. Harvard Papers in Botany 9(1): 178.

Welsh, S.L., N.D. Atwood, S. Goodrich, L.C. Higgins. 2003. A Utah Flora: Third Edition. Brigham Young University, Provo, UT.

Daniela Roth. 2008. Species account for *Eriogonum lachnogynum var. sarahiae.* Navajo Natural Heritage Program, P.O. Box 1480, Window Rock, AZ 86515. Additional copies at http://nnhp.nndfw.org/

Eriogonum lachnogynum var. sarahiae ©Daniela Roth, NNHP

Eriogonum lachnogynum var. sarahiae habitat ©Daniela Roth, NNHP

Daniela Roth. 2008. Species account for *Eriogonum lachnogynum var. sarahiae.* Navajo Natural Heritage Program, P.O. Box 1480, Window Rock, AZ 86515. Additional copies at http://nnhp.nndfw.org/

Phacelia indecora J.T. Howell
Bluff Phacelia

Family: Hydrophyllaceae **Synonyms:** None

NESL Status: G4 **Federal Status:** None

Plant Description: Annual, 3-14cm tall, with erect to spreading stems, glandular. Leaves elliptic to oblong, 4 – 26 mm long, hirsutulous and glandular. Corolla narrowly campanulate, pale blue, 3 – 4 mm long, the lobes pubescent, the tube pale yellow streaked with blue lines. Flowering period is May.

Similar species: Similar to *P. incana*, but the stems are finely glandular-puberulent vs. glandular villous with spreading hairs. The corolla is pale blue vs. white to pale lavender in *P. incana.*

Habitat: Salt Desert scrub communities at ca. 3600 to 4500ft elevation.

Distribution: Endemic to San Juan Co, UT.

Known Distribution on the Navajo Nation: Not yet known from the Navajo Nation

Potential Navajo Nation Distribution: San Juan River drainage.

Survey Period: Positive identification is only possible during May and June.

Avoidance: A 200 ft buffer zone is recommended to avoid disturbance; may be more, depending on size and nature of the project.

References:

Atwood, D.N. et al. 1991. Utah Threatened, Endangered, and Sensitive Plant Field Guide. U.S. Forest Service Intermountain Region, National Park Service, Bureau of Land Management, Utah Natural Heritage Program, U.S. Fish & Wildlife Service, Environmental Protection Agency, Navajo Nation, and Skull Valley Goshute Tribe.

Utah Rare Plant Guide Team. 2003. Utah Rare Plant Guide. Utah Native Plant Society. http://www.utahrareplants.org/

Welsh, S.L., N.D. Atwood, S. Goodrich, L.C. Higgins. 2003. A Utah Flora: Third Edition. Brigham Young University, Provo, UT.

Phacelia indecora ©Daniela Roth, NNHP

Phacelia indecora habitat ©Daniela Roth, NNHP

Primula specuicola Rydb.
Cave Primrose

Family: Primulaceae

Synonyms: None

NESL Status: G4

Federal Status: None

Plant Description: Scapose perennial herb, 6-28cm tall; leaves in a basal rosette, dentate, blades oblong to lanceolate, 2 – 20 cm long, white-mealy below, green above; umbels 5-40 flowered, corolla tube yellow, 8-10 mm long, the lobes bright pink to violet. Flowers March through April

Similar species: Not easily confused with anything else growing in hanging gardens of the Colorado Plateau.

Habitat: Hanging gardens and occasionally streamsides below; mainly in alcoves in Entrada and Navajo Sandstone formations at 3500 to 7200ft. In the Grand Canyon known from seeps in Kaibab and Redwall limestone.

Distribution: Endemic to hanging gardens in Northern Arizona and southern Utah.

Navajo Nation Distribution: Chinle Wash area and the canyons surrounding Navajo Mountain.

Potential Navajo Nation Distribution: Hanging gardens from the Chinle drainage to the canyon north and south of Navajo Mountain.

Recommended Survey Period: Best during the flowering season from March through April but can be identified by an experienced botanist throughout the active growing season.

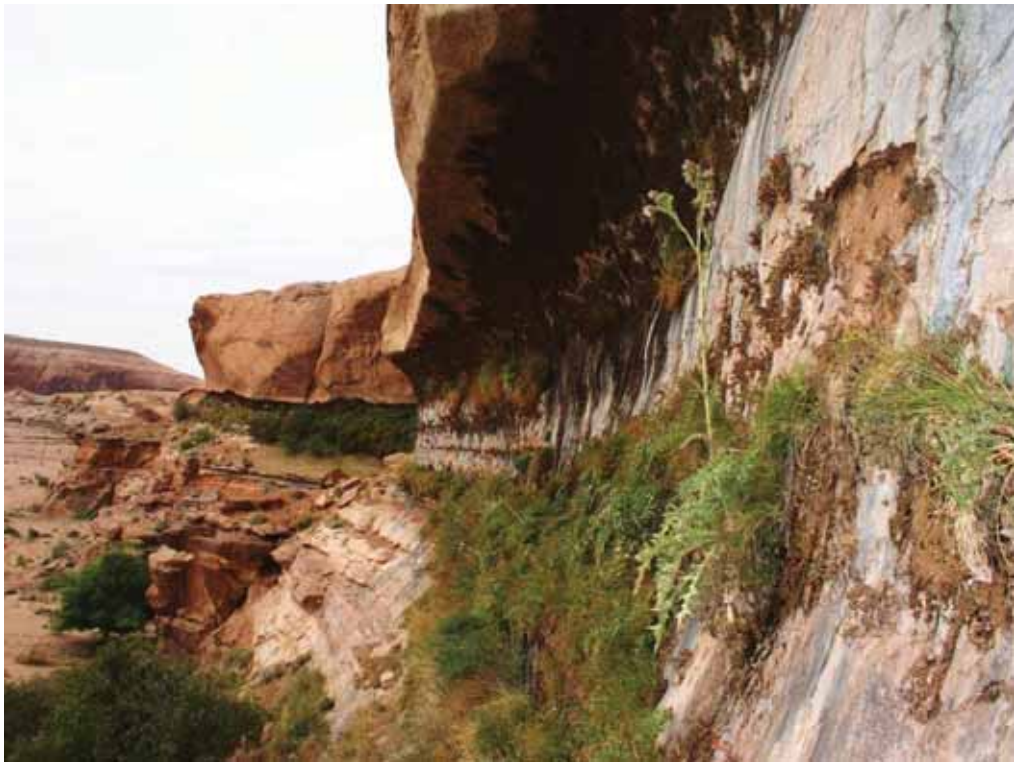
Recommended Avoidance: A 200 ft buffer zone is recommended to avoid disturbance; may be more, depending on size and nature of the project. Any activity impacting groundwater will need special consideration.

References:

Welsh, S.L., N.D. Atwood, S. Goodrich, L.C. Higgins. 2003. A Utah Flora: Third Edition. Brigham Young University, Provo, UT.

Daniela Roth. 2008. Species account for *Primula specuicola.* Navajo Natural Heritage Program, P.O. Box 1480, Window Rock, AZ 86515. Additional copies at http://nnhp.ndfw.org/

Primula specuicola ©Marian Rohman



Primula specuicola habitat ©Daniela Roth, NNHP

Daniela Roth. 2008. Species account for *Primula specuicola.* Navajo Natural Heritage Program, P.O. Box 1480, Window Rock, AZ 86515. Additional copies at http://nnhp.nndfw.org/

Psorothamnus arborescens var. pubescens (Parish) Barneby
Marble Canyon Dalea

Family: Fabaceae

Synonyms: None

NESL Status: G4

Federal Status: None

Plant Description: Armed shrubs 4-10 dm tall; leaves 1.4-3.8cm long, leaflets 7-15, glandular beneath, strigose on both sides. Racemes 11-21 flowered, 1.8-4.5cm long. Calyx 8-10mm long, the tube 3.8-4.8mm long, 10-ribbed, villous, the teeth 3.6-5.2mm long, linear-lanceolate, as long as the tube; flowers 8.1-10.6 mm long, indigo; valves of pods with large, round, discrete yellowish or orange blister glands, pubescent between blister glands. Flowering and fruiting from May to June.

Similar species: Differs consistently from *P. fremontii* only in the ornamentation of the pod. *P. fremontii* has small orange glands that are confluent lengthwise into crowded ridges towards the pod's beak. *P. arborescens* has large round blister glands separated from one another by spaces as wide as their diameter.

Habitat: On soils derived from the Moenkopi Formation in mixed desert shrub communities between 3400 – 4900ft

Distribution: Endemic Northern Coconino County, AZ, in the vicinity of Marble Canyon.

Navajo Nation Distribution: Currently only known from Navajo Springs area, south of Navajo Bridge.

Potential Navajo Nation Distribution: Lee's Backbone to Bitter Springs.

Recommended Survey Period: Proper identification is only possible during the flowering and fruiting period in May and June.

Recommended Avoidance: A 200 ft buffer zone is recommended to avoid disturbance; may be more or less depending on size and nature of the project.

References:

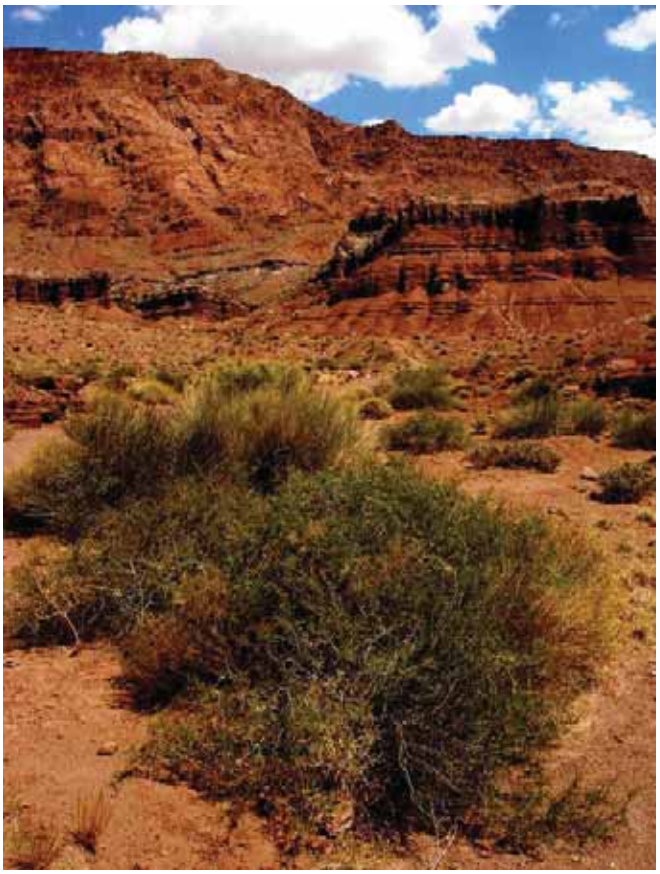
Arizona Rare Plant Committee. 2001. Arizona rare plant field guide: a collaboration of agencies and organizations. Washington: U.S. Government Printing Office. http://aznps.org/rareplants.html

Cronquist, A. et al., eds. 1989. Intermountain Flora, vol. 3, Part B. New York Botanical Garden, Bronx, NY. p. 268.

Welsh, S.L., N.D. Atwood, S. Goodrich, L.C. Higgins. 2003. A Utah Flora: Third Edition. Brigham Young University, Provo, UT.

Daniela Roth. 2008. Species account for *Psorothamnus arborescens var. pubescens.* Navajo Natural Heritage Program, P.O. Box 1480, Window Rock, AZ 86515. Additional copies at http://nnhp.nndfw.org/

Psorotha*mnus arborescens var. pubescens*
©Daniela Roth, NNHP



Psorothamnus arborescens var. pubescens habitat
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Daniela Roth. 2008. Species account for *Psorothamnus arborescens var. pubescens.* Navajo Natural Heritage Program, P.O. Box 1480, Window Rock, AZ 86515. Additional copies at http://nnhp.nndfw.org/

Puccinellia parishii Hitchc.
Parish's Alkali Grass

Family: Poaceae **Synonyms:** None

NESL Status: G4 **Federal Status:** None

Plant Description: Annual grass; stems 1 to many, 5 – 28 cm tall; leaves 1- 6 cm long, 1 – 2 mm wide, leaf sheaths open to the base, ligules 1 – 3 mm long; inflorescence a narrow panicle, branches erect-appressed; spikelets 2 - 6 flowered, 4 – 6 mm long; florets disarticulating above the glumes, glumes much shorter than the lemmas; lemmas 1.5 – 2 mm long, pubescent on the mid and lateral nerves nearly to the apex, and on the intermediate nerves ca. half way. Short lived winter or spring annual. Flowering time is from late April to early June.

Similar Species: *P. parishii* is distinguished from other species of *Puccinellia* growing in similar habitats by its annual habit. *Poa annua* has wider leaves and the tips are boat shaped.

Habitat: Alkaline seeps, springs, and seasonally wet areas such as washes. Populations are known to occur between 5000 and 7200 ft elevation.

General Distribution: *P. parishii* is known from a series of widely disjunct populations ranging from San Bernadino Co, in southern California to northern and eastern Arizona, western New Mexico and southwestern Colorado.

Navajo Nation Distribution: Coconino Co, AZ, near Tuba City; in Navajo Co, AZ, near Shonto; Apache Co, AZ, near Tees Nos Pos, Monument Valley and south of Red Valley, and San Juan Co, NM, east of Beclabito and in the vicinity of Two Grey Hills.

Potential Navajo Nation Distribution: *P. parishii* may be found along any alkaline seep, spring or seasonally wet area.

Survey Period: Positive identification is only possible from mid April to early June. Suitable habitat can be identified year round.

Avoidance: A 200 ft buffer zone is recommended to avoid disturbance; may be more depending on slope, size and nature of the project.

References:

Arizona Rare Plant Committee. 2001. Arizona rare plant field guide: a collaboration of agencies and organizations. Washington: U.S. Government Printing Office. http://aznps.org/rareplants.html

Hitchcock, A.S. and A. Chase. 1971. Manual of the grasses of the United States, Volume 1. Dover Publications, Inc. New York.

Kelly, K. and J. McGinnis. 1994. Highly Safeguarded Protected Native Plants of Arizona. Arizona Department of Agriculture, Phoenix, AZ.

New Mexico Rare Plant Technical Council. 1999. New Mexico Rare Plants. Albuquerque, NM. New Mexico Rare Plants Homepage. http://nmrareplants.unm.edu

Phillips, A.M., and B.G. Phillips. 1991. Status Report, *Puccinellia parishii* Hitchc. Submitted to the U.S. Fish & Wildlife Service Ecological Services, Phoenix, AZ.

Daniela Roth. 2001. Species account for *Puccinellia parishii*. Navajo Natural Heritage Program, P.O. Box 1480, Window Rock, AZ 86515.
Additional copies at http://nnhp.ndfw.org/ Revised: 15 MAY 2008

Puccinellia parishii ©Daniela Roth, NNHP

Puccinellia parishii habitat ©Daniela Roth, NNHP

Daniela Roth. 2001. Species account for *Puccinellia parishii*. Navajo Natural Heritage Program, P.O. Box 1480, Window Rock, AZ 86515.
Additional copies at http://nnhp.nndfw.org/ Revised: 15 MAY 2008

Salvia pachyphylla Epling ex Munz *ssp. eremopictus* R. Taylor
Arizona Rose Sage

Family: Lamiaceae **Synonyms:** *Salvia compacta* Munz, *Salvia carnosa* var. *compacta* H.M. Hall

NESL Status: G4 **Federal Status:** None

Plant Description: Much branched, spreading shrubs, 35 – 50 cm tall, 30-150 cm wide; leaves spatulate, opposite, 2 – 4.4 cm long, 0.6 – 1.7 cm wide with axillary fascicles, cinereous, canescent, glandular; inflorescences verticillate, conspicuously bracteate; bracts scarious, purple to rose, 0.83 – 1.4 cm long, 0.35 – 0.92 cm wide; flowers violet, 1.3-2.45 cm long. Flowering from July to October.

Similar species: Distinct from other members of the *S. dorri* complex by its larger leaves, a larger inflorescence and has a villous ring of hairs within the corolla tube.

Habitat: Desert shrublands and Pinion-Juniper communities on basalt or soils derived from the Chinle Formation, from 5500 to 6500 m elevation. On the Navajo Nation often along the base of volcanic plugs, mesa tops and slopes.

General Distribution: Apache, Navajo & Coconino counties, Arizona

Navajo Nation Distribution: North of Dilkon, Navajo County.

Potential Navajo Nation Distribution: Southern boundary of the Navajo –Hopi reservations to the southern boundary of the Navajo Nation, between north of Winslow and Petrified Forest National Park.

Survey Period: Best during the flowering period from mid July to October, but can be identified during the entire active growing season by an experienced individual. Suitable habitat can be identified year round.

Avoidance: A 200 ft buffer zone is recommended to avoid disturbance; may be more or less depending on size and nature of the project.

References:

McDougall, W.B. 1973. Seedplants of northern Arizona. The Museum of Northern Arizona, Flagstaff.

Kearney, R.H. and T.H. Peebles. 1960. Arizona Flora (with supplement). University of California Press, Berkeley.

Strachan, J.L. 1982. A revision of the *Salvia dorrii* complex (Lamiaceae). Brittonia 34(2):151-169.

Taylor, Robin, M. and Tina Ayers. 2006. Systematics of *Salvia pachyphylla* (Lamiaceae). Madroño, Vol. 53, No.1, pp. 11-24.

Daniela Roth. 2001. Species account for *Salvia pachyphylla ssp. eremopictus*. Navajo Natural Heritage Program, P.O. Box 1480, Window Rock, AZ 86515. Additional copies at http://nnhp.nndfw.org/ Revised: 15 MAY 2008

Salvia pachyphylla ssp. eremopictus ©Daniela Roth, NNHP

Salvia pachyphylla ssp. eremopictus habitat ©Daniela Roth, NNHP

Daniela Roth. 2001. Species account for *Salvia pachyphylla ssp. eremopictus*. Navajo Natural Heritage Program, P.O. Box 1480, Window Rock, AZ 86515. Additional copies at http://nnhp.nndfw.org/ Revised: 15 MAY 2008

Sclerocactus cloverae Heil & Porter *ssp. brackii* Heil & Porter
Brack Hardwall Cactus

Family: Cactaceae **Synonyms:** None

NESL Status: G4 **Federal Status:** None

Plant Description: Stems mostly solitary, elongate cylindrical, 3 – 8 cm long, 2 – 7 cm in diameter; central spines usually 4 –5, straw colored to brown, lower one hooked and about 3 cm long; radial spines 5 – 8; flowers purple, 2.5 – 3.5 cm long, 1.5 – 3 cm in diameter; fruits green to tan, 1 – 5 mm long, 5 – 12 mm broad. Flowers from late April to May.

Similar species: Differs from *S. cloverae ssp. cloverae* by first producing flowers when they are 3 cm or less in diameter. The var. *brackii* exhibits reduced spination that last for several years into early reproductive maturity.

Habitat: Desert scrub and scattered juniper communities. On sandy clay hills of the Nacimiento Formation at 5000 to 6000ft.

Distribution: San Juan County, New Mexico.

Navajo Nation Distribution: San Juan County, NM, south of the San Juan River.

Potential Navajo Nation Distribution: San Juan County, NM, south of the San Juan River.

Survey Period: Positive identification is only possible during the flowering and fruiting period from late April to mid June. Suitable habitat can be identified year round.

Avoidance: A 200 ft buffer zone is recommended to avoid disturbance; may be more or less depending on size and nature of the project.

References:

Heil, K., and J.M. Porter. 1994. *Sclerocactus* (Cactaceae): A Revision. Haseltonia No. 2: 20 - 46.

New Mexico Rare Plant Technical Council. 1999. New Mexico Rare Plants. Albuquerque, NM. New Mexico Rare Plants Homepage. http://nmrareplants.unm.edu

USDI Bureau of Land Management. 1995. The Farmington District Endangered, Threatened, and Sensitive Plant Field Guide. Prepared by Ecosphere Environmental Services, Inc., Farmington, NM.

Daniela Roth. 2001. Species account for *Sclerocactus cloverae ssp. brackii*. Navajo Natural Heritage Program, P.O. Box 1480, Window Rock, AZ 86515. Additional copies at http://nnhp.nndfw.org/ Revised: 15 MAY 2008

Sclerocactus cloverae ssp. brackii ©Daniela Roth, NNHP

Sclerocactus cloverae ssp. brackii habitat ©Daniela Roth, NNHP

Daniela Roth. 2001. Species account for *Sclerocactus cloverae ssp. brackii*. Navajo Natural Heritage Program, P.O. Box 1480, Window Rock, AZ 86515. Additional copies at http://nnhp.nndfw.org/ Revised: 15 MAY 2008

Symphyotrichum welshii (Cronquist) G.L. Nesom
Welsh's American-aster

Family: Asteraceae

Synonyms: *Aster welshii* Cronq.

NESL Status: G4

Federal Status: None

Plant Description: Herbaceous perennial 30 to 100cm tall; subrhizomatous, stems ascending to erect, sometimes lax. Leaves oblanceolate to spatulate, 10 to 40+ x 4 – 9+mm, mostly entire, margins sometimes serrulate. Ray flowers 18 to 25, white to pink, 5 to 12mm long. Flowering August through October.

Similar species: Differs from *S. eatonii* and *S. lanceolatum* var. *hesperius* in producing basal offshoots and overwintering rosettes.

Habitat: Wet meadows, stream banks, seeps and hanging gardens at 4,300 to 8,000ft

Distribution: Mostly southwestern Utah and northern Coconino Co., AZ

Navajo Nation Distribution: Currently only known from one population in the Tsegi watershed, northern Navajo County.

Potential Navajo Nation Distribution: Hanging gardens in northern Coconino and Navajo counties, AZ.

Recommended Survey Period: During the flowering period from August to October.

Recommended Avoidance: A 200 ft buffer zone is recommended to avoid disturbance; may be more, depending on size and nature of the project. Any activity impacting groundwater will need special consideration.

References:

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Welsh, S.L., N.D. Atwood, S. Goodrich, L.C. Higgins. 2003. A Utah Flora: Third Edition. Brigham Young University, Provo, UT.

Daniela Roth. 2008. Species account for *Symphyotrichum welshii.* Navajo Natural Heritage Program, P.O. Box 1480, Window Rock, AZ 86515. Additional copies at http://nnhp.nndfw.org/

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BIRDS: NON-ENDANGERED RAPTORS and MIGRATORY BIRDS

Navajo/Federal Statuses: Migratory Bird Treaty Act (U.S. Code Title 16, Chapter 7, §703-712); not listed under the NESL or ESA.

Distribution: Navajo Nation-wide depending upon species.

Habitat: Potentially all habitats on the Navajo Nation.

Species: Non-Endangered Raptors include:

- American Kestrel (*Falco sparverius*)
- Barn Owl (*Tyto alba*)
- Cooper's Hawk (*Accipiter cooperii*)
- Great Horned Owl (*Bubo virginianus*)
- Loggerhead Shrike (*Lanius ludovicianus*)
- Long-eared Owl (*Asio otus*)
- Northern Harrier (*Circus cyaneus*)
- Osprey (*Pandion haliaetus*)
- Prairie Falcon (*Falco mexicanus*)
- Red-tailed Hawk (*Buteo jamaicensis*)
- Sharp-shinned Hawk (*Accipiter striatus*)
- Swainson's Hawk (*Buteo swainsoni*)
- Turkey Vulture (*Cathartes aura*)
- Western Screech-owl (*Megascops kennicottii*)

Migratory Birds include all species protected under the Federal Migratory Bird Treaty Act (listed within Code of Federal Regulations 50:10.13).

Survey Method: Surveys specific for these species are not required; however, the following Avoidance Guidelines are recommended if active nest(s) are discovered within close proximity to project site.

Avoidance: Non-Endangered Raptors: No disturbance within 0.15 km (490 ft) of active nest during incubation to fledging (as determined by direct field observation or qualified literature source specific for nesting dates in the Southwestern U.S.).
Migratory Birds: No disturbance within 50 m (165 ft) of active nest during incubation to fledging (as determined by direct field observation or qualified literature source specific for nesting dates in the Southwestern U.S.).