

## SPECIES RISK

The species list was reviewed for the purpose of assessing risks to species and their habitat. The list of species was divided into 2 groups:

- species associated with terrestrial and aquatic systems e.g. the prominent threats to the species are those associated with the habitat, and
- species that have threats in addition to and not fully addressed by threats to ecosystem and aquatic characteristics.

**SPECIES ASSOCIATED WITH TERRESTRIAL AND AQUATIC SYSTEMS:** Prominent threats to these species are addressed through the threats to the terrestrial and aquatic ecosystem characteristics described above. Aquatic ecosystem threats are those activities that physically modify hydrology, chemistry, geomorphology, perennial stream flow characteristics, plants and native fauna of aquatic systems including, but not limited to, recreation, construction or maintenance activities, and wildfire that causes excessive erosion in the watersheds, and herbivory which can also decrease plant numbers. These species and subspecies are listed in Table 45 and are not discussed further in this report. Although some species are associated with structural components of PNVTs such as snags, downed logs, specific tree sizes, openings, and shrubs, these components are considered part of a PNVT functioning within the range of historic variability, and as such, are subject to the same threats as the PNVT.

*Table 1: Species whose threats are addressed through threats to PNVTs or aquatic ecological characteristics*

Taxon	Scientific name	Common name
Bird	<i>Buteo regalis</i>	Ferruginous hawk
Bird	<i>Buteogallus anthracinus</i>	Common black hawk
Bird	<i>Catharus ustulatus</i>	Swainson's thrush
Bird	<i>Coccothraustes vespertinus</i>	Evening grosbeak
Bird	<i>Ioporonis tolmiei</i>	MacGillivray's warbler
Bird	<i>Regulus satrapa</i>	Golden-crowned kinglet
Invertebrate	<i>Acrolophitus nevadensis</i>	Nevada pointed-headed grasshopper
Invertebrate	<i>Cicindela oregona maricopa</i>	Maricopa tiger beetle
Invertebrate	<i>Oeneis alberta daura</i>	Alberta Arctic
Invertebrate	<i>Aeshna persephone</i>	Persephone's damer
Invertebrate	<i>Piruna polingii</i>	Four-spotted Skipperling
Invertebrate	<i>Speyeria nokomis nitocris</i>	Nitocris Fritillary
Invertebrate	<i>Smicridea dispar</i>	A caddisfly
Invertebrate	<i>Wormaldia arizonensis</i>	A caddisfly
Mammal	<i>Lasiurus blossevillii</i>	Western red bat
Mammal	<i>Microtus mogollonensis navaho</i>	Navajo Mogollon Vole
Mammal	<i>Reithrodontomys montanus</i>	Plains harvest mouse
Mammal	<i>Sorex merriami leucogenys</i>	Merriam's Shrew
Plant	<i>Abies lasiocarpa var. arizonica</i>	Corkbark (subalpine) Fir
Plant	<i>Anulocaulis leiosolenus var. leiosolenus</i>	Southwestern ringstem

Plant	<i>Asclepias hallii</i>	Hall's Milkweed
Plant	<i>Asclepias quinqueidentata</i>	Slimpod milkweed
Plant	<i>Botrychium crenulatum</i>	Crenulate Moonwort
Plant	<i>Botrychium echo</i>	Reflected Moonwort
Plant	<i>Botrychium lunaria</i>	Common moonwort
Plant	<i>Cystopteris utahensis</i>	Utah Bladder Fern
Plant	<i>Epilobium oregonense</i>	Oregon willowherb
Plant	<i>Isoetes bollanderi</i>	Bollander's quillwort
Plant	<i>Moneses uniflora</i>	Wood nymph
Plant	<i>Nuphar lutea</i>	Pond lily
Plant	<i>Penstemon caespitosus</i> var. <i>desertipicti</i>	Mat penstemon
Plant	<i>Phacelia crenulata</i> var. <i>augustifolia</i>	Cleftleaf scorpionweed
Plant	<i>Pinus aristata</i>	Bristlecone Pine
Plant	<i>Polemonium pulcherrimum</i> ssp. <i>delicatum</i>	Beautiful Jacob's Ladder
Plant	<i>Utricularia vulgaris</i>	Common bladderwort
Plant	<i>Xanthoparmelia huachucensis</i>	Huachuca Xanthoparmelia lichen

### **SPECIES WITH THREATS IN ADDITION TO THOSE FOR ECOSYSTEM**

**DIVERSITY:** The species list was reviewed to determine if there was a threat that precludes the species from responding to changes in ecosystem diversity characteristics. Threats were identified that placed the species at risk for sustainability. If species are threatened by non-habitat threats, such as *disease, or collection*, then the threats were screened as to whether they are under the control and authority of the Forest Service. The focus was not on risks to individuals. If the threat was not under agency authority, the Forests contribution to sustainability of the species may be limited.

**Threats associated with limited distribution and endemism:** One hundred and seven species carried forward have *limited distributions* (found in few localities). Of these, 47 are *endemic* (occurs to a limited extent in the southwest). Some have very limited distribution or habitat in northern Arizona, or are only known from the Coconino NF. Endemic species and those with limited or restricted distributions are listed in Appendix J.

Risks to these species are associated with the narrowness of their range, the threats to the habitat at those locations and their rarity (number, size and distribution of populations). The Forest has a high contribution to the sustainability of these species because they are rare, are restricted to a narrow geographic area, or found only in certain locations on the Forest. These species have increased vulnerability to mortality, extinction, and disrupted life processes, that is, movements, reproduction, and gene flow. They are easily affected by localized or stochastic events.

Species whose prominent threats are those associated with ecosystem diversity and threats associated with endemism or limited distributions are listed in Table 46. They may possibly need additional Forest plan components to ensure sustainability.

**Table 2: Species with threats associated with limited distribution or endemism in addition to threats to ecosystem or aquatic diversity**

<b>Taxa</b>	<b>Scientific name</b>	<b>Common name</b>
Bird	<i>Rallus longirostris yumanensis</i>	Yuma clapper rail
Invertebrate	<i>Anacroneuria wipukupa</i>	A stonefly
Invertebrate	<i>Apatania arizona</i>	A caddisfly
Invertebrate	<i>Atopsyche sperryi</i>	A caddisfly
Invertebrate	<i>Atopsyche tripunctata</i>	A caddisfly
Invertebrate	<i>Baetodes arizonensis</i>	A mayfly
Invertebrate	<i>Chimarra primula</i>	A caddisfly
Invertebrate	<i>Culoptila kimminsi</i>	A caddisfly
Invertebrate	<i>Culoptila moselyi</i>	A caddisfly
Invertebrate	<i>Ithytrichia mexicana</i>	A caddisfly
Invertebrate	<i>Lepidostoma knulli</i>	A caddisfly
Invertebrate	<i>Nectopsyche dorsalis</i>	A caddisfly
Invertebrate	<i>Ochrotrichia ildria</i>	A caddisfly
Invertebrate	<i>Ophiogomphus arizonicus</i>	Arizona Snaketail
Invertebrate	<i>Polycentropus arizonensis</i>	A caddisfly
Invertebrate	<i>Polycentropus gertschi</i>	A caddisfly
Invertebrate	<i>Protoptila balmorhea</i>	Balmorhea saddle-case caddisfly
Invertebrate	<i>Pyrgulopsis morrisoni</i>	Page springsnail
Invertebrate	<i>Pyrgulopsis simplex</i>	Fossil Springsnail
Invertebrate	<i>Radiodiscus millecostatus</i>	Ribbed pinwheel
Mammal	<i>Perognathus amplus cineris</i>	Wupatki Arizona Pocket Mouse
Mammal	<i>Sorex nanus</i>	Dwarf shrew
Plant	<i>Aletes macdougali</i>	Macdougals Aletes
Plant	<i>Allium begelovii</i>	Bigelow's onion
Plant	<i>Astragalus rusbyi</i>	Rusby's Milk-vetch
Plant	<i>Astragalus subcinereus</i>	Silver Milkvetch
Plant	<i>Astragalus troglodytus</i>	Creeping Milk-vetch
Plant	<i>Isoetes bolanderi</i>	Bollander's quillwort
Plant	<i>Lepidium montanum var. glabrum</i>	Mountain Pepperweed
Plant	<i>Macromeria viridiflora var. thurberi</i>	Giant-trumpets
Plant	<i>Macromeria viridiflora var. viridiflora</i>	Giant-trumpets
Plant	<i>Mertensia macdougali</i>	Macdougals Bluebells
Plant	<i>Nuphar lutea</i>	Pond lily
Plant	<i>Penstemon caespitosus var. desertipicti</i>	Mat penstemon
Plant	<i>Phacelia crenulata var. angustifolia</i>	Cleftleaf scorpionweed
Plant	<i>Phacelia serrata</i>	Serrate Phacelia
Plant	<i>Phlox amabilis</i>	Arizona Phlox
Plant	<i>Potentilla crinita var. lemmonii</i>	Bearded Cinquefoil
Plant	<i>Sisyrinchium longipes</i>	Timberland Blue-eye-grass
Plant	<i>Sporobolus interruptus</i>	Black Dropseed

## Species with threats not associated with ecosystem diversity characteristics

Species were grouped around key habitat elements finer or larger than landscape scale but not ecosystem diversity characteristics. These elements are called special features.

### *Special features include the following:*

- Rocks: Rock features include canyons, cliffs, talus, and other rocky surfaces.
- Water features: Water features include hanging gardens, ephemeral pools, seasonally wet areas, wet ground, springs, seeps, and stock tanks.
- Human made structures: Bridges, buildings, archaeological sites, railroad beds.
- Soil type: Soils with different parent materials or mineral concentrations, such as limestone, sandstone, or basalt.

## Species with threats in addition to those for ecosystem diversity or special features

Table 47 lists the special feature, the additional threats, and the species in the group. Species with *limited distributions* are shaded. *Endemic species* are in bold font. It is obvious by looking at the table that a variety of plant, bird, invertebrate and mammal species are primarily associated with the rock special feature. Plants are the primary taxa associated with archaeological sites, specific soil types, water features and the majority of these plants are endemic or have limited distributions. There are a number of aquatic invertebrates known only from specific locations, many of them from Oak Creek. Interestingly, Oak Creek has the largest number of species of caddisflies reported in any drainage in Arizona and includes more than 50% of species reported from Arizona (Blinn and Ruitter 2009).

**Table 3: Species threats associated with special features**

Habitat feature	Threats	Species name
<p>Rocks (canyons, cliffs, ledges, caves, talus slopes)</p>	<p>Activities including rock climbing, caving, construction, mineral activities, and vandalism can alter or remove habitat. Caving modifies surface features, temperature and humidity levels in caves modifying the micro-environment for roosting or hibernating bats, possibly making the cave unsuitable or less suitable for occupancy.</p> <p>Habitat may be altered enough to prevent plant establishment, destroy plants, or affect the survival of talusnails.</p>	<ul style="list-style-type: none"> <li>• American peregrine falcon</li> <li>• Mexican spotted owl</li> <li>• <b>Walnut Canyon Talusnail</b></li> <li>• <b>Oak Creek Talusnail</b></li> <li>• <b>Milk Ranch Talusnail</b></li> <li>• Pale Townsend's Big-Eared Bat</li> <li>• Allen's Lappet-Browed Bat</li> <li>• Arizona Myotis</li> <li>• <b>Arizona Bugbane</b></li> <li>• Black spleenwort</li> <li>• Ebony spleenwort</li> <li>• Diamond Valley Suncup</li> <li>• <b>Mogollon Thistle</b></li> <li>• <b>Rough Whitlow-grass (var. stelligera)</b></li> <li>• <b>Cliff Fleabane</b></li> <li>• Dane's dwarf gentian</li> <li>• Bearded gentian</li> <li>• <b>Senator Mine Alum-root</b></li> <li>• Arizona Whitefeather</li> <li>• <b>Lyngholm's Cliffbrake</b></li> <li>• <b>Compacted Rock Daisy</b></li> <li>• <b>Alcove Bog-orchid</b></li> <li>• <b>Thurber's Cinquefoil</b></li> </ul>
<p>Human structures (buildings, bridges, railroad beds)</p>	<p>Chemical and pesticide use and storage can poison species or prey.</p> <p>Maintenance, construction, and demolition activities and vandalism can damage or destroy features or individuals.</p>	<ul style="list-style-type: none"> <li>• Allen's Lappet-Browed Bat</li> <li>• Arizona Myotis</li> <li>• Macoun's false bindweed</li> </ul>
<p>Human structures (archaeological sites)</p>	<p>Ground or site disturbing activities and compaction around archaeological sites can decrease plant numbers, especially small regenerating plants.</p>	<ul style="list-style-type: none"> <li>• Tonto Basin Agave</li> <li>• Phillips' agave</li> <li>• <b>Verde Valley Sage</b></li> </ul>

Habitat feature	Threats	Species name
Soil type (Basalt, cinders)	Large scale ground disturbing activities including, but not limited to, recreation, road related work, construction and mineral withdrawal, can result in plant removal or damage.	<ul style="list-style-type: none"> <li>• Porter's sandwort</li> <li>• Diamond Valley Suncup</li> <li>• Wild Buckwheat</li> <li>• <b>Jones' Wild Buckwheat</b></li> <li>• Dane's dwarf gentian</li> <li>• Bearded gentian</li> <li>• <b>Basin Bladder-pod</b></li> <li>• <b>Sunset Crater Beardtongue</b></li> <li>• <b>Flagstaff Beardtongue</b></li> <li>• Tufted saxifrage</li> <li>• Spider saxifrage</li> </ul>
Soil type (Calcareous, alkaline, gypsum)	Invasive species can out-compete slower growing sensitive plants by taking up growing space, moisture, and nutrients and choking out native species.	<ul style="list-style-type: none"> <li>• Southwestern ringstem</li> <li>• <b>Disturbed (Tusayan) rabbitbrush</b></li> <li>• <b>Ripley's Wild-buckwheat</b></li> <li>• Skunk-top Scurfpea</li> <li>• Toadflax Beardtongue</li> <li>• <b>Rusby's Milkwort</b></li> <li>• <b>Verde Valley Sage</b></li> </ul>
Soil type (Dolomitic limestone and limestone)	Dolomitic limestone often forms bluffs from which recreationists view the landscape. Disturbance to soils in these areas due to dispersed camping or other management activities can destroy plants.	<ul style="list-style-type: none"> <li>• <b>Mt. Dellenbaugh Sandwort</b></li> <li>• <b>Disturbed (Tusayan) rabbitbrush</b></li> <li>• Clustered leather-flower</li> <li>• <b>Jones' Wild Buckwheat</b></li> <li>• <b>Ripley's Wild-buckwheat</b></li> <li>• <b>Flagstaff Pennyroyal</b></li> <li>• <b>Basin Bladder-pod</b></li> <li>• <b>Mearns lotus</b></li> <li>• Skunk-top Scurfpea</li> <li>• <b>Compacted Rock Daisy</b></li> <li>• Western Flame-flower</li> <li>• <b>Rusby's Milkwort</b></li> <li>• <b>Arizona Cliffrose</b></li> <li>• <b>Verde Valley Sage</b></li> <li>• Tonto Basin Agave</li> </ul>

Habitat feature	Threats	Species name
Soil type (Sandstone)	Disturbance to sandstone soils due to dispersed camping or management activities can decrease plant numbers.	<ul style="list-style-type: none"> <li>• Wild Buckwheat</li> <li>• <b>Jones' Wild Buckwheat</b></li> <li>• <b>Lynholm's Cliffbrake</b></li> <li>• <b>Rusby's Milkwort</b></li> <li>• <b>Verde Valley Sage</b></li> <li>• Rothrock's Hedge-nettle</li> </ul>
Soil type (Verde Formation)	Disturbance to Verde Formation soils, which has a unique chemical composition, can decrease plant numbers.	<ul style="list-style-type: none"> <li>• <b>Heathleaf Wild Buckwheat</b></li> <li>• <b>Ripley's Wild-buckwheat</b></li> <li>• <b>Rusby's Milkwort</b></li> <li>• <b>Arizona Cliffrose</b></li> <li>• <b>Verde Valley Sage</b></li> </ul>
Water features (hanging gardens, seasonally wet areas, wet ground, springs, seeps),	Activities that physically modify hydrology, structure or composition of water features including, but not limited to, recreation, construction or maintenance activities, spring or seep related projects, and herbivory, which can decrease plant numbers; and can decrease larval host plants for butterflies.	<ul style="list-style-type: none"> <li>• Nokomis Fritillary</li> <li>• <b>Arizona Bugbane</b></li> <li>• Columbine</li> <li>• Cochise Sedge</li> <li>• <b>Mogollon Thistle</b></li> <li>• <b>Jones' spider-flower</b></li> <li>• <b>Rough Whitlow-grass (var. stelligera)</b></li> <li>• <b>Arizona Sneezeweed</b></li> <li>• Western Mouse-tail</li> <li>• Western Flame-flower</li> <li>• <b>Alcove Bog-orchid</b></li> <li>• Western Porterella</li> <li>• <b>A Buttercup (var. subaffinis)</b></li> <li>• <b>Oregon Buttercup</b></li> <li>• <b>Blumer's Dock</b></li> <li>• <b>Oak Creek Tritelia</b></li> </ul>

Some species have threats that are in addition to threats to ecosystem or aquatic diversity characteristics or to special features. These are listed in Table 48.

**Table 4: Additional threats to species that are not associated with ecosystem diversity characteristics or special features**

Additional primary threats not associated with habitat or feature	Species name
Human activities that result in <i>disturbance</i> can disrupt sensitive life stages such as breeding (birds and bats); and hibernation (bats). Activities include but are not limited to recreation, construction, vegetative treatments, and vandalism.	<ul style="list-style-type: none"> <li>• Northern goshawks</li> <li>• Clark's grebe</li> <li>• Bald eagle (listed and non listed populations)</li> <li>• Mexican spotted owl</li> <li>• Southwestern willow flycatcher</li> <li>• American peregrine falcon</li> <li>• Allen's lappet-browed bat</li> <li>• Pale Townsend's big-eared bat</li> <li>• Arizona myotis</li> <li>• Southwestern myotis</li> </ul>
Activities on lands in other ownership such as cattle grazing, stockyards, development, transportation corridors, railroads, fencing, dogs running loose	<ul style="list-style-type: none"> <li>• Southwestern willow flycatcher</li> <li>• Gila monster</li> <li>• Pronghorn</li> <li>• Gunnison's prairie dog</li> </ul>
<i>Collection or harvest</i> can result in loss of individuals to populations, or mortality.	<ul style="list-style-type: none"> <li>• Northern goshawks</li> <li>• Bald eagle (listed and non listed populations)</li> <li>• Mexican spotted owl</li> <li>• Pronghorn</li> <li>• Mountain lion</li> <li>• Beaver</li> <li>• Gunnison's prairie dog</li> <li>• American peregrine falcon</li> <li>• Gila monster</li> </ul>
<i>Disease</i> results in loss of individuals to populations or mortality of entire colonies as in Parvovirus (ferrets) and bubonic plague (prairie dogs), or loss of key prey (Western burrowing owls). <i>Human activities that result in the spread of disease or infected soil and water</i> from one occupied site to another can kill frogs and toads. Activities include recreation, fire and grazing management, research.	<ul style="list-style-type: none"> <li>• Gunnison's prairie dog</li> <li>• Black-footed ferret</li> <li>• Western burrowing owl (loss of prairie dogs)</li> <li>• Arizona toad</li> <li>• Chiricahua leopard frog</li> <li>• Lowland leopard frog</li> <li>• Northern leopard frog</li> </ul>
<i>Illegal shooting</i> results in loss of individuals to populations	<ul style="list-style-type: none"> <li>• Mexican gray wolf</li> </ul>
<i>Nest parasitism</i> from brown-headed cowbirds which associate with livestock reduces survival of the host species' young.	<ul style="list-style-type: none"> <li>• Abert's Towhee</li> <li>• Southwestern willow flycatcher</li> </ul>

Additional primary threats not associated with habitat or feature	Species name
<i>Nonnative or invasive aquatic species</i> eat, compete with, and hybridize with native aquatic species.	<ul style="list-style-type: none"> <li>• All native fish</li> <li>• Sonora mud turtle</li> <li>• Chiricahua leopard frog</li> <li>• Lowland leopard frog</li> <li>• Northern leopard frog</li> <li>• Northern Mexican gartersnake</li> <li>• Narrow-headed gartersnake</li> <li>• California floater</li> </ul>
<i>Water impoundments</i> provide habitat for Woodhouse's toads which hybridize with Arizona toads.	<ul style="list-style-type: none"> <li>• Arizona toad</li> </ul>
<i>Development, dams, fencing, major transportation corridors, and road construction and maintenance</i> can fragment habitat which can alter seasonal movements, dispersal, gene flow, and predator-prey relationships.	<ul style="list-style-type: none"> <li>• Pronghorn</li> <li>• Mountain lion</li> <li>• Southwestern willow flycatcher</li> <li>• Beaver</li> <li>• Native fish</li> <li>• Narrow-headed gartersnake</li> </ul>
<i>Ungulate herbivory, managed and unmanaged grazing</i> reduces the vigor, maintenance and survival of highly palatable plants. This can indirectly affect nesting habitat for Western yellow-billed cuckoos and Clark's grebe; and prey habitat for Mexican spotted owls and northern goshawks.	<ul style="list-style-type: none"> <li>• Bebb's willow</li> <li>• Quaking aspen</li> <li>• Arizona cliffrose</li> </ul>
<i>Off trail hiking</i> reduces the vigor, maintenance and survival of alpine tundra plants.	<ul style="list-style-type: none"> <li>• Porter's sandwort</li> <li>• Crenulate moonwort</li> <li>• Common moonwort</li> <li>• Blackroot sedge</li> <li>• Different-nerve sedge</li> <li>• San Francisco Peaks groundsel</li> </ul>
<i>Lead poisoning</i> causes behavioral, physiological, and biochemical effects in individuals and can cause death.	<ul style="list-style-type: none"> <li>• California condor</li> </ul>

Table 49 describes threats to special features and to species and whether the threats are under agency control and authority. The Forest is limited in its ability to contribute to the sustainability of a species when the threats, or part of the threats, are outside the control or authority of the Forest Service. The primary threats under Forest Service management authority, at least in part, are human activities, chemical and pesticide use and storage, managed grazing, some impoundments, nonnative invasive plant and animal species, development, fencing, collection, and road and transportation corridors.

**Table 5: Management authority of species or species habitat threats**

<b>Primary Threats under agency management authority</b>
Human activities including rock climbing, caving, construction, maintenance, mineral activities, recreation, water related projects, vegetative treatments (including fire), off trail hiking, and vandalism. Forest Service has approval or enforcement authority for these activities on Forest land barring other jurisdictions, laws, regulations. Example of exceptions: locatable minerals, road work. Forest Service authority is subject to the limitations under the 1872 Mining Act. Some road work may be under other jurisdictions such as Federal Highways, or Arizona Department of Transportation.
<i>Chemical and pesticide use and storage</i> on Forest administered sites.
<i>Human activities that result in the spread of disease (Bd) or infected soil and water</i> from one occupied site to another. Forest has control and authority of access to areas inhabited by rare frogs on Forest lands.
<i>Managed grazing</i> Forest has management responsibilities for cattle grazing and the authority to construct grazing exclosures and adjust the timing of grazing.
<i>Impoundments</i> Some impoundments are permitted by the Forest Service, and others are not under Forest Service authority.
<i>Nonnative invasive plant species:</i> The Forest has the authority to treat these plant species subject to applicable laws and regulations.
<i>Nonnative invasive animal species:</i> The Forest has the authority to work with other agencies regarding non-native invasive animal species and can construct habitat related features such as barriers.
<i>Development:</i> Forest Service has authority to develop administrative sites, recreation facilities, and permit or allow energy or communication related infrastructure on Forest administered lands. Forest has no authority on lands in other ownership. Forest has authority to exchange lands in and out of Forest Service ownership which may or may not result in development.
<i>Fencing:</i> Forest has authority to build fences. Other entities have authorities to build and maintain fences within the Forest boundary including private land owners and state and federal agencies, such as with fences along road easements.
<i>Collection:</i> Permitted activities by the Forest Service usually include the removal of individual plants, plant parts, fungi, or the collection of invertebrates.
<i>Roads and transportation corridors:</i> Forest has authority to manage Forest roads. Cooperative relationships exist with entities that also have authority to manage roads within Forest boundaries such as counties, federal and state agencies, and private parties.

**Primary threats outside agency management authority**

*Collection:* U.S. Fish and Wildlife regulates the taking of Bald eagles, Southwestern willow flycatchers, Mexican spotted owls, and threatened and endangered fish. Some taking of animals occurs through falconry which is also regulated by Arizona Game and Fish Department. Species include: common black hawks and northern goshawks. Arizona Game and Fish Department also regulates nonnative fish, amphibian, and reptile populations.

*Harvest:* Arizona Game and Fish Department is responsible for harvest of wildlife populations. Species include: Gunnison's prairie dogs, mountain lions, pronghorn, and beaver.

*Illegal shooting:* Shooting that involves illegal species, weaponry, season, location, etc. Law enforcement is the responsible entity and jurisdiction varies depending on the individual violation.

*Excessive wildlife herbivory.* Arizona Game and Fish Department is responsible for management of wildlife populations. Forest Service can erect fence exclosures and coordinate with the State on habitat issues and opportunities.

*Diseases* such as bubonic plague or canine distemper.

The primary source of *lead poisoning* in California condors is ammunition which is not regulated by the Forest Service.

*Cattle grazing or livestock concentrations (such as stockyards) on lands* other than Forest Service

*Activities on lands in other ownership* are not under the authority of the Forest Service.

