

APPENDIX C ñ VEGETATION COMMUNITIES AND ASSOCIATED WILDLIFE SPECIES

Each vegetation community is fully described by Brown (1982a, 1994). The Brown classification for the American Southwest is based on biogeography delineators such as climate, vegetation physiognomy, and plant dominants.

Upland Sonoran Desert Scrub

The Upland Sonoran Desert Scrub vegetation is at times referred to as the Arizona Desert or Paloverde-Cacti Desert. This vegetation is mainly associated with the Lower Sonoran Desert Scrub. It occurs on BLM land in the western part of the state and is the largest vegetation community at 3,280,602 acres. Cacti plants are characteristic of this desert scrub and include buckhorn cholla, cane cholla, chain fruit cholla, teddy bear cholla, desert Christmas cactus, pencil cholla, Klein cholla, Devilís club ground cholla, fishhook pincushion, Thornber pincushion, fish-horn barrel cactus, compass barrel cactus, and saguaro. Non-cactus dominant woody plants are blue palo verde, foothill palo verde, ironwood, creosotebush, white bursage, whitethorn acacia, limber bush, ocotillo, jojoba, little-leaved ratany, crucifixion thorn, and bush buckwheat. Fire is not common in this vegetation community. **The Desired Future Conditions are for an adequate cover and mix of natural plant species that have good vigor. In terms of fire management and fire ecology, the Desired Future Conditions are for fire to control or reduce the exotic annual weeds such as red brome and to limit woody vegetation to non-hazardous levels.**

A great majority of this vegetation occurs on slopes and broken ground giving it the name of Upland Sonoran Desert Scrub. Elevations range between 984-3,280 ft. Average annual precipitation is unreliable and bi-seasonal which averages 12-16 inches with approximately 30ñ60% occurring during summer months. Temperatures are warm and characteristic of subtropical deserts with a winter temperature range of 9ñ19]C and summer range of 22ñ27]C. Soils are variable but predominately sand characteristically covered with desert pavement. Historic fire had a return interval of decades to hundreds of years and was probably not common in this vegetation community (Rogers and Steele 1980). However, today the risk of wildfire may increase after abnormally high annual precipitation which encourages abundant growth of red brome and buffelgrass (McAuliffe 1995).

Numerous mammals occupy this prevalent vegetation community, including mule deer (*Odocoileus hemionus*), desert bighorn sheep (*Ovis Canadensis*), javelina (*Tayassu tajacu*), mountain lion (*Felis concolor*), ringtail cat (*Bassariscus astutes*), bobcat (*Felis rufus*), California leaf-nosed bat (*Macrotus californicus*), California myotis (*Myotis californicus*), black-tailed jack-rabbit (*Lepus californicus*), desert cottontail (*Sylvilagus audubonii*), spotted skunk (*Spilogale gracilis*), striped skunk (*Mephitis mephitis*), Arizona pocket mouse (*Perognathus amplus*), Baileyís pocket mouse (*Chaetodipus baileyi*), cactus mouse (*Peromyscus eremicus*), white-throated wood rat (*Neotoma albigula*), gray fox (*Urocyon cinereoargenteus*), the endemic Harris antelope squirrel (*Ammospermophilus harrisi*), and mesquite mouse (*Peromyscus merriami*). This paloverde-cacti-mixed scrub series supports diverse bird communities, including many species associated with other vegetation communities that extend into suitable habitats in the Arizona Upland Sonoran Desert Scrub. These species include typical thornscrub species such as Harrisí hawk (*Parabuteo unicinctus*), white-winged dove (*Zenaida asiatica*), elf owl (*Micrathene whitneyi*), pyrrhuloxia (*Cardinalis sinuatus*), the icactusí woodpeckers (gila woodpecker (*Melanerpes uropygialis*), northern flicker (*Colaptes auratus*), and ladder-backed woodpecker (*Picoides scalaris*), curve-billed thrasher (*Toxostoma curvirostre*), cactus wren (*Campylorhynchus brunneicapilus*), black-throated sparrow (*Amphispiza bilineata*), red-tailed hawk (*Buteo jamaicensis*), Gambelís quail (*Lophortyx gambelii*), gilded flicker (*Colaptes chrysoides*), ash-throated flycatcher (*Myiarchus cinerascens*), house finch (*Carpodacus mexicanus*), and black-tailed gnatcatcher (*Poliophtila melanura*).

Many Sonoran and other desert reptiles also add to the wildlife diversity of this vegetation community, including species with more limited ranges such as western whiptail (*Cnemidophorus tigris*), gila monster (*Heloderma suspectum*), Arizona Sonoran coral snake (*Micruroides euryxanthus*), tiger rattlesnake (*Crotalus tigris*), desert tortoise (*Gopherus agassizii*), Mojave green rattlesnake (*Crotalus scutulatus scutulatus*), western rattlesnake (*Crotalus viridis*), western diamondback rattlesnake (*Crotalus atrox*), regal horned lizard (*Phrynosoma solare*), desert horned lizard (*Phrynosoma platyrhinos*), and ornate tree lizard (*Urosaurus ornatus*) (Brown 1994).

Lower Sonoran Desert Scrub

The Lower Sonoran Desert Scrub vegetation on BLM land occurs mainly in western Arizona. It is the second most common vegetation type on BLM land as it occupies 2,727,540 acres. This vegetation type is relatively species rich in comparison with the Great Basin Desert Scrub as there is a mixture of different shrub species throughout this type. The Sonoran Desert Scrub vegetation is associated with Mohave Desert Scrub and Upland Sonoran Desert Scrub. Characteristic shrubs are creosotebush, whitebursage, ocotillo, brittlebrush, foothill palo verde, fourwing saltbush, and Ironwood. Saguaro is a characteristic cactus. Western honey mesquite, ironwood, catclaw acacia, blue palo verde, desert willow, and smoketree are usually associated with washes. Big galleta grass is an important grass species. Invasive weedy species include exotic species such as buffelgrass, red brome, filaree, prickly lettuce, Russian thistle, and London rocket. Fire is not common in this vegetation community. **The Desired Future Conditions are for an adequate cover and mix of natural plant species that have good vigor. In terms of fire management and fire ecology, the Desired Future Conditions are for fire to control or reduce the exotic annual weeds such as red brome and buffelgrass, and to limit woody vegetation to non-hazardous levels.**

As a result of high temperatures and low precipitation, plant growth is typically opened and simple reflecting intense competition for soil water among individuals. Annual precipitation varies between 2 and 9 inches. Winter temperatures are mild but summer months are hot, and desert pavement is common. Vegetation tends to occur along washes and small drainages. Sand dunes are common in some areas. Historic fire had a return interval of decades to hundreds of years and was probably not common in this vegetation community (Rogers and Steele 1980). However, today the risk of wildfire may increase after abnormally high annual precipitation which encourages abundant growth of red brome and buffelgrass (McAuliffe 1995).

Mammals typical to this arid region are generally small burrowing mammals, such as mule deer (*Odocoileus hemionus*), desert bighorn sheep (*Ovis Canadensis*), javelina (*Tayassu tajacu*), mountain lion (*Felis concolor*), ringtail cat (*Bassariscus astutes*), bobcat (*Felis rufu*), grey fox (*Urocyon cinereoargenteus*), kit fox (*Vulpes velox*), white-tailed antelope squirrel (*Ammospermophilus leucurus*), black-tailed jack rabbit (*Lepus californicus*), desert pocket mouse (*Chaetodipus penicillatus*), and desert and Merriam Kangaroo rats (*Dipodomys deserti* and *D. merriami*), as well as the ubiquitous coyote (*Canis latrans*). This vegetation community is the poorest of the Sonoran Desert for birds, because of its sparsely vegetated and structurally shorter habitats. Typical bird species include lesser numbers of arid-adapted species, such as the LeConte's thrasher (*Toxostoma lecontei*), white-winged dove (*Zenaida asiatica*), elf owl (*Micrathene whitneyi*), black-throated sparrow (*Amphisipiza bilineata*), loggerhead shrike (*Lanius ludovicianus*), cactus wren (*Campylorhynchus brunneicapilus*), red-tailed hawk (*Buteo jamaicensis*), ash-throated flycatcher (*Myiarchus cinerascens*), gilded flicker (*Colaptes chrysoides*), mourning dove (*Zenaida macroura*), Gambel's quail (*Lophortyx gambelii*), and verdin (*Auriparus flaviceps*). Amphibians include Couch's spadefoot toad (*Scaphiopus cochii*), western green toad (*Bufo debilis insidiator*), and Woodhouse's toad (*Bufo woodhousii*). This vegetation community supports a diverse and productive community of reptiles. The sandy plains and dunes of the Lower Colorado River Sonoran Desert Scrub support a number of unique sand-adapted lizards and snakes, such as fringe-toed lizards (*Uma inornata*), banded sand snake (*Chilomeniscus cinctus*), and sidewinder (*Crotalus cerastes*).

Rocky outcrops, bajadas, talus slopes, washes, and gravel plains each support varied and often different herpetofauna communities ñ chuckwalla (*Sauromalus ater*), desert spiny lizard (*Sceloporus magister*), western whiptail (*Cnemidophorus tigris*), desert glossy snake (*Arizona elegans eburnata*), western rattlesnake (*Crotalus viridis*), regal horned lizard (*Phrynosoma solare*), desert horned lizard (*Phrynosoma platyrhinos*), gopher snake (*Pituophis catenifer*), and desert tortoise (*Gopherus agassizii*) (Brown 1994).

Great Basin Pinyon-Juniper Woodland

Great Basin Pinyon-Juniper Woodland vegetation is wide spread throughout Arizona and grows on 1,533,012 acres of BLM land. It is associated with Upland Sonoran Desert Scrub and Great Basin Pinyon-Juniper Woodland vegetation. The Great Basin Conifer community is a cold-desert, evergreen woodland that is characterized by juniper and pinyon pine trees. Juniper trees tend to dominate at elevations below 6,560 ft, while pinyon pine dominates at the higher elevations. These trees are short-growing and rarely exceed 12 m in height. The canopy cover is mostly opened except on higher elevations or mesic sites where tree limbs may interlock. Understory shrubs, forbs, and grasses are usually sparse due to aridity and intense competition for soil water from the juniper and pinyon pine trees. Important juniper species are Rocky Mountain juniper and Great Basin juniper. The Rocky Mountain pinyon pine dominates in Arizona. Associated grasses may include blue gramma, galleta grass, Indian ricegrass, western wheatgrass, Junegrass, and several muhleys or dropseeds. Dominant shrubs are big sagebrush, snakeweed, rabbitbrush, winterfat, black sagebrush, blackbrush, cliffrose, Apache plume, Mormon-tea, fourwing saltbrush, antelope bitterbrush, and yucca. Forbs include several gilia, buckwheat, penstemon, lupine, and globemallow species. The mixtures of grasses, shrubs, and forbs depend on soil, precipitation, temperature, and disturbance. Cacti include several different species of hedgehog, pricklypear, and cholla.

The Great Basin Pinyon-Juniper Woodland is cold-temperate woodland characterized by cold winter temperatures with freezing temperatures occurring approximately 150 days per year. Summer temperatures are warm. Annual precipitation ranges between 10 and 22 inches, is distributed evenly throughout the year, and mainly occurs as snow in winter months. Soils are characteristically shallow and rocky. Juniper trees have invaded large areas of former grasslands and sagebrush dominated rangelands. Several factors, including fire suppression, climate change, and livestock grazing, may be responsible for the juniper invasion. Efforts to remove the invading trees have not been successful. Historic wildfire was not common. The sparse understory and openness of the pinyonñjuniper woodlands did not support the spread of fire expect on mesic areas where fuel was sufficient (Paysen et al. 2000). However, in modern times, many of these woodlands have sufficient fuel loads to support fire because of increased tree densities and the establishment of cheatgrass, red brome, buffelgrass and other annual weeds. **The Desired Future Conditions are that annual weeds such as cheatgrass are controlled, ladder fuels and downed woody debris are limited or not present, and juniper and piñon pine tree densities and cover occur at their historic range of variation.**

Only a few vertebrate species are closely tied to or centered within this vegetation community, such as mountain lion (*Felis concolor*), coyote (*Canis latrans*), grey fox (*Urocyon cinereoargenteus*), ringtrail cat (*Bassariscus astutus*), mule deer (*Odocoileus hemionus*), pinyon mouse (*Peromyscus truei*), bushy-tailed woodrat (*Neotoma cinerea*), Hualapai Mexican vole (*Microtus mexicanus hualpaiensis*), pinyon jay (*Gymnorhinus cyanocephalus*), gray flycatcher (*Empidonax wrightii*) Gray vireo (*Vireo vicinior*), black-throated gray warbler (*Dendroica nigrescens*), Scottís oriole (*Icterus parisorum*), wild turkey (*Meleagris gallopavo*), long-eared owl (*Asio otus*), Cassinís kingbird (*Tyrannus vociferans*), chipping sparrow (*Spizella passerina*), juniper titmouse (*Baeolophus ridgwayi*), ash-throated flycatcher (*Myiarchus cinerascens*), Bewickís wren (*Thryomanes bewickii*), bushtit (*Psaltriparus minimus*), western scrub-jay (*Aphelocoma californica*), common raven (*Corvus corax*), gray vireo (*Vireo vicinior*), mountain bluebird (*Sialia currucoides*), Woodhouseís toad (*Bufo woodhousii*), Great Basin spadefoot toad (*Spea*

intermontana), and the Striped whiptail (*Cnemidophorus velox*). A somewhat larger number of the more adaptable, and therefore, more widely distributed species also may be found in these habitats year-round or seasonally (Brown 1994).

Mohave Desert Scrub

Mohave Desert Scrub vegetation is located on 1,165,687 acres. The Mohave Desert Scrub vegetation mixture is intermediate between Great Basin Desert Scrub and Sonoran Desert Scrub. The characteristic shrubs include creosotebush, Joshua tree, all-scale, brittlebush, desert holly, white burrobrush, shadscale, blackbrush, and many more shrubs. Cacti are well represented and include Engelmann hedgehog, silver cholla, Mohave pricklypear, beavertail cactus, many-headed barrel cactus. Ephemeral plants, many of which are endemic (approximately 90 out of 250 species), are characteristic of Mohave Desert Scrub. These short-lived plants that complete their life cycle in one growing season are divided into two major groups: winter and summer annuals. The winter and summer annuals respond to winter and summer precipitation, respectively.

The Mohave Desert Scrub is a warm-temperate desert with scanty precipitation that occurs mainly during winter months. Elevation for the Mohave Desert Scrub is broad in Arizona and ranges from below 980 ft to 4,000 ft. Precipitation is low with annual values ranging between 2 and 8 inches and occurs with a predominately winter and summer bi-modal pattern. Temperatures are relatively low in the winter and high in the summer. Temperatures can range from approximately 0 °C in the winter months to 40 °C in summer months. Dry lakes are common. Historic wildfire was probably not common in this vegetation community.

The Desired Future Conditions are for an adequate cover and mix of natural plant species that have good vigor. In terms of fire management and fire ecology, the Desired Future Conditions are for fire to control or reduce the exotic annual weeds such as red brome and to limit woody vegetation to non-hazardous levels.

Mule deer (*Odocoileus hemionus*), desert bighorn sheep (*Ovis Canadensis*), javelina (*Tayassu tajacu*), mountain lion (*Felis concolor*), ringtail cat (*Bassariscus astutes*), bobcat (*Felis rufus*), and coyote (*Canis latrans*) are large mammals occupying this vegetation community, while smaller, less wide-ranging mammals abound, including Merriam's kangaroo rat (*D. merriami*), little pocket mouse (*Perognathus longimembris*), white-tailed antelope squirrel (*Ammospermophilus leucurus*), desert woodrat (*Neotoma lepida*), southern grasshopper mouse (*Onychomys torridus*), long-tailed pocket mouse (*Perognathus formosus*), cactus mouse (*Peromyscus eremicus*), Harris' antelope squirrel (*Ammospermophilus harrisi*) and canyon mouse (*Peromyscus crinitus*). Many of the bird and reptile species typical of this vegetation community are subspecies or subpopulations of species found in other desert vegetation communities in Arizona (Brown 1994). Bird species include black-tailed gnatcatcher (*Polioptila melanura*), great horned owl (*Bubo virginianus*), Phainopepla (*Phainopepla nitens*), black-throated sparrow (*Amphispiza bilineata*), cactus wren (*Campylorhynchus brunneicapillus*), common raven (*Corvus corax*), rock wren (*Salpinctes obsoletus*), ash-throated flycatcher (*Myiarchus cinerascens*), loggerhead shrike (*Lanius ludovicianus*), mourning dove (*Zenaida macroura*), red-tailed hawk (*Buteo jamaicensis*), house finch (*Carpodacus mexicanus*), and Gambel's quail (*Lophortyx gambelii*). Reptiles include desert spiny lizard (*Sceloporus magister*), Mojave desert tortoise (*Gopherus agassizii*), zebra-tailed lizard (*Callisaurus draconoides*), side-blotched lizard (*Uta stansburiana stejnegeri*), long-nosed leopard lizard (*Gambelia wislizenii*), Mojave rattlesnake (*Crotalus scutulatus scutulatus*), and coachwhip (*Masticophis flagellum*), Mojave fringe-toed lizard (*Uma scoparia*).

Great Basin Desert Scrub

Great Basin Desert Scrub vegetation occurs on 1,058,401 acres of BLM land in the Arizona Strip, Phoenix, Kingman, and Safford Field Offices. The Painted Desert is predominately Great Basin Desert

Scrub vegetation. It is associated with Upland Sonoran Desert Scrub and Great Basin Pinyon-Juniper Woodland vegetation. Species diversity is low with dominant shrubs occupying vast tracts of land. Characteristic vegetation is low-growing, widely spaced hemispherical, non-sprouting shrubs with widely spaced bunchgrasses. Dominant shrubs include big sagebrush, black sagebrush, Bigelow sagebrush, shadscale, fourwing saltbush, rabbitbrush, winterfat, hopsage, horsebrush, blackbrush, and greasewood. Associated grasses may include blue gramma, galleta grass, Indian ricegrass, western wheatgrass, Junegrass, and several muhleys or dropseeds. Forbs include several gilia, buckwheat, penstemon, lupine, and globemallow species. Cacti number and species in Great Basin Desert scrub are relatively few in comparison to those found in warm deserts. Cactus plants are small in stature or prostrate and include several species of prickly pear, hedge hog, and cholla. The mixtures of the different plants depend on soil, precipitation, temperature, and disturbance. Introduced weeds such as cheatgrass, medusahead, red brome, Russian thistle, halogeton, filaree, tumble mustard occur on disturbed sites. The introduced woody plants, Russian olive and saltcedar are commonly found present in riparian corridors. Historic fire intervals range between 5- 100 years depending on the shrub community type and fuel build-up (Paysen et al. 2000). Annual weeds such as cheatgrass and red brome have caused an increase in fire re-occurrence and fuel flammability. **The Desired Future Conditions are for fire to naturally reduce annual weed densities and cover, limit or reduce the invasion of juniper, and for the densities of shrubs, such as big sagebrush, to be maintained within their historic range of variability.**

The Great Basin Desert Scrub is part of the Great Basin Desert which is a cold desert characterized by cold, harsh winters, hot summers, and low precipitation. Elevation ranges between 3,930 and 7,220 ft. Average annual precipitation is approximately less than 10 inches with the majority occurring during the winter months as snow. Maximum daily temperature values may remain below freezing during many days of December, January and February—the three coldest months of the year. For much of the area, increasing spring and summer temperatures coincide with decreasing soil water supplies which limits plant growth.

A distinct fauna is centered in this vegetation community. Mule deer (*Odocoileus hemionus*), bighorn sheep (*Ovis canadensis*), Townsend's ground squirrel (*Spermophilus townsendi*), badger (*Taxidea taxus*), long-tailed pocket mouse (*Perognathus formosus*), and northern grasshopper mouse (*Onychomys leucogaster*) are associated with sagebrush communities of the Great Basin Desert Scrub. Large ungulates are poorly represented here, however several birds such as the golden eagle (*Aquila chrysaetos*), burrowing owl (*Athene cunicularia*), Sage thrasher (*Oreoscoptes montanus*), Sage sparrow (*Amphispiza belli*), Vesper sparrow (*Pooecetes gramineus*), common raven (*Corvus corax*), rock wren (*Salpinctes obsoletus*), horned lark (*Eremophila alpestris*), Say's phoebe (*Sayornis saya*), western meadowlark (*Sturnella neglecta*), and Brewer's sparrow (*Spizella breweri*) are characteristic of sagebrush communities. The Sagebrush lizard (*Sceloporus graciosus*) and Great Basin spadefoot toad (*Scaphiopus intermontanus*) are common representative species. A number of reptilian subspecies such as Desert horned lizard (*Phrynosoma platyrhinos platyrhinos*), and Great Basin and Plateau tiger whiptails (*Cnemidophorus tigris tigris* and *C. Tigris septentrionalis*) are indicative of Great Basin Desert Scrub and a history of evolutionary separation (Brown 1994).

Plains and Great Basin Grassland

The Plains and Great Basin Grassland vegetation occupies 747,509 acres of BLM lands and is located on scattered, small land parcels on BLM land mainly in eastern Arizona. This grassland vegetation is associated with Great Basin Pinyon-Juniper Woodland vegetation at higher elevations and with Semi-Desert Grasslands or Great Basin Desert Scrub at lower elevations. The plains grasses are representative of the tall, medium, and short prairies of the central plains region. The Great Basin grasses are the southern extension from the Great Basin. These grasslands are much altered now but once were a continuous cover dominated by various grass species and interspersed with shrubs and forbs. Grazing and other agricultural practices have greatly influenced the cover and composition of these grasslands. Fire

with moderate return intervals was important in the ecology of these grasslands (Paysen et al. 2000). However, grazing and fire suppression has altered the historic natural fire regime. **The Desired Future Conditions are for a predominance of perennial grass cover, reduced cover of annual grasses, and for fire to naturally inhibit the invasion of woody shrubs such as rabbitbrush, snakeweed, and big sagebrush.**

The Plains Grassland vegetation can be divided into tall, medium, and short grassland fractions depending on general grass height. Tall grasses occur on sandhills and are dominated by big bluestem and little bluestem, and Indiangrass, switchgrass, western wheatgrass, needle-and-thread grass, galleta, and sand dropseed. Shinnery oak and midget oak are common shrubs. The short grass areas are dominated by blue grama, Indian ricegrass, galleta grass, prairie Junegrass, plains lovegrass, and alkali sacaton. Associated shrubs in both the tall and short grass vegetation may include fourwing saltbush, big sagebrush, winterfat, soapweed, prairie sumac, rabbitbrush and snakeweed depending on the degree of past grazing and other disturbances. Associated forbs may include primrose, bahia, spiderflower, four-o'clock, gaura, mallow, coneflower, bricklebrush, and aster. Associated cacti include plains pricklypear, hedgehogs, and pin cushion.

Plains and Great Basin grasslands are cold-temperate vegetation and vary in elevation between 4,920 and 7,545 ft. Precipitation within the plains grasslands occurs mainly during summer-month thunderstorms and averages between 12 and 18 inches. The Great Basin grasses occur on drier and colder sites than the Plains grasses. Average precipitation for the former ranges between 180–300 mm and occurs mainly during winter and spring months.

Grassland vegetation provides a beneficial food source for larger grazing mammals such as the Pronghorn (*Antilocapra Americana*) and Bison (*Bison bison*). Smaller burrowing mammals include Gunnison's prairie dogs (*C. gunnisoni*), Plains pocket gopher (*Geomys bursarius*), striped skunk (*Mephitis mephitis*), and northern grasshopper mouse (*Onychomys leucogaster*). The open landscape of the grasslands provides suitable habitat for bird species such as western meadowlark (*Sturnella neglecta*) and eastern meadowlark (*Sturnella magna*) Prairie falcon (*Falco mexicanus*), Vesper sparrow (*Pooecetes gramineus*), western kingbird (*Tyrannus verticalis*), Swainson's hawk (*Buteo swainsoni*), burrowing owl (*Athene cunicularia*), lark sparrow (*Chondestes grammacus*), common raven (*Corvus corax*), American kestrel (*Falco sparvericus*), horned lark (*Eremophila aepestrus*), red-tailed hawk (*Buteo jamaicensis*), ash-throated flycatcher (*Myiarchus cinerascens*), rock wren (*Salpinctes obsoletus*), northern mockingbird (*Mimus polyglottos*), loggerhead shrike (*Lanius ludovicianus*), and black-throated sparrow (*Amphispiza bilineata*). The burrows created by small mammals are often co-habited by reptiles such as the gophersnake (*Pituophis melanoleucus sayi*), coachwhip (*Masticophis flagellum*), Utah milksnake (*Lampropeltis triangulum taylori*), and western rattlesnake (*Crotalus viridis*) (Brown 1994).

Semidesert Grassland

The Semidesert Grassland is located on 757,668 acres of BLM land mainly in east-central and southeast Arizona. This vegetation type is associated with Plains and Great Basin grassland, Madrean Evergreen Woodland, and Chihuahuan Desert Scrub. Originally the grasses were perennial bunchgrasses but grazing has encouraged the increased growth of sod grasses on areas with deep soil and heavy to moderate rainfall. The bunchgrasses have been replaced by annual grasses in areas with low precipitation. In some areas with deep soils and well protected from erosion bunchgrasses still cover large areas in association with a few shrubs and cacti. However, there are areas where grass cover has been reduced as a result of woody plant and cacti colonization. Fire with moderate return intervals was important in the ecology of these grasslands (Paysen et al. 2000). However, grazing and fire suppression has altered the historic natural fire regime. **The Desired Future Conditions are for perennial grasses to**

cover its historic range of variability, annual grass cover is reduced, and fire naturally inhibits the invasion of woody plants such as juniper, tarbush, whitethorn, and creosotebush.

Tobosa grass and black grama are the most dominant species in the Semidesert Grassland. Tobosa grass is generally found growing on heavy soils that are subject to flooding. Black grama is usually found on gravelly, upland soils. The other grasses are numerous and include black grama, sideoats grama, black grama, slender grama, chino grama, bush muhly, threeawn species, Arizona cottontop, vine grass, plains bristlegass, plains lovegrass, wolftail, and little bluestem. Lehmann lovegrass was introduced for its forage value but has expanded at the expense of more palatable grass species. The assorted shrubs that are intermixed among the grasses include mesquite, one-seed juniper, lotebush, all-thorn, Mormon tea, false mesquite, catclaw acacia, desert hackberry, barberry, and ocotillo. Tarbush, whitethorn, and creosotebush have invaded extensive areas. Cacti and other succulents are important in this vegetation type and they include several yucca species, sotols, beargrass, several agrave species, barrel cactus, Turkís head, cane cholla, desert Christmas cholla, rainbow cactus, and several pricklypear and hedgehog species. The important forbs include mallow, lupine, buckwheat, filaree, spiderling, white-mat, amaranth, and devils claw. Invasive grasses include red brome, bristlegass, foxtail barley, and wild oats which are increasing as a result of past grazing practices.

The Semidesert grassland is a warm temperate grassland ranging in elevation from 2,300-4,920 ft. Most of this grassland receives an annual precipitation between 8-12 inches with the majority coming during the spring and summer. Winters are mild and freezing temperatures occur generally less than 100 days during the year. Summers are warm with several days over 38 [C.

The Pronghorn antelope (*Antilocapra americana*) and White-tailed deer (*Odocoileus virginianus*) are the primary large grazing mammals associated with the Semidesert Grassland. The Javelina (*Dicotyles tajacu*), also known as the Collared peccary, can be found in the Semidesert Grassland. Small burrowing mammals are primarily represented by the Black-tailed jackrabbit (*Lepus californicus*) and various burrowing rodents, including the Spotted ground squirrel (*Spermophilus spilosoma*), Hispid pocket mouse (*Perognathus hispidus*), antelope jack rabbit (*Lepus alleni*), and northern grasshopper mouse (*Onychomys leucogaster*). Numerous bird species include Swainsonís hawk (*Buteo swainsoni*), Mourning dove (*Zenaido macroura*), greater roadrunner (*Geococcyx californianus*), Sayís phoebe (*Sayornis saya*) Cactus wren (*Campylorhynchus brunneicapillus*), Gambelís quail (*Lophortyx gambelii*), Black-throated sparrow (*Amphispiza bilineata*), Cassinís sparrow (*Aimophila cassinii*), Botteriís sparrow (*Aimophila botterri*), brown-headed cowbird (*Molothrus ater*), Chihushuan raven (*Corvus cryptoleucus*), scaled quail (*Callipepla squamata*), and burrowing owl (*Athene cunicularia*). The amphibian Woodhouseís toad (*Bufo woodhousii*) is found within this vegetation community. Reptiles include the Desert box turtle (*Terrapene ornate luteola*), Mexican (western) hognose snake (*Heterodon nasicus kennerlyi*), the all-female Desert-grassland whiptail (*Cnemidophorus uniparens*), and common earless lizard (*Holbrookia texana scitula*) (Brown 1994).

Interior Chaparral

Interior Chaparral vegetation represents 425,287 acres of BLM land mainly in western Arizona. It is associated with Upland Sonoran Desert Scrub, Lower Sonoran Desert Scrub, Mohave Desert Scrub, and Great Basin Pinyon-Juniper Woodland vegetation. The vegetation is dominated by shrubs with small, thick, evergreen leaves and wide-spreading, deep root systems. Historic fire was an important component of the ecosystem (Pase and Brown 1982a). As such, the shrubs are well adapted to fire and reproduce readily from heat-scarified seed that is stored in soil for decades. Some species readily sprout from root crowns after fire. The dense compacted leafy growth of the shrubs are naturally flammable which leads to a high fire hazard. The dominant plant is shrub live oak. Other shrubs are birchleaf mountain mahogany, skunkbush sumac, silktassel, desert ceanothus, hollyleaf buckthorn, cliffrose, desert olive, sophora, and

Arizona rosewood. Shrub cover is approximately 60-70% which allows grasses such as sideoats grama, hairy grama, cane bluestem, plains lovegrass, wolftail, and threeawn to grow in the inter-shrub spaces. Forbs are not common except after fire and include penstemon species, Wright's verbena, goldenrod, purple nightshade, hoarhound, and scarlet morning glory. Occasionally, one-seed juniper, emory oak, or pinyon pine may occur. Weedy species include filaree and red brome which are increasing because of disturbances such as grazing and fire. **The Desired Future Conditions are that fire naturally maintains shrub cover while reducing annual grass cover, the invasion of woody plants such as juniper and piñon pine are controlled, and the average age of chaparral stands is reduced through controlled fire or mechanical treatment.**

Interior Chaparral vegetation is considered a warm-temperate scrubland with elevations mainly between 3,445-6,070 ft but higher sites occur on drier and warmer slopes. The climate is characterized by cool, moist winters and hot, dry summers. The majority of precipitation occurs during winter months when plants are dormant or nearly so.

Small mammals associated with the Interior Chaparral include the Cliff chipmunk (*Eutamias dorsalis*), White-footed mouse (*Peromyscus leucopus*), White-throated woodrat (*Neotoma albigula*), and eastern cottontail (*Sylvilagus floridanus*). Nesting birds include the Spotted towhee (*Pipilo maculatus*), Virginia's warbler (*Vermivora virginiae*), western scrub jay (*Aphelocoma californica*), Crissal thrasher (*Toxostoma dorsale*), black-chinned sparrow (*Spizella atrogularis*), rufous-crowned sparrow (*Aimophila ruficeps*), bushtit (*Psaltiriparus minimus*), blue-gray gnatcatcher (*Polioptila caerulea*), Scott's oriole (*Icterus parisorum*), rock wren (*Salpinctes obsoletus*), and canyon wren (*Catherpes mexicanus*). Amphibians common to this vegetation community include Woodhouse's toad (*Bufo woodhousii*) and Arizona toad (*Bufo microscaphus*). Reptiles common to the Interior Chaparral include the Western threadsnake (*Leptotyphlops humilis*), Glossy snake (*Arizona elegans*), Smith's black-headed snake (*Tantilla hobartsmithi*), Western rattlesnake (*Crotalus viridis*), Western fence lizard (*S. occidentalis*), Arizona alligator lizard (*Gerrhonorus kingi*), and Sonora mountain kingsnake (*Lampropeltis pyromelana*) (Brown 1994).

Chihuahuan Desert Scrub

Chihuahuan Desert Scrub is part of the vast Chihuahuan Desert and grows on 447,398 acres of BLM land. This vegetation is associated with Semidesert Grassland and Upland Sonoran Desert Scrub vegetation on BLM land in southeast Arizona. Annual precipitation ranges between 8-12 inches with the majority received during the summer. Temperatures are hot in the summer and commonly over 40 °C and freezing temperatures occurring during winter months. Elevation varies between 2,300-4,900 ft.. The Chihuahuan Desert Scrub is shrub dominated but herbaceous and succulent plants are also an important part of its structure. The dominant shrubs are creosotebush, tarbush, and whitehorn acacia cover large expanses of outwash plains, low hills, and valleys. Saltbushes occur on fine textured soils and open stands of mesquite grow on sandy, wind eroded hummocks. Secondary important plants are mariola, guayule, goldeneye, desert zinnias, dogweeds, Condalia species, lechuguilla, ocotillo, and ratany. On the upslopes, succulents such as several agave and yucca species are present along with ocotillo, Coldenia species, catclaw, fourwing saltbush, cenizo, condalia, and many more species. Cacti are low growing, prostrate, clumped and they include several cholla, prickly pear, hedgehog, Turk's head, pin cushion, and fishhook species. Semidesert grasses occur within this desert scrub with importance increasing near their common boundary. Fire is not common in this vegetation community. **The Desired Future Conditions are for an adequate cover and mix of natural plant species that have good vigor. In terms of fire management and fire ecology, the Desired Future Conditions are for fire to control or reduce the exotic annual weeds such as red brome and to limit woody vegetation to non-hazardous levels.**

Southern grasshopper mouse (*Onychomys torridus*), white-throated woodrat (*Neotoma albigula*), silky pocket mouse (*Perognathus flavus*), chisel-tooth kangaroo rat (*Dipodomys microps*), antelope jack rabbit (*Lepus alleni*), yellow-nosed cotton rat (*Sigmodon ochrognathus*), and Ordís and Merriamís kangaroo rats (*Dipodomys ordii* and *D. merriami*) dominate the mammal populations of the Chihuahuan Desert Scrub. Scaled quail (*Callipepla squamata*), Chihuahuan raven (*Corvus cryptoleucus*), pyrrhuloxia (*Cardinalis sinuatus*), Swainsonís hawk (*Buteo swainsoni*), scaled quail (*Callipepla squamata*), black-throated sparrow (*Amphisipiza bilineata*), common poorwill (*Phalaenoptilus nuttallii*), red-tailed hawk (*Buteo jamaicensis*), Verdin (*Auriparus flaviceps*), cactus wren (*Campylorhynchus brunneicapillus*), lesser nighthawk (*Chordeiles acutipennis*), loggerhead shrike (*Lanius ludovicianus*), ash-throated flycatcher (*Myiarchus cinerascens*), rock wren (*Salpinctes obsoletus*), and Gambelís quail (*Lophortyx gambelii*) are considered to be the characteristic bird species of the Chihuahuan Desert Scrub. Amphibians include Woodhouseís toad (*Bufo woodhousii*) and Plains spadefoot toad (*Spea bombifrons*). Reptiles include the exas Banded gecko (*Coleonyx brevis*), Greater earless lizard (*Cophosaurus texanus*), and Little striped and Marbled whiptails (*Cnemidophorus inornatus*, *C. tigris marmoratus*) (Brown 1994).

Riparian

Riparian vegetation is found on 176,927 acres of BLM land in association with streams and rivers. The area occupied by riparian vegetation is relatively small in relationship with other vegetation types but their biological and ecological importance is larger than their limited geographic occurrence. Riparian vegetation is important to wildlife as forage, cover, breeding, and migration corridors. Riparian corridors have been greatly disturbed by a variety of activity such as grazing, mining, tree harvesting, and stream flow alteration. **The Desired Future Conditions are that annual weed cover and density is controlled and ladder fuels and downed woody debris are limited or not present. Disturbances such as livestock grazing, mining, and off road vehicle travel, that can potentially reduce natural vegetation cover and vigor, are managed to maintain adequate cover and mix of natural plant species.**

The nature and species composition of the riparian vegetation changes depending on elevation and associated upland vegetation community. For example, at high elevation stream gradients are steep with relatively high precipitation and cool temperatures, while at low elevations stream gradients are gentle, low precipitation, and warm temperatures. At the higher elevations Pacific willow, bigtooth maple, narrowleaf cottonwood, box elder, black cherry, sycamore, Arizona walnut, velvet ash and western soapberry and red willow are the woody plants. At lower elevations mesquite, Gooddings willow, netleaf hackberry, western soapberry, velvet ash, Wrightís Sycamore, and black cherry characterize riparian vegetation. Russian olive and saltcedar are two invasive woody plants that have colonized large expanses of low- to mid-elevation riparian corridors.

Large mammals characteristic of riparian woodlands include White-tailed deer and Black bear (*Ursus americanus*). Small rodents include Arizona gray squirrel (*Sciurus arizonensis*). The River otter (*Lutra canadensis*) is a rare species found in woodlands adjacent to streams. Small carinovres such as Ringtailed cat (*Bassaricus astutus*) and Skunk (*Mephitis spp, spilogale putorius*) are also found in woodlands containing streams. Red bats (*Lasiurus borealis*) are found in riparian woodlands. Riparian habitats typically host the greatest variety, and often numbers, of birds in Arizona, with many being riparian-obligate species. Examples of bird species inhabiting riparian woodlands include the Zone-tailed hawk (*buteo albonotatus*), Northern (Bullockís) oriole (*Icterus galbula*), Yellow-billed cuckoo (*Coccyzus americanus*), Black phoebe (*Sayornis nigricans*), the Federally endangered Southwestern willow flycatcher (*Empidonax traillii extimus*), brown-crested flycatcher (*Myiarchus tyrannulus*), yellow warbler (*Dendroica petechia*), Bellís vireo (*Vireo bellii*), Lucyís warbler (*Vermivora luciae*), black-chinned hummingbird (*Archilochus alexandri*), summer tanager (*Piranga rubra*), lesser goldfinch (*Carduelis psaltria*), yellow-breasted chat (*Icteria virens*), hooded oriole (*Icterus curullatus*), Abertís towhee (*Pipilo aberti*), western screech-owl (*Otus asio*), ash-throated flycatcher (*Myiarchus cinerascens*), Gambelís

quail (*Lophortyx gambellii*), Costaís hummingbird (*Calypte costae*), and Pyrrhuloxia (*Cardinalis sinuatus*). Arizona treefrog (*H. Wringtorum*), canyon treefrog (*Hyla arenicolor*), Woodhouseís toad (*Bufo woodhousii*), tiger salamander (*Ambystoma tigrinum*), and leopard frogs (*Rana* spp.) are found more in interior forest. Ringnecked snake (*Diadophis punctatus*), black-necked gartersnake (*Thamnophis cyrtopsis cyrtopsis*), Mexican gartersnake (*Thamnophis eques megalops*), Checkered gartersnake (*Thamnophis marcianus marcianus*), narrow-headed gartersnake (*Thamnophis rufipunctatus*), Arizona mud turtle (*Kinosternon*), yellow mud turtle (*Kinosternon*), and Sonora mud turtle (*Kinosternon sonoriensei*) are often found in riparian woodlands.

Cotton rat (*Sigmodon hispidis*), White-footed mouse (*peromyscus leucopus*), Desert pocket mouse (*Perognathus penicillatus*), and Arizona shrew (*Sorex arizonae*) are commonly found in the Riparian Scrub, as well as in other communities. Phainopepla (*Phainopepla nitens*), Crissal thrasher (*Toxostoma dorsale*), Verdin (*Auriparus flaviceps*) and Black-tailed gnatcatcher (*Polioptila melanura*) are representative of nesting birds. Red-spotted toad (*Bufo punctatus*), though found in various communities, is quite common to the Riparian Scrub.

Madrean Evergreen Woodland

The Madrean Evergreen Woodland is a warm-temperate forest located on 67,731 acres of BLM land in the southeast and west-central Arizona. This vegetation type is associated with Semidesert grassland and interior chaparral at low elevations and Montane Conifer Forests at high elevations. Elevations range from 3,940 to 7,220 ft. Annual precipitation usually exceeds 15 inches with over half received during the growing season. The climate of the Madrean Evergreen Woodland is favorable and thus has supported human habitation for hundreds of years. Trees at lower elevations include Emory oak, Arizona white oak, alligator bark juniper, one-seeded juniper, and Mexican Pinyon. At the higher elevations Apache pine, Arizona pine, pino triste, and Durango pine become prevalent along with the oaks. The important grasses are several muhly species, cane bluestem, little bluestem, plains lovegrass, blue grama, sideoats grama, hairy grama, tanglehead, and green sprangletop. Forbs include penstemon, lupine, bricklebushe, sage species and many other species. The shrubs are indigobushes, buckwheats, rose-mallows, and Louisiana sage. Cacti and succulents include many species that are found in the Semidesert Grassland. **The Desired Future Conditions are that annual weeds such as red brome and buffle grass are controlled, ladder fuels and downed woody debris are limited or not present, a high percent of large trees are maintained, and tree stand vigor is maintained through controlled fire and mechanical treatments.**

White-tailed deer (*Odocoileus virginianus*) is a common game species found in the Madrean Evergreen Woodland. Common small mammals include Southern pocket gopher (*Thomomys umbrinus*), Mexican fox squirrel (*Sciurus nayaritensis*), and Eastern cottontail (*Sylvilagus floridanus*). A number of bird species are characteristic of this community, including include Montezuma quail (*Cyrtonyx montezumae*), Acorn woodpecker (*Melanerpes formicivorus*), Mexican jay (*Aphelocoma ultramarina*), Bridled titmouse (*Parus wollweberi*), Bushtit (*Psaltriparus minimus*), Huttonís vireo (*Vireo huttoni*), Black-throated gray warbler (*Dendroica nigrescens*), black-headed grosbeak (*Pheucticus melanocephalus*), hepatic tanager (*Piranga flavai*), red-shafted flicker (*Colaptes cafer*), Stellarís jay (*Cyanocitta stelleri*), dusky-capped flycatcher (*Myiarchus tuberculifer*), Virginiaís warbler (*Vermivora virginiae*), and whiskered screech-owl (*Otus trichopsis*). The elegant trogon (*Trogon elegans*) is uncommon but typically found in this habitat adjacent to sycamore drainages. The Madrean Evergreen Woodland also has a variety of reptilian species, including Rock rattlesnake (*Crotalus lepidus*), Ridenose rattlesnake (*C. willardi*), Mountain skink (*Eumeces callicephalus*), Sonoran mountain kingsnake (*Lampropeltis pyromelana*), Clarkís spiny lizard (*Sceloporus clarki*), and Chihuahuan blackhead snake (*Tantilla wilcoxi wilcoxi*), black-tailed rattlesnake (*Crotalus molossus molossus*), and Yarrowís spiny lizard (*Sceloporus jarrovi jarrovi*) (Brown 1994).

Montane Conifer Forest

The Montane Conifer Forest is a cold-temperate forest occurring on 19,067 acres of BLM lands at an elevation range of 6,560-9,840 ft on mountain slopes and ridge tops. Mean annual precipitation ranges from 18 to 30 inches with more than 50% being received during the growing season. Snow is common during the winter. Ponderosa pine forest is located at the lower elevations and Douglas-fir, white pine, limber pine, and aspen grow at the higher elevations in canyons and north-facing slopes. At its lower limit, this vegetation is associated with Madrean Evergreen Woodland and Great Basin Pinyon-Juniper Woodland vegetation. Ponderosa pine is the most common forest-type on BLM land. Old-growth ponderosa pine forests are often park-like with scattered large, old trees and occasional clumps of younger trees. The understory is mostly grass, forbs, and a few shrubs. Frequent light fires probably kept the forests in this park-like structure as the older trees were relatively fire resistant. The fires would burn every three to five years and remove the herbaceous understory and younger trees (Pase and Brown 1982b). Crown cover of these forests was approximately 50-70%. With the absence of fire, many ponderosa pine stands are composed of multi-aged trees with the young trees growing in idog-hair thickets. **The Desired Future Conditions are that idog-hair thickets are controlled, ladder fuels and downed woody debris are limited or not present, a high percent of large trees are maintained, and tree stand vigor is maintained through controlled fire and mechanical treatments.**

Mule deer (*Odocoileus hemionus*), White-tailed deer (*O. virginianus*), and Rocky Mountain elk (*Cervus elaphus*) are the primary large mammals in the Montane Conifer Forest. Bats, such as Southwestern myotis (*Myotis auricolus*), Long-eared myotis (*M. evotis*), Big brown bat (*Eptesicus fuscus*), are common. Small mammals characteristic of this forest community include Merriam shrew (*Sorex merriami*), Nuttall's cottontail (*Sylvilagus nuttalli*), Abert's tassel-eared squirrel (*Sciurus aberti*), Porcupine (*Erethizon dorsatum*), and Deer mouse (*Peromyscus maniculatus*). The large number of bird species includes northern goshawk (*Accipiter gentiles*), Flammulated owl (*Otus flammeolus*), Broad-tailed hummingbird (*Selasphorus platycercus*), Cordilleran flycatcher (*Empidonax difficilis*), Steller's jay (*Cyanocitta stelleri*), Brown creeper (*Certhis familiaris*), Western bluebird (*Sialia mexicana*), Plumbeous vireo (*Vireo solitarius*), Yellow-rumped warbler (*Dendroica coronata*), hermit thrush (*Catharus guttatus*), red-breasted nuthatch (*Sitta canadensis*), brown creeper (*Certhia Americana*), broad-tailed hummingbird (*Selasphorus platycercus*), red-faced warbler (*Cardellina rubrifrons*), hairy woodpecker (*Piranga ludoviciana*), mountain chickadee (*Poecile gambeli*), red-shafted flicker (*Colaptes cafer*), American robin (*Turdus migratorius*), band-tailed pigeon (*Columba fasciata*), dark-eyed junco (*Junco hyemalis*), Mexican spotted owl (*Strix occidentalis lucida*), olive-sided flycatcher (*Contopus cooperi*), and Pine siskin (*Carduelis pinus*). Characteristic lizards include Arizona alligator lizard (*Gerrhonotus kingi*), Gopher snake (*Pituophis melanoleucus*), Western rattlesnake (*Crotalus viridis*), Great Plains skink (*Eumeces obsoletus*), and Wandering gartersnake (*Thamnophis elegans vagrans*) (Brown 1994).

Game Species and Furbearers

Table C-1 lists Big game species and their habitats occurring on BLM-administered lands in Arizona, while Table C-2 lists small game, predator, and furbearing species and their habitats occurring on BLM-administered lands in Arizona.

Sportfish

Common sportfish in Arizona include Apache trout (*Oncorhynchus gilae apache*), cutthroat trout (*O. clark*), rainbow trout (*O. mykiss*), brook trout (*Salvelinus fontinalis*), brown trout (*Salmo trutta*), smallmouth bass (*Micropterus dolomieu*), largemouth bass (*M. salmoides*), striped bass (*Morone saxatilis*), white bass (*M. chrysops*), yellow bass (*M. mississippiensis*), arctic grayling (*Thymallus arcticus*), desert sucker (*Catostomus insignis*), bigmouth buffalo (*Ictiobus cyprinellus*), flathead catfish

(*Pylodictis olivaris*), channel catfish (*Ictalurus punctatus*), tilapia (*Tilapia nilotica*), black bullhead (*Ameiurus melas*), yellow bullhead (*A. natalis*), bluegill (*Lepomis macrochirus*), green sunfish (*L. cyanellus*), redear sunfish (*L. microlophus*), walleye (*Stizostedion vitreum*), black crappie (*Pomoxis nigromaculatus*), white crappie (*P. annularis*), northern pike (*Esox lucius*), roundtail chub (*Gila robusta*), and yellow perch (*Perca flavescens*).

Table C1 - Big Game species and their habitats occurring on BLM-administered lands in Arizona

Species	Vegetation Community	General Habitat Description	Arizona BLM Field Offices(s)
Mammals			
Bighorn Sheep	Sonoran Desert Scrub, Mohave Desert Scrub, Great Basin Desert Scrub (rarely)	Historically, desert bighorn occurred on all mountain ranges and plateau slopes in the southern, northern, and western sections of Arizona. Desert Bighornís occur from 90 to 4,500 feet elevation, found on desert mountain ledges and grassy basins of southern and western AZ. The breeding season extends from early June through October, but the peak rutting activity takes place in August. The gestation period is about six months, and most lambs are born in late winter or early spring. Native grasses are important in the bighornís diet, although the animals also feed heavily on jojoba and other woody plants. Pincushion, barrel, and saguaro cactuses provide moisture. Preferred plants vary with habitat quality, locality, and species availability.	
Desert Bighorn Sheep <i>Ovis canadensis mexicana</i>	Sonoran Desert Scrub	Found in southern portions of Arizona.	Phoenix Tucson Yuma Lake Havasu
Desert Bighorn Sheep <i>Ovis canadensis nelsoni</i>	Mohave Desert Scrub	Found in northeastern portions of Arizona	Arizona Strip Kingman Phoenix Lake Havasu
Rocky Mountain Bighorn Sheep <i>Ovis canadensis</i>	Great Basin Desert Scrub	Found predominantly on Forest Service lands in high elevation, eastern portions of Arizona. Future reintroductions are being considered (AGFD Strategic Plan) to expand the current range of Rocky Mountain Bighornís.	Safford
Collared Peccary <i>Pecari tajacu</i>	Sonoran Desert Scrub (AZ Upland subdivision), Semi-desert Grasslands	The collared peccary, or javelina, is of tropical origin, and is thought to have expanded northward as scrub and cactus have replaced Arizonaís native grasslands. Javelina are opportunistic feeders, eating flowers, fruits, nuts, and berries of a great variety of plants. Prickly pear cactus makes up the major portion of their diet however, along with agaves, yucca roots, and other desert succulents.	Arizona Strip Kingman Safford Tucson Phoenix Lake Havasu Yuma

Species	Vegetation Community	General Habitat Description	Arizona BLM Field Offices(s)
Rocky Mountain Elk <i>Cervus elaphus nelsoni</i>	Montane Conifer Forest; Great Basin Pinyon-Juniper Woodlands (winter)	Native elk, eliminated sometime prior to 1900, were reintroduced back into Arizona in the 1920s. Mountain meadows, ponderosa pine woodlands, spruce-fir forests, and other high-elevation habitats between 7,000 and 10,500 feet elevation constitute the elk's principal summer range. Elk are rarely found more than one-half mile from water and tend to stay on the summer range as long as possible, arriving early in the year and remaining until forced down by deep snow. Their winter range, which is usually between 5,500 and 6,500 feet elevation, is more limited in extent and may only comprise about 10 percent of the animal's total habitat. Calves are born between late May and early June after an 8-month gestation period. Elk are grass feeding animals.	Arizona Strip Tucson Phoenix
Mule Deer <i>Odocoileus hemionus</i>	AZ Upland Sonoran Desert Scrub, Semi-desert Grassland, Interior Chaparral, Montane Conifer Forest, Mohave Desert Scrub edges, Great Basin Pinyon-Juniper Woodlands (winter)	Mule deer are the most abundant big-game animal in AZ. They can be found in most areas of the state, from sparsely vegetated deserts upward into high, forested mountains. Mule deer are primarily browsers, although they feed largely on forbs and new grass growth in the spring and summer. Other major diet items are twigs, bark, buds, and oak in northern AZ, with jojoba, buck brush, and mountain mahogany being favored in southern AZ.	Arizona Strip Kingman Safford Tucson Phoenix Lake Havasu Yuma
White-tailed Deer <i>Odocoileus virginianus</i>	Madrean Evergreen woodland, Montane conifer Forest, Riparian	White-tailed deer are most common in the state's southeastern mountains, but range northward to the edge of the Mogollon Rim and up into the White Mountains. Whitetails require areas of predictable summer precipitation and are most common in oak woodlands and on chaparral covered hillsides with oaks and pines.	Safford Tucson Phoenix Lake Havasu Yuma
Pronghorn Antelope <i>Antilocapra americana</i>	Plains & Great Basin Grasslands, Lower Colorado River Valley subdivision of Sonoran Desert Scrub, Mohave Desert Scrub edges, Great Basin Desert Scrub & grassland edge	Pronghorn antelope are native to the prairies of North America. In Arizona, antelope persist primarily in the northern plains, inhabiting high elevation meadows between forested areas. Scattered herds are also found in the grasslands of central and southeastern Arizona. Antelope breed in August and September, and the young are born in May and June. Fawns remain hidden until they are about two to three weeks old and strong enough to travel with adults.	Arizona Strip Kingman Safford Phoenix Lake Havasu
Black Bear <i>Ursus Americanus</i>	Various (Riparian, Interior Chaparral, Madrean Evergreen Woodland, Montane Conifer Forest)	Black bears in AZ are found in a variety of habitats, including subalpine and montane conifer forests, riparian forests, evergreen woodlands, and chaparral. Cubs are born in winter dens during January. Most Arizona bears hibernate from November through March.	Arizona Strip Safford Tucson Phoenix

Species	Vegetation Community	General Habitat Description	Arizona BLM Field Offices(s)
Mountain Lion <i>Puma concolor</i>	Various (AZ Upland Sonoran Desert Scrub, Great Basin Pinyon-Juniper Woodlands, Interior chaparral, Madrean Evergreen Woodland, Montane Conifer forest)	In AZ, mountain lions are absent only from the extremely arid southwest and those areas heavily impacted by human development. In general, the distribution of mountain lions in the state corresponds with the distribution of the animal's major prey species – the mule and white-tailed deer.	Arizona Strip Safford Tucson Phoenix Lake Havasu Yuma
Birds			
Gould's Turkey <i>Meleagris gallopavo mexicana</i>	Montane Conifer Forest, Riparian	Gould's turkeys have been transplanted and occur currently in low numbers in the Galiuro Mountains, and from recent releases in the Chiricahua Mountains. Gould's turkeys in the Huachuca Mountains are hunted on a very limited basis. They occasionally are found along the San Pedro River, as they are well adapted to mature cottonwood riparian habitats.	Tucson Safford
Merriam's Turkey <i>Meleagris gallopavo merriami</i>	Montane Conifer Forest, Riparian	The Merriam's race of wild turkey is found in ponderosa pine forests and in riparian deciduous forests and other vegetation types at elevations ranging from 3,500 to 10,000 feet. During the winter, turkeys congregate in the pinyon pine-oak habitats just below the interface with the ponderosa pine forest. During the summer months, hens and poult's spend much of their time searching for bugs and seeds in small meadows and forest openings. As winter approaches, the turkeys feed increasingly on acorns, pinyon nuts, and other mast crops. Later, with the onset of winter, the birds follow pine stringers downslope to snow-free areas where they feed on the seeds of ponderosa pine, juniper, pinyons, and other plants.	Arizona Strip Safford Tucson Phoenix Lake Havasu Yuma

Table C2. Small game, predator, and furbearing species and their habitats occurring on BLM-administered lands in Arizona.

Species	General Habitat Description
Small Game Mammals	
Tree Squirrels	No fewer than four species and eight subspecies of tree squirrels can be found in Arizona's forests. Throughout the summer, squirrels feed on the seeds of developing cones as well as on underground fungi or truffles that grow under mature pine trees. These foods are the most nutritious for the squirrel, and only when they are exhausted does the animal resort to feeding on the inner bark of pine twigs.
Abertis (Tassel-Eared) Squirrel <i>Sciurus aberti</i>	Most widespread. Exclusively inhabitants of ponderosa pine forests. Close relatives include the black-bellied and white-tailed Kaibab squirrels.
Kaibab Squirrel <i>Sciurus aberti kaibabensis</i>	Kaibab Squirrels are a subspecies of tassel-eared squirrels. Exclusively inhabits ponderosa pine forests of northwestern Arizona.
Abertis Chuska Squirrel <i>Sciurus aberti chuscensis</i>	Chuska squirrels are a subspecies of tassel-eared squirrels. Found in isolated populations in extreme northeastern Arizona on Navajo Reservation.
Arizona Gray Squirrel <i>Sciurus arizonensis</i>	Inhabits riparian deciduous forests and oak woodlands south of the Mogollon Rim.
Chiricahua Fox Squirrel <i>Sciurus nayaritensis chiricahuae</i>	Inhabits riparian deciduous forests and oak woodlands south of the Mogollon Rim.
Red (Chicaree) Squirrel <i>Tamiasciurus hudsonicus</i>	Restricted to the higher forests of spruce and fir above 8,500 feet elevation.
Cottontails	Although able to breed most of the year, most young are produced in spring when the new growth of plants is most available. At other times of the year, selected foods include twigs, newly emerging grasses, weeds, and even cacti.
Desert Cottontail <i>Sylvilagus audubonii</i>	Most abundant, the desert cottontail is found in every county in the state up to elevations exceeding 7,000 feet.
Eastern Cottontail <i>Sylvilagus floridanus</i>	Found in the mountains of southeastern and central Arizona where it occupies many of the same habitats as the white-tailed deer.
Mountain Cottontail <i>Sylvilagus nuttalli</i>	Largely restricted to elevations above 7,500 feet from the Mogollon Rim northward.
Small Game Birds	
Pigeons and Doves	
Band-Tailed Pigeon <i>Columba fasciata</i>	Bandtails are birds of the mountains and usually nest in mixed conifer forests, ponderosa pine forests, or in dense stands of evergreen oaks and pines between 4,500 and 9,100 feet elevation. As migratory birds, bandtails are usually only present in AZ from late March through mid-October. After feeding on acorns and other fall mast crops, most AZ bandtails migrate southward to the Sierra Madre Occidental in Mexico.

Species	General Habitat Description
Mourning Dove <i>Zenaida macroura</i>	This is the most common and widely occurring game bird in AZ. Mourning doves occur from the lowest elevations along the Colorado River upward through forests of ponderosa pines to 8,500 feet. Their staple foods throughout the year are primarily small seeds and cultivated grains. Although some doves can be found nesting on the ground in open prairies, the best nesting habitats are brushlands and woodlands within the Sonoran Desert.
White-winged Dove <i>Zenaida asiatica</i>	There are two types of white-winged dove populations in AZ, a thinly scattered population found throughout the Sonoran Desert and the surrounding countryside, and colonial populations that nest collectively along river bottoms adjacent to agricultural areas. Feeding sites are often composed of standing crops of barley, maize, and safflower.
Quail	
Scaled Quail <i>Callipepla squamata</i>	Occurs in semidesert grasslands and the Chihuahuan desert preferring open plains and foothills. Breeding occurs in spring after wet winters, but also during the summer months after the monsoons.
Gambelís Quail <i>Callipepla gambelii</i>	Found throughout the Sonoran and Mojave deserts upward in elevation through semidesert grassland and chaparral to the edges of pinyon-juniper woodland and pine forest ñ wherever mesquites and other brushy cover occur. Breed only in spring and early summer, breeding intensity and success are directly related to the amount of rainfall received during the previous October through March.
(Mearnís) Montezuma Quail <i>Cyrtonyx montezumae</i>	Prefers oak woodlands and oak savannas in the southeastern portions of the state where grass cover is abundant enough to conceal its presence. Nest only after the summer monsoon season, often postponing breeding until after the summer solstice when the days are getting shorter.
California Quail <i>Callipepla californicus</i>	Introduced into Arizona in the 1960ís. Range is small, generally found in higher elevations, in eastern portions of Arizona.
Other Upland Game Birds	
Chukar <i>Alectoris chukar</i>	Chukar were introduced into Arizona in the 1940ís and 1970ís, and originated from Turkish stock. Chukar are cheatgrass obligates, and currently only persist on game farms and on the Arizona Strip (although are occasionally found in other parts of the state). Recent fires on the Arizona Strip have expanded cheat grass, causing an upswing in chukar populations.
Sandhill Crane <i>Crus canadensis</i>	Portions of three distinct populations of sandhill cranes winter in AZ. Cranes from both the Rocky Mountain and Mid-Continent populations winter in the Sulphur Springs and Gila River valleys in southeastern Arizona. Other sandhills from the Lower Colorado River Valley population winter along the lower Colorado River, primarily on the Colorado River Indian Reservation, Cibola National Wildlife Refuge, and Below Gillespie Dam on the Gila River. Wintering areas feature shallow-water roosting sites with low or sparse vegetation including playa lakes and sandbars along shallow, braided river channels. Another requirement is the close proximity of harvested fields of grain. Migration to wintering areas begins in September, with cranes arriving on their wintering areas between late September and mid-October.

Species	General Habitat Description
Ring-Necked Pheasant <i>Phasianus colchicus</i>	Pheasant populations persisting in AZ are largely confined to agricultural areas having relatively high humidity (Yuma and Mesa areas) or high enough in elevation to escape the desiccating heat of Sonoran Desert Summers (Virgin River and Verde River valleys). Most hens nest by mid-May. Pheasants roost on the ground or the low branches of trees. Primary foods are cultivated greens and grains ñ alfalfa, barley sprouts, and kernels of maize, barley, and corn.
Blue Grouse <i>Dendragapus obscurus</i>	Blue grouse in AZ do not migrate downhill during the winter months as they do in the more northern states. Instead, they spend the winter roosting in Douglas fir trees, subsisting on needles until spring. The peak of mating activity usually takes place during the last part of May or the first week of June. In fall, hens and poults feed at the edge of mountain meadows and in old burns on forbs.
Waterfowl	Arizona's waterfowl can be grouped into two general classes ñ ducks, geese, and coots that nest in the state; and those that merely winter here or migrate through. Arizona's principal waterfowl nesting grounds are the natural and modified marshes found above the Mogollon Rim and in the White Mountains. Most of these marshlands depend on winter precipitation and snowmelt rather than groundwater, and are generally seasonal, and are mostly located 7,000 feet elevation. Farm ponds and other small wetlands in the southeastern part of the state are also inhabited by species of Mexican ducks. The principal duck species nesting in AZ are mallards (especially in the White Mountains), pintails, cinnamon teal, redheads, and ruddy ducks. Additionally, smaller numbers of gadwall, green-winged teal, blue-winged teal, and ring-necked ducks are also found in northern marshes. Less common are canvasbacks, shovelers, and American widgeons.
Predators	
Bobcat <i>Felis rufus</i>	Found throughout the state in broken and brushy country. Their principal prey is cottontail rabbits and jackrabbits, but they also take both smaller and larger mammals, as well as snakes and lizards. The bobcat is also classified as a furbearer.
Coyote <i>Canis latrans</i>	Coyotes are widespread opportunists, feeding mainly on small mammals, but also on carrion, bird eggs, insects, and vegetable matter such as manzanita and juniper berries.
FOXES	
Common Gray Fox <i>Urocyon cinereoargenteus</i>	Most common fox in AZ, occurring wherever there is wooded country and broken terrain. Favor brushy habitats, rock piles and desert washes, although they also will climb trees.
Red Fox <i>Vulpes vulpes</i>	Uncommon in AZ, occurring only in the northeast portions of the state.
Kit Fox <i>Vulpes macrotis</i>	Found in valleys and on sandy plains in the southwestern deserts, spending much of their day underground.
SKUNKS	
Hog-Nosed Skunk <i>Conepatus leuconotus leuconotus</i>	Occurs primarily in southeastern AZ. Breeds in late winter and produces young in April or May.
Hooded Skunk <i>Mephitis macroura</i>	Generally confined to southeastern Arizona. Breeds in late winter and produces young in April or May.

Species	General Habitat Description
Striped Skunk <i>Mephitis mephitis</i>	Most common in AZ, with a widespread distribution, living everywhere but the most extreme deserts, and are often found near water. Breeds in late winter and produces young in April or May.
Western Spotted Skunk <i>Spilogale gracilis</i>	Mostly occurs in rocky, mountainous areas. Breeds in late September or early October.
Furbearers	
American Badger <i>Taxidea taxus</i>	Widely distributed, the badger occurs almost anywhere in AZ having ground suitable to dig and excavate cavities. Badgers feed primarily on burrowing rodents such as prairie dogs and ground squirrels, but also will take snakes, lizards, and insects on occasion. Breeding season is in summer, with young not being born until the following spring.
American Beaver <i>Castor canadensis</i>	Beavers, at one time found nearly everywhere in AZ, now occur only along some permanent streams, certain shallow lakes, and a few dirt-lined canals. Diet is almost exclusively plant material with the bark of cottonwoods, aspen, and willow trees being especially important. Other reported foods include tamarisk, mesquite, and the roots of aquatic plants such as cattail and bulrush.
Common Raccoon <i>Procyon lotor</i>	A relatively common animal along Arizona's perennial streams, lakes, and reservoirs. Raccoons are omnivores, eating whatever food is available in aquatic insect larvae, beetle grubs, fish, frogs, crayfish, wild fruits, and carrion.
Long-Tailed Weasel <i>Mustela frenata</i>	There is only one species of weasel in Arizona, restricted to high elevation sites such as those on the Kaibab Plateau, Mogollon Rim, Chuska-Lukachukai Mountains, and southern Arizona's sky islands. Predators, feeding on cottontails, rodents, birds, snakes, and lizards. Weasels breed in midsummer, with young not born until the following spring.
Muskrat <i>Ondatra Zibethica</i>	Muskrats can be found along most of Arizona's perennial rivers and permanent marshes. Primarily a vegetarian, the muskrat feeds on aquatic grasses, pondweed, cattail roots, and the leaves of seep willows. Muskrats in AZ are reported to breed year round, but most of the young are born between March and October.
Ringtail <i>Bassariscus astutus</i>	Most common in the rocky regions of southern and western AZ with the Grand Canyon being especially favored. The only areas devoid of ringtails are flat, alluvial valleys, as the animal prefers boulder-strewn hillsides, canyons, rock-walled houses, and mine shafts. Diet consists of small mammals, birds, lizards, and insects, as plant fruits.
River Otter <i>Lontra canadensis</i>	Once found throughout the Salt, Verde, LCR, and probably also the Gila and Colorado River systems, this species is now confined to the Verde River and its major tributaries where it was reintroduced in the early 1980s. Diet includes fish, water birds, turtles, eggs, and crayfish.

All habitat information for Tables D1 and D2 was summarized from:

Hunt Arizona 2002 Edition and Survey, Harvest and Hunt Data for Big and Small Game. Arizona Game and Fish Department.

Additional range information on Bighorn Sheep, Gould's Turkey, Tassel-Eared Squirrels, Chukar, and California Quail was derived from pers.comms.:

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