

# Appendix J - Vegetation Communities Related to Fire

## Related to Fire

The following vegetative communities are present in the Agua Fria National Monument and the Bradshaw-Harquahala planning areas. The vegetative communities' descriptions are found in the Arizona Statewide land Use Plan Amendment for Fire, Fuels and Air Quality Management, Appendix C.

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, Devil's 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 30-60% occurring during summer months. Temperatures are warm and characteristic of subtropical deserts with a winter temperature range of 9-19 °C and summer range of 22-27 °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*), Bailey's 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 Harris' hawk (*Parabuteo unicinctus*), white-winged dove (*Zenaida asiatica*), elf owl (*Micrathene whitneyi*), pyrrhuloxia (*Cardinalis sinuatus*), the "cactus" woodpeckers (gila woodpecker (***Melanerpes uropygialis***), northern flicker (*Colaptes auratus*), and ladder-backed woodpecker (*Picoides scalaris*), curve-billed thrasher (*Toxostoma curvirostre*), cactus wren (*Campylorhynchus brunneicapillus*), lack-throated sparrow (*Amphispiza bilineata*), red-tailed hawk (*Buteo jamaicensis*), Gambel's 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, octillo, 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, prickley 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 rufus*), 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 (*Amphispiza bilineata*), loggerhead shrike (*Lanius ludovicianus*), cactus wren (*Campylorhynchus brunneicapillus*), 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* insidiar), 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 – 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 pinyon–juniper woodlands did not support the spread of fire except 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*), ringtail 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*), Scott's oriole (*Icterus parisorum*), wild turkey (*Meleagris gallopavo*), long-eared owl (*Asio otus*), Cassin's kingbird (*Tyrannus vociferans*), chipping sparrow (*Spizella passerina*), juniper titmouse (*Baeolophus ridgwayi*), ash-throated flycatcher (*Myiarchus cinerascens*), Bewick's wren (*Thryomanes bewickii*), bushtit (*Psaltriparus minimus*), western scrub-jay (*Aphelocoma californica*), common raven (*Corvus corax*), gray vireo (*Vireo vicinior*), mountain bluebird (*Sialia currucoides*), Woodhouse's 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).

## 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 Desertscrub 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 chrysaeos*), 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 (*Erempphila 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 (*Scophiopus intermontanus*) are common representative species. A number of reptilian subspecies such as Desert horned lizard (*Phrynosomo 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).

## 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 of 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 bristlegrass, 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, Turk's 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, bristlegrass, 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 Swainson's hawk (*Buteo swainsoni*), Mourning dove (*Zenaido macroura*), greater roadrunner (*Geococcyx californianus*), Say's phoebe (*Sayornis saya*) Cactus wren (*Campylorhynchus brunneicapillus*), Gambel's quail (*Lophortyx gambelii*), Black-throated sparrow (*Amphispiza bilineata*), Cassin's sparrow (*Aimophila cassinii*), Botteri's sparrow (*Aimophila botterri*), brown-headed cowbird (*Molothrus ater*), Chihushuan raven (*Corvus cryptoleucus*), scaled quail (*Callipepla squamata*), and burrowing owl (*Athene cunicularia*). The amphibian Woodhouse's 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 albiguld*), 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).

## 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, Wright's 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 carnivores 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 (Bullock's) oriole (*Icterus galbula*), Yellow-billed cuckoo (*Coccyzus americanus*), Black phoebe (*Sayornix nigricans*), the Federally endangered Southwestern willow flycatcher (*Empidonax traillii extimus*), brown-crested flycatcher (*Myiarchus tyrannulus*), yellow warbler (*Dendroica petechia*), Bell's vireo (*Vireo bellii*), Lucy's 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*), Abert's towhee (*Pipilo aberti*), western screech-owl (*Otus asio*), ash-throated flycatcher (*Myiarchus cinerascens*), Gambel's quail (*Lophortyx gambellii*), Costa's hummingbird (*Calypte costae*), and Pyrrhuloxia (*Cardinalis sinuatus*). Arizona treefrog (*H. Wringtonum*), canyon treefrog (*Hyla arenicolor*), Woodhouse's 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 hispidus*), 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 (*Poliopitila melanura*) are representative of nesting birds. Red-spotted toad (*Bufo punctatus*), though found in various communities, is quite common to the Riparian Scrub.

# **Appendix K – Special Stipulations for Special Recreation Permits**

In addition to the conditions and stipulations listed on the Special Recreation Application and Permit form, the Arizona and Phoenix District BLM have established the following additional stipulations designed to protect the lands and resources involved, reduce user conflicts, and/or minimize health and safety hazards. The stipulations will be made part of the permit. Failure to comply with these stipulations may result in the loss of permit privileges.

## **General Administrative:**

Estimated fee payments, or the minimum non-refundable annual fee, whichever is applicable, will be submitted in advance to the BLM authorized officer prior to issuance or validation of the permit. Any additional use fees will be due at the end of the six month reporting period in which the fees were accrued. Overpayment of fees will be applied to the following year=s estimated use fees. Use fees for commercial permits are 3% of gross revenue or the minimum annual fee of \$80, whichever is greater.

Post-use reports and estimated fee payments for annual and multi-year permits will be submitted to the BLM on a fiscal year semi-annual basis. They are due within 15 days after the six month use period (April 15 and October 15).

The permittee is required to contact private landowners and other governmental agencies whose property is affected by the use associated with the permit (this includes the Arizona State Land Department for state trust lands). Evidence that authorization has been obtained must be available to the BLM authorized officer upon request.

Any changes to the approved Plan of Operations must first be approved by the BLM authorized officer. This includes the use of subcontractors.

The permit does not authorize exclusive use and shall not be construed in any way so as to prevent public use or access on any public lands except as expressly allowed under the permit.

The permittee is required to provide the BLM authorized officer with a copy of a valid Certificate of Insurance covering the periods of use. The U.S. Government must be named as a co-insured party on the policy. Minimum general liability limits are: \$300,000 per occurrence and \$500,000 annual aggregate for bodily injury, and \$30,000 property damage per occurrence and \$50,000 annual aggregate, if the policy specifies aggregate limits.

It is the responsibility of the permittee to ensure valid insurance coverage, including general public liability, with the limits listed above, is provided for all equipment and services supplied by subcontractors. A copy of the valid insurance coverage must be made available to the BLM authorized officer upon request.

A copy of this permit and the stipulations must be carried by guides during all tours conducted on BLM-administered lands, and must be made available to any BLM employee or client upon request.

Any violation of the permit terms, conditions and stipulations may be subject to penalties prescribed in 43 CFR 8372.0-7, which may include fines up to \$1,000 and/or imprisonment up to 12 months. Additionally, any such violation may result in permit probation, suspension or revocation. Examples which can lead to permit violations include, but are not limited to; delinquent post use reports and/or payments, deviations to operating plan not approved by authorized official, violation of laws and regulations, significant resource damage and public endangerment.

All signs on public lands must be authorized by the BLM in writing.

The permittee is responsible for ensuring the safety of all clients and support personnel, assuring that all permit actions are in conformance with local, state and federal health and safety standards and providing for appropriate emergency attention.

All injuries requiring emergency hospital care will be reported to the BLM authorized officer within two days of the occurrence and a Death and Injury Report submitted to the BLM authorized officer within 10 days of the occurrence.

The BLM reserves the right to alter the terms, conditions or stipulations of a permit at any time for reasons such as significant policy, administrative procedure or stipulation change.

Annual permits remain valid if the permittee is in good standing by complying with all terms, conditions and stipulations including timely submission of post use reports, and applicable use fee payments. For multi-year permits, an annual review is done at the beginning of each fiscal year (October 1) and permits are validated for the upcoming fiscal year. For a permit to be validated, the permittee must be in good standing by complying with all terms, conditions and stipulations including timely submission of post use reports, and applicable use fee payments. In addition, certificates of insurance shall be current, and operating plans must be reviewed and updated with any changes before a permit will be validated for the upcoming fiscal year.

## **Resource Protection:**

All activities are to remain on the approved roads, trails, washes and/or staging areas. No deviation to these routes is permitted without prior approval from the BLM authorized officer. Motorized vehicles are not permitted in riparian areas or in running washes except at road crossings.

Employees and clients will be instructed that it is unlawful to disturb, deface, excavate or remove any archaeological or paleontological objects or structures. Simply, look but don=t touch! Rock art may be photographed but not touched. Collection of prehistoric or historic artifacts is not allowed. Any prehistoric or historic cultural site or human remains discovered by the permittee, employees or clients will be left undisturbed and reported as soon as possible to the BLM authorized officer.

Permittee must notify the BLM authorized officer of any specific archaeological sites proposed for inclusion on tours. Tours to sites are subject to BLM approval and protective stipulations.

Historical mine sites should not be disturbed. Collecting artifacts from these sites is strictly prohibited.

All persons operating under this SRP, including subcontractors, are prohibited from entering abandoned mines.

Proposed activities will be conducted in a manner that will not interfere with mining or exploration operations. No minerals are to be collected from areas encumbered by active mining claims unless authorized by the claimant(s).

Harassment of livestock, wildlife, wild horses or burros, or destruction of private and public

improvements such as fences and gates is prohibited. All gates and fences shall be left as found. The taking of any threatened or endangered plant or animal is prohibited.

8. Collection, harassment and disturbance of desert tortoises and Gila monsters is prohibited by

Arizona State Law. If encountered on roads or trails they should be avoided. If a desert tortoise is encountered and cannot be avoided, it should be carefully moved to safety by carrying it horizontal to the ground, not tilted, and placed in the shade the minimum distance needed to remove it from harm's way. Gila monsters should be avoided and not handled. They are venomous and can inflict a serious and painful bite.

9. Vegetation clearing, trimming or removal is not permitted without prior approval from the BLM authorized official.

10. If the volume of use is determined to be adversely impacting soils or riparian condition through erosion, bank alteration or other means, the BLM may restrict use of affected areas or routes to allow restoration and recovery of degraded areas. During wet periods, certain road and trail segments may be closed to all traffic. The BLM will consider the applicant's needs when designing and implementing restrictions or watershed restoration efforts that could influence the operation.

12. In order to minimize the importation or spread of noxious weeds, before entering public land, all vehicles are to be washed thoroughly (including the undercarriage and engine compartment) to remove all soil and vegetation debris (including seeds and seed heads) acquired from previous use. This washing should occur at the home base of operations of the permittee before traveling to public lands. All vehicles used for activities approved by this permit are subject to inspection by the BLM.

The permittee will be committed to preserving and protecting the public lands by learning, practicing and promoting the *Leave No Trace* principles listed below:

- < Plan ahead and prepare.
- < Travel and camp on durable surfaces.
- < Dispose of waste properly.
- < Leave what you find.

- < Minimize campfire impacts.
- < Respect wildlife.
- < Be considerate of other visitors.

## **Motorized Vehicle Use:**

No motorized vehicles are permitted in riparian areas or in running washes except at road crossings. Substantiated reports of unauthorized use in these areas will result in immediate probation and possible suspension or revocation of permit privileges.

All motor vehicle use will comply with existing BLM and state motorized vehicle laws and regulations on public lands relating to use, standards, registration, operation and inspection. These regulations include, but are not limited to, the following:

No person shall operate an off-road vehicle on public lands:

In a reckless, careless or negligent manner;

In excess of established speed limits;

While under the influence of alcohol, narcotics or drugs;

In a manner causing, or likely to cause, significant undue damage to or disturbance of the soil, wildlife, wildlife habitat, improvements, cultural, or vegetative resources.

Drivers shall yield the right-of-way to pedestrians, saddle horses, pack trains, and animal drawn vehicles.

Drivers are prohibited from operating a motor vehicle, unless the driver and each front seat passenger are restrained by a properly fastened safety belt.

Permittee will be committed to preserving and protecting the public lands by learning, practicing and promoting the *Tread Lightly!* principles listed below.

- < Travel and recreate with minimal impact,
- < Respect the environment and the rights of others,
- < Educate yourself, plan and prepare before you go,

< Allow for future use of the outdoors, leave it better than you found it, and  
Discover the rewards of responsible recreation.