

Table 3.17.2. State-listed and BLM-listed Special Status Species Potentially Occurring in the VPA.

| Common Name Scientific Name | Protection* | Preferred Habitat | Potential for Occurring on BLM Lands |
|---|-------------|---|---|
| Greater Sage-grouse <i>Centrocercus urophasianus</i> | SP/SD | Sagebrush plains, foothills, and mountain valleys. | Greater Sage-grouse are found in the sagebrush foothills and plains of the Intermountain Region. Since 1967, the abundance of male grouse on known breeding grounds in Utah has declined approximately 50%. Brood counts and harvest data show a similar downward trend. Habitat loss and fragmentation from agricultural encroachment, urbanization, and overgrazing are the primary threats to the Greater Sage-grouse. Habitat for Greater Sage-grouse occurs in the mid elevations of the VPA in the Uinta Basin and the Book Cliffs. Many studies have been conducted on Sage-grouse in Utah and in the Uinta Basin. One of the strongest populations in the State of Utah has been shown to occur on Diamond Mountain. Many of the active leks and nesting areas in the VPA have been identified and mapped. |
| Lewis' Woodpecker <i>Melanerpes lewis</i> | SP/SD | Burned-over Douglas fir, mixed conifer, pinyon-juniper, riparian, and oak woodlands, but is also found in the fringes of pine and juniper stands, and deciduous (cottonwood) forests. Dead trees and stumps are required for nesting. Wintering grounds are over a wide range of habitats, but oak woodlands are preferred. | The Lewis' Woodpecker is a year-round resident to western North America and, in Utah, is occasionally found in the riparian habitats of the Uinta Basin and along the Duchesne and Green Rivers. They breed in open Ponderosa Pine forests and cottonwood dominated riparian bottoms and winter primarily along low-elevation cottonwood dominated riparian bottoms. Nests have been found on the Green River, Lake Fork River, and in Ponderosa Pine forests on the Uinta Mountains. Formerly common in several areas of the state, the species distribution is currently reduced, and the species is experiencing a range-wide decline. This woodpecker usually feeds on flying insects in open areas interspersed with trees in the spring and summer. It feeds primarily on fruits and nuts in the fall and winter. It is adversely affected by loss of habitat from water development and agricultural practices and may be increasingly affected by competition for nest cavities from non-native bird species. |

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| Common Name Scientific Name | Protection* | Preferred Habitat | Potential for Occurring on BLM Lands |
|---|-------------|---|---|
| Long-billed Curlew <i>Numenius americanus</i> | SP/SD | Uncultivated rangelands and pastures near water. | The Long-billed Curlew is a neotropical migrant that summers in the upland meadows and rangelands of western North America. It forages in moist meadow wetlands and upland habitats. The curlew is adversely affected by human disturbance and habitat loss from agricultural practices. Habitat for long-billed curlew occurs in the mid elevations of the Uinta Mountains and the Book Cliffs and it has been observed in the VPA. |
| Northern Goshawk <i>Accipiter gentilis</i> | CS | Mature mountain forest and riparian zone habitats. | The Northern Goshawk is a neotropical migrant that occurs across the northern regions of North America in scattered populations primarily in mature mountain forest and valley cottonwood habitats. The species is adversely affected by loss of habitat from timber harvest and development in riparian areas. Because Goshawks occur in low-density populations, they are particularly susceptible to population loss. Goshawk populations appear to have declined across their range, particularly in the Colorado Plateau ecoregion. Areas of potentially suitable nesting habitat for Northern Goshawk consist of coniferous forest and mixed-aspen forest types, dominated by spruce, fir, pine, and aspen. Populations of Northern Goshawk have been identified in the mid elevations of the VPA in the Uinta Mountains and the Book Cliffs. |
| Three-toed Woodpecker <i>Picooides tridactylus</i> | SD | Coniferous forests, generally above 7,800 feet elevation. | The Three-toed Woodpecker nests and winters in northern coniferous forest and mixed-aspen forest types dominated by spruce, fir, pine, and aspen, usually above 7,800 feet elevation, in the northern regions of North America and the Rocky Mountains. Small populations have been located along the highest elevations of the Book Cliffs and possibly Diamond Mountain. The species is negatively affected by forest management practices such as clear cutting and fire suppression. |
| State-listed and BLM-listed Special Status Reptile Species | | | |
| Smooth greensnake <i>Opheodrys vernalis</i> | SP/SD | Moist grassy areas and meadows. | The smooth greensnake typically inhabits meadows, grassy marshes, and moist grassy fields along forest edges. Its distribution ranges from northeastern Utah into central Colorado and northern New Mexico, and into the Northern Plains from the Canadian border south to Kansas and Missouri. |

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| Common Name Scientific Name | Protection* | Preferred Habitat | Potential for Occurring on BLM Lands |
|--|-------------|---|---|
| State-listed and BLM-listed Special Status Fish Species | | | |
| Bluehead sucker <i>Catostomus discobolus</i> | SP | Fast flowing water in high gradient reaches of mountain rivers. | The bluehead sucker are typically associated with fast flowing rocky riffles in higher gradient reaches of small to large rivers in the Colorado River drainage including the Green, White, and Duchesne rivers and their tributaries as well as in the Bonneville and Snake River basins. Flow alteration, habitat loss/alteration, and the introduction of non-native fish species have been identified as significant causes of the decline of this species. |
| Colorado River cutthroat trout <i>Oncorhynchus clarki pleuriticus</i> | CS | Cool, clear water of high-elevation streams and lakes. | There are 20 known populations of purestrain Colorado River cutthroat trout in northeastern Utah. Most existing populations of this species are restricted to areas above 7,000 feet elevation. These populations are being managed by the State of Utah under a multiagency conservation agreement aimed at reducing or eliminating the threats to this species (CRCT Task Force 2001). Habitat alteration and the introduction of non-native fish species have been identified as the primary threats to this species. UDWR currently has plans to reestablish Colorado River cutthroat trout in the Bitter Creek and Upper Willow Creek areas of the Book Cliffs. Habitat restoration activities have been ongoing and these areas will be chemically treated prior to reintroduction of Colorado River cutthroat trout to remove non-native fish species. The only existing population of Colorado River cutthroat trout on BLM lands in the VPA is found in Sears Creek (water code: II BQ). |
| Flannelmouth sucker <i>Catostomus latipinnis</i> | SP | Large rivers, where they are often found in deep pools of slow-flowing, low-gradient reaches. | Flannelmouth sucker are typically associated with rocky pools and slow flowing, low-gradient reaches in the large rivers of the Colorado River drainage including the Green, White, and Duchesne rivers. Flow alteration, habitat loss/alteration, and the introduction of non-native fish species have been identified as significant causes of the decline of this species. |

Table 3.17.2. State-listed and BLM-listed Special Status Species Potentially Occurring in the VPA.

| Common Name Scientific Name | Protection* | Preferred Habitat | Potential for Occurring on BLM Lands |
|---|-------------|--|--|
| Roundtail chub <i>Gila robusta</i> | Threatened | Large rivers, and is most often found in murky pools near strong currents. | Roundtail chub are found in moderate-sized rivers in the Colorado River drainage including the Green and Duchesne rivers. Adults are generally associated with pools and eddies with overhead cover, often congregating below rapids while juveniles generally inhabit shallower habitats than adults. Roundtail chubs are also found in large reservoirs in the drainage. They are carnivorous, opportunistic feeders, taking terrestrial and aquatic insects, especially midges, mayflies, and caddis flies, as well as snails, crustaceans, fish, and sometimes-filamentous algae. This fish was once much more common throughout the Colorado River system than it is today. Habitat modification (e.g., stream channelization, damming, removal of riparian vegetation) and establishment of non-native predators are probably the primary factors contributing to the decline of this species. |
| State-listed and BLM-listed Special Status Plant Species | | | |
| Park rockcress <i>Arabis vivariensis</i> | Sensitive | Occurs on the Weber Formation sandstone and limestone outcrops in mixed desert shrub and pinyon-juniper communities at 5,000 to 6,000 feet elevation. | The park rockcress is found in Dinosaur National Monument and on 30 acres on Diamond Mountain and Cliff Ridge. |
| Hamilton milkvetch <i>Astragalus hamiltonii</i> | Sensitive | Occurs on Asphalt Ridge, Mowry, Dakota and Wasatch Formations and Lapoint and Dry Gulch Members of the Duchesne Formation in pinyon-juniper and desert shrub communities at 5,240 to 5,800 feet elevation. | The Hamilton milkvetch is currently known from only 19 sites (329 acres) between Lapoint and Vernal, Utah. |
| Owenby's thistle <i>Cirsium owenbyii</i> | Sensitive | Occurs on the east flank of the Uinta Mountains in the sagebrush, juniper, and riparian communities at 5,500 to 6,200 feet elevation. | The Owenby's thistle is currently known from only a few sites in Brown's Park (53 acres), Diamond Mountain and Cliff Ridge. |

Table 3.17.2. State-listed and BLM-listed Special Status Species Potentially Occurring in the VPA.

| Common Name Scientific Name | Protection* | Preferred Habitat | Potential for Occurring on BLM Lands |
|--|-------------|--|---|
| Goodrich stinkweed (<i>Cleomella palmeriana</i> var. <i>goodrichii</i>) | Sensitive | Typically occurs in heavy clay soils on eroded clay and shale slopes of the Mancos, Tropic and Morrison Formations in salt desert shrub communities from 4,000 to 6,000 feet elevation. | Goodrich stinkweed is known only from Rainbow Draw in Uintah County, Utah and from the Salmon-Baker area in Lemhi County, Idaho. The size and distribution of extant populations is not known. |
| Untermann daisy <i>Erigeron untermanii</i> | Sensitive | Occurs in the pinyon-juniper communities on calcareous shales and sandstones of the Uinta and Green River formations at 7,000 to 7,800 feet elevation. | The Untermann daisy is an endemic to the West Tavaputs Plateau in Duchesne County, Utah. |
| Alcove bog-orchard <i>Habenaria zothecina</i> | Sensitive | Occurs on moist stream banks, seeps, and hanging gardens of the Weber Sandstone Formation in mixed-desert shrub, pinyon-juniper, and oakbrush vegetation communities from 4,000 to 8,690 feet elevation. | Potential alcove bog-orchid habitat occurs in Dinosaur National Monument and elsewhere in Uintah County. There are currently no confirmed populations within the VFO (personal communication between J. H. Hornbeck, SWCA, and Clayton Newberry, BLM, June 30, 2008). |
| Rock hymenoxys <i>Hymenoxys lapidicola</i> | Sensitive | Occurs on rock crevices in the pinyon-juniper woodland or ponderosa pine-manzanita woodland communities from 5,700 to 8,100 feet elevation. | The rock hymenoxys is endemic to Cliff Ridge in Uintah County, Utah and adjacent regions of Dinosaur National Monument. |
| Huber's pepperweed <i>Lepidium huberi</i> | Sensitive | Rock crevices, eroding parent material and alluvial soils of the Chinle, Park City and Weber Formations in the Uinta and Green River Formation in the Book Cliffs. 5,000-8,000 ft. | Huber's pepperweed is known to occur in Big Brush Creek Gorge in the Uinta Mountains and has the potential to occur on the Utah side of the East Tavaputs Plateau. |

Table 3.17.2. State-listed and BLM-listed Special Status Species Potentially Occurring in the VPA.

| Common Name Scientific Name | Protection* | Preferred Habitat | Potential for Occurring on BLM Lands |
|---|-------------|---|--|
| Goodrich blazingstar (<i>Mentzelia goodrichii</i>) | Sensitive | Occurs on steep, highly erosive, marly-calciferous shale escarpments of the Parachute Creek Member of the Green River Formation from 8,100 to 8,800 feet elevation. | Goodrich blazingstar is a narrow endemic of the West Tavaputs Plateau in southern Duchesne County, Utah. It is known from the escarpments of Argyle, Indian, Sowers and Willow Canyons, the margin of Avintaquin Canyon and Gray Head Peak, and adjacent regions in the Badlands Cliffs. The size and distribution of extant populations is not known. |
| Stemless penstemon <i>Penstemon acaulis</i> | Sensitive | Occurs on semi-barren substrates in pinyon-juniper and sagebrush-grass communities at 5,840 to 7,285 feet elevation. | The stemless penstemon is currently known from nine sites in Brown's Park, Daggett County, Utah. |
| Gibbens penstemon (Gibbens beardtongue) <i>Penstemon gibbensii</i> | Sensitive | Occurs on sandy and shaley (Green River Shale) bluffs and slopes with juniper, thistle, Eriogonum, Elymus, serviceberry, rabbitbrush, and Thermopsis at 5,500 to 6,400 feet elevation. | Gibbons penstemon is currently known at only one site (6 acres) in Brown's Park, Daggett County, Utah. |
| Goodrich penstemon (Goodrich beardtongue) <i>Penstemon goodrichii</i> | Sensitive | Occurs on the Duchesne River Formation on blue-gray to reddish bands of clay badlands at 5,590 to 6,215 feet elevation. | Goodrich penstemon is currently known from 24 sites in the Lapoint-Tridell-Whiterocks area. |
| Graham's beardtongue <i>Penstemon grahamii</i> | Sensitive | Occurs on gravelly clay soils in pinyon-juniper woodlands on semi-barren knolls of white calcareous shale in sparsely vegetated desert shrub and pinyon-juniper communities from 4,691 to 6,758 feet elevation. | Graham's Beardtongue is currently known to occur on 1,287 acres in East Duchesne and Uintah Counties, Utah. |

Table 3.17.2. State-listed and BLM-listed Special Status Species Potentially Occurring in the VPA.

| Common Name Scientific Name | Protection* | Preferred Habitat | Potential for Occurring on BLM Lands |
|--|-------------|---|--|
| Uinta greenthread (<i>Thelesperma caespitosum</i>) | Sensitive | Occurs on dry, poorly developed soils on shale or marl slopes and benches and multicolored clay hills of the Parachute Creek Member of the Green River Formation or the Uinta Formation in mountain shrub/pinyon-juniper woodland communities from 5,900 to 8,860 feet elevation. | Endemic to Sweetwater County, Wyoming and the West Tavaputs Plateau of the Uinta Basin, Duchesne County, Utah. The size and distribution of extant populations is not known. |

*Protection:

CS: A species of concern being managed under a multi agency conservation agreement with the goal to keep the species from being federally listed.

Sensitive: Listed by the State of Utah, or BLM for plants, as a species sensitive to disturbance.

SD: Listed by the State of Utah as a species of special concern due to its limited distribution within the state.

SP: Listed by the State of Utah as a species of special concern due to declining population sizes within the state.

Threatened: Listed by the State of Utah as a species faced with substantial risk of extinction.

3.18 VEGETATION

3.18.1 DOMINANT VEGETATION COMMUNITIES

The vegetation on lands administered by the BLM within the VPA was mapped in conjunction with the Natural Resources Conservation Service (NRCS). Lands within the VPA under other jurisdictions were not analyzed. Because the soil associations were mapped to a minimum size of 50 acres, the designated vegetation associations only show changes in community types of a minimum of 50 acres as well, making the complex mosaic of natural vegetation not visible at this level of detail. The vegetation associations within the VPA were then classified using vegetation categories defined by the BLM and by GAP analysis (Edwards et al. 1996).

Vegetation across the VPA ranges from desert shrub to boreal forest. The following seven vegetation types are identified in the VPA: plains grassland/herbaceous, desert shrub, sagebrush/perennial grass, pinyon-juniper, mountain shrub, and conifer, which includes aspen/forb. Other minor vegetation/cover types are riparian areas and wetlands, and badlands. Descriptions of the identified vegetation types, including their associated plant species and general locations within the VPA, are provided below. The following associations occur intermixed throughout the VPA.

3.18.1.1 PLAINS GRASSLAND/HERBACEOUS

This vegetation type is dominated by herbaceous species and includes a few solitary shrubs. The plains grassland/herbaceous type is found in only a small portion of the VPA, but many of the species that compose it are found in the understory of the other associations. Most wildlife species use this area at some time during the year.

3.18.1.2 DESERT SHRUB

Vegetation of the desert shrub type typifies the cold desert environment. It composes approximately 20% of the VPA, mainly in the center of the planning area (e.g., Antelope Flat, Clay Basin, and half of the Myton Bench Area), and is located at the lower elevations from 4,800 to 6,000 feet. This type is characterized by shrubs such as shadscale, winterfat, Mormon tea, Gardner's saltbush, mat saltbush, four-winged saltbush, rabbitbrush, and greasewood (Table 3.18.1). The understory is sparse and may contain Indian ricegrass, galletta, scarlet globemallow, bud sagebrush, spring parsley, and textile onion. Soil salinity is relatively high.

Vegetation treatments or manipulations are not very successful in this type of community, due to the shallow soils and low moisture availability.

Table 3.18.1. Common Plants in the Desert Shrub Community in the VPA*

| Scientific Name | Common Name |
|--|-----------------------|
| Shrubs | |
| <i>Atriplex canescens</i> | Four-winged saltbush |
| <i>Atriplex confertifolia</i> | Shadscale |
| <i>Atriplex corrugata</i> | Mat saltbush |
| <i>Atriplex gardneri</i> | Gardner's saltbush |
| <i>Artemisia spinescens</i> | Bud sage |
| <i>Ceratoides lanata</i> | Winterfat |
| <i>Chrysothamnus</i> spp. | Rabbitbrush species |
| <i>Ephedra nevadensis</i> | Mormon tea |
| <i>Sarcobatus vermiculatus</i> | Greasewood |
| Grasses and Forbs | |
| <i>Agropyron dasystachyum</i> var. <i>dasystachyum</i> | Thickspike wheatgrass |
| <i>Allium textile</i> | Textile onion |
| <i>Arenaria</i> spp. | Sandwort |
| <i>Cymopterus</i> spp. | Spring parsley |
| <i>Eriogonum</i> spp. | Buckwheat |
| <i>Descurainia pinnata</i> | Tansy mustard |
| <i>Hilaria jamesii</i> | Galleta |
| <i>Phlox</i> spp. | Phlox |
| <i>Poa sandbergii</i> | Sandberg bluegrass |
| <i>Poa</i> spp. | Bluegrasses |
| <i>Sitanion hystrix</i> | Squirreltail |
| <i>Sphaeralcea</i> spp. | Globemallow |
| <i>Sporobolus airoides</i> | Alkali sacaton |
| <i>Stipa hymenoides</i> | Indian ricegrass |

*Plant names follow A Utah Flora (Welsh et al. 1993).

3.18.1.3 SAGEBRUSH/PERENNIAL GRASS

The sagebrush association covers approximately 57% of the VPA. This association is composed mainly of black sagebrush, basin big sagebrush, Wyoming big sagebrush, and mountain big sagebrush (Table 3.18.2). Other important shrubs are rabbitbrush, Mormon tea, and bitterbrush. Basin big sagebrush and Wyoming big sagebrush dominate the zone between 5,000 and 7,000 feet. Typically, the basin big sagebrush is found in areas of well-drained soils that receive 10-16 inches of annual precipitation, and Wyoming big sagebrush occupies drier, shallow soils that receive 8-12 inches of annual precipitation. Mountain big sagebrush is dominant in areas over 7,000 feet in elevation that receive 14-20 inches of annual precipitation (Welsh et al. 1993).

The herbaceous understory is typically composed of bluebunch wheatgrass, Idaho fescue, western wheatgrass, Junegrass, Indian ricegrass, and many needlegrasses. Many forbs also occur in this area and are an important resource for Sage-grouse. Common forb species include balsamroot, mules ears, Indian paintbrush, sego lily, larkspur, phlox, and mustards (Edwards et al. 1994).

Wyoming and mountain big sagebrush are declining throughout the VPA, as evidenced by the existing, decadent, even-aged stands. Beginning in the late 1990s, drought accelerated the decline, which resulted in a sage die off and die back. Some areas had sagebrush mortality while others had re-growth of sagebrush in subsequent years. Where sagebrush died and the understory was cheat grass, the density of cheat grass increased. The native perennial grassland understory has also been invaded by annual species such as cheatgrass; some invasions cover thousands of acres. Prescribed burning may be used to treat these areas, which would also benefit wildlife habitat and the wildland urban interface. The sagebrush association provides important wildlife habitat in the form of crucial winter range for deer and elk and essential habitat and forage for Sage-grouse. Domestic livestock grazing occurs in this association, as does recreation.

Table 3.18.2. Species Commonly Associated with Sagebrush/ Perennial Grassland Communities in the VPA*

| Scientific Name | Common Name |
|--|------------------------|
| Shrubs | |
| <i>Artemisia nova</i> | Black sagebrush |
| <i>Artemisia tridentata</i> ssp. <i>tridentata</i> | Basin big sagebrush |
| <i>Artemisia tridentata</i> ssp. <i>vaseyana</i> | Mountain big sagebrush |
| <i>Artemisia tridentata</i> ssp. <i>wyomingensis</i> | Wyoming big Sagebrush |
| <i>Chrysothamnus viscidiflorus</i> | Douglas rabbitbrush |
| <i>Ceratoides lanata</i> | Winterfat |
| <i>Ephedra nevadensis</i> | Mormon tea |
| <i>Purshia tridentata</i> | Antelope bitterbrush |
| Grasses and Forbs | |
| <i>Astragalus</i> spp. | Milkvetch |
| <i>Balsamorhiza</i> spp. | Balsamroot species |
| <i>Brassica</i> spp. | Mustards species |
| <i>Calochortus nuttallii</i> | Sego lily |
| <i>Delphinium</i> spp. | Larkspur species |
| <i>Erigeron</i> spp. | Fleabane species |
| <i>Elymus cinereus</i> var. <i>cinereus</i> | Great Basin wildrye |
| <i>Elymus smithii</i> | Western wheatgrass |
| <i>Elymus spicatus</i> | Bluebunch wheatgrass |
| <i>Erysimum asperum</i> | Wallflower |
| <i>Festuca</i> spp. | Fescue species |
| <i>Koeleria macrantha</i> | Junegrass |

Table 3.18.2. Species Commonly Associated with Sagebrush/ Perennial Grassland Communities in the VPA*

| Scientific Name | Common Name |
|------------------------------|---------------------|
| <i>Lupinus</i> spp. | Lupine species |
| <i>Phlox</i> spp. | Phlox species |
| <i>Stipa</i> spp. | Needlegrass species |
| <i>Stipa hymenoides</i> | Indian ricegrass |
| <i>Wyethia amplexicaulis</i> | Mules ears |

*Plant names follow A Utah Flora (Welsh et al. 1993).

3.18.1.4 PINYON-JUNIPER

This association occurs at slightly higher elevations than the sagebrush. Typically, there is a wide transition zone from juniper-sagebrush to juniper, so the boundaries between these associations are indistinct.

In the juniper-dominated areas, the understory's percent cover generally decreases. Therefore, this association has many management challenges. Vegetation manipulation, in the form of chaining and prescribed burns, has been used in the past. (In the 1960s and 1970s, 11,600 acres in the VPA were chained and reseeded successfully, and in the 1980s, chaining occurred in Wood Canyon in the Nine Mile area and in Browns Park.) Through vegetation manipulation, openings that are beneficial to wildlife and ecosystem health can be created. Dense stands of juniper provide high-quality nesting habitat and thermal cover, but little forage value. Many more animal species can use this association if the juniper stands have a varied age class and structure. Common plant species in this association are shown in Table 3.18.3.

Table 3.18.3. Species Commonly Associated with Pinyon-Juniper Communities in the VPA*

| Scientific Name | Common Name |
|--|---------------------|
| Trees | |
| <i>Pinus edulis</i> | Pinyon pine |
| <i>Juniperus osteosperma</i> | Juniper |
| Shrubs | |
| <i>Artemisia tridentata</i> ssp. <i>tridentata</i> | Basin big sagebrush |
| <i>Chrysothamnus</i> spp. | Rabbitbrush species |
| <i>Ceratoides lanata</i> | Winterfat |
| <i>Ephedra nevadensis</i> | Mormon tea |
| Grasses and Forbs | |
| <i>Astragalus</i> spp. | Milkvetch species |
| <i>Erigeron</i> spp. | Fleabane species |
| <i>Elymus cinereus</i> var. <i>cinereus</i> | Great Basin wildrye |

Table 3.18.3. Species Commonly Associated with Pinyon-Juniper Communities in the VPA*

| Scientific Name | Common Name |
|---------------------------|--------------------|
| <i>Elymus smithii</i> | Western wheatgrass |
| <i>Erysimum asperum</i> | Wallflower |
| <i>Festuca</i> spp. | Fescue species |
| <i>Koeleria macrantha</i> | Junegrass |
| <i>Lupinus</i> spp. | Lupine species |
| <i>Phlox</i> spp. | Phlox species |
| <i>Stipa hymenoides</i> | Indian ricegrass |

*Plant names follow A Utah Flora (Welsh et al. 1993).

3.18.1.5 MOUNTAIN SHRUB

This association is sometimes called browse, because a large proportion of the species in this association are of high forage and cover value for wildlife. Dominant shrub species include serviceberry, gamble oak, mountain mahogany, snowberry, squaw apple, antelope bitterbrush, and sagebrush (Table 3.18.4). The sagebrush may occasionally grow densely in areas, but generally, it is less than 50% of the overall composition in this association. Common herbaceous species include showy goldeneye, whorled buckwheat, hoary aster, sticky geranium, and a variety of native grasses. Mountain shrub occurs in more sheltered microclimates within the VPA than the sagebrush/perennial grass association.

Table 3.18.4. Species Commonly Associated with Mountain Shrub Communities in the VPA*

| Scientific Name | Common Name |
|----------------------------------|----------------------|
| Shrubs | |
| <i>Artemisia tridentata</i> | Sagebrush |
| <i>Ceanothus</i> spp. | Buckbrush species |
| <i>Cercocarpus montanus</i> | Mountain mahogany |
| <i>Amelanchier</i> spp. | Serviceberry species |
| <i>Purshia tridentata</i> | Antelope bitterbrush |
| <i>Quercus gambelii</i> | Gamble oak |
| <i>Ribes cereum</i> | Wax currant |
| <i>Symphoricarpos oreophilus</i> | Mountain snowberry |
| Grasses and Forbs | |
| <i>Agastache urticifolia</i> | Hyssop |
| <i>Delphinium</i> spp. | Larkspur species |
| <i>Elymus glaucus</i> | Blue wildrye |
| <i>Elymus trachycaulus</i> | Slender wheatgrass |
| <i>Eriogonum heracleoides</i> | Whorled buckwheat |

Table 3.18.4. Species Commonly Associated with Mountain Shrub Communities in the VPA*

| Scientific Name | Common Name |
|---------------------------------|---------------------|
| <i>Eriogonum</i> spp. | Buckwheat species |
| <i>Erigeron</i> spp. | Fleabane species |
| <i>Festuca</i> spp. | Fescue species |
| <i>Geranium viscosissimum</i> | Sticky geranium |
| <i>Viguiera multiflora</i> | Showy goldeneye |
| <i>Mahonia repens</i> | Oregon grape |
| <i>Machaeranthera canescens</i> | Hoary aster |
| <i>Lupinus</i> spp. | Lupine species |
| <i>Phlox</i> spp. | Phlox species |
| <i>Poa</i> spp. | Bluegrass species |
| <i>Penstemon</i> spp. | Penstemon species |
| <i>Senecio</i> spp. | Groundsel species |
| <i>Stipa</i> spp. | Needlegrass species |
| <i>Trifolium</i> spp. | Clover species |

*Plant names follow A Utah Flora (Welsh et al. 1993)

3.18.1.6 CONIFER FOREST: CONIFER/ASPEN, ASPEN/FORB, AND SPRUCE/FIR

These three smaller vegetation associations combine to form the conifer forest association. The conifer forest association occurs at the highest elevations, mostly at the outer fringes of the VPA, covering approximately 4% of the total land area within the VPA. Douglas fir, spruce, ponderosa pine, and aspen communities are scattered throughout the higher elevations (7,500–10,500 feet). Because of the elevation, cheatgrass is not a significant threat. Elk, deer, and grouse frequently use this association in the summer. Domestic livestock also use this association for its forage and cover resources. Common species are shown in Table 3.18.5.

Table 3.18.5. Species Commonly Associated with Conifer Forest Community in the VPA*

| Scientific Name | Common Name |
|------------------------------|-----------------|
| Trees | |
| <i>Pseudotsuga menziesii</i> | Douglas fir |
| <i>Abies</i> spp. | Fir species |
| <i>Picea</i> spp. | Spruce species |
| <i>Pinus ponderosa</i> | Ponderosa pine |
| <i>Pinus</i> spp. | Pine species |
| <i>Populus tremuloides</i> | Quaking aspen |
| Shrubs | |
| <i>Ribes</i> spp. | Currant species |

Table 3.18.5. Species Commonly Associated with Conifer Forest Community in the VPA*

| Scientific Name | Common Name |
|----------------------------------|---------------------|
| <i>Rosa woodsii</i> | Wood rose |
| <i>Salix</i> spp. | Willow species |
| <i>Sambucus pubens</i> | Elderberry |
| <i>Symphoricarpos oreophilus</i> | Snowberry |
| Grasses and Forbs | |
| <i>Achillea millefolium</i> | Western yarrow |
| <i>Aquilegia coerulea</i> | Columbine |
| <i>Delphinium occidentale</i> | Tall larkspur |
| <i>Elymus trachycaulus</i> | Slender wheatgrass |
| <i>Frasera speciosa</i> | Green gentian |
| <i>Festuca</i> spp. | Fescue species |
| <i>Geranium</i> spp. | Geranium species |
| <i>Heracleum lanatum</i> | Cow parsnip |
| <i>Melica bulbosa</i> | Oniongrass |
| <i>Lupinus</i> spp. | Lupine species |
| <i>Mertensia</i> spp. | Bluebell species |
| <i>Phleum alpinum</i> | Alpine timothy |
| <i>Stipa</i> spp. | Needlegrass species |

*Plant names follow A Utah Flora (Welsh et al. 1993).

3.18.1.7 RIPARIAN AREAS AND WETLANDS

Approximately 16,000 acres of floodplains are found along the Green and White Rivers and Bitter, Evacuation, Sweetwater, and Willow Creeks in the Book Cliffs portion of the VPA. The Diamond Mountain portion of the VPA contains 15,650 acres of riparian areas as well as perennial and intermittent streams (BLM 1993b).

The ecological condition of the wetland and riparian areas in the VPA is considered to be threatened by flow alterations, non-native plant species, and grazing. Whitetop and tall whitetop are firmly established in the Green River watershed and in moist places that receive high pressure from recreation. Tamarisk is also well established along the river corridors, and *Phragmites* stands are increasing in size and distribution.

3.18.1.8 BADLANDS

In the Uinta Basin, badlands are characterized by Mancos shales, which occur as red and gray banded, eroded mudstones and sandstones and shale layers of the Uinta Formation. Mancos shales are high in selenium, and sometimes they have a sandstone cap layer. The badlands association is scattered throughout the resource area, but it comprises only 3% of the total area.

Vegetation on the badlands is very sparse; extensive areas of bare ground occur. Vegetation generally grows in areas where water can collect and at the base of slopes. A few annuals are tolerant of the side slopes in wet years, but such seasons are short. Gardner's saltbush and mat saltbush are the dominant species.

Antelope use these areas for forage and bedding, especially in the winter. Domestic sheep use the shrubs on the base slopes and in transition zones with other vegetation types. Some steeper, vertical slopes and knobs are used by raptors for nest sites. Wildlife use of this community is low in comparison to other communities, but it is relatively important to the wildlife that do use it.

3.18.2 INVASIVE SPECIES AND NOXIOUS WEEDS

At least 23,000 acres of noxious and undesirable weeds are a management concern, spreading and becoming a common threat to many areas, within the VPA (BLM 2001). Many large infestations in the area also occur on private and Tribal lands adjacent to or near BLM lands. Of particular management concern are potential and existing populations of invasive species in the oil and gas fields that are receiving increased activity and interest. Human activities, OHV use and vehicles, construction activities, soil disturbance, wind, wildlife movement, and domestic livestock grazing activities can increase the spread and establishment of noxious weeds.

Noxious weeds are identified and recognized by the federal government, the state, and local counties. Within the VPA, the BLM office would control all weeds designated as noxious, as per regulations. For a list of the noxious weeds for the VPA, refer to Table 3.18.6.

The Upper Green River Cooperative Weed Management Area, which includes Daggett County in Utah and Sweetwater County in Wyoming, was formed to manage weeds across lands under various jurisdictions and to pool resources for weed control activities and education. The Uinta Basin Cooperative Weed Management Area was organized in 2003 to meet similar objectives. Current collaborative weed management agencies include the NPS, BLM, USFS, UDWR, Ute Tribe, and SITLA. One result of collaborative efforts is the Red Creek Tamarisk Project. The tamarisk is being controlled both in Wyoming and Utah on the Red Creek watershed.

Russian knapweed, spotted knapweed, Canada thistle, tall whitetop, whitetop, musk thistle, Scotch thistle, and leafy spurge have been singled out as the most invasive species and have become the priority for management and control due to their expanding populations on BLM lands in the VPA. Russian knapweed occurs from Myton to Browns Park with large infestations on private and Tribal lands in the Roosevelt area and the Green River corridor. Also of concern are the increasing populations of Russian knapweed in the oil and gas fields. So far, two populations of spotted knapweed are known: one is located on Diamond Mountain, the other on Blue Mountain. An infestation of diffuse knapweed was located on Blue Mountain, resulting in a special emphasis area for control. One infestation of leafy spurge occurs on BLM lands; however, there are also populations on nearby private land. Canada thistle is a problem in moist areas, especially where livestock use is prevalent. Scotch thistle is coming in as patches scattered throughout the VPA. Whitetop is a problem scattered across the VPA and is increasing in the oil and gas fields. Tall whitetop has major infestations on all land ownerships in all three counties, especially in the Green River corridor.

Henbane and houndstongue are undesirable plants that are targeted by the BLM for control on the VPA due to the increased infestations on native rangelands. These species are prevalent in the Argyle Ridge area, and Nine Mile Canyon. In the Book Cliff portion of the VPA they are prevalent on Seep Ridge and in the Willow Creek watershed. Henbane is a threat in the Browns Park area due to heavy infestations in Wyoming, where it is not controlled.

Russian thistle, halogeton, and cheatgrass are undesirable weed species that occur throughout the Uinta Basin, Clay Basin, and Browns Park. These three plants are already heavily established along the roadsides, and the populations increase with oil field development. Cheatgrass has become so widespread that control efforts are focused on reducing its density through large-scale habitat manipulation programs, and not by individual sprayings. In 1992, a cheatgrass inventory identified 55,700 acres as having greater than 60% cheatgrass cover, and 162,000 acres were identified as having 10-60% cheatgrass cover. The cheatgrass infestation in the VPA has increased and is a major management concern.

Tamarisk has effectively established itself along all the riparian ecosystems, as well as in patches where moisture accumulates in the desert shrub and sagebrush/grass communities. Some control has been gained over the tamarisk infestations via herbicide use in Red Creek and Browns Park. Some areas of tamarisk within Utah are currently protected as designated critical habitat for the federally endangered southwestern willow flycatcher, which further complicates its management. However, it should be noted that the VPA does not contain designated critical habitat for the southwestern willow flycatcher. Tamarisk was listed as a county noxious weed in Uintah County as of 2003.

Table 3.18.6. Noxious Weeds and Undesired Plant Species

| Common Name | Scientific Name | Status | Known Distribution |
|-------------------------------------|-----------------------------|--------------------|--|
| Bermudagrass | <i>Cynodon dactylon</i> | State Noxious Weed | No populations known at this time |
| Dyer's woad | <i>Isatis tinctoria</i> | State Noxious Weed | Found on private land in Duchesne and Uintah Counties |
| Field bindweed (wild morning glory) | <i>Convolvulus arvensis</i> | State Noxious Weed | Occasional. Heavy infestations in farm and city lands |
| Johnsongrass | <i>Sorghum halepense</i> | State Noxious Weed | No populations known at this time |
| Knapweed, diffuse | <i>Centaurea diffusa</i> | State Noxious Weed | One population on Blue Mountain |
| Knapweed, Russian | <i>Centaurea repens</i> | State Noxious Weed | Heavy infestations especially in Pelican Lake area, Green River, Browns Park and adjacent lands to Myton, to Roosevelt. Increasing in the oil and gas fields |
| Knapweed, spotted | <i>Centaurea maculosa</i> | State Noxious Weed | Known populations on Diamond Mountain and Blue Mountain |

Table 3.18.6. Noxious Weeds and Undesired Plant Species

| Common Name | Scientific Name | Status | Known Distribution |
|--|--|---|--|
| Knapweed, squarrose | <i>Centaurea squarrosa</i> or <i>Centaurea virgata</i> | State Noxious Weed | No populations known at this time |
| Leafy spurge | <i>Euphorbia esula</i> | State Noxious Weed | Small population on ditch area, some on private lands |
| Medusahead | <i>Taeniatherum caput-medusae</i> | State Noxious Weed | No populations known at this time |
| Purple loosestrife | <i>Lythrum salicaria</i> | State Noxious Weed | Coming into east Duchesne County. No populations known on BLM lands at this time |
| Quackgrass | <i>Agropyron repens</i> or <i>Elytrigia repens</i> | State Noxious Weed | Occasional |
| Tall whitetop (perennial pepperweed) | <i>Lepidium latifolium</i> | State Noxious Weed | Very prevalent along all riparian areas and moist patches |
| Canada thistle | <i>Cirsium arvense</i> | State Noxious Weed | Scattered along riparian areas |
| Musk thistle | <i>Carduus nutans</i> | State Noxious Weed | Scattered |
| Scotch thistle (cotton thistle) | <i>Onopordum acanthium</i> | State Noxious Weed | Scattered |
| Whitetop (hoary cress) | <i>Cardaria draba</i> | State Noxious Weed | Very prevalent along all riparian areas and moist patches |
| Yellow starthistle | <i>Centaurea solstitialis</i> | State Noxious Weed | No populations known at this time |
| Russian olive | <i>Elaeagnus angustifolia</i> | Duchesne and Uintah County Noxious Weed | Scattered along riparian areas |
| Salt cedar | <i>Tamarix ramosissima</i> | State Noxious Weed | Riparian areas, seeps, springs, wetlands, wash beds & wash banks, roadsides, stock ponds, occasionally in open areas with high water table |
| Other Undesirable Plant Species | | | |
| Black henbane | <i>Hyoscyamus niger</i> | Undesired Plant Species | Very prevalent in Book Cliffs, Nine Mile Canyon, and Argyle |
| Bull thistle | <i>Cirsium vulgare</i> | Undesired Plant Species | Occasional |
| Buffalobur | <i>Solanum rostratum</i> | Undesired Plant Species | No populations known at this time |
| Camelthorn | <i>Alhagi camelorum</i> | Undesired Plant Species | Occasional |
| Common cocklebur | <i>Xanthium strumarium</i> | Undesired Plant Species | Occasional |

Table 3.18.6. Noxious Weeds and Undesired Plant Species

| Common Name | Scientific Name | Status | Known Distribution |
|----------------------------|----------------------------------|-------------------------|---|
| Common crupina | <i>Crupina vulgaris</i> | Undesired Plant Species | No populations known at this time |
| Goat's rue | <i>Galega officinalis</i> | Undesired Plant Species | No populations known at this time |
| Jointed goatgrass | <i>Aegilops cylindrica</i> | Undesired Plant Species | No populations known at this time |
| Low larkspur | <i>Delphinium nuttallianum</i> | Undesired Plant Species | No populations identified for control. Common native plant |
| Poison hemlock | <i>Conium maculatum</i> | Undesired Plant Species | No populations known at this time |
| Poverty weed | <i>Iva axillaris</i> | Undesired Plant Species | Occasional |
| Purple starthistle | <i>Centaurea calcitrapa</i> | Undesired Plant Species | No populations known at this time |
| Silverleaf nightshade | <i>Solanum elaeagnifolium</i> | Undesired Plant Species | No populations known at this time |
| St. John's wort | <i>Hypericum perforatum</i> | Undesired Plant Species | No populations known at this time |
| Velvetleaf | <i>Abutilon theophrasti</i> | Undesired Plant Species | No populations known at this time |
| Water hemlock | <i>Cicuta douglasii</i> | Undesired Plant Species | No populations identified for control. Common native plant |
| Wild proso millet | <i>Panicum miliaceum</i> | Undesired Plant Species | No populations known at this time |
| Yellow nutsedge | <i>Cyperus esculentus</i> | Undesired Plant Species | No populations known at this time |
| Toadflax, Dalmatian | <i>Linaria dalmatica</i> | Undesired Plant Species | No populations known at this time |
| Toadflax, yellow | <i>Linaria vulgaris</i> | Undesired Plant Species | One population known in Chipita |
| Whorled or poison milkweed | <i>Asclepias subverticillata</i> | Undesired Plant Species | Occasional |
| Halogeton | <i>Halogeton glomeratus</i> | Undesired Plant Species | Numerous infestations |
| Cheatgrass | <i>Bromus tectorum</i> | Undesired Plant Species | Numerous major infestations |
| Houndstongue | <i>Cynoglossum officinale</i> | Undesired Plant Species | Very prevalent in Book Cliffs, Nine Mile Canyon, and Argyle |
| Common teasel | <i>Dipsacus fullonum</i> | Undesired Plant Species | Becoming common along Upper Green River |

3.19 VISUAL RESOURCES

The current management objective for visual resources is to manage the public lands in such a way as to preserve those scenic vistas that are deemed most important and to design or mitigate all visual intrusions so that the intrusions do not exceed the established Visual Resource Management (VRM) class objectives. Activities within the VPA that could potentially cause visual intrusions and have an impact on scenic quality are primarily surface-disturbing activities, including minerals exploration and development, OHV use, trail and/or road development, and fire management.

3.19.1 VISUAL RESOURCE MANAGEMENT (VRM) CLASSES

The BLM uses the VRM system to inventory, manage, and set objectives for visual resources. The VRM system uses visual management classes (Class I through IV, Class I and Class II being the most protective) to designate permissible levels of landscape alteration, with the broad goal of protecting the visual quality of public lands. The assignment of VRM classes is based on the management decisions made in the RMP. All actions proposed during the RMP process that would result in surface disturbance must consider the importance of the visual values and the impacts that proposed actions could have on these values. The VRM class objectives are described in Appendix J. However, a brief summary of the VRM classes objectives are: VRM Class I: preserve the existing character of the landscape; VRM Class II: retain the existing character of the landscape with a low level of landscape change; VRM Class III: partially retain the existing character of the landscape with only moderate change to the landscape; VRM Class IV: major modifications are allowed to the existing character of the landscape, and the level of change can be high.

An area is assigned a VRM class objective based on its scenic quality, the level of visual sensitivity of the area, and the viewing distance of the area. Once an area has been assigned a VRM class, the area classification can be used to determine the impacts of proposed activities on visual resources and to analyze the level of disturbance that an area can tolerate before the proposed activity exceeds the VRM objectives for the area (BLM 1992).

3.19.2 REGIONAL OVERVIEW

The entire VPA has been visually inventoried and classified according to the VRM classification system. As the VPA is located in the Uinta Basin, its visual quality is diverse, ranging from areas that are visually homogeneous to areas with unique and spectacular visual quality. The areas of highest scenic quality are found along the Book Cliffs, in the Bitter Creek Drainage, along portions of the White and Green River corridors, within the Browns Park ACEC, in the vicinities of Red Mountain and Diamond Mountain, and areas that border Dinosaur National Monument (Bartel 2002; see Figure 32 in the Maps section).

Areas being managed as VRM Class I include: Winter Ridge, Bull Canyon, West Cold Springs, Diamond Breaks, and Daniels Canyon WSAs, and the Book Cliffs Mountain Browse Natural Area/Instant Study Area (ISA).

Areas being managed as VRM Class II are: Nine Mile Canyon, the Upper Book Cliffs, the White River Corridor, the Upper Green River and the Green River Corridor from Dinosaur National Monument to State Highway 40, and Red Mountain-Dry Fork ACEC.

The remainder of the VPA is being managed as either VRM Class III or VRM Class IV.

Throughout the VPA, unmanaged OHV use is visually evident which, although localized, is long-term. New roads and trails are being created by OHV use, and OHVs are cutting trails across and over highly visible ridgelines. At present, the only area managed for OHV use is near Fantasy Canyon (including Devils Playground). The areas of highest OHV use (and corresponding visual degradation) are:

1. in the vicinity of Buckskin Hills, north of the town of Vernal;
2. an area to the north of Red Wash, in the vicinity of Bourdette Draw; and
3. an area south of the Bonanza Power Plant and north of the White River corridor.

Throughout the VPA, the rapid increase of petroleum and natural gas exploration and extraction are also visually evident. However, through visual mitigation and careful placement of drilling well pads, this development is not presently exceeding VRM class objectives.

The proximity of intense exploration and development near areas of high scenic quality and the increasing number of people seeking recreation in the VPA are creating resource-use conflicts, particularly in the White River corridor and the Book Cliffs Divide.

3.20 WILD HORSES

This section describes the affected environment concerning wild horses in the Bonanza Herd Area (HA), the Hill Creek HMA, and the Winter Ridge Herd Area (HA). Approximately 2,340 animal unit months (AUMs) are currently allocated to support 195 horses in the Hill Creek Herd Area. No forage has been allocated for horses in the Bonanza Herd Area and the Winter Ridge Herd Area.

3.20.1 BONANZA HERD MANAGEMENT AREA

In 1984, the wild horse population in the Bonanza Herd Area was estimated at approximately 40 horses (BLM 1985a). Prior to completion of the 1985 Book Cliffs RMP, plans were discussed to limit the herd to approximately 50 horses. However, the final decision was to remove all wild horses because of management conflicts. The rationale for the decision was based on unresolved conflicts associated with the manageability and protection of the horses. There was a perception that the horses could not be managed to achieve and maintain a thriving natural ecological balance, as required by the Wild Horse and Burro Act (BLM 2001).

In 1986, the BLM conducted a wild horse gather within the Bonanza HA. The Ute Tribe filed a complaint alleging ownership of the gathered horses. A national organization, Wild Horse Organized Assistance (WFOA), notified the BLM that if all of the horses were removed they

would bring suit against the BLM, citing as precedent an Interior Board of Land Appeals decision disallowing total removal from a herd area in Nevada. Consequently, the horses removed during the 1986 gather were returned to the Ute Tribe, based on Consent Decree 86-C-0821G issued by the United States District Court, Central Division. In turn, the Ute Tribe relinquished all claims on 13 wild horses within the herd area that had not been gathered. As part of the court order, and at the intercession of WHOA, the Ute Tribe agreed to deliver 26 unbranded wild horses to the BLM from the Pyramid Lake Paiute Reservation in Nevada. These horses were subsequently released into the Bonanza HA.

In 1998, as a result of detection of equine infectious anemia (EIA) disease in horses gathered by the Ute Tribe from lands adjacent to the HA, the BLM, the Animal Plant Health Inspection Service (APHIS), the Utah Department of Agriculture and Food, and the Ute Tribe entered into an agreement to gather and test all horses in the Uinta Basin, including the Bonanza horses, for EIA. In 1999, the BLM gathered the Bonanza wild horses and tested them for EIA. Some wild horses tested positive for EIA, were subsequently disposed of, and in June 2000, 72 disease-free horses were returned to the HA.

As mentioned above, in July 2001 the Book Cliffs RMP decision regarding the Bonanza HA was amended. The amended plan established the herd area as a herd management area (HMA) and provided guidelines for the long-term management of wild horses at an appropriate management level (AML) of 85 horses. However, the Bonanza herd (at a population of 92 individuals) was gathered in November 2001 to comply with a court order, which required the BLM to remove all of the wild horses from the HMA. The horses were placed either in the BLM's Adopt-A-Horse program or in sanctuaries.

Approximately 16 miles of the western boundary of the Bonanza HA (fenced) abuts the Uintah and Ouray Indian Reservation.

3.20.2 WINTER RIDGE HERD AREA

According to the 1985 Book Cliffs RMP, the Winter Ridge wild horses were to be gathered and removed; however, the decision has not been implemented. The rationale for the 1985 decision to remove this herd was that the area might not be suitable habitat for wild horses. Because of the high elevation of the area, deep snow (24-40 inches annually) can accumulate during the winter months, putting a wild horse herd in this area at risk. In 2003, 40 wild horses were gathered and removed from the Winter Ridge Herd Area to ease stress on native rangelands caused by grazing and to maintain the well-being of the wild horses remaining in the area.

This herd area is bordered by state grazing allotments that permit domestic horses to graze. Currently, there is little or no fencing between the state and federal allotments. Should Winter Ridge be designated as an HMA, a fenceline agreement may need to be negotiated between the state, the permittee, and the BLM to minimize possible trespass situations between wild and domestic horses, or the BLM may need to negotiate with the state of Utah to eliminate domestic horses from those adjacent state allotments.

3.20.3 HILL CREEK HERD MANAGEMENT AREA

The Hill Creek Extension of the Uintah and Ouray Indian Reservation separates the Hill Creek HMA into two parts: the northwestern and the southeastern.

In 2001, lands within the northwestern part, known as Naval Oil Shale Reserve Number 2 (NOSR-2) lands, were transferred to the Ute Tribe. Until the date of transfer, the BLM managed the surface resources on these lands, including wild horses, but the transfer allowed the Ute Tribe to manage, protect, and assert control over any horse located or found within the boundary of this parcel. The northern boundary of the transferred parcel is unfenced, so wild horses and Tribal horses, particularly those on either side of the unfenced boundary have been intermingling. Tribal and wild horses can potentially intermingle even in areas where fences exist: most existing fences are in need of maintenance or replacement.

As a result of the transfer of the NOSR-2 lands, the Hill Creek HMA can no longer be managed as one unit without greatly impacting Tribal lands. Thus, for the purposes of analysis in the VPA, the Hill Creek HMA will be considered as two herd areas: 1) Hill Creek Northwest/Wild Horse Bench and 2) Hill Creek Southeast/Agency Draw.

3.20.3.1 HILL CREEK NORTHWEST/WILD HORSE BENCH

The transfer of the NOSR-2 lands to the Tribe resulted in the reduction of the HMA by 48,000 acres, or approximately 35%. This part of the HMA was estimated to contain approximately 50-60% of the total wild horse habitat. In the Wild Horse Bench portion of the Hill Creek Herd Area is a resident herd of approximately 100 horses, composed of several bands.

Livestock grazing within the HMA has been permitted to the Ute Tribe, although the Tribe has not used this allotment for over twenty years. The livestock grazing allotment is called Lower Showalter.

Wild horses are also currently using an area north of and adjacent to the HMA, bordered on the east by Tribal Lands and on the west by the Green River. Comprising approximately 30,347 acres, the horses have established home ranges there. Up until now, the area has not been considered crucial to the long-term survival of the herd and was not included in the original delineation of the HMA (BLM 1983a).

3.20.3.2 HILL CREEK SOUTHEAST/AGENCY DRAW

This portion of the Hill Creek HMA comprises approximately 55% private land (owned by Utah Oil Shale Corporation), 35% BLM land, and 10% state land. Maintaining wild horses in an area in which 65% of the land is in non-federal ownership could severely limit the ability of the BLM to manage them. If the BLM were requested to remove the wild horses from the private and state land, Southeast/Agency Draw would essentially be split into two parts. However, in the past, these two owners have not objected to wild horses grazing their land.

The HMA is bordered on the south by Tribal lands. In this area, horses move freely between public and Tribal lands. As Tribal lands are higher in elevation, during the winter season, horses tend to move from Tribal lands in the south onto public lands to the north. As a result of this seasonal migration, winter census counts for the HMA are typically two to three times higher than late summer counts (150-170 horses in winter, compared to 40-50 in summer). During the summer, the few springs and ponds in the herd area provide only enough water to support a resident herd of 40-50 horses, and so the majority of the horses move back to the Tribal land at that time. The population estimate for BLM/Tribal horses that use this portion of the HMA is presently unknown. The BLM and the Tribe gathered over 510 horses from this general area in 2002–2003 because drought conditions were negatively impacting the herds and range conditions.

Similar to horses in the Wild Horse Bench area, horses in the Agency Draw area are also using land outside the herd area boundary. This 22,865-acre area, Big Pack Mountain, has not been considered crucial to the long-term survival of the herd and was not included in the original delineation of the HA (BLM 1983a). Big Pack Mountain is bordered on its other three sides by private or Tribal lands.

3.21 WILDLIFE AND FISHERIES RESOURCES

The terrestrial wildlife species found in the VPA are typical of the intermountain region of the United States. These species include big game species such as mule deer, Rocky Mountain elk, pronghorn antelope, bighorn sheep, moose, black bear, and mountain lion. Additional species of concern in the VPA fall within the general categories of upland game species, raptors, waterfowl and shorebirds, fish and aquatic species, neotropical migrants, and small mammals and reptiles. Wildlife resources in the VPA are currently managed as directed by the Diamond Mountain RMP and Book Cliff RMP. These RMPs focus on managing habitat conditions instead of wildlife populations. Management goals for most wildlife populations in the VPA are determined primarily by UDWR, with the exception of federally protected wildlife populations, which are determined by USFWS. The current VPA RMPs allocate forage for elk, deer, and antelope. Additionally the Diamond Mountain RMP allocates forage for moose and bighorn at the level identified by the UDWR's prior stable numbers and long-term wildlife population management goals. Resource allocations for raptors, reptiles, amphibians, and other non-game species in the VPA are limited to protecting individuals and the habitat of state and federally listed species, and designating spatial and temporal buffers for nesting raptors.

The BLM's management of wildlife habitat in the VPA has had, and will continue to have, an impact on both local communities and those that exist outside of the Uinta Basin. There is considerable regional interest in the overall condition and management of the VPA. In the past, a majority of the local interest has been focused on big-game management and associated recreational activities. In recent years, however, non-consumptive uses in the VPA, such as tourism and wildlife viewing, have been increasing with the continued expansion of Utah's tourism industry. Because many of the wildlife species found in the VPA regularly cross public, private, and tribal lands, a collaborative effort between all land managers and owners has been essential for effective wildlife management in the VPA.

The UDWR has designated five wildlife management units within the VPA to aid in the management of these wildlife species. Seventy-six percent of Unit 17 (Wasatch Mountains) is located outside of the VPA. Of the remaining lands within the VPA designated part of this unit, the BLM administers only 1,245 acres, therefore, the wildlife management goals and objectives relative to this unit were not included in this analysis. The remaining four wildlife management units, and their sub-units, are outlined in Table 3.21.1. UDWR has developed, or is presently developing, wildlife management plans for the aforementioned big game wildlife species as well as fisheries and upland game populations.

Table 3.21.1. Wildlife Management Units within the VPA

| Unit/Sub-unit number | Unit/Sub-unit name | Acres of Unit in the VPA | Acres of Unit in the VPA Managed by BLM |
|---------------------------|---|--------------------------|---|
| 8, 8b 8c | North Slope Uinta Mountains West Daggett Three Corners | 365,651 | 62,528 (17% of Unit) |
| 9 9a 9b 9c 9d | South Slope Uinta Mountains Yellowstone Vernal Diamond Mountain Bonanza | 2,775,395 | 711,092 (26% of Unit) |
| 10 10a | Book Cliffs Bitter Creek and Little Creek | 1,225,726 | 652,440 (53% of Unit) |
| 11 11a | Nine Mile Anthro | 706,163 | 296,756 (42% of Unit) |

3.21.1 WILDLIFE ASSOCIATED WITH THE VPA

3.21.1.1 MULE DEER

Mule deer occupy most ecosystems in Utah but generally attain their greatest densities in shrublands in areas characterized by rough, broken terrain and abundant browse and cover. Many mule deer populations migrate between summer and winter ranges. Mule deer summer range habitat types on BLM-administered lands in the VPA consist primarily of oak, sagebrush, Douglas fir, and Utah juniper vegetation types. Winter range habitat primarily consists of Utah juniper, prickly pear, sagebrush, galleta, greasewood, and Fremont cottonwood vegetation types. Areas of high winter use in the Book Cliffs included areas of open pinyon/juniper woodland interspersed with four-wing saltbush and sagebrush in Lower McCook Ridge, Indian Ridge, and Big Park (Karpowitz 1984).

The amount of overall crucial winter range and the migration corridor for mule deer that the BLM manages is outlined in Table 3.21.2. The target wintering mule deer herd size and annual harvest for these three wildlife management units are described in Table 3.21.3.

Table 3.21.2. Mule Deer Habitat in the VPA

| Unit | Overall range | | Crucial winter range | | Migration corridor | |
|-----------------------------|--------------------|----------------------|----------------------|----------------------|--------------------|----------------------|
| | Total Area (acres) | Acres Managed by BLM | Total Area (acres) | Acres Managed by BLM | Total Area (acres) | Acres Managed by BLM |
| Book Cliffs | 1,203,853 | 651,819 | 355,992 | 58,361 | 58,361 | 47,091 |
| Nine Mile | 667,440 | 262,357 | 39,959 | 0 | 0 | 0 |
| North Slope Uinta Mountains | 349,738 | 61,526 | 105,949 | 0 | 0 | 0 |
| South Slope Uinta Mountains | 2,774,731 | 0 | 479,253 | 0 | 0 | 0 |
| Total | 4,995,762 | 975,702 | 981,153 | 58,361 | 58,361 | 47,091 |

Table 3.21.3. Wildlife Management Goals for Mule Deer

| Unit Number | Unit Name (subunit) | Estimated Population Size* ¹ | Population Objective ^{1**} | Buck-to-Doe Ratio | Buck Size | Annual Harvest |
|-------------|--|---|-------------------------------------|-------------------|-----------------------------|----------------|
| 8b, 8c | North Slope (West Daggett and Three Corners) | 5,000 | 6,200 | 15:100 | 30% being 3 point or better | 600 |
| 9a | South Slope (Yellowstone) | 11,200 | 13,000 | 15:100 | 30% being 3 point or better | 1,500 |
| 9b, 9c | South Slope (Vernal and Bonanza) | 10,100 | 13,000 | 15:100 | 30% being 3 point or better | 1,000 |
| 9d | South Slope (Diamond Mountain) | | | 25:100 | 30% being 3 point or better | Limited Entry |
| 10a | Book Cliffs (Bitter Creek and Little Creek) | 7,200 | 15,000 | 25:100 | 30% being 3 point or better | Limited Entry |
| 11a | Nine Mile (Anthro) | 2,950 | 8,500 | 15:100 | 30% being 3 point or better | 250 |

*Some of these units are estimated at about ½ of population objectives due to drought impacts and low productivity.

** Population objectives are updated on an annual basis.

¹ Hersey and Aoude 2006.

3.21.1.2 ROCKY MOUNTAIN ELK

The season and function of use of elk habitats help distinguish various types of winter ranges, production areas (calving grounds), and/or summer range. Production or calving areas are used from mid-May through June and typically occupy higher elevation sites than winter range. Calving grounds are usually characterized by aspen, montane coniferous forest, grassland/

meadow, and mountain brush habitats, and are generally in locations where cover, forage, and water are in close proximity (Fitzgerald et al. 1994). In western Colorado, for instance, most females calve within 660 feet of water (Seidel 1977). Crucial winter range is considered to be the part of the local deer and elk range where approximately 90% of the local population is located during an average of five winters out of ten from the first heavy snowfall to spring green-up.

The amount of crucial winter range for elk that the BLM manages is outlined in Table 3.21.4. The management goals for these four wildlife management subunits are described in Table 3.21.5.

Table 3.21.4. Rocky Mountain Elk Habitat in the VPA

| Unit | Overall range | | Crucial winter range | |
|-----------------------------|--------------------|----------------------|----------------------|----------------------|
| | Total Area (acres) | Acres managed by BLM | Total Area (acres) | Acres managed by BLM |
| Book Cliffs | 1,006,347 | 524,893 | 418,140 | 207,418 |
| Nine Mile | 450,518 | 171,070 | 76,996 | 2,489 |
| North Slope Uinta Mountains | 303,644 | 54,041 | 51,836 | 2,975 |
| South Slope Uinta Mountains | 1,694,137 | 251,978 | 328,916 | 73,469 |
| Total | 3,454,646 | 1,001,982 | 875,888 | 286,351 |

Table 3.21.5. Wildlife Management Goals for Rocky Mountain Elk

| Subunit number | Subunit Name | Estimated population size ¹ | Population objective ^{1*} | Bull/cow ratio | Bull age |
|----------------|---|--|------------------------------------|----------------|--------------------------------|
| 8a, 8b | North Slope (Summit and West Daggett) | 1,295 | 1,600 | 8:100 | 50% of bulls 3½ years or older |
| 8c | North Slope (Three Corners) | 1,075 | 500 | 8:100 | 50% of bulls 3½ years or older |
| 9a | South Slope (Yellowstone) | 5,600 | 5,500 | 8:100 | 50% of bulls 2½ years or older |
| 9b, 9c, 9d | South Slope (Vernal, Bonanza, and Diamond Mountain) | 3,030 | 2,500 | 8:100 | 50% of bulls 2½ years or older |
| 10a | Book Cliffs (Bitter Creek and Little Creek) | 3,900 | 7,500 | 8:100 | 50% of bulls 2½ years or older |
| 11a | Nine Mile (Anthro) | 1,000 | 700 | 8:100 | 50% of bulls 2½ years or older |

¹ Hersey and Aoude 2006.

* Population objectives are updated on an annual basis.

3.21.1.3 PRONGHORN

Pronghorn are common in Utah, where it primarily occurs in desert, grassland, and sagebrush habitats where they feed mainly on browse. Pronghorn are often found in small groups, and are usually most active during the day.

The lower elevations of the VPA sustain several pronghorn herds, which are highly valued by local sportsmen and wildlife enthusiasts. The BLM and UDWR maintain several guzzler systems in these areas to provide a water source for pronghorn during summer months. The pronghorn populations in the VPA have been adversely affected by historic range degradation and habitat loss in the sagebrush steppe habitat type as well as periodic drought conditions. The management goals for the pronghorn herds in these wildlife management units have not been finalized (UDWR 2001). Locations and total acreage of pronghorn habitat managed by the BLM in the VPA are shown in Table 3.21.6. Current population trends are given in Table 3.21.7. Population objectives are not currently available.

Table 3.21.6. Pronghorn Habitat in the VPA

| Unit | Total Area (acres) | Acres managed by BLM |
|-----------------------------|--------------------|----------------------|
| Book Cliffs | 122,968 | 85,973 |
| Nine Mile | 317,512 | 179,321 |
| North Slope Uinta Mountains | 108,612 | 57,799 |
| South Slope Uinta Mountains | 592,313 | 410,235 |
| Total | 1,141,405 | 733,328 |

Table 3.21.7. Pronghorn Population Trends in the VPA¹

| Subunit Number | Subunit Name | 2006 Estimated Population Size | 2007 Buck/Doe Ratio | 2006 Annual Harvest |
|----------------|--|--------------------------------|---------------------|---------------------|
| 8b, 8c | North Slope (West Daggett and Three Corners) | 605 | 59:100 | 30 |
| 9b, 9c | South Slope (Vernal and Bonanza) | 205 | 21-32:100 | 41 |
| 9d | South Slope (Diamond Mountain) | 589 | | |
| 10a | Book Cliffs (Bitter Creek) | 283 | 50:100 | 7 |
| 11a | Nine Mile (Anthro) | 327 | 67:100 | 22 |

¹ Hersey and Aoude 2006.

3.21.1.4 BIGHORN SHEEP

Rocky Mountain bighorn sheep can be found in small herds in northern-eastern Utah. Bighorn sheep have experienced significant declines in numbers in the early 1900s due to disease, habitat degradation, and hunting. Bighorn sheep require separation from domestic sheep to prevent the transmission of diseases, against which they have no natural defenses. Utah has been involved in an aggressive program for the past 30 years to restore bighorn sheep to their native habitat. Bighorn sheep currently exist in two areas in northern-eastern Utah, including areas adjacent to BLM-administered lands along the upper Green River, and in the Book Cliffs area. The current population estimate for bighorn sheep along the upper Green River (the West Daggett (8b) and Three Corners (8c) subunits of the North Slope wildlife management unit) is 182 individuals (Hersey and Aoude 2006). The total 2006 bighorn harvest from these management units was 4 individuals. Occasional sightings have also been documented in the Book Cliffs. These herds are all the result of reintroduction efforts and will likely continue to be augmented with additional reintroductions. Additional bighorn sheep reintroductions are proposed in the Browns Park/Diamond Mountain area. Water and vegetation improvements have also benefited these bighorn sheep populations. A management plan for bighorn sheep in the state of Utah has been developed. Locations and acreage of bighorn sheep habitat in the VPA is shown in Table 3.21.8.

Table 3.21.8. Rocky Mountain Bighorn Sheep Habitat in the VPA

| Unit | Total Area (acres) | Acres managed by BLM |
|-----------------------------|--------------------|----------------------|
| Book Cliffs | 633,271 | 228,002 |
| North Slope Uinta Mountains | 95,751 | 14,740 |
| South Slope Uinta Mountains | 405,481 | 38,805 |
| Total | 1,134,503 | 281,547 |

3.21.1.5 MOOSE

Moose occur in the Rocky Mountains and the northeastern portion of the Intermountain West (Zevloff and Collett 1988). Prior to 1918, moose were not known to occur in Utah. Since that time, they have been recorded on the north slope of the Uinta Mountains where their numbers have slowly increased. This increase has been attributed to an increase in beaver populations and the subsequent proliferation of marsh areas with which moose are typically associated (Zevloff and Collett 1988). From the Uinta population, moose have dispersed and/or been transplanted to a variety of locations throughout the state. Although they may range widely across habitat types, moose are primarily associated with boreal forests and riparian areas. Moose are predominantly browsers and rely on the stems, bark, and leaves of a variety of trees and shrubs for forage. Year-round forage includes willow, fir, and quaking aspen. During the summer, grasses, forbs, and aquatic vegetation typically compose a large portion of the moose diet (Zevloff and Collett 1988).

There are resident populations of moose in the North Slope Uinta Mountains, South Slope Uinta Mountains, Book Cliffs, and Nine Mile wildlife management units. Acreage of habitat in these units is shown in Table 3.21.9. Moose habitat is generally associated with early stages of seral development and shrub growth. Annual flooding and habitat management techniques, such as

prescribed burnings, are thought to improve habitat for moose. Current population trends are given in Table 3.21.10.

Table 3.21.9. Moose Habitat in the VPA

| Unit | Total Area (acres) | Acres managed by BLM |
|-----------------------------|--------------------|----------------------|
| Book Cliffs | 0 | 0 |
| Nine Mile | 98,090 | 19,893 |
| North Slope Uinta Mountains | 217,029 | 21,381 |
| South Slope Uinta Mountains | 1,095,295 | 71,342 |
| Total | 1,410,414 | 112,616 |

Table 3.21.10. Moose Population Trends in the VPA¹

| Subunit number | Subunit Name | 2005 Estimated population size | Population Objective* | 2007 Bull/cow ratio | 2006 Annual Harvest |
|----------------|--|--------------------------------|-----------------------|---------------------|---------------------|
| 8a | North Slope (Summit) | 200 | 400 | 108:100 | 37 |
| 8b, 8c | North Slope (West Daggett and Three Corners) | | | 115:100 | 13 |
| 9a | South Slope (Yellowstone) | 200 | 225 | 105:100 | 8 |
| 9b, 9d | South Slope (Vernal and Diamond Mountain) | | | 100:100 | 3 |
| 10a | Book Cliffs (Bitter Creek) | - | 100 | - | - |
| 11a | Nine Mile (Anthro) | - | 40 | - | - |

¹ Hersey and Aoude 2006.

* Population objectives are updated on an annual basis.

3.21.1.6 BISON

The Ute Tribe maintains an introduced bison population on tribal lands in the Hill Creek portion of the Book Cliffs. These bison can be frequently found on BLM lands adjacent to Ute Tribal lands in the southern Book Cliffs where suitable bison habitat has been identified.

3.21.1.7 BLACK BEAR

In the VPA, black bears are typically associated with forested or brushy mountain environments and wooded riparian corridors and seldom use open habitats (Zeveloff and Collett 1988). Black bears tend to be nocturnal and tend to shy away from human contact. They are generally omnivorous with preferred foods including berries, honey, fish, rodents, birds and bird eggs, insects, and nuts. Black bears obtain most of their meat from carrion. From November to April, bears enter a period of winter dormancy. Winter dens are located in caves, under rocks, or

beneath the roots of large trees where they are kept nourished and insulated by a thick layer of fat (Zeveloff and Collett 1988).

The VPA sustains several large populations of black bear, some of which are traditionally thought to be the highest density black bear population in the state of Utah. A long-term study being conducted by BYU has shown that the black bear population in the Book Cliffs area has local concentrations of individuals in the Horse Canyon, Main Canyon, and Trail Canyon areas. The factors that make these areas support such high bear populations are still being investigated, but initial studies have shown that good habitat conditions with respect to elevation, permanent water sources, cover, and diversity of food, as well as isolation from human disturbance has raised concerns about potential impact on resource development in these areas on these populations (Pers. Comm. Hal Black, 1/13/04). The amount of black bear habitat that the BLM manages in the VPA is outlined in Table 3.21.11.

Table 3.21.11. Black Bear Habitat in the VPA

| Unit | Total Area (acres) | Acres managed by BLM |
|-----------------------------|--------------------|----------------------|
| Book Cliffs | 232,792 | 108,291 |
| Nine Mile | 156,051 | 32,144 |
| North Slope Uinta Mountains | 155,511 | 0 |
| South Slope Uinta Mountains | 1,044,332 | 56,304 |
| Total | 1,588,686 | 196,739 |

3.21.1.8 MOUNTAIN LION

The mountain lion inhabits most ecosystems in Utah. However, it is most common in the rough, broken terrain of foothills and canyons, often in association with montane forests, shrublands, and pinyon-juniper woodlands (Fitzgerald et al. 1994). Mule deer is the mountain lion's preferred prey species. Consequently, mountain lion seasonal use ranges generally parallel those of mule deer.

Mountain lions are widespread and occur frequently throughout middle and upper elevations of the VPA where populations are considered stable. The amount of winter range for mountain lions that the BLM manages is the same as the mule deer habitat outlined in Table 3.21.2.

3.21.1.9 UPLAND SPECIES

Upland game in the VPA include populations of Blue Grouse, California Quail, Chukar Partridge, Greater Sage-grouse, Ruffed Grouse, Mourning Dove, Ring-necked Pheasant, Rio Grand Turkey, Merriam's Wild Turkey, and desert and mountain cottontail rabbit. Annual fluctuations for most upland game bird and small mammal populations closely correlate with annual climatic patterns. Mild winters and early spring precipitation during the months of March, April, and May are associated with increases in upland game populations. Warm, dry weather during the early summer, especially in June, is generally considered vital for the survival of newly born young of many upland game species. Ring-necked Pheasant and Greater Sage-grouse

are two upland game species that have experienced a long-term decline as a result of the degradation and loss of important sagebrush steppe and grassland habitat (UDWR 2000). The Greater Sage-grouse is discussed further in the sensitive species section (Section 3.17).

3.21.1.10 WATERFOWL, SHOREBIRDS, AND WADING BIRDS

The VPA is associated with the western portion of the Central Flyway, which guides migrating birds along the Rocky Mountains and the Great Plains. Because of the arid climate of the VPA, migration routes are often associated with riparian corridors and wetland or lake stopover areas. There are several important waterfowl habitats in the VPA including the Pariette Wetlands, Pelican Lake, and the Green and White rivers. Waterfowl, shorebirds, and wading bird populations are primarily associated with the Pariette Wetlands, Ouray National Wildlife Refuge, and other wetland areas such as Browns Park waterfowl management area (WMA), Mallard Springs WMA, Stewart Lake WMA, and Pelican Lake. These wetlands are an oasis in the Uinta Basin, surrounded by the harsh, arid desert landscape of northeast Utah. Mallard, Gadwall, Cinnamon Teal, Pintail, and Canada Geese are the most common waterfowl species observed in these areas. Herons, egrets, Black-necked Stilts, and various sandpipers are the more common wading birds seen. Other kinds of birds less frequently seen are American White Pelican, Sandhill Crane, American Bittern, and White-faced Ibis.

The Pariette Wetlands Refuge managed by the BLM includes over 9,000 acres (6,504 acres of desert uplands and 2,529 acres of open water, wetland, and riparian habitat) in Pariette Draw. The wetlands feature a perennial flowing stream, 23 man-made freshwater ponds with alkali bulrush, and other emergent vegetation. The marshes, wet meadows, grain fields, and irrigation structures in Pariette have been constructed to improve available habitat for waterfowl and other wildlife species in the area.

The Ouray National Wildlife Refuge consists of approximately 19 square miles of bottomland and river surface along 12 linear miles of the Green River. The Ouray refuge was originally established to provide habitat for breeding and migrating waterfowl. More specifically, the primary objective was to provide food and cover for 14 species of nesting ducks. While the purpose for which the Refuge was established has not changed, the methods of achieving the purpose have changed. Management strategies today are focused on managing water to mimic the natural floodplains that existed before dams were erected along the Green River. Portions of protective levees throughout the Refuge have been removed to allow more frequent flooding. The river feeds five bottomlands within the river floodplain, including Johnson Bottom, Leota Bottom, Wyasket Lake, Sheppard Bottom, and Woods Bottom, as it winds through the Wildlife Refuge. In late May, as natural flooding occurs, ponds are formed, spurring the growth of semi-aquatic plants which provide food and cover for ducks and other wildlife. In addition, these ponds serve as nurseries for the endangered fish species of the Colorado River system.

3.21.1.11 RAPTORS

There are 20 species of raptors found in the VPA, all of which are federally protected under the Migratory Bird Treaty Act. In addition, several raptor species are Utah State-protected. These raptor species are discussed further in the Special Status Species section (Section 3.17). Special

habitat needs for all of these raptor species include the protection of nest sites, foraging areas, and roosting or resting sites. Buffer zones are usually recommended around raptor nest sites during the early spring and summer when raptors are raising their young. The most utilized raptor nesting habitats in the VPA are generally found along riparian areas, juniper-desert shrub transition areas, and cliff faces.

An inventory of raptors within the Vernal Field Office boundary was completed in August 2003 by Utah State University – Uinta Basin. This study focused on determining the nesting requirements and the seasonally important raptor habitats located on public lands within the VPA boundary. GIS locations and the demographics of each raptor nest site identified during the inventory were recorded. This information was added to an expandable GIS database that will track nest site and other important raptor habitat locations. Special habitat needs relative to raptors are generally associated with limiting disturbance during the nesting season and maintaining small mammal populations as a prey base. Electrocution from power lines and environmental contaminants continue to be a threat to some raptor species in the VPA.

3.21.1.12 OTHER NON-GAME SPECIES

Because of the variety of habitats found within the VPA, the VPA contains a high diversity of non-game species such as neotropical migrants and other birds, small mammals, amphibians, and reptiles. The VPA contains various riparian, marsh, talus slope, aspen-conifer, pinyon-juniper, and ridge top habitats used by these wildlife species. A list developed by the USFWS, UDWR, Partners in Flight of neotropical migrants, and other sensitive bird species found in the VPA is provided in Appendix H, Table 33. Other common neotropical migrants and other bird, small mammal, amphibian, and reptile species to the VPA include the American Crow, American Kestrel, Black-capped Chickadee, Common Raven, Green-tailed Towhee, Horned Lark, House Finch, Song Sparrow, Vesper Sparrow, Western Kingbird, Western Meadowlark, black-tailed and white-tailed jackrabbits, golden-mantled ground squirrel, raccoon, red fox, coyote, common sagebrush lizard, common side-blotched lizard, gopher snake, and greater short-horned lizard. Several small mammal, amphibian, and reptile surveys have been conducted in the VPA. Many of these non-game species are also harder to study and monitor because of low population sizes and/or secretive behavior. However, the BLM is acquiring basic habitat and population information on non-game species listed by state and federal agencies as special status species.

Neotropical migrants, small mammals, amphibians, and reptiles often have special habitat needs. Areas in the VPA with the highest concentrations and diversity of these species are generally associated with riparian areas. Amphibian populations have been shown to be particularly susceptible to disturbance activities and increases in chemical pollutants in their habitats. A study of the reptile, amphibian, and small mammal species found in the Book Cliffs area was conducted by Brigham Young University in 1995 and 1996. These studies concluded that a large proportion of small mammals and all amphibian species in the study area had the potential to be significantly impacted by grazing in riparian and wetland areas. Most of the reptile species were associated with talus slopes and rock faces and appeared to be at little risk from all conceivable management options. Additionally, the UDWR has identified that many neotropical migrants rely on riparian areas and corridors for nesting and migration purposes.

3.21.1.13 FISHERIES AND AQUATIC SPECIES

The riparian and aquatic habitat in the VPA is generally associated with the Green and White river drainages. Aquatic species in the VPA include several special status fish species such as bonytail, Colorado pikeminnow, humpback chub, razorback sucker, roundtail chub, bluehead sucker, Colorado River cutthroat trout, and flannelmouth sucker, which are discussed further in the special status species section. The Green and White rivers provide critical habitat for several of these fish species. A primary concern with the riparian areas in the VPA is the effect of decreased regeneration of cottonwood and willow stands and the invasion of non-native plant species such as salt cedar (*Tamarix* sp.) and Russian olive (*Elaeagnus angustifolia*) on riparian and aquatic wildlife species.

There are several important cold- and warm-water fisheries within the VPA, including Matt Warner, Calder, Crouse, Steinaker, Red Fleet, Cottonwood, and Brough reservoirs; Pelican Lake; and the White and Green rivers and their tributaries. Most of the reservoirs in the resource area are managed as cold-water fisheries and are stocked with salmonids by the UDWR. The Green River below Flaming Gorge Dam and Pelican Lake have been designated by the state of Utah as waters to be managed under the Blue Ribbon Fisheries Initiative because of the quality angling they provide. The Pariette Wetlands have also been identified as an important aquatic area in the VPA. However, maintenance of the nonnative fisheries associated with the VPA have adversely impacted the recovery of several special status fish species found in the VPA, including the Colorado River cutthroat trout, bonytail, Colorado pikeminnow, humpback chub, and razorback sucker (Hawkins and Nesler 1991).

Aquatic species are often used as indicator species of ecosystem health. These species often need protection from resource utilization such as recreation, grazing, mineral extraction, and invasive non-native species. These species may be impacted by resource management decisions made outside the VPA (e.g., the operation of Flaming Gorge Dam on the Green River).

3.21.2 HABITAT FRAGMENTATION

Habitat fragmentation is a process that causes the disruption and transition of once large continuous blocks of wildlife habitat into less continuous habitat, primarily through human disturbances such as land clearing and other surface disturbances, and the conversion of vegetation from one type to another. Wildlife habitats in the VPA include aquatic, riparian, grassland, desert shrub, badlands, sagebrush steppe, pinyon/juniper woodland, mountain shrub, and conifer forest. These vegetation types are also discussed further in the Vegetation Section. Fragmentation of these habitat types due to activities such as oil and gas development, road and pipeline construction, fence construction on rangelands and dam construction on waterways, or other resource development and land conversion can have a number of detrimental impacts on wildlife species. Habitat fragmentation generally results in some direct impact on wildlife from the initial loss of habitat associated with the alteration. Additional indirect impacts of this habitat loss may also affect the surrounding habitats by increasing the amount of transitional and avoidance space associated with the surrounding habitats. Increasing the edge habitats has been shown to accelerate ecological processes, increase the ability of invading plant or animal species to becoming established in the interior of the patch, and decrease functional habitat use for a variety of wildlife species. Interior species also become more vulnerable to decreasing chances

of successful dispersal from occupied patches and colonization to unoccupied patches because of the decreased size and connectivity of the patches.

The VPA presently contains large areas of disturbed wildlife habitat. Fragmentation has become an issue in areas where mineral, agriculture, and other types of land development is currently occurring. Reducing the effects of habitat fragmentation on wildlife species include determining thresholds for disturbance, conserving existing habitats on an ecosystem level, providing usable corridors between neighboring patches, and controlling the invasion of undesirable species into these refuges. UDWR maintains a database that identifies important areas for many of the game and sensitive species in the VPA including intact riparian areas, important habitats for mule deer, Rocky Mountain elk, Greater Sage-grouse, Ferruginous Hawk, black-footed ferret, etc. The impacts on wintering mule deer and other big game animals from an increasing density of natural gas wells, roads, and associated human activities in the northern Book Cliffs area was analyzed in a four-year baseline study (1998–2002) by the UDWR. The UDWR identified that accelerated oil and gas development in the Book Cliffs area has the potential to further displace big game animals and increase habitat fragmentation during the winter period, thereby lowering the relative carrying capacity of the range. The UDWR recommended that this baseline study be continued for an additional three years to establish long-term distributional trends of wintering big game populations and to determine the potential impact that oil and gas development may have on these populations in the north Book Cliffs area. Efforts will continue to be made to identify and maintain existing important habitats and their interconnecting corridors. A description of the existing habitat fragmentation can be found in Tables 20 to 32 in Appendix H.

3.22 WOODLANDS AND FOREST RESOURCES

3.22.1 REGIONAL OVERVIEW

Woodland resources comprise lands producing forest tree species that may be used as non-sawtimber products and sold in units other than board feet. By contrast, forest resources are used for sawtimber products and may be sold in board feet. For management purposes in the VPA, forest resources have been grouped with woodland resources.

Woodland resources within the VPA begin at mid-elevations, where sagebrush communities of the lower, more arid areas become dominated by pinyon pine and juniper (5,000 to 8,000 ft). Generally, woodland resources within the VPA consist of pinyon pine, Utah juniper, and Gambel oak. Forest species, the source of most forest resources, are found at higher elevations (Colorado Plateau 2002). Forest resources include ponderosa pine, aspen, Douglas fir, and minor quantities of spruce, white fir, limber pine, and subalpine fir. The stands with commercial value are located south of the town of Myton, in the Five Mile, Trail Canyon, and Big Wash areas; the south Diamond Mountain Rim; the northern slopes of Diamond Mountain; in Browns Park, near Diamond Mountain; in the drainages that flow into Argyle Canyon; and the southern portions of the Book Cliffs (BLM 1990, 2002).

In the southern part of the VPA, in the vicinity of the Book Cliffs, the principal woodland species consist of pinyon pine, Utah juniper, and Rocky Mountain juniper. High-production

areas containing these species generally have slopes of less than 25% and have not been recently burned. In the higher elevations, Douglas fir and aspen generally grow on northern and eastern slopes (at 6,000–8,500 feet) and at the heads of canyons, where soil moisture is near the surface. Cottonwoods grow along the White and Green River bottoms and generally do not grow more than 100 yards from the rivers' edges. Stands also include Russian olive and tamarisk. Mature, single-storied stands of cottonwood grow along old river channels, oxbows, and sandbars. Some areas near Diamond Mountain in the northern portion of the VPA support forest species such as Douglas fir, ponderosa pine, and aspen. Douglas fir is the dominant species in these higher elevation areas, composing up to 70% of the canopy coverage (Diamond Mountain MSA 1990). Approximately 2,000 acres of ponderosa pine exist here as well, some as relict stands.

3.22.2 WOODLAND AND FOREST PRODUCTS

The most desirable woodland and forest products, sought after by both commercial and private interests, include sawtimber, fuelwood, posts, and Christmas trees. Interest in biomass is increasing and is expected to continue to grow as new uses and technologies develop. There is also a limited demand for other woodland products such as shrubs, trees, and seeds. The demand for woodland products continues to increase; however, the ability to satisfy the demand for woodland products is limited by the available woodland resource.

Commercial sales or commercial harvesting of forest resources are permitted by the BLM., Douglas fir, ponderosa pine, limber pine, aspen, and cottonwood trees may be sold in designated areas to protect forest stands from disease or to prevent wildland fires (BLM 1996).

Historically, pinyon pine has been the preferred species for fuelwood, but juniper has become popular as well. In the past, both of these woodland species were harvested following chainings, but most of the wood within these areas has been removed. Cutting of green wood is now a more common practice for commercial woodcutters.

Trees used as posts are generally found on the more productive, pinyon-juniper sites, where the soils are deep and well drained. Trees suitable for posts have become more difficult to find because they have been searched out and cut by local residents for many years. The areas where significant numbers of post-trees still grow are remote and not easily reached.

The annual demand for cut Christmas trees remains high, but the quantity of good-quality pinyon pine, the Christmas tree of choice, is limited (BLM 2002). Demand for Christmas trees from the VPA is primarily local, but each year, enough trees are sold to only partially satisfy local demand. Past sales of Christmas trees for personal use have been limited to approximately 600-800 trees. Live pinyon pine are also sold for landscaping.

Current management of woodland resources focuses on prescribed burns, burning of slash piles, and commercial and personal greenwood sales of pinyon pine and juniper. The BLM monitors commercial woodcutting periodically to ensure that woodcutters remain in compliance with permit stipulations.