

3.8 Vegetative Resources, Including Upland Vegetation, Noxious Weeds, and Invasive Species

3.8.1 Overview

Regulations from the CEQ direct agencies to insure the professional and scientific integrity of environmental analyses in an EIS. This direction includes using the best available science to describe existing conditions in the Project Area; in this case, the UNF. Published, peer reviewed studies are used when applicable to conditions in the UNF; however, in most cases only those studies that are relevant to identifying potential impacts from the proposed action (in Chapter 4) are considered. These studies are cited in the text. The most relevant literature for most resources in Chapter 3 comes from internal Forest Service publications and reports, because this information is based on UNF-specific investigations and assessments. Throughout Chapter 3, the UNF Land and Resource Management Plan (USFS 2003) and associated EIS (USFS 2003a) are the most frequently cited documents. These documents were not peer reviewed within the scientific community, but were written using best available science, open to public comment as dictated by the NEPA process, and revised accordingly by resource specialists.

Vegetative Communities

Plant communities of the UNF are varied because of the different types of geology, landforms, and soils that are found throughout the UNF. Major plant communities and their locations are summarized in table 3.24. Their locations can be seen in figure 3.22: Forest-wide Vegetation Map. A description of each community can be found under Section 3.8.3: Affected Environment.

The available GIS data for vegetation encompasses all land within the Forest Service boundary (approximately 983,670 acres), including all NFS Lands within the UNF with a Federally-owned, leasable mineral estate (approximately 897,400 acres).

Table 3.24. Summary of major plant communities of the UNF.

Plant Community	Current Impacts
Aspen	Fire suppression and livestock and elk grazing have led to loss of aspen to conifer encroachment.
Conifer	Fire suppression and spruce bark beetle outbreaks have put these communities at risk for losing structural or biological diversity.
Tall Forb	Grazing has led to soil and seed source loss and has shifted this plant community to include species that increase under grazing pressure, such as geranium and coneflower.
Mountain Brush	Cheatgrass, an invasive non-native grass, is present in understory of most communities. Fire suppression has led to older stands of oak stands, these stands are not considered to be at immediate risk and fire suppression has favored maple stands.
Pinyon/Juniper	Moderate to high risk of losing structural or biological diversity. Fire suppression has resulted in dense overstory and reduced understory.
Sagebrush	Because of fire suppression, understory species are limited and soil erosion is a problem.
Riparian	Plant community most impacted by development and has high risk of significant loss or losing structural or biological diversity.
Grass	No information available.
Alpine	Even slight disturbance is significant because recovery is slow.

Traditional Plant Gathering

Traditional plant gathering in the UNF is mainly practiced by the Northern Ute Tribe and primarily occurs in the Strawberry MA. Targeted plants include mostly forbs. The extent that these plants are available greatly affects traditional plant gathering.

Noxious Weeds

The Plant Protection Act of 2000 defines a noxious weed as “as a weed that could bring harm to agriculture, the public health, navigation, irrigation, natural resources, or the environment.” Thirty species of noxious weeds and other weed species of concern are known to occur on the UNF (USFS 2003). Location of noxious weed infestations can be seen in figure 3.23: Noxious Weeds. Noxious weed infestations occur in all RFOGDs. The largest infestation occurs in the Strawberry MA on Strawberry Project Lands. Musk thistle is the most prevalent of the noxious weed species and occurs in all RFOGDs. Alpine plant communities are currently the only community not immediately threatened by noxious weeds.

3.8.2 Introduction

Vegetative communities on the UNF are typical of semi-arid mountainous regions (USFS 1996b), and exist in a full range of seral stages and age classes (USFS 2003a). Plant communities are strongly influenced by the differences in geology, landforms, soils, and major drainages that characterize the UNF. The current vegetation patterns have also been influenced by grazing, timber harvest, fire, and insect outbreaks (USFS 1996b). Major plant communities on the UNF can be divided into nine types including aspen, conifer (including Douglas-fir/white fir and spruce/subalpine fir), tall forb, mountain brush, pinyon/juniper, sagebrush, riparian, grass, and

alpine. These community types are described below. Location of these community types can be seen in figure 3.22: Forest-wide Vegetation Map.

3.8.3 Affected Environment

Vegetative Communities

Aspen

Aspen (*Populus tremuloides*) stand characteristics vary depending on soil type, aspect, and elevations at which they occur (USFS 1996b). Aspen communities on the UNF can be classified as either seral, meaning communities will be replaced by conifers over time (usually one generation); or stable, where conifer encroachment remains low. Seral and stable aspen-dominated vegetation communities cover approximately 262,776 acres, or 27 percent of the UNF.

Seral aspen tend to occur on higher quality, moister sites than stable aspen. Aspen is considered seral on most sites in the UNF (USFS 2003), and is generally being replaced by spruce/fir (primarily subalpine fir) over time (USFS 2003). Historically, fire has maintained the patterns and structural diversity of aspen on the landscape. As a result of fire suppression (and grazing by livestock and elk) over the past 140 years, there has been an ongoing loss of seral aspen to conifer encroachment (USFS 2003). Vegetation survey data suggest that roughly 40 percent of the area on the UNF formerly dominated by aspen is now dominated by conifer (O'Brien and Collins 1997). Seventy-nine and 39 acres of aspen were regenerated by clearcutting in 2003 and 2004, respectively (USFS 2005).

Stable aspen stands occur mostly in the lower elevations and/or on the drier, south facing sites, and occur more frequently on the east side of the UNF, particularly in the Strawberry Reservoir area (USFS 1996b).

Conifer

Conifer vegetation on the UNF consists of two main cover types: stands dominated by Douglas-fir (*Pseudotsuga menziesii*)/white fir (*Abies concolor*), and those dominated by Engelmann spruce (*Picea engelmannii*)/subalpine fir (*Abies lasiocarpa*). Conifer-dominated vegetation communities cover approximately 104,955 acres, or 11 percent of the UNF.

Douglas-fir/white fir stands are mainly limited to cool exposures (e.g., north facing slopes or drainages) in lower to mid elevations, occurring in the southern and western portions of the UNF (USFS 1996b). This type is most common in the southern and western portions of the Forest, and is typically found on steep, north-facing slopes. This type can be found either as mixed stands, or relatively pure stands of either species. On moister sites, older Douglas-fir stands are being replaced by the more shade-tolerant white fir, due to the absence of low intensity, understory-thinning fires that historically controlled white fir encroachment. Because the Douglas-fir/white fir forest on the UNF occurs at lower elevations, closer to early settlements, it has been logged in the foothills near Utah and Heber Valleys since the 1850s (USFS 2003). According to a PFC analysis completed in 1998, Douglas-fir in all areas of the UNF (and white fir in the Wasatch mountains) is at a moderate to high risk for either significant loss or at risk of losing structural or biological diversity (USFS 2003b).

Engelmann spruce and subalpine fir stands are found at the heads of drainages and on ridge tops at higher elevations (USFS 1996b) mainly between 8,000 and 10,000 feet. Aspen and scattered lodgepole pine or Douglas-fir may be associated with this type in mixed or seral stands. The relatively shade-tolerant subalpine fir often dominates the understory of spruce/subalpine fir overstory stands. Both Engelmann spruce and subalpine fir have thin bark and suffer high mortality during even low-intensity fires, which tend to create uneven-aged, multi-layered stands. Reduced wildfire in the seral aspen cover type has resulted in increases in the total area of spruce/fir stands as seral aspen stands have shifted in composition to conifer stands. Structural patterns have also changed substantially as a result of timber harvesting, which began in the early 1900s (Nelson 1997). Spruce bark beetle outbreaks, beginning in the late 1950s, have played a significant role in spruce/subalpine fir stand development and management, as infestations in the late 1950s and 1980s led to heavy logging of relatively large, old trees (USFS 2003). According to a PFC analysis completed in 1998, spruce fir in the Wasatch Mountains is at a moderate to high risk for either significant loss or at risk of losing structural or biological diversity (USFS 2003b).

Tall forb

Tall forb communities cover approximately 20,181 acres (2 percent of the UNF). In the Wasatch Mountains, tall forb communities have been maintained primarily as understories of aspen- and sagebrush-dominated areas. The composition of tall forbs has shifted heavily toward those species that increase under grazing pressure, such as geranium (*Geranium sp.*), tall larkspur (*Delphinium exaltatum*), and western coneflower (*Rudbeckia occidentali*) (USFS 2003). On the majority of sites within the UNF, the loss of soil and seed-sources from past sheep grazing makes improving trends in these areas difficult (USFS 2003b).

Mountain brush

Mountain brush-dominated vegetation covers approximately 281,185 acres, or 29 percent of the UNF, and includes Gambel's oak (*Quercus gambelii*)/maple (*Acer spp.*) communities as well as communities dominated by mountain mahogany (*Cercocarpus montanus*), curlleaf mahogany (*Cercocarpus ledifolius*), serviceberry (*Amelanchier alnifolia*), and other species. In general, mountain brush communities are found on canyon sideslopes and broad ridges in soils derived from marly mudstones or sandstone limestone shale. Oak/maple is the second largest vegetation type (i.e., second to aspen) on the UNF. Large stands of Gambel's oak and maple are found on the western-most portion of the UNF (USFS 1996b).

Mountain brush communities not dominated by oak or maple are typically a complex of several shrub species. Cliffrose (*Purshia mexicana*), birchleaf mahogany (*Cercocarpus montanus*), curlleaf mahogany, bitterbrush (*Purshia tridentata*), and serviceberry are common components at lower elevations, while chokecherry (*Prunus virginiana*), snowberry (*Symphoricarpos albus*), and elderberry (*Sambucus sp.*) occur at higher elevations. Mountain brush communities are often intermingled with sagebrush at lower elevations, and aspen/conifer at higher elevations. Less desirable species such as yellow rabbitbrush (*Chrysothamnus viscidiflorus*) dominate some sites, and cheatgrass (*Bromus tectorum*) is present on almost all sites (USFS 2003).

The Forest includes over 200,000 acres of oak and oak/maple. Gambel oak occurs in relatively pure stands and in mixed stands with bigtooth maple. Oak, a clonal species, is a prolific sprouter after fire and can quickly form dense stands as clones mature within 10 years. Oak/maple stands can support a diverse understory of forbs and grasses until the overstory becomes too dense.

Reduced wildfire has led to relatively old stands of this cover type, a contrast with the historic condition. Nearly 60 percent of vegetation plots sampled within the UNF had stem ages greater than 50 years, and 15 percent had stem ages greater than 100 years. Older, denser oak stands tend to have lower levels of herbaceous growth and diversity than younger stands (USFS 2003). Oak/maple stands are not believed to be at immediate risk due to these over-mature conditions (USFS 2003b).

About 5,000 acres of the Forest are dominated by bigtooth maple, which is a dominant species on moister sites, particularly north-facing slopes and in draws. Maples sprout less vigorously than oaks and have been favored by fire suppression (USFS 2003).

Pinyon/juniper

Pinyon/juniper communities are dominated by pinyon pine (*Pinus edulis*) and Utah or Rocky Mountain juniper (*Juniperus osteosperma* or *Juniperus scopulorum*). Rocky Mountain juniper occurs on somewhat deeper soils than Utah juniper, and is generally found along valley bottoms and lower slopes. Pinyon/juniper communities are common throughout the UNF, covering approximately 46,130 acres of the Forest (5 percent of the UNF), primarily in the Wasatch Mountain and Bonneville Basin sub-regions, in the Diamond Fork and Upper Spanish Fork MAs, and in the Vernon Unit (USFS 2003). This community is primarily found between elevations of 5,000 and 8,000 feet, in soils derived from sandstone, shale, or conglomerate (USFS 1996b). Black sagebrush (*Artemisia nova*) is a common understory species (USFS 1996b) and in some areas, particularly in the Bonneville Basin, cheatgrass has become dominant. In general, pinyon/juniper stands are dominated by late-seral, dense overstory vegetation and a reduced herbaceous understory, compared to pre-settlement conditions (USFS 2003). According to a PFC analysis completed in 1998, pinyon/juniper in the Wasatch Mountains is at a moderate to high risk for either significant loss or at risk of losing structural or biological diversity (USFS 2003b).

Sagebrush

Sagebrush-dominated vegetation covers approximately 189,976 acres, or 19 percent of the UNF. The two largest areas of sagebrush occur in the Vernon Unit and in Strawberry Valley. In general, sagebrush types may occur as expanses covering several thousand acres or as small patches or islands surrounded by other vegetation (USFS 2003). Reduced wildfire for over 100 years has resulted in large amounts of late-seral sagebrush throughout the region. Where treatments have not occurred, sagebrush stands are dominated by older plants and have dense canopy cover. Understory species are often limited in these areas, presumably by competition for moisture from sagebrush roots, and soil erosion is also a problem (USFS 2003).

Each sagebrush species on the UNF has unique morphological and ecological characteristics, occurring as the dominant shrub in a given area with an understory of grasses and forbs. Six different kinds of sagebrush occur on the UNF, with mountain big sagebrush (*Artemisia tridentata vaseyana*) occupying the largest number of acres (USFS 2003). Mountain big sagebrush is found in a wide range of elevations, from the foothills to over 9,000 feet. Wyoming big sagebrush (*Artemisia tridentata wyomingensis*) is commonly found on drier valley floors and ridgetops at low and middle elevations in both the Bonneville Basin and Wasatch Mountains. Black sagebrush grows at low and mid elevations on the Vernon Unit. It forms the least dense stands of all sagebrush types on the UNF, rarely exceeding 20 percent canopy cover. Basin big sagebrush (*Artemisia tridentata ssp. tridentata*) is found on deep alluvial soils in canyon bottoms

at lower elevations (USFS 1996b). Only small, scattered fragments of this type remain on the Forest. Spiked big sagebrush (*Artemisia tridentata spiciformis*) occurs at higher elevations, typically above 7,000 feet, in the Wasatch Mountains. It often forms communities with an understory of tall forbs and is able to resprout after low-intensity fires. Silver sage (*Artemisia cana viscidula*) is common in deeper soil on valley bottoms, meadows, and at the edges of riparian areas at middle elevations, especially in the Wasatch Mountains (USFS 2003). Silver sage is often found where the water table has been drawn down on former wetlands (USFS 1996b). It is able to sprout quickly after low-intensity fire, and forms dense stands within 10-15 years.

Riparian

Riparian areas are associated with streams, as well as wet meadows, bogs, and fens, which are typically fed by springs, runoff, or snowmelt collecting in low areas. Riparian-dominated vegetation communities cover approximately 20,371 acres, or two percent of the UNF, primarily on the floodplains and valley bottoms of perennial and intermittent streams (USFS 1996b). Wet meadows and bogs/fens now occupy only a few hundred acres on the Forest. These areas are typically small and scattered, but are species-rich, containing a variety of sedges, rushes, grasses, and forbs (USFS 2003).

Approximately 6,300 acres of tree-dominated riparian vegetation is mapped within the UNF boundary (USFS 2003). These forested riparian communities occur at low to mid elevation, generally no higher than 7,000-7,500 feet. Narrowleaf cottonwood (*Populus angustifolia*), the most common riparian species, forms narrow corridors (referred to as “gallery forests”) along most perennial streams. Box elder (*Acer negundo*) can also be present and sometimes dominates. The midstory usually includes willow (*Salix sp.*), red osier dogwood (*Cornus stolonifera*), golden currant (*Ribes aureum*), hawthorn (*Crataegus sp.*), Wood’s rose (*Rosa woodsii*), and skunkbush (*Rhus trilobata*). A variety of forbs, grasses, and sedges form the understory (USFS 2003). The low-elevation forested riparian habitat type has been the most impacted by development and agriculture out of all vegetation types on the UNF. It also is the richest in species diversity, so the degradation of riparian areas has also had significant impacts on wildlife. According to a PFC analysis completed in 1998, riparian vegetation across the UNF is at a moderate to high risk for either significant loss or at risk of losing structural or biological diversity (USFS 2003b).

Above 7,000 feet, narrowleaf cottonwood becomes limited to isolated patches. In these areas, willows and occasionally birch (*Betula sp.*) dominate, with a suite of wetland grasses, sedges, rushes, and forbs occupying the interspaces and openings. Along small, spring-fed streams where flows are fairly constant, flood events are minor, and with gradients less than three percent, sedges and riparian grasses may form the primary vegetative cover along banks. These herbaceous riparian communities (referred to as “stringer meadows”) create stable banks on small, meandering streams (USFS 2003).

Grasses

Grassland-dominated vegetation communities cover approximately 14,705 acres, or 1.5 percent of the UNF. Common grass species on the UNF include Salina wildrye (*Elymus salinus*), bluebunch wheatgrass (*Agropyron spicatum*), slender wheatgrass (*Agropyron trachycaulum*), and mountain brome (*Bromus marginatus*). Grassland communities on the UNF are most often found

on slopes and ridges, and occasionally in openings within aspen and coniferous forest (USFS 1996b).

Alpine

The UNF is unique in that approximately 1,000 acres occur above the tree line (10,400 feet in Utah) (Welsh et al. 2003), on the highest ridges and peaks of the Wasatch Mountains. These alpine habitats are comprised mostly of rock outcrops, fellfields, and talus. Unique plant communities grow in small patches from pockets of soil scattered across fellfields and talus slopes, and from crevices in rock outcrops and cliffs. Plants in these areas are subject to harsh conditions, where growing seasons are short and soils are thin. Even slight disturbances in these areas are significant because recovery is so slow (USFS 2003).

Vegetative Communities Within Each RFOGD

Although all vegetation types (excluding alpine) are represented in each RFOGD, each RFOGD is characterized by unique topography, drainage patterns, and landscapes. The unique features and dominant vegetation types within each RFOGD are described below (summarized in Table 3.25). The available GIS data for vegetation encompasses all land within the Forest Service boundary (approximately 983,670 acres), which is assumed to include some non-NFS lands, as the LRMP FEIS (2003) also indicates that the NFS landbase totals approximately 897,400 acres.

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Table 3.25. Vegetation types and associated acres on the UNF by MA.

RFOGD	MA	Grass	Sage*	Forb	Mtn Brush	Riparian	Conifer	Aspen**	Pinyon/Juniper	Other†	Total
Currant Creek	Currant Creek	475	13,090	1,446	4,253	2,208	4,204	27,941	90	462	54,169
	West Fork Duchesne	664	11,035	3,260	226	725	9,431	16,047	0	271	41,658
	RFOGD subtotal	1,139	24,125	4,707	4,478	2,933	13,634	43,989	90	733	95,827
Deer Creek	Deer Creek Reservoir	534	1,392	1,006	9,031	553	3,253	24,507	15	34	40,326
	Hobble Creek	2,333	2,233	768	53,487	1,101	4,318	17,553	172	2,220	84,185
	Lower Provo	1,378	3,920	1,789	39,173	907	9,193	20,636	270	6,031	83,297
	RFOGD subtotal	4,245	7,545	3,563	101,692	2,560	16,765	62,696	457	8,285	207,808
Diamond Fork	Diamond Fork	2,480	13,238	405	56,199	1,474	4,203	17,560	7,857	1,026	104,443
	RFOGD subtotal	2,480	13,238	405	56,199	1,474	4,203	17,560	7,857	1,026	104,443
Payson	Mona	258	300	1,370	6,554	0	5,737	1,593	87	683	16,582
	Nephi	676	2,623	1,703	21,393	783	1,711	3,399	953	471	33,712
	Payson	590	1,210	732	13,684	264	6,946	13,213	0	71	36,709
	Thistle	629	1,161	418	20,075	669	4,877	8,368	500	135	36,832
	RFOGD subtotal	2,152	5,294	4,223	61,705	1,716	19,271	26,572	1,540	1,361	123,834
Spanish Fork Canyon	Upper Spanish Fork	544	7,745	0	13,963	293	4,503	1,368	17,253	763	46,432
	RFOGD subtotal	544	7,745	0	13,963	293	4,503	1,368	17,253	763	46,432
Strawberry	Strawberry Reservoir	867	43,703	1,768	2,153	7,141	7,719	47,517	0	16,598	127,467
	White River	43	10,624	0	4,302	578	7,019	11,063	80	533	34,244
	Willow Creek	0	9,715	0	163	841	1,680	11,795	0	11	24,204
	RFOGD subtotal	910	64,042	1,768	6,618	8,561	16,418	70,375	80	17,142	185,914

RFOGD	MA	Grass	Sage*	Forb	Mtn Brush	Riparian	Conifer	Aspen**	Pinyon/Juniper	Other†	Total
American Fork	American Fork	467	2,619	1,380	16,310	905	15,686	13,935	473	11,145	62,919
	RFOGD subtotal	467	2,619	1,380	16,310	905	15,686	13,935	473	11,145	62,919
Upper Provo	Upper Provo	2,464	6,004	4,136	1,623	1,241	14,068	25,949	17	1,069	56,570
	RFOGD subtotal	2,464	6,004	4,136	1,623	1,241	14,068	25,949	17	1,069	56,570
Vernon	Vernon	41	48,527	0	11,254	476	332	331	11,556	118	72,636
	West Sheeprock	261	10,836	0	7,343	213	76	0	6,806	150	25,686
	RFOGD subtotal	303	59,363	0	18,598	689	408	331	18,362	268	98,323
Forest-wide Total		14,705	189,976	20,181	281,185	20,371	104,955	262,776	46,130	41,793	982,070

Source: GIS data provided by the UNF; assumed to include non-NFS acreages that occur within the Forest Boundary.

* Includes sagebrush/grass and sagebrush/forb cover.

** Includes aspen/conifer (seral aspen)..

† Includes lakes, bare ground, glaciers (including alpine), agricultural land, and urban areas.

§ 96 percent (16,462 acres) = lakes, i.e., Strawberry Reservoir.

Currant Creek Group

Vegetation in the Currant Creek Group area is comprised primarily of aspen (including aspen/conifer), and sagebrush. Spruce/fir stands occur at upper elevations in Smith Basin, Pass Creek, and near Currant Creek Peak; and in the western portion of this area. Snowberry and mixed mountain brush communities are scattered throughout the southern portion (USFS 2003a).

Deer Creek Group

Within the Deer Creek group, oak, oak/maple, sagebrush/grass, mountain brush, pinyon/juniper, and aspen types primarily characterize vegetation at lower elevations, with limited spruce/fir and aspen/conifer at upper elevations and on north-facing slopes (USFS 2003a). The Little Provo-Deer Creek corridor at the eastern edge of the Lower Provo MA contains chokecherry, box elder, and many small sagebrush/grass and wet meadow areas (USFS 2003a).

Diamond Fork Group

Much of the landscape in the Diamond Fork drainage is quite dry, especially in contrast to the Right Fork of Hobbie Creek in the Deer Creek Group area to the north. Several of the dominant soil types, such as those derived from Green River shale, have properties that make them drought-prone and supportive of vegetation that is typically low-elevation. Vegetation is primarily oak and pinyon/juniper throughout the main drainage of Diamond Fork. Small amounts of aspen and conifer occur on upper-elevation, north-facing slopes (USFS 2003a).

Payson Group

Vegetation at lower elevations in the Mona MA is primarily sagebrush and dry grasses in the foothills (USFS 2003a). Lower-elevation vegetation in the Payson MA consists mostly of Gambel oak and oak/maple stands. Aspen, spruce, and Douglas-fir/white fir are present at upper elevations on north- and east-facing slopes elsewhere (USFS 2003a).

Spanish Fork Canyon Group

Two thirds of the vegetation in the Spanish Fork Canyon group consists of mountain brush and pinyon juniper. The elevational sequence of these species in Spanish Fork Canyon is well known among ecologists because it is inverted relative to the typical elevational sequence in the Wasatch Mountains. Typically, pinyon/juniper communities are found at the lowest elevations (usually along the foothills near the mouths of the canyons) and the mountain brush zone becomes best developed above the pinyon/juniper. In Spanish Fork Canyon, however, the mountain brush is well developed from the mouth of the canyon all the way to Sheep Creek. From this point to the top of the canyon at Soldier Summit, pinyon/juniper is the dominant vegetation. The Upper Spanish Fork Canyon Group comprises the middle of this elevational sequence. In addition, Douglas-fir/white fir occurs on the upper elevation north-facing slopes of this RFOGD Group and riparian vegetation occurs in the Sheep Creek, Tie Fork, and Indian Creek drainages (USFS 2003a).

Strawberry Group

Sagebrush is the most common vegetation type in the White River MA and Willow Creek MA, followed by aspen and shrubs (USFS 2003). In the Strawberry Reservoir MA, the valley floor is principally open, rolling terrain dominated by grasses and sagebrush. Wet meadows are found in the low areas. Various sedges, grasses, and forbs are found along the meandering streams. The surrounding upland terrain consists of rolling hills with interspersed openings of grasses, sagebrush, and other forbs amidst quaking aspen and Engelmann spruce/subalpine fir stands

(USFS 2003a). Douglas-fir/white fir occurs on many of the upper elevation, north-facing slopes in Willow Creek, while some subalpine fir occurs on the upper north-facing slopes in White River (USFS 2003a).

American Fork Group

The American Fork Group is comprised mainly of mountain brush, conifer (spruce/fir and Douglas-fir), and aspen. Riparian hardwood forests, containing cottonwood and box elder, can be found in American Fork Canyon and Dry Canyon. Alpine vegetation can be found in the Lone Peak Wilderness Area (USFS 2003a).

Upper Provo Group

Aspen and mixed-aspen vegetation dominates the Upper Provo Group. Spruce/fir stands are also common, with small areas of sagebrush/grass, open grass meadow parks, moist to wet meadows, and tall forb types interspersed. Riparian vegetation occurs along the South Fork Provo River, the Little South Fork, and Soapstone Creek (USFS 2003a).

Vernon Group

The Vernon Group lies within the Bonneville Basin and is generally representative of desert sagebrush/grass, mountain brush, and juniper habitats found throughout the Intermountain West. Slopes in the Sheeprock Mountains are relatively varied and steep, however, and the overall climate of the area is hotter and drier than in other parts of the Bonneville Basin due to its southwest aspect. Vegetation consists primarily of sagebrush (USFS 2003a). Riparian vegetation occurs along Vernon Creek, Bennion Creek, Harker Canyon, and Little Valley Creek. The Vernon Group is unique in that it contains a preponderance of moderate to dense sagebrush, as fires during 1990-95 burned more than 20 percent of the sage in this area (USFS 2003b).

Traditional Plant Gathering

The Northern Utes have maintained their ties to the Strawberry Valley area through plant collection, although current plant gathering is not widespread. One plant gathering location in Strawberry Valley (Daniels Canyon) is used fairly regularly by Northern Ute practitioners. Plants of interest to the Northern Utes include bluebells (*Mertensia spp.*), Indian potato (*Claytonia lanceolata*), wild onions (*Allium spp.*), yampa (*Perideridia gairdeneri*), western sweet cicely (*Osmorhiza occidentalis*), bear root (*Ligusticum spp.*), camas (*Camassia guamasti*), willows (*Salix spp.*), tarweed (*Madia glomerata*), horsemint (*Agastache urticifolia*), elderberries (*Sambucus spp.*), yarrow (*Achillea millefolium*), sagebrush (*Artemisia spp.*), wild strawberries (*Fragaria spp.*), aspen, and dandelion (*Taraxacum spp.*) (USFS 2006b). The Ute practitioners regard all of Strawberry Valley as a potential source for plant material, some of which is not common within the boundary of the Uintah-Ouray Ute Indian Reservation to the east of the UNF (USFS 2006b).

The ability of American Indian practitioners to use plants is affected by the degree to which plants are distributed across the landscape, the abundance of plants at a site, and the ability to access those plants (i.e., using roads) (USFS 2006b).

Noxious weeds

Thirty species of noxious weeds and other weed species of concern are known to occur on the UNF (USFS 2003). In general, infestation areas are underestimated because weed inventories are ongoing. Musk thistle (*Carduus nutans*) is most prevalent, occupying an estimated 23,000 acres;

693 acres of this species were treated in 2004 (USFS 2005). Whitetop (*Lepidium draba*) and cheatgrass form extensive stands in the uplands. Alpine areas are the only communities not immediately threatened by invasive weeds, although some weed species are capable of invading alpine sites (USFS 2003).

Past noxious weed treatment efforts, using integrated pest management, (USFS 2003a) have focused primarily on musk thistle, and in some areas infestations have been greatly reduced (e.g., Diamond Fork and Strawberry Valley). In contrast, populations of Canada thistle and whitetop have been increasing rapidly in spite of treatment efforts (USFS 2005).

Regarding invasive species in riparian areas, small infestations of salt cedar (*Tamarisk sp.*) have been found in several drainages on the UNF in the last 10-15 years. Perennial pepperweed (*Lepidium latifolium*) dominates banks along sections of the Spanish Fork River just below the UNF boundary, and is beginning to spread onto the UNF along Diamond Fork (USFS 2003).

RFOGDs

Invasive plant infestations within each RFOGD are shown in figure 3.23; specific noxious weed locations are not shown.

According to the LRMP, musk thistle and Canada thistle are present in most RFOGDs, and these species are the only noxious weeds documented in the Currant Creek Group and in the Upper Provo Group. The American Fork Group also contains Dalmatian toadflax (*Linaria dalmatica*), spotted knapweed (*Centaurea biebersteinii*), dyer's woad (*Isatis tinctoria*), and leafy spurge (*Euphorbia esula*; USFS 2003a).

The Deer Creek Group contains scattered occurrences of tamarisk, dyer's woad, houndstongue (*Cynoglossum officinale*), Dalmatian toadflax, whitetop, and cheatgrass; most infestations are found along roads or riparian drainages. Whitetop infestations covering one or more acres can be found scattered across the moister, upland areas in the Deer Creek Group. Leafy spurge and Yellow star-thistle (*Centaurea solstitialis*) occur in the western portion of the area (USFS 2003a).

The Diamond Fork Group contains a relatively high number of noxious and invasive weed species, located along roads and riparian drainages, including Scotch thistle (*Onopordum acanthium*), whitetop, tamarisk, and Dalmatian toadflax. Infestations of whitetop and thistles are the most extensive (USFS 2003a).

Infestations of tamarisk have been documented within several drainages in the Payson Group. The Spanish Fork Group contains infestations of whitetop stands, and tamarisk occurs within the riparian zone at the west end of Spanish Fork Canyon. The Strawberry Group contains infestations of whitetop, spotted knapweed, Russian knapweed (*Acroptilon repens*), and tamarisk. In the Vernon Group, various species of knapweeds occur near the eastern part of the area, outside the Forest boundary (USFS 2003a).

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Figure 3.22. Forest-wide vegetation map.

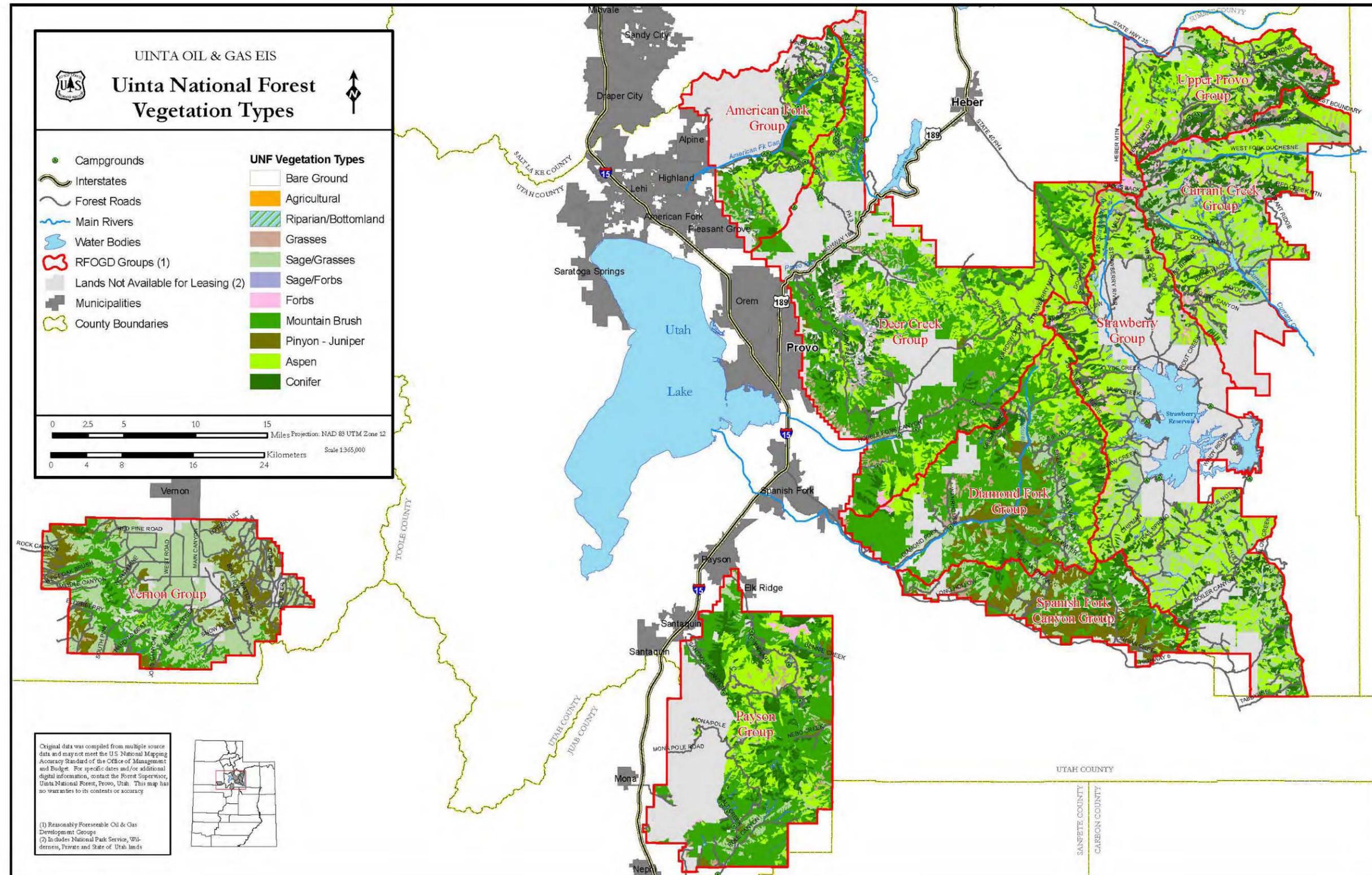
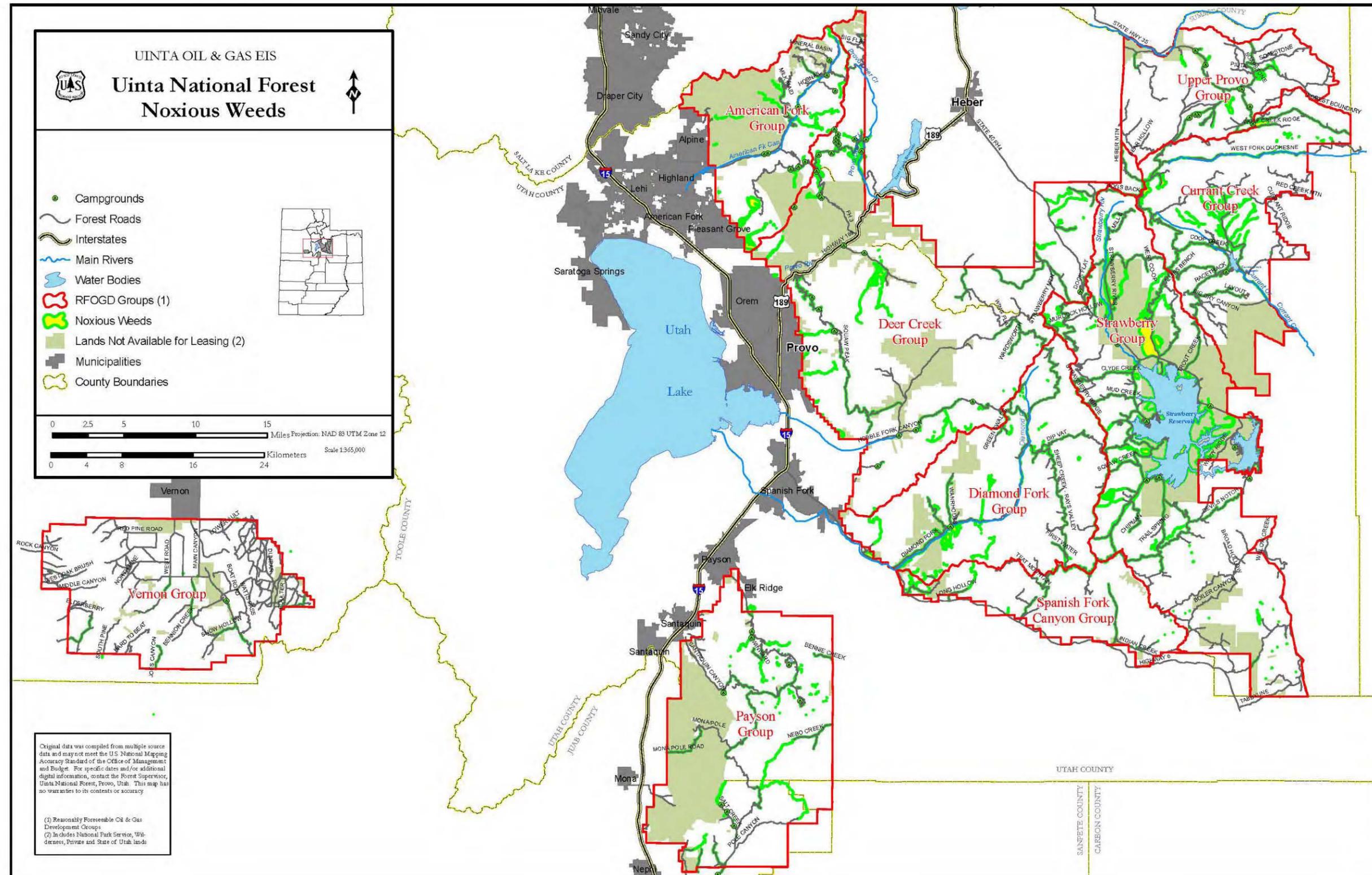


Figure 3.23. Noxious weeds.



3.9 Terrestrial and Aquatic Flora and Fauna, Including Threatened, Endangered, Sensitive, and Management Indicator Species

3.9.1 Introduction

Regulations from the CEQ direct agencies to insure the professional and scientific integrity of environmental analyses in an EIS. This direction includes using the best available science to describe existing conditions in the Project Area; in this case, the UNF. Published, peer reviewed studies are used when applicable to conditions in the UNF; however, in most cases only those studies that are relevant to identifying potential impacts from the proposed action (in Chapter 4) are considered. These studies are cited in the text. The most relevant literature for most resources in Chapter 3 comes from internal Forest Service publications and reports, because this information is based on UNF-specific investigations and assessments. Throughout Chapter 3, the UNF Land and Resource Management Plan (USFS 2003) and associated EIS (USFS 2003a) are the most frequently cited documents. These documents were not peer reviewed within the scientific community, but were written using best available science, open to public comment as dictated by the NEPA process, and revised accordingly by resource specialists.

This section of the EIS is a description of the biological resources of the UNF, including a discussion on wildlife. Special status species (Section 3.9.2) are described first and include both plant and animal species. Following the description of the special status species is a discussion on general wildlife and their habitat (Section 3.9.3).

3.9.2 Introduction to Special Status Species

Special status species are those identified by State (UDWL 2005) and Federal agencies that warrant special consideration during planning and management activities. The U.S. Fish and Wildlife Service (FWS) identifies three Threatened and Endangered (TE) species that are known or expected to occur on the UNF (USFWS 2007a). Seven other TE species listed in Appendix E: Table 1 of the LRMP FEIS have been extirpated from the UNF. There is one candidate species found in the UNF.

In addition to TE species, the Regional Forester identifies Sensitive species as those for which population viability is a concern, as evidenced by significant current and predicted downward trends in population numbers, density, and/or habitat capability that would reduce a species' existing distribution. Sensitive species must receive special management emphasis to ensure their viability and to preclude trends toward endangerment that could result in the need for Federal listing (FSM 2672.1). TE species potentially occurring on the UNF are listed in table 3.26, followed by background information on each species. The following information is taken largely from the LRMP FEIS, Appendix E: Biological Assessment and Biological Evaluation (BA/BE) and Appendix F: Viability Assessments). Additional information can be found in LRMP: Chapter 5.

Table 3.26. Threatened, endangered, candidate, and sensitive species that may occur on the UNF.

Scientific Name	Common name	Status	Suitable habitat on UNF?	Known occurrence on UNF?
Invertebrates				
<i>Valvata utahensis</i>	Utah valvata snail (desert valvata)	Endangered	No	No
Plants				
<i>Phacelia argillacea</i>	Clay phacelia	Endangered	Yes	No
<i>Spiranthes diluvialis</i>	Ute ladies'-tresses	Threatened	Yes	Yes
<i>Astragalus desereticus</i>	Deseret milkvetch	Threatened	No	No
<i>Aster kingii</i> var. <i>barnebyana</i>	Barneby woody aster	Sensitive	Yes	Yes
<i>Botrychium crenulatum</i>	Dainty moonwort	Sensitive	Yes	Yes
<i>Botrychium lineare</i>	Slender moonwort	Sensitive	Yes	No
<i>Draba globosa</i>	Rockcross draba	Sensitive	Yes	Yes
<i>Jamesia americana</i> var. <i>macrocalyx</i>	Wasatch jamesia	Sensitive	Yes	Yes
<i>Lesquerella garrettii</i>	Garrett's bladderpod	Sensitive	Yes	Yes
Birds				
<i>Coccyzus americanus occidentalis</i>	Western yellow-billed cuckoo	Candidate	Yes	No
<i>Haliaeetus leucocephalus</i>	Bald eagle	Sensitive	Yes	Yes, in winter
<i>Aegolius funereus</i>	Boreal owl	Sensitive	Yes	Yes
<i>Otus flammeolus</i>	Flammulated owl	Sensitive	Yes	Yes
<i>Accipiter gentiles</i>	Northern goshawk	Sensitive	Yes	Yes
<i>Falco peregrinus</i>	Peregrine falcon	Sensitive	Yes	No
<i>Picoides tridactylus</i>	Three-toed woodpecker	Sensitive	Yes	Yes
<i>Centrocercus urophasianus</i>	Greater sage-grouse	Sensitive	Yes	Yes
Mammals				
<i>Lynx canadensis</i>	Canada lynx	Threatened	Yes	Yes, transient
<i>Martes pennanti</i>	Fisher	Sensitive	Yes	No
<i>Euderma maculatum</i>	Spotted bat	Sensitive	Yes	Yes
<i>Plecotus townsendii</i>	Townsend's big-eared bat	Sensitive	Yes	Yes
<i>Gulo gulo</i>	Wolverine	Sensitive	Yes	No
Fishes and amphibians				
<i>Xyrauchen texanus</i>	Razorback sucker	Endangered	No	No
<i>Ptychocheilus lucius</i>	Colorado pikeminnow	Endangered	No	No
<i>Gila cypha</i>	Humpback chub	Endangered	No	No

Scientific Name	Common name	Status	Suitable habitat on UNF?	Known occurrence on UNF?
<i>Gila elegans</i>	Bonytail	Endangered	No	No
<i>Chasmistes liorus</i>	June sucker	Endangered	No	No
<i>Oncorhynchus clarki pleuriticus</i>	Colorado River cutthroat trout	Sensitive	Yes	Yes
<i>Oncorhynchus clarki utah</i>	Bonneville cutthroat trout	Sensitive	Yes	Yes
<i>Rana luteiventris</i>	Columbia spotted frog	Sensitive	Yes	Yes

Threatened/Endangered/Proposed/Candidate Species

Threatened, Endangered, and Candidate Species

The Endangered Species Act of 1973 (ESA), as amended, is Federal legislation that is intended to provide a means to conserve the ecosystems upon which TE and candidate species depend by providing programs for the conservation of those species, thus preventing extinction of plants and animals. FWS is the Federal agency that is responsible for administering the provisions of the ESA. ESA terms that will be used in this EIS are defined below:

- **Candidate species (candidate):** A plant or animal species for which FWS has sufficient information on biological vulnerability and threats to support a proposal to list as endangered or threatened.
- **Critical habitat:** Specific geographic areas, whether occupied by a listed species or not, that are essential for its conservation and that have been formally designated by rule published in the Federal Register.
- **Endangered species:** An animal or plant species in danger of extinction throughout all or a significant portion of its range.
- **Listed species:** A species, subspecies, or distinct population segment that has been added to the Federal list of endangered and threatened wildlife and plants.
- **Threatened species:** An animal or plant species likely to become endangered within the foreseeable future throughout all or a significant portion of its range.

There are a number of TE and candidate species that occur or have habitat in the UNF that will be discussed in this EIS. These species are summarized in table 3.27. For a complete description of each species please see Section 3.9.4: Affected Environment.

Please note that if the species is found throughout the RFOGD then only the RFOGD is listed in table 3.27. However, if it is only found within a specific MA or other geographic location, then that MA or location is listed instead of the RFOGD.

Table 3.27. Summary of TE species in the UNF.

Common name	Status	Suitable habitat on UNF ?/ Group	Known occurrence on UNF?/ Location	Current Condition
Clay phacelia	Endangered	Yes/ Spanish Fork	Yes, within a few hundred feet of the UNF boundary,/ (Spanish Fork)	Only two locations adjacent to the UNF, both totally less than 100 individuals some years.
Ute ladies'-tresses	Threatened	Yes/ Diamond Fork and Spanish Fork	Yes/ Diamond Fork MA	One of the most valuable populations range-wide and has high priority for conservation and protection.
Western yellow-billed cuckoo	Candidate	Yes/ Deer Creek , Diamond Fork , Payson , American Fork , Spanish Fork	No	Historic nests along the Provo River and in American Fork Canyon
Canada lynx	Threatened	Yes/ West Fork Duchesne MA, Upper Provo MA Strawberry Group	No	Sightings in 2004 in the Strawberry MA and in 2005 in the Soapstone Basin area (West Fork Duchesne MA).

Utah valvata snail (desert valvata): Endangered

Utah valvata snail has not been found on the UNF. In Utah this species is only known from Utah Lake, where it is likely extirpated, and from fossil records (USFS 2003). This species will not be discussed further in the EIS.

Clay phacelia:Endangered

Clay phacelia is a winter annual endemic to Spanish Fork Canyon that occurs on substrates derived from shales of the Green River Formation. This species requires steep, sparsely vegetated slopes among mountain brush and pinyon/juniper communities between 5,900 and 6,500 feet. Potential habitat exists on the UNF, as confirmed by a study comparing soils, vegetation, and physical parameters between occupied and potential sites (USFS 2003). No populations are known to occur on the UNF, but they do occur adjacent to it (within a few hundred yards of the boundary) on private land (USFS 2003). Surveys were conducted on the UNF in conjunction with the LRMP revision and with several project-specific analyses; however, no individuals were found (USFS 2005). The species is known from only two locations in the upper Spanish Fork River drainage, each consisting of several clusters of plants totaling less than 100 individuals in some years (USFS 2003).

Ute ladies'-tresses: Threatened

Ute ladies'-tresses is an orchid dependent on sub-irrigated soils in wet meadows that occur along perennial streams, rivers, lakes, or springs between 4,400 and 6,800 feet elevation (UNPS 2006). This early-seral species often occurs on point bars and sedimentary surfaces created by recent flooding. It prefers open habitats and recent disturbances (USFS 2003). The only known occurrences of Ute ladies'-tresses on the UNF are along Diamond Fork, where more than 60 distinct colonies range yearly from a few hundred to nearly 17,000 total individuals (USFS 2005). Other populations of Ute ladies'-tresses are found on private lands downstream of the

UNF boundary along the Spanish Fork River and in the American Fork and Provo River drainages (USFS 2003). The USFWS considers the Diamond Fork occurrences of Ute ladies'-tresses one of the most valuable metapopulations range-wide, and thus a high priority for conservation and protection (USFS 2003). Since 2001, the number of individuals has decreased due to drought conditions combined with the lowered summer water tables, which occurred following completion of the Diamond Fork water pipeline and restoration of a more natural summer flow to the creek (USFS 2005).

Deseret milkvetch: Threatened

Deseret milkvetch occurs primarily on steep south- and west-facing slopes in open pinyon-juniper communities, and exclusively on sandy-gravelly soils weathered from conglomerate outcrops of the Moroni formation (CPC 2006). Habitat for this species is not found on the UNF (Franklin 2005); most outcrops of the Moroni formation on the UNF are clay-rich volcanic ashes. Deseret milkvetch is a narrow endemic that appears to be restricted to a single site approximately two miles east of the UNF boundary on private lands (in a sagebrush/grass community on substrates derived from a sandstone member of the Moroni formation). Surveys have failed to find this species on similar outcrops in the area (USFS 2003). This species will not be discussed further in the EIS.

Western yellow-billed cuckoo: Candidate

In Utah, western yellow-billed cuckoos are found almost exclusively in dense, low-elevation riparian forests. Riparian forest generally occurs below 7,000 feet on the UNF, with narrowleaf cottonwood being the dominant species. Approximately 6,300 acres of this cover type is mapped within the UNF boundary (4,500 acres on lands administered by the UNF), mainly along Dry Canyon, American Fork River, Deer Creek, the Provo and South Fork Provo River east of Woodland, the Provo River below Deer Creek Reservoir, Hobble Creek, Diamond Fork, Bennie Creek, Nebo Creek, Salt Creek, Red Creek, Pole Creek, Little Valley Creek, and Bennion Creek (USFS 2003). A few pairs of yellow-billed cuckoos have been found along the lower Spanish Fork River near Utah Lake in recent years, but none have been found in surveys conducted on the UNF (USFS 2003). Surveys were conducted in riparian forest habitats on the UNF during spring 2002 along American Fork, the North Fork of American Fork, Right Fork of Hobble Creek, Diamond Fork, Pole Canyon, Bear Canyon, Vernon Creek, and Little Valley Creek; no cuckoos were detected. In 1998 and 1999 yellow-billed cuckoos with brood patches were captured along the Provo River below Jordanelle Reservoir (USFS 2003). Historically, western yellow-billed cuckoos nested in the lower part of American Fork Canyon and along the Provo River (USFS 2003a).

Canada lynx: Threatened

Lynx inhabit boreal and montane habitats dominated by coniferous or mixed forest with thick undergrowth. They require forested landscapes with abundant prey (snowshoe hare [*Lepus americanus*], or when hares are absent, red squirrel [*Tamiasciurus hudsonicus*]) (USFS 2003). Den sites are typically in hollow trees, under stumps or logs, or in thick brush within mature or old growth stands with high log densities (Koehler and Brittell 1990). In the western United States, lynx are primarily associated with lodgepole pine, Engelmann spruce, and subalpine fir (Ruediger et al. 2000). The Uinta Mountains are important habitat for lynx; historically, lynx occurred throughout this area (USFS 2003). After the Canada lynx was declared a threatened species under the Endangered Species Act in 2000, the West Fork Duchesne MA of the Currant

Creek RFOGD and the adjacent Upper Provo RFOGD to the north were selected as Lynx Analysis Units (LAUs) because these watersheds contain much of the UNF’s spruce/fir forest, and because of their connectivity to high-elevation conifer forests to the north and northeast in the Uinta Mountains where lynx occurred historically (see figure 3.24: Forest-wide Wildlife Map) (USFS 2003a).

In 2004 two lynx (one male and one female) were detected on the UNF. Both had previously been translocated to Colorado and had radio-transmitter collars; neither lynx stayed in one area for more than one week, eventually moving off the UNF. The male passed through the Strawberry area in July 2004; the female was located at several locations on the UNF during the fall of 2004 (USFS 2005). In January 2005, a collared female lynx from Colorado was tracked by airplane and located in the Soapstone Basin on the west end of the Uinta Mountains (USFS 2006).

Razorback sucker, Colorado pikeminnow, humpback chub, and bonytail: Endangered

There are five Federally-listed (Endangered) fish species that could be impacted via downstream effects if activities are implemented that would take water from drainages inhabited by these species. None of these species actually occur on the UNF or have potential habitat on the UNF. Only the eastern portion of the UNF on both the Heber and Spanish Fork Ranger Districts has tributaries that flow into the Colorado River drainage, where these species have occurred in the past. Canyons of the Green River and Colorado River are likely the only remaining habitat in the State. Numerous dams in the river system below the UNF limit any potential effects from Forest Service management activities to these species. The populations of these fish continue to decline and recovery may not be likely (USFS 2003). These species will not be discussed further in the EIS.

June sucker: Endangered

The June sucker is a lake sucker endemic to Utah Lake and the mouth of the Provo River. Spawning only occurs in the Provo River. Suitable habitat for June sucker consists of 1) 1-3 feet of high quality water constantly flowing over a clean, unsilted gravel substrate, and 2) shallow areas with low velocities connected to the main channel of the river for sucker larvae (FR Volume 51, Page 10857). No habitat or current use of the UNF by the June sucker is known. Three populations have been introduced to locations off the UNF, including Camp Creek Reservoir and Rosebud Pond in Box Elder County, Red Butte Reservoir on the Wasatch-Cache National Forest; and at the Ogden Nature Center in Weber County (USFS 2003). This species will not be discussed further in this EIS.

Introduction to Sensitive Species and MIS

Sensitive Species

Sensitive species are those species with significant and predicted downward trends in population numbers, density, and/or habitat capability. Sensitive species must receive special management emphasis to reverse or stabilize the downward trends that could result in the need for Federal listing (FSM 2672.1). There are a number of sensitive species that occur or have habitat in the UNF that will be discussed in this EIS. These species are summarized in table 3.28. All species summarized in table 3.28 have suitable habitat in the UNF.

Table 3.28. Summary of Sensitive Species in the UNF and locations in RFOGDs.

Common name	Known presence or suitable habitat in UNF?/Location
Barneby woody aster	Yes, presence in Payson Group
Dainty moonwort	Yes, presence in Upper Provo Group
Slender moonwort	No, suitable habitat in Upper Provo Group, Currant Creek Group, Strawberry Group, and Vernon Group
Garrett's bladderpod	Yes, presence in American Fork Group, Deer Creek Group, habitat in Payson Group, Strawberry Group
Rockcress draba	Yes, presence in American Fork Group
Wasatch jamesia	Yes, presence in American Fork Group, Deer Creek Group, habitat in Payson Group
Bald eagle	Yes, winter presence in American Fork Group, Deer Creek Group, Diamond Fork Group, Payson Group, Spanish Fork Group, Strawberry Group, and Vernon Group
Boreal owl	Yes, presence in Currant Creek Group and nest in Upper Provo Group
Flammulated owl	Yes, habitat in Currant Creek Group, Deer Creek Group, Diamond Fork Group, Payson Group, Strawberry Group; nest in American Fork Group
Northern goshawk	Yes, nest in American Fork Group, Currant Creek Group, Deer Creek Group, Diamond Fork Group, Payson Group, Strawberry Group, Upper Provo Group; presence in Spanish Fork Group
Peregrine falcon	No, historic nests in Deer Creek Group
Three-toed woodpecker	Yes, presence in American Fork, Currant Creek, Deer Creek, Payson, Strawberry, Upper Provo
Sage-grouse	Yes; presence in Strawberry, Vernon
Spotted bat	Yes, presence in American Fork; habitat in Currant Creek, Deer Creek, Payson, Upper Provo, Vernon
Townsend's big-eared bat	Yes, habitat in Currant Creek, Upper Provo; presence in American Fork, Deer Creek, Payson, Vernon
Fisher	Yes, suitable habitat only, historic presence at Trial Lake (Ashley National Forest)
Wolverine	Yes, historic presence in American Fork, Deer Creek
Colorado River cutthroat trout	Yes, presence in Currant Creek, Strawberry
Bonneville cutthroat trout	Yes, presence in American Fork, Deer Creek, Diamond Fork, Payson, Spanish Fork, Strawberry, Upper Provo
Columbia spotted frog	Yes, presence in Deer Creek, Diamond Fork, Upper Provo

Management Indicator Species

Management Indicator Species (MIS) are species that the UNF uses to evaluate and monitor management practices. These species serve as ecological indicators of the effects of management actions on communities. Table 3.29 is a listing of MIS in the UNF and the communities they represent. The communities they represent are found in all RFOGDs except aspen/conifer in West Sheeprock MA and riparian in Mona MA.

Table 3.29. MIS in the UNF.

Common Name	Scientific Name	Management Indicator Community
Northern goshawk	<i>Accipiter gentilis</i>	Aspen/conifer
Three-toed woodpecker	<i>Picoides tridactylus</i>	Conifer
American beaver	<i>Castor canadensis</i>	Riparian
Bonneville cutthroat trout	<i>Oncorhynchus clarki utah</i>	Aquatic
Colorado River cutthroat trout	<i>Oncorhynchus clarki pleuriticus</i>	Aquatic

Source: LRMP: Appendix B.

Description of Sensitive Species and MIS

The following is a description of sensitive and MIS that have not been previously described under TE and candidate species.

Barneby woody aster: Sensitive

Barneby woody aster or Barneby’s rock aster (Franklin 2005) is endemic to the Bear River, Wasatch, and Canyon Mountains, and occurs mainly on Precambrian quartzite stratum where it grows from crevices in rock outcrops, cliffs, and ledges. Barneby woody aster tolerates a wide range of elevations (between 5,000 and 11,750 feet). At lower elevations this species seems to be restricted to north exposures and protected sites, often on steep canyon walls adjacent to perennial streams; at higher elevations individuals grow on all aspects, often on exposed sites (USFS 2003). Barneby woody aster may be an ecotypic variant of King woody aster (*Aster kingii* var. *kingii*), which is well distributed throughout the Wasatch and Bear River Mountains with good population numbers (Tuhy 1991 and USFS 2003). Documented occurrences of plants with characteristics of Barneby woody aster on calciferous substrates on Mount Nebo (four locations; Franklin 2005) in the Wasatch Mountains exhibit various degrees of the two variants and are considered King woody aster along with all other woody asters in the Wasatch Mountains (on and off the UNF; Welsh 2003 and USFS 2003). The Utah Natural Heritage Program, however, recognizes the two varieties and classifies the Mount Nebo individuals as Barneby woody aster (Franklin 2005).

Dainty moonwort: Sensitive

Dainty moonwort is a diminutive, ephemeral fern that occurs in portions of wet meadows, marshes and bogs, frequently atop tussocks or other raised areas. Dainty moonwort is frequently sympatric with other species in the genus that have very similar characteristics. In Utah, dainty moonwort is known from a single location that occurs within the UNF, in a large wet meadow on the southwestern flank of the Uinta Mountains immediately adjacent to a road and a heavily used dispersed campsite (USFS 2003). More than 10,000 individuals were observed at this location in 1994, and although less than 150 were observed in 2002 the population appears stable. Extensive plant collection efforts across the Uinta Mountains have failed to locate the species elsewhere on the UNF; thus, this population is considered essential to the maintenance of genetic diversity and viability of the species (USFS 2003).

Slender moonwort: Sensitive

Slender moonwort is a small perennial fern that is relatively distinctive when compared to other *Botrychium* species (e.g., dainty moonwort). Slender moonwort has been found in a wide variety of habitats, including grass-forb meadows, under trees in woods, and on shelves of limestone

cliffs. The species occurs between 5,000 and 6,500 feet elevation (UNPS 2007). Suitable habitat for slender moonwort occurs on the UNF but the species does not. Historical populations are thought to have occurred in Indian Canyon in either Duchesne or Carbon County (southeast of the UNF) and in Big Cottonwood Canyon (north). Intensive surveys have been conducted in suitable habitat near the historical occurrences and have failed to locate the species (Franklin 2005). Suitable habitat on the UNF includes mapped wet meadow areas in Upper Provo, Currant Creek, Strawberry, and Vernon RFOGDs.

Rockcress draba: Sensitive

Rockcress draba is a small, herbaceous perennial that occurs in gravelly tundra soils above the timberline, often in moist soils near the edges of receding snowbanks. Occasionally this species is found in spruce-fir krummholz habitat. Rockcress draba is endemic to Utah in the Deep Creek, Uinta, and central Wasatch Mountains, where it is relatively abundant (Franklin 2005). Systematic surveys for this species have not been conducted on the UNF (USFS 2003). One of the two known occurrences in Utah is within the Wasatch-Cache portion of the Lone Peak Wilderness Area, just a few hundred feet below a ridgeline that forms the boundary with the UNF (Stone 1995; USFS 2003). In 2002 a population was discovered within the UNF boundary in the same area (USFS 2003).

Wasatch jamesia: Sensitive

Wasatch jamesia is a shrubby saxifrage that occurs over a wide range of elevations at the base of cliffs on north-facing slopes or in well-shaded cracks. The species can be found on an array of rock substrates, including limestones, quartzites, and granitics, but appears to show preference for a particular rock band in some locations. Wasatch jamesia is endemic to the central Wasatch Mountains and the Deep Creek Mountains of Utah. On the UNF, it is known to occur on limestone outcrops and cliffs in the main stem of American Fork Canyon, in the North Fork of American Fork Canyon, on Mount Timpanogos, and in Provo and Rock Canyons (USFS 2003). Systematic surveys for Wasatch jamesia across the entire UNF have not been completed. Occurrences of this species on the UNF are abundant relative to occurrences elsewhere, which are patchy and inconsistent in terms of apparent habitat preference (USFS 2003).

Garrett's bladderpod: Sensitive

Garrett's bladderpod is a small, low-growing perennial mustard that occurs between 8,900 and 11,400 feet on talus slopes and other unstable, sparsely vegetated substrates in subalpine and alpine zones (Tuhy 1991 and USFS 2003). It is also found on or near weathered rock outcrops, often along ridge crests. This species is endemic to the central and southern Wasatch Mountains, from Big Cottonwood Canyon to Provo Peak. The Uinta and Wasatch-Cache National Forests provide most (80-90 percent) of the known and potential habitat for Garrett's bladderpod throughout its range. On the UNF, Garrett's bladderpod occurs on at least six sites on Mount Timpanogos and Provo Peak (Tuhy 1991) that are sparse and contain only a few tens of individuals each, but appear to be stable populations (USFS 2003).

Bald eagle: Sensitive

In Utah, the bald eagle is primarily a winter resident, with only limited breeding occurring within the State (USFS 2003). Wintering bald eagles are opportunistic feeders that can be found in a variety of habitats, most often congregating near rivers, lakes, and marshes looking for unfrozen, open water from which to catch fish and waterfowl. Along rivers, bald eagles typically perch and roost in large cottonwood trees and snags (USFS 2003, Buehler et al. 1991a and 1991b). No bald

eagle nests have been found on or near the UNF. In winter, they have often been seen in Heber Valley, the Vernon Unit, in canyons along the Wasatch Front (including Provo Canyon, American Fork, Hobbie Creek, White River, and Diamond Fork), and on the Nebo Unit along Salt Creek (USFS 2005). Wintering bald eagles in the Vernon area are known to roost and hunt from large juniper trees (USFS 2003).

Boreal owl: Sensitive

In the Rocky Mountains, Boreal owls inhabit mature, multilayered spruce/fir forests, nesting in tree cavities often made by woodpeckers. Dense canopy cover that provides cool microsites for daytime summer roosting may be important in the western States (Hayward and Verner 1994). Boreal owls have been detected on the UNF in Soapstone Basin, where a nest was found in an aspen tree in 2001, and near Wolf Creek Summit. To maintain Boreal owl habitat, Hayward and Verner (1994) state that timber management must maintain mature and older forests across the landscape, specifically uneven-aged management that maintains large-diameter trees, canopy structure, and forest floor moisture to provide nesting, roosting, and foraging habitat (USFS 2003).

Flammulated owl: Sensitive

Flammulated owls inhabit montane forest, specifically mature and old growth ponderosa pine and Douglas-fir habitats with open stand structure. This species typically nests in large cavities made by woodpeckers and feeds on nocturnal arthropods (USFS 2003). On the UNF, most nests have been found in aspen trees within stable aspen or seral aspen forest. Flammulated owls have a low reproductive rate, with a large variation in adult survival. Timber harvesting can have negative impacts on flammulated owls if large old trees, open stand structure, and some dense vegetation for roosting are not retained (McCallum 1994; USFS 2003).

Northern goshawk: Sensitive and MIS

Goshawks nest in a wide variety of forest types, including coniferous, deciduous, and mixed forests, and usually in mature or old-growth stands. The largest trees in dense, mature stands with high canopy closure (60-95 percent) are usually selected for nest sites (USFS 2003). Goshawks forage in a variety of habitat types, including open habitats and early-seral vegetation. The goshawk is broadly associated with forested vegetation types on the UNF, occurring in stable aspen, seral aspen, spruce/fir, Douglas-fir/white fir, and forested riparian vegetation types. Goshawks prey on a wide variety of birds and small mammals, most often woodpeckers, jays, grouse, snowshoe hares, or red squirrels. The UNF has been monitoring goshawk territory occupancy since 1996. In 2004 six of fifteen (40 percent) monitored territories were occupied (USFS 2005). In 2005 ten of sixteen (63 percent) territories were occupied (a new territory was discovered in Rock Canyon in 2005) (USFS 2005b). Suitability analysis for goshawk determined that 260,500 acres were capable for nesting, 306,620 acres were capable for PFA habitat, and 556,070 acres were capable for goshawk foraging on the UNF (USFS 2006i).

Peregrine falcon: Sensitive

Peregrine falcons occupy a wide variety of open habitats, nesting on cliffs, river banks, tundra mounds, large stick nests of other species, tree cavities, and human-made structures. They forage wherever prey concentrate, particularly on tidal flats, river mouths, lakeshores, farmlands, dunes, beaches, and river valleys (USFS 2003). Peregrine falcons nested throughout much of Utah in the past, but are now restricted to the Colorado Plateau and a few locations along the Wasatch

Front, some of which fall within the UNF boundary east of Orem and Provo. In general, populations are increasing in Utah (USFS 2003).

Three-toed woodpecker: Sensitive and MIS (Utah Partners in Flight (PIF) Priority)

Three-toed woodpeckers inhabit coniferous forests, primarily spruce, where they excavate their own nest cavities in snags or occasionally in live trees. Up to 75 percent of their diet consists of wood-boring beetles and caterpillars that attack dead or dying conifers (USFS 2003). Populations have been shown to increase in some areas three to five years after forest fires, presumably in response to spruce beetle outbreaks (Koplin 1969 and 1972). On the UNF, three-toed woodpeckers occur in conifer forest types and are most closely associated with the spruce/fir forest type (USFS 2005). Five individuals have been recorded since 2001 on the Annual Breeding Bird Survey (BBS) routes located within the UNF, most on the Soapstone route (Upper Provo, Currant Creek RFOGDs). In 2004 three-toed woodpeckers were detected at 14 of 43 (33 percent) survey stations across the UNF (following Forest-wide survey protocols drafted in 2003), and at an additional 17 locations during project surveys or incidental observations on the UNF. In 2005 at least one woodpecker was detected at 17 of 42 (40 percent) survey stations, and at an additional 45 locations (USFS 2005c). In both years, individuals were detected in spruce/fir, Douglas-fir, and lodgepole pine forest types, and commonly detected in areas with spruce beetle activity (USFS 2005). Suitability analysis for three-toed woodpecker determined that 67,110 acres were capable for nesting and 25,820 acres were capable for foraging and wintering on the UNF (USFS 2006j).

Greater Sage-grouse: Sensitive

Greater sage grouse occur in sagebrush habitats, using open areas for breeding display sites. Sage grouse prefer heavy canopy cover for nesting, and relatively open stands for early brood-rearing (Connelly et al. 2000; USFS 2003). Two populations occur on the UNF: one in Strawberry Valley and one in the Vernon Unit (USFS 2003). The Strawberry Valley population numbers 100-150 birds; during winter, these individuals move east to lower elevations between Currant Creek and Red Creek on the western edge of the Uinta Basin. There is one primary sage grouse lek on the Vernon Unit, where UDWL has been conducting lek counts since 1968 (USFS 2003). Nineteen sagebrush or sage/grass sites were studied on the Vernon MA in 2003; of the five sites with data from previous years, four were trending downward (USFS 2005).

Fisher: Sensitive

Fishers inhabit a wide variety of forest types, including coniferous, mixed, and deciduous, preferring late-successional forests and avoiding non-forested areas. They typically select structural characteristics associated with old forests for resting and denning sites, which include tree hollows, snags, or logs. Fishers may also den in the ground or in rocky crevices. Fishers are generalized predators, eating mainly small- to medium-size mammals and birds, as well as carrion and fruit. Snowshoe hares are very common prey species, as are porcupines. Fishers were extirpated over much of their former range in the U.S. and eastern Canada as a result of trapping and extensive logging (Powell and Zielinski 1994). The only fisher record in Utah is a record of tracks that were observed at Trial Lake in the western Uinta Mountains in 1938 (USFS 2003). It is unlikely that fishers occur in Utah or on the UNF (USFS 2003), although suitable habitat does occur. This species will not be discussed further in the EIS.

Spotted bat: Sensitive

Spotted bats occur in a wide variety of habitats, including ponderosa pine (*Pinus ponderosa*) forests, pinyon/juniper woodlands, canyon bottoms, open pastures, and hayfields. Elevations are also wide-ranging, from below sea level to approximately 10,000 feet. Limited observations indicate that spotted bats roost in cracks and crevices in rocky outcrops, cliffs, and canyons (USFS 2003). Migration patterns are poorly understood, but populations from lower elevation habitats apparently do not migrate. Spotted bats have been recorded in American Fork Canyon and in the city of Provo. Little is known about the distribution or habitat use patterns of spotted bats on the UNF. Most spotted bat records in Utah come from southern Utah, where hibernating individuals have been found in caves (USFS 2003).

Townsend's big-eared bat: Sensitive

In Utah, Townsend's big-eared bat is considered one of the most common bat species in the State, roosting in a variety of desert and forest communities. In a survey of 820 potential roosting sites in northern Utah, abandoned mines and caves with small to midsize openings located at low to middle elevations, in areas dominated by sagebrush grassland, juniper woodlands and mountain brush communities were most likely to be occupied by big-eared bats (Sherwin et al. 2000). In winter, both sexes hibernate in mines or caves. Townsend's big-eared bats have been found in or near the UNF along the Wasatch Front, in American Fork Canyon, Slide Canyon, Rock Canyon, the city of Provo, Powerhouse Mountain near Hobble Creek Canyon, Diamond Fork Canyon, in the Vernon RFOGD, and in Bear Canyon on the Nebo Unit (USFS 2003).

Wolverine: Sensitive

Wolverines inhabit alpine tundra, boreal, and subalpine coniferous forests, occupying higher-elevation habitats in summer and lower-elevation habitats in winter (USFS 2003). In northern tundra regions, wolverines primarily use snow tunnels for natal dens; in others, rocky areas, such as talus slopes and boulder fields are used. Where wolverines occur in forested regions, den sites are typically large hollow snags, logs, root wads, or stumps. Wolverines have very large home ranges (up to 350 square miles and eat a wide variety of foods in snow-free months, including snowshoe hares, porcupines, squirrels, other small mammals, and berries (Banci 1994). Winter diets primarily consist of ungulates, from scavenging on carrion (USFS 2003).

Historically, wolverines were found throughout the Wasatch Range, the central High Plateaus, and the Uinta Mountains. There are two records of wolverine sightings on the UNF: one along Silver Creek near Silver Lake and one along the Provo River just below Deer Creek Dam in 1977. More recent sightings in Utah are from 1990: one in the Uinta Mountains in Daggett County and one in the Wasatch Range in Morgan County. It is not clear whether wolverines have been extirpated from Utah or if they may still occur at very low densities in some areas (USFS 2003).

Colorado River cutthroat trout: Sensitive and MIS

Habitat for Colorado River cutthroat trout typically includes well oxygenated, clear, cool water in rivers, streams, and lakes with clean gravel, cobble, and boulder substrate, and abundant cover. In general, cutthroat trout are limited to cooler, clearer tributaries high in a watershed (Behnke 1992). The initiation of spawning is influenced by water temperature, increased water discharge from runoff, elevation, and latitude. The distance cutthroat trout travel to spawn is generally short and the post-spawning mortality rate is high. Optimal stream habitat for spawning

is characterized by clear, cold, relatively silt-free water with rocky substrate and riffle:pool ratios of approximately 1:1 (USFS 2003).

All of the major rivers and streams within the UNF have been assessed for the presence or absence of Colorado River cutthroat trout, and riparian and aquatic habitat inventories have also been completed. The UNF holds approximately four percent of the remaining populations of Colorado River cutthroat trout that occur on NFS lands, which contain 95-100 percent of the remaining populations of this species (May 2003). Cutthroat have been extirpated from the majority of streams on the UNF, although remnant populations have been found in the West Fork Duchesne River, Upper Currant Creek, Willow Creek, and the Right Fork of White River. Trout habitat improvement pilot projects were completed (as mitigation from Central Utah Project impacts) on West Fork Duchesne, Currant Creek, Strawberry River and its tributaries above Soldier Creek Dam, and upper Diamond Fork and Sixth Water Creek in the upper portion of the Spanish Fork River (USFS 2003).

Bonneville cutthroat trout: Sensitive and MIS

Habitat and spawning requirements for Bonneville cutthroat trout are similar to those for Colorado River cutthroat trout. The UNF holds approximately 5 percent of the populations of Bonneville cutthroat trout that occur on NFS lands, which contain 80-90 percent of the remaining populations of this species (May 2003, USFS 2003:F-23). Bonneville cutthroat trout have been extirpated from the majority of streams on the UNF, although remnant populations have been found in the following RFOGDs: American Fork, Deer Creek, Diamond Fork, Payson, Upper Provo, and Upper Spanish Fork (USFS 2003).

Columbia spotted frog: Sensitive

The Columbia spotted frog is a true frog that inhabits aquatic systems with ponded habitats possessing emergent vegetation (USFS 2003). Spotted frogs typically occur along the margins of streams, lakes, ponds, springs, and marshes. They breed in shallow water in ponds or other quiet waters. In 2002, spotted frogs were observed by Utah Division of Wildlife Resources (UDWL) biologists on BOR property within the UNF boundary in the lower Diamond Fork drainage. This is the only population known to occur within the UNF boundary. There is a current population along the Provo River below Jordanelle Dam, and additional populations were found in 2002 along the upper Provo River east of Woodland on private land and on the Wasatch-Cache National Forest. These populations are very close to the northern boundary of the UNF (USFS 2003).

American beaver: MIS

Beavers are herbivores that live in family colonies (4-8 individuals) and build dams out of willow or aspen (on the UNF) in perennial slow-moving streams, ponds, small lakes, and reservoirs (USFS 2006c). Beavers are common and well distributed in suitable riparian habitat across the UNF. The American beaver is classified as MIS on the UNF because of its close association with riparian habitats and its “keystone” ecological role in these areas. The beaver’s dam-building behavior significantly affects ecosystem structure and function as well as the habitat of numerous plant and animal species (USFS 2005a). Monitoring reports show the density of active beaver colonies in the Strawberry area was about one per five miles of stream in both 2004 and 2005. Suitability analysis in 2006 for beaver habitat on the UNF found 30,560 acres of suitable waterbodies and 880 suitable stream miles (USFS 2006c).

3.9.3 Introduction to Wildlife

All vegetation types on the UNF provide habitat for wildlife; vegetation is described in Section 3.8: Vegetative Resources, Including Upland Vegetation, Noxious Weeds, and Invasive Species. Due to the wide variety of vegetation on the UNF, the diversity of wildlife species is also high (USFS 2003a). The wildlife species discussed in this section include those evaluated for viability concern in the LRMP FEIS (Appendix F), those not already discussed in the special status species section, and other terrestrial wildlife species, such as big game. Other information was taken from UNF reports (e.g., capability/suitability analyses, State of the Forest Reports), UDWL, and others, as cited. Additional information specific to MAs can be found in the LRMP.

Noise levels on the UNF are generally low in fall, winter, and spring. The main sources of noise on the UNF come from recreational and other vehicles during summer (e.g., ATVs, boats; see Section 3.13: Developed and Dispersed Recreation). Areas with more developed recreation sites (e.g., Strawberry Valley) have relatively high noise levels, while dispersed recreational activities, such as ATV use, create less predictable noise occurrences in certain areas. In general, wildlife species' sensitivity to noise depends on temperament, sex, age, and prior experience with noise (National Park Service 1994). Some species may habituate to noise (Larkin 1996, Thomson and Henderson 1998) while others may exhibit a wide range of distress behaviors (FHWA 2004).

Wildlife is divided into the following categories:

- Mammals, including big game, bats, predators
- Birds, including raptors and owls, upland game birds, woodpeckers, migratory birds
- Fishes
- Reptiles

Each of the categories is summarized below. Each summary includes a brief list of the species included in each category, a description of their habitat, and known locations in the UNF.

Mammals

Big Game

Mule deer (*Odocoileus americanus*) have declined from higher population levels in the 1960s, but are currently at or near population objectives established by the UDWL, as are Rocky Mountain elk (*Cervus Canadensis*) (USFS 2003b). Moose (*Alces alces*) herds are thought to be reaching a population plateau in northern Utah after many years of rapid population growth (UDWL 2000a). Bighorn sheep populations on the UNF are increasing (UDWL 2000d); mountain goat populations are stable (UDWL 2000e). In general, the size and condition of big game populations are primarily determined by the quantity and quality of their habitat (UDWL 2000a, 2000b, and 2000c).

Designated critical habitats for elk and mule deer within each RFOGD are shown in figure 3.24, and are described under each RFOGD separately at the end of this section. Mule deer, elk, and moose tend to use different habitats between summer and winter. Most of the UNF is considered summer range for big game (mule deer, elk, and moose), providing forage in addition to calving (elk and moose) and fawning (mule deer) habitat. Seral and stable aspen forests are especially important for providing calving/fawning habitat, forage, and browse for mule deer, elk, and

moose (USFS 2003b; USFS 2003). Also important for big game summer range is spruce-fir (providing cover), Douglas-fir (cover and browse), upper elevation riparian wet meadow (forage and cover), forested riparian, as well as sagebrush and mountain brush at higher elevations (forage) (USFS 2003).

Although the majority of big game (mule deer, elk, and moose) winter range is located on private lands below the UNF, lower-elevation areas on the UNF do provide important winter range, especially oak/maple habitat along the Wasatch Front (see LRMP, Appendix E: Deer and Elk Winter Range Maps). Much of the winter range off the UNF has been impacted by urban growth and development (particularly along the Wasatch Front), thus increasing the importance of winter range on the UNF. Winter range trend study sites have been established as part of a State-wide Forest Service/ UDWL monitoring study. Twenty-nine sites were evaluated in 2002, at which soil conditions showed a stable or downward trend, browse conditions were predominantly stable, and herbaceous understory conditions showed a stable or downward trend. Browse utilization was described as moderate to heavy or heavy. Drought conditions and fires have contributed to the increased number of sites with downward trends (USFS 2003b).

Lower elevation sagebrush, mountain brush, and forested riparian communities (below 7,000-7,500 feet) also provide important winter range forage for big game (mule deer, elk, and moose). Pinyon-juniper provides winter range for elk and deer. UDWL winter range monitoring in sagebrush shows that trends for soil, browse, and herbaceous cover are generally static; however, a detailed study at three sites along the Wasatch Front shows accelerated decline in the vigor of sagebrush plants and little recruitment over the last eight years (USFS 2003).

Alpine habitats on the UNF provide habitat for Rocky Mountain bighorn sheep (*Ovis canadensis canadensis*) and mountain goats (*Oreamnos americanus*). Both species are herbivores and prefer rugged, high elevation terrain. Rocky Mountain bighorn sheep were reintroduced, unsuccessfully, to Mount Nebo in the 1970s. In 2000 25 bighorn sheep were reintroduced onto Mount Timpanogos and additional releases occurred in 2001 in the Cascade Mountain/Provo Peak area. Mountain goats were first introduced to Utah in 1967 in the Twin Peaks area, north of Little Cottonwood Canyon. That herd has grown and subsequent introductions have occurred on Mount Timpanogos and in the Cascade Mountain/Provo Peak area. Mountain goats have also been sighted on Spanish Fork Peak (USFS 2003).

Bats

Eighteen species of bats occur in Utah. Two species are sensitive (Townsend's big-eared bat and spotted bat); these are discussed in Section 3.9.2: Introduction to Special Status Species. All are nocturnal and exhibit strong roost fidelity; many have established feeding territories. Moths are the most common prey item. Bats may migrate south for winter and roost in trees or crevices (USFS 2003), or they may hibernate and roost in caves or mines. Most bats in Utah hibernate, although only a small percentage of caves and mines provide suitable habitat with proper temperatures, air circulation, and abundant food supply for maternity roosting and hibernation. Maternity colonies are particularly sensitive to disturbances. Bats may use abandoned mines more frequently than caves due to increased human disturbance in caves (Rogers and Sherwin 1997). Structural features resulting from mining activity (bald head raises, domes, stopes, and rooms) may also contribute to suitable microclimates in mines (Diamond and Diamond 2003).

USFS crews surveyed mines across northern Utah in 1993; ten different bat species were detected in 193 out of 355 mines. On the UNF, fringed myotis (*Myotis thysanodes*), long-legged myotis (*M. volans*), small-footed myotis (*M. ciliolabrum*), long-eared myotis (*M. evotis*), little brown myotis (*M. lucifugus*), and big brown bat (*Eptesicus fuscus*) were detected on the Spanish Fork district (along the Wasatch Range); small-footed myotis, little brown bat, and big brown bat were detected on the Pleasant Grove district. Bats are most abundant in mines on the Vernon Unit. In a survey of 76 mine openings and 35 adits by Diamond and Diamond (2003) in the Vernon RFOGD, one adit served as a hibernaculum for Townsend's big-eared bats, long-eared myotis, and western pipistrelle bats (*Pipistrellus hesperus*). Another served as a maternity roost for long-legged myotis and big brown bats. The remaining adits were night and/or day roosts.

Predators

Predator populations are supported in large part by the presence of prey species in a given area. Common prey species such as squirrels (*Spermophilus sp.*), chipmunks (*Neotamias sp.*), and rabbits (*Lepus sp.*) are present in most habitat types on the UNF, while other prey animals are more restricted. Snowshoe hares (*Lepus americanus*; the preferred prey of Canada lynx; see Section 3.9.2: Introduction to Special Status Species) and porcupine, for example, are present only in conifer habitats. Beavers (*Castor canadensis*), gophers (*Thomomys sp.*), voles (*Microtus sp.*), mink (*Mustela vison*), and muskrats (*Ondatra zibethicus*) are only present in riparian areas or wet meadows. Alpine habitats provide unique habitat for long-tailed weasels (*Mustela frenata*), yellow-bellied marmots (*Marmota flaviventris*), and American pikas (*Ochotona princeps*; USFS 2003). Few predators prey exclusively on one or a few prey species, thus most are habitat generalists. Common predators on the UNF include mountain lions (*Felis concolor*), coyotes (*Canis latrans*), and red foxes (*Vulpes vulpes*). Black bears (*Ursus americanus*) are omnivores common in forested areas on the UNF and may occasionally be predatory. The American marten was evaluated for viability and is described below.

Birds

The LRMP FEIS contains a table (table 3-73, USFS 2003) showing habitat associations for birds evaluated for viability concern on the UNF. All vegetation types on the forest provide habitat for birds, although the greatest number of bird species can be found in riparian (both forested and non-forested), conifer, and pinyon-juniper habitats. Birds of prey (raptors and owls), upland game birds, woodpeckers, and migratory birds are discussed below.

Raptors and Owls

Raptors and owls generally nest in forested (i.e., conifer or pinyon-juniper habitat on the UNF) and riparian areas, in large trees, or on cliffs; some species nest in open areas on the ground or beneath shrubs. In the UNF, golden eagles (*Aquila chrysaetos*), turkey vultures (*Cathartes aura*), and ravens (*Corvus corax*) nest on cliffs (USFS 2003). Foraging by raptors and owls for birds, small mammals, reptiles, insects, or fish may occur in any relatively open vegetation. Common species on the UNF include sharp-shinned hawks (*Accipiter striatus*), Cooper's hawks (*Accipiter cooperii*), northern saw-whet owl (*Aegolius acadicus*), osprey (*Pandion haliaetus*), Swainson's hawk (*Buteo swainsoni*), and great horned owl (*Bubo virginianus*). Species evaluated for viability that may occur on the UNF are listed below.

Upland Game Birds

Several upland game birds (grouse) are native to Utah and occur on the UNF. Grouse hens nest in the spring; nests are typically built at the base of small trees or shrubs. Ruffed grouse (*Bonasa*

umbellus) can be found in forested riparian or oak maple habitats; blue grouse (*Dendragapus obscurus*) are restricted to conifer habitats (spruce/fir and Douglas-fir/white fir on the UNF). Greater sage grouse (*Centrocercus urophasianus*) was evaluated for viability and is described below.

Woodpeckers

Woodpeckers generally nest in snags (standing dead trees) and dead branches, and forage on insects within both live trees and snags. Most woodpeckers are primary cavity nesters (i.e., excavate their own cavity). Woodpeckers on the UNF generally occur in Douglas-fir/white fir or stable aspen habitat (USFS 2003), and include downy woodpecker (*Picoides pubescens*), hairy woodpecker (*P. villosus*), three-toed woodpecker (sensitive and MIS; discussed in Section 3.9.2: Introduction to Special Status Species), and Lewis’s woodpecker (*Melanerpes lewis*), which frequently uses cavities excavated by other woodpeckers (USFS 2003). Lewis’s woodpecker was evaluated for viability and is described below.

Migratory Birds

Migratory birds occur in all habitats on the UNF. Aspen (stable) and conifer forests (both spruce/fir and Douglas-fir/white fir) are important for cavity-nesting birds, particularly those areas containing mature trees. Other migratory birds have unique habitat associations in pinyon/juniper and oak maple habitats, shrub habitats (i.e., sagebrush, mountain brush), and in alpine areas. Riparian areas have relatively high species richness, and are the most important habitat to migratory birds. According to the Utah Partners in Flight Avian Conservation Strategy, lowland riparian habitats (below about 5,500 feet elevation) were used by more bird species as primary or secondary breeding habitat than any other habitat type (i.e., mountain riparian, wetland, or wet meadow) in Utah (Parrish et al. 2002; USFS 2003). However, the UNF contains relatively little lowland riparian habitat. Most migratory birds on the UNF utilize pinyon/juniper, forest, or shrubsteppe.

Migratory birds evaluated for viability in the LRMP FEIS are described in table 3.30. In addition to the LRMP FEIS (F:71-82), information is taken from Bosworth (2003), CPC (2006), Parrish et al. (2002), and UDWL (2006).

Table 3.30. Migratory birds* (including TE species) evaluated for viability that may occur on the UNF.

Species	Breeding Habitat	UNF occurrence	Nesting substrate
Bald eagle <i>Haliaeetus leucocephalus</i>	Large trees near water	Common in suitable habitat (winter)	Trees (conifers) or cliffs
Black rosy-finch <i>Leucosticte atrata</i>	Alpine	Mt. Timpanogos	On the ground or cliffs
Black swift <i>Cypseloides niger</i>	All forest; waterfalls and wet cliffs	Mt. Timpanogos, Provo Canyon	Cliffs
Black-throated gray warbler <i>Dendroica nigrescens</i>	Pinyon/juniper	Common in suitable habitat	Trees (conifers or deciduous)
Boreal owl <i>Aegolius funerus</i>	Mature spruce/fir forest; some individuals migrate	Wolf Creek Summit, Soapstone Basin, and Soapstone Mountain	Snags

Species	Breeding Habitat	UNF occurrence	Nesting substrate
Brewer's sparrow <i>Spizella breweri</i>	Sagebrush	Common in suitable habitat	Shrubs
Broad-tailed hummingbird <i>Selasphorus platycercus</i>	All habitats except sagebrush	Common in suitable habitat	Trees (conifers or deciduous)
Ferruginous hawk <i>Buteo regalis</i>	Pinyon-juniper	Historic occurrence in the Vernon RFOGD	Trees (conifers) or cliffs
Flammulated owl <i>Otus flammeolus</i>	Mature ponderosa pine and Douglas-fir	American Fork – south fork	Snags
Great gray owl <i>Strix nebulosa</i>	Dense conifer and hardwood forest	Wolf Creek Summit area	Trees or snags
Lewis' woodpecker <i>Melanerpes lewis</i>	Ponderosa pine	Salamander Lake	Trees (deciduous) or snags
Northern goshawk <i>Accipiter gentilis</i>	Mature forest	Common in suitable habitat	Trees (conifers or deciduous)
Peregrine falcon <i>Falco peregrinus</i>	Variety of open habitats	None recent	Trees or cliffs
Purple martin <i>Progne subis</i>	Aspen (cavities), forested riparian; open habitats near water	Strawberry Res., Payson lakes, Provo River	Snags
Sage sparrow <i>Amphispiza belli</i>	Sagebrush	Infrequent	Shrubs or on the ground
Sandhill crane <i>Grus canadensis</i>	Riparian, wet meadow	Strawberry Valley	On the ground
Short-eared owl <i>Asio flammeus</i>	Open habitats with low vegetation	Vernon RFOGD, Strawberry Valley, Buckley Draw	On the ground
Veery <i>Catharus fuscescens</i>	Forested riparian	None recent	On the ground or shrubs
Virginia's warbler <i>Vermivora virginiae</i>	Oak/maple, pinyon/juniper	Common in suitable habitat	On the ground
Western yellow-billed cuckoo <i>Coccyzus americanus</i>	Lowland riparian	None recent	Trees (cottonwood or willow)
Williamson's sapsucker <i>Sphyrapicus thyroideus</i>	All forested montane	Infrequent	Trees (conifers or deciduous)

*Greater sage-grouse and three-toed woodpecker were evaluated for viability but are not migratory.

Fishes

There are approximately 800 miles of perennial streams, 2,030 miles of intermittent streams, and 17,770 surface acres of lakes and reservoirs on the UNF. This diverse array of aquatic habitats, along with its biotic components, forms a complex and interconnected ecosystem. Because of the high elevation, aquatic ecosystems on the UNF support a diverse assemblage of native cold

water fish. The two largest fisheries on the UNF are Strawberry and Currant Creek Reservoirs. There are at least nine native fish species (table 3.31) that historically were found in the waters of the UNF (USFS 2003). Some of these species have not been confirmed to be on the UNF; however, aquatic habitats within the UNF fall within the range and habitats identified for each species by the UDWL (UNHP 2007) and the primary literature (Sigler and Sigler 1996). Three species are Utah State-sensitive species; Bonneville cutthroat trout and Colorado River cutthroat trout (discussed above), and southern leatherside chub (historically found in Utah Lake drainage).

Table 3.31. Common fish species on the UNF.

Common Name	Scientific Name	Location
Bonneville cutthroat trout	<i>Oncorhynchus clarki utah</i>	Native, Bonneville Basin
Brook trout	<i>Salvelinus fontinalis</i>	Non-native species
Brown trout	<i>Salmo trutta</i>	Non-native species
Colorado River cutthroat trout	<i>Oncorhynchus clarki pleuriticus</i>	Native, Colorado Basin
Kokanee salmon	<i>Oncorhynchus nerka</i>	Non-native species
Mottled sculpin	<i>Cottus bairdi</i>	Native species
Mountain sucker	<i>Catostomus platyrhynchus</i>	Native species
Mountain whitefish	<i>Prosopium williamsoni</i>	Native species
Rainbow trout	<i>Oncorhynchus mykiss</i>	Non-native species
Redside shiner	<i>Richardsonius balteatus</i>	Native, Bonneville Basin; Non-native, Colorado Basin
Southern leatherside chub	<i>Gila alecia</i>	Native species
Speckled dace	<i>Rinichthys osculus yarrowi</i>	Native species
Utah chub	<i>Gila atraria</i>	Native, Bonneville Basin

In addition to native species, non-native rainbow trout, brown trout, brook trout, and carp were introduced during the late 1800s and began to displace native fish populations. Non-native species impact native fish, amphibians, and aquatic invertebrates through predation, competition, and hybridization (Quist and Hubert 2004, Walser et al. 1999). In addition, the genetic purity, and any subsequent ecological adaptations, of Bonneville cutthroat trout and Colorado River cutthroat trout is destroyed when they hybridize with introduced rainbow trout. Although non-native species can negatively impact native species, they are considered economically important from a recreation and/or sport fishing perspective and are managed accordingly (USFS 2003; see Section 3.13: Developed and Dispersed Recreation).

Reptiles

Reptiles are cold-blooded, terrestrial animals that are present in a wide variety of habitats. Reptiles on the UNF are inactive during the winter and most seek underground cover during cold periods. Species evaluated for viability that may occur on the UNF are described below.

Milk snakes (*Lampropeltis triangulum*) occur in a wide variety of habitats including open forest, mountain shrub, and sagebrush (Bosworth 2003). This species is widely distributed in North America from sea level to about 9,000 feet. Populations in Utah, western Colorado, and Arizona are considered the subspecies Utah milk snake (*L. triangulum taylori*) (Stebbins 2003). In Utah,

this species is found in the Utah High Plateaus, the southern Wasatch Range, the Uinta Mountains, and the Uinta Basin (Bosworth 2003). On the UNF, it has been found on the Vernon Unit, and in American Fork, Hobbles Creek, and Diamond Fork Canyons (USFS 2003).

Rubber boas (*Charina bottae*) occur in a wide variety of habitat types: grasslands, broken chaparral, woodland, and forest, and are commonly found beneath rotting logs, rocks, and bark. This species is distributed from northern British Columbia to southern California, central Nevada, and central Utah. Utah populations are considered the subspecies Rocky Mountain rubber boa (*C. bottae utahensis*) (Stebbins 2003). In Utah, rubber boas have been found throughout the Wasatch Range (Bosworth 2003) and from various locations across the UNF (USFS 2003:F-69).

Smooth green snake (*Opheodrys vernalis*) is associated with riparian habitats, wet meadows, and other mesic areas (NatureServe Explorer 2006). Smooth green snakes occur discontinuously throughout the southern parts of central and eastern Canada and in the United States (Stebbins 2003). In Utah, the species is known to occur in the Wasatch, Uinta, La Sal, and Abajo Mountains, and the East Tavaputs Plateau (Bosworth 2003). On the UNF, it has been found along Diamond Fork, at Aspen Grove, in Payson Canyon (Bosworth 2003; USFS 2003), and in tributaries of the Provo River (UDWL 2006).

Sonoran mountain kingsnake (*Lampropeltis pyromelana*) occurs in chaparral, pinyon/juniper woodlands, pine woodlands, brushy and rocky canyons, talus slopes, and riparian habitats (NatureServe Explorer 2006); it preys on lizards, other snakes, and small mammals. This species is distributed discontinuously in the southwestern United States and Mexico (USFS 2003). The UNF is at the northern extent of this species' range (Stebbins 2003). There are records of Sonoran mountain kingsnake from Utah County outside the UNF boundary, although the species is now thought to be extirpated from this area (Bosworth 2003).

3.9.4 RFOGDs

The unique features of each RFOGD with regard to TE and sensitive species are described below. Table 3.32 presents a summary of TE species' presence within each RFOGD. Regarding critical habitat for big game, all mapped winter range for elk and mule deer is designated "critical" habitat (as opposed to "high value") with the exception of two small areas in the southeast corner of the Strawberry RFOGD.

Table 3.32. TE and sensitive species presence by RFOGD.

Species	Currant Creek	Deer Creek	Diamond Fork	Payson	Spanish Fork	Strawberry	American Fork	Upper Provo	Vernon
Plants									
Clay phacelia					habitat				
Ute ladies'-tresses			present		habitat				
Barneby woody aster				present					
Dainty moonwort								present	
Rockcress draba							present		
Wasatch jamesia		present		present			present		
Garrett's bladderpod		present		present		present	present		
Birds									
Bald eagle		winter	winter	winter	winter	winter	winter		winter
Western yellow-billed cuckoo							historic nest		
Boreal owl	present								
Flammulated owl	habitat	habitat	habitat	habitat		habitat	nest		
Northern goshawk	nest	nest	nest	nest	present	nest	nest	nest	
Peregrine falcon		historic nest							
Three-toed woodpecker	present	present		present		present	present	present	
Greater sage-grouse						present			present
Mammals									
							nest		
Canada lynx						transient		transient	
Spotted bat	habitat	habitat		habitat			present	habitat	habitat
Townsend's big-eared bat	habitat	present		present			present	habitat	present
Wolverine		historic					historic		

Species	Currant Creek	Deer Creek	Diamond Fork	Payson	Spanish Fork	Strawberry	American Fork	Upper Provo	Vernon
Fishes and Amphibians									
Colorado River cutthroat trout	present					present			
Bonneville cutthroat trout		present	present	present	present	present	present	present	historic
Columbia spotted frog		present	present					present	

Currant Creek

Special Status Species

Boreal owl has been detected within the Currant Creek RFOGD, at the Wolf Creek Campground. The boundaries of the West Fork Duchesne MA in the northern portion of the Currant Creek RFOGD correspond with those of one of the UNF’s two LAUs (USFS 2003a).

Special Status Species: Fisheries

Strong populations of Colorado River cutthroat trout are believed to exist in six tributaries to Currant Creek Reservoir: Jones Cabin Creek, Low Pass Creek, Right Fork Currant Creek, Pass Creek, Race Track Creek, and the Currant Creek headwaters, which includes the Left Fork of Currant Creek, South Fork of the Left Fork Currant Creek, and Tut Creek, in addition to West Fork of the Duchesne River, Little West Fork of the Duchesne River, and Vat Creek. These populations have been identified as conservation populations (USFS 2003a).

Fish Habitat

Based on 2005 and 2006 data provided by the UNF (USFS 2006h), habitat in the tributaries to Currant Creek Reservoir and the West Fork of the Duchesne River is considered fair to good; however, habitat in the Little West Fork and Vat Creek is classified as poor (Hirsch et al. 2005:Appendix C). Jones Cabin Creek, Pass Creek, Left Fork Currant Creek, West Fork Duchesne, Wolf Creek, and Vat Creek have higher percentages of fine sediment than is typical of cutthroat spawning gravels. Forest Road 050, which parallels the West Fork Duchesne River, is a large contributor of sediment.

Wildlife Habitat

The primary wildlife habitat types within this RFOGD are aspen forest, conifer (old growth spruce/fir), and sagebrush, as well as riparian habitat along the many streams, springs, and ponds associated with Currant Creek, West Fork Duchesne River, and Vat Creek drainages (see Section 3.6: Watershed Resources, Including Wetlands, Floodplains, and Riparian Areas) (USFS 2003a).

Big Game

This area is considered summer and transitional range for big game. Critical elk winter range occurs on the eastern end of the State-owned Currant Creek Wildlife MA along Currant Creek below Forest Service land (USFS 2003a). The eastern half of this RFOGD is moose winter range.

Deer Creek

Special Status Species

Wasatch jamesia and Garrett’s bladderpod are found at various locations within the Lower Provo MA in the northwest portion of the Deer Creek RFOGD. This is the only RFOGD in which a peregrine falcon nest has been found. As peregrine falcon numbers continue to increase in Utah, it is likely that birds will again nest within Hobble Creek MA in the southern portion of this RFOGD. Wolverines were also found in this area (USFS 2003a). The distribution of amphibian species within the RFOGD is not well documented; however, observations of Columbia spotted frog have been reported above Deer Creek Reservoir (USFS 2003a).

Special Status Species: Fisheries

Streams within this RFOGD were historically inhabited by Bonneville cutthroat trout, and some genetically pure populations may still reside in isolated stream reaches (USFS 2003a).

Fish Habitat

Based on 2005 and 2006 data provided by the UNF (USFS 2006h), the percentage of fine sediment in Daniels Creek, Main Creek, Right Fork of Hobble Creek, and Wardsworth Creek is higher than typical. Fish habitat in Daniels Creek and Main Creek is considered fair to good.

Wildlife Habitat

The primary wildlife habitat types within this RFOGD are aspen forest and oak/maple. Riparian habitats occur along Daniels Creek, Main Creek, the Right Fork of Hobble Creek, along the Provo River between Deer Creek Reservoir and the western UNF boundary, and along the South Fork Provo River (see Section 3.7: Water Resources, Including Culinary and Municipal Water Systems, Surface Water, and Groundwater). Most of this riparian habitat occurs on non-Forest Service lands (USFS 2003a). Rocky alpine habitats occur on Provo Peak and Corral Mountain (USFS 2003a), and throughout the Mount Timpanogos Wilderness Area (USFS 2003a).

Big game

Most of this RFOGD is considered summer and transitional range for big game at high elevations. Substantial amounts of critical deer and elk winter range occur at lower elevations (USFS 2003a). Critical deer and elk winter range occur within and above Daniels Canyon along the UNF boundary (USFS 2003a). Mountain goats and bighorn sheep occur on Mount Timpanogos and in the Cascade Mountain/Provo Peak area where suitable habitat exists (USFS 2003a).

Diamond Fork

Special Status Species

Ute ladies'-tresses is known to occur in the Diamond Fork RFOGD. The Diamond Fork/Spanish Fork River Ute ladies'-tresses population is the largest along the Wasatch Front, and one of the largest, most concentrated occurrences throughout the species' range (USFS 2003a). In 2002, a population of Columbia spotted frog was discovered on BOR land within this RFOGD boundary, in the lower Diamond Fork drainage (USFS 2003a).

Special Status Species: Fisheries

Populations of Bonneville cutthroat trout within this RFOGD have been identified as conservation populations in Fifth Water Creek, Chase Creek, Shingle Mill Creek, Sixth Water Creek, Halls Fork, and Cottonwood Creek.

Fish Habitat

A Diamond Fork Area Assessment in 2000 indicated that many stream channels are incised and without properly functioning floodplains, due to grazing and high flows from the release of irrigation water through the strawberry tunnel. In addition, these impacts have resulted in riparian areas in some locations that are considered functional-at-risk or non-functional. UNF data from 2005 and 2006 indicates high percentages of fine sediments, particularly in Fifth Water Creek (USFS 2000a).

Wildlife Habitat

The Diamond Fork RFOGD contains a wide variety of vegetation, including conifer and aspen forests in the eastern portion of the RFOGD, to pinyon/juniper, oak/maple, mountain brush, sagebrush, and grass-dominated habitats elsewhere. Forested riparian habitat occurs along Diamond Fork, Wanrhodes Canyon, Cottonwood Canyon, Fifth Water, and Dry Canyon (see Section 3.6: Watershed Resources, Including Wetlands, Floodplains, and Riparian Areas; USFS 2003a).

Big game

This RFOGD provides critical deer and elk winter range at lower elevations (figure 3.24), in addition to summer and transitional big game range. Mountain goats have dispersed south to Spanish Fork Peak along the lower, northern boundary of the Diamond Fork MA (USFS 2003a).

Payson

Special Status Species

The Payson RFOGD is the only RFOGD that contains populations of Barneby woody aster (Mount Nebo area).

Special Status Species: Fisheries

Populations of Bonneville cutthroat trout have been identified as conservation populations in Nebo and Holman Creeks (USFS 2003a).

Fish Habitat

UNF data from 2005 and 2006 indicates that fish habitat in Peteetneet Creek is fair, and fair to good in Holman and Nebo Creeks; with a high percentage of fine sediments in the three creeks.

Wildlife Habitat

The primary habitat types within this RFOGD are oak/maple, alpine habitat on Mount Nebo, conifer forest (spruce/fir and Douglas-fir/white fir), and aspen forest (USFS 2003a). Riparian habitat occurs along North Creek, Mona Creek, Willow Creek, Salt Creek, Red Creek, Pole Creek, Peteetneet Creek, Santaquin Creek, Bennie, and Nebo Creeks (see Section 3.6: Watershed Resources, Including Wetlands, Floodplains, and Riparian Areas; USFS 2003a).

Big game

This RFOGD provides critical deer and elk winter range at lower elevations, in addition to summer and transitional big game range (USFS 2003a). The majority of this RFOGD contains bighorn sheep habitat.

Spanish Fork Canyon

Special Status Species

The Spanish Fork Canyon RFOGD is the only Group that contains habitat for clay phacelia (Endangered). Clay phacelia occurs within Spanish Fork Canyon outside the UNF boundary. Habitat for Ute ladies'-tresses also exists in this RFOGD.

Special Status Species: Fisheries

Streams within the RFOGD were historically inhabited by Bonneville cutthroat trout and some genetically pure populations may still reside in isolated stream reaches (USFS 2003a).

Fish Habitat

Based on 2005 and 2006 data provided by the UNF (USFS 2006h), percentages of fine sediment in Tie Fork and Indian Creek are higher than is typical of cutthroat spawning gravels.

Wildlife Habitat

The primary wildlife habitats in this RFOGD are pinyon/juniper, oak/maple, sagebrush, and conifer forest (primarily Douglas-fir/white fir). Important riparian habitat is found in the Sheep Creek, Tie Fork, and Indian Creek drainages.

Big game

The Upper Spanish Fork MA provides large areas of critical and high value winter range for elk and mule deer. Rocky Mountain bighorn sheep were common within this area before the late 1800s, but overhunting, disease transmission, and competition from domestic sheep led to their extirpation (USFS 2003a).

Strawberry

Special Status Species

A historic record of Canada lynx comes from Strawberry Valley in 1966 (USFS 2003a). More recently (July 2004), a male lynx with a radio-transmitter that had been previously translocated to Colorado was observed in this area. The lynx did not stay in the area for more than one week, and eventually moved off the UNF. Sage-grouse on the UNF occur in this RFOGD (in addition to Vernon), where winter range and brooding habitat occurs (figure 3.24).

Special Status Species: Fisheries

Streams within the RFOGD were historically inhabited by Colorado River cutthroat trout and some genetically pure populations still reside in isolated stream reaches (USFS 2003a). Strong populations of Bonneville cutthroat trout, introduced into the Strawberry Reservoir drainage, occur within several of the major stream systems (USFS 2003a).

Fish Habitat

Colorado River cutthroat trout habitat is considered good in Trail Hollow and its tributaries and fair in The Left Fork and Middle Fork of the White River, Johnson Fork, and Tabbyune Creek (Hirsh et al. 2005). However, USFS (1996) indicated that sediment inputs to Tabbyune Creek and the Left Fork White River were high. Further, UNF data from 2005 and 2006 indicates high percentages of fine sediment at sample sites on Tabbyune Creek, Left Fork White River, Right Fork White River, and Willow Creek. High sediment inputs in the area are due to naturally high erosion that in some areas is exacerbated by grazing, mining, road construction, etc. (USFS 1996). Within the Strawberry Reservoir management area, fish habitat has been heavily impacted by human activities including the removal of native willows during the 1960s, early water diversions, and heavy livestock grazing (USFS 2004). These activities have resulted in high levels of bank erosion, increased sediment loads, increased stream temperatures, stream widening and stream channel incision. Increased sedimentation and stream bed armoring could negatively impact spawning of salmonids by reducing access to clean, aerated gravels. In addition, over-winter survival of stream resident salmonids could be impacted by stream widening and the subsequent reduction in structure and number of deep pools (USFS 2004).

Wildlife Habitat

The primary habitat types in this RFOGD include aspen forest, conifer forest, oak/maple, sagebrush, and wet meadows. Large areas of riparian habitat occur along Strawberry River, Willow Creek, Bjorkman Creek, Co-op Creek, Clyde Creek, Mud Creek, Indian Creek, Trail Hollow, Tabbyune Creek, and the Left, Middle, and Right Fork of the White River (see Section 3.6: Watershed Resources, Including Wetlands, Floodplains, and Riparian Areas) (USFS 2003a).

Big game

This RFOGD provides high value and critical winter range for both elk and mule deer in addition to summer and transitional big game range (USFS 2003a).

American Fork

Special Status Species

The American Fork RFOGD is the only RFOGD containing the sensitive plant rockcress draba, which inhabits gravelly tundra soils. The majority of rockcress draba individuals in one of two known sites in the Wasatch Range can be found a few hundred yards outside the UNF boundary near the Lone Peak Wilderness Area; in 2002 a nearby population was discovered within the UNF (USFS 2003b). Sensitive plants Wasatch jamesia and Garrett’s bladderpod are also found in the American Fork RFOGD (USFS 2003a). The American Fork RFOGD is also the only area in which spotted bats have been recorded (not just suitable habitat), in American Fork Canyon, and the only area in which flammulated owls are known to nest. Wolverines historically occurred within this RFOGD (USFS 2003a).

Special Status Species: Fisheries

Streams were historically inhabited by Bonneville cutthroat trout, and some genetically pure populations still reside in isolated stream reaches in the American Fork River (USFS 2003a).

Fish Habitat

The American Fork River was not evaluated for sediment (USFS 2006h).

Wildlife Habitat

The low-elevation forested riparian habitat type that occurs in American Fork Canyon and Dry Canyon is the richest in species diversity on the UNF, and has been negatively impacted by development more than any other habitat type (USFS 2003a).

Big game

A herd of mountain goats occurs within the Lone Peak Wilderness Area, originally translocated into the Twin Peaks area in 1967 as the first mountain goat introduction in Utah. Rocky Mountain bighorn sheep also occur within the Lone Peak Wilderness Area as a result of recent reintroductions. Oak/maple, mountain brush, and sagebrush vegetation associations along the west slope of the RFOGD provide critical and high value deer winter range and high value elk winter range.

Upper Provo

Special Status Species

The Upper Provo RFOGD is the only RFOGD in which the Sensitive plant dainty moonwort is found. The boundaries of the Upper Provo RFOGD correspond with those of one of the UNF’s

two LAUs (USFS 2003a). In January 2005, a collared female lynx from Colorado was tracked by airplane and located in the Soapstone Basin on the west end of the Uinta Mountains (USFS 2006). Boreal owls have been detected in the Soapstone Basin area and a nest was found on Soapstone Mountain in 2001. Columbia spotted frogs have been documented in habitat areas immediately adjacent to the Upper Provo MA Group, and the species is assumed to occur here (USFS 2003a).

Special Status Species: Fisheries

Bonneville cutthroat trout populations have been identified as conservation populations in the Little South Fork of the Provo River and as persistence populations in Bench Creek, Upper South Fork of the Provo River, and Soapstone Creek.

Fish Habitat

Based on 2005 and 2006 data provided by the UNF (USFS 2006h), percent fine sediment in Dipvat Creek is higher than is typical of cutthroat spawning gravels. Bench Creek, Provo River, and Soapstone Creek were not evaluated.

Wildlife Habitat

The Upper Provo Management Area is an important area for terrestrial wildlife species because this area provides connectivity to large forested areas on the Wasatch-Cache and Ashley National Forests in the Uinta Mountains. The primary habitat types are aspen forest, conifer forest (primarily spruce/fir), and sagebrush. Riparian habitat occurs along the South Fork Provo River, the Little South Fork, and Soapstone Creek (USFS 2003a).

Big game

Because of its higher elevations, this management area is considered primarily summer and transitional range for big game, although high value elk winter range is located at the northwest corner of the management area (USFS 2003a).

Vernon

Special Status Species

The Vernon RFOGD provides habitat for one of two populations of greater sage grouse that occur on the UNF. Lek counts from the primary lek within this management area have fluctuated greatly, but the overall population trend has been stable between 1968, when the UDWL began conducting lek counts, and the present (USFS 2003a). Abandoned mines within the Vernon MA provide potential roosting habitat for Townsend’s big-eared bats, spotted bats, and other bat species.

Special Status Species: Fisheries

Streams within the Vernon RFOGD were historically inhabited by Bonneville cutthroat trout; however, these populations are no longer present.

Fish Habitat

Fish habitat is severely limited due to the lack of sufficient stream flows (USFS 2003a). Streams in this RFOGD were not evaluated for sediment (USFS 2006h).

Wildlife Habitat

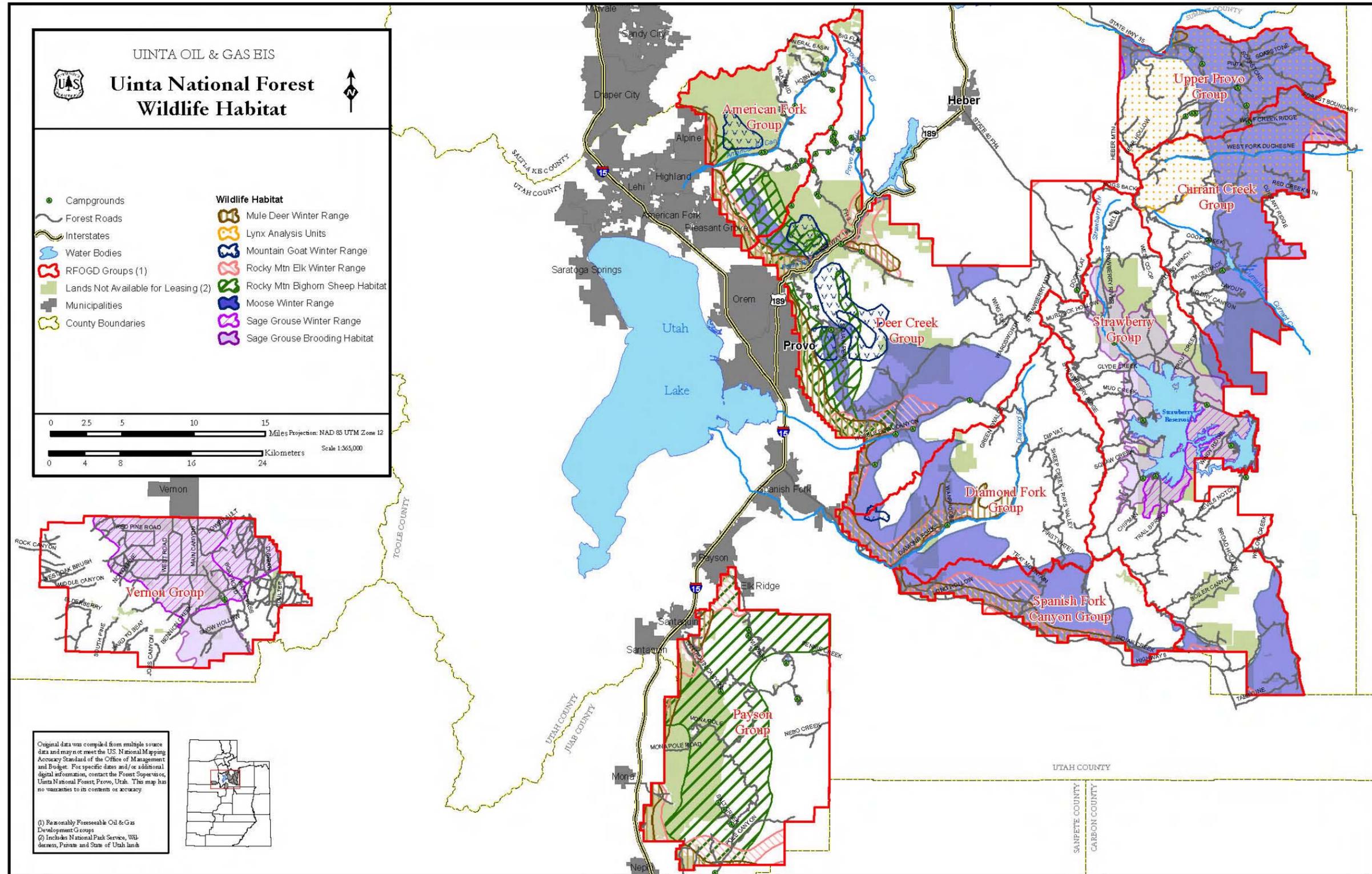
The primary habitat types of this area are sagebrush, pinyon/juniper woodland, oak/maple, and mountain brush. Riparian habitat occurs along Vernon Creek, Bennion Creek, Harker Canyon, and Little Valley Creek (USFS 2003a).

Big game

The Vernon RFOGD is also the only part of the UNF where pronghorn antelope occur. Pronghorn occur at low densities in both the Vernon and West Sheeprock MAs.

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Figure 3.24. Forest-wide wildlife map.



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